8. Technology Integration

The Technology Integration subprogram accelerates the adoption and use of alternative fuel and advanced technology vehicles to help meet national energy and environmental goals and accelerate dissemination of advanced vehicle technologies through demonstrations and education. This subprogram's efforts logically follow successful research by industry and government and help to accelerate the commercialization and/or widespread adoption of technologies that are developed in other VT program areas. Deployment activities linked to R&D also provide early market feedback to emerging R&D.

Subprogram functions include both regulatory and voluntary components. The regulatory elements include legislative, rulemaking, and compliance activities associated with alternative fuel requirements identified within the Energy Policy Acts of 1992 and 2005 (EPACT 1992 and EPACT 2005), as well as the Energy Independence and Security Act of 2007 (EISA). Voluntary efforts include demonstration of advanced technology vehicles to verify market readiness and public information, education, outreach and technical assistance efforts. VTP works with public/private partnerships between DOE and local coalitions of key stakeholders across the country (such as through Clean Cities) to implement strategies and projects that displace petroleum. In addition, the annual DOE/EPA Fuel Economy Guide publication and related data dissemination efforts (required by law) are produced, along with the website www.fueleconomy.gov.

Education aids in overcoming institutional barriers to widespread use of advanced vehicle technologies and alternative fuels, and serves to train the next generation of participants in this technology sector. Activities such as the Advanced Vehicle Competitions (EcoCAR) and Graduate Automotive Technology Education (GATE) encourage the interest of university student engineers and engage their participation in advanced technology development.

EcoCAR 2: Plugging In to the Future: EcoCAR 2 is a three-year collegiate engineering competition and the only program of its kind. The mission of EcoCAR 2 is to educate the next generation of automotive engineers through an unparalleled hands-on, real-world engineering experience. The competition challenges 16 North American universities to reduce the environmental impact of vehicles without compromising performance, safety and consumer acceptability. EcoCAR 2 requires students to explore a variety of powertrain architectures and follow a real-world engineering regimen modeled after GM's Global Vehicle Development Process (GVDP). EcoCAR 2 teams will utilize a Chevrolet Malibu, donated by General Motors, as the integration platform for their advanced vehicle design.

Graduate Automotive Technology Education (GATE): DOE established the GATE Program in 1998 to train a future workforce of automotive engineering professionals in developing and commercializing advanced automotive technologies to help overcome technology barriers preventing the development and production of cost-effective, high-efficiency vehicles for the U.S. market. DOE originally established 10 GATE Centers of Excellence at nine U.S. universities that addressed fuel cells, hybrid electric vehicle drivetrains and control systems, lightweight materials, direct-injection engines, and advanced energy storage. In 2005, DOE began a second competition to form new, or expand, existing GATE Centers of Excellence. The eight universities that received awards focused on hybrid propulsion systems, fuel cells, advanced computation and simulation, energy storage systems, biofuels, and lightweight materials. In 2011, DOE supported seven new or expanded Centers of Excellence, focused on hybrid propulsion, energy storage, and lightweight materials.

EPAct Transportation Regulatory Activities: VTP manages several Energy Policy Act (EPAct) transportation regulatory activities that aim to reduce U.S. petroleum consumption through the use of alternative fuels, building a core market for alternative fuel vehicles (AFVs), and other petroleum-displacement methods.

Clean Cities: Clean Cities advances the nation's economic, environmental, and energy security by supporting local actions to reduce petroleum consumption in transportation. Clean Cities is a national network of nearly 100 volunteer coalitions that bring together stakeholders in the public and private sectors to deploy alternative and renewable fuels, idle-reduction measures, fuel economy improvements, and emerging transportation technologies.

In August 2009, DOE announced the selection of projects supporting two program areas under ARRA: transportation electrification education; and clean fuels, vehicles and infrastructure development. With funding totaling $39 million, the 10 ARRA-funded Advanced Electric Drive Vehicle Education activities support educational programs to substantially reduce petroleum consumption. Activities under this program include engineering degree and certificate programs, emergency responder and safety training, consumer and K-12 educational outreach, developing and providing teaching materials, and training service personnel, vehicle mechanics, and supporting infrastructure.

Additionally, the Department announced the selection of 25 projects totaling nearly $300 million that will speed the transformation of the nation's fleet. These projects will place more than 8,000 alternative fuel and energy efficient vehicles on the road, and establish hundreds of refueling locations/recharging sites across the country, which are both activities that support efforts to reduce petroleum consumption. Activities include development of alternative fuel infrastructure and alternative fuel corridors; alternative fuel vehicle deployment, including deployments of light-duty alternative fuel vehicles and vehicle conversions; upgrades to existing alternative fuel infrastructure; technical training; and education and outreach.

In this merit review activity, each reviewer was asked to respond to a series of questions, involving multiple-choice responses, expository responses where text comments were requested, as well as numeric scoring responses *(on a scale of 1 to 4)*. In the pages that follow, the reviewer responses to each question for each project will be summarized: the multiple choice and numeric score questions will be presented in graph form for each project, and the expository text responses will be summarized in paragraph form for each question. A summary table presenting the average numeric score for each question for each project is presented below.

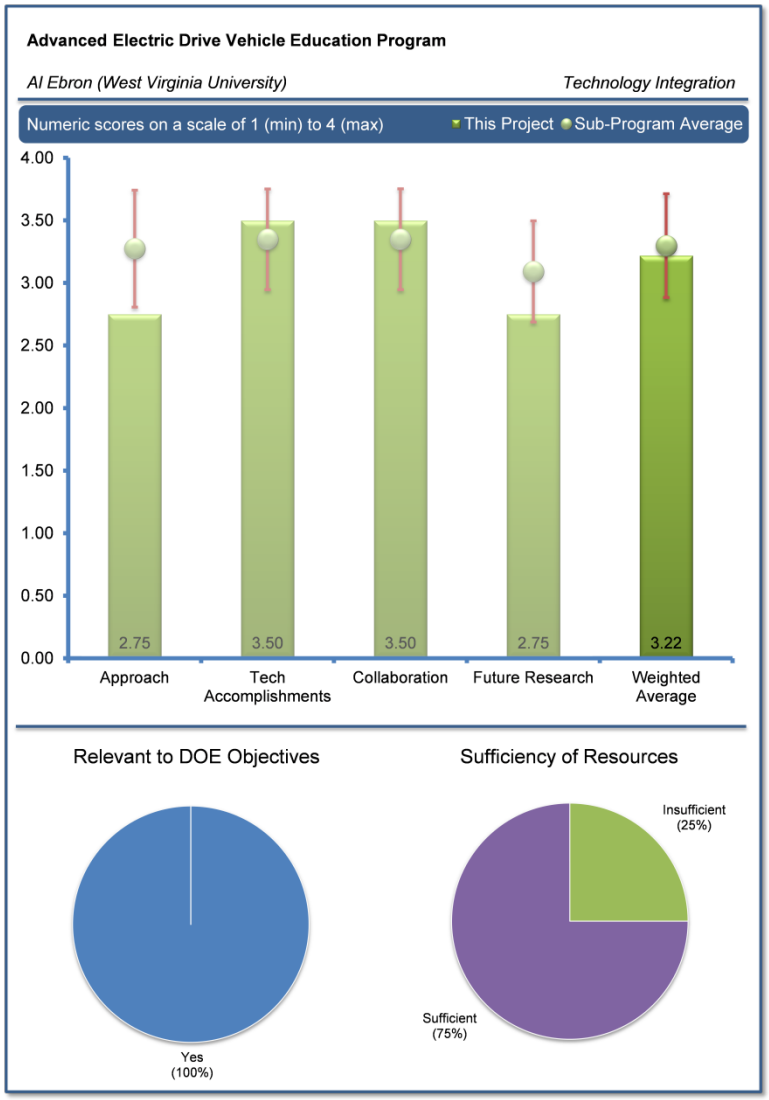
Presentation Title	Principal Investigator and Organization	Page Number	Approach	Technical Accomplishments	Collaborations	Future Research	Weighted Average
‡ Advanced Electric Drive Vehicle Education Program	Al Ebron (West Virginia University)	8-5	2.75	3.50	3.50	2.75	3.22
‡ Indiana Advanced Electric Vehicle Training and Education Consortium (I-AEVtec)	James Caruthers (Purdue University)	8-9	3.40	3.40	3.40	3.40	3.40
‡ Advanced Electric Drive Vehicle Education Program: CSU Ventures	Gary Caille (Colorado State University)	8-12	3.20	3.40	3.40	3.00	3.30
‡ Advanced Electric Drive Vehicles – A Comprehensive Education, Training, and Outreach Program	Mehdi Ferdowsi (Missouri University of Science and Technology)	8-15	3.00	2.60	2.60	2.80	2.73
‡ Development and Implementation of Degree Programs in Electric Drive Vehicle Technology	Ka Yuen Simon Ng (Wayne State University)	8-18	3.75	3.50	3.50	3.00	3.50
‡ Electric Vehicle Safety Training for Emergency Responders	Andrew Klock (National Fire Protection Association)	8-21	3.40	3.40	3.40	3.60	3.43
‡ Recovery Act – An Interdisciplinary Program for Education and Outreach in Transportation Electrification	Carl Anderson (Michigan Technological University)	8-25	3.80	3.60	3.60	3.80	3.68
‡ Recovery Act—Transportation Electrification Education Partnership for Green Jobs and Sustainable Mobility	Huei Peng (University of Michigan)	8-28	3.20	3.20	3.20	3.40	3.23
‡ Advanced Electric Drive Vehicles	Lawrence Schwendeman (J. Sargeant Reynolds Community College)	8-31	2.00	2.20	2.20	2.20	2.15
‡ Electric Vehicle Service Personnel Training Program	Gerald Bernstein (City College of San Francisco)	8-34	3.40	3.00	3.00	3.00	3.10
‡ Idaho Petroleum Reduction Leadership Project	Beth Baird (Idaho Petroleum Reduction Leadership Project)	8-37	3.57	3.14	3.14	3.29	3.27

Presentation Title	Principal Investigator and Organization	Page Number	Approach	Technical Accomplishments	Collaborations	Future Research	Weighted Average
‡ Puget Sound Clean Cities Petroleum Reduction Project	Stephanie Meyn (Puget Sound Clean Air Agency)	8-41	3.57	3.71	3.71	3.43	3.64
‡ Utah Clean Cities Transportation Sector Petroleum Reduction Technologies Program	Robin Erickson (Utah Clean Cities Coalition)	8-45	3.57	3.71	3.71	3.43	3.64
‡ SANBAG - Ryder Natural Gas Vehicle Project	Kelly Lynn (San Bernardino Associated Governments)	8-48	2.83	3.17	3.17	2.67	3.02
‡ Heavy-Duty Natural Gas Drayage Truck Replacement Program	Vicki White (South Coast Air Quality Management District)	8-53	3.83	3.50	3.50	3.33	3.56
‡ UPS Ontario - Las Vegas LNG Corridor Extension Project: Bridging the Gap	Larry Watkins (South Coast Air Quality Management District)	8-59	3.17	3.17	3.17	2.50	3.08
‡ Wisconsin Clean Transportation Program	Maria Redmond (State of Wisconsin)	8-64	3.29	3.71	3.71	3.14	3.54
‡ Connecticut Clean Cities Future Fuels Project	Carla York (Connecticut Clean Cities Future Fuels Project)	8-69	3.50	3.50	3.50	3.50	3.50
‡ State of Indiana/Greater IN Clean Cities Alternative Fuels Implementation Plan	Patrick Flynn (State of Indiana)	8-72	3.67	3.17	3.17	3.50	3.33
‡ NJ Compressed Natural Gas Refuse Trucks, Shuttle Buses and Infrastructure	Chuck Feinberg (New Jersey Clean Cities Coalition)	8-76	3.57	3.43	3.43	3.29	3.45
‡ Promoting a Green Economy through Clean Transportation Alternatives	Rita Ebert (Greater Long Island Clean Cities Coalition)	8-81	3.00	3.67	3.67	3.17	3.44
‡ New York State-wide Alternative Fuel Vehicle Program for Vehicles and Fueling Stations	Patrick Bolton (New York State Energy Research and Development Authority)	8-84	3.40	3.60	3.60	3.20	3.50
‡ The Ohio Advanced Transportation Partnership (OATP)	Cynthia Maves (Clean Fuels Ohio)	8-87	3.29	3.57	3.57	3.14	3.45
‡ RECOVERY ACT -- CLEAN ENERGY COALITION MICHIGAN GREEN FLEETS	Sean Reed (Clean Energy Coalition)	8-92	3.57	3.29	3.29	3.29	3.36
‡ Midwest Region Alternative Fuels Project	Kelly Gilbert (Metropolitan Energy Information Center)	8-97	3.29	3.71	3.71	3.14	3.54
‡ North Central Texas Alternative Fuel and Advanced Technology Investments	Lori Clark (North Central Texas Council of Governments)	8-100	3.50	3.50	3.50	3.67	3.52
‡ Texas Propane Vehicle Pilot Project	Dan Kelly (Railroad Commission of Texas)	8-102	4.00	4.00	4.00	3.00	3.88
‡ Development of National Liquid Propane (Autogas) Refueling Network, Clean School Bus/Vehicle Incentive & Green Jobs Outreach Program	David Day (Texas State Technical College)	8-104	3.00	2.33	2.33	2.67	2.54
‡ DeKalb County/Metropolitan Atlanta Alternative Fuel and Advanced Technology Vehicle Project	Don Francis (DeKalb County)	8-106	3.50	3.83	3.83	3.00	3.65
‡ Chicago Area Alternative Fuels Deployment Project (CAAFDP)	Samantha Bingham (City of Chicago, Department of Environment)	8-110	3.57	3.43	3.43	3.14	3.43
‡ Kentucky Hybrid Electric School Bus Program	Tom Stratton (Kentucky Department of Education)	8-115	2.33	3.17	3.17	3.17	2.96

Presentation Title	Principal Investigator and Organization	Page Number	Approach	Technical Accomplishments	Collaborations	Future Research	Weighted Average
‡ Maryland Hybrid Truck Goods Movement Initiative	Christopher Rice (Maryland Energy Administration)	8-120	3.00	2.71	2.71	2.71	2.79
‡ Carolinas Blue Skies & Green Jobs Initiative	Kathy Boyer (Triangle J Council of Government)	8-124	3.00	3.50	3.50	2.33	3.23
‡ Southeast Propane AutoGas Development Program	Al Christopher (Virginia Department of Mines, Minerals and Energy)	8-129	4.00	3.83	3.83	3.50	3.83
‡ California Low Carbon Fuels Infrastructure Investment Initiative	Robert Bowen (California Department of General Services)	8-132	2.00	2.83	2.83	2.00	2.52
National Alternative Fuels Training Consortium (NAFTC) Clean Cities Learning Program	Al Ebron (West Virginia University)	8-137	3.00	3.60	3.60	3.20	3.40
Overall Average			3.28	3.35	3.35	3.09	3.30

‡ denotes ARRA funded projects

Advanced Electric Drive Vehicle Education Program: Al Ebron (West Virginia University) – arravt031



Reviewer Sample Size

This project was reviewed by four reviewers.

Question 1: Does this project support the overall DOE objectives? Why or why not?

The reviewers' responses were mixed. A reviewer said that the project supports the petroleum displacement goal in an indirect but important way, adding that technicians would need to be able to diagnose and service electric-drive vehicles as they enter the fleet. The reviewer continued, stating that first responders likewise need to be prepared; perhaps even more so, since first responders do not have time to read manuals when responding to an emergency. The reviewer concluded that outreach efforts help build knowledge, interest, and excitement in electric-drive vehicles and related technologies.

Another commenter stated that training, education, outreach and awareness activities such as these are of value in providing electric vehicle (EV) and hybrid electric vehicle (HEV) literacy to the public, as well as providing specific training to the workforce sector, thus accelerating mass market introduction and penetration of advanced electric drive vehicles, resulting in the Department of Energy (DOE) objectives of petroleum displacement.

The third reviewer noted that the program would reach a large number of people due primarily to the Odyssey Day events and would educate the public about the importance of alternative fuels and advanced technology vehicles and their impact on petroleum reduction.

The final commenter believed that this project would support the overall DOE objectives if it could accomplish its goals within the time frame for the award. The evaluator noted that seven months remain in a three-year project that saw $6.9 million of federal funds awarded, and only 35% of the project is complete to date. This evaluator wondered what was going on in a project that has created 17.5 new full time equivalent (FTE) jobs and retained 20.5 FTE jobs. The reviewer asked if this is a jobs program at the National Alternative Fuels Training Consortium (NAFTC). The reviewer continued by stating that it could not be understood why the second year goals were still in progress, as well as many of the third year goals. In the reviewer's opinion, at this point in the award, final reviews of curriculum should be taking place and the research should be wrapping up.

Question 2: What is your assessment of the approach to performing the work? To what degree are technical barriers addressed? Is the project well-designed, feasible, and integrated with other efforts?

The reviewers' responses were mixed. A commenter said that developing curricula, training trainers, and making handbooks and mobile applications ensured that the benefits of this project would continue long after the current effort, as does educating and inspiring young people through the alternative fuel vehicle (AFV) Odyssey Day.

One evaluator said that, while discussed, the reviewer would have liked to see the barriers, and specific steps taken to address them stated in the presentation as was found in other presentations.

Another evaluator said that it was not clear in the presentation how each product would be deployed or to whom. The reviewer was also uncertain on how the materials were evaluated on effectiveness and impact. The reviewer asked if there was a tracking mechanism to determine the scale of deployment and impact and what the outreach strategy was. The reviewer also wished to know how the career and technical education (CTE) would be used beyond the two pilot schools, such as through Clean Cities and schools in those areas.

The final reviewer said that the presentation contained some pretty far-reaching numbers about the audience impact. The reviewer used the example of the number of 105 million people being used as part of the presentation, that is, the number of people that this program would reach. When asked how that number was arrived at, the response was, if a paper had a circulation of 100,000 the entire circulation was counted as reached. The reviewer opined that this was only if readers stopped and read that article or page. The reviewer noted having difficulty with the presentation and described it as smoke and mirrors because, in the reviewer's opinion, to use these types of numbers with no qualifications put the entire program under suspicion. The reviewer suggested that the project needed to qualify the overall effect into more believable terms. The commenter would have preferred a method that stated any news and media sources used would expose 100 million people to the programs and, at best, a 20% interest factor, then 20 million would be reached in terms of their interest. The reviewer felt that this would be more believable. The commenter suggested that the conversion factor for direct mail (i.e., mail that is sent directly to a person's inbox) is 0.5 to 1.5 %. The reviewer ended by stating that those were real numbers so the question is what is real.

Question 3: Characterize your understanding of the technical accomplishments and progress toward overall project and DOE goals.

The reviewers' responses were mixed. One reviewer noted that excellent progress had been made in the development of multiple products for first responders, trainers, educators and students at 7-12th grade, automotive technicians, and electric vehicle supply equipment (EVSE) installers. The reviewer added that keeping the material updated with current plug-in electric vehicle (PEV) information would continue to be a challenge, but the grantee was mindful of this and made corrections as necessary. The reviewer also said that, in some cases, such as iPhone apps, the grantee has gone beyond the scope of the grant. The commenter also noted that multiple learning methods seemed to be incorporated into each product.

Another evaluator commented that the project looked to be on schedule and finishing milestones and tasks.

The third reviewer said that the project appeared to have made numerous significant accomplishments, adding that the output was impressive. The reviewer noted that the presenter's claim of reaching over 100 million people may or may not be realistic, depending strongly on the definition of reach.

The final reviewer stated that the rate of progress was slow, and wondered about the expenditure to date. The reviewer was of the opinion that if the project had spent $1.5 million so far, it would be okay. The reviewer went on to suggest that using project management standards, team members might not be happy with the progress, but would have only spent one-third of the money. The reviewer suspected the project team has spent a lot more than one-third. The reviewer had examined the courseware developed to date, and believed there were several issues. In the commenter's opinion, the trainer manual is at least that. The reviewer felt that it was more of a reference manual with lots of great graphics, but did not describe how and what a trainer teaches. The reviewer believed that PowerPoint slides included in the manual were an example of this. The reviewer was concerned that there was no text, no storyline that accompanied the slide, and opined that it was just PowerPoint slides that stood on their own. The

reviewer suggested that the text and slides need to be integrated as one, where a storyline is created that is a guide for the instructor to follow. The reviewer added that this is necessary because slides alone leave much for the instructor to interpret, which means in the end that the training is not standardized. The reviewer noted that they have seen this before. The reviewer continued that what happens is that the instructor interprets what is important and what is not, so the material being taught vacillates from one high to another. The reviewer noted that this does not mean that the instructors cannot add their personal stories. Rather, continued this reviewer, it means that those stories are taken along a particular knowledge path. The reviewer finished by saying that the material in the rest of the course book (emergency responder) might be that which is required with the PowerPoint slides, but that it needs to have an integrated narrative that helps the learner know the beginning and end of the program.

Question 4: What is your assessment of the level of collaboration and coordination with other institutions?

The reviewers' responses were mixed. One reviewer said that their collaboration seems to be good with a number of good partners. The second reviewer commented that there was an extensive set of appropriate collaborations with a nationwide consortium of training centers. This expert wondered if the creation of the first-responder safety-training manual duplicated work done by the National Fire Protection Association (NFPA), and if that was reported in another session. The same reviewer noted that the presenter said that West Virginia University (WVU) is not currently coordinating with NFPA.

The third expert stated that the collaboration with the OEM is good and helped to develop quality first responder materials. SME was involved in reviewing documents. The reviewer went on to say that one EVSE equipment company would help with infrastructure guide, wondering if perhaps others should be brought in for review. The reviewer suggested that a large network seemed to be in place to ensure quality products.

The final reviewer would like to have heard more specific examples on what role the partnerships and collaborations have played, adding that this was the same with most of the presentations, being sure they cannot talk to everything in the allotted time given. The reviewer added that the information was present in summary form on the slide, which was adequate.

Question 5: Has the project effectively planned its future work in a logical manner by incorporating appropriate decision points, considering barriers to the realization of the proposed technology, and, when sensible, mitigating risk by providing alternate development pathways?

A reviewer stated that the curricula and train the trainer programs probably yielded a greater bang for the buck than the direct technician and first-responder training, so DOE may want to consider increasing the emphasis on this pathway in the future. The second reviewer would have liked to have heard more about the sustainability of the project past its end date.

The third commenter was curious how the materials would be offered to organizations outside of NAFTC schools and how much these materials would cost and how to host the varying courses. The reviewer also wondered how those trained as trainers and their locations would be tracked. The reviewer asked if there was a mechanism in place that can easily transmit new materials and information to those who have been trained since the technology is rapidly evolving and how will the products just coming on-line be evaluated in time to make any necessary corrections.

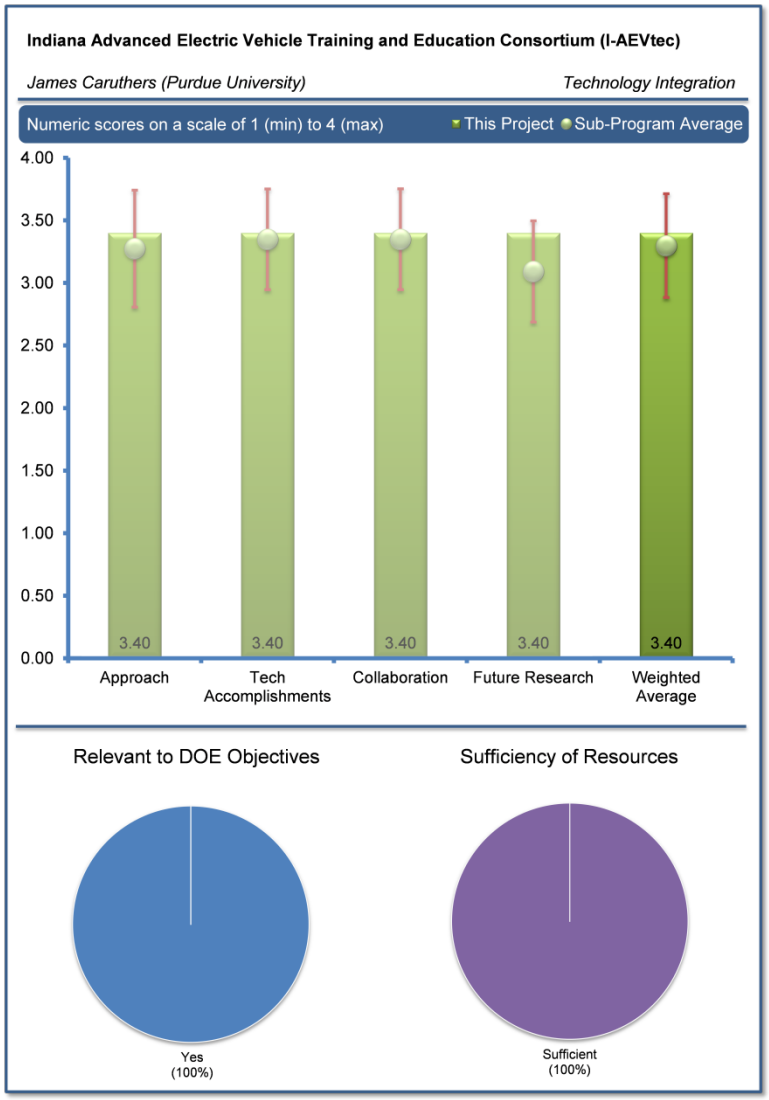
The final reviewer was unsure if this project could be finished on time with 65% of the work yet to be completed, and an expenditure rate that the reviewer believed exceeded the funds necessary to finish up. The reviewer suggested that DOE ask how much money was left and what the end of project plan looks like. When questioned about how much of the money awarded under the grant was used to develop first responder training, the reviewer was not satisfied with the project's response, that it was not broken down that way. The reviewer believed this was a bad sign, and that each project task should have a funding line associated with it. The reviewer noted that this response made them wonder.

Question 6: How sufficient are the resources for the project to achieve the stated milestones in a timely fashion?

Three reviewers observed that resources were sufficient, while one noted resources were insufficient. A reviewer responded that there was a large funding source for multiple complicated tasks. The commenter added that milestones appeared to be on track by the end of the year. The reviewer wondered that if course corrections needed to be adopted if there would be sufficient time.

Another reviewer said that this was a hard question to answer, because the reviewer believes that excessive money was awarded in the curriculum development area and the presentation did not show what funds were specifically allocated towards those tasks. The reviewer selected insufficient only because they believed the project team had overspent the funds and that too many of the tasks were in process, noting that not even a percentage was offered as to how in process those tasks are. The reviewer recommended that someone at DOE find out how much money had been spent in total, what the exact progress of the tasks as they currently exist were, and what the plan for finishing up the project on time and at budget was. The reviewer also suggested a written plan.

Indiana Advanced Electric Vehicle Training and Education Consortium (I-AEVtec): James Caruthers (Purdue University) – arravt032



Reviewer Sample Size

This project was reviewed by five reviewers.

Question 1: Does this project support the overall DOE objectives? Why or why not?

The reviewer responses were generally positive. A commenter said that the project creates an EV relevant curriculum at a number of higher education institutions and for secondary education in Indiana. The reviewer noted that with the creation of a hub for online material, this program would target a broad audience with different needs for understanding technology, adding that with additional focus on outreach (EV grand prix, science fair), the project seems well poised to inspire interest across the community in petroleum-displacing technologies.

One evaluator commented that training and education activities, such as these, were of value in providing EV and HEV literacy to the public, as well as providing specific training to the workforce sector, accelerating mass market introduction and penetration of advanced electric drive vehicles, thus resulting in the DOE objectives of petroleum displacement.

Another commenter was of the opinion that electric vehicles could contribute to significant petroleum displacement only if their use became widespread and was sustainable. The reviewer added that support of new technology in the hands of actual users is always necessary for gaining consumer acceptance. The reviewer also stated that the development of engineers and technicians was at the core of that support, and additionally exposing the minds of the young to the basic principles of electric vehicles would create a demand for the education and training in this field in the coming years.

The fourth reviewer stated that this was an excellent, well-interconnected education and consortium-building project. The final reviewer opined that the project supported the objective of petroleum displacement although it provided secondary support. The reviewer added that the project addressed part of the overall system that is necessary to make electric vehicles successful, which can displace petroleum, but that this displacement was not directly tied to the project. The reviewer concluded by saying that it was not necessarily a bad thing, just a clarification.

Question 2: What is your assessment of the approach to performing the work? To what degree are technical barriers addressed? Is the project well-designed, feasible, and integrated with other efforts?

The reviewer responses were generally positive. One reviewer stated that the project was well organized, making execution straightforward. Another reviewer mentioned that the project presented clear objectives and a strategy for deployment. The third reviewer commented that there was a very impressive group of networked supporting companies, and an impressive grouping of

schools each contributing to the deliverables. The reviewer observed a broad impact in the region, and commented that it was nice that that they were getting the visible outreach at the racetrack.

The fourth expert said that the project had a high level of integration across various institutions, and that the hub for online information served and would serve as a valuable resource in addressing the different educational needs of the audiences the project sponsors were trying to reach. The reviewer added that it allowed them to effectively target different parts of the community, different technical capacities, and different interests. The commenter did caution that, because the project was at a moderate level of implementation, it was difficult to assess the degree to which the sponsors were addressing technical barriers. The reviewer continued by saying that some of the institutions covered by the project appeared to be offering limited courses at this point, but the reviewer also stated that the high level of planning and integration across institutions indicated that the project sponsors were addressing technical barriers.

The final evaluator stated that, overall, the project seemed well designed and seemed to be addressing barriers. The reviewer added that it was somewhat hard to tell given the amount of information that can be provided in the way U.S. DOE conducted these reviews. The commenter did not find it clear whether or not feedback from K-12 teachers were being collected and used to continuously improve that portion of the project, but the reviewer added that this was because of the time available to discuss the project.

Question 3: Characterize your understanding of the technical accomplishments and progress toward overall project and DOE goals.

The reviewer responses were generally positive. A commenter said that the project demonstrated clear objectives, relevance to the overall project goals, and how each objective dealt with addressing barriers. The second reviewer noted that significant progress towards overcoming the barriers had been achieved, adding that the project is on track to achieve all goals by the close of the project. The third evaluator stated that as an education-focused project there were fewer tangible technical accomplishments, per se. This reviewer added that the educational impact is great and thus the workforce development role is very important, and because of the visibility of the outreach then it is possible that it will lead to attracting more students into this important field.

The fourth reviewer felt the project indicated substantial progress toward the goals of creating and implementing curriculum at the higher educational and secondary levels. This evaluator also stated that the project sponsors have worked to create a dialog with partners in industry and government, and that participation in outreach activities (grand prix, science fair) indicated a high level of community engagement, and successive years indicated increasing engagement.

Another expert stated that, at least based on the presentation and what the presenter verbally said, the project seemed very much on track. The reviewer cautioned that they were taking the presenter's word for that. The reviewer said that good progress appeared to be being made towards meeting the goals of the project, which may almost be met. The reviewer also said that the Grand Prix race was very impressive and looked to be a great piece of work.

Question 4: What is your assessment of the level of collaboration and coordination with other institutions?

The reviewer responses were generally positive. One reviewer noted there was good collaboration across multiple universities. A second expert said that Purdue has formed collaboration and coordination with most every possible EV and automotive organization in the Midwest, including Cummins and the Indianapolis Motor Speedway. The third evaluator said that it was a very nice network of impacted companies, and suggested that it needed to be cultivated to be the source of continuation funding to keep this activity vital into the long-term future. The fourth commenter stated that significant progress has been made in project management, adding that the project demonstrated collaboration with industry, government, and institutional partners. This reviewer concluded by saying that it appeared that collaboration with industry and local governments had been established, but was in the beginning stages. The final commenter mentioned that there was good collaboration within Indiana in terms of educational institutions and industry. This reviewer also said that it was unclear how, if at all, collaboration was happening outside of the state.

Question 5: Has the project effectively planned its future work in a logical manner by incorporating appropriate decision points, considering barriers to the realization of the proposed technology, and, when sensible, mitigating risk by providing alternate development pathways?

The reviewer responses were generally positive. A reviewer noted there was a very strong focus on barriers to providing technical workforce in this important area.

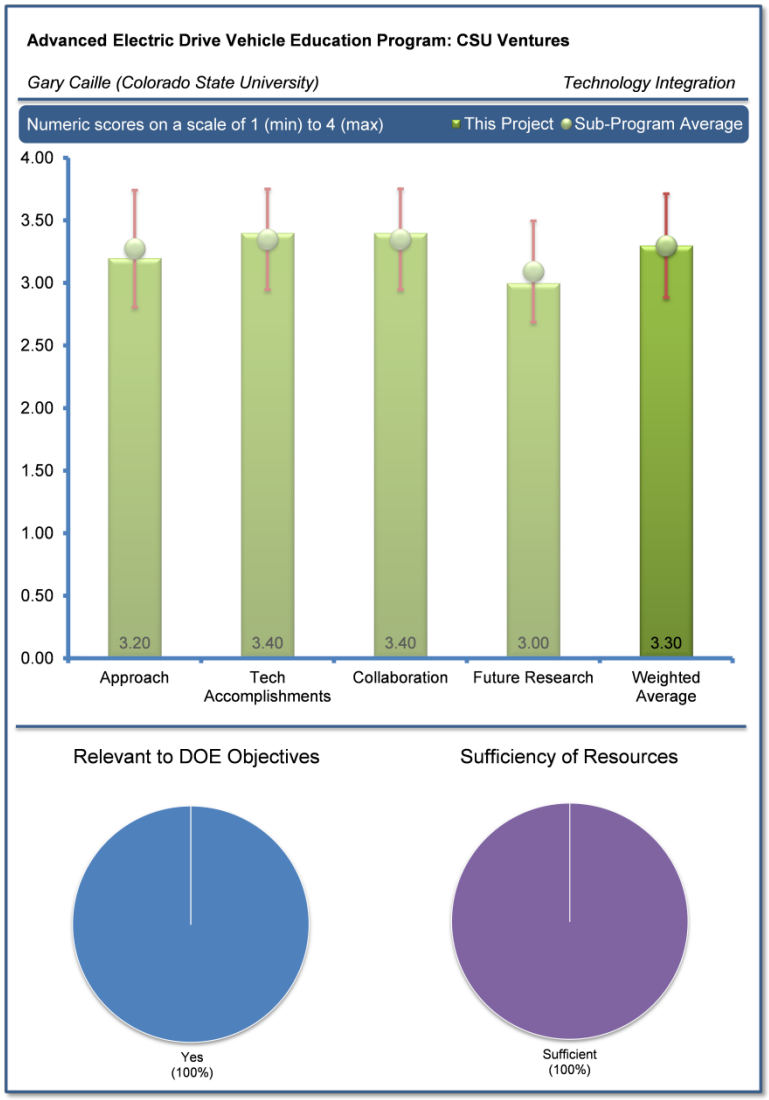
Another commenter stated that even though the project was coming to a close and most all barriers had been overcome, Purdue continues to refine its approach towards success. This reviewer gave the example that they have now aligned the International EV Grand Prix at Indy with opening day activities at the racetrack for the Indy 500. The reviewer added that this capitalized on the large attendance already occurring at the racetrack to increase the exposure of their EV program and EV technology.

The third evaluator said that given what was in the presentation, the project appeared to have well planned out future activities to complete the remaining pieces of the project. The final expert said that the project had clear goals for continuing curriculum development at partner institutions and continuing development of the EV hub. The reviewer added that precise future decision points regarding curriculum and alternative development pathways were less clear.

Question 6: How sufficient are the resources for the project to achieve the stated milestones in a timely fashion?

All commenters indicated sufficient resources. One reviewer said that things appeared to be allocated appropriately to complete the stated objectives of the project in a timely fashion. Another evaluator commented that the project was set to finish in roughly six months, and according to the presentation, less than half of the obligated funds had been used. The third reviewer noted that at the two-third schedule mark the project was 55% expended, concluding that barring an unidentified large expense, the project should finish under well under budget. The fourth reviewer noted that it was difficult to evaluate the sufficiency or insufficiency of the funding when the reviewers had been provided with so little information about how the money had been allocated or spent. The commenter added that this was definitely a large budget and probably had been dispersed among the participants broadly, and that this was consistent with the large number of schools involved and the network of companies that were participating.

Advanced Electric Drive Vehicle Education Program: CSU Ventures: Gary Caille (Colorado State University) – arravt033



Reviewer Sample Size

This project was reviewed by five reviewers.

Question 1: Does this project support the overall DOE objectives? Why or why not?

The reviewer responses were generally positive. One commenter said that the project addressed challenges in the EV industry in a well-thought manner and approached shortages in workforce from multiple angles at all educational levels. This reviewer also said that the project was aiming to improve knowledge of the industry both from within academia and in the workforce. The second reviewer said that there was an excellent network of educational impact in the EV and hybrid technology area.

The third commenter opined that, indirectly, the project supported DOE's objectives in that it supported the overall ecosystem that allowed electric vehicles to be successful, but that the project does not directly displace petroleum. This reviewer added that this was not meant as a disparagement of the project, just a clarification.

The fourth evaluator said that training and education activities, such as these, were of value in providing EV and HEV literacy to the public, as well as providing specific training to the workforce sector, thus accelerating mass market introduction and penetration of advanced electric drive vehicles, resulting in the DOE objectives of petroleum displacement. The fifth reviewer noted that the development of service technicians, engineers, and emergency responders was vital to the success and proliferation of EVs.

Question 2: What is your assessment of the approach to performing the work? To what degree are technical barriers addressed? Is the project well-designed, feasible, and integrated with other efforts?

The reviewer responses were mixed. A commenter cited a very nice linkage between higher education and feeder groups in the region as well as a connection to those who may be interested in retooling for career advancement. The reviewer added that the outreach provided to the Native American groups was excellent and a very difficult challenge, broadly speaking. The commenter continued by stating that the use and development of Gooru as an internet teaching platform is an excellent way to have broader deployment for the long run.

Another expert said that the program sponsor did an excellent job of recognizing barriers toward accomplishing the program's goals, noting that in order to address these barriers, the program formed collaborations with many organizations, and was clearly carrying on a robust dialog with those organizations and the groups they represented.

The third reviewer mentioned the use and leveraging of technology and the technical non-profit partnership. The fourth commenter said that the overall strategy was logical, adding that it was not fully clear how the success of activity would be determined. The

final evaluator stated that the project had very good components focused on K-12 education. This reviewer also said that it was hard to see what exactly the project's strategy was (or success around) for professional and engineer education and that it appeared the project may be duplicating previous efforts by other groups, especially around first-responder training.

Question 3: Characterize your understanding of the technical accomplishments and progress toward overall project and DOE goals.

The reviewer responses were mixed. One reviewer said that the project team has made excellent attempts to break down the barriers and thus have accomplished a great deal. This reviewer also said that the technical tool of Gooru is expected to have a lasting impact for EV training in the future. Another commenter stated that the project was moving along as expected, and accomplishing and meeting its goals, and tasks. The third reviewer noted that the progress towards goals was apparent but was difficult to assess quantitatively. This reviewer added that several barriers should be overcome through this effort.

The fourth evaluator commented that significant progress had clearly been made toward implementing educational and workforce development programs. The reviewer continued by saying that, across all levels targeted (e.g., secondary, higher education, first responder training), that the sponsors have made demonstrated progress toward the project goals. The reviewer cited an example of the project taking innovative steps in teacher training and developing a common interface for communicating information. The reviewer also said that sponsors have formed solid connections and collaborations with organizations across the spectrum of the EV workforce. The commenter suggested that absolute measures of progress toward stated goals could be more clearly stated.

The fifth evaluator stated that it was hard to tell how much progress was being made against goals because the presentation did not detail this very clearly or in detail. The reviewer added that things looked good for K-12 educational work, but it was unclear how effective activities had been in other areas. The reviewer also said that the Gooru work was particularly interesting and showed a big potential impact.

Question 4: What is your assessment of the level of collaboration and coordination with other institutions?

The reviewer responses were generally positive. A reviewer stated that the collaboration with other institutions was strong based on the functionality needed for each segment of the training. A separate evaluator said the presentation showed connections and activities with a lot of project partners. The third expert noted a very good collaboration and use of partnerships in both academic and non-profit, non-government organizations. The fourth commenter noted that the project had formed collaborations with industry, educational institutions, and a wide variety of key stakeholders, including veterans and Native American groups.

The fifth expert also reiterated that the project had very nice teaming with veterans and Native American groups. The reviewer continued by saying that the development of curriculum at several institutions was definitely a great achievement in the coordination area. The reviewer also mentioned that, as the presentation noted, universities were very bureaucratic and slow moving. The commenter concluded by saying that this project had collaborations in many directions so it provided useful linkages for the broadest range of possible participants for the long run.

Question 5: Has the project effectively planned its future work in a logical manner by incorporating appropriate decision points, considering barriers to the realization of the proposed technology, and, when sensible, mitigating risk by providing alternate development pathways?

The reviewer responses were mixed. The first reviewer believed that future continuation would depend on having enough students to populate the new classes that had been created, adding that the network of outreach and partnerships discussed in their presentation were critical for that future vitality. Another reviewer said that the presentation and presenter stated that the project would complete future activities and seemed on track, but the reviewer found it hard to tell for sure, given the level of detail provided. The same reviewer pointed out this is more of a commentary on the review process than this particular project. The third evaluator suggested that while the project had stated goals including continuing developing short courses, continuing outreach, and implementing first responder training, the project could more clearly state the specific metrics of future activities. The fourth commenter would have liked to see more on efforts for sustainability past the end of the grant period.

The fifth reviewer said that it was hard to determine exactly which barriers would be overcome and which still need more emphasis. The commenter added not being sure about where the remaining effort would be placed. The reviewer suggested that the program needed to look at other means to reach out to veterans if this has not been successful to date, noting that the military trains and deploys a great number of ground vehicle maintainers. The reviewer wondered if the Veterans Administration had been engaged in job placement for veterans. The reviewer added that the Navajo Nation is also interested in this type of training.

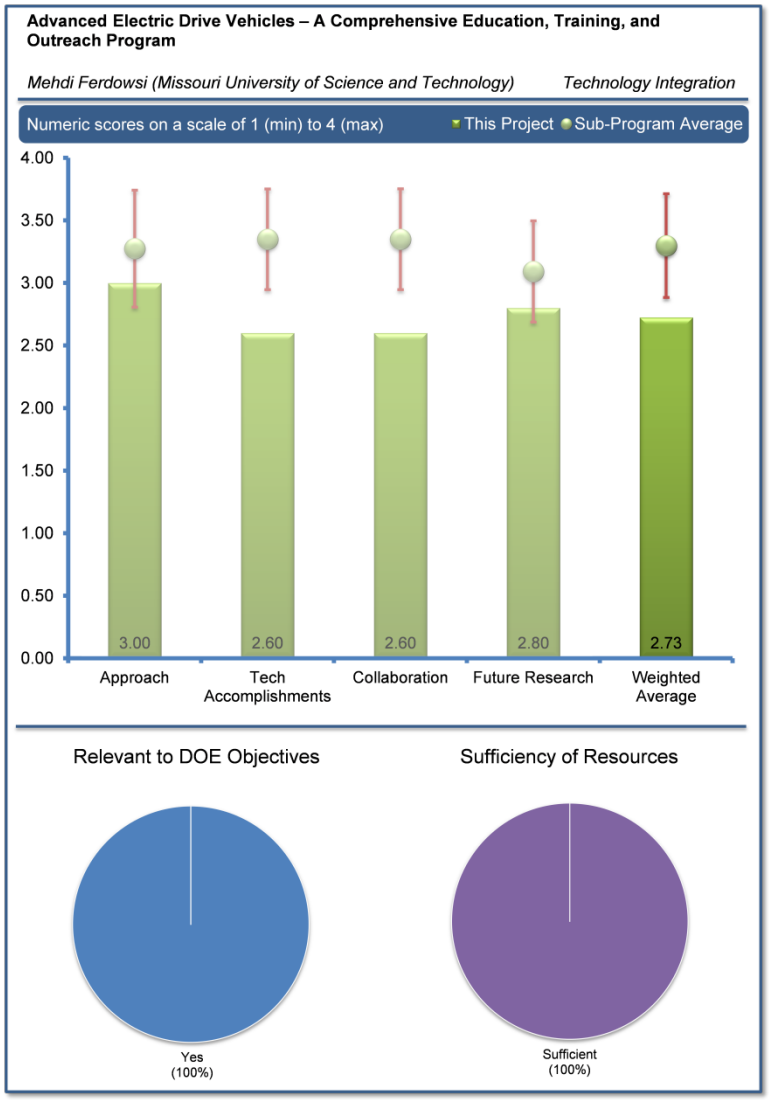
Question 6: How sufficient are the resources for the project to achieve the stated milestones in a timely fashion?

All reviewers indicated resources were sufficient. A reviewer said that the resourcing appeared to be sufficient, adding that there was no information to indicate the status of the funding.

The second commenter stated that it was difficult to evaluate the sufficiency or insufficiency of the funding when the reviewers had been provided with so little information about how the money had been allocated or spent. The reviewer continued by saying that this was definitely a large budget and probably had been dispersed among the participants broadly. The evaluator also said that it would be nice to have a network of companies who would be interested in providing support in the future. The reviewer concluded by saying that the EV and hybrid technology area is very rapidly moving and it is important to keep up with it.

Another reviewer noted that remaining funds are not stated on the contract, but that the project states it is 72% complete and has requested an extension through 9/13.

Advanced Electric Drive Vehicles - A Comprehensive Education, Training, and Outreach Program: Mehdi Ferdowsi (Missouri University of Science and Technology) – arravt034



Reviewer Sample Size

This project was reviewed by five reviewers.

Question 1: Does this project support the overall DOE objectives? Why or why not?

The reviewer responses were generally positive. A reviewer noted that there was a very diverse and intense educational rework to emphasize EV and hybrids. The second reviewer stated that professional development of EV engineers and technicians supported the objective of petroleum displacement. The third commenter stated that the project took a comprehensive approach to encouraging interest and knowledge in electric vehicle technology ranging from integrating courses at the undergraduate and graduate level, to community outreach.

The fourth evaluator opined that the project indirectly supports DOE objectives, in that it supports the overall ecosystem that allows electric vehicles to be successful, but that the project does not directly displace petroleum. The reviewer did not mean this as a disparagement of the project, just a clarification.

According to the final reviewer, training, education, outreach and awareness activities such as these are of value in providing EV and HEV literacy to the public, as well as providing specific training to the workforce sector; thus accelerating mass market introduction and penetration of advanced electric drive vehicles, resulting in the DOE objectives of petroleum displacement.

Question 2: What is your assessment of the approach to performing the work? To what degree are technical barriers addressed? Is the project well-designed, feasible, and integrated with other efforts?

The reviewer responses were mixed. A commenter said that the project was organized well and equally targeted the spectrum of post-secondary students. The reviewer noted that the outreach component addressed the education of the general public. An evaluator said that the project seemed to be on track and has implemented a number of objectives, including courses across the participating institutions. The reviewer went on to say that, while the project identified a number of program barriers (including fast-evolving technology, input from industry, etc.), it appeared that barriers had not been a significant impediment. The reviewer suggested that more detail on this would be helpful. A reviewer said that this program has shown the most intensive curriculum modernization and the most testing. The reviewer added that this was a difficult challenge and had been well achieved. The reviewer commented that it would be nice to have a better connection to companies and jobs especially as this could help with the future continuation of the efforts into the long-term future. An evaluator said that the presentation was not very clear as to what exactly the group was doing, adding that the presenter listed the things they have either done or were going to do, but the

underlying strategy was often not clear so it was hard to say it was better than fair. A separate reviewer said that although it was communicated during the presentation, it would be helpful to put these in the form of a slide.

Question 3: Characterize your understanding of the technical accomplishments and progress toward overall project and DOE goals.

The reviewer responses were mixed. A reviewer said that significant progress has been made to integrate EV subject matter into the curriculum at three separate institutions, adding that more input from industry is needed to balance the theoretical with the practical. The reviewer suggested that incorporation of the most common industry model and simulations related to EV system optimization into the curriculum would benefit students and further attract employers. The reviewer also said that, if not already incorporated, training for engineers on the scope of EV design standards from the Society of Automotive Engineers and the American National Standards Institute, and others could be very helpful.

One commenter stated that the project demonstrated significant progress toward goals of implementing courses across participating institutions, obtaining necessary technology and software, and community outreach. The reviewer went on to say that there appeared to be no significant barriers to finalizing remaining project goals. The evaluator commented that the project stated that roughly 40% remained. The reviewer suggested that, given the time remaining on the contract, additional information about accomplishing remaining goals would be useful.

A reviewer suggested that significant progress had been made, but the number of classes and numbers of students impacted seemed overstated in some cases. The reviewer noted that it was possible that examples were brought to many of these classes, but it was difficult to believe that the examples had been revamped entirely.

One expert opined that the presentation and presenter at first appeared to try to take credit for existing engineering classes, adding that even after a specific question on this, it was not clear that the project really had anything to do with some of the courses listed in the presentation so these likely should not be included in a list of accomplishments. The reviewer suggested that at a minimum, it should be clearly stated how these were related to the project but that the project cannot take any specific credit for them. The reviewer concluded that this called into question everything else in the presentation whether deserved or not.

Question 4: What is your assessment of the level of collaboration and coordination with other institutions?

The reviewer responses were mixed. An evaluator stated that the project had established a collaborative effort with partner institutions; efforts on designing and implementing courses, as well as specific aspects of program goals (e.g., outreach) material seemed complementary.

Another reviewer felt there was good outreach to the science museum and good coordination among the various educational institutions. The reviewer suggested that it would have been good to have some connection to employers in the region to assist in connecting education with job placement and continuation efforts that would go beyond the end of this grant.

A different expert noted that the list of collaborators made sense for the scale of the project, but that the reviewer would be interested to see if more business partners could be fostered, with respect to internships, jobs.

Another commenter said that the collaboration with the other learning institutions was strong. However, more connection to the industry was needed. This was challenging given the location of the program. Smith Electric appeared to be the only industry partner.

The final reviewer said that the project had several active partners, but they appeared to be more affiliated institutions than true partners. The reviewer added that the project appeared to really only have the three educational partners. The reviewer concluded that the industry partners seemed to be marginally connected at best to this specific project.

Question 5: Has the project effectively planned its future work in a logical manner by incorporating appropriate decision points, considering barriers to the realization of the proposed technology, and, when sensible, mitigating risk by providing alternate development pathways?

The reviewer responses were mixed. A commenter stated that future plans were based on completing the original project scope even after a couple of setbacks with the lab software.

A different reviewer said that while the project plans were good, that the reviewer would have liked to see more effort to connect to companies, to lead to a more sustainable program after this grant has been finished.

Another evaluator asked if there were plans to share best practices to other institutions that are conducting similar education and outreach efforts.

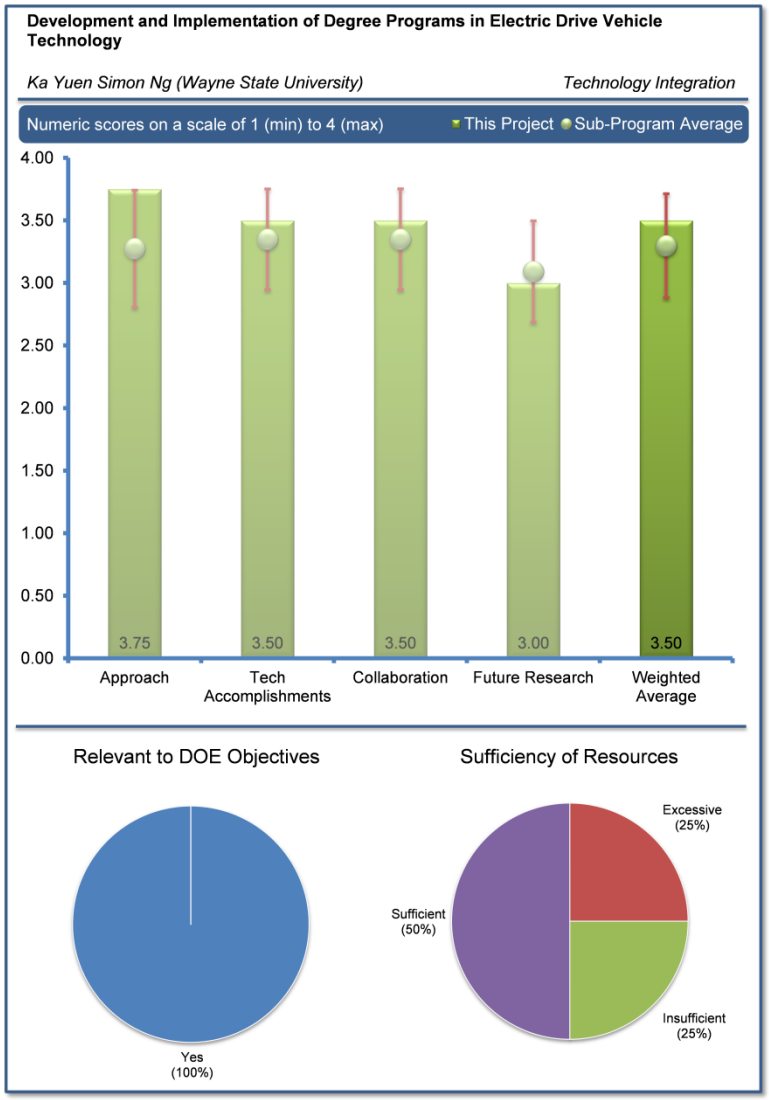
A different expert commented that while the program stated that there were no significant barriers to remaining project goals and appeared to be on track to finish on target, the remaining tasks were stated in relatively general terms. The reviewer suggested that the presentation could be more specific regarding the tasks remaining.

The final evaluator said that it was very hard to assess future activities in the terms of this review. The evaluator felt that little clear information was provided other than to say that future deadlines would be met. Because of questions previously mentioned, the reviewer felt that it was difficult to have a lot of confidence in the statements in the presentation.

Question 6: How sufficient are the resources for the project to achieve the stated milestones in a timely fashion?

All reviewers indicated that the resources were sufficient. A reviewer said that the project was on-target for completion with the resources provided. A reviewer noted that it was difficult to evaluate the sufficiency or insufficiency of the funding when the reviewers had been provided with so little information about how the money had been allocated or spent. The reviewer went on to say that this was definitely a large budget and probably had been dispersed among the participants broadly. One reviewer commented that the funds remaining were unclear.

Development and Implementation of Degree Programs in Electric Drive Vehicle Technology: Ka Yuen Simon Ng (Wayne State University) – arravt035



Reviewer Sample Size

This project was reviewed by four reviewers.

Question 1: Does this project support the overall DOE objectives? Why or why not?

The reviewer responses were generally positive. The first reviewer stated that the project was very relevant to DOE objectives, if indirectly. The reviewer expressed concern whether these courses prepared students for working with more conventional and/or hybrid vehicles also, since it is not yet clear which way the industry will go. The reviewer was impressed by the presenter's statement that students were getting jobs in Michigan after taking only one energy storage course.

Another commenter said that, with electric vehicle technology being part of the current and future vehicle technology, engineers are needed to improve, develop, and design for manufacture electric vehicle technology.

The third expert said that the project has trained students in chemical, mechanical and electrical engineering, adding that many would be hired by various companies through the automotive industry supply chain, supporting the industry with the potential to be working on fuel economy improvements and advanced vehicle technologies. The reviewer suggested that the program could track placement of the students who have graduated from the various programs to confirm the percentage who are now in the automotive industry working on advanced vehicle technologies.

The final evaluator believed the program accomplished the goals of DOE. The reviewer added that the project was well conceived and the numbers given for students trained were believable. For the reviewer, one of the best parts of the program was that the majority if not all of the courses were taught in the evening. The reviewer noted that this enabled students who have jobs during the day to receive the necessary training so that the students could shift or develop a specialty in electric drive systems. The reviewer also had a general comment about the presentation, noting that reviewers have 20 minutes to listen to the awardee describe the program and that there were entirely too many slides with so much data on them that were very hard to digest in 20 minutes. The reviewer suggested that awardees should be reminded of this fact and cut their presentations downs to no more than 10 slides (which the reviewer thought was generous). The reviewer felt the presenters can bring other slides as backup but they should give the goals of their award, items accomplished, results and planned future activities.

Question 2: What is your assessment of the approach to performing the work? To what degree are technical barriers addressed? Is the project well-designed, feasible, and integrated with other efforts?

The reviewers' responses were generally positive. A reviewer said that the range of courses developed was comprehensive, including associate, bachelors, and graduate degrees, even short courses for K-12 and community college teachers. The reviewer

added that the laboratory emphasis was good. This reviewer noted that Wayne State University had access to engine dynamos for hybrid auxiliary power unit (APU) work, but they do not have (or have funding for) an integrated hybrid powertrain testing and development lab. One evaluator commented that the project's strategy was well done and that the team has procured the necessary lab equipment to foster a learn-by-doing methodology, which the reviewer was convinced is the best way to learn. The reviewer added that the program had a steady by moving forward approach to the creation and implementation of new courses that fulfill the DOE training requirements.

An expert commented on the nice integration of design, develop, implement, and validate, adding that more information and results were needed on the validation for each component since this was part of the project's approach.

A reviewer opined that there was a comprehensive approach, with an associate degree building to a Master's degree, including three state of the art laboratories. The commenter noted that one barrier that was addressed was the procurement of various tools for the labs, and that this has now been completed. The reviewer added that the focus is now on validation. The reviewer went on to say that 663 students have taken the classes, and that in regard to curriculum design, most tasks have been finished. The reviewer noted that the project was oversubscribed for the high school teachers program and went on to say that Macomb Community College created the program and expanded the program. The reviewer stated that the project had developed a capstone course, which averaged 60 students, approximately a little less than anticipated. The reviewer concluded by saying that the lab is for undergraduate and for associate's degree students, which leverages even greater use.

Question 3: Characterize your understanding of the technical accomplishments and progress toward overall project and DOE goals.

The reviewers' responses were generally positive. An evaluator said that a laboratory had been established and 15 relevant courses were developed with 663 cumulative enrollees.

A different reviewer noted the development of the three state-of-the art engineering laboratories being completed, where the barrier was being able to purchase certain items for the labs addressed. The reviewer added that the approval process for the various curricula seemed to be done expeditiously by the Wayne State University Board of Governors and that the education of teachers and others in the community had been successful.

Another expert stated that one of the best courses that they taught in this program, EVE 5620/CHE5620, helped make this program stand out. The reviewer added that this course, as it was described, looked at the politics of the energy program and no other program this reviewer had evaluated even mentioned a course or training of this nature. The reviewer continued by saying that the course looked at the overall effect of energy programs on the entire energy grid, which signified to the reviewer that this program worked to look at the entire energy issue, not just the implementation of specific energy efforts. The reviewer thought it was absolutely important for students to have the BIG picture about anything they sought knowledge about. The reviewer finished by saying that the program trusted the students to make good choices and the reviewer felt this was very important. The reviewer also commented that the laboratories the project procured as well as the equipment was noteworthy.

The fourth reviewer stated that many students had taken part in the M.S. and A.A.S. program, adding that hopefully, low enrollment in the B.S. program would increase in the future from A.A.S students. The reviewer suggested that feedback on the job placement would be nice, wondering if all the students got jobs in the electric vehicle areas.

Question 4: What is your assessment of the level of collaboration and coordination with other institutions?

The reviewer's responses were generally positive. A reviewer noted that the project was working with a community college, NextEnergy, and an industrial advisory board and was very impressed with the advisory board and the feedback that could be provided.

A different commenter stated that, for the size of the program, their collaborative partners Macomb Community College and NextEnergy were judged as good. The reviewer felt there might be more partners if the program were to attract the attention of GM or Ford and include them in their efforts, as these companies were looking for these types of students for their organizations.

A third evaluator said that the advisory board had an excellent array of individuals from the automotive industry, academia, and etc. to oversee the program development and to offer site visits for the students to their organizations' facilities. The reviewer noted that two-thirds of the students in the program were part of the EcoCAR 2 program. The reviewer continued by saying that having the local community college as a partner demonstrated additional leveraging and support and would reach another important segment of the population. The reviewer suggested that the program consider active outreach activities with the local Ann Arbor/Detroit Clean Cities coalition, whom the reviewer felt could be helpful with the summer program for teachers or other educational workshops.

The last reviewer noted that the program was closely integrated with EcoCar team, noting that 75% of the team members were in the program. The reviewer added that there was a strong advisory board, although it appeared to be composed almost exclusively of high-level people (e.g., presidents, vice presidents, etc.). The reviewer suggested the project consider adding some shop-floor-supervisor-level people to the advisory board.

Question 5: Has the project effectively planned its future work in a logical manner by incorporating appropriate decision points, considering barriers to the realization of the proposed technology, and, when sensible, mitigating risk by providing alternate development pathways?

The reviewer responses were generally positive. An evaluator commented that future work ends in December 2012, and believes the program is on track to finish what it has planned by that time.

The second reviewer said that the project was winding down with less new activities for the next seven months.

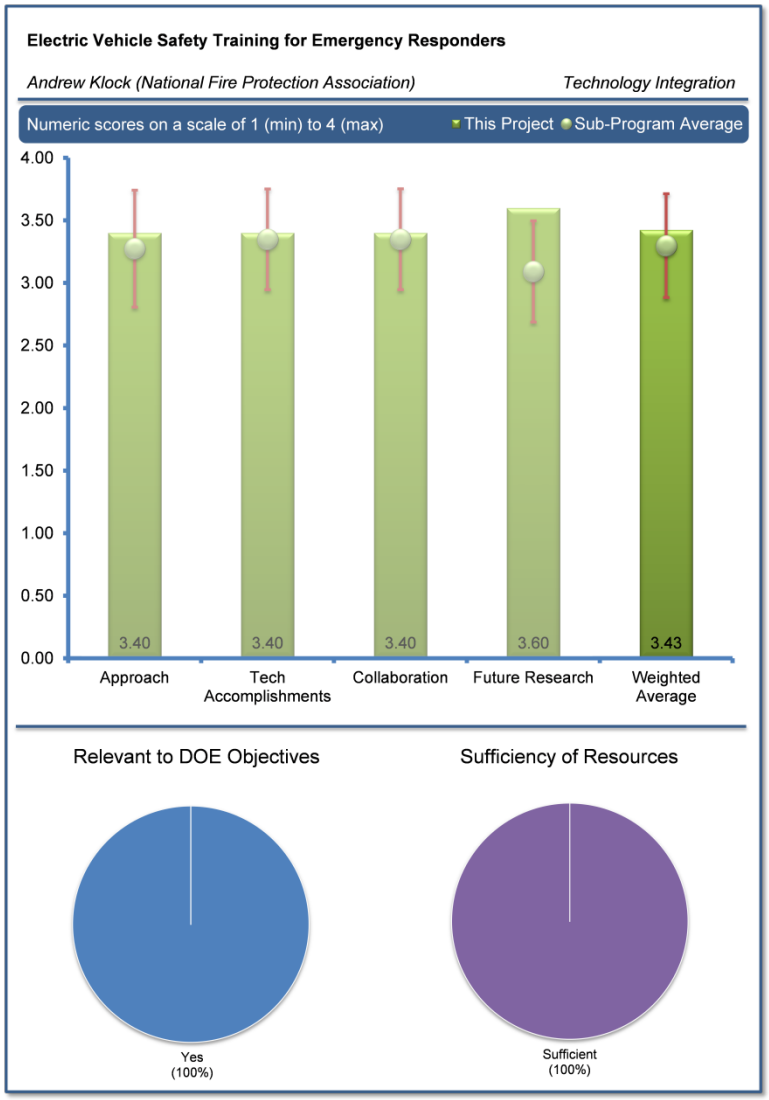
The third reviewer said that future activities seemed completed and appropriate and suggested the project may want to put some effort into exploring funding or partnerships to expand laboratory capabilities (e.g., to create an integrated hybrid powertrain testing and development lab).

The final commenter said that the investment would also be used for the EcoCar 2 program. The reviewer went on to note that one barrier listed was the funding of the internship program, but did not recall this being addressed during the remainder of the year. The reviewer felt that it seemed as if this was no longer a priority by the partners. The reviewer noted that it was excellent that the presenters have developed a strategy for students who received associate degrees to be able to successfully enter into the B.S. program, and a plan for those who want to go to graduate school...and a continuing education course. The reviewer ended by stating that the survey would be used to identify additional changes need to curricula.

Question 6: How sufficient are the resources for the project to achieve the stated milestones in a timely fashion?

One reviewer stated that the project resources were insufficient; two felt the resources were sufficient and one reviewer found the resources to be excessive. A reviewer stated that the project appeared to be on track to finish the project work by the end of 2012. One evaluator said that the speaker suggested 75% of the funding had been expended, so it appeared that they will be on-time with the program. The reviewer added that summer activities remained, but the resources seemed quite sufficient to complete the milestones in a timely manner. A reviewer suggested that adding resources to enable creation of an integrated, hybrid powertrain testing and development laboratory be considered. A commenter said that there was a pretty substantial budget of $6.25 million, suggesting that future work, which is stated as 25% of the project (approximately $1.5 million), might be high for the planned activities of maintaining classes and outreach activities.

Electric Vehicle Safety Training for Emergency Responders: Andrew Klock (National Fire Protection Association) – arravt036



Reviewer Sample Size

This project was reviewed by five reviewers.

Question 1: Does this project support the overall DOE objectives? Why or why not?

The reviewer's responses were generally positive. One commenter stated that training, education, outreach and awareness activities such as these were of value in providing EV and HEV literacy to the public, as well as providing specific training to the workforce sector, thus accelerating mass market introduction and penetration of advanced electric drive vehicles, resulting in the DOE objectives of petroleum displacement.

Another evaluator noted that effective EV knowledge transfer to emergency responders would reduce property damage, injury, loss of life, and help achieve public acceptance of high volume EV/hybrid production in the United States.

The third reviewer said that first-responder/safety training was very important to enabling a successful increased market penetration of electric-drive vehicles.

A fourth expert commented that the program's goal was to reach a million first responders and provide them with the knowledge base to assist PEV drivers in crash or other emergency situations. The reviewer added that this would lead to a sustainable program if accidents are handled properly and consumers would continue to purchase these vehicles, which would lead to petroleum reduction. The reviewer said that the project's approach seemed to be effective and yielding strong results.

The last commenter commented the project does meet DOE's overall objectives as it is part of the network support infrastructure to assure electric vehicles are safe to operate and that response to electric vehicle incidents is in place.

Question 2: What is your assessment of the approach to performing the work? To what degree are technical barriers addressed? Is the project well-designed, feasible, and integrated with other efforts?

The reviewer responses were generally positive. The first reviewer remarked that the approach seemed to be effective and yielding strong results. Another reviewer said that the program had a very good strategy for deployment of efforts and products from work performed.

The third reviewer said that through a carefully planned and executed development, partnership and distribution strategy, National Fire Protection Association (NFPA) offers high value, standards- based training programs, a web based centralized EV safety repository, and an EV quick reference guide (EFG).

The fourth evaluator said that an overall barrier had been with the lack of high speed internet at local firefighting departments and volunteer fire departments which prohibited access to the web portal that was designed initially, although 16,000 have been trained through the online course. The reviewer went on to say that train the trainer programs have been implemented with 25 of 50 state fire academies, with 3 trainers hired. The reviewer added, that while the goal was admirable, there appeared to be no strategy as to why high priority roll-out states were not targeted first, such as California and Arizona. The evaluator asked what strategy was there to complete the training, and if there was a tracking system in place that would allow trainers from each of the academies to report the first responders who have been trained throughout their state. The reviewer felt this would allow for course updates and new product information to be easily distributed. The reviewer also wondered how it would be known whether one million people were reached. The commenter said that on the other hand, close collaboration with the auto industry, National Highway Traffic Safety Administration NHTSA and General Motors (GM) in particular, was to be commended and has helped achieve the development of quality materials. The reviewer is sure this was a monumental task in coordination. This evaluator suggested that greater integration with other courses funded by DOE on this topic (i.e., NAFTC) should be considered to leverage resources and collaboration with other DOE programs to increase the knowledge of these materials on the web. In addition, continued this reviewer, ways to communicate it to greater audiences should be added to the outreach strategy. The reviewer gave the example of the speaker that was receptive to having the Wayne State program take advantage of these materials.

The fifth commenter acknowledged reviewing this program two years ago and noted that it is a great deal better than it was. The reviewer had one issue with the implementation strategy, which might be an in-house bias issue, this is, the inclusion of police first responders from the beginning. The reviewer acknowledged that the project was now considering police and are working with the New York State police, but the researchers are preparing to roll out this program and much should have been done from the start. The reviewer believed this was important because the police are usually first at the scene and fire is called upon later on in the incident. The reviewer was concerned there might be a lot of blue canaries if any type of hazmat exists and police are not aware of the present dangers. The reviewer was concerned that Slide 2 in the presentation barriers section includes that fire service and law enforcement suffer, but the partner's section below had no police agencies named. The reviewer suggested it would have been great to have the International Association of Chiefs of Police (IACP) as a partner there. The reviewer concluded by saying that partnering with law enforcement was acknowledged and this was a noteworthy change.

Question 3: Characterize your understanding of the technical accomplishments and progress toward overall project and DOE goals.

The reviewer responses were generally positive. A reviewer said that the project had accomplished much and it seemed that the funding or expenditures were in line with what was accomplished.

The second commenter said that the materials were developed and reviewed by OEMs and incorporated vehicle designs that may be proprietary in nature. The reviewer added that the online course had modules that have individual tests that must be taken in order to receive a certificate of completion and that the course (possibly the train the trainer course) had been revised three times already, which showed that the grantee wanted to ensure a quality product and would not cut corners. The evaluator noted that the feedback forms suggested a 90% approval rate and that the project developed a quick reference guide, which is user friendly.

The third reviewer said that the program had developed classroom and online EV safety training courses (29,000 trained), videos, Emergency Field Guide (print and electronic), and an EV safety web portal (101,000 hits). The evaluator commented that the project team had established numerous working partnerships with auto manufacturers to facilitate information flow, availability of EV safety related documents, and improvement of industry Emergency Response Guides.

The fourth commenter stated that the content created was of very high quality and immersiveness.

The final reviewer said that the program had created a one-stop-shop web portal for electric drive first-responder information, set up and delivered train the trainer programs, created the EVsafetytraining.org web portal (which is now available online), and created a quick-reference field guide with concise summaries of the most critical safety information on all electric-drive cars currently in production or on the road in significant numbers. The reviewer noted that 29,000 emergency responders had been trained. The reviewer was uncertain whether this number double-counted some trainees who took multiple courses. The evaluator

noted the project had created a structure for ensuring that the content stayed current, that the course has been revised three times in last nine months, and there were plans to continue updating it at least every six months. The reviewer also said that while California is not on the list of 30 states trainers trained, that the state would be on the list the following week.

Question 4: What is your assessment of the level of collaboration and coordination with other institutions?

The reviewer responses were generally positive. One evaluator mentioned that the program had great collaborations and partnerships. The second commenter observed that the project had a number of active partnerships, including automobile manufacturers, government agencies and one law enforcement agency. Another reviewer mentioned that there were active partnerships with all high level United States fire service organizations, automobile manufacturers (15 total), law enforcement and governmental agencies.

The fourth reviewer detailed that the project collaborated with all OEMs producing electric-drive vehicles in the United States and set up partnerships with every state. The reviewer also commented that the project was working with NHTSA, an insurance company, and many major fire safety organizations. The reviewer stated that the Society of Fire Protection Engineers was conspicuously absent. The reviewer also noted that working feedback forms are provided for all courses/products and feedback has been 90% positive.

The fifth reviewer stated that close collaboration seems apparent with state fire academies, the OEMs, State Farm, but was not sure about EVSE companies. The reviewer suggested that NFPA should consider greater collaboration with local Clean Cities coalitions and with other similar programs to leverage resources. The reviewer felt that feedback from focus groups were a successful way to develop quality materials and tools.

Question 5: Has the project effectively planned its future work in a logical manner by incorporating appropriate decision points, considering barriers to the realization of the proposed technology, and, when sensible, mitigating risk by providing alternate development pathways?

The reviewer responses were generally positive. One commenter mentioned that the program had a very good plan for sustainability of efforts.

The second reviewer said that the project would continue course and vehicle-specific updates to fire service training, while expanding to law enforcement and emergency medical services (EMS) personnel.

A different evaluator said that the program appeared to be on track to finish, with the law enforcement training piece under development. The reviewer anticipated the project would be able to achieve this by collaborating with the New York State police.

A fourth expert said that the project would train fire, law enforcement and EMS personnel to deliver course content and curriculum throughout the first responder community, and would continue to develop emergency responder and automotive partnerships, while updating training programs and reference material to stay current with emerging technology.

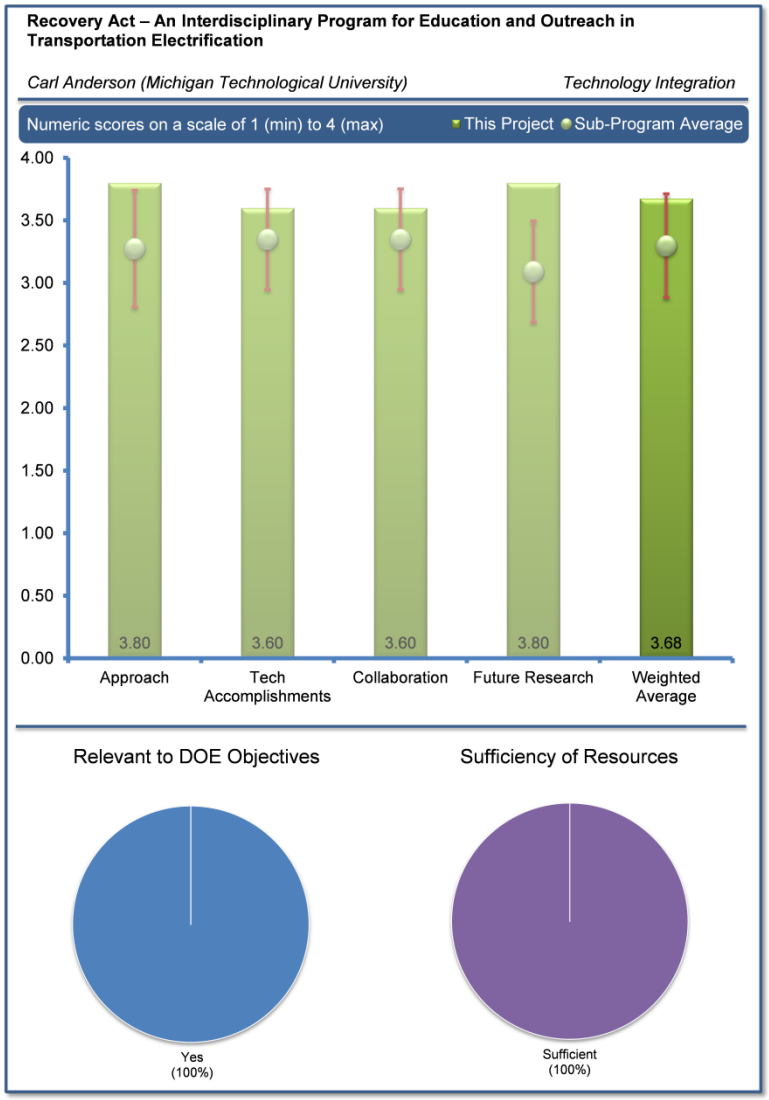
The last reviewer said that the project's future plans for 2012 included information dissemination at nationwide fire association events and developing future revenue streams through advertising and fundraising in order to ensure product materials can be updated. The reviewer suggested new outreach strategies (EVSEs, Clean Cities, AAA, etc.) should be considered to leverage resources now and in the future. The reviewer noted that future plans also included law enforcement academies with a pilot in New York in the process of being completed. The reviewer ended by saying that this was an excellent next step as well as EMS.

Question 6: How sufficient are the resources for the project to achieve the stated milestones in a timely fashion?

All reviewers said the resources were sufficient. One reviewer said that the project has been well funded for its effort and it appears the project is on track to finish at budget on time. One commenter said that resources were sufficient now that the project has been extended to 2013. A reviewer said the program was on task with funding. The reviewer also expressed concern with the future of the electric vehicle knowledge, wondering if when this funding ends and the group starts charging for this information if

emergency responders would be active in staying current on electric vehicle technology and vehicles. The reviewer suggested that some government mandated training or requirement should be implemented.

Recovery Act - An Interdisciplinary Program for Education and Outreach in Transportation Electrification: Carl Anderson (Michigan Technological University) – arravt037



Reviewer Sample Size

This project was reviewed by five reviewers.

Question 1: Does this project support the overall DOE objectives? Why or why not?

The first reviewer remarked that the project displayed excellent connections between education and potential future careers, all of which was leading to an increase in the adoption of alternative fuel vehicles nationally.

The second reviewer remarked that the professional training of engineers and outreach to the public on EV technology was vital to the goal of petroleum displacement.

According to the third reviewer, this project took a comprehensive approach to the program's objectives, by training undergraduate and graduate students, engineers in the workforce, and conducting an impressive outreach program through the mobile lab. The project worked closely with industry to ensure that courses matched industry needs.

The fourth reviewer stated that training, education, outreach and awareness activities such as these are of value in providing EV and HEV literacy to the public, as well as providing specific training to the workforce sector, thus accelerating mass market introduction and penetration of advanced electric drive vehicles, resulting in the DOE objectives of petroleum displacement.

The final reviewer remarked that the project indirectly supported objectives in that it supported the overall ecosystem that allowed electric vehicles to be successful, but that the project does not directly displace petroleum. That is not meant as a disparagement of the project, just a clarification.

Question 2: What is your assessment of the approach to performing the work? To what degree are technical barriers addressed? Is the project well-designed, feasible, and integrated with other efforts?

The first reviewer really liked the travelling lab and the ability to provide training and outreach anywhere. This reviewer was impressed with the capability that was built in there and thus allowing lab experiences relevant to vehicle technology in many locations. The curriculum changes appeared to be very well-thought-out and implemented.

The second reviewer thought that the project appeared to be very well-designed and put together.

According to the third reviewer, the project identified several barriers to implementation, including lack of defined curriculum and lack of clear direction from the industry. The project has done a great job of overcoming these barriers in particular, both through

developing courses and seeking and integrating feedback into future courses, and through strong collaboration with industry. In addition, the progress the project has made overall, including the development of courses, development of the mobile lab, and extensive outreach conducted and planned, demonstrated that project has targeted and overcome barriers.

The fourth reviewer commented that both the content development and the outreach activity using the mobile lab were well used in addressing the goals and barriers stated with the project.

The final reviewer observed a complete, immersed training program for engineers that is very hard to improve on, and that the project goes well beyond just concepts of electrified vehicles.

Question 3: Characterize your understanding of the technical accomplishments and progress toward overall project and DOE goals.

Reviewers observed that the project has had technical accomplishments and made effective progress. According to the first reviewer, emphasis on the curriculum and being able to meaningfully take it on the road was excellent, was a major technical accomplishment, and should provide long-range impact as it is used in the future.

The second reviewer remarked that the project seems to be making very strong progress and has achieved most of its objectives already.

According to the third reviewer, again, this project has made substantial progress toward completion of the project goals. For instance, the reviewer noted, the project has developed and updated a number of courses, with demonstrated increases in enrollment. The project has made significant technical progress by building and integrating learning opportunities into the mobile lab. In addition, the project has looked for and worked toward an innovative means of outreach, including demonstrations of hybrid technology, and development of specific hybrid gaming software.

The fourth reviewer remarked that goals and barriers within the scope of this project were adequately stated and that steps to overcome barriers and meet goals were as well.

The final reviewer observed that a lot has been accomplished given the resources provided, and that barriers have been overcome already. This reviewer suggested that if not currently covered in the program, consider adding a section or course on EV standards and safety as it would be the next frontier in the evolution of EVs.

Question 4: What is your assessment of the level of collaboration and coordination with other institutions?

Reviewers saw meaningful collaboration. The first reviewer was very impressed with the network of companies that were networked in to link with this training program. The reviewer noted that this was important for job placement as well as for future sponsorship when this grant has been expended. The second reviewer remarked that the project has demonstrated significant collaborations with industry, including the Michigan Academy for Green Mobility Alliance. The third reviewer stated collaboration with other stakeholder organizations was outstanding. The final reviewer saw very strong industry connections. The reviewer added that the project possibly could be doing more to connect and collaborate with other educational institutions if only to spread the good work that this project is doing with government support to additional audiences.

Question 5: Has the project effectively planned its future work in a logical manner by incorporating appropriate decision points, considering barriers to the realization of the proposed technology, and, when sensible, mitigating risk by providing alternate development pathways?

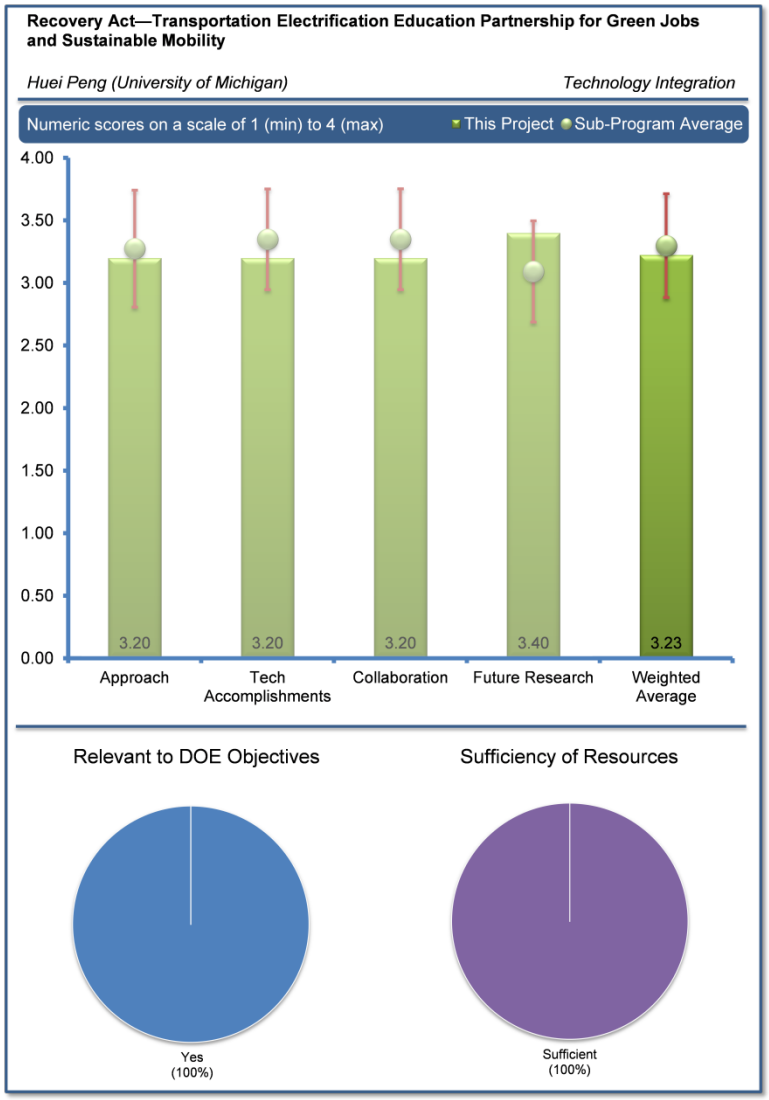
The first reviewer stated that this project looked like it could be sustainable and beneficial for the education that it can achieve for students who were attracted to vehicle technology jobs. By working and training students in this space then it enabled companies to be moving their product lines and designs more into this electric and hybrid framework. The second reviewer commented that the project seemed to have everything in place to complete all necessary future activities. The third reviewer remarked that the project was 85% complete, and has clearly defined remaining steps toward completion. These included ongoing marketing and student recruitment, ongoing course improvements in response to course feedback, and integrations of final stage simulators to

mobile lab. The final reviewer remarked future activities were focused on shifting the program into self-sustaining mode as part of the regular Michigan Tech offerings. Some work remained for completion of the laboratory.

Question 6: How sufficient are the resources for the project to achieve the stated milestones in a timely fashion?

Reviewers stated that resources were sufficient. The first reviewer saw excellent use of resources. According to another reviewer, it was difficult to evaluate the sufficiency or insufficiency of the funding when so little information about how the money had been allocated or spent has been provided. In general, this reviewer was impressed with what has been accomplished.

Recovery Act-Transportation Electrification Education Partnership for Green Jobs and Sustainable Mobility: Huei Peng (University of Michigan) – arravt038



Reviewer Sample Size

This project was reviewed by five reviewers.

Question 1: Does this project support the overall DOE objectives? Why or why not?

The first reviewer remarked the project supports petroleum displacement by educating the next generation(s) of vehicle engineers and designers about advanced propulsion technologies.

According to the second reviewer, training and education activities such as these are of value in providing EV and HEV literacy to the public, as well as providing specific training to the workforce sector, thus accelerating mass market introduction and penetration of advanced electric drive vehicles, resulting in the DOE objectives of petroleum displacement.

The third reviewer remarked that with electric vehicle technology being part of the current and future vehicle technology, engineers are needed to improve, develop, and design for manufacture EV technology.

The fourth reviewer commented that the program would train future engineers about advanced vehicle technologies, encourage younger students to think about engineering and sciences educational track and the community as a whole to purchase plug-in electric vehicles. The 10 courses would reach 300-500 students annually and train 50-100 professional engineers in this new area.

The final reviewer thought the project does as it is designed; the project creates courses and learning for the design and development of electrified vehicles, so its long term goal is to create a cadre of design engineers who will take vehicle technologies to the next step. So the DOE objectives are seen in terms of long term goals. This reviewer noted that while the presenter did a fair to good job, the presentation was terrible. This reviewer indicated that the presentation was so busy, confusing, and unable to be read, that even the presenter had trouble figuring out what was on the slides. This reviewer noted that reviewers have 20 minutes to really get the gist of what the program is about, make a determination as whether it is meritorious, and reviewers have 10 minutes to ask questions. The reviewer indicated that the presentation should generously have been no more than 10 slides. The presenter should have had backup slides in case anyone wanted to know more. The lab pictures were nice and one or two of those would have been okay, but that would be part of the 10 slide presentation. This reviewer indicated that a degree in cryptology was needed just to decipher the slides.

Question 2: What is your assessment of the approach to performing the work? To what degree are technical barriers addressed? Is the project well-designed, feasible, and integrated with other efforts?

The first reviewer remarked that the development of curriculum, and the outreach activities, was well within the confines of the project's parameters and capacities.

The second reviewer remarked that the project was providing education at all levels, from kindergarten through graduate-level, short courses through degree programs. This reviewer was a little concerned by a statement that the PI concentrated on developing top-notch courses, rather than a program.

The third reviewer remarked that the objective was to develop graduate, undergraduate and short courses and outreach activities in the field of Electrified Transportation. The deployment was then to create some undergraduate, graduate, and short courses and do some outreach. Currently, students were taking these undergraduate and graduate courses. This reviewer inquired as to how it was known that these were the courses the students needed for Electrified Transportation or if there were courses that were lacking.

The fourth reviewer observed one technical barrier was the development of one of the laboratories was a problem due to the upgrade necessary to the University of Michigan (UM) facility. This reviewer questioned whether adding Pennsylvania State to the program was a distraction when time (and maximizing resources) could have been spent focusing on in-state universities. The success rate of student enrollment into the classes was unclear. This reviewer inquired about how many students were moving on to further education, which field, or careers in the automotive (advanced technology vehicle) industry. This reviewer would like to know what the student satisfaction rate with the new courses and laboratories was. This reviewer questioned how UM measured the success of integration of the labs with the courses that had been developed.

The final reviewer remarked grade might have been higher if the presentation information was clearer, but from indications it appears the project has done a good job on this.

Question 3: Characterize your understanding of the technical accomplishments and progress toward overall project and DOE goals.

The first reviewer noted that the Green Mobility lab has created nine jobs: five co-ops; a small desktop dyno; and fuel cell system integration and power electronics at Kettering, which was a great boost to the Kettering program. The laboratories appeared to be excellent for additional learning beyond the classroom and were the cornerstone of this project.

The second reviewer remarked that the project developed a diverse set of courses, and noted nearly 800 enrollees to date. This reviewer observed that two labs were established, a high school summer camp was offered, videos were created, and educational kits and a (crude) video game were developed. This reviewer commented that the education lab has been helping the university attract paid research.

The third reviewer said the outreach activities and curriculum development resulting in courses and the mobile laboratory was in sync with the project's goals and methods for addressing barriers.

The fourth reviewer remarked that the project created some really neat and exciting laboratories. The outreach activities look very interesting and engaging, especially the education kit. This reviewer would like to know how recruiting for short courses would be improved in the future because this is a barrier.

The final reviewer thought the technical accomplishments appeared to be substantial but this reviewer was just not sure because the slides looked designed to overwhelm the reviewers with technical details. Moreover, the 2011 and 2012 achievements presented on Slide 9 did not seem to reflect what the other slides seemed to be saying, which was very confusing.

Question 4: What is your assessment of the level of collaboration and coordination with other institutions?

The first reviewer saw collaboration with a recognized set of universities with strong capabilities and backgrounds in automotive technology, and appropriate industry partners including OEMs and Tier 1 suppliers.

The second reviewer commented that collaboration is good, and noted that collaboration with General Motors Corporation (GM), Ford, DTE, and Bosch in course development as well as A&D equipment is noteworthy, and also noted collaborations with the University of Michigan-Ann Arbor, Dearborn Kettering and Pennsylvania State University.

The third reviewer saw four partner schools and many industrial partners, and the presentation showed some good work by Kettering and the University of Michigan. This reviewer questioned how Pennsylvania State fit into the project because Pennsylvania State was a collaborator.

The final reviewer remarked that courses were developed in partnership with GM, Ford, Bosch, and two others but broader collaboration with the vast network of companies in Michigan could lead to future resources and opportunities for students to be placed. Working with the business schools could increase participation in the green manufacturing course, which seemed like an excellent addition to a mechanical, chemical or electrical engineering degree. This reviewer remarked that collaboration with Pennsylvania State seemed like a good idea but questioned if it was a distraction. This reviewer suggested that future collaboration with Ann Arbor/Detroit Clean Cities is a possibility for the student events and other outreach courses for the community. The Pennsylvania State effort can work with the EcoCAR 2 outreach teams and Pittsburgh/Philadelphia Clean Cities, as well, to reach a greater audience. Online tools and videos could be promoted or linked from local Clean Cities' web sites.

Question 5: Has the project effectively planned its future work in a logical manner by incorporating appropriate decision points, considering barriers to the realization of the proposed technology, and, when sensible, mitigating risk by providing alternate development pathways?

The first commenter observed that project funding was nearing completion. Appropriate future work included finishing out a lab, developing another course, and continuing to deliver courses and camps. The second reviewer thought that the project was on track to finish the work on their labs in the next few months and start use of the I-HES lab in September. This reviewer saw no reason why the project would not finish and have in place the necessary tools and course materials to turn out trained design and development engineers. The third reviewer noted that project was winding down with 10% left. Future work stated that courses would be improved. This reviewer questioned how course work would be improved, and would like information about the process. The final reviewer noted that the main barrier of the third lab being built has now been addressed. This reviewer inquired about what the plans were to keep the curricula and labs current. While future funding was not as critical for the University of Michigan, this reviewer wondered if it may be an issue for Kettering.

Question 6: How sufficient are the resources for the project to achieve the stated milestones in a timely fashion?

Reviewers thought that resources were sufficient. One reviewer would like the project to consider extending this highly successful effort. The second reviewer commented that 90% of the project was complete and this reviewer suspected the funds were sufficient. The third reviewer commented that it appeared the third lab would be finished at the end of fiscal year 2012. But, this reviewer pointed out that there is little time to validate how effectively the equipment at the lab augmented the course work.

Advanced Electric Drive Vehicles: Lawrence Schwendeman (J. Sargeant Reynolds Community College) – arravt039

Reviewer Sample Size

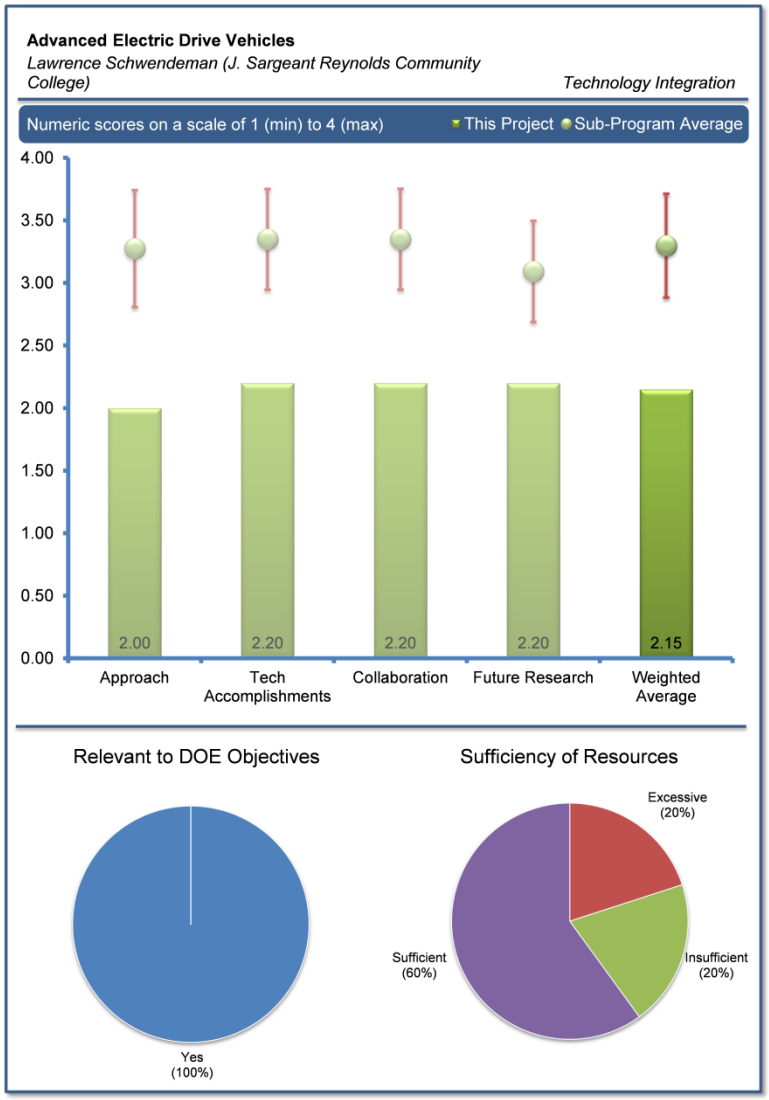
This project was reviewed by five reviewers.

Question 1: Does this project support the overall DOE objectives? Why or why not?

Most reviewers found that the project supported DOE's objectives. The first reviewer stated training and education activities such as these were of value in providing EV and HEV literacy to the public, as well as providing specific training to the workforce sector, thus accelerating mass market introduction and penetration of advanced electric drive vehicles, resulting in the DOE objectives of petroleum displacement.

The second reviewer commented that training of EV service technicians was important to the widespread proliferation of this technology and therefore the displacement of petroleum.

The third reviewer remarked that project targets development of five courses related to EV and PHEV diagnosis and repair. The project has made substantial progress on developing and implementing relevant coursework. Overall, the project recognizes and aims to help address a critical shortage of technicians in this field.



The fourth reviewer commented that the education is aimed at vehicle technology technicians and increasing skills were needed as more cars have hybrid drive or even are purely electric. The intention was good as it provided for skilled service sector jobs to support these new cars.

The final reviewer remarked that the project indirectly supported the objective in that it supported the overall ecosystem that allows electric vehicles to be successful, but that the project does not directly displace petroleum. That is not meant as a disparagement of the project, just a clarification.

Question 2: What is your assessment of the approach to performing the work? To what degree are technical barriers addressed? Is the project well-designed, feasible, and integrated with other efforts?

The first reviewer remarked the development of courses and delivery in a community college setting.

According to the second reviewer, sponsors recognized a difficulty in attracting students to the program, and seemed to be moving in the direction of more distance learning opportunities. Given the targeting of students for this kind of program, this reviewer recommended putting heightened efforts into distance and evening learning programs.

The third reviewer noted that classes were being developed and have been cycled through several times, but the project has not connected with a market of students who wanted to take these classes. The project has made efforts to connect and share curriculum elements with others nationally, but this has not gone far enough.

The fourth reviewer remarked that the strategy for this local community college was to invent the curriculum without the help of other organizations and industry. This was a very difficult challenge to do alone. The other technician training efforts were done under a larger umbrella of support from universities and industry. The development of training for fuel cell vehicles is premature. Even if fuel cell vehicles (FCVs) penetrated the market in 2015, FCVs would not be seen at independent shops for 8 to 10 years.

The final reviewer opined that the project does not appear to be focused on real industry needs. The reviewer remarked that the presenter did not provide a good rationale, defense or strategy in the presentation for some aspects of the project, especially the pieces that are yet to be accomplished. The presenter referenced how all graduates get jobs, but that seemed more to be about mechanics on traditional vehicles and did not necessarily justify trainings on something like fuel cell vehicles.

Question 3: Characterize your understanding of the technical accomplishments and progress toward overall project and DOE goals.

Reviewers had mixed comments. The first reviewer stated that the project has had difficulty overcoming the barrier of attracting students into the program. Nonetheless, the project has made significant progress on developing and implementing the curriculum.

According to the second reviewer, given the strategy charted, good progress had been made. Industry partnerships were emerging and the curriculum was developing. Better connections with potential students would help the program along. The third reviewer stated that courses were developed and offered in a timely fashion.

The fourth reviewer commented progress has been good in creating the classes, but the actual impact has been rather small because fewer students have signed up for these classes than originally hoped. The reviewer mentioned that perhaps the project should have had more effort and mechanisms to provide outreach about the kinds of new education that was being offered.

According to the final reviewer, the project appears to have accomplished a couple of its goals, but that it was very difficult to tell how effective these were or how valuable the progress has been. As a side note, this reviewer observed that the presenter should do a better job in the future of listening to questions from reviewers. There were several times that the presenter would answer a different question than the one asked, even if the question was repeated and stated differently. It got to the point that it seemed as if the reviewer did not care to answer the questions being asked, that the presenter just heard what he wanted to hear and was going to talk about what he wanted to talk about. This was probably not the case, but that was how it seemed at least to this reviewer.

Question 4: What is your assessment of the level of collaboration and coordination with other institutions?

Reviewers had mixed responses on collaboration. According to the first reviewer, the project has formed collaborations with OEMs and with one partner institution. In addition, the project was engaged in frequent communication with local technicians about training needs. The second reviewer observed that the emerging industry collaborators and the other school in San Francisco seemed to have propelled the effort forward.

According to the third reviewer, most work was done at the lead organization with little outside collaboration. City Colleges of San Francisco is mentioned as a collaborator on instructional development. Additionally, Ford, GM and others were mentioned as industrial partners, but it was not clear what their role has been. This reviewer inquired whether Ford, GM, and others would be sponsors who would help continue this into the future.

The fourth reviewer noted that the project mentioned one partner – City College of San Francisco – although the extent of collaboration seemed pretty limited. In addition, industry partners were listed but as partners of the automotive program. The reviewer noted that it was hard to tell if these partners had specific roles in this particular project.

Question 5: Has the project effectively planned its future work in a logical manner by incorporating appropriate decision points, considering barriers to the realization of the proposed technology, and, when sensible, mitigating risk by providing alternate development pathways?

The first reviewer observed that one course remained to be developed and two new courses would be held for the first time this summer and next fall. Another reviewer noted that the presentation and presenter indicated that the project would complete future activities, but the details were lacking so it was hard to make a good assessment of the prospects for completing future activities.

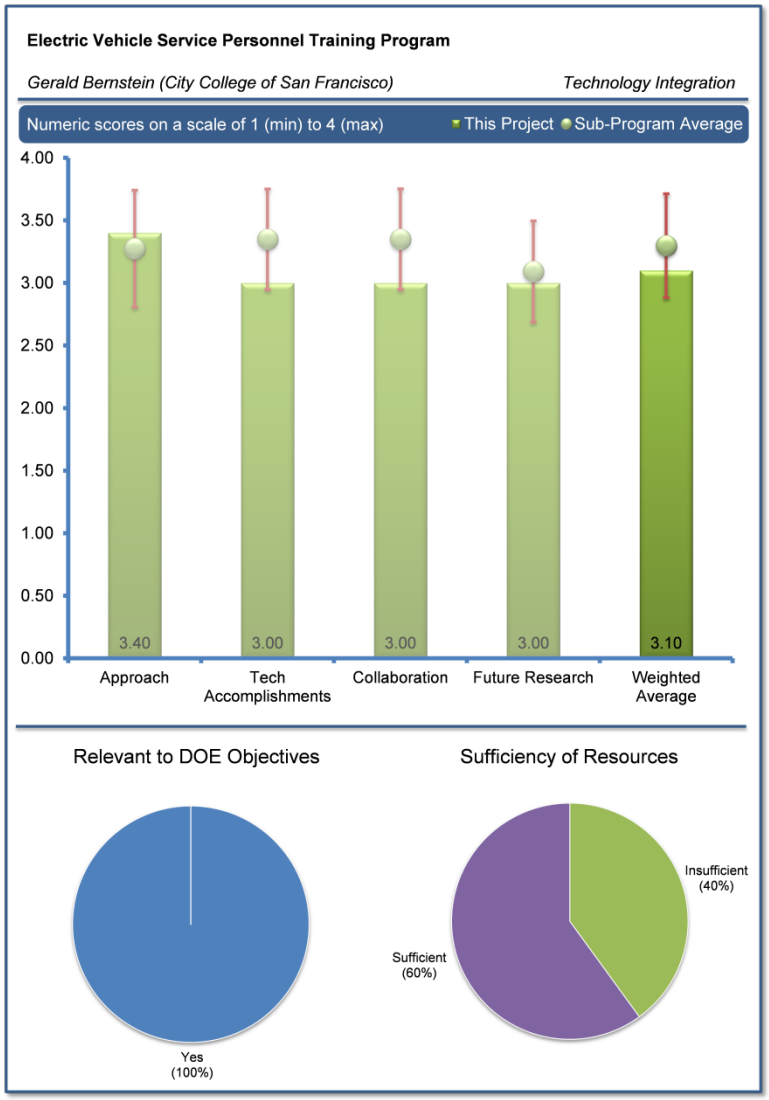
The third reviewer commented that the project seemed to be just continuing. However, since the project had recognized difficulty in attracting students, the project should be doing something to change the outreach or curriculum advertising to improve the impact.

The fourth reviewer expressed that the development of fuel cell vehicle curriculum was notable but out of step with reality. The reviewer suggested that that effort be repurposed towards the other curriculum development or inventing new methods of training delivery that are attractive to the potential students in the area.

Question 6: How sufficient are the resources for the project to achieve the stated milestones in a timely fashion?

Reviewers had mixed responses. One reviewer stated that funds were insufficient and that the strategy for deployment and the level of funding do not match. Just the procurement of training assets could consume much of the budget. Three reviewers found funds to be sufficient. One reviewer stated that funds were excessive. This reviewer commented that because of the low number of students, this project has a low return on investment. It was difficult to evaluate the sufficiency or insufficiency of the funding when reviewers have been provided with so little information about how the money has been allocated or spent. This was definitely a large budget for the few number of students impacted.

Electric Vehicle Service Personnel Training Program: Gerald Bernstein (City College of San Francisco) – arravt040



Reviewer Sample Size

This project was reviewed by five reviewers.

Question 1: Does this project support the overall DOE objectives? Why or why not?

Reviewers generally found that the project supported DOE's objectives. The first reviewer thought the project very relevant to supporting the purchase and operation of petroleum-saving advanced electric-drive vehicles.

According to the second reviewer, this was a really good project. While the subject was subtle it may very well be the lynchpin of a decision to buy a hybrid or electric vehicle, because it answers two perplexing questions including where and who would repair the reviewer's car when something goes wrong and how much it would cost. Considering the payback for $600,000 of expenditure, this program may very well yield the highest expenditure to return ratio. The reviewer commented that people make decisions to buy more on the service support than perhaps anything else, especially when it comes to big ticket items like a car. If DOE's objectives of petroleum displacement rely on a significant number of Americans switching to electric vehicles, then service becomes, in many cases, a make-or-break factor. So this project is important to the overall buying decision made by Americans.

The third reviewer stated that training, and education programs such as these are of value in providing EV and HEV literacy to the public, as well as providing specific training to the workforce sector, thus accelerating mass market introduction and penetration of advanced electric drive vehicles, resulting in the DOE objectives of petroleum displacement.

The fourth reviewer remarked that education is needed for the new generation of auto technicians to become familiar with electric drive vehicles. The fifth reviewer commented this project would lead to sustainability with satisfied customers of PEVs and HEVs, purchasing these vehicles in the future, spreading positive feedback to their neighbors, and getting good performance from their current vehicles. Greater penetration would lead to greater petroleum displacement. San Francisco is the third largest market for HEVs.

Question 2: What is your assessment of the approach to performing the work? To what degree are technical barriers addressed? Is the project well-designed, feasible, and integrated with other efforts?

According to the first reviewer, the strategy for deployment was sound, and this reviewer observed that two college classes with an evolving curriculum at two different colleges, a fleet training program, and independent tech training were good first steps. The overall program called for expansion to four colleges and one in a neighboring state, the fourth fleet training, and independent

training to third California location and one to a neighboring state. Again, for the money their work was aggressive and the plan appeared to be sound.

The second reviewer remarked that with a small budget, the project has managed to successfully create and deploy education and training content and classes addressing a local need for a gap in workforce in EVs and HEVs.

The third reviewer observed an interesting and accurate observation that maintenance of advanced technology vehicles was going to move increasingly outside of factory-trained dealer networks as vehicles age past their warranty periods. A three-county survey showed that working technicians generally do not want a program, just specific courses. This reviewer questioned whether a three-county survey was sufficient to reveal statewide or nationwide training needs.

According to the fourth reviewer, although this can be tough for community colleges, better integration with the automotive manufacturers is needed for technology or equipment support. This reviewer was not sure the community college should be given this task, and questioned whether DOE can help with this.

The final reviewer remarked that the baseline for students enrolled in this course to know automotive electronics. The program is reaching automotive mechanics beyond the dealer network. Many HEVs are older and have no warranties so this program is important to keeping performance and customer satisfaction for this technology and future purchases of advanced vehicle technologies. Working technicians are hard to attract and just want specific course or courses on the weekends or at night. This program has adapted to these needs. But greater penetration could be generated by talking to the owners of the independent stations who may see a market opportunity as having skilled technicians in this area. This program is also reaching automotive courses at high schools. The program has been or will be expanded to 10 community colleges in California and one in Oregon.

Question 3: Characterize your understanding of the technical accomplishments and progress toward overall project and DOE goals.

Reviewers had mixed responses regarding the technical accomplishments. The first reviewer noted that the project has done a really good job; the program has expanded and brought other fleets and schools into the process. By 2012, the project will have three independent tech programs, which is not bad when considering the funds in the state that has the most hybrid or electric drive vehicles.

The second reviewer thought the goals and milestones were appropriately met, and that the project is addressing the barriers detailed during the presentation. Also the presentation addressed future barriers along with current barriers. According to the third reviewer, the City College of San Francisco (CCSF) appears to be on or ahead of schedule with regard to milestones, with one or two exceptions. This reviewer observed that the students were learning about safety and fluid changes and diagnostics, but not as much about how to actually repair components and systems. CCSF reported a useful list of lessons learned.

According to the fourth reviewer, some barriers to success are having enough local resources to obtain a PEV or HEV vehicle to work on in the classroom. Having additional diagnostic software is needed so more students have access to learning. Union issues have been a barrier to the San Francisco fleet manager program, preventing attendance on weekends as overtime needs to be accounted for. Students want individual courses, not certification programs, and timing needs to be adjusted to weekends or nights, but not too frequently for working technicians. These barriers were noted by the speaker, and the CCSF adapted or modified direction in a timely manner. Community colleges appeared to be quite eager to offer this training. Safety is always the basis of the course then operational issues. A survey led to addressing much of the lessons learned and then developed course corrections.

The final reviewer perceived that it was tough to gauge progress based on the presentation, other than some courses that were provided. This reviewer would like to know the number of students, fleet maintenance personnel, and independent technicians this program has reached.

Question 4: What is your assessment of the level of collaboration and coordination with other institutions?

Reviewers generally perceived strong collaboration. The first reviewer remarked that within the purview of this program there was noteworthy collaboration with Pat's Garage and Perfect Sky, who were working to increase the training and information about the history, benefits of electric drive vehicles. From all indications, partners were onboard and fully supportive of the college's efforts.

The second reviewer thought that collaboration level appropriate given scale of project.

Another reviewer thought that some higher level collaboration was needed, but very good collaboration with local shops.

The fourth reviewer observed that the college seemed to be working well with other community colleges and were partners of NAFTC. This reviewer assumed the automotive technician curriculum was developed in partnership or was peer reviewed by NAFTC. The reviewer suggested that greater collaboration with local Clean Cities could help with finding outside speakers, resources, coordinating high school or fleet programs, or other outreach activities.

The final reviewer thought that collaborations were adequate, but could be stronger, perhaps with the addition of Automotive Service Excellence (ASE), original equipment manufacturers (OEMs), or service manual developers, e.g., Haynes, Chilton, etc.

Question 5: Has the project effectively planned its future work in a logical manner by incorporating appropriate decision points, considering barriers to the realization of the proposed technology, and, when sensible, mitigating risk by providing alternate development pathways?

One reviewer observed that future activities were sound and in line with the overall goals and objectives of the project, and it appeared to be at budget and on time.

Another reviewer thought future activities seemed reasonable. This reviewer observed that the computer-based training aid idea might merit further work. The same reviewer suggested that a hardware-in-the-loop approach might make sense and elaborated that a part that is not operating correctly could be diagnosed while the rest of the vehicle systems are simulated.

The third reviewer would like to know whether funding was available to keep the curriculum updated and to expand the program to other colleges and high school. This reviewer would also like to know what the plan was to raise additional revenue streams. But, according to this reviewer, the program has exceeded its goals in the number of colleges it set out to reach.

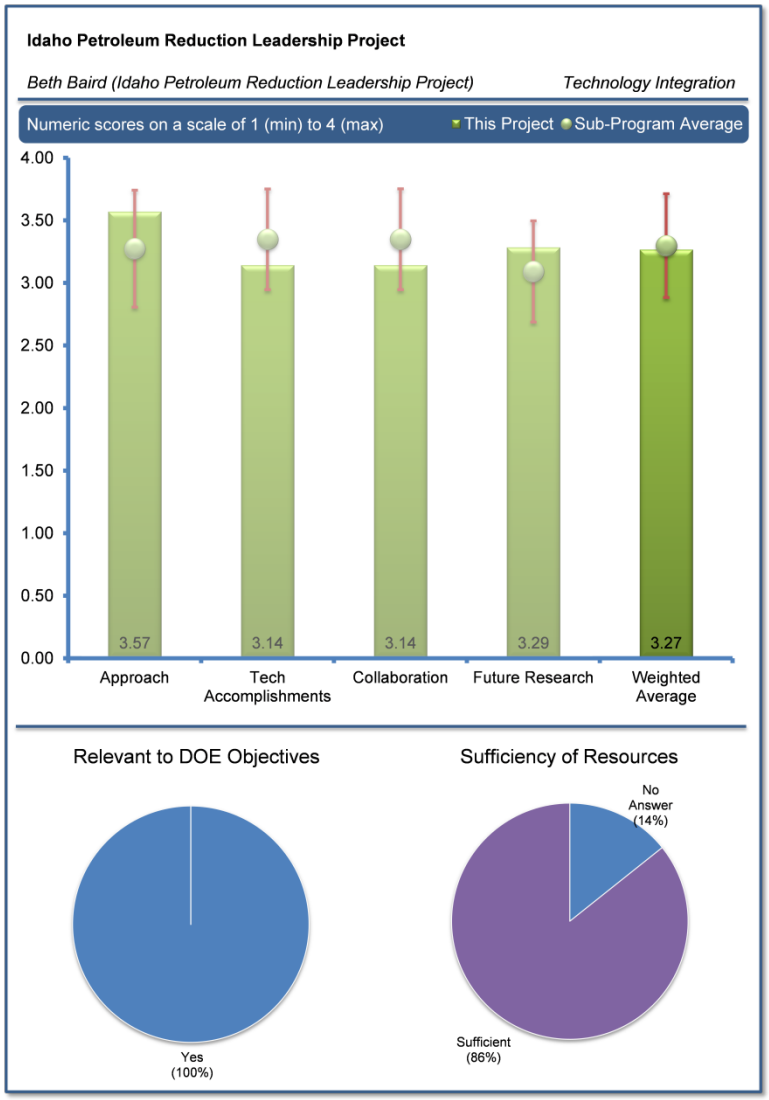
The fourth reviewer observed that a major barrier was equipment. While this was not a $1-5 million project, it was a $500,000 project and it seemed little was used for major equipment.

The final reviewer would like more information presented on the paths of sustainability of the program.

Question 6: How sufficient are the resources for the project to achieve the stated milestones in a timely fashion?

Two reviewers thought resources were insufficient. One reviewer marked insufficient not because the work cannot be completed, but because the project should be given a greater level of funding for follow-on work. A second reviewer remarked that the project may need a three-month extension to December 2012. Perhaps having one additional staff member could have helped community colleges find donated vehicles, funding for additional software, finding guest speakers, developing fleet manager programs, and building high school programs. Three reviewers thought that resources were sufficient. One reviewer commented that accomplishments appeared reasonable given the relatively limited resources available.

Idaho Petroleum Reduction Leadership Project: Beth Baird (Idaho Petroleum Reduction Leadership Project) – arravt041



Reviewer Sample Size

This project was reviewed by seven reviewers.

Question 1: Does this project support the overall DOE objectives? Why or why not?

One reviewer responded that the project has not only achieved its goals but exceeded it by a long shot. The reviewer noted that this program should be the poster child for DOE. Not only did Republic Services switch the funded vehicles over to CNG, but the project was so successful that Republic Services decided to switch their entire U.S. fleet over to CNG. This reviewer thought that that the potential 800 vehicle changeover was amazing.

According to the second reviewer, this project displaced petroleum through conversions to CNG that would not have occurred without this project and the persistence of the coordinator.

The third reviewer remarked great job implementing vehicles correlated with infrastructure. The fourth reviewer observed a good amount of petroleum fuel displacement, and that this would lead to more displacement by Republic Services and other fleets.

The fifth reviewer observed that the purpose was to introduce CNG as a viable fuel in Idaho, plus raise awareness of it. The project also included at least one national-presence partner, who moved forward with CNG in other areas based upon this project. Jobs were not a primary focus of the proposed project, but the project did see some created along the way.

The sixth reviewer commented that this project was relatively modest in terms of budget but maximized its effectiveness by targeting a large fleet that saw heavy daily use and was very visible to the public. This reviewer observed that Republic Services made the commitment to switch to a cleaner fuel and based on the success of the pilot program in Boise, has decided to switch over more of their fleets nationwide to natural gas. This reviewer considered that a resounding success. This reviewer also observed that the project has resulted in 4 fuel facilities installed, 29 trash trucks and 4 support vehicles.

The seventh reviewer commented that the project achieved a very high majority of goals, good outreach and education, and achieved a significant degree of fuel use and vehicle emission reductions.

Question 2: What is your assessment of the approach to performing the work? To what degree are technical barriers addressed? Is the project well-designed, feasible, and integrated with other efforts?

The first reviewer recognized a great deal of work up front to assure the success of the program from the start. This included working the political side of the equation by instigating clarification of an Idaho Public Utilities Commission Rule to expressly allow resale of natural gas for use in vehicles. This could have been a major barrier to implementation. Efforts also included raising awareness of the benefits of using CNG and its availability to fleets. The PI worked this award from beginning and really

kept the pressure on to make sure it was successful. This reviewer gathered that a lot of hard work and tenacity went into this project.

A second reviewer commented that the Idaho project appeared to have been well designed by choosing projects that were ready to proceed, exercising good communications with stakeholders, such as the PUC, monitoring construction of fueling infrastructure and maintaining good marketing strategy.

The third reviewer was impressed by how diverse barriers were overcome, such as permitting requirements, and observed that a workshop was held with an OEM, Cummins, which was a key to successful deployment. Another reviewer observed that regulatory and state barriers were overcome.

The fifth reviewer identified that a shovel-ready project was chosen for a greater chance of success. There was a simple fueling setup for the truck fleet at the company-owned overnight parking area. Permitting and CNG resale barriers were addressed and overcome early. It was a well-planned and executed project, albeit limited in scope to just one major fleet. The project spurred a significant investment by Republic Services in their other fleets nationwide, so it was a great return for the relatively small investment.

The sixth reviewer commented that outreach was kept as a key element because of the perceived issue in Idaho. The project took the approach of starting with a ready-to-go project to get some momentum, and had already completed all NEPA work for it. This reviewer observed that the project's approach focused on establishing a fleet, building the first public station in Boise, and doing outreach. A public survey was done early on to determine familiarity with CNG, and then the survey was used to focus outreach efforts. This reviewer's only concern was that the project was largely focused on only one fleet, though acknowledged it was positive to get that fleet to serve as a model, which it did. The reviewer further commented that given the budget size, it was a bit of a concern that the project was initially designed to only focus on that one fleet. Luckily, the fleet came through, reported this reviewer, and others did follow, resulting in greater petroleum displacement than proposed. The same reviewer cautioned that the approach could have fallen short if the target fleet had any issues. This reviewer would have liked to see probably three or so fleets targeted initially.

The final reviewer recommended documenting the permitting lessons learned. This reviewer asked how many PEVs/EVSEs would be deployed if the project team could start now.

Question 3: Characterize your understanding of the technical accomplishments and progress toward overall project and DOE goals.

Reviewers generally perceived that the project was making good progress. The first reviewer observed successful resolution of all the barriers that would have prevented the implementation of CNG into waste hauling trucks. The fact that the company now wants to convert its entire fleet is a testament to this success. One of the most important aspects of this grant was adherence to the motto "keep it simple." Shovel ready, find and make a win, and allow people to see the effects and get onboard with CNG as an alternative fuel. This was a great idea and a proven way to proceed and succeed.

The second reviewer commented that all targeted objectives were met and with measureable impacts. The third reviewer commented that the project reached goals. Another reviewer commented that the project was nearly complete and on schedule, and has returned a higher than expected reduction in petroleum at the local level, with the likelihood of much higher reductions nationwide as Republic Services continued the strategy on their own.

The fifth reviewer saw a clear focus on what the barriers were and still are. Permitting in particular was an issue. This reviewer observed that, overall, a smaller-scale project than many of other ARRA projects. This reviewer observed that the plan was to put in four CNG stations, which was accomplished, plus acquiring 28 CNG vehicles when 33 were actually acquired. Vehicles were primarily trash trucks, 29 total of these. The project included training for operator, maintenance, and tank inspector personnel, and also facility modifications. A marketing coordinator was hired to do the outreach part, and developed materials that could be used to move the project up the chain. According to this reviewer, overall, the project was looking at annual petroleum displacements

greater than proposed. Republic Services, which is a waste hauler, went CNG in other parts of country based upon this project. Another reviewer noted that the project reported the completion of 10 millstones and added 2 new ones in outreach and training with a community college. Project reported meeting or exceeding technical goals and introduced a significant amount of AFV equipment and infrastructure. Among these were technical training, shop improvements and a robust outreach and marketing campaign and fleet conversion due to opening of public stations. There was an effective pre- and post-public use of surveys to measure change in public awareness. This reviewer noted that the graphics used in the presentation should have been easier to read.

The sixth reviewer perceived that the issues were less technical and more logistical or political.

Question 4: What is your assessment of the level of collaboration and coordination with other institutions?

Reviewers generally saw effective coordination. According to the first reviewer, during the grant cycle a number of other partners stepped up, i.e., City of Boise, Valley Regional Transit, and the Taxi company, and it appeared by all indications that these partners were not just acting as recipients but as full-on marketing partners as well. Everyone was on the team and working to bring about real change, and this seemed like a real example of 21st century leadership.

The second reviewer remarked that the collaboration with the waste hauler as well as the communities was impressive. This reviewer liked seeing pre- and post-surveys on public awareness as well as calls to fleets. A reviewer commented the project appeared to have been an effective collaboration with local partners.

Another reviewer noted Republic Services has been an ideal partner, advocating the use of CNG locally and taking their CNG program nationwide to 14 other cities. Several initial targeted partners dropped out, while other fleets joined in that were not part of the initial target group. While only one other major partner was landed for this project, perhaps continued success of this program will spur others to take notice and participate in future opportunities.

A fourth reviewer observed that the project collaborated with other local fleets interested in converting to CNG since the stations opened. The reviewer noted that many have already moved toward CNG as a result of outreach and direct fleet contact approach. In Idaho, the cost of CNG was $1.98/diesel gallon equivalents, versus $3.80/gallon for diesel. So once the word got out, that was seen as the key to getting interest. Overall, though, this somewhat smaller scope project meant not that many collaborators/partners were anticipated. To be fair, this might be a function of the market, which is Idaho.

Both the fifth and sixth reviewers observed a fairly small amount of partners.

Question 5: Has the project effectively planned its future work in a logical manner by incorporating appropriate decision points, considering barriers to the realization of the proposed technology, and, when sensible, mitigating risk by providing alternate development pathways?

Reviewers perceived that the project has clearly identified future activities. The first reviewer commented this program was as solid as a rock, and that there was an understanding of what needed to be done. Necessary changes were learned and implemented as it occurred, and there was an effort to get more people involved as soon as the word hit the street. The reviewer referenced Thomas Jefferson who once said that states should be the experimental laboratories of the government; in many respects what was done in Idaho was a great example of what can be done to reduce dependence on foreign oil.

For the second reviewer, this project had already overcome its biggest barriers to success, so future activities would be on track.

The third reviewer perceived that the project goals have been met in terms of infrastructure, and future activities would focus on public education and reporting of results. Future goals were similar to other projects, with perhaps more emphasis on public education and building for future projects.

The fourth reviewer did not think much else was needed, and was glad that outreach is continuing. Another reviewer remarked that future follow up activities seemed to have been well thought out.

The final reviewer remarked that all key grant activities were done or nearly done; just finishing things off over next year and that most of the effort remaining appeared to be outreach.

Question 6: How sufficient are the resources for the project to achieve the stated milestones in a timely fashion?

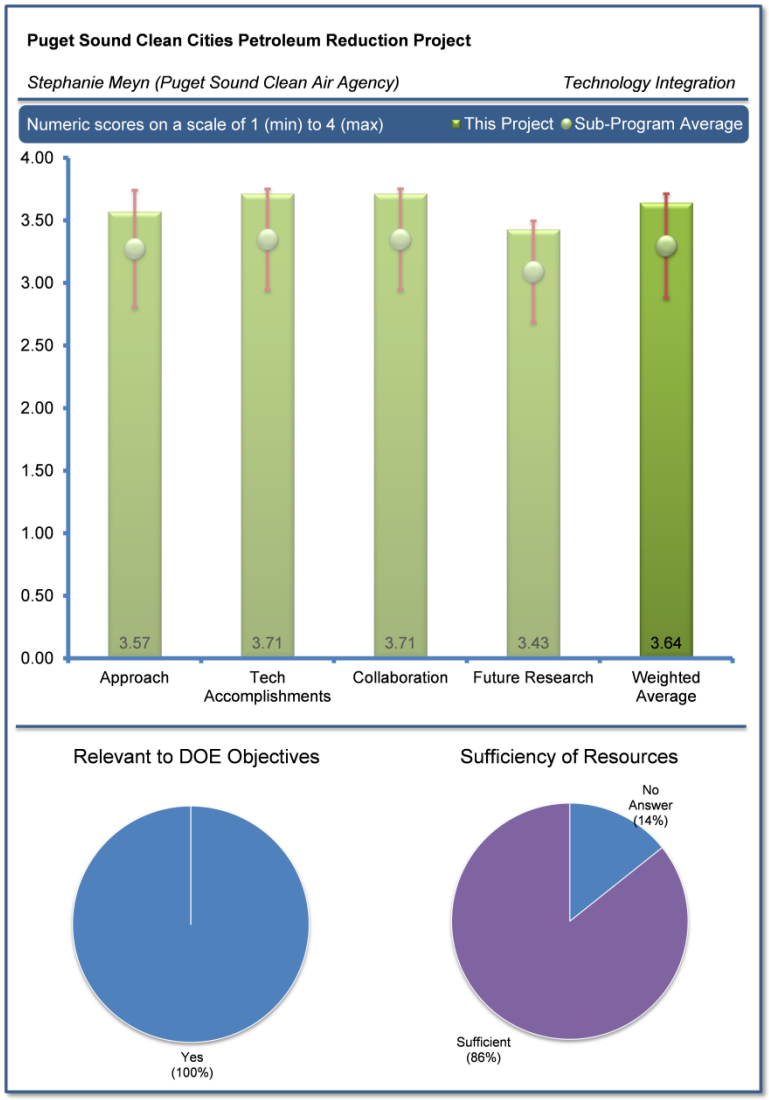
All reviewers thought that resources were sufficient. One reviewer remarked the use of resources appeared to be optimum considering that the expense associated with new waste trucks was very high but the realization made by Republic Services that the cost truly justified the end and the switch to CNG. For this reviewer, this reflected that the use of funds and resources were sufficient to get this particular phase complete. This reviewer remarked that the program was well managed, has the momentum to succeed, and should be considered for future opportunities based on this performance.

A second reviewer commented that the allocated resource level appeared appropriate.

The third reviewer observed no indicated shortfall on funding. That makes sense, given that most of activities remaining are outreach.

A fourth reviewer remarked there seemed to be an efficient use of resources to achieve project goals within the established time frame. The final reviewer noted that the project was able to cover incremental costs to purchase a number of CNG refuse haulers and to help with infrastructure, and had money left for building public awareness.

Puget Sound Clean Cities Petroleum Reduction Project: Stephanie Meyn (Puget Sound Clean Air Agency) – arravt042



Reviewer Sample Size

This project was reviewed by seven reviewers.

Question 1: Does this project support the overall DOE objectives? Why or why not?

Many reviewers noted that the project supported DOE's objective for petroleum displacement. According to the first reviewer, after reviewing a number of similar programs, this reviewer walked away from the presentation thinking this was an honest program. The program has accounted for 50,000 gallons of fuel displaced and this was a believable figure when considering the number and types of vehicles put into use, which was 237.

The second reviewer thought that this project used multiple strategies to displace petroleum and successfully measured impacts.

The third reviewer observed a major displacement of petroleum.

A fourth reviewer perceived that the project clearly fell within the DOE objectives.

The fifth reviewer saw a wide range of vehicles and types of fuels. The project was leveraging existing CNG acceptance in the area. The reviewer saw a realistic approach that built on existing strengths in the market.

The final reviewer commented the project's goal was to reduce petroleum consumption, create a sustainable market for renewable alternative fuels, create/maintain jobs, and do public awareness through Sea-Tac Airport.

Question 2: What is your assessment of the approach to performing the work? To what degree are technical barriers addressed? Is the project well-designed, feasible, and integrated with other efforts?

The first reviewer was particularly drawn to the fourth graphic, which showed the breakdown of funds according to each of the program objectives, AFV stations, vehicles and education and outreach. This reviewer suggested that DOE should insist all programs do a breakdown of this type; this would help reviewers be more accurate with the math as to where the lion's shares of the funds were going. The reviewer observed that this was a simple but a wonderful slide. This reviewer would have liked an overall strategy statement of one or two sentences that summed up the spirit and intent of the program, but what was included in the presentation seemed to work just fine.

The second reviewer commented that this project was very complex, which created challenges. On the other hand, there was a diverse strategy that sought to offer appropriate solutions for diverse stakeholders, ranging from airports to rural communities.

The third reviewer commented that an innovative approach of leasing airport ground vehicles to the airlines by the airport, unfortunately did not work. Now the project has gone to plan B and approached each airline. This reviewer recognized that a dairy farm renewable gas project ran into roadblocks with a gas cleaning system. The reviewer recommended that perhaps complete, better research of feasibility before committing to unproven strategies.

The fourth reviewer liked the diversity of fuels and vehicle powertrains and observed a great focus on renewables. This reviewer was also impressed that each airline was approached individually. This reviewer would like to know what was learned from this process, and whether there would be any documentation.

The fifth reviewer observed that the project appeared to have been based on a unique strategy involving a good variety of relevant partners. Another reviewer remarked that a large complex project created many barriers and it was more difficult to overcome all of them. However, this reviewer thought that the redo in switching from RNG to CNG during the project was clever.

The final reviewer observed there were underutilized refueling stations (CNG and LPG), so the project focused most of the DOE funding on vehicles: 250 CNG/LPG, 220 hybrids, plus electric airport equipment. Hybrids also included electric-bucket utility trucks, which provided an opportunity for quieter operation as well as idle reduction. The strategy focused on the airport as a key opportunity. The airport had set a requirement for cleaner or alternative fuel taxis/shuttles, plus ground-support equipment. Many of the vehicles in the program were very high use (70,000 miles/annually) and visible within the community. This resulted in a relatively big bang for the buck. In addition, the airport was a critical factor used for outreach, including video, handouts, etc. The project also included developing educational materials to provide roadmap for projects. Overall, the reviewer observed a very good approach using a key partner (the airport), and relying upon existing refueling stations meant using most of money on vehicles (nearly 1,000 on-road and airport), resulting in a large project with relatively high long-term fuel displacement.

Question 3: Characterize your understanding of the technical accomplishments and progress toward overall project and DOE goals.

Reviewers generally saw good progress, and several reviewers commented on the collaboration with the local airport. According to the first reviewer, the project appeared to be well focused and thought-out by planning to achieve its goals by partnering with Sea-Tac airport, taxi fleets, and heavy duty trucks. The economic benefits, job creation, and small business development appeared to have been significant. Through use of signage, video screens at the airport, and driving training the project appeared to have been effective, and has also reported millions of gallons of conventional fuel displacement.

According to the second reviewer, these programs have a trickle-down effect as new stations and vehicles are introduced. The need for repair, maintenance, systems design and development people are needed, so the jobs creation portion of this program lies in the background but is evident. This program was ambitious especially the introduction of the program to Sea-Tac but it was admirable and necessary. Excellent progress was noted by the reviewer, with the introduction of 237 CNG vehicles and a 50,000 gallon displacement. According to this reviewer, the 200 taxis with Clean Cities' logos was a natural advertising campaign that would raise awareness of the implementation in the Seattle area.

The third reviewer noted that working with airports/airlines is complex. However, it appeared that the project has regrouped and is moving forward.

The fourth reviewer remarked that the project has put out two publications to help others understand and deploy alternative fuels. There have been significant strides with a number of fleets.

Another reviewer remarked that 60% of the budget had been spent, but that 85% of the project was complete. This reviewer observed that most of the non-outreach work was done, except for the airport ground-service equipment. The reviewer noted that there had been some hang-ups on working with the airport as a whole, so the project team had to retrench and go to each airline individually. The project was making progress, but slower than if the project had been able to work at an airport level. This reviewer observed that there have been issues with the renewable natural gas system, so there has been a focus on CNG

infrastructure for use by fleets. This reviewer also observed that the project installed fueling infrastructure for E85 (one station), biodiesel, and EVs (137). Biodiesel was coming from a local seed-crusher, so there was a local source for feedstock. The E85 station is only the fifth in the state, and was being used by city vehicles, police, and state EPAct fleet vehicles. A new CNG-taxi company was formed, which created 120 jobs, plus a local conversion company grew from 3 to 19 employees. Overall, the reviewer noted very good progress; however, airport/airline issues remained. If not for those remaining issues, the progress would have been judged outstanding.

The fifth reviewer suggested capturing all of those ancillary benefits the presenter mentioned, such as hybrid bucket trucks being quieter and safer. The sixth reviewer observed that the project is still overcoming barriers with RNG and airport vehicle use.

Question 4: What is your assessment of the level of collaboration and coordination with other institutions?

Reviewers generally saw evidence of strong collaboration. The first reviewer remarked it appeared that the right partners were chosen, including four cities and municipalities/counties. This reviewer thought the project did a great job on collaboration and coordination of other institutions.

The second reviewer observed a lot of hard work had gone into partnerships. Clearly, this collaboration would not have occurred without the strong commitment of the PIs. The third reviewer noted the project had taken on a very large and complex project but had been able to maintain partnerships while working towards solutions.

The fourth reviewer thought CNG for Hire was an interesting startup and a good marketing/outreach benefit, and also observed a lengthy list of partners.

The fifth reviewer observed that the project team was working with many local governments, 14 in total; universities; and companies, including individual airlines. This included nearly all the local municipalities, plus a number of particularly large fuel users (airport, port, etc.). More than 50% cost-share from these partners was received.

The sixth reviewer thought that the Puget Sound project leadership selected a varied and effective array of partnerships including local colleges and universities, regional and local governments, conversion businesses, and etc.

The final reviewer was glad to see a linkage to so many municipalities as well as national programs like the EV Project.

Question 5: Has the project effectively planned its future work in a logical manner by incorporating appropriate decision points, considering barriers to the realization of the proposed technology, and, when sensible, mitigating risk by providing alternate development pathways?

The first reviewer noted that airport ground support equipment work was still underway, and that the project was working with individual airlines. This reviewer noted that outreach was still underway. All else seemed to largely be done.

It was apparent to the second reviewer that the project was effectively working through issues with the airport. However, a resolution of issues with RNG was still unclear. The third reviewer observed that the project focused on addressing failed initiatives and overcoming infrastructure installation barriers, as well as marketing/outreach and reporting of results.

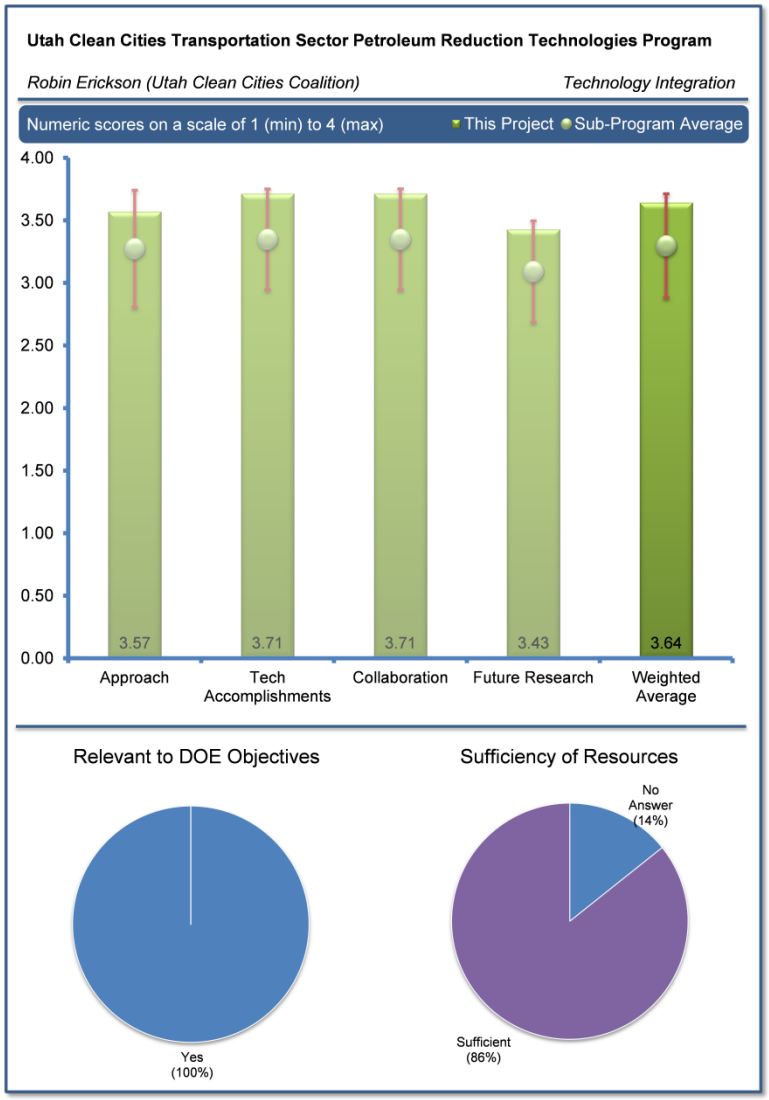
The fourth reviewer commented that the project appeared to have been successful in accordance with goals and objectives, and that future work was well thought out. The fifth reviewer expressed that the project summary was a bit overstated for the current timeframe; for instance, when the presentation indicated millions of gallons of displacement per year, the project's own figures said about 600,000 gallons were currently being displaced. Once the Sea-Tac program is online, then those numbers can be revised upwards. This reviewer advised caution in how the figures are used or stated.

According to the sixth reviewer, the complexity of the project would create challenges, but this reviewer appreciated the candor of the project implementers. The final reviewer wished good luck to the airport.

Question 6: How sufficient are the resources for the project to achieve the stated milestones in a timely fashion?

Reviewers thought that resources were sufficient. One reviewer remarked that with 60% funds expended so far and 85% of the work completed that the earned value numbers were very high. This reviewer commented "great job." The second reviewer commented that funding seemed fine, and that more of project was completed than the budget. No indication of problems with funding. A reviewer noted that reported resources appeared sufficient to accomplish goals within time frame. Another reviewer commented it seemed there were adequate resources budgeted for the project.

Utah Clean Cities Transportation Sector Petroleum Reduction Technologies Program: Robin Erickson (Utah Clean Cities Coalition) – arravt043



Reviewer Sample Size

This project was reviewed by seven reviewers.

Question 1: Does this project support the overall DOE objectives? Why or why not?

The first reviewer remarked that this was a great project. According to the presentation, 1 million GGEs a year had been replaced by CNG vehicles.

The second reviewer perceived that private fleets as well as the public benefited from this effort. This reviewer was pleased to see that this project included school buses, which were not included in many other projects reviewed.

The third reviewer observed that the project was focused on CNG, LNG, hybrid, electric, and biodiesel use, and also included creating fuel corridors for AFVs. The project is extremely large in scope, and is displacing 1 million gallons/year, while also providing a base for others to add to that.

The fourth reviewer observed a substantial petroleum fuel displacement. The fifth reviewer stated that the project does support DOE's petroleum displacement objectives.

The sixth reviewer commented that there was a good diversity of vehicles and partners, both large and small. This reviewer also observed many upgrades and new stations, and perceived the project was getting a lot of bang for the bucks.

Question 2: What is your assessment of the approach to performing the work? To what degree are technical barriers addressed? Is the project well-designed, feasible, and integrated with other efforts?

According to the first reviewer, the project has achieved many goals in two and a half years of time with 80% of the work completed by mid-2012. This was astonishing considering that in the middle of the implementation the project had to endure a retrenchment with their partners, letting some go and bringing new ones on. The project implementers truly knew the meaning of the word agility.

The second reviewer commented this project's focus on a corridor made sense, and that the project also considered the economics in the state, including the work with Kennecott Copper Mine, in order to maximize outreach to a growth sector in the state economy.

The third reviewer remarked that the project was able to regroup after some folks dropped out. Another reviewer observed a nice focus on the contracts early on, and an excellent number of partners. The fifth reviewer noted a well-defined action plan and execution of strategy to accomplish goals.

The sixth reviewer observed that the approach focused on doing each required procedure, including contracts, NEPA reviews, etc., and then implemented the project. The reviewer noted that when problems with some stakeholders happened, the project team adjusted to move vehicles to other participants. This reviewer observed that in June 2011, the project team had to retrench, replacing 44% of stations/vehicles with original participants. The project team's strategy was to get a wide range of participants, particularly fleets, many with highly visible vehicles. This was what allowed the flexibility when the project team had to retrench and reallocate vehicles. This reviewer observed that, overall, it took six months to retrench completely, which was pretty good considering the extent to which changes were needed to be made. The project's overall strategy focused on many stations and vehicles resulted in a very high petroleum displacement, which can be built upon in the future.

The seventh reviewer observed that the project aggressively pursued project partners and enlisted a good variety. The project employed a sound strategy to build an alternative fuel corridor along major trucking routes and to deal with contracts and NEPA early in the process. This reviewer observed a good variety of alternative fuels included in the program and a large number of vehicles placed into service.

Question 3: Characterize your understanding of the technical accomplishments and progress toward overall project and DOE goals.

Generally, the reviewers had positive comments about the project's accomplishments. The first reviewer commented that accomplishments were impressive, and elaborated that one of the more interesting aspects of this project was the establishment of a resale market for vehicles which saw the resale at 10% to 30% higher than OEM vehicles. This reviewer observed that under this grant 19 CNG stations were upgraded, 34 alternative fuel stations developed, and 544 new alternative fuel vehicles deployed with 300 jobs created, and 1 million GGEs a year of petroleum displacement.

The second reviewer was pleased to see that the project had achieved 100% deployment by August 2011. The fact that the project was now having so many station openings was a strong indicator of success.

The third reviewer observed that the project was able to overcome many barriers of partnership and geography.

The fourth reviewer recognized that the project had issues with partners dropping out, but was able to re-connect with UPS for a crucial LNG fleet. The project plan was impressive with corresponding good results. According to this reviewer, the Clean Cities' coordinator's force of will had much to do with the success.

The fifth reviewer observed that project leaders demonstrated excellent planning and management skills to achieve goals, overcome barriers and accomplish project on schedule. Thirty-four alternative fueling stations have become operational and other goals have been achieved. Over 1 million gallons of fossil fuel have been displaced.

The sixth reviewer observed that the project team claims 80% of the project had been completed so far. Ninety percent of infrastructure and NEPA reviews were done now, 85% of AFVs deployed, 25% of training/outreach completed, and 100% of contracts signed with 33 sub-recipients. The project has opened 34 AF stations in total, including 1 biodiesel, 3 LNG, 11 electric charging, and 19 CNG stations along the I-15 corridor. The project also upgraded another 19 CNG stations, and saw much interest in CNG when petroleum prices increased. This reviewer observed that the project was currently displacing 1 million gallons/year of petroleum, higher than proposed, and a base from which more was expected to be added. This was highly impressive displacement, particularly concerning the issues that arose along the way. So far 100 jobs have been retained versus 115 projected.

The final reviewer would like to know how much fuel came from each stakeholder type and/or fuel type.

Question 4: What is your assessment of the level of collaboration and coordination with other institutions?

Reviewers saw that the project had many partnerships. The first reviewer observed a large amount of partners and a very complex project.

The second reviewer thought that the project obtained significant cost-share from partners. According to this reviewer, the DOE share was approximately $15 million, while the recipient share was roughly $37 million. The project team included 33 partners

overall: fleets, including private and public, plus mining; public stations; and private stations. The reviewer observed that the project even included a petroleum transport company running on LNG, and that universities and school districts were also included, expanding the opportunity for getting the word out on the project.

The third reviewer remarked the project achieved a very extensive array of private businesses, local governments and partners in formulating and executing goals.

The fourth reviewer observed that partnerships included 33 different partners from governments, municipalities, private corporations, universities and school districts. This reviewer believed that by spreading the effort to include a number of different partners, a word of mouth network had been built that would get other partners to join the effort.

Another reviewer thought the level of collaboration was good, especially for a predominantly rural state. The sixth reviewer observed that a variety of partners were enlisted, including a number of school districts. The seventh reviewer observed many partnerships, and liked the diversity.

Question 5: Has the project effectively planned its future work in a logical manner by incorporating appropriate decision points, considering barriers to the realization of the proposed technology, and, when sensible, mitigating risk by providing alternate development pathways?

According to the first reviewer, future activities certainly build on the work so far. The Fueling the Future educational supplements for schools as well as highway signage for station locations were solid endeavors to help the citizens of Utah work towards greater implementation of AFV vehicles.

The second reviewer thought that future activities seemed appropriate. The third reviewer commented that the project continued tracking success stories, and have planned a good slate of AFV workshop training and highway signage. There were still two stations to install.

The fourth reviewer observed 2 stations and 12 vehicles left to get going.

The fifth reviewer observed that the remaining actions included training and outreach, as well as highway signage. The project team was putting together success stories and tracking data. Nearly all vehicles were in place, but had two stations to go.

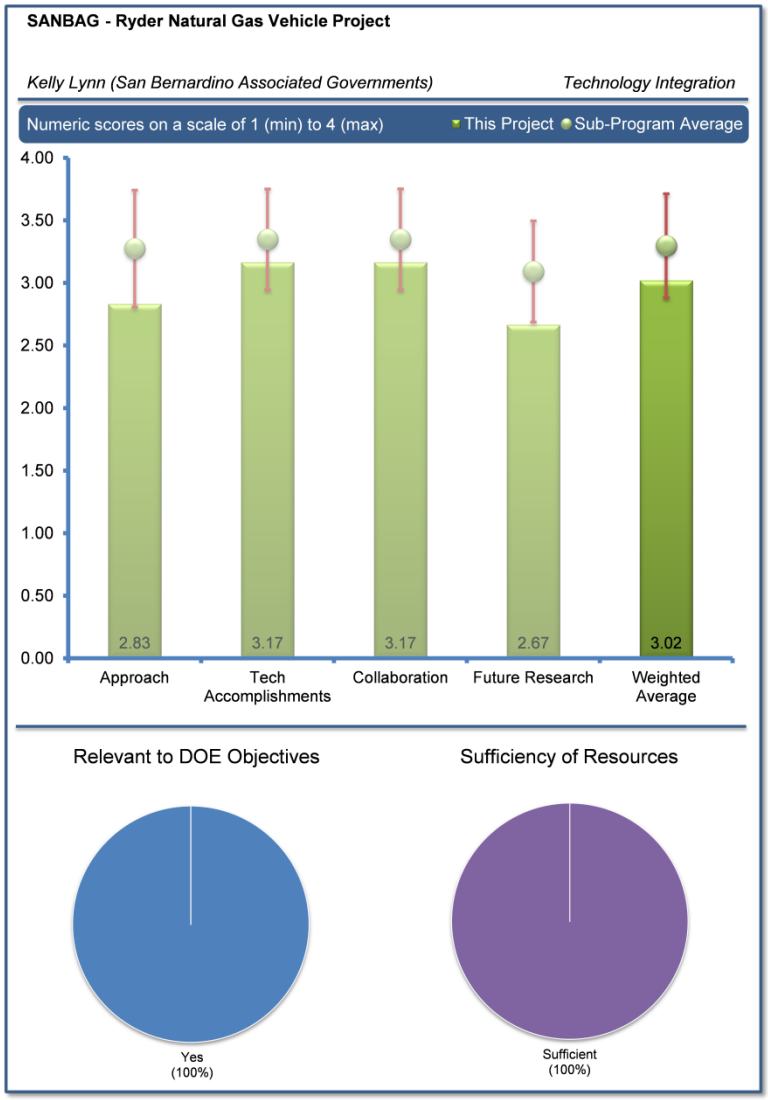
Another reviewer thought that sharing success stories and collaborations should be very effective.

The seventh reviewer cautioned that outreach plans seemed a bit thin. This reviewer would like to know plans for keeping the momentum of the vehicle and station users.

Question 6: How sufficient are the resources for the project to achieve the stated milestones in a timely fashion?

Reviewers found that resources were sufficient. One reviewer commented that the project's funding share was impressive with recipient share at three times what DOE's share totaled [DOE Program Clarification: Cost share is 2.5 times the Federal share (i.e., $37 million recipient cost share and $15 million Federal cost share).]. Another reviewer commented that no problems were identified, and that there was a very high degree of cost-sharing. A third reviewer thought that the project seemed to make good use of resources. The project spread the wealth to a variety of projects and fuels and allowed more sub-recipients to benefit. Another reviewer remarked resources appeared sufficient to achieve goals within the timeline. The final reviewer commented thought that a nice job was done matching funds.

SANBAG - Ryder Natural Gas Vehicle Project: Kelly Lynn (San Bernardino Associated Governments) – arravt044



Reviewer Sample Size

This project was reviewed by six reviewers.

Question 1: Does this project support the overall DOE objectives? Why or why not?

The first reviewer observed a 100% petroleum displacement, and that the reduction of emissions by using a domestic energy source fully supported DOE's objectives of petroleum displacement and energy security.

According to the second reviewer, by increasing the use of alternative fuels, this project supported the objective of petroleum displacement. It was estimated the project would directly displace 1.5 million gallons of diesel fuel by introducing 202 heavy duty natural gas vehicles. The project would also decrease particulate matter and NO_x emissions.

The third reviewer indicated that the project was on track to meet the stated goals of 1.5 million gallons of diesel displaced annually and the use of 3 million gallons of LNG used annually.

The fourth reviewer observed that the project would apparently displace approximately 1.5 million gallons of diesel fuel over its four-year project life. However, according to this reviewer, the presentation did not state what timeframe the 1.5 million referred to. Clean Cities Recovery Act applications called for such calculations over four years; however, the presenter did not know. The presentation did not provide any explanation of the estimate but Ryder Truck presumably had a sound basis for making such estimates. However, it must be assumed that the estimates come from Ryder –again there was no explanation, which should have been provided.

The fifth reviewer commented that this was the first and also the largest natural gas truck deployment in commercial leasing and rental operations. This $20 million project was going to pay for incremental costs of 202 new natural gas trucks and fund the installation of 2 LNG and CNG stations. This reviewer further observed it was part of a larger regional corridor project, the Interstate Clean Transportation Corridor (ICTC), and it was projected to have 400 green jobs. The same reviewer further reported that it was projected to reduce annually 1.51 million gallons of fuels, 4.2 metric tons of GHGs emissions, and 131 tons of NO_x and completely eliminate 2.65 tons of diesel PM emissions from local neighborhoods, but pointed out it was unclear what these metrics were based on. This reviewer questioned whether the metrics were based on purely replacing 202 trucks with diesel with natural gas, and inquired whether this grant funding was accelerating compliance with state environmental policies.

According to the sixth reviewer, this project is expected to displace 1.51 million gallons of diesel fuel. However, it was unclear how the grantee came up with these estimates. This reviewer questioned whether it was based on the 202 trucks or other vehicles as well. The reviewer inquired whether the presenter could provide more explanation. The presenter stated it was the largest commercial leasing fleet in the nation operating on natural gas. This reviewer observed that this project fulfilled the needs of a

large multi-state regional corridor and expected creation of 400 green jobs, which was significant if accurate. The commenter remarked that it would be helpful if DOE asked all the presenters to provide a return on investment for all areas, including jobs and petroleum reduction. This reviewer also observed that the project anticipated 4.194 metric tons of GHG reductions, 131 tons of NO_x reduction, and 2.65 tons of particulate matter PM reduction. These figures were based on 202 trucks. This reviewer understood that the project also installed two to three public stations, but this was a little unclear. The presenter mentioned that Ryder was looking for grants to promote further use. It concerned this reviewer that this project seemed dependent upon future funding for growth. According to this reviewer, the presentation's estimate of 400 jobs created appeared excessive and lacked credibility, particularly if only the net job creation was counted, as it should be. The presenter stated that the estimates had been generated by the project consultant and believed that the project included numerous Ryder employees who would presumably have been employed without the project, irrespective of whatever fuel configuration its trucks were. But this does not impeach the credibility of the fuel displacement estimates for the reasons stated above.

Question 2: What is your assessment of the approach to performing the work? To what degree are technical barriers addressed? Is the project well-designed, feasible, and integrated with other efforts?

According to the first reviewer, the technical barriers were relatively low as LNG is an established technology. However, there were economic barriers in terms of capital investment. With the cost of natural gas so low, the timing for this project was excellent.

The second reviewer commented that all 202 heavy duty trucks have been delivered and the plan of where the stations are to be put at the Ryder facilities would fill in the infrastructure needs nicely. A concern of this reviewer was that permitting had been slow in coming for one of the stations. It would be a big plus to the project if the permitting took place by August and November of this year. This reviewer was encouraged that everyone had been impressed with the power provided by the trucks because that was a concern early in the project.

The third reviewer remarked that while it would have been preferable to have included multiple vehicle owners or operators in the project, if a single owner was used, Ryder is one of the best choices because its trucks are leased to multiple businesses, many of which had already committed or expressed a desire to rent the LNG trucks. These businesses can be expected to provide additional visibility to the use of LNG and to provide examples for other regional centers within their companies.

The fourth reviewer observed that the strategy was to pay for the incremental cost of 202 heavy-duty natural gas trucks and to install 2 LNG/CNG refueling stations. The plan was to work with a national leasing fleet, specifically Ryder, with the expectation of future growth. The national partner also had a lot of exposure to private consumers for a good long term outreach strategy. According to the presentation, Ryder has over 1,200 customers. Ryder also has an influence with the OEM based on their purchasing power. This was good for the long-term strength of this project. The reviewer cautioned that although this was a good approach, it would be nice to see Ryder make more of an initial investment in the project, especially if the cost savings were significant to them.

The fifth reviewer observed that the project was going to pay for incremental costs of 202 new natural gas trucks and fund the installation of 2 LNG and CNG stations. This project got slowed down because it had to replace its main commercial partner with another partner. The replacement partner, Ryder, turned out to lend a tremendous amount of credibility to the project because of its AAA access to commercial customers such as Kraft, Staples and CVS. Ryder has over 1,200 customers that will magnify the penetration of the impact of the project. Additionally, because Ryder is a big truck customer it also has the ability to influence the OEMs and Tier and Tier 2 suppliers. The Rancho Dominguez station was completed in May 2011. It was unclear to this reviewer when the Fontaine and Orange stations would be fully operational, but hopefully soon. Two-hundred and two natural gas (CNG and LNG) Peterbilt and Freightliner vehicles were delivered by December 31, 2011. The project was placing stations in gaps along key, West coast corridors. This reviewer noted that the approach had to be altered and appeared to have altered in a constructive manner, but DOE needed to monitor that this project stays on track. No good explanation was supplied about forthcoming data tracking regarding actual numbers of displacement fuels and emissions reductions.

While the sixth reviewer acknowledged that the project was on track to meet stated deployment goals, issues remained with the completion of the City of Orange refueling site. The presenter stated there was an education curve for staff, and that a list of other cities was provided in the Los Angeles metro area that had completed similar projects. Presenting this list and setting up meetings with other city officials could have happened earlier and contributed to quicker completion of the permitting and station construction. This reviewer believed that more information on how Ryder promoted the trucks to their leasing customers would have been helpful in the review.

Question 3: Characterize your understanding of the technical accomplishments and progress toward overall project and DOE goals.

Reviewers had mixed responses. The first reviewer stated that a majority of objectives and goals had been met, save the Orange refueling facility and maintenance shop upgrades.

The second reviewer remarked that having all vehicles delivered and one station built showed good progress. The estimates of fuel savings and emissions reductions were very encouraging but would need to see if these estimates were realized after the operational data was analyzed. The new station locations in this project help to fill in the needed infrastructure in the area.

According to the third reviewer, there appeared to have been some early project restarts as some partners withdrew. However, having a very well established partner like Ryder may have made the project stronger as it provided access to 1,200 potential fleet customers. It appeared that vehicle deployment was predictively on schedule but the refueling stations were seriously behind schedule. The approach Slide map showed three Ryder labels while the text indicated that only two stations were constructed, which was a bit confusing. Also, the exact timing of station openings and vehicle deployment was a bit confusing and it appeared to not be perfectly timed.

According to the fourth reviewer, reasonable progress had been made despite a substantial delay due to the default of the original fleet owner partner, which was not identified nor was any explanation given of what happened. The project schedule shown in the presentation would be only about six months behind what it should have been according to the original Clean Cities ARRA requirements, which was reasonable under the circumstances. This reviewer cautioned that the presenter did not know about data collection on use of the trucks, refueling, and etc., which was required of the ARRA grants. Siting of refueling sites seemed well chosen to fill gaps in the region.

Another reviewer observed that the project was delayed due to partner switch and permitting problems, but these were resolved. The project managers have identified valid locations for its refueling stations to fill in the gaps of natural gas availability along key corridors. NEPA paperwork and permits are done, the Orange County permit is not done yet, but close, and construction will take place this summer. The approach had to be altered and this slowed down progress. DOE would need to make sure objectives continue to stay on track in a timely fashion. According to the slides, the vehicles, including 202 CNG/LNG, were ordered and delivered around the beginning of the year. This reviewer did not know how these vehicles were performing to date. It did not appear that training, such as for drivers or technicians, had been done yet to support these vehicles. This reviewer observed that the Rancho Dominguez facility was completed in May 2011, and that two more stations have yet to be constructed. However, it looked like one more station than was originally proposed would be constructed. It was unclear whether the project was on target to achieve the petroleum reduction goals. This reviewer suggested that DOE needed to continue monitoring this. The reviewer noted that no jobs creation or maintenance data were presented, but 400 were projected. The reviewer suggested that DOE follow-up on this over the course of the project. The DOE grant is paying for incremental costs for the alternative fuel truck expenses, as well as refueling infrastructure, which is not yet done. CEC paid for the trucks, which is complete [DOE Program Clarification: CEC as well as DOE helped to pay the incremental costs of the trucks. The project reports jobs data on a quarterly basis to DOE and supports the jobs data in that report.].

The sixth reviewer noted that this project got slowed down because it had to replace its main commercial partner with another partner. The lengthy permitting process for new LNG and CNG stations has also slowed progress. The Rancho Dominguez station was completed in May 2011. Pursuant to a slide in the presentation, 202 natural gas (CNG and LNG) Peterbilt and Freightliner vehicles were delivered by December 31, 2011. Two more stations have yet to be constructed but would be constructed hopefully

soon. This reviewer suggested that DOE should closely monitor the progress of these two stations and when construction begins. No actual jobs data was tracked other than initial 400 count projections supplied to the reviewers. It was not clear what training for drivers, maintenance workers and service station attendants has been developed and implemented.

Question 4: What is your assessment of the level of collaboration and coordination with other institutions?

Reviewers generally perceived strong partnerships. The first reviewer noted that collaboration was very good and the use of SCAG would help get the word out about the project to the community.

While the second reviewer thought the list of project partners was fairly short, it included the necessary players to carry out the project due to Ryder obtaining commitments or interest from numerous lease fleet operators. It would have been preferable to this reviewer to have gotten these entities to commit to becoming partners in the project but, if their interest was as stated in the presentation, their participation would be adequate for the success of the project.

The third reviewer noted that collaboration with the project partners appeared to be sufficient, as the presenter stated many groups within the partners and projects had ongoing collaboration and communication.

The fourth reviewer remarked that this project had some great partners. This was still a good project even though a major national truck partner departed and Ryder was recruited. The replacement partner, Ryder, turned out to lend a tremendous amount of credibility because of its AAA access to commercial customers such as Kraft, Staples and CVS. Ryder has over 1,200 customers that will magnify the penetration of the impact of the project. Additionally, because Ryder is a big truck customer it also has the ability to influence OEMs and Tier and Tier 2 suppliers. This reviewer observed that major partners include CEC, San Bernardino Associated Governments (SANBAG), and Ryder. This was a multi-state highway corridor project and must have required coordination in this regard. This reviewer suggested that SANBAG may want to consider recruiting other partners to use the stations. Two more stations had yet to be constructed but would be done hopefully soon, one each in Fontaine and Rancho.

The fifth reviewer commented that the project management pulled together great partners: CEC and Ryder. In spite of losing a large partner, this project secured another great partner in Ryder. CEC is fulfilling its commitments by providing $9.3 million for the incremental cost of the vehicles. This reviewer hoped San Bernardino continued to work with Ryder to provide a long-term educational outreach program to continue growth. This reviewer remarked that this would be rated higher if SANBAG secured other fleets to use the retail stations.

The final reviewer stated that while the SANBAG and Ryder partnership appeared strong, there does not appear to be a collaboration with any universities or laboratories, which was probably not needed.

Question 5: Has the project effectively planned its future work in a logical manner by incorporating appropriate decision points, considering barriers to the realization of the proposed technology, and, when sensible, mitigating risk by providing alternate development pathways?

Reviewers had mixed comments pertaining to future activities. The first reviewer remarked that the project seemed to be on track in terms of viable timetable for construction of stations and acquisition/deployment of vehicles despite being behind original schedule. Plans for outreach and monitoring were included as required.

According to the second reviewer, future plans were adequate but success hinged on the successful permitting of the stations. It was not clear to this reviewer exactly what data would be collected and how it would be analyzed.

The third reviewer stated that future plans appeared to be well thought out, though it seemed that the issues with the Orange refueling station have taken the focus off of future marketing, collection, and reporting for the time being.

The fourth reviewer remarked that it was unknown when the Orange and Fontana sites would be developed. [DOE Program Clarification: The presentation on Slide 5 indicated that there will be a Ribbon Cutting Event for a station opening in the Summer of 2012. This station would be the Orange Station.] There was no indication that other fleets will be solicited to introduce additional LNG vehicles. It appeared all 202 vehicles were deployed prior to station construction. Actual monitoring methods were

unknown. Given the deployment of vehicles before fueling infrastructure was installed suggested that the development pathways were not well planned.

The fifth reviewer said that this project still had a long way to go before completion. Milestones include obtaining Orange County's permit, installation of 2 natural gas stations, feedback on how the 202 vehicles were performing, and consumer feedback. The reviewer questioned whether the project was achieving the overall DOE program goals of fuel displacement and jobs created. Additionally, the reviewer inquired about the overall long-term promotion efforts. While the presenter said there was a plan, little information was provided during the presentation. Finally, this reviewer wondered if the future of this project was dependent upon additional grants to continue its success.

The final reviewer questioned why Ryder was only contributing $642,000 to the project as represented in the budget if the project really was achieving cost savings based on Ryder's contribution [DOE Program Clarification: It should be noted that the cost of the base vehicle by Ryder is not included in the cost share calculation]. Furthermore, the partners had a plan for securing more participation from Ryder going forward but their limited contribution to the total $20 million budget seemed small. This reviewer observed that two more stations had yet to be constructed but would be done hopefully soon in Fontaine and Orange. The reviewer suggested that DOE closely monitor the progress of these stations and when construction is underway. This reviewer highlighted the need for data collection of the performance of the 202 vehicles, and questioned whether relevant ARRA metrics needed to be supplied. This reviewer would like information on actual job creation. Continued media, communications, education awareness and outreach plan is needed and required. This reviewer suggested developing and implementing training for drivers, maintenance workers and service station attendants, along with the development of a manual for first responders and truck drivers.

Question 6: How sufficient are the resources for the project to achieve the stated milestones in a timely fashion?

All reviewers indicated that funding was sufficient. The first reviewer commented that resources appeared to be in-line with project needs, and the second reviewer commented that funds were sufficient for this project.

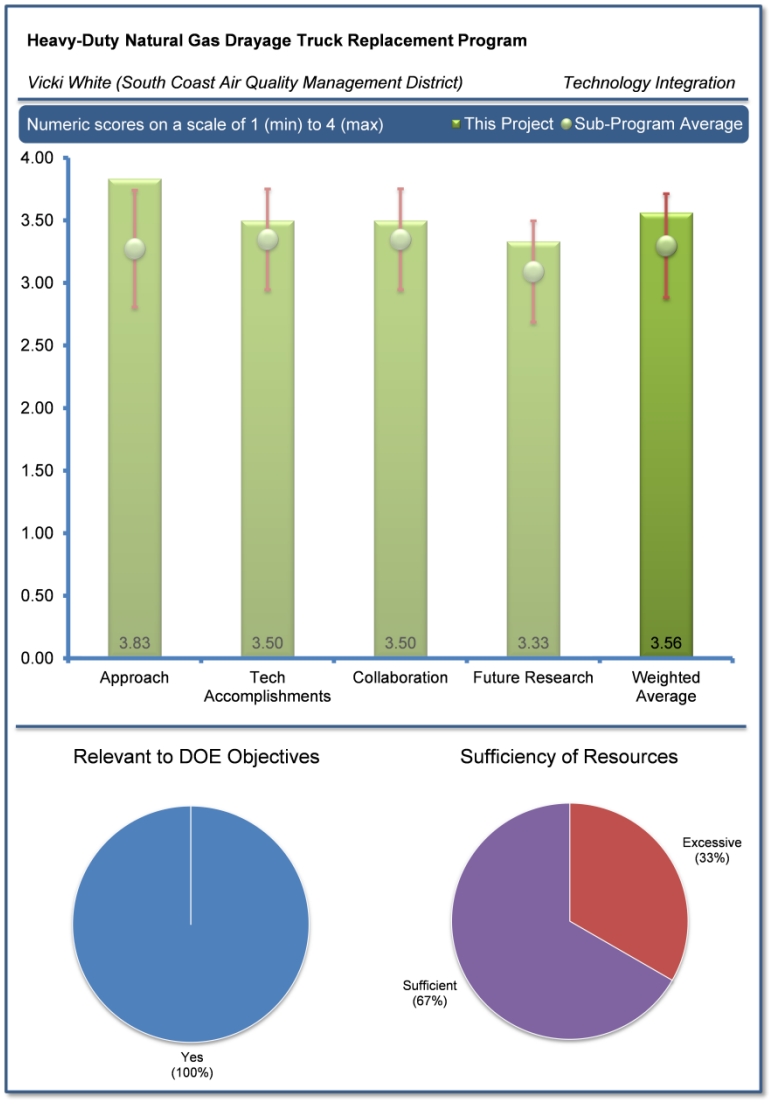
The third reviewer remarked that this $20 million project was going to pay for incremental costs of 202 new natural gas trucks and fund the installation of 3 LNG and CNG stations, which is 1 more station than proposed. However, it was unclear to this reviewer what DOE's return on investment was as there was no data supplied to track on achieving the goals of job creation, fuels displacement and emissions reduction. It would be helpful to know how much of funds had been spent, and on what portions of the projects money has been spent, as this reviewer could not tell.

The fourth reviewer assumed that the 202 vehicles were operating without the construction of the fueling infrastructure at the Orange and Fontana sites, so this called into question why those were even needed, thus the appearance of possible excessive resources.

Another reviewer remarked that Ryder was said to be contributing $17-$19 million of its own, although the recipient fleet owner was only required by the budget to contribute $600,000, which would have represented a major windfall. It would have been preferable that the presentation explained what the $17-$19 million represented. This reviewer questioned whether it was only the base cost of trucks that Ryder would have been purchasing in any event. If that were the case, the resource commitments by the combined federal and state governments could be seen as excessive.

According to the final reviewer, this project seemed to have sufficient funds to accomplish the vehicle deployment and the construction of three stations, which was one more than proposed. But it was unclear whether or not future funding was needed to sustain this program over the long haul. It was still unclear to this reviewer whether or not DOE was getting a good return on its investment because the project was not complete. It appeared to this reviewer that this project might just be using DOE funds to accelerate compliance with state mandates. This was something DOE should take into consideration when funding projects.

Heavy-Duty Natural Gas Drayage Truck Replacement Program: Vicki White (South Coast Air Quality Management District) – arravt045



Reviewer Sample Size

This project was reviewed by six reviewers.

Question 1: Does this project support the overall DOE objectives? Why or why not?

Reviewers generally agreed that the project met DOE objectives. The first reviewer remarked that this was a great project. The overall project is 88% complete with procurement and deployment. The project expects the rest by the end of the year. This project focused on retiring old trucks and replacing them with natural gas trucks. These vehicles would not have been purchased without the grant. This project was effective in maintaining jobs that would otherwise have been lost due to more stringent environmental standards. This reviewer perceived a double win because of jobs saved and the creation of a new demand for clean burning technologies. Potentially 68 jobs were created but the presenter was a little unclear on how many were actually retained. The presenter indicated that the number of trucks expected to be replaced under this grant would be 219 LNG trucks.

The second reviewer commented that by deploying more than the original estimated amount of LNG trucks that the project has been effective at increasing the amount of petroleum displacement.

The third reviewer remarked that the project scope included replacing and retiring older diesel trucks that serviced the Ports of Los Angeles and Long Beach with natural gas trucks. Originally the scope was for 180 natural gas trucks but due to the successful leveraging of the grant funds, 219 natural gas trucks would be funded. This project increased the use of alternative fuels and reduced the consumption of diesel fuel. State estimates for the 219 trucks were 198 tons a year of NO_x emissions and 9.2 tons of diesel PM emissions annually over the 15 years of the projected useful life of the new natural gas trucks. There was an estimate of a 25% GHG reduction, however, the partners have plans to start tracking the petroleum and emissions reduction more closely and have radio frequency identification tag (RFID) installed in each truck as part of the project. The RFID is used to record trucks' usage in the Ports. Quarterly reports would be submitted by new natural gas truck owners so data is scheduled to be compiled and available to evaluate. This reviewer also noted an estimated 68 jobs created or retained. The project was effective also in retaining operator/owner fleet jobs that may have been lost due to California's new stringent environmental rules. This project was a winner two-fold in that new reliable and effective clean technology was deployed and that there were measureable, economic development benefits to the Ports community.

The fourth reviewer commented that the project would result in the deployment of 219 Class 8 LNG tractor trucks for use in drayage/delivery of freight from ports of Los Angeles and Long Beach. This would displace petroleum accordingly, with an equivalent volume of diesel used for this high fuel use application.

The fifth reviewer commented that it is unknown how much petroleum would be displaced, as the presentation made no mention of petroleum displacement levels. While cleaner exhausts were clearly a positive, DOE's primary focus was on petroleum displacement. However, this project would reduce petroleum use.

The final reviewer affirmed that this project is very relevant to the goals of DOE to reduce the use of petroleum by replacing diesel engines with natural gas trucks. However, the presentation did not make this apparent, and this reviewer does not recall a question about the amount of petroleum displacement being asked.

Question 2: What is your assessment of the approach to performing the work? To what degree are technical barriers addressed? Is the project well-designed, feasible, and integrated with other efforts?

The first reviewer commented that project barriers have been successfully overcome allowing the project to move forward nicely. The requirement to have the old trucks scrapped and for the applicant to show a high use pattern would insure that maximum emissions and oil displacement benefit would be realized in the project.

The second reviewer observed that the project appeared very well planned. Solicitations issued resulting in more applications than could be funded so the grantee selected sub-recipients based on cost-effectiveness, fuel use, age or technology of truck being replaced, and etc. Multiple solicitations and awards have been already carried out, and trucks replaced must be scrapped. This reviewer thought that the project was particularly well focused in terms of addressing severe pollution and public health problems from air pollution in the heavily populated, low-income residential areas adjacent to the ports.

Another reviewer indicated that it was fabulous that the grant only paid for incremental costs of new technology and the old technology was scrapped. The reviewer also questioned the incremental cost of $150,000 per vehicle [DOE Program Clarification: $150,000 per vehicle is total cost.]. This reviewer also inquired about the expected payback and noted that the presenter indicated this would not be achieved without the grant. The grant managed a solicitation to secure sub-recipients and made sure sub-recipients were operating near the port where there was refueling. Over 1,500 applications were received. This reviewer remarked that the project approach to performing the work was nicely done. The project also did a lot to provide public outreach, and also assisted those who could not fill out the grant application which was nice. The grant developed a list of lenders for a long term sustainable program which was wonderful. The reviewer also commented that the grant included an emissions inspection before scrapping the vehicle under the program. While the reviewer liked this approach, the downtime on the trucks was significant, and there were a lot of mechanical concerns. This reviewer was interested that the grant eliminated trucks that were not otherwise going to be removed. Diesel emissions in this location were identified as high- and at-risk locations. Emissions reduction is key to regional goals at this location. However, this reviewer questioned whether DOE was paying for compliance for a program that would otherwise achieve the same goals without the grant in another year or two.

The fourth reviewer commented that the project partners and managers quickly realized there was an issue with communication and language barriers and implemented a translation program for applicants. Project managers also ensured each applicant had one-on-one assistance with completing their application and information for loan providers and financial opportunities.

According to the fifth reviewer, there are minimal if any technical barriers, as LNG is a well-known technology, so none are being addressed. However, the project is deploying LNG vehicles at a rate that appears to be faster than planned. Given the fairly short distances and near repeatable missions, this was an excellent use of LNG for truck transportation.

The final reviewer observed that this was an RFP process. Several funding opportunities were released, resulting in over 1,500 applicants. This was an impressive and time-consuming project that required one-on-one meetings with all fleet owners that participated. Note that four different foreign language translation services were required and secured as some small business fleet operators were not fluent enough in English to understand program requirements such as technology and financing. The reviewer

observed that the average price of the new natural gas truck is approximately $150,000 - $175,000. The average grant award per truck was approximately $75,000. The gap between the grant funds and purchase price was significant so the project partners worked closely with lending institutions to help small business fleet operators secure loans for the balance of the truck. The project lead and partners' involvement in assisting with financing really was a key component for many of the owner/operators in obtaining funding. These examples of unique community outreach really highlighted some of the great lessons learned from this grant award. This reviewer also observed that originally the scope was for 180 natural gas trucks but due to successful leveraging of the grant funds 219 natural gas trucks would be funded. Each diesel truck that qualified for permanent retirement had to be inspected to ensure compliance with the program. Each new natural gas replacement truck also needed to be inspected to ensure it complied with program goals. Model Year 2007 trucks and newer qualified for benefits. According to this reviewer, the presenter indicated there was limited infrastructure in place. The RFID was used to record trucks use age in the Ports to ensure that the natural gas trucks were being used in the Ports. Quarterly reports would be submitted by new natural gas truck owners so data is scheduled to be compiled and available to evaluate. This reviewer cautioned that it may appear that operators were being incentivized to comply, and this reviewer was unclear if this was an appropriate role.

Question 3: Characterize your understanding of the technical accomplishments and progress toward overall project and DOE goals.

The first reviewer noted that there has been a tremendous response to solicitations so this was a very successful project. This reviewer noted that originally the scope was for 180 natural gas trucks but due to successful leveraging of the grant funds 219 natural gas trucks would be funded. One-hundred and sixty natural gas trucks have been funded and on the road and the project is on track to do the balance of the vehicles by the end of the year. Each diesel truck that qualified for permanent retirement had to be inspected to ensure compliance with program. Each new natural gas replacement truck also needed to be inspected to ensure it complied with program goals. Trucks from the Model Year 2007 and newer qualified for benefits. This reviewer remarked that overcoming barriers showed a project's flexibility in adjusting to market factors. This was an impressive and time consuming project that required one-on-one meetings with all fleet owners that participated. Note that four different foreign language translation services were required and secured as some small business fleet operators were not sufficiently fluent in English to understand program requirements, such as technology and financing. The average price of the new natural gas truck is approximately $150,000 - $175,000. The average grant awarded per truck was approximately $75,000. This reviewer remarked that the gap between the grant funds and purchase price was significant so project partners recruited and worked closely with lending institutions to help small business fleet operators secure loans for the balance of the truck. The project lead and partners' involvement in assisting with financing really is another key component for many of the small business owners or operators in obtaining funding. These examples of unique community outreach really highlighted some of the great lessons learned from this grant award. This reviewer observed that state estimates for the 219 trucks are 198 tons a year of NO_x emissions and 9.2 tons of diesel particulate matter emissions annually over the 15 years of the projected useful life of the new natural gas trucks. Estimates of 25% GHG reductions were made, however the partners have plans to start tracking the petroleum and emissions reduction more closely and have RFID tag installed in each truck that was a part of the project. The RFID was used to record trucks usage in the Ports. Quarterly reports will be submitted by new natural gas truck owners so data is scheduled to be compiled and available to evaluate.

The second reviewer noted from the presentation that over 50% of the applications were from small or single operators. This fact made it evident that the project was addressing a need to keep these operators from being able to access the port facilities and continue their business while meeting the clean vehicle requirements of the port.

The third reviewer noted that the project was 88% complete, with 160 of the originally planned 180 trucks already having been acquired and deployed, some of which were deployed immediately after the project contract was executed. This presenter noted that slides show 160 trucks but the presenter updated this to 182 as of the Annual Merit Review, thus meeting the originally planned amount ahead of the 24 month required timetable. According to this reviewer, the grantee correctly did not count as job creation the prevention of truck operators from going out of business since that would not have had any effect on net employment (amount of drayage), just would have moved it to other firms. Only jobs in manufacturing were counted, which was probably

correct. This reviewer noted that the project estimated 68 jobs and 0.31 jobs per LNG truck configuration installed, including the manufacture of any additional equipment.

The fourth reviewer indicated that it was very good that that the project already had most of the trucks operating now and that the balance of the trucks would be online by the end of the year. This schedule would allow for at least a year of data collection on all trucks. The fifth reviewer remarked that there were no real technical accomplishments beyond deploying LNG trucks, which the project has done well.

The final reviewer noted that the project goal was to provide 219 trucks (originally scoped 180). This reviewer thought the project did an excellent job leveraging funding to put more vehicles on the road and noted how the project has provided 160 vehicles to date and was on track to do the remaining vehicles by the end of the year. The reviewer also noted that the presentation addressed one technical challenge that arose by adding translators for those applying for the vehicles. Additionally, the project also received a significant number of responses to the two solicitations. This was evidence of getting the word out well and doing a lot of outreach also. This reviewer remarked, "great job." However, this reviewer expressed concern that there was not much justification behind job creations, and that this could be explained further. This reviewer liked that the project worked with lending institutions to sustain this project beyond the grant, and also remarked "outstanding." This project was on track to over-achieve its emissions reduction by placing more vehicles on the road than originally estimated. The reviewer noted 2.68 million gallons per year for the life of the vehicles, which is noted as 15 years, and an estimate that the project would generate 198 tons of NO_x reduction per year and 9.2 tons of PM per year over a 15 year span.

Question 4: What is your assessment of the level of collaboration and coordination with other institutions?

Most reviewers perceived that the project had significant partnerships across a wide variety of stakeholders, including Clean Cities. The first reviewer thought the collaboration was very good and indicated that having five Clean Cities coalitions involved in the project would ensure that a lot of people would hear about this effort.

The second reviewer also noted that the project included five Clean Cities coalitions as well as array of stakeholders: dealerships, manufacturers, governments, and ports.

The third reviewer noted how the project has both public and private partnerships and secured 15 sub-awards. The reviewer listed Air Quality Management District (AQMD), California Air Resources Board (CARB), the U.S. EPA, the Port of Los Angeles, the Port of Long Beach, California Energy Commission (CEC), and truck dealers as partners. The evaluator noted that the project did a great job getting out in the community to seek applicants and assisted the community in completing these applications, and how nice it was that free translators were provided, and that the project had five Clean Cities coalitions to support this project.

The fourth reviewer remarked that the collaboration and communication with financial partners and community members appeared to be strong throughout the project.

The fifth reviewer noted that the project had public and private partnerships and secured 15 sub awards. The project demonstrated strong community involvement by recruiting lenders and language translators and in the opinion of this reviewer, went above and beyond to make these awards available to the broadest group of recipients, not just the most clever and resourceful applicants. The reviewer remarked impressive partnership and listed CEC, AQMD, CARB, EPA, five Clean City coalitions, and Port of Los Angeles and Port of Long Beach as partners.

The final reviewer remarked that while there was good government collaboration, this was really an all government demonstration with the truck operators not even mentioned as a partner. In addition, this reviewer commented that there was no mention of any university or laboratory collaboration.

Question 5: Has the project effectively planned its future work in a logical manner by incorporating appropriate decision points, considering barriers to the realization of the proposed technology, and, when sensible, mitigating risk by providing alternate development pathways?

Reviewers generally perceived that planned future activities were satisfactory. According to the first reviewer, the future activities of getting the balance of the trucks operational and collecting and reporting the operational data would satisfactorily complete the project.

According to the second reviewer, the project team was effective at identifying and overcoming barriers that would lead to project success and future replication.

The third reviewer noted that the project would fund 219 trucks, exceeding the project proposal of 180, and that monitoring and reporting was to continue for two years as required.

The fourth reviewer liked that this project did audits to ensure that each truck was used as intended and noted that the project was collecting data on trucks that serviced the ports. This reviewer noted that the project planned on reporting the data, and that the reviewer looked forward to learning more. According to the reviewer, the project worked with local lenders to continue this project into the future, which showed forward thinking. The reviewer also noted that there was limited long-term outreach, as least as communicated in the presentation. However, the reviewer noted that the project would do a few more before completion. This reviewer commented that more could be done with technician training to reduce outreach as a barrier to the project's overall success.

The fifth reviewer noted close coordination with engine and truck manufacturers and dealers to ensure natural gas vehicles were properly maintained and the delivery of future vehicles in a timely manner. However, this reviewer noted that the technician training may be a barrier to long-term success if not addressed. The reviewer also observed that data was collected and monitored on a quarterly basis, that there was long-term planning as evidenced by securing financial institutions, and that only selected cost-effective projects were funded to ensure overall long-term success.

The final reviewer was unsure if each vehicle would be equipped with data loggers to collect mileage and fuel use, if the LNG fueling is limited to a single station, and how the LNG use would be tied to single vehicles. This reviewer remarked that there does not appear to be any technology advancement nor alternative development pathways, which are not needed. However, there would be some type of future monitoring.

Question 6: How sufficient are the resources for the project to achieve the stated milestones in a timely fashion?

Most reviewers perceived resources to be sufficient. One reviewer remarked that project resources were sufficient to meet the original plan and milestones. Considering the high environmental and public health benefits of this project, additional resources might be desirable.

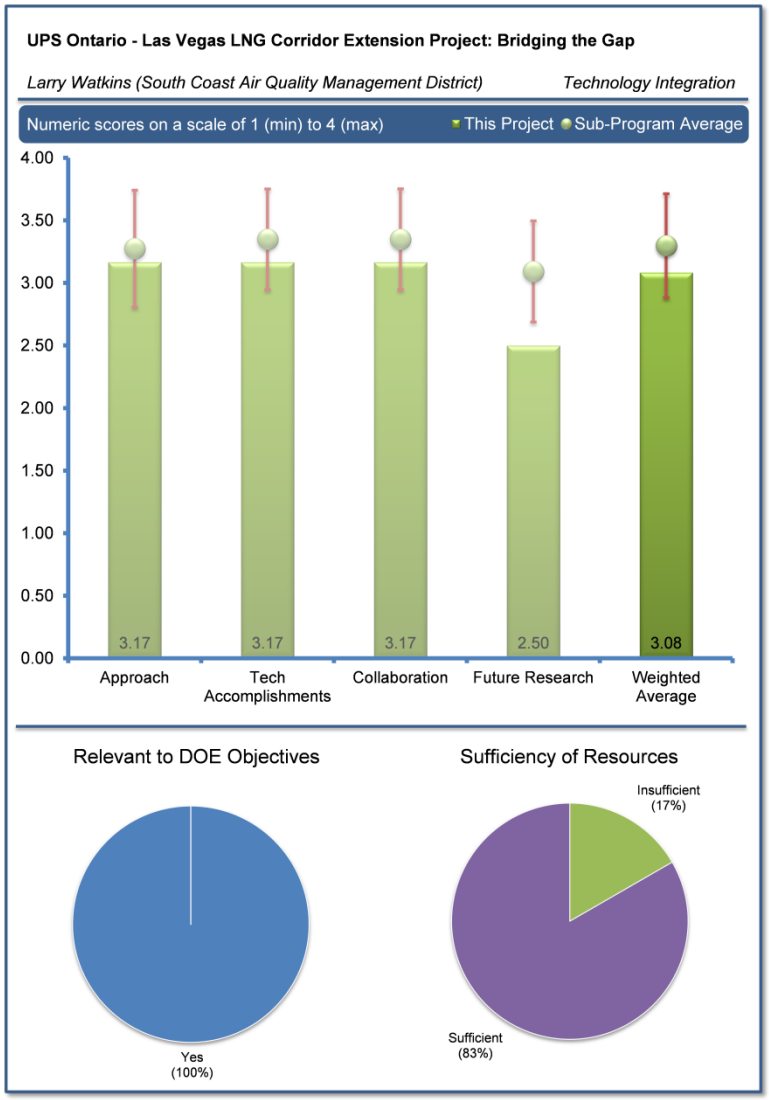
The second reviewer commented the funding seemed sufficient for the project, and remarked that it was very impressive that the cost share for the project was so high.

The third reviewer thought the project did a great job leveraging additional resources to over-deliver on this project and also worked with lenders to sustain this project on the long-term. The project also chose sub-grantees that were most cost-effective at achieving the emissions reduction goals.

The fourth reviewer observed that the project's resources increased after receiving the award. Originally the scope was for 180 natural trucks but due to successful leveraging of the grant funds, 219 natural trucks would be funded. This reviewer also noted how each diesel truck that was qualified for permanent retirement had to be inspected to ensure compliance with program. Each new natural gas replacement truck also needed to be inspected to ensure it complied with program goals. 2007 trucks and newer qualified for benefits. This reviewer perceived that long-term planning was evident by the securing of financial institutions, and observed that only selected cost-effective projects were selected and funded to ensure the overall long-term success of project.

Two reviewers thought that resources were excessive. The fifth reviewer thought that while one-on-one applicant help may seem excessive, the presenter certainly demonstrated the need for such personalized assistance. The sixth reviewer commented that DOE cost share was matched by more than 250% by the other project partners. However, with a total project funding of $33.74 million and a deployment goal of 219 natural gas trucks, the cost per truck was $154,064. This reviewer remarked that this seemed to be extremely excessive.

UPS Ontario - Las Vegas LNG Corridor Extension Project: Bridging the Gap: Larry Watkins (South Coast Air Quality Management District) – arravt047



Reviewer Sample Size

This project was reviewed by six reviewers.

Question 1: Does this project support the overall DOE objectives? Why or why not?

Reviewers generally agreed that the project fit DOE's goals. The first reviewer remarked that the project resulted in significant petroleum displacement.

The second reviewer remarked yes, that this project definitely supported the DOE objective of oil displacement. This reviewer noted that this project would help displace oil use of 1.25 million gallons annually by using LNG trucks instead of diesel. In addition, because it would also complete the LNG refueling corridor from Southern California to Utah, it may provide fueling for other projects and thus help displace additional oil.

The third reviewer remarked the project would directly result in 48 new Class 8 LNG tractor trucks for use by UPS but would indirectly result in more than that because it was a catalyst project for UPS, which would replace its Class 8 trucks with LNG trucks according to its normal retirement schedule. The reviewer noted that these were high-mileage, high-fuel use vehicles. The reviewer noted an estimated 1.25 million gallons of diesel to be displaced per year.

The fourth reviewer agreed that this was relevant. The project was proposing to pay for the incremental costs of 48 Class A Kenworth trucks. The reviewer noted that the project planned to install one clean corridor LNG/CNG refueling station in Las Vegas, and that the project expected to displace 1.25 million gallons of diesel annually and reduce emissions by 83.23 tons of NO_x, 1.07 tons of PM and 236 tons of GHGs annually. The reviewer also noted that the project anticipated creating 58.1 jobs including mechanics, maintenance trucks, service stations, and etc.

The fifth reviewer remarked that the estimates of 1.25 million gallons of diesel displaced annually and estimated 1.3 million miles driven would contribute to the original petroleum reduction estimates.

The final reviewer noted that this was the first multi-state, publicly accessible LNG refueling corridor project supporting delivery operations from the Port of Long Beach to Salt Lake City, Utah. The reviewer observed that the project included 48 heavy duty Kenworth trucks for UPS and was putting in a publicly accessible Clean Energy refueling station in Las Vegas, Nevada. The project included 32 trucks in Las Vegas and 16 in Ontario, California. The refueling station would be strategically placed on the ICTC corridor. The reviewer observed a projected displacement of 1.25 million gallons diesel annually and emissions reductions of 83.23 tons of NO_x, 1.07 tons of PM, and 236 tons of GHG annually. This reviewer also noted that this project was projected to create and retain 58.1 jobs without multipliers in the construction, manufacturing and capital reinvestment sectors.

Question 2: What is your assessment of the approach to performing the work? To what degree are technical barriers addressed? Is the project well-designed, feasible, and integrated with other efforts?

The first reviewer perceived a simple, straight-forward project that has accomplished deployment on a revised schedule.

The second reviewer commented that the project has been moving along very well and has successfully addressed all of the barriers identified in the project. The project has been well designed and was being implemented successfully.

The third reviewer noted that the project was well designed in terms of bridging the gap in the corridor between Los Angeles and Long Beach, California and Salt Lake City while serving an initial 32 UPS trucks based in Las Vegas. This reviewer observed that the project was delayed by a dispute over the price of trucks and LNG refueling site, and was delayed for 18 months due to location raising issues with the U.S. Department of Homeland Security.

The fourth reviewer commented that SCAQMD picked an experienced team to install a needed LNG/CNG refueling station. This reviewer observed that the station would be managed and owned by Clean Energy and that 32 of the vehicles would be in Vegas and 16 in Ontario, California. The station would have 30,000 gallons of storage. This reviewer noted that the station location was chosen to be on the ICTC clean corridor, which the reviewer thought was good. It was apparent to the reviewer that there was some training to be done, but there was little discussion about it. Furthermore, this review observed little discussion about how this station would be supported outside of UPS. This reviewer believed that DOE should follow up on this with the project managers.

The fifth reviewer noted that SCAQMD pulled together an experienced team to execute this project and divided up the responsibilities. The location of the Las Vegas station was selected as an important mid-point leg in the I-15 corridor linking Southern California with Salt Lake City. This station was planned to have 30,000 gallons of LNG storage and 3 dispensers. The reviewer observed that Clean Energy took the lead in securing and purchasing the site and long lead-time equipment. Clean Energy assumed all responsibilities for the turnkey developer, operator and maintenance. Furthermore, this reviewer noted how UPS took the lead in ordering the 48 T800 LNG heavy-duty Class 8 trucks from Kenworth. UPS also was required to purchase an easement from the Las Vegas Airport, which was still not completed. The reviewer noted that as illustrated in the milestones, all 48 trucks have been delivered, and that training has occurred for mechanics and UPS drivers. The reviewer observed that the refueling station location was selected to be strategically placed on the ICTC corridor. This reviewer noted that this project has encountered some challenges in permitting and siting of the permanent station in Las Vegas, Nevada near the airport. This reviewer understood that there were all sorts of questions that may arise due to transporting goods and services in a delivery truck that was fueled by an airport service station that provided LNG. There was a temporary station that as operational, but this reviewer thought the presentation materials were vague in distinguishing the difference between the temporary and permanent station. However, this reviewer thought the fact that there was a substitute station in operation illustrated the resourcefulness of the project's partners. This reviewer was unclear about what the long-term education, communications, marketing and training outreach plans were.

The final reviewer noted that while the project managers had a clear vision for project success, two main barriers each contributed to a one-and-a-half year delay in project deployment.

Question 3: Characterize your understanding of the technical accomplishments and progress toward overall project and DOE goals.

The reviewers had mixed feedback on technical accomplishments and progress. The first reviewer noted that the project had started collecting data and has already shown 1.3 million miles driven and 250,000 gallons of LNG purchased by UPS.

According to the second reviewer, the project appeared to be back on track despite the initial delays. At the time of the presentation, this reviewer noted that a temporary facility had been created to refuel the vehicles pending the completion of the planned facility, and that trucks have yet to be deployed under the project [DOE Program Clarification: As of the Final 2012 Annual Merit Review Results Report, all 48 trucks had been deployed].

According to the third reviewer, the project had overcome the major barriers that were encountered, but still have one barrier to overcome before the Las Vegas station is developed to its original specifications and functionality.

The fourth reviewer noted that according to the presentation materials, all 48 vehicles were put into service. This reviewer noted that a temporary refueling station was put up at the Las Vegas airport, but that the permanent station has been delayed because of permitting, electric utilities and easement ownership. The presentation indicated 2,500 gallons were being used daily, which according to the reviewer seemed low. This reviewer would like to know how the project expected to grow with more vehicles. This reviewer would like to know the costs for the temporary station and how this factored into the project, and who owed it. Furthermore, this reviewer noted that the station cost $3 million in Las Vegas, and would like to know if this was on target with what was originally estimated. The reviewer noted that England was another carrier that was going to use this station. However, it was unclear to the reviewer how much. The reviewer cautioned that these seemed like low numbers, and would like to see more long term projections. Furthermore, this reviewer requested hearing more about what was done in the driver training and technical training, including details on how the training went and whether training would be on-going. This reviewer requested a better understanding of the return on investment for the overall project goals, including emissions, petroleum displacement and job creation.

The fifth reviewer observed that according to the presentation materials, all 48 trucks had been delivered to UPS. The reviewer noted that the presenter said the trucks cost approximately $134,000 and that it required extensive negotiations with the manufacturer to get this cost down. The reviewer observed that UPS exerted a tremendous amount of time and resources to get Kenworth to manufacture the trucks at this cost. This reviewer noted that data tracking for the performance of vehicles and metrics for tracking fuel displacement and emissions reduction was not explained, and inquired if any data tracking was on-going. The reviewer would like to know what data was being tracked. For this reviewer, the presentation was confusing because the presentation stated in the beginning that the station would be a publicly accessible Clean Energy refueling station in Las Vegas, Nevada. However, according to this reviewer, the Technical Accomplishments and Progress section seemed to imply that the station could accommodate UPS and CR England's trucks that have a volume of 2,500 DEGs daily, and could fuel 576 trucks daily. This reviewer would like to know whether the temporary station was just for UPS and CR England or if it was also publicly available. This reviewer became confused when during the presentation it was mentioned that the Las Vegas station was completed but then it was stated in the presentation that a permanent electrical meter needed to be secured from the utility and operation of temporary generator stopped. The reviewer inquired if the generator was used at the temporary station and therefore was not needed at the permanent station. The reviewer questioned how much money it cost to operate the temporary station, and inquired whether the temporary station was close to the permanent station. The reviewer observed that the presenter said the station cost $3 million, and questioned how this compared to costs projections for this station.

The final reviewer noted that there were not any real technical objectives to overcome as the real burdens were permitting. This reviewer thought that it was odd that the final hurdle was getting the electric utility to energize the meter.

Question 4: What is your assessment of the level of collaboration and coordination with other institutions?

Reviewers generally saw a strong collaboration with an array of partners. The first reviewer noted that the project had excellent collaboration and was very unique in that a local government like the SCAQMD had been able to coordinate a project that had an impact in other areas of the U.S.

The second reviewer stated that the project partners did well to continue dialogue with the public and private organizations that created the delays, and were able to eventually work through those barriers.

According to the third reviewer, partners in this project were impressive. This reviewer notes participation of SCAQMD, Clean Energy, UPS, two Clean Cities' coalitions, and multiple state governmental agencies and quasi-governmental agencies, including the California Ports and Nevada Airport. The reviewer opines that the project partners appeared to be working together well, that the station as working and UPS had the new 48 LNG trucks. This reviewer noted that at some point CR England became a partner in the project and that this reviewer was not clear what role if any CR England was assuming. The reviewer observed that the presenter said Clean Energy had plans to do 150 more stations in this corridor, which according to the reviewer was fantastic news. The reviewer appreciated a handy map in the presentation illustrating the numerous existing LNG stations in the corridor. It was not clear to this reviewer where or which of these stations were Clean Energy existing stations and/or planned. From the presentation, the reviewer noted that UPS has had such success with this technology that it has purchased extra trucks at the

company's expense because the return on investment was evident. The presenter said that as UPS replaces trucks that UPS will be replacing them with these LNG trucks. The reviewer thought that this obviously was a further sign of a successful project. This reviewer recommended that as the trucks were on the road and data tracking occurred the team should look for opportunities to share lessons learned with stakeholders, industry, and public.

The fourth reviewer believed that the project had good partners. This reviewer detailed state, municipalities, Clean Cities' coordinators, and private partners, specifically Clean Energy and UPS. However, this reviewer would like to hear more about what the private partners were going to do to continue to support this project as the grant comes to a close.

The fifth reviewer believed that project partners seemed to be communicating well and that the success of the project was a reflection of that, as well as the decision to segment deployment responsibilities. There was not any university or laboratory involvement, nor was it obvious why there should be, so this reviewer had to question why this was a review question.

The final reviewer noted that the list of partners/collaborators was short, but included those needed. However, this reviewer cautioned that the collaboration was apparently insufficient in advance to prevent the unforeseen events that had substantially delayed the project. Clean Fuel, shown as a collaborator, was only added to the project by UPS to operate the refueling site. This reviewer also noted that Daimler/Freightliner were only added after price negotiations with the original vendor failed.

Question 5: Has the project effectively planned its future work in a logical manner by incorporating appropriate decision points, considering barriers to the realization of the proposed technology, and, when sensible, mitigating risk by providing alternate development pathways?

The first reviewer noted that the future activities were very adequate and would provide good information about the operation of the trucks and amount of fuel that would be used. The second reviewer commented that the proposed future activities hinged on the completion of the Las Vegas refueling facility and the subsequent marketing to potential users of the site. The third reviewer thought that it was a bit confusing as to why the electric meter was not energized; however, this reviewer assumed that this should not be too difficult to accomplish.

The fourth reviewer would like to see more explanation about what the project managers planned to do to reach out to new fleets, and would like to know what was going to be done to continue to train drivers and mechanics over the long haul. This reviewer remarked that because the Las Vegas site was not yet complete, that it was DOE's job to make sure that this aspect of the project was completed. This reviewer would like to better understand what role UPS and Clean Energy were going to have in the future. The presentation described that Clean Energy was going to install 150 more stations at their own expense. The reviewer emphasized that this was great news, but questions whether this means the project was self-sufficient without additional federal or state funding in the future.

According to the fifth reviewer, the going-forward plan did not explain in detail what the ongoing training and education component was going to be for new drivers and mechanics. With such high-profile partners as UPS and Clean Energy it would be helpful if a media and communications plan was designed and implemented because it seemed like plenty of helpful, interesting and useful lessons learned could be shared with stakeholders. The reviewer noted that the presentation was silent on how the actual tracking of the data collection such as fuels displacement and emissions reductions would occur for sharing with the stakeholders and for public dissemination. The reviewer observed that the presenter said UPS was thrilled with the performance of these new trucks and has already purchased more assuming the cost for the entire new LNG truck. According to the reviewer, this obviously is a sign of a successful project and as the trucks are on the road and data tracking occurs the team should look for opportunities to share lessons learned with stakeholders, industry, and public. This reviewer also believed that there needs to be some clarification on permanent versus temporary Las Vegas station, and clarification about if the Las Vegas station was publically available or just for UPS and CR England.

The final reviewer noted that proposed future activities were essentially to perform the work that was originally scheduled to have been accomplished by now. The follow-up, reporting, etc. that would have been done in the third and fourth year of the project would now not be possible until after the project period has expired.

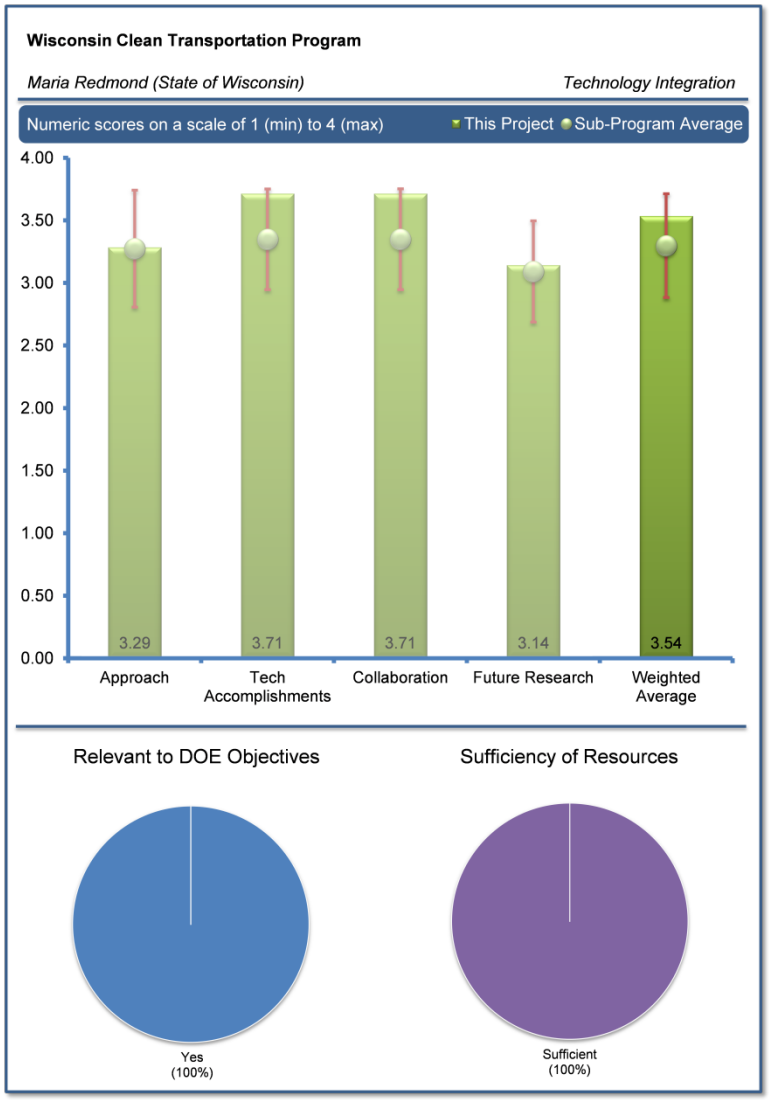
Question 6: How sufficient are the resources for the project to achieve the stated milestones in a timely fashion?

One reviewer opined that resources were insufficient. This reviewer noted that resources could have been realigned to provide more support and motivation to those organizations and agencies that created the project barriers and delays.

Five reviewers thought that resources were sufficient. Specifically, one reviewer commented that resources seemed sufficient. Another reviewer commented that project resources were ultimately adequate due to the emergence of an alternative truck supplier; however, this reviewer commented that resources would have been insufficient if not for this fortuitous development.

The final reviewer noted that it appeared that the project had sufficient budget to complete the tasks outlined. However, this reviewer noted that little information was provided on the breakdown of the budget, and there also seemed to be limited funds allocated to long-term marketing outreach, education and training. This reviewer would like to know who was going to do that in the future. It seemed to another reviewer that the big ticket items had been budgeted for, including the new trucks and new station. However, this reviewer was concerned that there really was no detailed budget data shared. While it appeared that the project was executing according to scope, this reviewer did not have any financial data to confirm that there was enough money to fund the completion of the project, including administration, marketing, media, communications, data tracking and ongoing training for drivers, service attendance and maintenance workers.

Wisconsin Clean Transportation Program: Maria Redmond (State of Wisconsin) – arravt048



Reviewer Sample Size

This project was reviewed by seven reviewers.

Question 1: Does this project support the overall DOE objectives? Why or why not?

The first reviewer noted that this project resulted in 17 alternative fuel refueling stations, including biodiesel, E85 and electricity, being deployed, as well as up to 280 AFVs. The project also included training and outreach components for vehicle operators, technicians, refueling site staff and supervisors and users of refueling infrastructure. According to this reviewer, all of these actions supported the DOE objectives of petroleum displacement.

The second reviewer remarked that the project was obviously aimed at deploying alternative fuel vehicles and infrastructure, which would support DOE's objective of petroleum displacement.

The third reviewer noted that fleets would now go beyond because of these purchases. A large number of partners ensures that there is broad potential for future success. This reviewer observed a good depth in utility partners, and excellent breadth and depth to the types of vehicles deployed, from refuse to light-duty and fuel choices including hybrids, plug-ins, and CNG. This reviewer believed that the potential of this project to exponentially grow alternative fuels used in the area is excellent.

The fourth reviewer noted that the project targeted replacement of petroleum-consuming vehicles with other fuels. By building stations and monitoring technical issues with the vehicles the project can feel assured of actual usage of the vehicles. This reviewer wondered if the wide variety of fuel types and vehicle applications may be allowing member fleets to do pet projects that looked good or intrigued fleet managers, rather than fully maximizing petroleum reduction. However, according to this reviewer the project management seemed to believe the variety was a positive as it encouraged fleet managers to embrace a wide variety of technologies in future RFPs.

The fifth reviewer commented that this project addressed a broad spectrum of vehicle and alternative fuel types for petroleum displacement. It also included infrastructure development and Madison Area Technical College fuel system maintenance training.

The sixth reviewer commented that the project was relevant to petroleum displacement goals for DOE, but that the total displacement estimated was not listed specifically, unless this reviewer missed it. According to the seventh reviewer, the objectives were clearly defined as reducing petroleum use, creating jobs, reducing emissions, especially in non-attainment areas, and building an AFV industry. This reviewer noted that no specific numbers were cited as goals, however.

Question 2: What is your assessment of the approach to performing the work? To what degree are technical barriers addressed? Is the project well-designed, feasible, and integrated with other efforts?

Generally, reviewers thought that deployment activities were effective. According to the first reviewer, the project seemed to be well thought-out, including addressing barriers and tweaking the project design as conditions changed.

The second reviewer thought the strategy for deployment was comprehensive and well thought-out. This reviewer noted that prior approval of vehicle purchases were required, and the team did frequent monitoring and site visits to follow up on implementation. There have been numerous technical difficulties, primarily with heavy-duty hybrids, but the team took action to address them, once the team was made aware of them. The project is working closely with Eaton to resolve technical issues. This reviewer anticipates that the lessons learned from this project should prove valuable in addressing existing mechanical and technical problems and preventing them in the future. This reviewer also thought that the outreach and education, done in conjunction with Wisconsin Clean Cities, was excellent.

The third reviewer observed a straightforward deployment approach with broad reach of technologies including virtually all major alternative fuel and alternative technology options for transportation. This reviewer noted that both light-duty and heavy-duty vehicles were included, and that the project team members made an effort to be at the fleet sites when the vehicles were delivered to ensure success.

The fourth reviewer commented that the team focused on addressing project management issues from the start, setting up comprehensive reporting systems. The project made sure that all vehicles were approved ahead of time and were verified upon delivery. The PI helped fleet partners throughout the process with activities like reviewing technological specifications and evaluating quotes. The reviewer commented that the project similarly helped infrastructure projects with Davis-Bacon compliance, Buy American requirements, and signage, and noted that the PIs worked with a variety of partners to develop and conduct trainings for a variety of AFV types.

According to the fifth reviewer, the project was very well-designed and integrated. The schedule slippage of initial deployment data from December 31, 2011 to June 30, 2012, due to vehicle availability and construction delays, was the only reason the project did not receive an outstanding rating. The reviewer indicated that the project correctly identified the importance of site visits.

The sixth reviewer referenced a prior comment on a variety of technologies relating to petroleum reduction. It also seemed to this reviewer that there was not an initial strategy to deal with technical problems that have delayed the project. However, this reviewer perceived that the project management had adapted and now had an active strategy to push fleet managers to communicate and collaborate when vehicles broke down. Seeing fleet managers incorporate new technologies into unrelated RFPs was a great sign. This reviewer also observed that the project had a tough time getting partner fleets to report technical issues to them. For example, the project implementers did not always find out when vehicles were taken out of service for various reasons, such as mechanical issues, and etc. There had been a couple instances of not finding out for six months. The biggest technical challenges were in the heavy-duty hybrid vehicles, across suppliers and systems. The reviewer observed that the project did a lot of site visits to monitor the vehicles, and that the project made the fleets get approval of purchases before the order was placed. The project was seeing more fleets use this as a stepping stone to buy more AFVs in their fleets, and were adding AFVs to the RFP process.

The final reviewer observed that clearly the project learned early in the process that more monitoring and control strategies were needed, and that using a technical consultant to help address vehicle problems ensured an informed advocate for the fleet other than the PI. The PI indicated partners were sent a stern reminder if the partners did not communicate appropriately, but this reviewer suggested that the PI should consider different tactics that build the partnership and establish good habits of communication. The PI's frustration is understood but this reviewer suggested that a different approach should be taken. This reviewer noted that one of the municipal partners was only now determining how to charge/bill infrastructure users for fuel. This particular portion was poorly planned but it was unclear to this reviewer whether the city provided poor information to the PI about their ability to make their infrastructure available. This reviewer noted that data collection was only now being thought about and a potential state portal was being considered. This reviewer expressed concern that the timing of this activity seemed late considering the number of vehicles that have already been deployed [DOE Program Clarification: This is incorrect and a

misunderstanding of the PI's statement. Data collection and reporting has been completed and complied with on a quarterly basis from all sub-recipients and the prime recipient. The PI was discussing a plan to refine the project team's data collection methods for long-term use beyond the required ARRA reporting templates used now to report to DOE project management.].

Question 3: Characterize your understanding of the technical accomplishments and progress toward overall project and DOE goals.

Several reviewers saw that the project had good progress. The first reviewer commented that the project seemed to have made significant accomplishments and progress to date, even dealing with problems outside of the project's control. The reviewer praised that it was good how the project appeared to have moved quickly to redeploy funds from fleets that could not perform as expected to new fleets or projects that could use the funds.

The second reviewer commented that despite early hurdles, the project has made excellent progress and has adjusted methods as needed to complete the project on time and on budget. The project has displayed a clear understanding that to be successful, there was a need to find fleets with near-term order windows and pursue only those partners.

According to the third reviewer, this year the project made good progress by going from 24% to 61% complete. It had a broad spectrum of alternative fuel and vehicle types. The project reported 221 of 280 vehicles deployed, which was 79%, and 12 of 17 fueling sites were completed. This reviewer noted how the project helped support fuel system maintenance training at the Madison Area Technical College.

The fourth noted that deployment was behind schedule, but this was explainable; the causes included vehicle and infrastructure availability, which should be done about six months behind schedule. The project was gaining real-world experience with new technologies, and working on solving problems, especially with hybrid vehicles, in conjunction with manufacturer representatives. This reviewer noted that the renewable natural gas aspect in Dane County was novel and may be of interest to other Clean Cities partners. This reviewer remarked that there appeared to be extensive training and an outreach aspect, including events, to the project as well, which was useful for these new technologies. This reviewer noted that the monthly newsletter to partners was unique and suggested giving consideration to showing a copy of an issue in the presentation.

The fifth reviewer praised that while the program had not been without its challenges, the team has made very good progress in addressing them. This reviewer noted that all 17 stations were up and running, and most vehicle issues were being addressed [DOE Program Clarification: All 17 pieces of fueling infrastructure were not operational at the time of this presentation.]. VTM shuttle buses were described as total failures, which would impact overall petroleum reduction; for this reviewer, it would be interesting to see a case study developed on these vehicles. The reviewer noted that the presentation did not indicate what the goal was for annual petroleum displacement, however, so while the project implementation was going well, it was difficult to know how successful it has been with regard to its impact on petroleum use.

The sixth reviewer noted that the technical breakdowns have slowed technical accomplishments some; however, the project was nearly done and the project has dealt with those set-backs. The reviewer would like to see specific petroleum reduction numbers to be able to judge better, and remarked that the amount of outreach was positive. This reviewer also observed that the project included a non-attainment area so project investigators were targeting a few of the partners to be in that area and increase emissions performance. This reviewer observed that the project originally targeted getting all vehicles in place by the end of last year but this was behind schedule because of vehicle technical issues and ordering delays. However, project implementers now think that completion could occur by June. The reviewer also observed that now 90% of the vehicles were purchased, all stations except one were up and running and doing well, up to 71% of the funding was spent and 16 sites were completed, with 267 vehicles ordered and deployed.

The final reviewer remarked that while the original completion date for deployment has been pushed back, 90% of vehicle purchases have been completed as of the time of presentation, with the remainder to be completed by the end of the fiscal year. All but one of the infrastructure sites were installed, reported this reviewer, and many trainings and events had been conducted. This reviewer also pointed out that all NEPA EQs were completed and approved. Furthermore, added this reviewer, over $10 million of

DOE money and over $12 million of cost share had been spent. Finally, this reviewer summarized that a second RFP for replacement projects was recently completed, which was the reason for some of the delay.

Question 4: What is your assessment of the level of collaboration and coordination with other institutions?

Generally, reviewers saw strong collaboration and coordination. The first reviewer remarked that there has been smart partnering on the part of the State Energy Office (SEO), the project lead; the project worked with several utilities, which then entered into contracts with multiple local governments, to reduce the number of contracts the SEO would have to deal with. This reviewer noted very good coordination between SEO, technical consultant, project participants, and industry representatives. The reviewer noted that this was a well-managed project.

The second reviewer noted that the project was led by the SEO with participation from the local Clean Cities coalition. This reviewer observed a good list of fleet partners around the state, and that some fleet partners were able to consider alternative fuel vehicles as a result of this project.

The third reviewer noted that the state energy office has worked very closely with the Clean Cities coalition, a technical consultant, and 36 public and private fleets. There has been frequent contact with the fleets through regular newsletters and site visits.

Another reviewer commented that the 36 partnerships, outstanding training and outreach activities, along with the project's extra effort of site visits gave this project an outstanding rating in collaborating and coordinating with other institutions.

The fifth reviewer commented that the amount of fleets involved meant a great deal of coordination and monitoring. This reviewer was impressed that the project felt comfortable monitoring all vehicle purchases and usage for such a wide variety. This reviewer observed that the project worked with Wisconsin Clean Cities, mainly on outreach and marketing; that the management team was the SEO, Wisconsin Clean Cities, and that there was a technical consultant; the project had a fair amount of fleets that did not spend all of their money so in the past quarter the project took away the extra money and used it for a second round of funding for fleets already in the program that were able to purchase new vehicles in the next couple months; and that the project performed field visits because it helped keep the fleets cognizant that the fleets needed to be reporting issues to the SEO or Wisconsin Clean Cities and not just their dealers.

The sixth reviewer remarked that there were a good number of partners on this project, and the key partners appeared to be collaborating very well. It was less clear to this reviewer how much collaboration was happening outside of the immediate project actors, including with Clean Cities coalitions outside the area who could benefit from what the project has learned.

The final reviewer commented, again, that the project had addressed communication problems with partners but some of it seemed to be the stick approach opposed to the carrot which would build longer term partners. It was unclear to this reviewer why the project was only now looking to train drivers; seemed like that should have been part of the vehicle deployment. This reviewer believed that this piece could be better coordinated.

Question 5: Has the project effectively planned its future work in a logical manner by incorporating appropriate decision points, considering barriers to the realization of the proposed technology, and, when sensible, mitigating risk by providing alternate development pathways?

The first reviewer commented that the SEO had already initiated a second round of funding, using money that had not been spent, which should result in up to 50 additional vehicles being deployed. The project had operator training and nine outreach events scheduled through June 2012, and would continue collecting data.

The second reviewer noted that the project appeared on track to complete the remaining outreach activities and finish deploying vehicles and infrastructure.

According to the third reviewer, the PI had focused on solutions to problems and barriers and adjusted accordingly. This reviewer noted that the PI was to be commended for overcoming fairly serious vehicle reliability issues, and that outreach and training were proposed as future activities.

The fourth reviewer commented that the future work plan was straightforward, and would close out the project. Additionally, online data submission for reporting would be a useful addition.

Another reviewer remarked that future activities included completion of vehicle acquisition and infrastructure equipment installation. This reviewer commended how the project initiated a Round 2 of funding to purchase by the end of the year, 50 more vehicles with the remaining un-costed funds.

According to the sixth reviewer, the primary focus of future activities was on completing the vehicle and infrastructure deployment and the associated trainings and data collection. Most activities other than the data collection should be complete by June 30. This reviewer noted that Round 2 RFP projects may take a little longer.

The final reviewer commented that the outreach and training plans were great, lots of opportunity there. If at all possible, it would be great to see future work addressing the public/private station conundrum and perhaps building a framework to make it work. According to this reviewer, this was one of the big market barriers, especially for CNG stations, so it would be a great final accomplishment to contribute a solution. The reviewer understood it might be beyond the scope of the project and depended much more on outside decision makers, but it was something to shoot for. It would also be nice to see further plans on addressing some of the technical issues with heavy-duty hybrids, as that is another big barrier that was found by this project. This reviewer also observed that the city of Milwaukee had a CNG station with a public and private side and the city was struggling with how to price the CNG on the public side. The city had to pass a resolution to address it. Milwaukee was not allowed to profit on the sales, so the city has had to price the CNG perfectly so that it addressed all of the maintenance and implementation; or the city could pass a resolution allowing a certain amount of profit, but then the market changes over time so Milwaukee would either be price gougers or not making the approved profit. The private side of the station is up and operational; the public side was planned under the grant but Milwaukee needs to figure out how to price it properly. The reviewer also noted that the project was looking to do more training in the future. The reviewer noted problems with heavy-duty hybrids, specifically Eaton utility trucks. The issues were mostly technical or mechanical issues, some driver and training. The reviewer observed that Eaton had a new regional representative there who has been very helpful and knowledgeable to get performance improvement through software updates. The reviewer also noted that the VTM shuttle buses had been total failures. The hybrid systems have rarely functioned and have not delivered efficiency improvements when the systems do function.

Question 6: How sufficient are the resources for the project to achieve the stated milestones in a timely fashion?

All reviewers indicated that resources were sufficient. One reviewer commented that the PI and consultants have adjusted resources to ensure success.

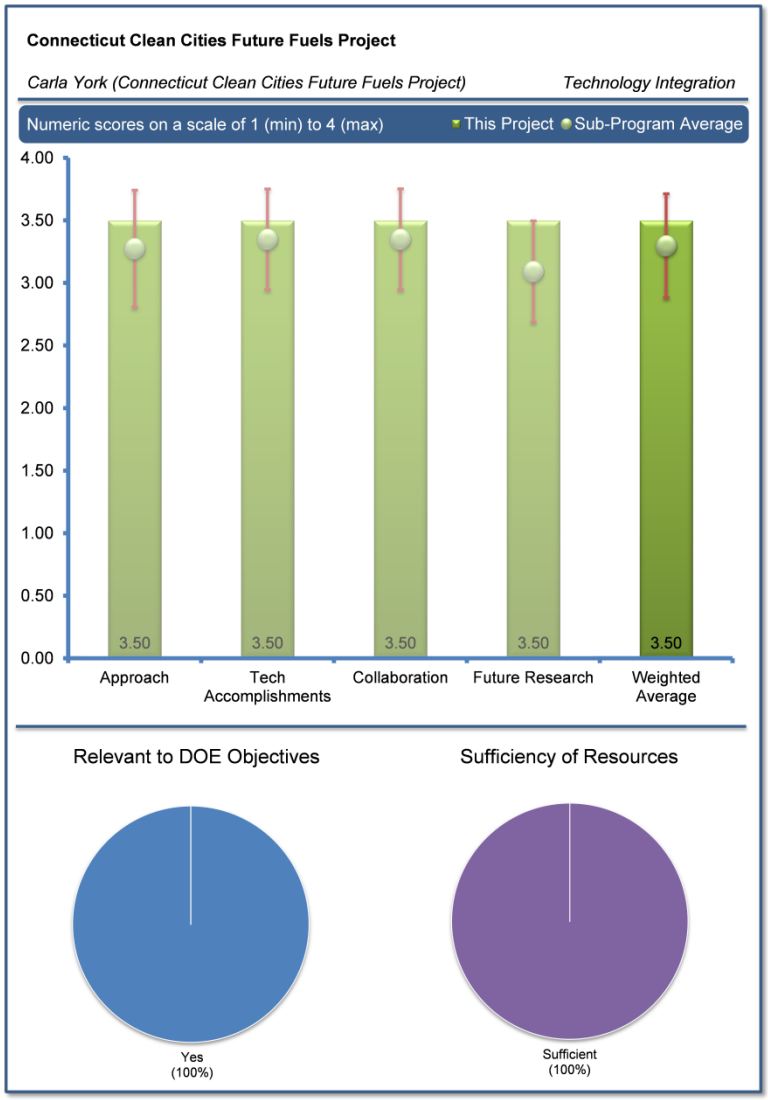
Another reviewer remarked that resources seemed reasonable, given the scope and scale of vehicles implemented. This reviewer observed that there has been $15 million in funding, plus $17 million to match; the technical consultant developed a training and outreach program to educate the fleets; the technical consultant was also working with Navistar and Eaton, which are the vendors, to provide onsite training when the vehicles are deployed; and that WPPI/We Energy are the utilities, and the project has partnered with them to reduce the number of contracts.

The third reviewer remarked that the project lead has made good use of the available resources. Although there have been slight delays in deployment of stations and vehicles, the delays have not been significant. The fourth reviewer commented funding should be sufficient for vehicle and fueling station deployment. More vehicles are to be deployed with funds from partner under-spending. This would expand displacement with a logical methodology for choosing projects.

The fifth reviewer noted that because of drop-outs, the project has about $500,000 remaining in uncommitted funds, but that was being taken care of. To date, the project has spent over $10 million in DOE funds and $12 million in cost share, which left about 30% of spending remaining.

The last reviewer noted that the DOE project funding of $15 million and the $17 million matching funds are sufficient to reach stated milestones.

Connecticut Clean Cities Future Fuels Project: Carla York (Connecticut Clean Cities Future Fuels Project) – arravt049



Reviewer Sample Size

This project was reviewed by six reviewers.

Question 1: Does this project support the overall DOE objectives? Why or why not?

There were mixed responses for this question. One reviewer stated that this project has shown great results, and that the project team's tracking system is constantly validating the investment.

A second reviewer said that jobs are a primary focus as well as economic growth and collaboration to leverage in-project investments. This person commented that this project is focused on new alternative fuel vehicle (AFV) and alternative fuel refueling stations. The same reviewer also said that this project incorporates five fuels, including five hydrogen (H_2)-fueled buses, but did not include E85 and liquefied petroleum gas (LPG). The reviewer then added that the project represents 15 million miles overall traveled over the life of the project.

A third reviewer remarked that the project showed a substantial amount of petroleum displacement.

A fourth reviewer felt that the petroleum and greenhouse gas displacement figures were quite overstated. The reviewer said that eliminating six million gallons of petroleum and 11 million pounds of greenhouse gases with 286 vehicles deployed is most admirable, but that no other program that evaluated by this reviewer even came close to displacing six million gallons of fuel. According to this reviewer's calculations, each vehicle would use about 20,979 gallons of fuel each year. The reviewer continued to say that if the vehicles mentioned are diesel vehicles with a 10 miles-per-gallon average, then this equates to about 209,790 miles driven per vehicle each year [DOE Program Clarification: It appears that the reviewer mistakenly believes the displacement of 6 million gallons was an annual displacement. However, the 6 million gallons represented the estimated displacement over the four year project period]. This reviewer also pointed out the importance of considering that only 28 heavy-duty (HDV) vehicles are included in the proposed 286 vehicles, which means the light-duty and medium-duty vehicles (LDVs/MDVs) would get better gas mileage. The reviewer suggested that these numbers be investigated. The reviewer further observed that because this is the implementation or building phase, AFV stations would not be constructed for all four years.

Question 2: What is your assessment of the approach to performing the work? To what degree are technical barriers addressed? Is the project well-designed, feasible, and integrated with other efforts?

Comments to this question were generally positive. One commenter thought that the researchers did a very good job in working with the first responders and data collection.

A second commenter said that the researchers did a good job getting two taxi companies to commit to compressed natural gas (CNG) and to share an order for the MV1, allowing the para-transport market to expand, and developing an alternative fuel corridor along a major trucking route.

A third commenter also noted that the researchers did a good job on the outreach, and was glad that they highlighted matching locations to fleets. However, this commenter questioned the researchers if there were any work with schools, if the researchers could quantify the amount of usage by the public (or non-partners), if the strategy could have accounted for vehicle delays, or if the researchers have any contingency plans.

A fourth commenter remarked that this is a state-wide project with compartmentalized project implementation, calling for different people managing different parts. This commenter added that the project includes a broad range of fuels and vehicles (LDV/MDV/HDV), and is also focused on a corridor across the state (I-95 and I-91). The same commenter mentioned that the researchers' strategy focuses on target stakeholder groups (public/private fleets, local governments, first responders, State Fire Marshal, etc.), and is designed to leverage additional participants such as AT&T. The commenter continued on to say that the project uses Sabre Technologies data collection system for infrastructure, which provides for real-time data collection. Furthermore, it was pointed out by this commenter that the system also allows immediate notification of issues, that it can be integrated with Geographic Information Systems (GIS) and Google systems, and that data can be received on I-Pad or smart phones. According to the commenter, with all of this data collection capability, the project should be able to report extensive, detailed data when completed, which is key to the usefulness of the project. The commenter concluded that this level of data collection also appears relatively uncommon among these American Reinvestment and Recovery Act (ARRA) projects, but is clearly important.

A fifth commenter felt that the researchers' strategy was solid and that they had achieved much, but did have some issues with the gallons displaced as well as media coverage. The commenter observed that one of the more important issues was that any piece of the project that would have resulted in long delays in being shovel ready was not included. This commenter further emphasized the importance of this idea because this program was designed to facilitate AFV acceptance in everyday use. The commenter praised the researchers' choice of targets and fleet, which has the greatest number of hydrogen buses on the east coast. This commenter also opined that some type of pay off needs to be accomplished to turn back the doubters.

Question 3: Characterize your understanding of the technical accomplishments and progress toward overall project and DOE goals.

Responses to this question were generally positive. One reviewer applauded the methods that the researchers used to collect data and measure website hits. The same commenter asked the researchers if there were plans to make this available to other Clean Cities coalitions (and other similar projects).

The second reviewer commented that the researchers are making their goals through somewhat difficult times. The third person made note of the fact that all vehicles were ordered, most were delivered, and most stations were online and pumping. This reviewer then mentioned that the project instituted real-time monitoring of fuel use at each station, emissions reductions, etc., and targeted fleets, first responders, and other likely groups. The commenter also stated that there were some delays due to order backlogs for vehicles, but that this is a common problem for all projects. This person then commented that real-time monitoring of fuel use is innovative.

A fourth reviewer claimed that the project is 81% complete, and that most of the fueling stations were complete, with a few exceptions. The commenter remarked that the project team held ribbon-cuttings for all new stations, with local and state officials, in order to provide additional visibility. The reviewer additionally stated that vehicle acquisitions were planned to be completed by the end of May 2012, but that there may be some that are delayed until this summer, and that taxi fleets will be fully deployed by early June. This person followed up by saying that all of the required National Environmental Policy Act (NEPA) documentation had been submitted for all of the vehicles and has been approved by the U.S. Department of Energy (DOE). The commenter noted that the project held 20 events this year, with 1,100 attendees, developed safety materials on new vehicle types for the region, and

conducted safety training. The reviewer also mentioned that the project team anticipates an overall displacement of 6 million gallons of petroleum and 11 million pounds (lbs.) of greenhouse gases over the four-year project.

A fifth reviewer said the researchers seemed more honest and upfront about exposure to their efforts. The commenter explained how the researchers listed a number of 218 million and upwards for possible exposures, but that 20% of that number seemed more realistic. The reviewer commended the station monitoring system that allowed the station to report in automatically when there was a problem. This person said that this should be adopted by all other programs, and that it could potentially save a significant amount of time and money.

Question 4: What is your assessment of the level of collaboration and coordination with other institutions?

Most reviewers were pleased with the collaboration on this project. One reviewer said that the researchers did a great job in getting a number of non-profit, local government, and private industry partners into the process. A second person was impressed by the project team's work with first responders as well as its measured media market exposures. A third commenter stated that the project received over 50% cost-share – $13.2 million from DOE and $16.7 million from recipients. This person then noted that the project partnered with all Connecticut Clean Cities Coalitions, state/local governments, private industry, and utilities/non-profits. The same reviewer pointed out that the hydrogen station had cost about $3 million in total, including in-kind and the like, half from DOE and the rest from the partners. A fourth reviewer observed that the collaboration fostered between two taxi companies in two cities to make a large order for CNG-fueled MV1 para-transport taxis is filling a gaping need.

Question 5: Has the project effectively planned its future work in a logical manner by incorporating appropriate decision points, considering barriers to the realization of the proposed technology, and, when sensible, mitigating risk by providing alternate development pathways?

Reviewer responses for this question were generally positive. One reviewer was impressed by the project's opportunity for a data collection platform to be used in the future.

A second commenter stated that the researchers are winding down their efforts with marketing and other outreach events planned, as well as completing manuals for the Emergency Response Program. This person applauded the eight-hour program that gives first responders placards to take with them showing the emergency response critical issues and points for different types of vehicles.

A third person felt that the plan to account for return on investment (ROI) was commendable. This reviewer also asked the researchers how the project planned to maintain usage of the stations after the grant is spent.

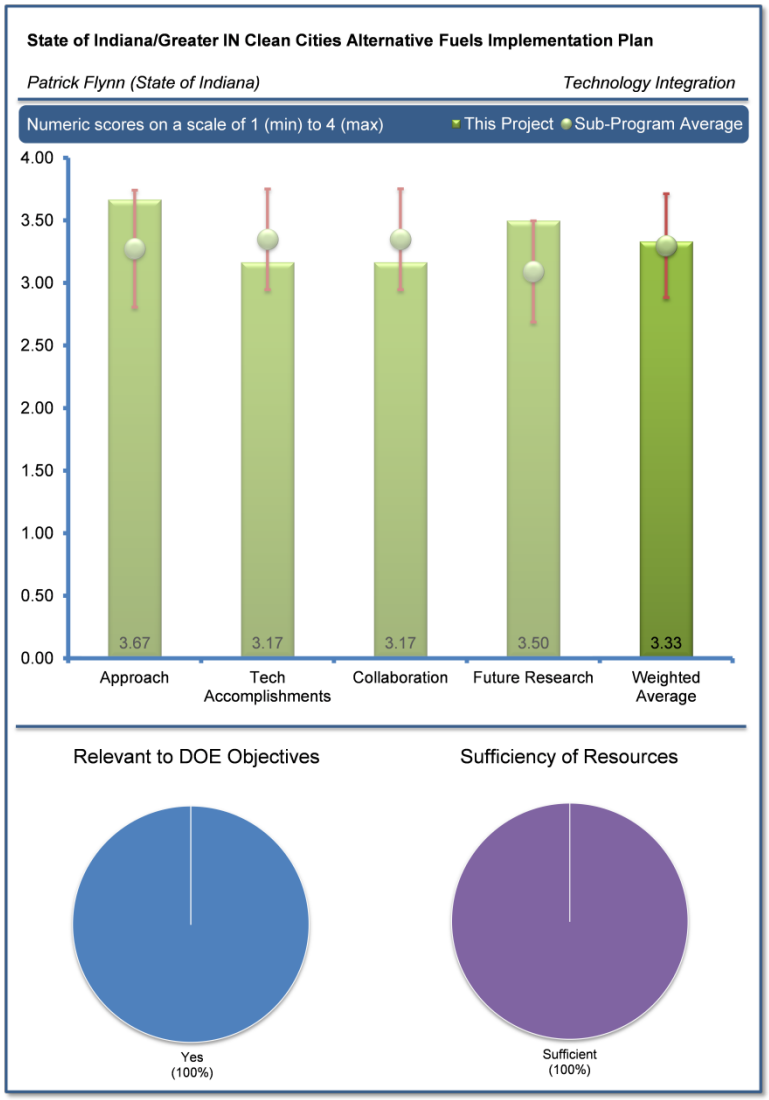
A fourth commenter observed that the researchers proposed future training for first responders, a large slate of events, follow-up for tracking fuel use, and reporting of data. The reviewer additionally stated that real-time data tracking of fuel use and money saved seems like it would be a tremendous tool for recruiting fleets to switch over to alternative fuels.

A fifth reviewer mentioned that the focus for going forward is getting recent deployment in place and on-going data collection. This person then pointed out that the researchers expect to conduct remaining station openings by the end of June for one and the end of September for the other. This reviewer remarked that it seems like some effort on detailed data analysis should be made, although exactly how much was a bit unclear. The commenter also responded that the project was designed to have the capability for detailed analysis, so it is expected that it will occur, but that it simply did not appear to be an area of emphasis in the future plans.

Question 6: How sufficient are the resources for the project to achieve the stated milestones in a timely fashion?

All of the commenters agreed that the resources were sufficient. The reviewers generally did not see any problems with the project's resources. One reviewer reported that the resources were spent wisely for maximum impact, but indicated a need for a bigger budget in order to install more hydrogen fueling points. This person then noted that the funds were used to address a previously unmet civic need in para-transport and to create synergy with other funded projects, like the hydrogen buses.

State of Indiana/Greater IN Clean Cities Alternative Fuels Implementation Plan: Patrick Flynn (State of Indiana) – arravt050



Reviewer Sample Size

This project was reviewed by six reviewers.

Question 1: Does this project support the overall DOE objectives? Why or why not?

All six reviewers responded positively to this question.

The first reviewer remarked that the project is obviously aimed at deploying alternative fuel vehicles and infrastructure, which will support DOE's objective of petroleum displacement.

The second reviewer noted that the project displaces petroleum through vehicle and alternative fuel infrastructure deployment (1.4 million gallons displaced annually), and is thus relevant to DOE goals.

The third reviewer reported that the project will displace over 1.4 million gallons of petroleum annually and create more than 200 jobs.

The fourth reviewer stated that the project supports a fuel neutral approach for displacing petroleum.

The fifth reviewer commented that the project had an excellent mix of vehicle types and fuel types, as well as excellent additional displacement. This person mentioned that the project deployed 369 vehicles and 122 infrastructure sites with 1.4 million gallons displaced annually, and that partner fleets spanned the state. The commenter also noted that there was quick additional growth at the Indiana Department of Transportation (INDOT) of $2.5 million in additional funds to convert 357 more vehicles to autogas. This person then said that Sysco hybrid tractors were deployed in nine states impacting petroleum use in a broad geographic area. The same reviewer pointed out that the researchers added Tippecanoe School Corporation as a partner when funds became available.

The sixth reviewer claimed that by helping public and private fleets replace petroleum vehicles with alternative fuels that best fit their duty cycle, the project team maximized reduction potential. This person went on to say that the large amount of stations and vehicles (especially the significant focus on the state fleet and autogas) meant a great deal of implementation. The reviewer then stated that the goal of the project was to take Clean Cities fuel neutrality and apply it to the implementation, incorporating all fuels except biodiesel (BD). According to the reviewer, the way the funding opportunity announcement (FOA) was structured in a way that limited interest in biodiesel.

Question 2: What is your assessment of the approach to performing the work? To what degree are technical barriers addressed? Is the project well-designed, feasible, and integrated with other efforts?

Comments in this section were quite positive. One commenter stated that the project appears to have just taken U.S. DOE's strategy for deploying the ARRA funds and replicated the process at the state level. This person explained that the project had

some good strategy at its core, but that it is unclear if there is a strategy to really facilitate the market development around some of the vehicles/fuel that the presenters claim is likely to happen. A different reviewer felt that the researcher's plan for expansion was excellent because the INDOT infrastructure was placed with growth in mind. This person cautioned that the project's only barrier appears to be that INDOT had to rewrite some vehicle specifications, but went on to say that the barriers seemed to be addressed in a timely manner with successful outcomes.

A third commenter was impressed by the way the project helped partners solve some of the problems that could have occurred in implementing technologies on their own (e.g. additional E85 stations to let a police department fully run their vehicles on E85). This person then mentioned that it seemed like the researchers really targeted ways to maximize fuel switches that would not have functioned well on their own. This reviewer said that by using the federal grant scoring metric, the presenters stayed true to the project goals. Additionally, the reviewer stated that the researchers essentially used the federal grant scoring to make their own FOA to choose fleets to use and scored them that way. This person observed that INDOT put in 115 stations with the grant and retrofitted some vehicles; because of the infrastructure INDOT was able to go out on their own and retrofit 404 Ford Rangers. Finally, the reviewer is waiting to see results from this year as it is the first time the vehicles are fully being fueled with the new technologies.

A fourth commenter emphasized that the researchers used a very logical and appropriate strategy (using DOE FOA scoring and logic on project strength and contribution to petroleum displacement) to identify projects and partners to be funded. This person then added that the project contained broad fuel neutral approach spanning the entire state of Indiana.

A fifth reviewer commented that the project addressed the key barriers of expanding infrastructure and providing training to first responders through a wide range of partnerships, and that the partners were selected through a Request for Proposals (RFP) process. This person made note of the fact that when fully deployed, the project will be a major push for acceptance of AFVs and will help catalyze further market action. According to the commenter, the Principal Investigator (PI) found that there are particular applications for AFVs that are particularly relevant to the Indiana economy, especially with dairy and agriculture vehicles.

A sixth reviewer pointed out that the project encompassed the majority of available alternative vehicle types, had clear milestones and met them on schedule, and was selected by considering various criteria including job creation.

Question 3: Characterize your understanding of the technical accomplishments and progress toward overall project and DOE goals.

Most of the reviewers' responses for this question were positive. One reviewer indicated that the researchers have made excellent progress, used an excellent model, and formulated a nice plan to build the infrastructure, make it bigger, and make it a good experience that will grow business for the local supplier. The reviewer then pointed out that PI found new partners when funding freed up. This person said that first responder training through NAFTC was completed, and that NAFTC is doing more this year so the researchers are clearly expanding the funded project already. The same commenter applauded the researcher's proactive work to easily make the infrastructure available to other fleets. This person noted that the investigators have addressed the problem of the propane association not being happy with INDOT selling fuel opposed to propane marketers. The commenter then added that by using INDOT to attract fleets, the project has the potential to grow exponentially. The reviewer added that with the dairy partner, the researchers took what the project was doing and made it better by growing infrastructure on the routes that the dairy partner used, like a roadmap for the dairy industry. This person remarked that when the price of hybrids and conversion costs went down, that cost went into first responder training and more vehicles. The commenter said that the researchers reacted quickly to identify additional projects when the funds were available.

A second reviewer said that the project had a large amount of stations and vehicles, showed significant petroleum reduction and nearly complete vehicle and station implementation, and was done in ways that solved problems the presenters' partners were facing. Additionally, the commenter noted that the investigators had basically finished implementation last fall (98% spent), so the next year and a half are focused on data collection. This person reported that the presenters created new bid specifications in organizations to fit Davis-Bacon, and that the jobs mentioned are hard jobs the researchers have counted at the primary level vendors. The same reviewer also stated that the Fort Wayne police fleet is now fueling E85 basically 100% of the time; it was at

50% initially but then the fleet partnered with a petroleum marketer to install three more stations in the heart of the city. Finally, the commenter described that the savings that funded the last-stage LPG school buses in Tippecanoe County came from fleets seeing lower costs when vehicles were purchased than was expected when submitting bids.

A third reviewer mentioned that the project had significant infrastructure and vehicle counts (121 fueling sites and approximately 369 vehicles). This commenter confirms that fueling site deployment (propane) enabled INDOT to expand their propane vehicle fleet by 400 vehicles beyond the 245 funded by the project. This person added that virtually all vehicles have been deployed, enabling nearly two full years of data collection. The reviewer also indicated that Renewable Dairy Fuels project (renewable natural gas) was already showing expansion beyond stations funded by the project, which could be a potential pattern for the dairy industry for reducing greenhouse gases. The commenter concluded that the E85 police fleet (Fort Wayne) is enabled by strategic ethanol infrastructure, and is reducing fleet fueling costs.

A fourth commenter affirmed that the project was substantially completed by last fall, with all deployments completed by April 2012, and that currently, the only activities that remained included reporting, outreach, and administrative tasks. This person stated that the project deployed 115 LPG stations for government use, first responder trainings, and a bio-methane CNG station, among other projects.

A fifth reviewer mentioned that the project initiated support for a new project of recovering bio-methane from diary for fuel for a class eight milk delivery truck, assisted in the establishment of a CNG corridor on interstate I-65, and is displacing 1.4 million gallons of gasoline annually.

A sixth commenter expressed that the project had definitely made good progress and accomplished quite a bit, but that it was unclear to the commenter if the investments in some areas would really result in leveraged and/or long-term benefits given the one-off and very diverse nature of the work funded with grant money.

Question 4: What is your assessment of the level of collaboration and coordination with other institutions?

The reviewer comments in this section were positive for the most part. One reviewer stated that the project has ten partners consisting of government, private and public institutions.

A second reviewer said that the researchers' partners included the State Energy Office, Clean Cities coalition, and major fleets (like Sysco), who are all pursuing novel projects as a result of this work.

The third commenter elaborated that INDOT was a key partner for propane infrastructure, the Energy Office did the contracting, and the Clean Cities Coalition did the field work.

A fourth reviewer felt that the researchers had great partnerships with the implementing fleets. It seemed to this person that the investigators chose to go for off-the-shelf technologies, and thus avoided the types of partnerships with academia/industry that would have been natural in aggressively pursuing more advanced technologies. However, the reviewer commented that this was unimportant as the payoff was obviously quicker and the implementation cleaner. In addition, this commenter suggested that perhaps there could have been more safety training, testing of technology, etc. Additionally, this person recalled that the researchers have been working to train INDOT and other technicians so that incidents could be responded to on their own fleet without outside help. The reviewer emphasized that INDOT CNG/propane stations were designed to be open to other government entities; none have taken them up on it yet but some are looking and INDOT has the contracts ready. This person went on to say that INDOT stations are getting some pushback because local propane dealers want to be the ones selling it, but INDOT believes it will work out fine. The commenter specifies that INDOT stations will seed it and get fleets to invest, at which point the propane dealers can come in and build a station of their own volition. The reviewer also made note of the fact that the presenters tried to retrofit Indianapolis prisoner transport vans to CNG because those run a regular route. However, the reviewer explained that the vans do have to go outside of the loop occasionally, so there were worries about a dedicated CNG vehicle, which is why the researchers ended up going with propane. This same person pointed out that the investigators are looking at putting in more stations down the corridor so the project could use those trucks to make runs all the way down to Florida, which is a model that

can then be taken throughout the country. According to the reviewer, CNG allowed them to address their greenhouse gas (GHG) emissions in a significant way (even more if bio-methane could be used). This person concludes that the researchers hope to be running solely on bio-methane after Labor Day.

A fifth commenter recounted that the KAKCO station upgrade supported both their fleet and AT&T so it would demonstrate the viability of the station configuration. This person then offered that the presenters could possibly communicate dairy project success more within industry.

A sixth reviewer remarked that it was unclear how much collaboration happened outside of the project manager and individual grantees, and also if there is a mechanism to gather and share lessons learned from this project more broadly than just the identified partners.

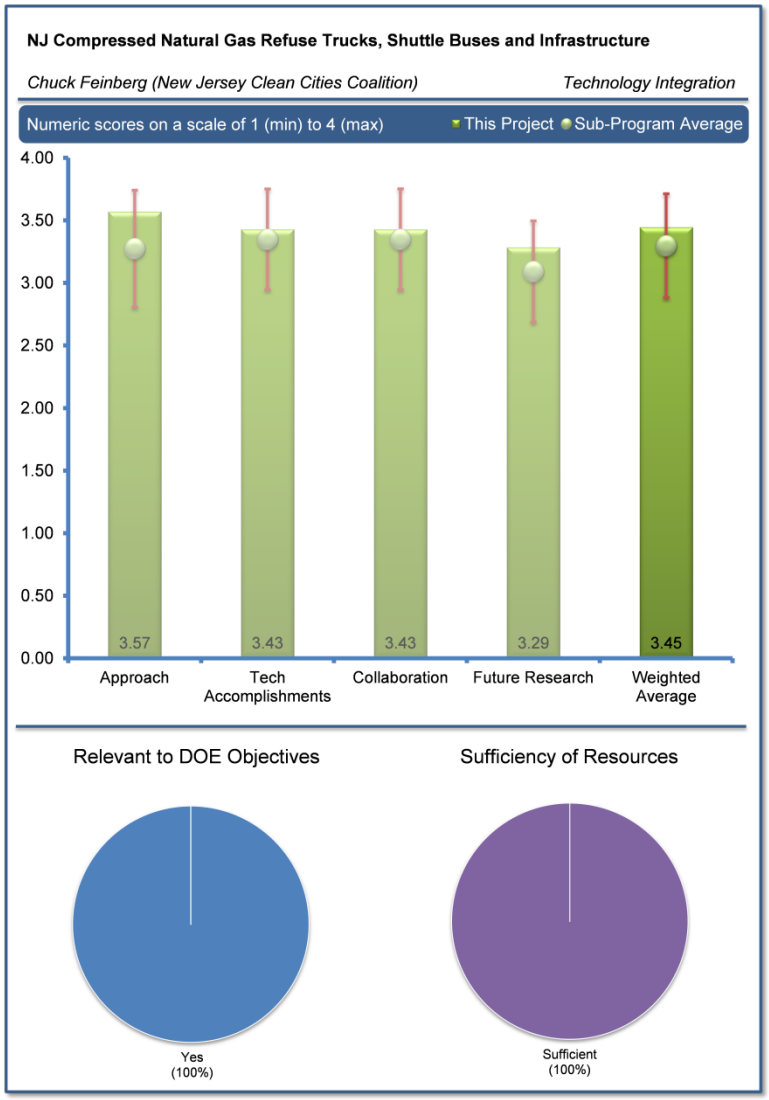
Question 5: Has the project effectively planned its future work in a logical manner by incorporating appropriate decision points, considering barriers to the realization of the proposed technology, and, when sensible, mitigating risk by providing alternate development pathways?

All the reviewer responses for this question were favorable. A couple reviewers said that the project appears to be on track to complete future activities, and that there is not much left to do. One of those reviewers added that the project recently added five propane buses to the Tippecanoe School District, and that getting the last two or three of those will completely finish the vehicle implementation. Another commenter stated that the project plans well for the future, particularly the growth of LPG vehicles and infrastructure. This person also pointed out that savings due to fuel price will help retain city jobs. A different reviewer remarked that the future work seems appropriate to close out the project, and that mostly outreach events and data collection/analysis are implemented at this stage. The reviewer complemented the researchers on their use of a computer kiosk to display information about the project at outreach events. An additional commenter recounted that many of the fleets have been buying additional AFVs beyond what was required in this project. This person mentioned that the PI planned to conduct more trainings, events, and outreach in the future and is looking to replicate the CNG project with other dairies. The same commenter concluded that the LPG stations can eventually catalyze more interest and generate private investments in more LPG infrastructure and vehicles.

Question 6: How sufficient are the resources for the project to achieve the stated milestones in a timely fashion?

All reviewers unanimously agreed that the project's resources were sufficient. All of the comments in this section were positive. One reviewer summarized that the amount of vehicles and stations suggested that the resources were used very well. This person noted that the project started in 2009, used $10.125 million from DOE, and was matched $12.415 million. The reviewer made note of the fact that the total cost of INDOT propane and E85 stations was around $3 million for 115 stations, although there was access to the infrastructure tax credit of 30% up to $30,000 through their vendor, and the average cost was $35,000-40,000 installed, though INDOT has had to do some later work on their own. A different reviewer stated that 98% of the DOE and cost share money has been spent. This commenter specifies that the researchers were able to add partners with some of the unspent funds and the projects seem to have had reasonable prices for the infrastructure projects.

NJ Compressed Natural Gas Refuse Trucks, Shuttle Buses and Infrastructure: Chuck Feinberg (New Jersey Clean Cities Coalition) – arravt051



Reviewer Sample Size

This project was reviewed by seven reviewers.

Question 1: Does this project support the overall DOE objectives? Why or why not?

Evaluators were overall supportive of this project. The first reviewer stated that this project would displace over 2 million gallons of petroleum annually and reduce emissions of criteria pollutants and GHGs by over 900,000 lbs. per year.

The second reviewer remarked that the project has jump-started the use of CNG in heavy duty vehicles in New Jersey, and would have a major impact on petroleum displacement in the state, with nearly 300 heavy duty vehicles deployed and six refueling stations that would be open to the public.

A second commenter explained that the project is obviously aimed at deploying alternative fuel vehicles and infrastructure, which will support DOE's objective of petroleum displacement.

The third reviewer indicated that the project is obviously aimed at deploying alt fuel vehicles and infrastructure, which will support DOE's objective of petroleum displacement.

The fourth reviewer observed that both leveraging and visibility of wrapped refuse haulers were excellent. The commenter noted that this CNG project attracted diverse participants with high volume, high visibility applications to have the biggest effect on petroleum reduction and emissions. This person said that the HD portion in particular had significant fuel and emissions savings. The commenter also mentioned how wrapped jitneys transport casino patrons among casinos and drivers talk about their vehicles being natural gas. According to the reviewer, both are excellent support of the broad petroleum displacement goal.

The fifth reviewer noted that the project will reduce a relatively large amount of petroleum consumption by targeting a large amount of high-fuel consuming vehicles. The sixth reviewer reported that the project has high relevance to DOE objectives because the project will displace a significant amount of petroleum (i.e., approximately two million gallons per year). The seventh reviewer affirmed that the project supported reducing petroleum dependence by focusing on developing the infrastructure for compressed natural gas refuse haulers and shuttle buses.

Question 2: What is your assessment of the approach to performing the work? To what degree are technical barriers addressed? Is the project well-designed, feasible, and integrated with other efforts?

All reviews were positive for this section. One reviewer stated that the project was well-designed and straightforward, focusing on the deployment of vehicles and refueling stations using one alternative fuel, CNG. This person mentioned that the vehicles selected

for the project are all high fuel use, high visibility, and high impact. The same commenter pointed out that deployment activities occurred throughout the state, and will have a widespread impact in terms of petroleum displacement and community awareness. It was the reviewer's opinion that the project integrated well with Waste Management's (WM) introduction of natural gas to its fleets across the country, and fit with the growing interest in the use of natural gas vehicles by the waste hauling industry in general.

The second reviewer claimed that the project had a very good strategy of focusing its efforts on one particular fuel and making sure that it was successful with what it did with that fuel, and continued to look for ways to leverage that work for even greater benefit. The third commenter reported that technical problems included a design issue with jitneys (tank over cab was knocked off at an overpass), which was quickly addressed and resolved. The person also stated that the root cause (lack of training, substitute drivers) of some problems was quickly solved. According to the reviewer, the PI implemented a solution that was appropriate and did not overreact. This person acknowledged that the high visibility of these projects have already brought interest from other fleets and policy-makers.

The fourth commenter applauded the strategy of targeting one technology and applications that are both highly consuming and highly visible because it targets petroleum reduction much more than niche technologies. Additionally, this person described that the researchers' strategy was to limit the project to one technology (CNG) and fleets with high fuel use and visibility. The reviewer highlighted that the goal was to have a big impact on emissions reduction and outreach, and to create jobs and get the technologies out to the public. The commenter brought to light that even though the project did not use a large number of fleets, that the project was designed to use ones that would prove to the public that alternative fuel infrastructure was available.

The fifth expert pointed out that the investigators used strategic locations for fueling sites around the state to serve these fleets, with some public access. This person also mentioned that this was the first statewide alternative fuel project for New Jersey. The sixth reviewer remarked that the selection process focused on partners that were capable of following through on their commitments. The reviewer observed that this keep it simple approach has seemed to work well, although the City of Newark had to drop out but the PI brought in new replacement partners. The seventh commenter summarized that the strategy of the project was to create a critical mass of NGV activity to sustain continued development of the technology, and overcome the deployment barrier in New Jersey for NGV(s).

Question 3: Characterize your understanding of the technical accomplishments and progress toward overall project and DOE goals.

The general reviewer response was that excellent progress and petroleum displacement had been made on this project. One reviewer commented that the lack of any significant problems with the stations or vehicles was a testament to the project's good up-front planning and implementation. This person went on to say that the project has already resulted in an increase in interest in all alternative fuels in the state, the opening of several other CNG stations, and the deployment of additional, privately-funded vehicles. The reviewer indicated that one original participant dropped out due to cost-share issues, but that the setback was quickly overcome, and probably resulted in a stronger project overall.

Another commenter mentioned that three remaining CNG stations have been awarded and can be completed in a timely manner. The person stated that the high fuel use and emissions benefits of this project have already contributed significantly to DOE's goals. The reviewer also commended the researchers on their excellent progress and collaboration on solving problems. The commenter concluded that the revised energy master plan for New Jersey now included alternative fuels because of the success of this program.

A third expert noted that most of the stations had been built (some with public access), and that most of the vehicles are on the road and documenting petroleum savings. The reviewer expressed that it is hard to fully evaluate the project without data on the amount of money spent, timeline, and etc. According to this person, addressing permitting issues is the one issue that sounds like it still needed work. Additionally, the commenter stated that there are four stations in operation currently, one in construction, one in local permitting process, and approximately 300 vehicles (trash trucks and shuttles) as well as six stations that will be open to the public in the future. This person pointed out that the local permitting process was one of the unexpected hurdles the researchers found, and that it is still being dealt with to a certain extent. This reviewer then reported that the WM site in Camden has two

public quick fill pumps as well as 88-time fill posts for the WM trucks. The expert emphasized that the time fill kept the cost of the station much lower than it would have been, and that WM is using the station design as a model for those elsewhere. The reviewer concluded that another public station has deployed 500,000 gasoline gallon equivalents (GGEs) since August 2010.

The fourth reviewer noted that the project planned the deployment of 300 natural gas refuse haulers and shuttle buses, of which 35 refuse haulers and 202 shuttle buses have been purchased and deployed to date. The commenter also mentioned that the project also supports six compressed natural gas fueling stations, of which three are operational, two will be open soon, and one is in the permitting process. Currently, observed this reviewer, the project has an annual displacement of 2 million gallons of petroleum per year, which equates to 900,000 pounds of pollutants and greenhouse gas emissions eliminated.

The fifth reviewer indicated that the project has made great progress and appears to have achieved all appropriate accomplishments to date.

The sixth reviewer reported that over 230 vehicles had been deployed in six fleets, and three stations (of six) were operational. This reviewer further noted that actual fuel displacement numbers were not listed in the presentation, but would have been useful information to gauge project success. The same reviewer presumed high displacement given the number of vehicles. This reviewer remarked that it was good to see stations spurring additional demand (specifically, private waste haulers interested in CNG as a result of the Newark station). Because there was not much discussion in presentation about data collection efforts, this reviewer questioned what was being done (or will be done) to track these vehicles to assist in quantifying project success.

The seventh reviewer stated that four of the six CNG stations were complete, one is under construction, and one is stuck in permitting. The same reviewer also noted that over 235 CNG vehicles had been deployed to date, with more to follow, and that many of the projects have enabled other fleets to buy CNG vehicles. This reviewer acknowledged that some of the reporting has been difficult, but the PI was working with partners to address this challenge. Furthermore, continued this reviewer, the project was a bit behind schedule, but is making progress.

Question 4: What is your assessment of the level of collaboration and coordination with other institutions?

The first reviewer praised the researcher's collaboration among partners, both public and private. The commenter reported that the project involved coordination with multiple gas utilities and state agencies to the degree necessary.

The second reviewer applauded the project's list of partners and said it appeared to be doing its best to spread the word on its work beyond these partners within the region. The same person recommended that the project manager consider distilling the project's lessons learned and key takeaways to share the good work from this project with Clean Cities Coalitions around the country.

A third reviewer stated that the project has a high industry partner collaboration and has stimulated a range of discussion about alternative fuels. This person noted that the impact of the project has the opportunity to grow CNG in New Jersey significantly and that WM is using it as a model for other facilities to do the same. The commenter remarked that fleet operators are now committing to NG vehicles because of the refuse recycling facility, and that the town that mandated CNG will influence and assist other cities who are doing the same. The same expert mentioned that the Jitney association consisted of independent owner operators that serve Atlantic City casinos and specialize in transportation between the casinos and the airport. The reviewer described that the vehicles that were 15 years old were replaced, and that the newer vehicles were used to showcase NG while transporting casino patrons between sites.

A fourth commenter criticized that the breadth of partners is somewhat limited, but that is dictated by the specific focus of the project. This reviewer was very impressed with the buy-in that the investigators got from the refuse haulers and jitney association. In addition, this person questioned the need for more collaboration within the state to publicize and spread CNG adoption, but noted that it sounded like there was some effort there. Additionally, this commenter recalled that the project had 11 partners, and that it did not go through the state government at all (only Clean Cities is running it). Secondly, the reviewer stated that Essex county facility services many trucks in New Jersey and even 200 in New York City. The expert described that this proved to fleet operators working out of there, that fleet operators could buy trucks because there would be a station at the facility where drop-offs

are made. This person reinforced that this station is letting the presenters get fleets to buy trucks outside of grant funding. Thirdly, the reviewer acknowledged that the Atlantic City site has 190 shuttle bus operators and that those are all independently owned. This person went on to say that the association opened a new fueling station which would also be open to the public, which is a good exposure for CNG because it would be so visible in a tourist destination. Lastly, the commenter noted that the researchers worked closely with the board of public utilities [kind of public utilities commission (PUC) combined with a state energy office (SEO)], and that their new energy plan has a transportation component for the first time and looks to CNG.

The fifth reviewer pointed out that the project was led by the Clean Cities coalition, and noted connection with 11 fleets in the state. This reviewer further remarked that the New Jersey Board of Public Utilities (including the state energy office) is not a direct partner, but is involved as a collaborator, and that gas utilities are also involved.

The sixth commenter felt that the partners represented a wide range of sectors and fleet types. The expert then said that there has been no direct state involvement, but that the Clean Cities Coalition has worked closely with the New Jersey Board of Public Utilities (BPU), New Jersey Transit, New Jersey Department of Environmental Protection (DEP), Port Authority, and utilities. This same person remarked that some of the partners, like the Atlantic City jitneys, have been extremely enthusiastic about the project and intended to continue developing their CNG capabilities.

The final reviewer reported that the project has 11 public and private partners.

Question 5: Has the project effectively planned its future work in a logical manner by incorporating appropriate decision points, considering barriers to the realization of the proposed technology, and, when sensible, mitigating risk by providing alternate development pathways?

The first reviewer pointed out that future work is well-planned and already well underway. This person described that the lessons from initial phases of the project would clearly be used to accomplish the remaining work. Another reviewer noted that future work is logical to complete the project.

The third reviewer supported this assertion and noted that the project appeared to have a good plan to accomplish what it needs to for its future work. A third reviewer also agreed, indicating that the future work is logical to complete the project.

The fourth reviewer explained the project has $500,000 remaining, which will be used to deploy additional natural gas vehicles, although few specifics were provided. This reviewer added that the project lead would continue with training for fueling and maintaining vehicles, outreach to the public and policy makers, and marketing campaigns for the new stations.

Another reviewer reinforced the statements made by the previous reviewer and stated future activities are completing vehicles deployment and start-up of the last fueling station. This reviewer indicated that the project also includes the continued training and outreach activities to the project completion date of December 14, 2013.

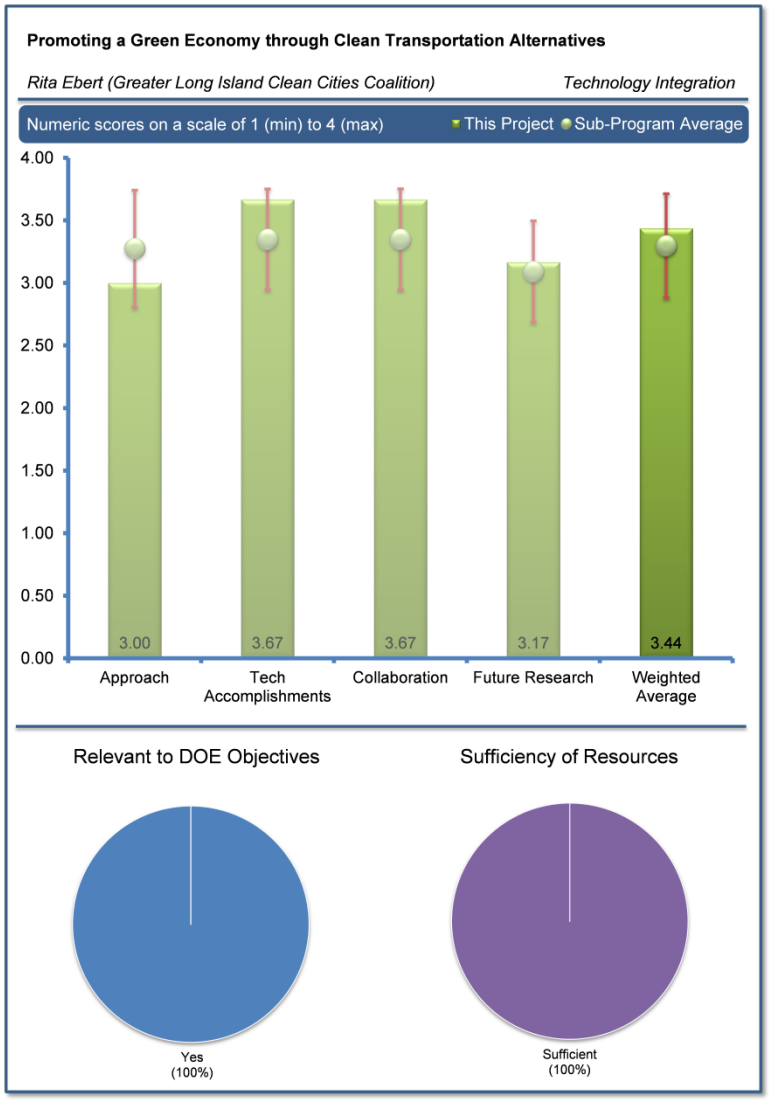
The sixth reviewer agreed stating that the first priority is completing the deployments and continuing trainings. This reviewer mentioned that now that much of the infrastructure is in place, the PI is looking to expand the use of CNG in New Jersey further, although additional funding may be necessary. The same commenter affirmed that the interest is primarily in CNG, but that there may be opportunities to do LNG as well.

The seventh reviewer pointed out that there is not a lot left to do, but that it would be nice to see more details on the outreach and first responder training. Additionally the reviewer noted that one of the big grant partners in the proposal ended up backing out because the partner could not meet the cost share and had some other issues. The commenter noted that this freed up funding for new partners, observed this is still being worked on ($500,000 in federal money still available), and expressed a decision on that is still being considered. The expert then stated that the researchers needed to finish the construction of stations as well as outreach and first responder training. This person lastly affirmed that the Atlantic County Utilities Authority (ACUA) is collecting methane for electricity generation onsite, and said that Essex County burns it, so no biomethane goes through these facilities.

Question 6: How sufficient are the resources for the project to achieve the stated milestones in a timely fashion?

All of the commenters agreed that the resources were sufficient. The first commenter indicated that resources were well matched to project needs. Another commenter was very impressed with how well the project team leveraged funds (i.e., $15 million in Federal funding and $32 million in leveraged, non-Federal funding). This commenter noted that because the project team focused on one fuel and two implementations, it enabled leverage of a significant number of fleets and diesel reductions. A third commenter remarked that project resources were sufficiently planned to enable the successful completion of the project. The fourth commenter offered that money has not been the main obstacle to date, though permitting and construction delays have been obstacles. The same commenter added that the project has had no trouble meeting the cost share requirements and has approximately $500,000 remaining to reallocate to other projects. A fifth commenter opined that the $14,500,000 in DOE funding and the $31,672,444 match are sufficient funding to reach stated goals. The final commenter stated that resources should be sufficient given the scope limitation to CNG only.

Promoting a Green Economy through Clean Transportation Alternatives: Rita Ebert (Greater Long Island Clean Cities Coalition) – arravt052



Reviewer Sample Size

This project was reviewed by six reviewers.

Question 1: Does this project support the overall DOE objectives? Why or why not?

One expert commented that the petroleum fuel displacement was substantial.

The second reviewer remarked that this project absolutely supports the overall DOE objectives, highlighting that this is another poster child program for DOE, and explaining that matching funds exceeded DOE's investment. The reviewer also commented it was admirable that 1,633,389 gallons of diesel fuel have been displaced so far. According to this person, 135 heavy-duty CNG AFVs, 11 light-duty, and 5 CNG stations have either been developed or are being developed. The expert felt that the presentation was well thought out and presented the facts clearly, however this person remarked that the presenter read the slides instead of encapsulating what was on them.

A third evaluator mentioned that the project called for more than 150 AFVs plus 6 refueling stations to strengthen a refueling corridor and the alternative fuel industry, and also includes conducting outreach and training. This person noted that the researchers are also focused on creating jobs for the local economy based upon clean technologies.

The fourth reviewer highlighted that the project targeted a wide geographic area, key points along the LIE corridor, and commercial, municipal fleets for immediate impact. This person observed that the presenters chose to concentrate locally rather than participate with other New York coalitions that might have watered-down the impact in this area.

Question 2: What is your assessment of the approach to performing the work? To what degree are technical barriers addressed? Is the project well-designed, feasible, and integrated with other efforts?

The first commenter judged the strategy to be good because of what the project had accomplished in the end, despite the overall strategy not being described in the slides. The reviewer added that the best strategy information was contained on Slide 19 where the approach was described.

A second evaluator observed that the investigator's strategy was built upon successful approaches and projects that had already been completed. This person noted that most of the vehicles were MD/HD, which resulted in significantly more fuel displacement (roughly 11,000 gallons per vehicle). The reviewer indicated that the project was focused on key leverage opportunities, and a number of participants also had CMAQ or other funds, which could not be applied to this project. But the commenter said that

those partners will acquire additional CNG vehicles to locate nearby at the same locations as vehicles under this project, and thus be able to share the alternative fuel infrastructure. This person felt that this was a very useful way to stretch the project's funding to create even more petroleum displacement.

The third reviewer praised the researcher's strategy, the fleets chosen, and the accessible locations chosen for the stations. This reviewer also noted that the project includes many MDVs and HDVs.

A fourth expert indicated that CNG was targeted heavily based on availability and interest, and because other fuels/technologies were not as accessible on Long Island. This person described the strategy to leverage local needs and availability as smart. The commenter applauded the clear criteria for choosing which projects to fund, and noted good advance planning as well as the backup plan to replace dropped-out projects. This person stated that the investigators overcame political budget-wrangling by local officials.

The fifth evaluator summarized that the project used one fuel, created less barriers, and did not use a huge number of vehicles. The sixth commenter felt the project was successful and liked that it included heavy and light duty vehicles, but questioned if it should consider other strategies beyond just CNG.

Question 3: Characterize your understanding of the technical accomplishments and progress toward overall project and DOE goals.

One reviewer stated that, whatever the formal strategy was, the bottom line was that the project has made significant achievements since 2009. It seemed to a second reviewer that the work done on the project was very competent.

The third person reported that four out of five stations were open and accessible to the public, and liked that the investigators conducted training for all grant awardees.

The fourth commenter felt that the issues were primarily non-technical, and that there were a lot of issues to overcome surrounding the partner continuity. However, this person applauded how the presenters established partner ratings. The fifth evaluator claimed that there were not a huge amount of barriers to overcome.

The sixth expert noted that there were 129 NGVs in place, with 4 stations open (with last one by July 1) so far. This person mentioned that the researchers' approach was to build a corridor along Long Island Expressway, and in addition, they tried to make the project vehicles visible. The reviewer added that significant barriers resulted in a few delays, and local elections meant new officials changed budgets (Nassau County), plus there were backlogs on getting vehicles. However, the expert pointed out that the project team had other projects planned, so it reallocated using those. This person then mentioned that Nassau was the site for the one station that did not get done.

Question 4: What is your assessment of the level of collaboration and coordination with other institutions?

Reviewers generally observed multiple collaborations. The first evaluator was impressed by the number and diversity of partners that the researchers have enlisted for support, which included Long Island townships, and private project partners. A second reviewer was impressed by the project's management and oversight of the funding provided to its diverse partners. A third commenter described that the large number of partners turned out to be critical when changes to the project were needed due to a partner backing out. In addition, this person said that the partners brought more than 50% of the funding. Specifically, continued this reviewer, DOE funding was $15 million, with a local match of $21.4 million. A fourth expert complemented the presenters on their collaboration with municipalities to fund the deserving programs. A fifth person indicated that the researchers did a great job keeping partners on schedule. A sixth reviewer did not think the investigators had a huge amount of partners.

Question 5: Has the project effectively planned its future work in a logical manner by incorporating appropriate decision points, considering barriers to the realization of the proposed technology, and, when sensible, mitigating risk by providing alternate development pathways?

The first commenter opined that the investigators are on the downhill slide with a number of vehicles yet to be deployed and one CNG station remaining to be finished. This person was glad that the researchers apparently front-loaded the project, and got to work early getting things done. The same evaluator acknowledged that the presenters should also be commended for the ability to work through the political election change over and the redistribution of funds without de-voiding any goals or objectives.

The second reviewer described proposed future activities as appropriate. The third commenter stated that there are 18 vehicles and 1 station to go at this time. This person continued on to say that most of the remaining efforts will focus on doing more outreach and events, plus reporting/documentation. The reviewer specified that the researchers will also continue to reach out to new fleets to use stations built under this project, and expect to generate an on-going need for training.

The fourth expert felt that the investigators have a good handle on completing what is left to finish. This reviewer noted that the project will be reaching out to new fleets.

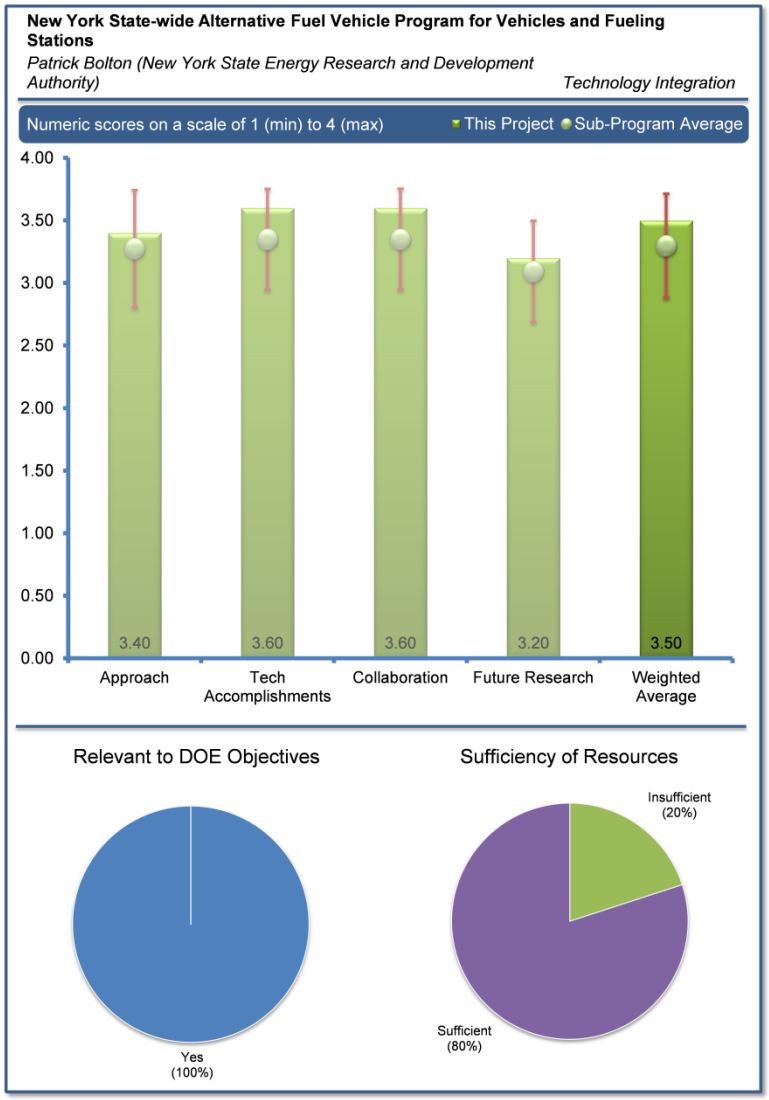
The fifth reviewer noted that the project intends to complete all installations and deployments, and reach out to new fleets to increase use of stations installed under the Program. The project will continue training to reach new employees and new fleets/partners.

The final reviewer thought proposed future activities were good, but this reviewer did not see any concrete plans of how the researchers would accomplish the outreach and evaluation.

Question 6: How sufficient are the resources for the project to achieve the stated milestones in a timely fashion?

All of the reviewers were in agreement that this project's funding is sufficient. The first commenter observed that with the project's matching funds the investigators appear to be well funded, and the fund investment from DOE appears to be sufficient. A second evaluator heard no mention of an issue, but stated that the presenters did raise the subject of a penalty for partners for withdrawal from a project to identify/encourage commitment, or at least help to fund the re-allocations that were necessary. A third reviewer remarked that the resources were adequate for the needs of the area and scope of this project. This person confirmed that the project had wide-reaching impact on the community. According to a fourth evaluator, it looked expensive to focus the project on all on heavy duty vehicles, but seemed like the right choice for that community. This commenter would like to see that reasoning/differentiation spelled out explicitly in the presenter's report(s).

New York State-wide Alternative Fuel Vehicle Program for Vehicles and Fueling Stations: Patrick Bolton (New York State Energy Research and Development Authority) – arravt053



Reviewer Sample Size

This project was reviewed by five reviewers.

Question 1: Does this project support the overall DOE objectives? Why or why not?

The first reviewer stated that this project absolutely met DOE objectives. This reviewer further added that the project team's deployed vehicles have driven 3 million miles and the displacement of fossil fuel was considered substantial with 372 out of 382 vehicles deployed.

The second commenter was impressed at the scale of this project. This person added that they seemed to have made an impact across a broad sector and a large geographic area.

The third expert commended the amount of petroleum fuel displacement for this project. The fourth evaluator claimed that the project hit all the key points.

The final reviewer highlighted the project's impressive reductions in petroleum usage and emissions and big emphasis on electric vehicle charging stations, but not on deployment of EV vehicles. The commenter continued on to say that the researchers alluded that a different project was deploying EVs, so this was a great way to support that initiative.

Question 2: What is your assessment of the approach to performing the work? To what degree are technical barriers addressed? Is the project well-designed, feasible, and integrated with other efforts?

Reviewers had varied feedback on deployment. One expert was impressed that this project worked with diverse sectors and seemed to offer solutions that were appropriate to the partners. A second commenter noted that the project is expanding infrastructure in key geographical areas.

A third evaluator indicated that the investigators attempted to cover the whole state, involve 5 Clean Cities coalitions and 42 fleets, include schools, municipalities, private fleets, and universities. This person added that the project is regimented in keeping tabs on each sub-project, and the project management plan is clear. The reviewer also reported that the project included a big push for propane school buses, education on AFVs in general, and matching projects with the most appropriate alternative fuels for each one, not just pushing one type of fuel for all.

A fourth commenter applauded the project's numbers, spread of technologies, and quick start in 2010.

A fifth expert felt that the presenters have a very sound strategy for deployment. However, the reviewer had concerns with the area of first responder training. This person explained that when people say first responder in and around these programs in general

they are speaking about Fire and EMT personnel and little consideration, if any, is given to police who usually show up first at the scene of an accident. The expert added that it is police personnel that file the accident report and maintain the accident experts. This person also mentioned that any type of hazards including hazmat that include automobiles, trucks, and/or buses that could pose a threat to first responders needs to be addressed for police as well. The reviewer reinforced that while the first responder training was truly staged by fire folks with their mobile training vehicle, an outreach to police must be started. However, outside of the first responder training, this reviewer considered the project's approach to be outstanding.

Question 3: Characterize your understanding of the technical accomplishments and progress toward overall project and DOE goals.

The first evaluator expressed that the project is a great piece of work. This person described that the researchers moved quickly and constructed a word of mouth network that is attracting other potential AFV adopters. The expert felt that one of the more interesting aspects that should be looked at is the project's cost comparison data comparing AFV cost of ownership to standard vehicle ownership. The reviewer hoped that this takes into account all the costs including cost to repair the AFV vehicles.

A second evaluator was impressed that the investigators doubled many of their original goals and have sparked continued purchases beyond original partner commitments.

A third commenter remarked that the presenters did a great job getting ownership cost calculation done and written up in the paper.

A fourth expert noted that 99 EV charging stations have been installed, most of which will be publicly accessible, and that 7 CNG/LNG fuel station installations have also been installed. This person pointed out that the project leveraged funds to help spur other grants aimed at EV vehicles.

A fifth reviewer remarked that the project included many different fuels and infrastructure, which are creating barriers to deployment.

Question 4: What is your assessment of the level of collaboration and coordination with other institutions?

The first reviewer thought the investigators' collaboration and coordination was wonderful, with 42 various agencies, groups, organizations, counties, and cities. This person expressed that this is really an example of what cross boundary collaboration should look like. A second evaluator was pleased to see that this project appeared to be focused on offering locally appropriate solutions. A reviewer acknowledged that the project had a nice spread of partners with which to deal. Another expert stated that the project had collaboration with five Clean Cities Coalitions and many fleets. The final reviewer liked the pie chart of stakeholders and thought it was a nice spread.

Question 5: Has the project effectively planned its future work in a logical manner by incorporating appropriate decision points, considering barriers to the realization of the proposed technology, and, when sensible, mitigating risk by providing alternate development pathways?

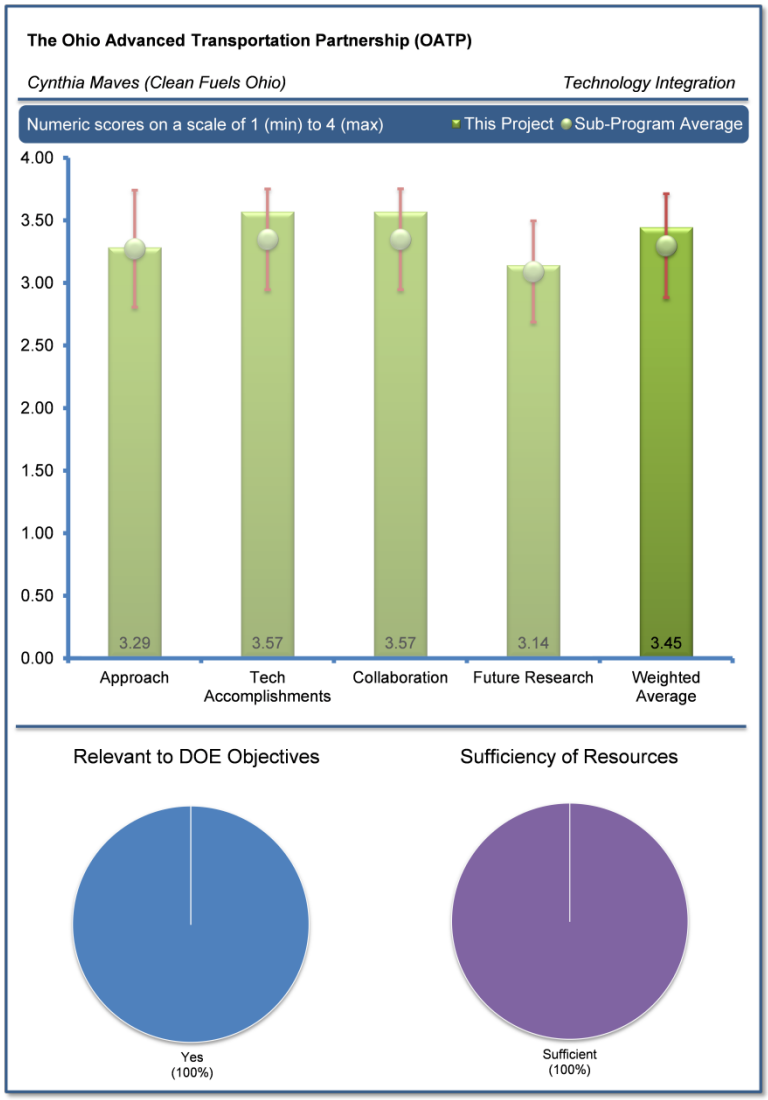
The first commenter observed that the investigators will continue their marketing and outreach efforts and reporting of fuel usage and fuel dispensed, with the lion's share of the work completed in 2011. A second reviewer said that data collection could be useful for the future. A third evaluator noted that future activities include data collection and reporting, and finishing deployments. The fourth expert commended the project's proposed future activities, but questioned how the project plans to maintain usage of the stations after the project.

Question 6: How sufficient are the resources for the project to achieve the stated milestones in a timely fashion?

One reviewer thought resources were insufficient. The remaining reviewers felt the project's resources were sufficient. The first reviewer felt that compared to other projects, this state-wide initiative is daunting given its funding resources in a state that is so population dense. The second commenter voiced that the resources appear to be sufficient as most of the heavy lifting was accomplished in 2011 and 15% of the budget remains at this point in time. A third evaluator stated that the resources were a very large award, spread out over a large number of projects. This person was impressed by the impact and stimulated significant

private investment. A fourth expert felt that this project produced a lot of good for the amount of resources provided. This person observed a little imbalance of EVSE, but was glad the researchers were making a strong showing.

The Ohio Advanced Transportation Partnership (OATP): Cynthia Maves (Clean Fuels Ohio) – arravt054



Reviewer Sample Size

This project was reviewed by seven reviewers.

Question 1: Does this project support the overall DOE objectives? Why or why not?

The first expert noted that this project supports diverse alternative fuel types, and encourages the deployment of vehicles and alternative fuel infrastructure. This person added that the CNG and LNG stations, in particular, should contribute to increased petroleum displacement.

The second commenter affirmed that the project is obviously aimed at deploying alternative fuel vehicles and infrastructure, which will support DOE's objective of petroleum displacement.

The third evaluator applauded the project's diversification among fuels and vehicle types. This person claimed that projects with this breadth and depth require an excellent PI in order to be successful. According to this reviewer, the Clean Fuels Ohio's ability to assist fleets in analyzing optimal fuels would be best ensured success. The commenter also felt that there was excellent petroleum displacement potential for this project and for growth beyond the funded work.

The fourth expert highlighted that by introducing non-petroleum vehicles into Ohio, it allows fleets to displace petroleum consumption. The fifth expert remarked that the project reduced dependency on imported petroleum through deployment of alternative vehicles, construction of charging and fueling stations, and public outreach.

Another reviewer remarked that the project is relevant because it is estimated to displace 875,000 gallons per year. This project is focusing on job creation as well. This commenter recounted that the researchers want to keep Ohio up to date in automotive technology with initiatives like vehicle conversion centers.

The seventh reviewer noted that the project will reduce petroleum use by about 875,000 gallons per year and will result in significant emissions reductions and job creation.

Question 2: What is your assessment of the approach to performing the work? To what degree are technical barriers addressed? Is the project well-designed, feasible, and integrated with other efforts?

Reviewers generally had positive input on the deployment strategy, and some reviewers also noted barriers that have been overcome. One reviewer reported that the project had a diversified fuel and technology portfolio with the deployment of 292 vehicles (natural gas, hybrid, propane, and electric) and 75 fueling stations (natural gas, propane, and electric). This person also mentioned that the researcher's balance of fuels met local needs and their clearly-defined marketing campaign seemed poised for success. The expert added that the team is shaping the projects to maximize use of grant funding.

A second person said that the approach the PI took was to deploy a diverse set of fuels in a wide range of fleets, both big and small. This commenter observed that the focus was on creating a statewide network of stations from Cleveland to Columbus. The evaluator also indicated that the PI has been very inclusive, bringing in a large number of partners with both local and national presences.

A third evaluator acknowledged that the researchers identified a clear milestone approach for completing vehicle deployment, installing fueling infrastructure and outreach activities.

A fourth reviewer noted that the economic recession impacted the project's partners at the start. This person highlighted that additionally, the equipment was in short supply so there was insufficient competition among vendors. Also, the commenter highlighted that the Clean Fuels Ohio experienced some delays because of that, but has overcome a number of barriers to find success, and said that their forthrightness about the barriers they encountered makes them excellent PIs. This person pointed out that the investigators have clearly learned from managing the project and will use that knowledge moving forward. The evaluator made note of the fact that an excellent growth result of the project was the interest in a conversion center for LPG vehicles in Ohio, as well as natural gas. This person highlighted that companies see there is a market in Ohio for conversions which may also draw parts suppliers. The commenter thought it was commendable that a driver was hesitant about CNG and completely turned around after using the vehicle. The reviewer remarked that the Owens Corning portion of the project was built on a similar successful project in Texas, and concluded that every part of the project was well integrated and planned for [DOE Program Clarification: The partner in the sub-project to whom the reviewer is referring is Dillon Transport. Owens Corning is not an official partner in this project.].

A fifth expert felt that the deployment strategy was admirable in addressing a wide variety of technologies and applications. This reviewer certainly could see the value of putting EVSE in areas where it will have educational impact, but questioned how it could actually address technical barriers without a plan for follow-up and gathering feedback. This person also thought that factoring in the state's auto parts strength was a great idea, but did not feel like there was much of a structure for using it to address technical barriers. Additionally, the evaluator mentioned that the researchers aimed for a portfolio as diversified as possible. Secondly, the commenter said that Ohio is the second biggest supplier of auto parts and needs to stay competitive in that, and staying on the cutting edge with alternative fuel technologies is something the presenters think is an essential part of that. Thirdly, the expert noted that the outreach strategy is really focused on fleet managers much more than the general public because that is who the researchers see using the stations, but the EV infrastructure will be more public oriented. Fourthly, this person recounted that the still-to-come EV infrastructure was focused on areas where it will have a large educational and public impact, such as universities, city governments, museums, etc., and all will be public access. This reviewer noted that Bowling Green has them installed and free to use. Lastly, the reviewer confirmed that the investigators did provide some technical assistance to fleets in determining which fuel choice would be best for them.

A sixth person stated that the project appears to be quite well designed although there appears to have been a significant number of problems that developed after the grant was awarded, which raised questions.

A seventh commenter brought to light that the project faced several notable barriers: the recession and budgetary concerns caused some local governments to drop out, a lot of equipment was in short supply, and there was insufficient competition among vendors. The evaluator added that Clean Fuels Ohio was able to replace the original partners that dropped out. This person continued on to say that the project originally started with 20 partners and is now up to 43 and growing, but that more partners does not necessarily mean a better project. The expert stated that the fuels addressed were CNG, LNG, propane, EVs, renewable natural gas, and hybrids. This person speculated that it may have made more sense to focus on fewer fuel types and fewer partners. The reviewer concluded by stating that Clean Fuels demonstrated good forethought by helping fleets analyze their duty cycles during the early stages of the project to help them determine which technology would work best for them.

Question 3: Characterize your understanding of the technical accomplishments and progress toward overall project and DOE goals.

Reviewers had a broad range of responses regarding the technical accomplishments. The first commenter observed that the project had a deployment of 117 vehicles, and about half of the stations seemed to this person to be a bit behind schedule given the 2013 end date, but the team plans to catch up by October. The evaluator added that petroleum displacement is already significant but will hopefully accelerate as more vehicles come online. This expert would like to see some examples of the media outreach materials when they are completed, and commented that these should be included in the presentation.

A second reviewer reinforced that the progress has been slower than expected (the project is about 60% complete) because of a lot of turnover in sub-recipients. This person mentioned that only about 100 of the vehicles are deployed, but most of the infrastructure is in use, including the LNG station and the 10 LNG trucks, which will be part of an LNG corridor from Chicago to Pennsylvania. The commenter noted that the presenters have hosted trainings for fire marshals and building inspectors, and have hired a marketing firm to develop a marketing plan. The reviewer said that the EVSE will be public and will be in educational and municipal settings.

A third evaluator felt that the project has been a little slower than some others in reaching objectives, but that it also started later. For this reviewer, it would be useful to see more concrete documentation of the vendor/technology obstacles encountered and how they were overcome because it would give future parties a blueprint to follow. The expert pointed out that the project is now at around 60% deployment, and researchers had some partners pull out because they could not cover the cost share. This person mentioned that the investigators saw some problems because there were not enough/approved vendors for some vehicles, for example, there were specific vehicle functions that were not available or had not been EPA certified yet. The evaluator also indicated that the Clean Energy CNG stations have unused capacity now so more usage is expected to come up. The reviewer reported that the project includes 292 vehicles (114 CNG) and 57 stations (42 EV, 6 CNG), and one renewable natural gas station (Quasar bio-digester) at the end; about 120 vehicles put in so far. According to this commenter, the presenters had Senator Brown speaking at a CNG station opening recently with two more in Cleveland coming online in August. This person then stated that a Frito Lay EV charging project was almost $100,000 in cost due to length of conduit required because of station location because the project had to be set back from the street a fair amount and ran a lot of conduit.

A fourth reviewer mentioned that the project experienced only modest progress this year in meeting milestones by going from 30% to 43% completion [DOE Program Clarification: PI presented that the project was 60% complete at the time of the review]. The project calls for 292 alternative vehicles, 42 charging locations, and 15 other fueling stations. This person remarked that the project had 50 marketing activities, media events, education activities, and completed natural gas station training for fire marshals and building inspectors.

A fifth expert observed that some projects have come in under budget or down scoped so the investigators are constantly adjusting. This person said that the project's success is clearly the result of excellent work by the PI with partners. The commenter elaborated that the researchers identified a technical assistance need very early on and were smart to ask for assistance. Again, according to this reviewer, clearly overcoming the barriers and managing the constantly changing landscape of the project could only be done with a knowledgeable and outstanding PI.

It appeared to a sixth reviewer that the project has made good progress and accomplished good things in terms of vehicles and infrastructure. The person was unsure of how to rate the marketing campaign piece given the amount of information provided both in the presentation and verbally. The commenter said that this is likely fine, but it is hard to say for sure.

The seventh evaluator felt that it was unclear from the presentation how the 60% completion compares to the initial projections. This person noted that two CNG stations, six propane stations, and some EVSE have been completed, and five CNG stations are 50% complete. The commenter stated that the presenter indicated that the amount of petroleum displaced may be higher than estimated because Clean Energy stations have greater capacity than original vendor. However, the person pointed out that although the number of locations for EV charging increased from 2 to 42 when compared to earlier projections, the number of CNG, propane and hybrid vehicles to be deployed decreased by 10-20%, so that may negatively affect total displacement. The

expert noted that delayed openings of the remaining CNG stations may also have a negative impact on overall petroleum displacement, when compared to original estimates. The reviewer concluded that some projects came in under cost, and noted a good use of this funding by issuing a second RFP in March 2012.

Question 4: What is your assessment of the level of collaboration and coordination with other institutions?

Many commenters complimented the researchers on their variety and depth of local and national partnerships. One reviewer mentioned that the increase from the original 20 partners to 43 meant more coordination was required to implement all projects.

The second evaluator noted good partnerships with industry, and acknowledged that the presenters' media campaign will bring a lot of benefit to the project and the partners, and the focus on fire marshals and building inspector training will ensure future projects for any fleet are barrier-free. This person noted that the PIs used a national laboratory for technical assistance early in the project and were communicative with their partners about the level of assistance that was available without cost to the project team and what was not. The reviewer claimed that the investigators clearly navigated the situation successfully and formed good partnerships with municipalities. This person voiced that focusing the EV project on cities will ensure high visibility.

A third person offered that the Ohio Advanced Transportation Partnership is an outstanding example of the power of partnerships.

A fourth commenter stated that the project's partnerships were a balance of government, non-profit, and private partners. This person mentioned that the team saw a significant increase in the number of partners since their initial proposal, including several major companies (Frito Lay, Scotts Miracle-Gro).

A fifth expert noted that there is a great variety and depth of partnerships, and that there are 43 partners, all sub-grantees. The project started out with 22 so it has grown dramatically. This reviewer pointed out that the investigators had a major partner drop out in 2010 so they issued a new RFP with that funding and got a lot of new partners through that. This person mentioned that the researchers held a well-attended fleet education workshop after a station dedication this spring, as well as a CNG workshop for Fire Marshalls and inspectors recently. According to the evaluator, the project team hired a marketing firm to work with the project, conducted a fleet manager survey by phone to use in implementation, and was currently focusing on free media. This person added that the Columbus CNG station will have credit card public access, which the city will build two more of in the future, with or without grant money.

Another reviewer noted that a lot of partners have dropped out, but the total number of partners has increased from 22 to 43. Partnerships include a wide range of local and national partners in the public and private sectors.

The final reviewer observed that there are a good number of partners on this project, and there appears to be good coordination between the project manager and the sub-awardees. It is less clear to this reviewer how much collaboration is happening outside of these interactions, including with Clean Cities coalitions outside the area who could benefit from the project's learnings.

Question 5: Has the project effectively planned its future work in a logical manner by incorporating appropriate decision points, considering barriers to the realization of the proposed technology, and, when sensible, mitigating risk by providing alternate development pathways?

One reviewer noted that the future activities have heavy emphasis on marketing and outreach, training, meetings, workshops, data collection, and reporting, which seems reasonable for this stage of the project.

A second commenter agreed that the project appears from the information provided to be on track to complete the future work required.

A third person voiced that the project was a catalyst for more CNG vehicles being acquired by partners. This expert was highly confident that the PI will translate this project into more for the state of Ohio because the PI has a clear plan for future work to be completed in a timely manner. This person affirmed that the majority of barriers have already been addressed and future risk has been mitigated already.

A fourth evaluator summarized that the detailed future work plans are sufficient to complete the project objectives.

A fifth reviewer highlighted that the plans include strategies to catch up on progress, completing NEPA reviews and installations by October, and conducting marketing events for the CNG stations. This person claimed that trainings will continue and marketing activities will accelerate. The commenter added that Clean Fuels Ohio is working with the Columbus transit authority to see if they can make their CNG stations public.

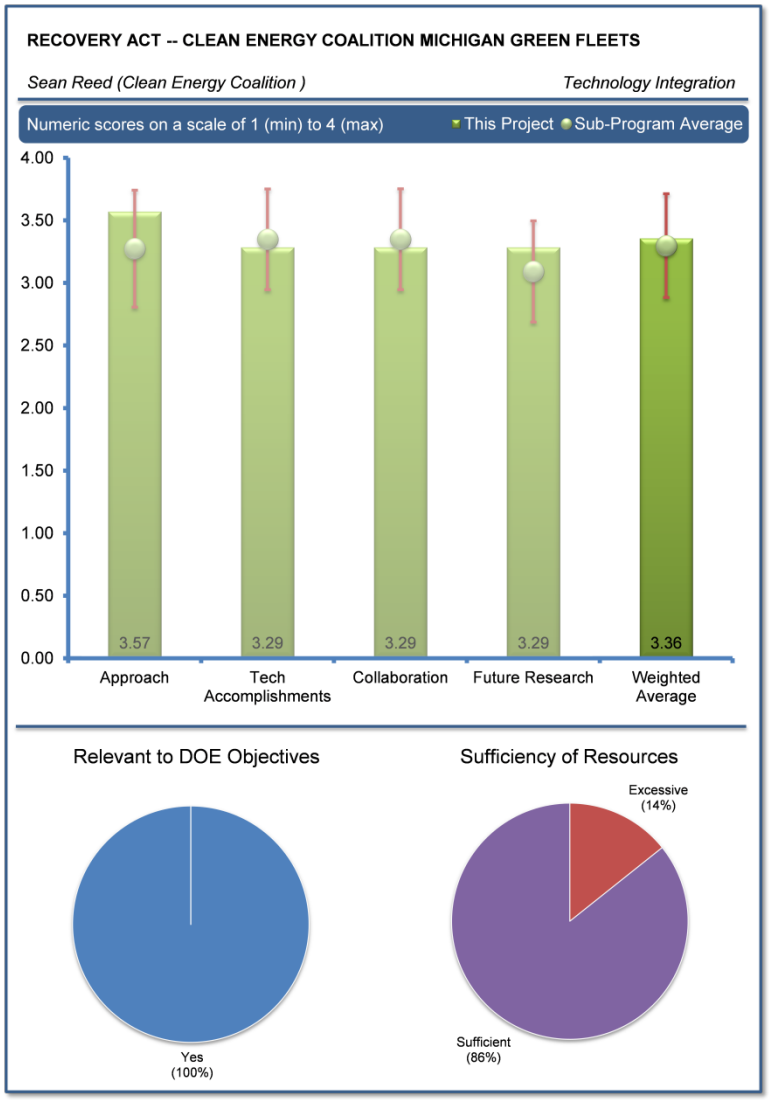
A sixth expert commented that the project continues to December 2013, but has no future activity listed past December 2012.

A seventh person reinforced that the future plans were ambitious with a lot of potential. This reviewer would like to get more of a concrete goal in what that EVSE will do and what barriers it addresses beyond just putting it in the public sphere. This person expected that partner contributions will increase because the investigators are seeing CNG station costs come in higher than expected, and reported that the partners will cover the cost. The reviewer pointed out that the presenters were about to issue contracts from a new RFP that was funded by cost savings from other parts of the project. This person recounted that the researchers want to finish EV station ordering and installation by the fall, and emphasized that is one of the big areas needed.

Question 6: How sufficient are the resources for the project to achieve the stated milestones in a timely fashion?

All of the reviewers agreed that the resources provided to this project are sufficient. One evaluator affirmed that the economic issues that caused a number of original partners to drop out could not have been predicted, and Clean Fuels Ohio was able to replace them with new partners. A second reviewer indicated that a large portion of the remaining work is media events, meetings, and training. This person felt that the PI was clearly well-prepared to be successful. Two reviewers noted that funds consist of $11,041,500 in DOE funds and $18,275,000 in partner contributions, with one of these reviewers commenting that these funds are sufficient to achieve the stated milestones, and a second noting that the project is run by the Clean Cities coalition in Ohio. A fifth person highlighted that the project team had second round of RFPs for additional projects with available funding. A sixth reviewer reported that some money still remains from projects that dropped out, which will be reassigned to more awards. It seemed to this person that the project has expended plenty of cost-share.

RECOVERY ACT -- CLEAN ENERGY COALITION MICHIGAN GREEN FLEETS: Sean Reed (Clean Energy Coalition) – arravt055



Reviewer Sample Size

This project was reviewed by seven reviewers.

Question 1: Does this project support the overall DOE objectives? Why or why not?

Many reviewers were in agreement that this project supports DOE's objective of petroleum displacement. One evaluator mentioned that the project is deploying over 500 alternative fuel vehicles, 20 CNG and 7 propane refueling stations, and 33 EV recharging stations, consistent with overall DOE petroleum displacement goals.

The second commenter noted that the project will create significant petroleum reduction across fuels, and pointed out that despite a shaky start when a major partner bowed out, this project has found a lot of success. The expert said that the researchers are taking the time to identify the right fuel for each partner to ensure longevity with the change to alternative fuels. This person applauded the investigators' mix of CNG and LPG and a lower number of vehicles on HD hybrids and HDVs.

A third person summarized that the project converts or purchases vehicles to run on non-petroleum fuels, thus displacing petroleum use. According to the fourth reviewer, the project is obviously aimed at deploying alternative fuel vehicles and infrastructure, which will support DOE's objective of petroleum displacement.

The fifth reviewer stated that the project will reduce 1.2 million gallons of petroleum use per year or more. This person highlighted that jobs are a critical part of this project as well, as Michigan was particularly hard-hit by the recession. According to this commenter, the other objective was to build fleet partnerships and infrastructure.

The sixth reviewer noted that the project is focusing on petroleum reduction, and expects to exceed the goal of 1.2 million gallons of displacement per year, which is relevant to DOE objectives. The seventh reviewer observed that the project adopted a fuel neutral approach for displacing petroleum with alternative fueled vehicles, and building the infrastructure necessary to support these vehicles.

Question 2: What is your assessment of the approach to performing the work? To what degree are technical barriers addressed? Is the project well-designed, feasible, and integrated with other efforts?

One expert claimed that the project had a good selection process that prioritized displacement potential and project readiness, and ensured that vehicles and infrastructure were readily available commercially. This person noted that the project includes first responder and technician training and ongoing assistance to partners to maximize their displacement. The evaluator remarked that

the strategy includes developing technology and application-specific case studies and summary reports for each partner. The reviewer complimented the investigators on their partnering with the Michigan Economic Development Corporation, and that the project includes a manageable number of partners.

A second commenter mentioned that the job creation was crucial in Michigan. This person also remarked that each fleet gets emissions savings and economic savings. The reviewer reported that the project team explains to their management what the real world savings are for them. This person pointed out that the fuel-neutral approach allows the best fuel to be identified for a broad spectrum of user types. The evaluator acknowledged that the case studies are completed for each project and reviewed via a conference call. This person observed that the researchers are capitalizing on local work to speak to corporate people about the project. The commenter commended the researchers on addressing the CNG infrastructure barrier when one jurisdiction was not friendly to CNG being public, and noted that they quickly identified that a contiguous jurisdiction was friendly. This person explained that politics suddenly became very important, which was not something the investigators expected. This person described that the presenters replaced a major partner with another who would displace an equal amount of petroleum, which was a big barrier that they successfully overcame. This reviewer mentioned that the investigators identified a recycling company who converted 18 trucks to CNG plus added 2 CNG stations, and also brought in Frito Lay to do propane. The expert pointed out that the project successfully addressed a barrier when installing LPG infrastructure. This person indicated that the researchers received contradictory guidance from two code officials (fire marshal and an OSHA official) about where to put a station, and that the project had to negotiate carefully. The commenter concluded that 100% of projects should be done by June 2012.

A third evaluator felt that the strategies seemed cognizant of the realities facing fleet management, which that person thought was great. The reviewer would like to see more of a focused strategy in terms of what vehicles/fleets to target and how that will overcome technical barriers and allow further adoption. This person liked the idea of doing partial conversions and providing data on results, to encourage fleets to do further adoption on their own if it works. The expert pointed out that because of municipality budget restrictions, it was a big sales point to reduce operating expenses for the fleets. This person claimed that the investigators targeted fleets for partial conversion to increase market penetration and visibility of technologies and also want to leverage economies of scale. The evaluator indicated that the presenters really want to get concrete data on usage and costs so that they can demonstrate the metrics very clearly. The reviewer explained that the researchers stayed fuel neutral to get in to a broad spectrum of vehicle classes, and are focusing on private fleets a lot because they are allowed to consider long-term cost savings.

A fourth person remarked that the presenters' approach is very detailed to maximize fuel displacement for each participating fleet. This person emphasized that the project's broad use of technologies, including natural gas, propane, and hybrids (with hydraulic hybrids). The evaluator commented that the use of data collected from the project to provide partners with case studies and ongoing consulting to maximize fuel savings is unique among these projects, and shows value to partners beyond just giving access to DOE funding. The reviewer pointed out that it is important to present results of the projects to high-level decision makers in these companies, to build further petroleum displacement. The commenter mentioned that the investigators helping fleets think about how to use operating budget savings to supplement capital budgets is a value-add component.

A fifth expert stated that the presenters' strategy is to provide significant relief in promoting increased market penetration of alternative vehicles, where the approach is to be fuel neutral, letting the application determine the fuel type.

A sixth reviewer pointed out that because of limited budgets, higher than expected costs, and limited infrastructure, the project tried to cast a wide net and work with a variety of providers in-state and try a number of different fuels for different applications to provide budget relief for its partners. According to this reviewer, one solution to information barriers is to create technology and application-specific case studies for each fleet showing the fuel savings and GHG reductions.

A seventh evaluator noted that the project appears to have gotten off to a slow start for reasons not entirely under the project partners' control. This person said that the significant delay, especially on the infrastructure work, seemed to indicate that the project strategy was not as well developed or designed at the outset as it could have been.

Question 3: Characterize your understanding of the technical accomplishments and progress toward overall project and DOE goals.

Several reviewers noted that the project has overcome barriers. One evaluator expressed that excellent progress had been made despite significant hurdles. The commenter observed that the presenters' creativity and thoughtful approach ensured success. This person stated that even as the cost of conversions came up over time and made the budget a challenge, the researchers found solutions and willing partners. The expert added that all vehicles are either in place or ordered and all infrastructures have begun construction.

A second reviewer was encouraged by how the investigators had identified barriers along the way and put in programs to overcome them (i.e., the hybrid training by Eaton). This person made note of a slight delay in accomplishing some objectives, but stated that the project still seemed to be on track. The commenter remarked that one of the goals was to create and sustain local markets, but did not see much information on how that was going in the presentation. The expert commented that the presenters provided reports to fleets demonstrating deployment cycles and what they paid/would have paid in fuel comparing the new and standard fuel type. This person claimed that this was done after the first full quarter to show the expected annual savings and environmental impacts (at full deployment). The reviewer noted that there had been training provided to first responders, and mentioned that the investigators had run into some permitting issues (four months for one fleet to get a permit for propane with two jurisdictions giving contradictory advice). The commenter noted that the researchers expect a baseline of 1 million GGE displacement per year. This person confirmed that the presentation gave a lot of details on the data, savings, jobs, etc. The evaluator offered praise that the presenters were honest about the low job creation of the project because fuel changes are not usually more labor intensive (post-conversion). According to this person, the researchers put Eaton hydraulic hybrids into garbage trucks in Ann Arbor but had not seen a level of savings near what was expected from the systems. The commenter continued to say that Eaton thinks that this may be largely due need for driver training and is going to come in and educate drivers on how to use the systems. The expert explained that the investigators are going to put some in place in another city soon and Eaton will train at the same time so there is not a lag.

A third commenter said that this project is similar to several others but that the pace of deployment is slower than expected. This person further offered that the deployments of vehicles and stations are still good. The reviewer commended the researchers on their outline of accomplishments (numbers of vehicles, stations, and gallons of petroleum in clearly defined graphs) in the presentation, and opined that this helped the reviewer understand the project more easily. According to this reviewer, the addition of details on how the project dollars were used within Michigan supplements a good data presentation.

A fourth evaluator affirmed that the accomplishments of the project have been the deployment of 159 vehicles and installation of a CNG station. This person claimed that this represents progressing from 30% completion last year to 75% completion this year.

A fifth reviewer noted that the project is about 80% complete, and brought to light that 35% of the partners dropped out and had to be replaced, which created a major setback. The expert remarked that at this point, over 430 vehicles are deployed and some EVSE remain to be installed. The evaluator mentioned that the presenters have conducted trainings around the state, and all vehicles and infrastructure are expected to be deployed by the end of June 2012.

A sixth commenter recounted that the project had encountered a number of technical barriers, but had overcome or is in the process of overcoming them. This person indicated that 4 of 11 original partners dropped out, but new partners included 2 high fuel usage fleets (i.e., Frito-Lay and UBCR recycling company) whose vehicles will have a large impact on petroleum displacement. The expert confirmed the project encountered some permitting issues that were resolved. This person explained that vehicle deployments are on target, but station deployment is somewhat behind schedule. The evaluator acknowledged that hydraulic hybrid numbers have been lower than anticipated, but the researchers are working with Eaton to address driver training issues. This person stated that most of the stations to be deployed are EVSE, but was not clear how much petroleum displacement is expected from EVs. The reviewer concluded that the petroleum displacement goal was originally 1.2 million GGEs, and now it is expected to exceed that amount.

A seventh commenter reiterated that the project seems to have gotten off to a slow start, although much seems to be underway now. This reviewer felt that the project should make decent progress, assuming that the work that is underway is completed in a timely manner. Given the amount of money the project has received, it did not appear to this person that this project has accomplished as much as some other projects at similar funding levels.

Question 4: What is your assessment of the level of collaboration and coordination with other institutions?

Reviewers generally observed effective collaboration. One person remarked that the project appears to be very well coordinated. The commenter noted that the project also includes ongoing collaboration with partners to ensure maximum petroleum displacement, and a good mix of government, industry, and higher education participants.

A second evaluator applauded the project group's industry interaction. This person claimed that the researchers have identified strong, willing partners, and further noted that partners are well-coordinated, and communication from the PI to partners is excellent.

The third evaluator witnessed a good usage of partners; the project worked hard to bring in new partners when original ones dropped out. According to this reviewer, providing data to the partners is an excellent use of funding. This reviewer also noted that the project is partnering with Michigan Economic Development Corporation (MEDC) (which operated the SEO) as well as Greater Lansing Clean Cities. The project had 11 original partners in the proposal and 4 of them dropped out in the first year, including a grocery store chain converting Class 8 trucks that was one-third of the program and a huge emissions reduction. The project ended up identifying a recycling fleet that converted all 18 of their trucks to CNG and put in 2 CNG stations (as of January); each tractor travels 120,000 miles per year. This reviewer observed that Frito Lay piloted propane in the state, converting over half of their fleet. The same reviewer reported that the project is having potential issues with one fleet that is looking to sub out all of their vehicles and thus would not be able to take alternative technologies. This reviewer would like to know if the project has considered getting Penske/other big nationals to take on the technology. The reviewer noted that the project has tried to get other fleets to put pressure on a jurisdiction that does not want to open up a station to the public; the other fleets are interested in using that station though if it was made public.

According to a fourth reviewer, the collaboration was good between the implementing partners (Clean Cities and Michigan Energy Office) and the 12 award recipients, which consisted of city governments (Ann Arbor & Detroit), industry and universities.

The fifth reviewer noted that the project is a collaboration of the Michigan Economic Development Corp and the Clean Cities Coalition, plus about a dozen sub-recipients of all different types. The reviewer further observed that the project also tried to engage local manufacturers in particular.

The sixth reviewer observed only two main partners with CEC (Clean Cities Lansing and MEDC), but a number of sub-recipients. This reviewer reported that several major fleets were included (Frito Lay, FedEx, Schwans) along with the University of Michigan. The same reviewer thought the project did good work in identifying a replacement for major supermarket that dropped out of the project to keep displacement up.

The final reviewer commented that the project has a few partners, but the collaboration appears relatively limited. This is particularly true of public sector participation. It was unclear to this reviewer how project lessons will be shared, if at all, outside of the immediate project partner for whom the information on case studies is prepared.

Question 5: Has the project effectively planned its future work in a logical manner by incorporating appropriate decision points, considering barriers to the realization of the proposed technology, and, when sensible, mitigating risk by providing alternate development pathways?

Reviewers generally saw effective planning of future work. The first reviewer found that the project has outstanding planning of future work. All the remaining work can be accomplished within the project timeframe. Collecting data from partners should be seamless because of the excellent work by the PI. According to this reviewer, the PI clearly understands how to grow the project with partners.

The second reviewer noted that first responder training coming up in July. This reviewer concluded that following up with first responder trainings and trainings by Eaton on the hybrids is a great set of future goals. This reviewer also liked that they are continuing to provide partners with the data reports and looking at doing case studies with them. This reviewer noted that the project expects 100% of vehicles and stations to be implemented by this June (originally was December 2011), that the project will continue to do training (especially first responder) even though they have exceeded milestones, because the project finds them very useful. The project is putting in most of their vehicles this year, and has a lot of EVSEs left to put in (mostly in Ann Arbor and Western Michigan University campus). The project is now down to about 30 vehicles and 13 stations left to deploy, and wants to be able to use the case studies they do for the partners to benchmark the various technologies and their savings to help others determine what technology might be useful.

According to the third reviewer, future work will include training, ongoing consulting to project partners, as well as deployment of remaining vehicles and infrastructure. The fourth reviewer noted that the project will finish deploying vehicles and stations; work already underway. According to this reviewer, continuing the project partner case studies is very good.

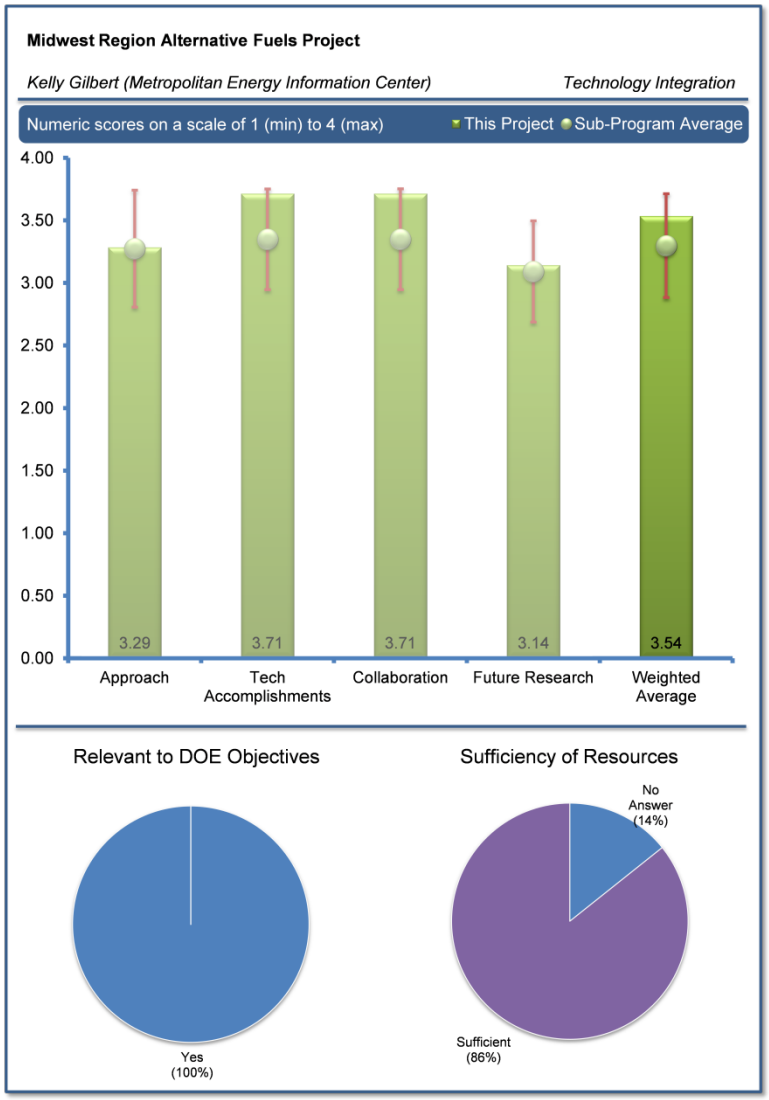
The fifth reviewer commented that the project will deploy the remaining 30 vehicles and 13 stations, continue training sessions and data reporting, and conduct driver training for the hydraulic hybrid trucks. The sixth reviewer observed that the future activity is offering consulting to project partners until 31 December, 2013. That is the closing date of the project.

The final reviewer commented that, again, given what appears to have been a slow start to the project, it is difficult to have very strong confidence in the project team's ability to complete the future work. Hopefully, everything will be completed on time as they say, but, according to this reviewer, it is hard to be sure about that.

Question 6: How sufficient are the resources for the project to achieve the stated milestones in a timely fashion?

Six reviewers found that resources are sufficient, and one reviewer found resources are excessive. The first reviewer opined that a lot will be accomplished with the funding received. The second reviewer observed a good use of federal dollars, and that the sub-recipient match is higher than originally anticipated. A third reviewer commented that sufficient resources are planned to execute the remaining portions of the project successfully and in a timely manner. A fourth reviewer reported that funds include $14.9 million from DOE and $26 million in matching funds. The fifth reviewer observed over $11 million of DOE funds spent to date and over $30 million in cost share. According to this reviewer, this represents approximately two-thirds vehicles, and one-third infrastructure. The same reviewer observed that the project seemed to have been able to do even more than originally expected with the amount of money it has. A sixth reviewer remarked that the $15 million in DOE funding and the $26.5 million in matching funds are sufficient resources to reach the stated goals. The seventh reviewer who found resources are excessive reiterated that compared to other projects, this project seems to be using more government funds per project benefits than other projects.

Midwest Region Alternative Fuels Project: Kelly Gilbert (Metropolitan Energy Information Center) – arravt056



Reviewer Sample Size

This project was reviewed by seven reviewers.

Question 1: Does this project support the overall DOE objectives? Why or why not?

The first reviewer absolutely found that the project met DOE objectives. This reviewer noted that the project deployed 301 vehicles, or 85% of project objective, with orders for 328 vehicles with an overall 365 due to be deployed by end of project. The reviewer also observed 215,000 gallons of petroleum fuel displaced. Additionally, the project's AFV stations are 75% complete. This reviewer described the work as admirable.

The second reviewer saw a good number of vehicles deployed or ordered with a corresponding number of stations. The reviewer saw an ambitious project covering a wide geographic area.

The third reviewer liked the project's diverse strategies to offer options.

The fourth evaluator noted that the project included targets of 333 AFVs and 36 stations over a three-state region, plus maintaining/creating jobs. This included roughly 300 natural gas vehicles (NGVs), 40 hybrid-electric vehicles (HEVs), and 6 EVs in the project. As for stations, this reviewer noted there were plans for 15 EVSE, 10 CNG stations, 7 E85 stations, and 1 biodiesel station, not including 3 stations planned for E85 sites.

Another reviewer found this project supports DOE's goal of reducing dependence on foreign oil and gasoline by deploying 365 AFVs and 36 new alt fueling stations in 3-state region.

The final reviewer remarked that there was going to be a fair amount of fuel displaced.

Question 2: What is your assessment of the approach to performing the work? To what degree are technical barriers addressed? Is the project well-designed, feasible, and integrated with other efforts?

Reviewers had mixed input on project deployment. According to the first reviewer, while the project's approach is not spelled out, it obviously works. The reviewer elaborated that each partner became a lead for each organization, creating a collaborative hub for the movement of information and funds. Moreover, as projects came in under budget, the project added partners.

The second reviewer noted that the project focused on marketplace transformation in Missouri, Kansas, and Nebraska. The project tried to have a relatively strong focus on jobs, and significant outreach activities were included as critical elements. The project's strategy also included involving nearly all of the local partners necessary not only to make the project succeed, but also to provide options as new opportunities arose. According to this reviewer, most of the project focused on light-duty vehicles, or at least lower

fuel use larger vehicles, such as school buses, which is why the overall petroleum displacement is lower than other projects with fewer (but heavy-duty) vehicles. The project's focus was largely on partners with shovel-ready projects, which appeared to contribute to much of the project being accomplished on time.

The third reviewer liked that the project was able to increase the numbers due to cost decreases. This reviewer also noted a wide area for deployment.

According to the fourth reviewer, the project seemed to have been flexible in overcoming any barriers, e.g., different budget cycles among some partners and choosing projects with ready partners. The presentation by project leaders demonstrated good knowledge and skills in completing project goals, said the reviewer.

Another evaluator commented that the project focused on deploying a large number of vehicles with a variety of fuel types, and that it tried to establish a sustainable alternative fuel market.

The sixth reviewer observed that there were some delays on implementation that could provide insight for future efforts.

It was unclear to the final reviewer what barriers were overcome. This reviewer noted there was not much discussion of barriers.

Question 3: Characterize your understanding of the technical accomplishments and progress toward overall project and DOE goals.

Reviewers had mixed responses to this question. The first reviewer commented that project implementers have achieved much in their project, which originally targeted 333 vehicles for introduction, but this number has increased to 365, so this reviewer said that the original program goals have been exceeded. The project has created 36 AFV fuel stations at 19 locations with 85,000 gallons of alternative fuel dispensed so far. Seven bio-stations are in the works but were delayed by a project revision. This reviewer perceived that this was another poster child program that DOE could use to underscore the success of these efforts.

The second reviewer noted that currently, the project is reported to be more than 80% complete. The reviewer pointed out that some projects came in at lower cost than planned, so the project team was able to use the savings to add activities, and increase displacement. The project also had some acquisitions where costs came down during the project, particularly in hybrid areas. The reviewer recognized that project implementers expected 100% of vehicles in place by the end of June, with 90% currently in place and 100% ordered, but some might be delayed to September due to delays in getting stations in place. The stations delayed were biofuel stations, said the reviewer. Overall, 75% of stations are in place, and have pumped 250,000 GGE to date. This reviewer noted that the CNG station in Omaha is attracting attention from non-project participants resulting in follow-on/leveraged displacements, and that the project included lots of highly visible outreach events throughout the region. Overall, according to this reviewer, there were a few delays, but the project team appears to have responded quickly and appropriately.

The third reviewer noted that it appears the project is on target. Another reviewer noted that the project appears to be on goal at anticipated levels. This reviewer observed a good array of media events but this reviewer had difficulty discerning how effective they were.

The fifth reviewer observed that there have been some delays due to partner budgets and backlog in supply chain for vehicles. The CNG tanks are for vehicles primarily, noted the reviewer. One project component with seven fueling stations is on hold. This reviewer perceived a low deployment rate compared to other projects.

The final reviewer recommended that although difficult, it is important to quantify the effects of the project on employment. This reviewer was sure that the project was selling itself short by dismissing employment from its presentation.

Question 4: What is your assessment of the level of collaboration and coordination with other institutions?

Reviewers saw effective collaboration and partnerships. The first reviewer thought that including 19 partners, and 6 municipalities or counties is commendable. This reviewer noted that partnerships extended across multiple disciplines, organizations and

interests. The second reviewer thought the project had done a nice job with first responder training. This reviewer loved that the project is working so closely with the schools.

According to the third reviewer, this project does a good job of integrating diverse stakeholders, ranging from fueling stations to metropolitan governments, as well as schools and fueling stations for more rural areas.

The fourth reviewer noted that overall, the project included 19 partners over 3 states, including 6 municipalities and 4 utilities, plus private companies. The reviewer pointed out that many events were held with the partners. The partners also brought over a 50% cost-share consisting of $12.2 million DOE versus $18.5 million cost-share. According to this reviewer, having a strong network of partners also helped when some activities came in less expensive than planned, and the project team easily had partners willing to sign on for additional activities while bringing additional, unplanned cost-share. Thus, the project is accomplishing more than was planned in some areas due to these successful partnerships.

The fifth reviewer perceived that the 19 project partners appeared to represent a very wide and varied cross section of the communities served.

The sixth reviewer observed a well-organized partner team, with each partner having a team lead. This reviewer noted a good number and variety of partners over a wide geographical area, and that the project showed good planning. The final reviewer observed numerous partners.

Question 5: Has the project effectively planned its future work in a logical manner by incorporating appropriate decision points, considering barriers to the realization of the proposed technology, and, when sensible, mitigating risk by providing alternate development pathways?

The first reviewer noted that the project's future activities seemed appropriate and that the project was addressing the delays with the fueling station. According to this reviewer, those delays seemed outside the scope for the project implementers to control, and seemed understandable given the economy.

The second reviewer observed that most of the remaining events yet to be completed included media outreach and marketing efforts to create more awareness of the program. Additionally, the project is wrapping up the bio-stations, vehicle introduction and AFV station work.

The third reviewer commented that most of the remaining activities are outreach, training, data collection, events, and reporting, plus that the biofuels stations still need to be completed.

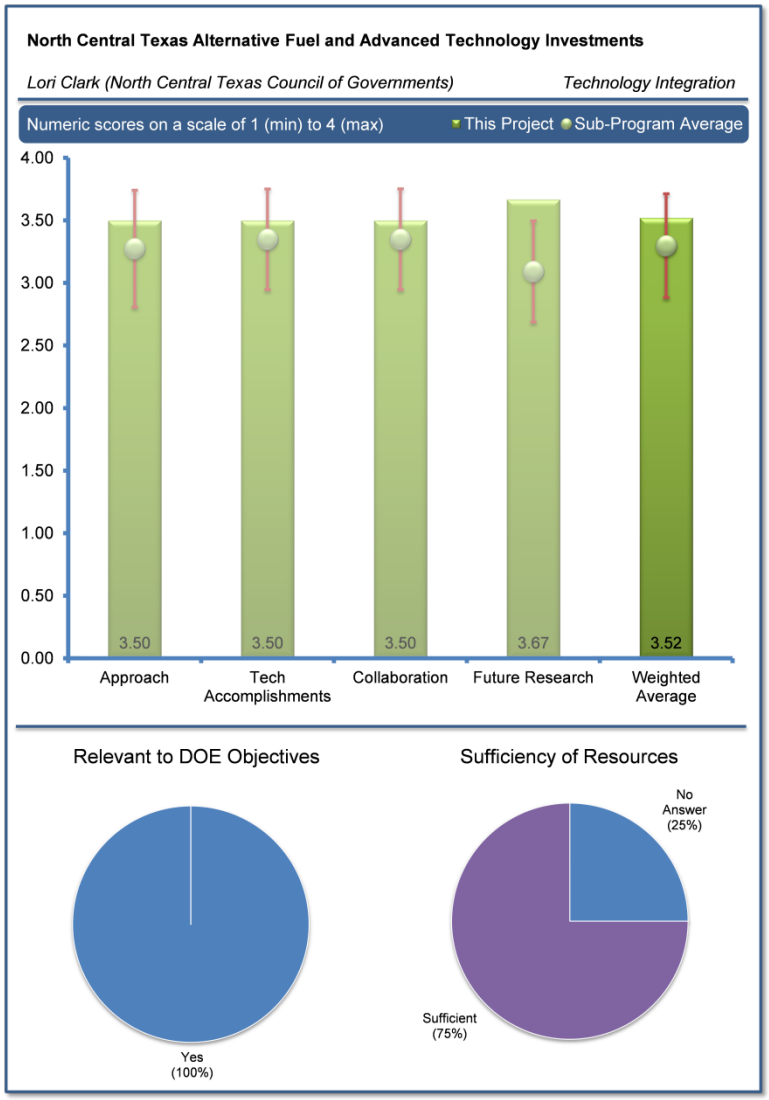
According to another reviewer, the future work proposed for training administration and technical work was reasonable and workable.

The fifth reviewer observed that the project would continue outreach and training, and is waiting for final vehicle deliveries and completion of stations. The sixth reviewer perceived that there was still a fair amount to be completed.

Question 6: How sufficient are the resources for the project to achieve the stated milestones in a timely fashion?

All reviewers felt that the project resources were sufficient in order to achieve the project milestones in a timely fashion. One reviewer noted that resources were sufficient for the project as planned, and that the project was able to add partners when some projects came in under budget. The second reviewer pointed out that one of the best parts of this program was that when funds became available, implementers sought out new partners rather than just let the funds sit there without dedication to a particular end goal. The third reviewer commented that the reported resources appeared consistent with project goals and timeline, and the final commenting reviewer conveyed that there was no indication of any issues on funding.

North Central Texas Alternative Fuel and Advanced Technology Investments: Lori Clark (North Central Texas Council of Governments) – arravt057



Reviewer Sample Size

This project was reviewed by four reviewers.

Question 1: Does this project support the overall DOE objectives? Why or why not?

According to the first reviewer, this project took a portfolio approach to deploy vehicles and infrastructure using natural gas, propane, ethanol, biodiesel, and electricity to displace petroleum. The reviewer noted that estimated petroleum reduction was 870,000 gallons per year, and that extended over the life of the vehicles. The project has also resulted in petroleum reductions beyond project partners due to fuel use at installed infrastructure.

The second reviewer commented that this project would support petroleum displacement by increasing the use, availability, and awareness of alternative fuels and advanced technology vehicles. The reviewer observed that the project would deploy 284 vehicles including CNG, electric, and hybrid, and would develop 11 refueling stations for CNG, electric, ethanol, and biodiesel. The reviewer also noted that the project anticipates 872,847 GGEs to be displaced annually.

Question 2: What is your assessment of the approach to performing the work? To what degree are technical barriers addressed? Is the project well-designed, feasible, and integrated with other efforts?

Reviewers generally perceived good progress. According to the first reviewer, the project was well designed in its strategy for deployment. The fuel neutral approach to vehicle deployment and infrastructure development would spur further advancement in multiple alternative fuel vehicle and advanced technology vehicle markets. The partners were identified prior to submitting the application to DOE and contingency projects were used as needed when projects were withdrawn. The marketing, outreach, and training campaign complemented the deployment efforts, stated the reviewer.

The second reviewer commented that project leaders have pursued appropriate solutions to overcome barriers, both technical and non-technical barriers. For example, one project partner has suspended additional electric vehicle orders because the partner is not getting the anticipated range of the two vehicles purchased; project leaders plan to investigate this issue and ensure the proper time and training resources are dedicated. This reviewer also observed that efforts of project partners have been integrated with efforts of organizations outside of the project, e.g., coordinating partnerships for refueling infrastructure.

The final reviewer perceived that the program has made good progress. This reviewer noted that the team has adapted well to changing boundary conditions, such as high turnover with a city government, partners dropping out, and etc.

Question 3: Characterize your understanding of the technical accomplishments and progress toward overall project and DOE goals.

Reviewers generally saw very good progress. According to the first reviewer, of the 284 vehicles, 232 were deployed and 38 were ordered as of March 16, 2012. With 95% of the vehicles deployed or ordered, this project has made significant progress towards its goals. The reviewer noted that of the 11 refueling stations, 6 were operational and 1 had site work started. This reviewer perceived good progress on the refueling stations. The reviewer also noted that the PI addressed barriers stemming from working with many project partners, vehicle lead times, and infrastructure NEPA clearance.

For the second reviewer, the information presented clearly showed progress between the project's beginning to 2011 and now to 2012. Appropriate plans are in place to continue this momentum. Further, there has been progress made beyond the project partners, specifically because of new shared refueling infrastructure, which contributes to overall accomplishments and DOE goals.

The final reviewer perceived good progress, and good stewardship of tax dollars. The reviewer observed that the program is changing plans on the fly to deal with half-hearted partners dropping out or other issues.

Question 4: What is your assessment of the level of collaboration and coordination with other institutions?

Reviewers observed strong partnerships and collaborations. The first reviewer noted that project partners included public, private, and nonprofit entities. These partners are invested stakeholders, evident from their proactive response to an initial solicitation from the North Central Texas Council of Governments, remarked the reviewer. There was also coordination between project partners and other organizations to facilitate increased use of private access refueling infrastructure.

The second reviewer observed that the PI collaborated with eight private or nonprofit organizations for 44% of the DOE funds and nine public organizations for 56% of DOE funds. The reviewer noted that this collaboration brought a variety of players to the table and ensured a diverse impact of the project. It was necessary for all partners to participate in selecting vehicles, purchasing vehicles, identifying fueling sites, and building fueling stations. For this reviewer, the progress made on this project would not have been possible without outstanding collaboration with other institutions.

The final reviewer perceived numerous collaborations, and thought the project did a good job reacting to some partners that backed out late in the game.

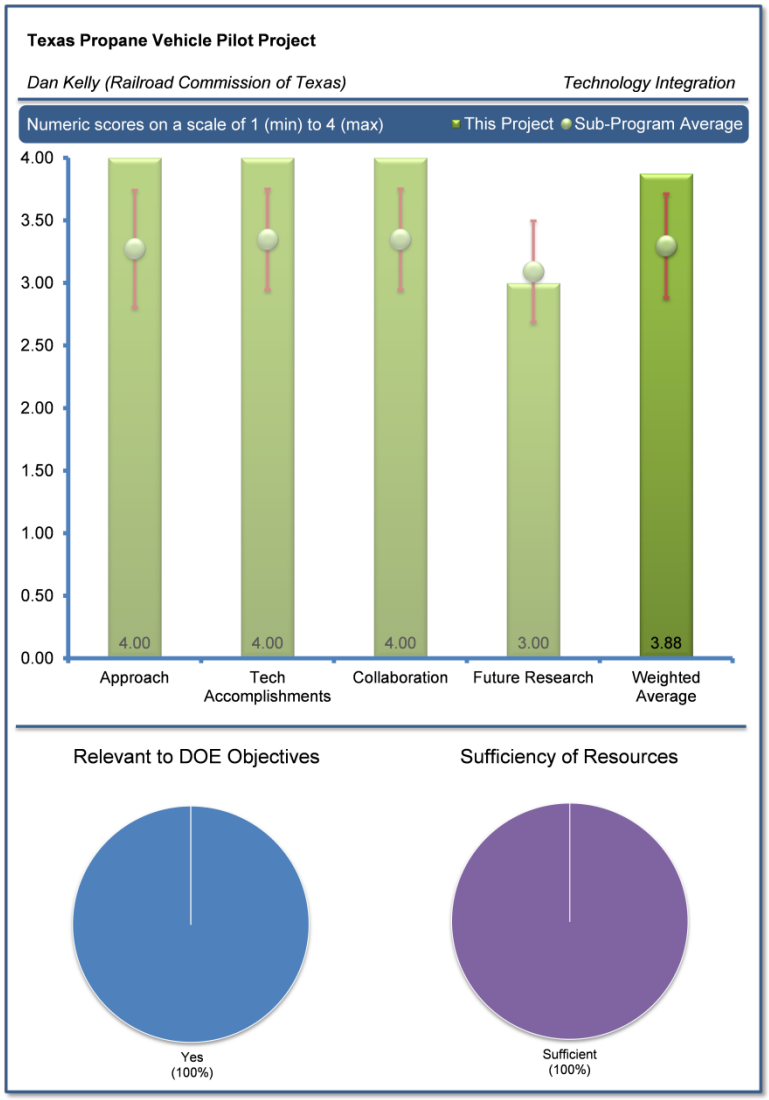
Question 5: Has the project effectively planned its future work in a logical manner by incorporating appropriate decision points, considering barriers to the realization of the proposed technology, and, when sensible, mitigating risk by providing alternate development pathways?

The first reviewer perceived that planned future work is appropriate, logical, and has the potential to be very effective with regard to petroleum and emissions reduction. In particular, the training for natural gas and hybrid vehicles, as well as the marketing and outreach campaign, are likely to have far-reaching impacts, noted the reviewer. The development of a separate contingency list of projects to be approved for use as needed demonstrates a strong commitment to the consideration of barriers and mitigating risk. The second reviewer noted that the PI has considered barriers to the realization of the proposed technology, such as vehicle lead times, infrastructure NEPA clearances, reallocating funds, and sub-recipient internal procurement processes. This reviewer thought the project had effectively planned how it would complete the deployment of vehicles, construction of infrastructure, and technology training.

Question 6: How sufficient are the resources for the project to achieve the stated milestones in a timely fashion?

All three reviewers thought that project resources were sufficient in order to achieve the project milestones in a timely fashion. One reviewer commented that resources were sufficient for the remaining deployment and training activities. According to the second reviewer, ARRA presented an unusual funding opportunity. This reviewer noted that parties appear to be using funds consistent with the program goals.

Texas Propane Vehicle Pilot Project: Dan Kelly (Railroad Commission of Texas) – arravt058



Reviewer Sample Size

This project was reviewed by two reviewers.

Question 1: Does this project support the overall DOE objectives? Why or why not?

Reviewers observed that the project met DOE's objectives. According to the first reviewer, the estimated petroleum displacement for this project is approximately 865,000 gallons per year. This project put vehicles and infrastructure in place to contribute to continued alternative fuel use and petroleum displacement. Likewise, the second reviewer noted that this project would reduce dependency of petroleum by approximately 12 million GGEs through deployment of natural gas and propane vehicles, propane fueling stations, and education program.

Question 2: What is your assessment of the approach to performing the work? To what degree are technical barriers addressed? Is the project well-designed, feasible, and integrated with other efforts?

The first reviewer commented the project is leveraging pre-existing relationships with key industry players to address technical barriers, such as vehicle availability. The reviewer indicated that the project is feasible and builds upon similar past successes. The training used some existing materials and would also result in new materials for use by others. This reviewer observed that project leaders are ensuring that fleets integrating propane or natural gas for the first time have access to other fleets that have been through the same process.

The second reviewer added that this project addressed the technical challenges of deploying alternative fuel school buses. The project addressed the barrier of vehicle availability by pulling together necessary stakeholders to encourage the development of a propane powered school bus. Through education and outreach to school districts regarding the benefits of propane vehicles, key decision makers signed on to use this new technology, said the reviewer. The reviewer identified that the project had a comprehensive strategy which included public education, driver training, emergency responder training, and mechanic training. The reviewer noted that this comprehensive strategy would ensure the successful use of the deployed vehicles.

Question 3: Characterize your understanding of the technical accomplishments and progress toward overall project and DOE goals.

Both reviewers observed that the project has had good progress. According to the first reviewer, the project is on schedule and is projected to meet deployment and installation goals. The reviewer noted that the training program is comprehensive in that it touches drivers, refuelers, first responders, and mechanics. According to this reviewer, these training materials would be used beyond the timeline and scope of the project. Similarly, the funded fleet loan program has the potential to influence other fleets not participating in the project, resulting in future petroleum displacement. The second reviewer observed that the project has

successfully deployed 481 propane school buses, pickups and other vehicles, and is making excellent progress towards the objectives. The public education program has exceeded its targets in the quantity of events, media coverage, and number of fleets reached. This reviewer concluded that creating demand for propane school buses, and thus spurring the vehicle availability, will support the DOE goals of petroleum reduction by setting the example for other areas of the country to use this new technology. The reviewer noted how the PI is addressing barriers of partners who cannot meet the timeframe or provide matching funds leaving the project. This reviewer emphasized that the replacement fleets have been identified and new contracts are being issued to address this change.

Question 4: What is your assessment of the level of collaboration and coordination with other institutions?

Reviewers generally observed multiple collaborators. The first reviewer noted that in addition to close coordination with project partners, the project also leverages connections with other fleets to help support those just beginning to implement propane and natural gas vehicles. The project's utilization of tools such as webinars, blog posts, and other outreach further ties the project and industry partners together. In addition, the project includes coordination with OEMs and fuel providers, as well as Clean Cities coalitions.

The second evaluator noted that the project interacted with vehicle manufacturers, infrastructure providers, school districts, cities, counties, the Propane Education and Research Council, and the Central Texas Clean Cities coalition. Close collaboration with these institutions are necessary to arrange the vehicle deployment, infrastructure development, and education efforts. This reviewer commented that the project could have done a better job of incorporating other DOE-funded first responder training curriculum rather than spending resources developing its own emergency responder training.

Question 5: Has the project effectively planned its future work in a logical manner by incorporating appropriate decision points, considering barriers to the realization of the proposed technology, and, when sensible, mitigating risk by providing alternate development pathways?

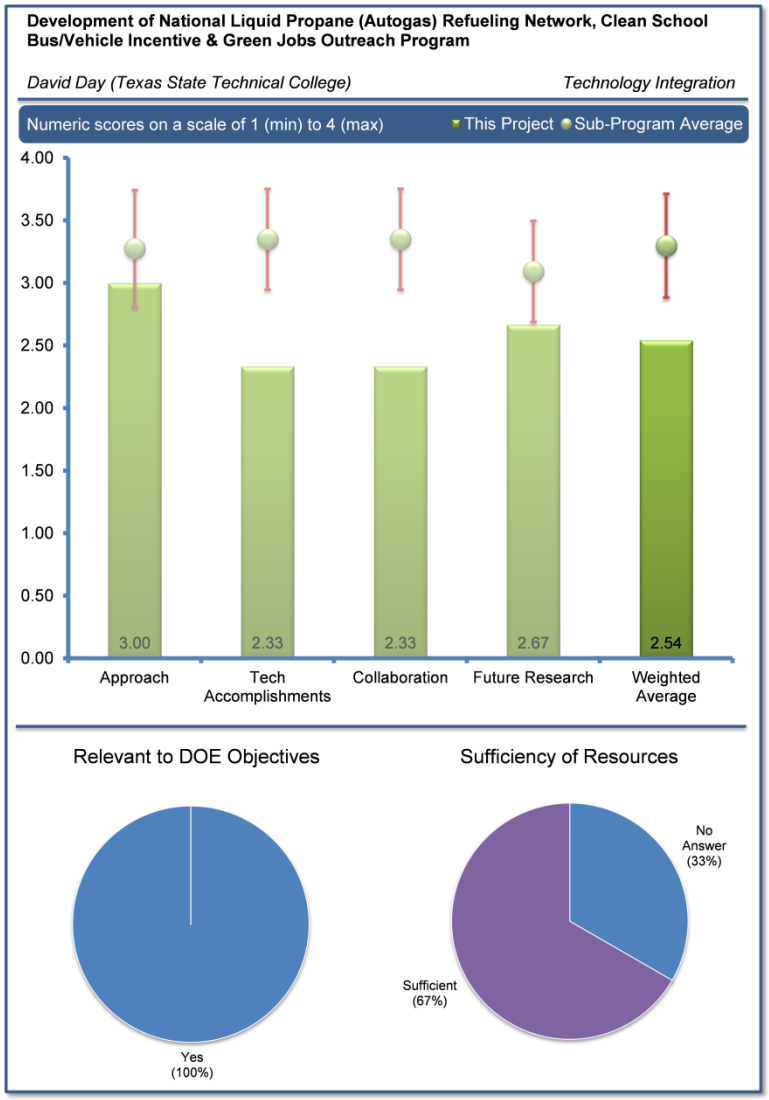
According to the first reviewer, future plans are logical and appropriate. For this reviewer, a particular strength of the project is that it has enabled an administrative structure to allow for further deployment, if funding is available. Also, the project included an evaluation period related to public education and training, which would allow for changes if warranted. This reviewer noted that continued lack of vehicle availability may still be a problem in the future; the project includes plans for communication with OEMs and other industry partners.

The second evaluator observed that the project had clear plans for future activities that would complete the project's objectives and expand future petroleum reduction. The reviewer noted that the vehicle and infrastructure would be completely deployed by January 2013, public education and training will be continued, and vehicle and infrastructure data would be collected and reported quarterly. This evaluator remarked that the PI will build upon the success of this project by seeking additional funding for partners on the waiting list.

Question 6: How sufficient are the resources for the project to achieve the stated milestones in a timely fashion?

Both reviewers thought that the funding was sufficient. One reviewer thought the project has sufficient resources to complete deployment and outreach goals.

Development of National Liquid Propane (Autogas) Refueling Network, Clean School Bus/Vehicle Incentive & Green Jobs Outreach Program: David Day (Texas State Technical College) – arravt059



Reviewer Sample Size

This project was reviewed by three reviewers.

Question 1: Does this project support the overall DOE objectives? Why or why not?

One reviewer felt that the project supported the DOE objective of petroleum displacement by installing alternative fuel infrastructure, deploying alternative fuel vehicles, and providing alternative fuel technician training. The second commenter stated that this project will deploy fueling infrastructure and provide workforce training to contribute to petroleum displacement. The third evaluator criticized that the project needed a better method for ensuring that planned refueling stations are actually utilized in the long term.

Question 2: What is your assessment of the approach to performing the work? To what degree are technical barriers addressed? Is the project well-designed, feasible, and integrated with other efforts?

Multiple experts confirmed that the project had a generally effective strategy for deployment of propane vehicles by addressing the needed infrastructure, vehicles, mechanic training, and outreach. One commenter pointed out that the design of the project became well-integrated with other alternative fuel vehicle deployment efforts by addressing mechanic training in areas that are deploying propane vehicles.

Another reviewer mentioned that while the strategy has changed from the original project, it was feasible and generally effective. This person highlighted that there is some room for improvement, such as reconsidering the role of certain fuel marketers in propane infrastructure development, but that the current and future deployment efforts were generally well-designed.

Question 3: Characterize your understanding of the technical accomplishments and progress toward overall project and DOE goals.

One evaluator noted that at approximately 50% complete, the project is somewhat behind others with regard to progress at this time. This person elaborated that significant changes to the original plans have contributed to this delay. The reviewer observed that while the original plans indicated a strong project, the changes may actually contribute to a more well-thought-out project overall, one that ensures that infrastructure is being sited where vehicles exist.

A second commenter claimed that the project has been on target with the goal to train ASE-certified technicians to service propane vehicles by training 150 technicians. This person reported that the project successfully deployed 90 propane school buses in Los Angeles. However, the expert pointed out that progress has been slow to address a significant project barrier regarding developing

propane fueling stations. The reviewer indicated that when a project partner pulled out of the committed 100 fueling stations, the PI was slow to address that issue and determine a different course of action.

Question 4: What is your assessment of the level of collaboration and coordination with other institutions?

One person explained that the project includes collaboration with fleets, technical institutions, and Clean Cities coalitions. In addition, the evaluator reported that the project was using resources (i.e., training curriculum) that already existed and modified it for their use. This person voiced that the project's partners seemed fairly well coordinated, though the presentation pointed out several challenges having to do with relationships among the partners that may be contributing to the delayed progress. The commenter recounted that the role of Rush Truck Centers, while referenced briefly during the presentation, was not clear.

A second reviewer mentioned that the project consisted of collaboration with CleanFUEL Holdings, Public Solutions Group, Rush Truck Centers, and Clean Cities Coalitions. Based on the information provided, it appeared to the reviewer that the collaboration among those groups has been insufficient to meet the original objectives of the project. According to this expert, Texas State Technical College appeared to be pursuing the propane training for mechanics while technology deployment aspects of the project would benefit from improved collaboration with other project partners.

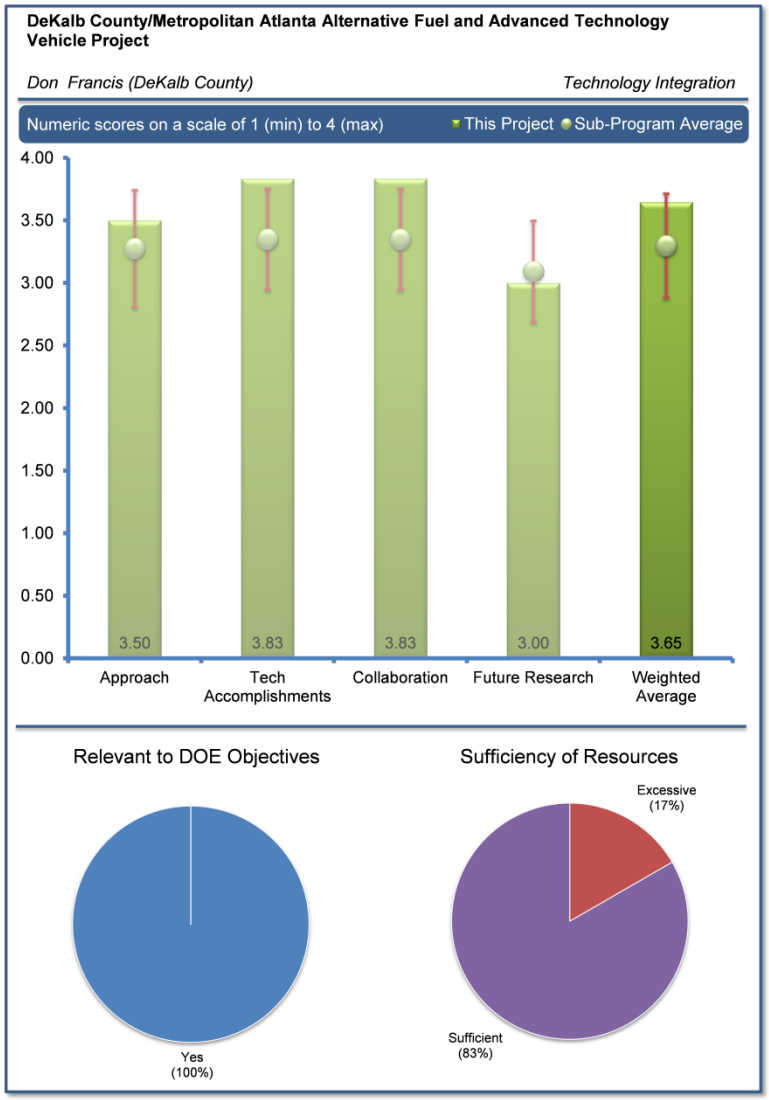
Question 5: Has the project effectively planned its future work in a logical manner by incorporating appropriate decision points, considering barriers to the realization of the proposed technology, and, when sensible, mitigating risk by providing alternate development pathways?

One commenter explained that future plans that take into consideration the challenges and barriers encountered to date, are logical and appropriate given the project's progress thus far, and leaves room for additional adjustments as needed. The evaluator remarked that the project had plans to use any remaining funding left from the reduced number of station installations. Furthermore, the expert said that the project planned to expand and change training programs to accommodate different/additional vehicle offerings.

Question 6: How sufficient are the resources for the project to achieve the stated milestones in a timely fashion?

All reviewers agreed that the resources for this project are sufficient. It was mentioned by one commenter that it may be challenging to find partners interested in purchasing propane school buses and to deploy the vehicles in a timely fashion, but that there should be sufficient resources to do so if the PI provided adequate commitment to managing this effort.

DeKalb County/Metropolitan Atlanta Alternative Fuel and Advanced Technology Vehicle Project: Don Francis (DeKalb County) – arravt060



Reviewer Sample Size

This project was reviewed by six reviewers.

Question 1: Does this project support the overall DOE objectives? Why or why not?

One commenter remarked that all vehicle technologies would contribute to petroleum reduction as would infrastructure projects.

Another evaluator said that the project would be installing alternative fuel infrastructure (six to seven refueling stations) and would operate over 200 vehicles which would support the objective of displacing oil.

A third expert stated that the project would displace some 240,000 gallons per year of petroleum fuels with CNG, including some made from landfill gas (LFG).

A fourth reviewer affirmed that each of the aspects of the project met or exceeded the estimated petroleum reduction numbers, primarily from the heavy throughput expected with the Dekalb County station.

A fifth person claimed that the project leveraged assets and large employers in Atlanta to create a very interesting and effective renewable fuels story. According to this reviewer, the investigators creatively repurposed the landfill to supply seven stations and renewable natural gas. The evaluator then mentioned that this project increased CNG in the region exponentially, and that there was only one station prior to this project. The reviewer described that the job creation numbers and air quality matters were not addressed in the presentation. The commenter remarked that the reduction in petroleum fuels seemed like it should be yielding more savings. The expert then observed that this project was 33% complete based on project goals but only started in March 2010 and ended in March 2015. The reviewer wondered what the long term realistic projections were based on the ARRA goals.

A sixth evaluator noted that this was a big project and had high expectations to displace fuel, but that the cost is significant also (almost $15 million in DOE funding). To this person, the job benefit was unclear. The commenter voiced that there is not much to use in order to compare this project against others because air quality was given very little attention in the presentation. The reviewer then brought to light that the presentation indicated that the project has displaced 239,642 gallons, which the reviewer said was quite low for the dollars invested. The evaluator contemplated what the realistic long-term projections were of this project based on ARRA goals (jobs, emissions reductions, and fuel displacement).

Question 2: What is your assessment of the approach to performing the work? To what degree are technical barriers addressed? Is the project well-designed, feasible, and integrated with other efforts?

One person noted that this project clearly makes monitoring of the project an objective in order to measure project success. This reviewer observed that vehicle deployments are straightforward with no technology challenges, but speculated the landfill gas

(LFG) to renewable natural gas (RNG) technology may provide challenges. The commenter confirmed that the time lines for permitting, approvals, and bidding all seemed appropriate.

A second reviewer commented that the project had progressed very well and addressed the barriers as evidenced by the number of stations and vehicles already in operation.

A third evaluator summarized that the project is on track for meeting milestones and the deployment strategies built into the project, and that all vehicles and stations were deployed on schedule.

A fourth commenter claimed the investigators were on target to have their vehicles and have an impressive list of fleet participation including Coke, Marriott, UPS, airport shuttles and the City of Atlanta. This person expressed that training users and public relations (PR) and media outreach plans sound promising, wished further details were provided.

A fifth expert explained that the project's approach includes the installation of a landfill natural gas to CNG refueling station. This person noted that the natural gas would otherwise likely be used for electric power generation. The reviewer questioned whether or not there was a net GHG benefit, and suggested that DOE include this in its evaluation in the future. However, the commenter asserted that this station does meet the need for CNG refueling in the area. The reviewer stated that the researchers are on target but a little behind schedule, and have a great variety of users, which will help with project sustainability and expansion. This person pointed out that the investigators plan to install an additional six stations in metro Atlanta, and planned to decrease petroleum usage by deploying 200 CNG and diesel, hybrid, and hydraulic hybrid vehicles. This evaluator also mentioned that the presenters planned to train the users and educate the community, and would like to learn more about what this plan includes because little detail was provided. The reviewer went on to say that the investigators also planned to collect data and report the success of the project. Overall, the commenter agreed that the project's approach seemed reasonable.

A sixth expert remarked that the project combined eight CNG refueling stations with some 170 CNG vehicles, HD hybrid vehicles, and electric charging stations [DOE Program Clarification: Since the Annual Merit Review, EVSEs are no longer a focus of this project.]. The reviewer stated that the project implored an aggressive outreach to spur deployment of additional CNG vehicles, as needed to make the refueling stations viable. This person noted that all of the alternative fuel/technology vehicles in the project will have been deployed by June of 2012, meeting the schedule required by the ARRA grants, despite some reported delays due to EPA certification/availability issues. The evaluator noted that more parking shuttles and more Coca Cola trucks are being deployed than had been anticipated. The reviewer added that approximately 200 vehicles were included, many, but not all, of which are high fuel use vehicles. The expert remarked that the training is to be completed by July 2012 and outreach is to be underway for completion, per project requirements, by December 2012 but will continue after that. However, this person brought to light that with the exception of the refueling station at the county landfill, the LFG-NG project does not really relate to transportation. The commenter emphasized that the county has been recovering the gas and using it to generate electricity. According to this reviewer, other than the station at the landfill, the gas may only be put into the Atlanta Gas pipeline and distribution system. The evaluator further opined that any gas extracted from the system for CNG would not be the LFG and found it difficult to identify a direct relationship between putting LFG into the system and using CNG in transportation.

Question 3: Characterize your understanding of the technical accomplishments and progress toward overall project and DOE goals.

One reviewer observed that the progress in the project has been excellent. This person supported their previous statement by saying that any vehicles and stations are in operation and data has been collected to show the amount of gallons of petroleum fuel that has been reduced.

Another commenter recalled that deployment of vehicles and training is being completed on schedule, construction of stations is only a few months behind schedule, and outreach is on track to meet schedule. A third evaluator noted that the project appears to have met, or will soon meet all technical and programmatic goals. The fourth reviewer pointed out that the project's goal to build and operate is going very well. This person also mentioned that demonstrating LFG to RNG may present technical challenges; however, the project's focus seemed to be on petroleum reduction technologies.

A different commenter acknowledged that the researchers had the 2009 Vehicle Technology DOE rules as barriers and have addressed these technical problems. According to the expert, this created delays and lost a partner but the investigators were able to regroup and put together a revised scope. This evaluator explained that the availability and location of the planned CNG stations may not be enough for the response received from public fleet demand. This person said that the presenters were slow to order the vehicles but were confident that data could be tracked for two years. The reviewer said that in general, the proposal was silent on tracking data for vehicle performance, emissions reduction, and petroleum replacement.

The seventh reviewer claimed that a problem for this grant was that vehicle technology needed to be commercially available (based on the grant restrictions) in 2009. This person stated that the technology had changed and was no longer available, which created delays and caused the project to lose some sub-recipients. The commenter suggested that DOE review this in the future to resolve their future solicitations and that DOE should stipulate using commercially ready technology at the point of implementation. The reviewer also pointed out that the availability of sufficient CNG stations continues to be a challenge for the overall success of this program. The evaluator added that with more stations, the vehicles deployed would be better received. The expert criticized that this project addresses technical barriers but more is still needed. The reviewer commented that the price of CNG and petroleum is a factor in the long term payback of this project. The person said that according to the presenter, the investment payback on the landfill gas facility would be longer because the price of CNG has dropped and there would be a smaller margin as a result. However, the commenter remarked that CNG costs are so low that it is attracting more users, which is a good thing. The evaluator highlighted that the project has had some delays in ordering the vehicles. The reviewer indicated that the researchers will continue to collect data for two years after deployment, regardless. The commenter reported that all vehicles are expected to be deployed by June 2012, which DOE will need to verify.

Question 4: What is your assessment of the level of collaboration and coordination with other institutions?

One expert voiced that the project's partners seem to be working together well, but that there is no university and lab participation, which may not be needed. A second reviewer explained that the collaborations and partners in this project have contributed to the early success of the project. A third commenter reinforced that collaboration and communication appeared to be strong between the project lead and the associated public and private partners. This person specified that the outreach and education plans are well-developed and efforts thus far have resulted in an increased demand for the technologies being deployed under the project. A fourth evaluator mentioned that the list of collaborators is reasonable and adequate, while apparently not comprehensive (as regards technology suppliers for LFG project). Multiple reviewers acknowledged that the project has outstanding partners that include the DeKalb County's Landfill Gas facility, Coke, Marriott, UPS, and airport shuttles. Although, the same experts claimed that more discussion of long term community outreach, media, and education would be helpful.

Question 5: Has the project effectively planned its future work in a logical manner by incorporating appropriate decision points, considering barriers to the realization of the proposed technology, and, when sensible, mitigating risk by providing alternate development pathways?

One commenter noted that a goal was to monitor the project to measure success, and emphasized that the project appears to be progressing in a reasonable manner and pace. A second reviewer summarized that given the current progress and planned future work, the project appeared to be on track to be successfully completed.

The third expert stated that outreach is to be completed per ARRA grant milestones by December 2012 but is to continue aggressively so as to generate enough users to make CNG stations viable. This person added that reporting is to continue through 2014 as required.

A fourth evaluator reinforced that future education and outreach plans have been developed for ongoing efforts, as is the plan for data collection on deployed vehicles. This person observed that due to the success of the project, there is additional interest from local partners to deploy similar vehicles and take advantage of the new refueling infrastructure.

The fifth commenter noted that the researchers are completing deployment and making sure everything is operational. This person questioned what the investigators are doing to continue to do outreach on this project, and what the return is on investment based on the ARRA goals. The reviewer pointed out that the county owns the facility, and that the payback on the vehicles from the

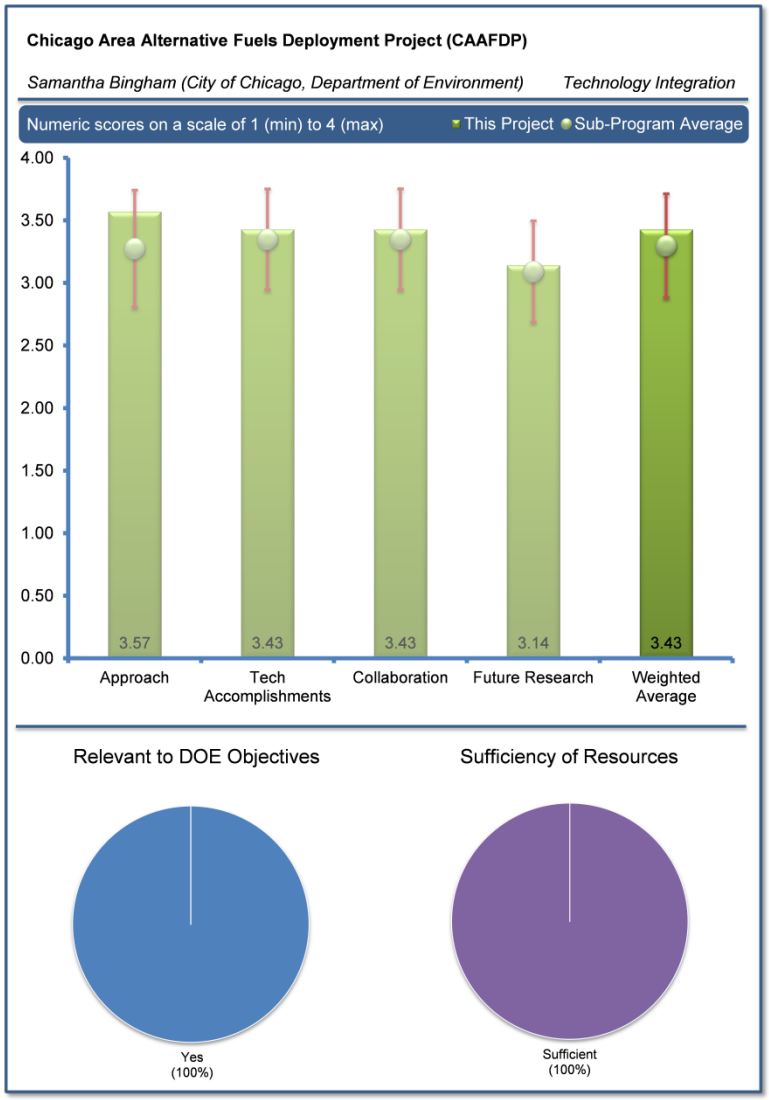
diesel fuel saves $5 million per year. The expert recounted that the presenters planned to put out 50-100 electric vehicle (EV) charging stations, and hoped to put an RFP out on that shortly. The evaluator remarked that it would be helpful to have more information on this and about how the researchers are promoting the technology. The person also questioned this strategy [DOE Program Clarification: Since the Annual Merit Review, EVSEs are no longer a focus of this project.].

The sixth reviewer observed that job creation and data tracking strategies were not shared in the presentation and should be explained. This reviewer remarked that training users and PR and media outreach plans sound promising. Furthermore, continued the same reviewer, it would be helpful if further details were provided.

Question 6: How sufficient are the resources for the project to achieve the stated milestones in a timely fashion?

Most reviewers felt the funds were sufficient for this project, but one felt that it was excessive. One expert mentioned that the resources appeared appropriate and that the cost share from non-DOE sources was excellent. A second evaluator commented that the resources were apparently sufficient as the milestones appeared to be met. A third commenter agreed that the researchers more than met the 50% cost share required by the grant guidelines. A fourth reviewer concluded that the total budget grant match appeared to exceed the 50% threshold and was reported as $24,682,387, while the DOE share was $14,983,167.

Chicago Area Alternative Fuels Deployment Project (CAAFDP): Samantha Bingham (City of Chicago, Department of Environment) – arravt061



Reviewer Sample Size

This project was reviewed by seven reviewers.

Question 1: Does this project support the overall DOE objectives? Why or why not?

All reviewers were in agreement that this project should be allowed to proceed. One reviewer stated that this project would greatly increase the amount of petroleum displacement in the region. This person mentioned that the researchers are already seeing snowball effects, with additional alternative fuel vehicles being deployed by other companies that have seen savings being realized by project participants.

A second expert noted that this project is obviously aimed at deploying alternative fuel vehicles and infrastructure, which would support DOE's objective of petroleum displacement.

A third commenter asserted that the project highly supports the overall DOE objectives. The reviewer noted that the project anticipates three million gallons of displacement per year, and is assisted by a variety of partners. This person recalled that a variety of fuels, vehicle types, and partners are included so the span of influence of this project is very wide. The reviewer went on to say that there has already been the snowball effect and more vehicles have been ordered because the ARRA projects started the snowball rolling. The commenter mentioned that upgraded pressure at CNG stations means there is room for future growth and it is more than a one off project. The person then claimed that the project is further supported by the Chicago Climate Action plan which calls for a 10% increase in alternative fuel use in Chicago by 2020. The reviewer remarked that the project contains a mix of private and public fleets, and that fueling is highly desirable for DOE projects.

The fourth reviewer explained that the project is relevant to petroleum displacement goals and noted that the three million gallons per year will nearly reach the goals for alternative fuel use set forth in the local Chicago Climate Action Plan.

The fifth expert explained that the project hit both sides of displacement by installing stations and adopting vehicles, and its goal is a huge amount of displaced GGEs. The sixth person stated that the project would reduce criteria pollutants by 400 tons per year, GHGs by 7,500 tons per year, and create 77 jobs. The seventh reviewer described that the project supported petroleum displacement by increasing the deployment of alternative and hybrid vehicles, and by developing fueling and charging infrastructure in the six county region surrounding the City of Chicago.

Question 2: What is your assessment of the approach to performing the work? To what degree are technical barriers addressed? Is the project well-designed, feasible, and integrated with other efforts?

One reviewer expressed that the project anticipated potential permitting, construction, and equipment availability issues. This person remarked that the researchers have a good mix of public and private sector partners; not an overwhelming number of partners. The person pointed out that the researchers had a sensible strategy of shared refueling by municipal partners, and private sector participants using publicly accessible refueling infrastructure. The commenter felt that upgrading existing local government CNG stations to 3,600 psi made good use of existing infrastructure that was underutilized. The expert claimed that focus on medium and heavy duty vehicles would maximize petroleum displacement. The same reviewer noted that the addition of E85 availability at city facilities and locking out E85 vehicles from gasoline usage ensures ongoing alternative fuel usage by those vehicles, and will increase E85 usage from 500,000 gallons per year (gpy) to 1.2 million gpy.

A second expert observed that the researchers had a great strategy in making big impacts in both vehicles and infrastructure. This person commented that the targeting areas deemed essential [e.g., the low-hanging fruit for CNG, and direct current (DC) fast chargers for EVs] really drive the technology and address barriers rather than just trying to get money out the door. The reviewer also felt that the regional cooperation was great to see as well, and helped to look at the city as part of a whole system. The expert liked that the investigators aimed at areas that are not incentivized by other programs but still can be potential game-changers commercially. Additionally, the same reviewer noted that the project is run by Chicago Clean Cities, which is run out of the City's Department of Transportation. This person stated that the city of Chicago was the only municipality to receive funding to do this, that the goal was for a 10% increase in Chicago use of alternative fuel, and that this project alone almost gets them there. The reviewer indicated that it was not just a city-aimed project; the presenters see all of their initiatives as regional because the city is part of a larger region. The expert added that the researchers wanted to grow infrastructure and increase adoption because there was only one CNG station in the region before this (at GTI). This person pointed out that the previous efforts in municipalities had died off when original equipment manufacturers (OEMs) did not offer vehicles, so the project was targeted at shared use to make the finances work so that there would be enough demand beyond the host fleet. The reviewer mentioned that the vehicles were CNG and various hybrids, but that the project built a number of EVSE (including 73 DC fast charging). The expert stated that having the big waste haulers (WM, Groot) converting to CNG has really persuaded the smaller ones to convert to CNG, and with the infrastructure in place, diesel would not be bought anymore. The commenter mentioned that the presenters saw the DC fast chargers as being essential because they allowed one-third of the population that lived in multi-unit dwelling to access the EV market. Finally, this person noted that the researchers are looking at ways to dis-incentivize usage of the DC chargers at peak demand in rush hour/early evening.

A third reviewer reinforced that the city has worked with a number of expert contractors to help overcome permitting and construction delays. The expert remarked that the project has helped change city policies to be more favorable to AFVs, and that the investigators have worked with fleets of all shapes and sizes, from taxis to garbage trucks.

A fourth commenter confirmed that the strategy of the project was to combine the Chicago Climate Action Plan with federal support funds, and that it supported the Green Taxi Program, new electric charging stations, and public/private natural gas fueling stations for both light and heavy duty vehicles.

A fifth commenter pointed out that the project included the deployment of almost 400 vehicles across six counties in Chicago, with more than 300 alternative fuel refueling stations (including charging stations). The expert recounted that the researchers are seeking to develop more public/shared infrastructure to keep access open even if the host fleet dropped out of the alternative fuel market. This person criticized that there is a somewhat limited reach of technology (only natural gas and hybrids), which the reviewer speculated could be a result of the participation of GTI.

A sixth commenter stated that project barriers include permitting issues, construction delays, equipment availability and all have been mitigated in a timely manner that keeps the project on track. This person affirmed that the project is well integrated with Chicago's Climate Action Plan, and that a mix of taxi fleets will provide high fuel displacement. According to the reviewer, the fact that the investigators have been successful in identifying and negotiating shared fueling among municipal partners is an excellent accomplishment.

A final reviewer mentioned that the presentation did not provide much information on project strategy, and felt it was difficult to assess the quality of the strategy because the researchers spent most of their time on the introductory slide. This person remarked that the project appeared to have taken the shotgun approach of many others whereby funds are made available for all alternative fuels and technologies based on evaluation factors but not designed to have a comprehensive impact on significant transformation of the system.

Question 3: Characterize your understanding of the technical accomplishments and progress toward overall project and DOE goals.

One reviewer pointed out that the project targeted several areas that will result in large petroleum displacement (taxis, waste haulers, and other medium duty and heavy duty vehicles), which are all high visibility, high fuel use partners. This person commended the researchers on their progress toward vehicle and station deployment. The expert mentioned that the development of nearly 200 EV charging stations and partnership with two-car sharing companies will make possible the introduction of EVs to the general public at a reasonable cost. The commenter said that E85 has been introduced to all 11 city-operated fueling stations and E85 vehicles are locked out from using gasoline. The reviewer continued to say that through this project, the presenters have shown that alternative fuels can be economically feasible, resulting in an additional WM station near the airport and introduction of 50 AT&T CNG vehicles that were not part of the project.

A second reviewer expressed that excellent progress has been made to date, and that a high number of vehicles and refueling/charging stations have been deployed. This person highlighted that despite the variety of applications and fuels and vocation types, the researchers have overcome barriers and the ARRA-funded portion of the project has led to additional deployments not funded by ARRA.

A third commenter felt the presenters did a great job addressing the problems that mattered and created barriers, rather than just buying vehicles indiscriminately. The reviewer voiced that there is still further work to go, but that progress is great given the barriers being addressed. Additionally, the expert noted that the investigators upgraded city CNG stations from 3,000 psi to 3,600 and also built E85 infrastructure at all 11 city stations so that it guaranteed E85 use by flex fuel vehicles. This person stated that all police vehicles are flex fuel and now use E85, elaborating that usage went from 500,000 gallons per year to 1.2 million gallons and growing. The reviewer pointed out that a large amount of the funding allowed municipalities that already had CNG stations to make them available to the public. The commenter remarked that the researchers were unsure what sort of reception would be received from taxi fleets because most of them were individual or small owners and cannot afford to convert a ton of vehicles without some risk. However, the reviewer said that many taxi fleets are now going out on the road with hybrids or natural gas vehicles (NGVs) without grant funding now. The expert mentioned that the researchers did an RFP with $1 million of Clean Cities and $1 million of city money to install and maintain public EVSE. The commenter went on to say that level two stations (207 in total) are mostly built out and are free, and the DC fast charging (73 in total) are getting there and can be accessed by buying a card. The expert then noted that the EVSE project was essential because none of the OEMs were initially planning on using Chicago as a launch market for EVs but it brought them in, and that the project also allowed car share fleets to invest in EVs and offer that as an option. The reviewer pointed out that the investigators hit an initial barrier in installing the DC chargers because there was potential of being a $10,000 fee from the utility for each station because of the voltage upgrade. However, the commenter clarified that the utility has been a big partner in the project and decided the stations could be labeled as new customers, thus the utility could cover the fee. The person added that the station essentially is a new customer even though it is installed under an existing meter and customer. The reviewer mentioned that the engine in the cement mixers is the Cummins 8.9L but that there have not been any issues with under-power (maybe because of Chicago's landscape). The expert remarked that the presenters have 14 mixers as part of the grant and are looking to get more.

A fourth person said that there are more than 350 vehicles and 223 stations deployed to date (26 being DC fast charging), and that 1.6 million gallons of petroleum have already been displaced. The reviewer indicated that several waste haulers (WM and Groot) will be purchasing only CNG trucks in the future because of the infrastructure installed as part of this project. The commenter described that some alternative fuel taxis are being purchased outside of this project now, as a result of project activities. The expert also confirmed that several other fleets are considering alternative fuel programs on their own as a result of the project

activities, which the reviewer attributes to good leveraging of DOE funding. The commenter was also amazed how the electric vehicle charging brought the Leaf to Chicago a year early.

A fifth reviewer commented that the project advanced from 25% completion last year to 77% complete this year, attracted a nearly two- to-one match in private to federal funds, displaced three million gallons of gasoline annually, and influenced city policy changes in respect to green taxis.

The sixth reviewer acknowledged that given the information provided both electronically and verbally, it is hard to gauge progress too well. This person recalled that the project appeared to have made some good progress on vehicles and infrastructure in certain areas, but questions remained in other areas. The commenter felt that in particular, the deployment of electric vehicle charging stations was not well explained and appeared to be seriously ambitious given the resources devoted to that piece of the project. Additionally, this person reported that there was brief mention of marketing but not enough information provided to assess this piece's effectiveness.

The seventh reviewer reported that the project is about 80% complete, with over 350 vehicles deployed and over 200 Level 2 and 70 Level 3 EVSE deployed. This reviewer acknowledged that the project team had overcome some issues with the utility on these installations. The same reviewer noted that the project team has taken cost-effective approaches to infrastructure deployment (e.g., upgrading a CNG station to 3600 psi and including E85 at city gas stations, which has doubled the city's fleet use of E85). Furthermore, continued this reviewer, the project team has also worked with car sharing and taxi fleets, which facilitates introducing the public to AFVs.

Question 4: What is your assessment of the level of collaboration and coordination with other institutions?

The first reviewer noted good partnerships with GTI, 350 Green, and City of Chicago Fleet & Facilities Management. This reviewer added that the city has released a RFP for a green airport fueling station as a result of the project's successful taxi component. The second reviewer observed excellent coordination across all technologies and a good partnership with GTI.

The third commenter reported a wide variety of fleets and regional participation. Further, this reviewer elaborated that combining the city and GTI is a great idea, as is incorporating outside efforts interested in installing EVSE. The reviewer described that getting the EV-makers to use Chicago as an early-release market is a great success. Additionally, the commenter noted that the investigators are working closely with Gas Technology Institute (Ted Barnes is co-presenting it), who developed the application for the project. The expert observed that Chicago CC identified the fleets, other government entities worked on permitting and deployment, and that private companies worked on technical issues and training. This person mentioned that GTI manages a large amount of the sub-grants. According to the commenter, the presenters have also aimed at private industry that can use public infrastructure to fuel, mainly NGV. The expert specified that some of these (for example, a small pizza fleet) have received a great deal of publicity for doing NGV conversion. The reviewer pointed out many snowball effects: others investing in alternative fuel vehicles outside of grant efforts; the EV-makers coming to the market; and AT&T jumping on a CNG station whenever it is built.

The fourth expert noted that the project had the partnership between the City of Chicago and GTI for project leadership. This person said that there were a total of 16 partners, which were a mix of local government and private fleets. The commenter also recounted that there was a separate initiative with 350 Green for EV infrastructure, and that a major national fleet (WM) was included.

The fifth reviewer explained that the city has worked with GTI, the Clean Cities Coalition, and other city and state entities. Additionally, this reviewer reported that the researchers have worked with over a dozen other partners of all types, many of whom had not worked with AFVs before. This reviewer also indicated that the project team included the utilities in its work as well.

The sixth expert stated that the project has 13 partners, and promoted the Green Taxi Program. This person brought to light that the program enlisted small independent taxi operators, and currently consists of 55 independent taxi companies that operate 70 NGV(s) and 50 hybrids.

The seventh commenter stated that coordination seems to be happening between the project manager and sub-awardees, but questioned the level of collaboration beyond that. In addition, this person affirmed that the brief mention of continuing to market current efforts is not clear about exactly what is going to happen to bring in additional partners and participants. The reviewer suggested efforts should be made to gather and share lessons learned through the national Clean Cities network.

Question 5: Has the project effectively planned its future work in a logical manner by incorporating appropriate decision points, considering barriers to the realization of the proposed technology, and, when sensible, mitigating risk by providing alternate development pathways?

One expert commented that the project's future activities' focus on completing deployment of vehicles and infrastructure, collecting data, and continuing marketing efforts. The second reviewer reported that future activities consist of continuing current efforts, data reporting, and marketing.

The third reviewer remarked that the majority of the presenter's hurdles have been overcome, and that future work is well-planned and can be accomplished successfully. The reviewer elaborated that future plans incorporate the right decision points and have the potential to grow the project even further.

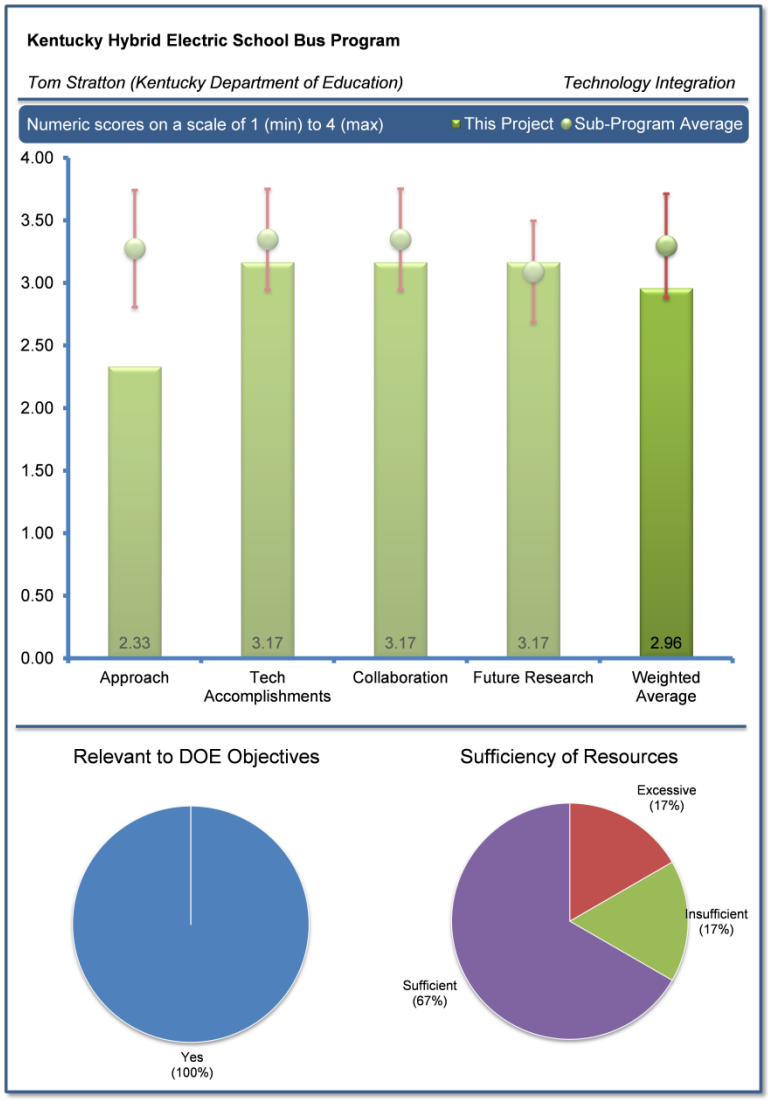
The fourth expert noted that the data from the EVSE will be very valuable and is a great way to focus future efforts. This person would be interested to see the success with smaller private fleets as well. Additionally, the commenter observed that there was a large amount of potential in private fleets that have undergone small conversions and are looking at doing their larger fleets soon (airport shuttle, handicapped mobility vehicles). Furthermore, the reviewer confirmed that the researcher would have more information available on EV charging rates, plans, and data once the EVSE gets completely built out.

The fifth reviewer reinforced that the future work was clearly laid out and should complete the project. The sixth expert recalls that the project will wrap up deployments later in 2012 and that training, reporting, and marketing would continue. This person said that the project helped push other waste haulers toward CNG and many of the fleets have bought more than expected. It has also gotten the attention of automakers to bring their products to Chicago for sale. The seventh reviewer mentioned that with little detail provided in the presentation and little time to discuss this topic in the review meeting, it is hard to rate this piece with much confidence.

Question 6: How sufficient are the resources for the project to achieve the stated milestones in a timely fashion?

All of the reviewers agree that the resources for this project are sufficient. A couple reviewers summarized that the project is very well planned and that sufficient resources remain to successfully complete the work in a timely fashion. One commenter felt that the project should yield a good return on dollars invested, in terms of petroleum displacement. Another person noted that the project had $15 million in DOE funding and $24.6 million from elsewhere.

Kentucky Hybrid Electric School Bus Program: Tom Stratton (Kentucky Department of Education) – arravt062



Reviewer Sample Size

This project was reviewed by six reviewers.

Question 1: Does this project support the overall DOE objectives? Why or why not?

The first reviewer asserted that this project clearly demonstrated petroleum displacement. The second reviewer noted that the project was 75% through for deploying vehicles and that the project would be finished in December 2012. This reviewer added that hybrid electric buses were a targeted area for DOE.

The third reviewer stated that the project definitely supported the objective of oil displacement as shown by early data of a 33% fuel economy increase using the hybrid school bus over the conventional diesel bus.

The fourth reviewer stated that it would reduce petroleum fuel use, but only marginally, based on the reported 44,000 gallons saved between January 2011 and February 2012, and the projected 140,000 gallons saved over the four year life span of the project. This reviewer also indicated that to date, the average fuel economy only increased from 6.3 to 8.4 miles per gallon (mpg) i.e., 2 mpg and that school buses were not heavy fuel users compared to other heavy-duty vehicles, nor were most of them high-mileage vehicles.

Another reviewer indicated that although the project is not displacing large amounts of petroleum, it is doing so in a good application and demonstrating good results.

The sixth reviewer opined that the driver, technical and first responder training were very good and that the future curriculum being developed would have a sustaining impact. The same reviewer indicated that this project was the largest fleet of hybrid electric buses in the country. While these hybrid buses increased fuel economy by approximately 33%, the average bus was getting 8.4 mpg with a baseline of 6.31 miles per gallon. The project goals were to displace 44,000 gallons per year and emissions reductions were not accurately measurable at this time. From January 2011 through February 2012, 494 tons of CO_2 emissions were saved, approximately 44,000 gallons per year were displaced, and emissions were reduced. In the future, this reviewer would like to see more detail regarding data collection methods. The reviewer noted that while this project was achieving its stated goals, it was questionable why so much federal money was invested in this project to begin with as it did not ever seem like it was going to be a project that would either reduce petroleum usage, emissions and/or create jobs. The reviewer continued to add that this project seemed more like a R&D project than deploying commercially available technology. The reviewer noted in the first instance, that the data collection technology appeared to be very expensive and so were the batteries for the buses [DOE Program Clarification: There is no specific, unique, data tracking equipment associated with this project.]. The reviewer pointed out that apparently the batteries in the Kentucky buses cost $20,000 each and the presenter told the reviewers that the price to replace these batteries was now $8,000 each. The reviewer also commented that the data tracking of drivers routes and bus performance was

helpful but again that this data seemed like it would help the manufacturers more than it would the grant recipients, as petroleum and emissions reductions and job creation goals were very modest to begin with. It also seemed like the data collection technology was not consistent throughout the fleet. While the reviewer applauded Kentucky for trying to use hybrid buses, the reviewer said that it did not appear that the return on investment would ever be realized going forward.

Question 2: What is your assessment of the approach to performing the work? To what degree are technical barriers addressed? Is the project well-designed, feasible, and integrated with other efforts?

The first reviewer indicated that the barriers had been met since the project was well on its way towards a successful completion.

Another reviewer noted that the project partners had a good strategy for selecting the most effective routes and drivers for the hybrid busses and noted that the selection was based on a thorough evaluation of the vehicle data.

The third reviewer pointed out that the use of Thomas Built and IC as manufacturers was an excellent strategy that would help ensure a successful project, versus using a small start-up conversion company with insufficient resources. The reviewer added that the technical barriers seemed to be more human in terms of acceptance and data collection.

The fourth reviewer criticized that the deployment of vehicles to date had been done according to whatever school district requested funding, and was not related to fuel use, mileage or cost effectiveness. This reviewer also mentioned that some buses reported only getting 6.64 mpg, which was barely greater than the reported average fuel economy of Kentucky conventional school buses.

The fifth reviewer agreed that the project succeeded in accomplishing its goals, but still questioned why DOE funded the project. The reviewer stated that the project did very little to reduce petroleum for the dollar invested. The reviewer added that the project may have been good at getting press coverage for Clean Cities but did little to achieve the overall goals. The reviewer continued to state that this seemed to be a strategy for reducing hybrid technology costs rather than using commercially ready technology. The reviewer also pointed out that there were some inconsistencies in the number of buses ordered. The reviewer explained that the project had 164 buses ordered as of September 2011. The reviewer acknowledged that the project did do technician and first responder training and commended the project's good job on this effort. The project did follow-up with driver training to increase petroleum reduction/performance, added the reviewer, but again that it seemed like R&D.

The sixth reviewer stated that while the project was very creative and an ambitious use of grant funds, there appeared to be too much dependence on one vehicle. Two vehicles were part of the effort but project leads determined early on that one of the vehicle's technologies was not suitable for the project [DOE Program Clarification: ThomasBuilt and IC Bus (International) are the manufacturers of the buses participating in this project.]. The presenter told the reviewers that Kentucky replaces buses every 14 years and sells them to another state after 14 years. The reviewer commented that it seemed like this project just augmented a State procurement program that was already in place and that it was debatable if petroleum displacement, emissions reduction, and job creation goals were ever considered when DOE approved the project. One of the reviewers stated that the only negative would be the lack of cellular communications for data downloading from the buses.

Question 3: Characterize your understanding of the technical accomplishments and progress toward overall project and DOE goals.

One reviewer was impressed with the progress of getting vehicles on the road and the collection and reporting of the data of the fuel saved in this project. In addition, the reviewer commented that the training and information provided to the public has helped to meet the objectives of the project.

Another reviewer agreed that the improvement to the fuel economy was 33% which was right on target to the projections, and that it was good that the project was achieving its goals. The reviewer did question why so much funding was invested for so little return (44,000 total gallons of diesel fuel saved from January 2011 - February 2012) and hoped that this played out over the course of the overall project. The reviewer went on to question how the 448 kg/494 tons of CO_2 emissions saved compared. The reviewer added that data was being used to compare schools and technology and to make comparisons. More questions needed to be asked

to see more information on what this data was showing, as data was not being collected the same way per vehicle and the reviewer wanted to know why. The reviewer also noted that the reduction in the price of the battery technology went from $22,000 to $8,000 and that this was good progress as a result of this project.

The third reviewer reiterated the previous commenter by saying that the 33% increase for average hybrid mpg was excellent and that it was excellent that the project was quantifying the mpg benefits. The reviewer also noted that deployment seemed to be on track.

The fourth reviewer said the project was well on its way to completion as the project partners expected to deploy the remainder of the buses during the upcoming RFP (#5).

The fifth reviewer judged the project most favorably by seeing it as a learning experience—the first project of this nature/scale for school buses on a state-wide basis - largely making the mistakes for others to learn from. Project sponsors had been generating and evaluating good data and apparently learning from mistakes - noting wide differences in results between different school districts routes, and etc., as well as differences in quality of data collection modules between bus manufacturers. The reviewer noted that this should enable some adjustments to remedy low effectiveness/cost effectiveness of some deployments. Unfortunately, the reviewer stated, the project deployment was already 75% completed, and such adjustments may not be made effective before the end of project deployment. The reviewer went on to add that the high vehicle cost, low cost-effectiveness may limit or prevent additional deployments beyond the project.

The final reviewer opined that the driver, technical, and first responder training were very good, and that the future curriculum being developed would have a sustaining impact. This reviewer summarized that the project was the largest fleet of hybrid electric buses in the country. While these hybrid buses increased fuel economy approximately 33%, the average bus was getting 8.4 miles per gallon with baseline of 6.31 miles per gallon. The project goals were to displace 44,000 gallons per year and emissions reductions were not accurately measurable at this time. From January 2011 to February 2012, 494 tons of CO_2 emissions were saved, approximately 44,000 gallons per year were displaced, and emissions were reduced. In the future, this reviewer would like to see more detail regarding data collection methods. The commenter added that the data tracking of driver's routes and bus performance was helpful but again, that this data seemed like it would help the manufacturers more than it would the grant recipients as petroleum and emissions reductions and job creation goals were very modest to begin with. It also seemed like the data collection technology was not consistent throughout the fleet. While the reviewer applauded Kentucky for trying to use hybrid buses it did not appear that the return on investment would ever be realized going forward. The reviewer concluded that if the project were going to the effort and expense to collect data it appeared that it was being shared with DOE and partners monthly so that the project could use to use this data.

Question 4: What is your assessment of the level of collaboration and coordination with other institutions?

Reviewers had mixed responses to this question. The first reviewer felt that the inclusion of the first responder training was an excellent part of the project, and that using bus original equipment manufacturers (OEM) and component OEMs significantly increased the likelihood of the project's success.

Another reviewer indicated that the project partners were working well together and that there was a demonstrated effective communication between all partners and the schools/communities that were receiving the vehicles.

The third reviewer felt that the collaboration with all of the school districts even though some did not use hybrid buses would help give information about the overall success of the project.

The fourth reviewer commented that the list of collaborators included those required for the project but most were departments of the Kentucky State government involved administratively, the school district potential beneficiaries, and the equipment providers. This reviewer thought that the ineffective deployment pattern could be seen as a failure of adequate coordination with the school districts, the State agency administering/selecting recipients, or the lack of a planning consultant.

The fifth reviewer reiterated that the project had partners through the supply chain including manufacturers, distributors, fleet managers, county executives, educators (NEED), and etc., and that 300 people were trained under the program.

The final reviewer claimed that coordination seemed to be good but it should be noted that there were not that many partners in the project. The partners seemed to collaborate but really only included mainly one Clean Cities group, the Kentucky State Department of Education, four other state agencies, and less than a handful of U.S. manufacturers. This reviewer also claimed that it was not readily clear from the presentations supplied from the Kentucky Clean Fuels Coalition and Kentucky Department of Education reviewers how many total buses were going to be a part of this project. In one of the presentations it stated 164 buses had been purchased and that the project was75% complete but there were only financial data for the 164 buses purchased which equaled $9,966,570; the total project budget was over $28 million. The project overview stated 174 Kentucky school districts are part of the project but based on the information supplied there are discrepancies between what percentages of the project as complete and how many total buses had been deployed. One presentation said a total of 213 buses were going to be purchased and that the project was 47% complete with only 101 buses deployed within 53 school districts. The reviewer continued that it was reported in the presentation that there had been many media stories about this project.

Question 5: Has the project effectively planned its future work in a logical manner by incorporating appropriate decision points, considering barriers to the realization of the proposed technology, and, when sensible, mitigating risk by providing alternate development pathways?

One reviewer commented that the researchers presented a good plan to continue to collect data from bus controller area network (CAN) per the American Reinvestment and Recovery Act of 2009 (ARRA) requirements. The reviewer added that the production of drivers' experience would help future adaption. Another reviewer added that the future activities of collecting additional data and holding public relations activities would help move the project to successful completion. The third reviewer agreed that the development of future curricula as a result of this project as well as holding public relations activities would have a sustaining impact.

The fourth reviewer noted that future data would help stakeholders understand real world applications, and added that if the project was going to the effort to collect data under the project, that the results received would at least be communicated to industry partners and manufacturers. The reviewer also added that it would be helpful to know how much displacement each vehicle was getting and how that looked over the course of the project.

The fifth different reviewer repeated that the project partners had developed a plan to continue to collect data and provide education and outreach on the projects. More detailed comments were received from one reviewer who pointed out that the project sponsors had been quite candid about the problems of effectiveness and are learning and doing what the researchers could to remedy them - noting that mileage of school buses within the state ranged from 600 to 5,000 miles per month. While the latter figure seemed higher than accurate (at least excluding some possible few very exceptional instances), the substantial differences may provide some potential to remedy the problems, though the differences were probably greatest between different school districts. Better training may also help remedy the problems and the project sponsors were engaged in providing that. The researchers were also talking to the equipment providers about lowering costs and improving performance.

The sixth reviewer noted that it was not readily clear from the two presentations supplied from Kentucky Clean Fuels Coalition and Kentucky Department of Education how many total buses were going to be a part of this project. In one of the presentations it stated that 164 buses had been purchased and that the project was 75% complete, but there was only financial data for the 164 buses purchased which equaled $9,966,570.00. The total project budget was over $28 million. The reviewer went on to say that in this presentation, the project overview stated 174 Kentucky school districts were part of the project but based on the information supplied, there were discrepancies between what percentage of the project was complete and how many total buses had been deployed. One presentation said a total of 213 buses were going to be purchased and that the project was 47% complete with only 101 buses deployed within 53 school districts. The data tracking of driver's routes and bus performance was helpful but again this data seemed like it would help the manufacturers more than it would the grant recipients as petroleum and emissions reductions and job creation goals were very modest to begin with. It also seemed like the data collection technology was not consistent throughout the fleet. While the reviewer applauded Kentucky for trying to use hybrid buses, it did not appear that the return on

investment would ever be realized going forward. The final reviewer continued to suggest that if the researchers were going to the effort and expense to collect data it appeared that it was being shared with DOE and partners monthly so that the project could use to use this data with other bus fleet customers and industry. The final reviewer again commented that the driver, technical and first responder training were very good and that the future curriculum being developed would have sustaining impact.

Question 6: How sufficient are the resources for the project to achieve the stated milestones in a timely fashion?

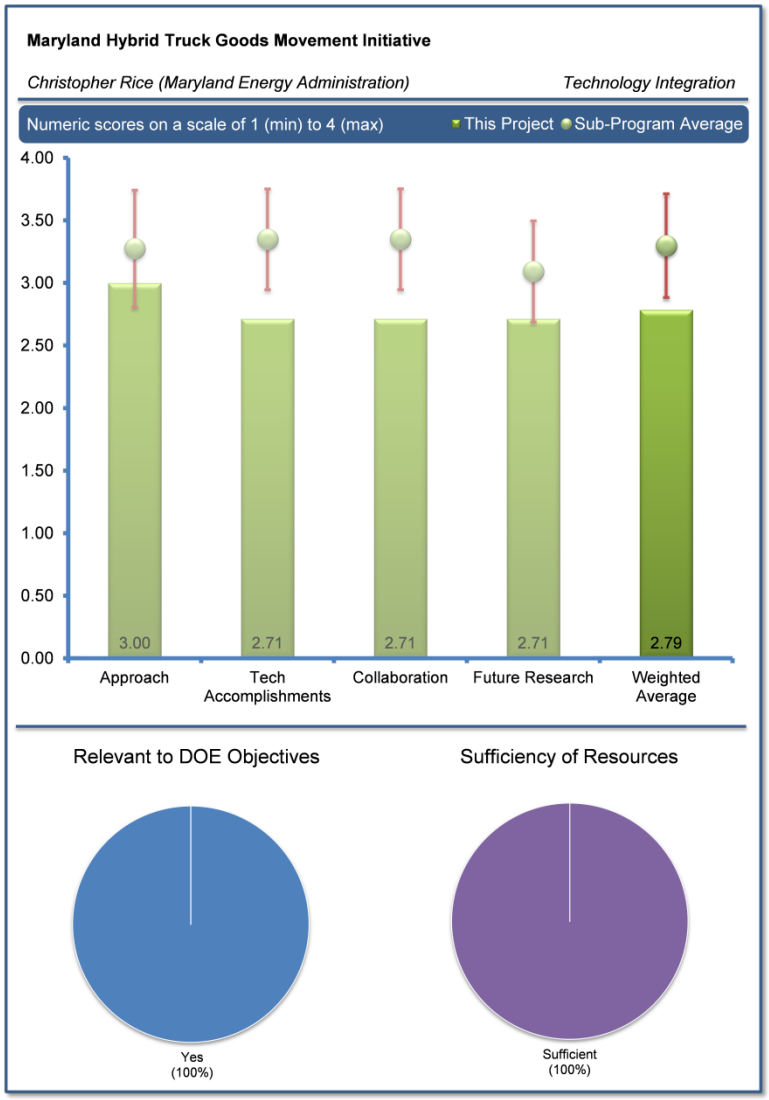
Four out of six reviewers felt that the resources were sufficient for the project. One reviewer commented that the resources appeared to be sufficient. Another reviewer remarked that resources appear to be at the proper level and observed good cost sharing. The third reviewer asserted that funds for this project are sufficient.

The fourth reviewer would have liked to see the State make some investment in the hybrid technologies rather than have the whole burden fall to the DOE. The reviewer went on to questions where the investment was from the state as it looked like the state was taking credit for vehicles that would have been bought by the State anyway.

The fifth reviewer thought the resources were excessive, stating that the cost per fuel volume reduced was high and that if fewer funds had been provided that the project might have been more focused on the districts/routes that would be taking advantage of the technology effectively- high mileage routes with substantial per mile savings, using training to maximize effectiveness, and etc.

The last reviewer noted insufficient resources based on a lack of information to make an informed response. The reviewer explained that it was not readily clear from the two presentations supplied from Kentucky Clean Fuels Coalition (KCFC) and the Kentucky Department of Education how many total buses were going to be a part of this project and how many had been deployed. In one of the presentations, it stated that 164 buses had been purchased and that the project was 75% complete but there was only financial data for the 164 buses purchased which equaled $9,966,570.00. The total project budget was over $28 million. In this presentation KCFC, the project overview stated 174 Kentucky school districts were part of the project but based on the information supplied there were discrepancies between what percentages of the project was complete and how many total buses had been deployed. One presentation said a total of 213 buses were going to be purchased and that the project was 47% complete with only 101 buses deployed within 53 school districts.

Maryland Hybrid Truck Goods Movement Initiative: Christopher Rice (Maryland Energy Administration) – arravt063



Reviewer Sample Size

This project was reviewed by seven reviewers.

Question 1: Does this project support the overall DOE objectives? Why or why not?

The first reviewer stated that the use of heavy-duty hybrid trucks, with proper driver training should increase petroleum displacement consistent with DOE goals. The second reviewer indicated that petroleum displacement was achieved by deploying a fleet of electric hybrid and hydraulic vehicles. The third reviewer stated that the project was obviously aimed at deploying alternative fuel vehicles, which would support DOE's objective of petroleum displacement. The fourth reviewer pointed out that heavy duty trucks were the highest-consuming segment of the vehicle fleet and successful hybrids would lower their consumption and displace petroleum.

The fifth reviewer stated that the project met DOE and ARRA program goals of petroleum reduction through deployment of advanced technologies as well as maintained focus on jobs per ARRA goals. This reviewer also claimed that developing these technologies could potentially reduce the cost of hybrid trucks to enable a better business case for fleet purchases, further expanding petroleum reduction potential (difficult to quantify).

The final reviewer stated that the project would displace over 130,000 gallons of petroleum per year, reduce greenhouse gases (GHG) emissions by over 600,000 pounds (lbs.) per year, and create 68 jobs. The final reviewer included that there would be 143 heavy duty hybrid diesel vehicles to replace existing vehicles, and that the savings seen were clear but cumulatively were not highly significant.

Question 2: What is your assessment of the approach to performing the work? To what degree are technical barriers addressed? Is the project well-designed, feasible, and integrated with other efforts?

One reviewer identified that the project involved a reasonable number of partners and vehicles, the supply chain issues involved with delayed deployment were correctly anticipated, and the project vehicles varied in size, duty cycle and freight types which should provide a good range of data for analysis.

Another reviewer indicated liking the focused strategy and that its focus was on a segment of the market that consumed huge amounts of fuel and was ripe for technological innovation. This reviewer proposed spreading the project out around the country as another creative idea.

The third reviewer commented that the deployment of one type of vehicle (hybrid trucks) with a relatively small number of partners was beneficial to the focus of work. This reviewer added that the project was a multi-state project, but that there were no clear details on how many vehicles went to which states.

The fourth reviewer felt that the despite the number of challenges with the supply chain and technologies, that the PI had worked with the sub-recipients and OEMs to try to address the problems and improve the products to get them fully operational and deployed. The strategy was reiterated by the final reviewer who stated that the strategy was to introduce in the Maryland region 143 heavy duty hybrid and hydraulic trucks in order to show feasibility for this emerging truck technology. The barrier was associated with expected start-up problems on minimally tested technologies.

The fifth reviewer noted that the project: targeted HD vehicles only (143) with hybrid technology; saw some differences in usage because of the types of freight being hauled/duty cycle; and had seen some technical issues with the hybrids in the first part of deployment. The project was having Freightliner work with the fleets to overcome the technical issues, as they could actually see a negative marginal mpg with some of the vehicles due to driver usage. The project needed to work more to educate the drivers on how to drive the vehicles properly, but the project expected that the hydraulic hybrids would take the driver out of the equation- if the efficiency gains were not as expected, that it would be a mechanical issue and not driver related.

The sixth reviewer felt that it was hard to gauge the strategy of the project. The reviewer stated that it appeared to be mostly a pass-through of grant funds to private fleets to buy hybrid trucks to be deployed wherever. This was not necessarily all bad, but it was not much of a strategy other than to benefit the participating fleets. The reviewer noted that the presenter did not develop the idea, but was approached by a third-party to submit the proposal for others.

The final reviewer noted that the project design did not integrate with other programs, projects or partners. The reviewer questioned whether the PI was not sufficiently invested in the project's success or was taking the role of a middle man. The reviewer continued that a barrier with partners not meeting their original commitment led to other initial partners receiving more vehicles. This reviewer felt that the PI demonstrated no interest in understanding the impact of the project in other states where vehicles were deployed. With regards to hydraulic hybrids – the commenter noted that the project threw warning lights early in the deployment phase, causing downtime, and a lack of driver confidence. The reviewer acknowledged that this was addressed but could have potentially been avoided with driver training. The reviewer added that driver training for getting maximum effectiveness was needed. Effectiveness of hybrid technology could be challenging if drivers were not trained appropriately. Partners have very different duty cycles - cube out versus weight out. The reviewer acknowledged large national partners - UPS, Sysco, Nestle, Aramark (uniform delivery side).

Question 3: Characterize your understanding of the technical accomplishments and progress toward overall project and DOE goals.

One reviewer indicated that good progress toward DOE goals had been made. All vehicles were hybrids, including hydraulic hybrids, and no infrastructure was included. The reviewer added that there was a very low likelihood that the project would not succeed simply because of its narrow scope.

Another reviewer stated that the project experienced strong accomplishments this year by going from 38% to 85% in vehicle deployment which was responsible for nearly 1,700,000 miles driven, and which identified the need for driver training on hybrid and hydraulic vehicles to achieve targeted improvements in fuel economy. On top of this, the reviewer identified that the current hydraulic trucks were unacceptably noisy, yet the project created 68 jobs.

A different reviewer noted that over 80% of the vehicles had been deployed, and that the remainder was some of the hydraulic hybrids that had many problems. Some of the projects had to reduce the number of vehicles, but the reviewer noticed that other partners stepped up and bought more. This reviewer reported that the trucks are deployed across the country, range in size from box trucks to Class 8 trucks, have been driven over 1 million miles to date, and are averaging a 25% fuel economy increase.

The fourth reviewer was unable to determine from the presentation which duty cycles and/or vehicle sizes were performing best, or what the annual petroleum displacement goal was. The reviewer noticed the Aramark and Sysco vehicles increased petroleum use for a short time based on the lack of driver training at that point in the project, as well as the slight problems with the hydraulic hybrids that Freightliner was attempting to resolve. The same reviewer stated that there was up to a 60% increase in efficiency from these hybrids once the vehicles were deployed, and claimed the presentation was light on data and other information that could have given a better sense of project success or failure.

The fifth reviewer noticed that it appeared that the trucks were being deployed, although there were issues that slowed the project down. The reviewer added that the project manager stated that there were issues with driver education that had to be addressed to get the project back on track.

The sixth reviewer stated that it was great to see that the project had quickly recovered from the fleets dropping commitments, and that a more structured plan to deal with technological problems would be good because the goal of the funding was to address technological barriers. The reviewer went on to suggest that more data and backing in the presentation would be helpful to give a better idea of whether or not it was successful. Some of the details the reviewer noted included: that the project had seen issues on fleet downtime as the researchers had implemented technologies that had not been tested much; most orders were placed by last July, but some of the fleets rescinded them due to economic conditions, and the remaining fleet partners were willing to pick up more demand and took the remaining vehicles; the vehicles supported were deployed all over the country (out to CA, down to FL); all vehicles deployed so far had been electric hybrids with the Eaton system, which saw about 25% fuel efficiency improvement; the project estimated 134,000 gallons diesel reduction annually (seen over 30,000 gallons thus far); the researchers have seen noise issues with the hydraulic hybrids to prevent them from being deployed, but Freightliner was working on that though Freightliner was not originally a cost-share partner; and the project is collecting fuel and mileage data quarterly.

Another reviewer claimed that the project had deployed 83% of vehicles to date, which was reasonable given the difficulties with the deployment of these hydraulic hybrids, and that the fleet training for the vehicles was very important to maximize hybrid fuel economy benefit, as the project showed. The reviewer was disappointed in the data collection activities, as it was noted that the activities did not seem as robust as would be expected. The reviewer continued that more details would be appreciated on how detailed the data collection was, and how the data would be used. The performance of the new hydraulic hybrid vehicles would be of interest to DOE, and real-world performance would assist in understanding the real potential for this technology. Quarterly fuel use data would not necessarily be sufficient to characterize this technology–other data collection efforts should be considered, as this was one of the largest deployments of hydraulic hybrid technology in the country.

Question 4: What is your assessment of the level of collaboration and coordination with other institutions?

The reviewers were split in regards to the collaboration and coordination of this project. The first reviewer indicated that project partners appeared to be fairly well coordinated. The second reviewer noted that the project had partnerships with both regional and national trucking firms. The third reviewer noted that MEA had worked with Clean Cities and a number of national fleets and OEMs, particularly Freightliner, and that some of the partners had been more eager to go further than others.

The fourth reviewer reported that collaboration appeared to be sufficient, and that participation from vehicle OEM (Daimler Trucks) to solve problems is a positive collaboration contribution. This reviewer added that involvement of major partners like Sysco and Nestle is a plus.

The fifth reviewer indicated that working with partners across state lines was great to see and was admirable. However, continued this reviewer, it did not seem like there was much effort to incorporate other partners beyond the few fleets using the truck and the OEMs. The reviewer then suggested that perhaps bringing in other partners to publicize or study the data would be useful. This reviewer also noted the following from the presentation: working with private fleets to get the hybrids into HD fleet; working with companies across the nation with wide-scale deployment; the project team was sought out for the national deployment and was approached by Gladstein, Neandross and Associates (GNA) who had done the legwork in finding the fleets and could help sell it to the governor's office; the government is very interested in EVs/hybrids and saw the value in letting people kick the tires on these across the U.S.; and UPS buying the hydraulic hybrids from Freightliner made it very easy to get Freightliner to invest in-

kind. The same reviewer opined that UPS was such a big customer that Freightliner was going to make sure they got everything right.

The sixth reviewer observed very little interaction with any groups or even among the groups in the project. The seventh reviewer remarked that there did not appear to be much collaboration at all. This reviewer indicated that work was done at the level of the individual participating fleets, but not much else was clear from the presentation. The same reviewer asserted that lessons learned on these trucks, especially the importance of and ways to address driver education, should be shared through the national Clean Cities network.

Question 5: Has the project effectively planned its future work in a logical manner by incorporating appropriate decision points, considering barriers to the realization of the proposed technology, and, when sensible, mitigating risk by providing alternate development pathways?

The first reviewer was confident that the future work plan was reasonable to complete the project, but asked if there would be sufficient time during the next year to complete the activities listed before the end of the contracts (i.e., outreach, technology evaluation). The second reviewer noted that there was a ribbon-cutting planned for August, additional driver trainings were planned, and the rest of the vehicles should be deployed later this year. Further, continued this reviewer, outreach and reporting would continue. The third reviewer reported the project's future work involved final technical and activity reporting. The fourth reviewer explained that future efforts involve deploying the remaining vehicles, training, outreach, data collection and evaluation. The fifth reviewer agreed that it was difficult to tell how exactly the future work that was listed would be accomplished, and/or accomplished on time.

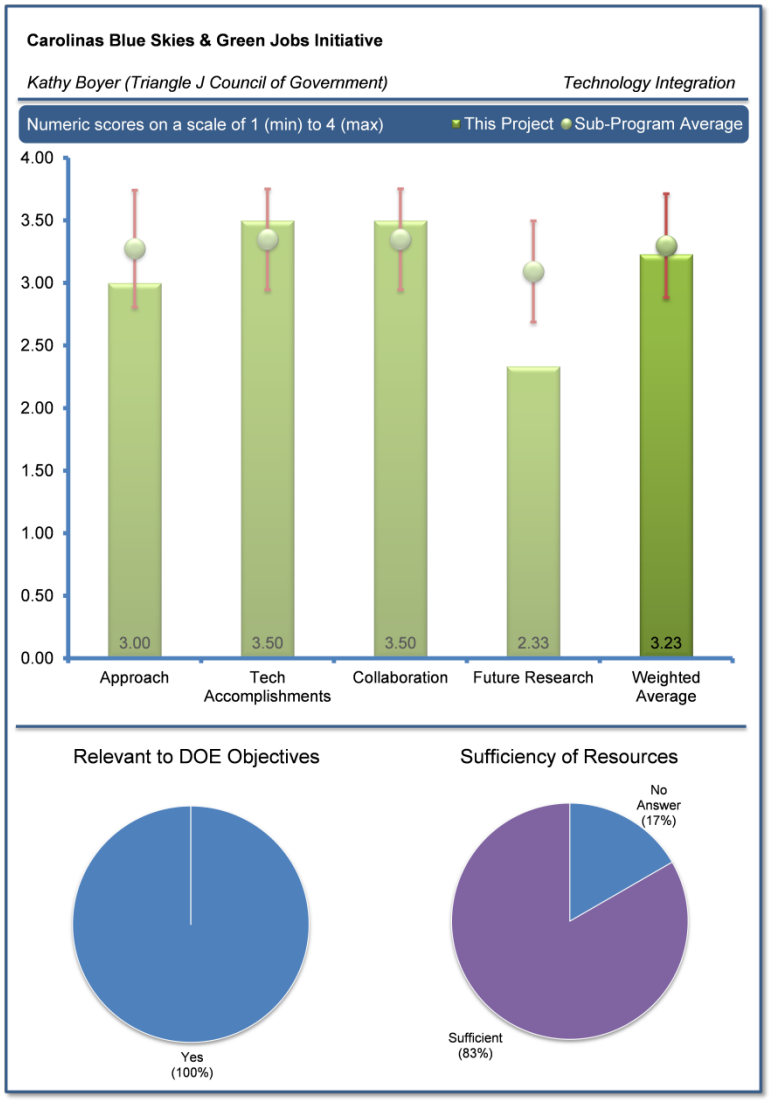
The sixth reviewer commented that the supply chain barriers seemed to have been solved by OEMs but that the PI did not make it sufficiently clear. This reviewer added that whether technology barriers had been overcome was not sufficiently addressed. The same reviewer noted that the proposed future work was vehicle deployment and training. However, this reviewer noted that the training seemed too little too late if the majority of the vehicles were already deployed and the lack of training had already been identified as a barrier as well.

The last reviewer noted that more detailed ideas on what to do with data collected and how to do outreach would be nice. The reviewer also asked if there was any planning to take this experience and use it to get more vehicles in other fleets. The reviewer then noted that: the remaining vehicles were largely hydraulic hybrids for UPS - expect a huge efficiency increase of 60% or more from them; expect to see additional cost share from Freightliner to get the hydraulic hybrids right for UPS; hired GNA to do the outreach; the hydraulic hybrids were going to be in the DC metro area since more stops equaled quicker payback; and asked if the hydraulic system was Parker Hannafin.

Question 6: How sufficient are the resources for the project to achieve the stated milestones in a timely fashion?

All of the reviewers agreed that the resources appeared to be sufficient. One reviewer noted that the resources appeared to be adequate to meet project objectives and that the anticipated petroleum displacement of 134,000 gallons per year seemed modest, given the resources provided. Another reviewer observed sufficient resources to complete the project, collect data, and successfully execute. The third reviewer noted that DOE contributed $5.9 million with a cost share of $10 million. The fourth reviewer stated that project funding of nearly $6 million from DOE and $10 million in matching funds was sufficient to achieve the stated milestones. Another person said that the funds appeared sufficient to cover the incremental cost of the hybrid vehicles being purchased. The sixth respondent pointed out that about 78% of the money had been spent, and the partners have contributed extra cost share including Freightliner, which was an unexpected contributor of cost share.

Carolina Blue Skies & Green Jobs Initiative: Kathy Boyer (Triangle J Council of Government) – arravt064



Reviewer Sample Size

This project was reviewed by six reviewers.

Question 1: Does this project support the overall DOE objectives? Why or why not?

The first reviewer asserted that the use of electric vehicles (EVs) helps petroleum displacement and that this project supports the DOE goal of oil displacement as well as estimated displacement of nearly 3.7 million gallons of gasoline gallon equivalent. The second reviewer mentioned that the current use of alternative fuels appeared to be in line with petroleum displacement goals. The third reviewer detailed that the project reported 325,000 gallons of petroleum fuel displaced to date by LPG, CNG, biofuels, electric, and etc., and that the project would ultimately deploy over 500 alternative fuel vehicles (AFVs) and EVs, approximately 90 alternative refueling stations, and 220 electric vehicle recharging stations.

A different reviewer stated that the project was expected to generate over a hundred jobs (the project has created 19.3 FTE based on actual FTEs) and convert about 200 vehicles to an alternative fuel, and that the project had already displaced 325,000 gallons of gasoline over 18 months. This reviewer would have liked to see if the project was on target to displace the expected 3 million plus gallons annually as the researchers had estimated, and how far off the project was, but that overall the project was very relevant and ambitious.

The fifth reviewer stated that this was a very ambitious and comprehensive plan that included four, state Clean Cities coalitions and tried to include all forms of renewable and alternative fuels. The reviewer added that the project scope underestimated fuels displacement and the project plans to exceed 3.7 million gallons of gasoline annually but did not explain how the project was going to achieve this metric. The original project scope was amended to reflect the demand for various fuel projects. The difference between the original plan and the current plan were the reduced number of stations: specifically 6 fewer biodiesel stations, 10 E85 stations and 2 EV stations as well as an additional 1 LPG station for a total of 8 biodiesel, 5 CNG, 9 E85, 110 EV, and 5 LPG stations. This reviewer continued to say that the vehicle deployment count increased from the original scope of 503 to a total of 528, with the majority of the vehicles being liquefied petroleum gas (LPG) with some NEV, HEV and CNG. The additional vehicles were the result of lower-cost projects and a reallocation of funds. It appeared that the EV stations were being installed with the hope that users would follow because currently there is not enough demand to support 110 charging stations, stated this reviewer. The same reviewer mentioned that there were twenty jobs retained with 63 lives touched through this ARRA funding, as well as the 43 sub-recipients, 88 vendors and 5 investigative leads that were part of the economic development benefit of this project. The reviewer concluded that it was exciting to see a lot of EV stations being installed but that there is no evidence to support this demand. The reviewer asked if the current technology was going to be compatible with the EV cars when

they got deployed to the United States. The reviewer recounted that the presenter made a comment that there was not a tremendous amount of EVs in the United States, but adhered to the theory that once stations were installed, EV cars would come.

The final reviewer asserted that the use of EVs helps petroleum displacement, but LPG does not.

Question 2: What is your assessment of the approach to performing the work? To what degree are technical barriers addressed? Is the project well-designed, feasible, and integrated with other efforts?

Mixed reviews were encountered regarding the project's approach to performing the work. One reviewer indicated that the project had been able to address the barriers identified for the project and that the mix of vehicles in this project would help make this project successful.

Another reviewer indicated that that all aspects of the project deployment appeared to be going well, but that there were several delays and issues with verification of conversion technologies.

The third reviewer commented that the project must have spent a lot of time herding cats as there appeared to be too many organizations (5 investigative leads, 43 sub-recipients, and 88 vendors) to effectively manage, and it was difficult to tell what the exact deployment strategy was as it had shifted. This reviewer noted that some things were curious, such as deployment of 222 EV chargers when Slide 9 suggested less than 25 NEVs would be deployed.

The fourth reviewer identified that there was no specific strategy identified in the presentation, that the project was a diffuse grouping of sub-projects covering almost all of the alternative fuels described as being fuel neutral, which could be seen as unfocused. This reviewer also added that a large number of sub-recipients were said to have delayed deployment considerably, resulting in the project being substantially behind schedule.

The fifth reviewer detailed how the project was a lot of work and how it was hard to find sub-recipients. The reviewer noted that the project had 44 sub-grants and 88 vendors and believed that there may be simpler ways of doing this. The reviewer asked how DOE was going to continue to fund these types of projects or if there were better methods for introducing this technology. This project had a strong outreach component and the reviewer wanted to know how it would be sustained. The reviewer was also concerned with the presenter's comment that the EV stations were being installed without fleets to support them today. The reviewer quoted that everyone was hopeful but asked if this was an effective strategy and remarked if the vehicle and the stations should go hand-in-hand. The reviewer concluded that if the overall project did achieve its goals it would displace a significant amount of petroleum, generate long term local business, and support alternative fuels in the region.

The final reviewer felt that given the complex nature of this project, including the 43 sub-recipients, 88 vendors, and 5 investigative leads and the all-inclusive fuels deployment technology that the project was behind schedule. However, that it appeared the project team altered the scope of the project given the economic factors affecting demand and lack of demand for certain types of alternative vehicle stations. The original project scope was amended to reflect the demand for various fuel projects. The difference between the original plans and the current plan was a reduced number of stations, specifically 6 fewer biodiesel stations, 10 fewer E85 stations, and 2 fewer EV stations, as well as an additional 1 LPG station for a total of 8 biodiesel, 5 CNG, 9 E85, a110 EV, and 5 LPG stations. This reviewer also added that the flexibility, team work and breadth of alternative vehicle technologies included in this project by incorporating various types of alternative fueling stations, alternative fuel vehicle deployments, and an extensive list of partnership members was remarkable.

Question 3: Characterize your understanding of the technical accomplishments and progress toward overall project and DOE goals.

Most of the reviewers were satisfied with the results to date. The first reviewer stated that there was very good progress, with over 325,000 gallons of gasoline displaced through operating over 200 vehicles at the 59 fueling stations that are operational. The second reviewer commented that the project partners had done well to overcome and work through the deployment barriers, especially the conversion delays as barriers arose.

The third reviewer reported that the project is 53% complete and noted that this was not unusual based on the number of collaborators involved. This reviewer added that given the extensive partners, sub-recipients, contractors, five Clean Cities, and two State governments), as well as the complexity of the environmental review process required for this project, it is behind schedule but on track. The same reviewer noted that the PIs identified problems meeting timelines and worked with partners and subcontractors to revise accordingly. This reviewer added that investigators surveyed sub-receipants to identify training needs and determined that three categories were needed including Operator, Maintenance and First Responder. It was suggested by this reviewer that DOE track the training barrier that the investigator identified. This reviewer explained that reporting was occurring on the fifth day after the quarter ends. It was unclear to this reviewer, however, what data was being collected and shared. Going forward, continued the reviewer, this project should track metrics of petroleum replacement and emissions reduction in a manner that is user friendly to the public so lessons can be learned from this project. In addition, this reviewer emphasized that this is a robust and comprehensive project to design and implement and a tremendous amount of work was required on the front end to create this initiative. Forty percent of Federal funds have been spent and the project is expected to be completed by the end of this summer. Accordingly, the same reviewer suggested that this Program begin to focus on education, lessons learned, and tracking petroleum and emissions reduction. This reviewer remarked that the project scope underestimated fuels displacement and the project's plan to exceed 3.7 million gallons of gasoline annually, but did not explain how the project team was going to achieve this metric.

The fourth reviewer stated that the project is 53% done. Although the project team claimed to be on track, this reviewer recommended that DOE continue to watch if the project team continues to progress because they are running behind, which is not unusual based on the number of collaborators involved. The reviewer detailed that the project had a total of 137 stations and 528 vehicles. The reviewer liked that the project supported a variety of technologies and asked if the police were really doing their own conversion. The reviewer wondered what assurances were available that the American Academy of Applied Forensics conversions were being done safely and if the PIs could further explain if training continued to be a barrier. The presenters projected to over-deliver on fuel displacement of 3.7 million gallons but only had 325,000 displaced to date, noted the reviewer, and asked how the project was going to get to 3.7 million gallons annually. The presenter attributed this shortfall to pulling back on the B20 and E85 stations, and the reviewer questioned how this new approach was going to achieve these goals. The reviewer observed that the project team was working hard to train sub-recipients. This reviewer also asserted that maintenance and first responder training was needed, and acknowledged that the project team was working on it. The same reviewer queried what was meant when the statement was made that the project team was reviewing to make sure it was done right.

One reviewer reported that only 203 of 1,031 planned vehicles were deployed and 59 alternative fuel stations were operational. The reviewer pointed out that this may be misleading because many of these were single EV charging units, which should not qualify as stations.

Another reviewer stated that only 53% of the funds were expended to date, with delays blamed on problems with Environmental Protection Agency certification, backlogs of tank orders, and loss of biofuels tax credits, etc. While this reviewer acknowledged that there was some validity to this, the project was well behind schedule across the wide range of its sub-projects. The same reviewer noted that project sponsors had made some adjustments, particularly in refocusing on providing more training, as well as substituting HD CNG vehicles for biofuels spending, attracting new fleets, etc.

Question 4: What is your assessment of the level of collaboration and coordination with other institutions?

Reviewer comments on the project's collaboration and coordination were mixed. One reviewer felt that the collaboration between project partners appeared to be effective. The second reviewer felt that there was an extraordinary amount of collaboration and coordination within this project.

The third reviewer stated that the list of participants (including four Clean Cities coalitions) was much too long. The reviewer identified that too many participants without adequate structure and coordination mechanisms set up in advance was probably one of the reasons the project was delayed.

The fourth reviewer asked why five personal investigators were needed, as it appeared that the only collaboration with industry partners was buying vehicles and infrastructure.

The fifth reviewer added that there were four Clean Cities coalitions and one local university doing this work in two states and guessed that the huge list of collaborators was really difficult to manage. The reviewer questioned if the model of this massive list for future reference was effective or not, but in general liked seeing the coordinators working together.

The final reviewer stated that this project of 43 sub-recipients, 88 vendors and 5 investigative leads and the all-inclusive fuels deployment technology must have required extensive collaboration, coordination and team work to design on the front-end. The reviewer noted that this was a very ambitious and comprehensive plan whose scope included four Clean Cities coalitions and one local university. The same reviewer observed that the project tried to include all forms of renewable and alternative fuels vehicles and charging station deployments. The reviewer noted that two states, North Carolina and South Carolina, were part of this program requiring two State governments and a number of local and governments involved government involvement in decision making and permitting, and also that the Carolina Blue Skies and Green Jobs Initiative should be commended for its inclusive technology and partnership involvement. The final reviewer also asked if this model was effective and liked seeing the coordinators work together and so many local companies being a part of the project. The reviewer was hopeful that in the long-term that local businesses would benefit.

Question 5: Has the project effectively planned its future work in a logical manner by incorporating appropriate decision points, considering barriers to the realization of the proposed technology, and, when sensible, mitigating risk by providing alternate development pathways?

One reviewer felt that the proposed future work of getting all the vehicles and infrastructure in place this year should allow for the project to meet its oil displacement goals.

Another reviewer inquired about the deployment schedule of the rest of the vehicles and stated that the project needed to take 22 months to deploy the first 50% of the vehicles; therefore the plan to deploy the remaining 50% in three months was questionable. In addition, the reviewer noted that there was no identified data collection and/or monitoring plan offered.

A different reviewer said that the future plans appeared to be well developed, except for the plans and roll-out for the technician/first responder training activities.

The fourth reviewer stated that although the project was only 53% done, the researchers claimed that the project would be finished with deployment by August and that DOE should continue to monitor this. The reviewer noted that the researchers have modified their approach to achieve the overall goals and that this was good. The reviewer hoped that the researchers planned to continue the key responder and technician training into the future. The reviewer added that the researchers should also comment on how the project would be sustainable in the future. The reviewer stated that it was exciting to see a lot of EV stations being installed, but questioned how the stations were being used. The reviewer went on to ask if the current technologies would be compatible with future technologies and also if the project manager could explain more about what the long term communications included.

The fifth different reviewer reiterated that the project appeared to be on track to deploy vehicles and stations by the end of the summer but that data tracking, training, education and communications and media plans were less clear. The reviewer explained that there was some training referenced for sub-recipient projects but it was not clear about how all the partners (four Clean Cities Coalitions, two State governments, DOE and numerous local governments) were going to become aware of lessons learned from this interesting project. The reviewer added that the researchers had modified the approach along the way to accommodate partners dropping out and new recruitment of new partners and it seemed to the reviewer to be a very attractive model but was curious if this was an effective model. The reviewer was excited to see many EV stations being installed but lacked the evidence to support this demand; also would need to determine if the current technologies would be compatible for when EV cars get deployed to the United States.

The sixth reviewer indicated that the proposed future activities were mainly those that were scheduled to have been completed by the end of the second year of the project. Data gathering and etc., which would have been the activities of the second two years, would now probably be pushed outside of the ARRA project period.

Question 6: How sufficient are the resources for the project to achieve the stated milestones in a timely fashion?

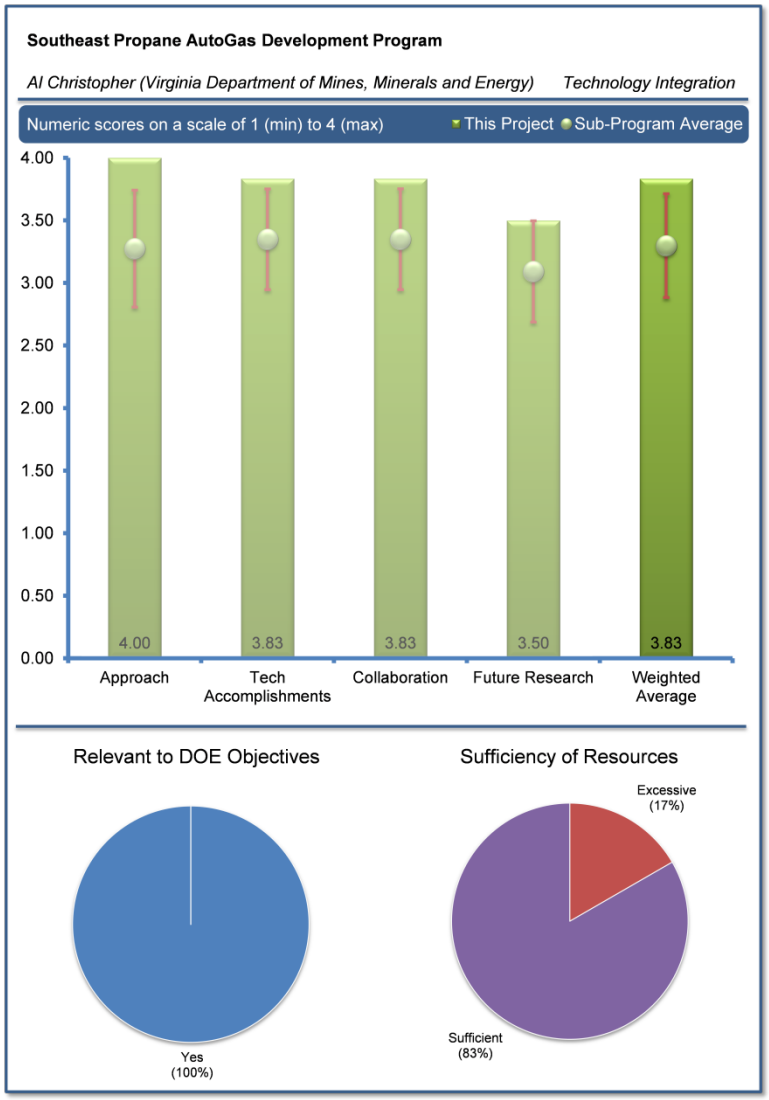
All reviewers determined that the resources for this project were sufficient. The first reviewer stated that resources appeared to be sufficient.

Another reviewer mentioned that partners have failed to come through on this project early on and that the project managers have had to seek alternative support. This reviewer also said that the speaker indicated that they have reallocated funds and pursued additional partners to address this, and that DOE should follow up and make sure this actually happens to keep this project on track for completion. The reviewer then added that if overall goals were achieved, that this would be a great project.

The third respondent stated that based on the fact that project scope was revised to accommodate more alternative energy vehicles and fewer stations it appeared that there was close monitoring of these budgeted items, however, what was less clear was what the balance of budgeted funds available for administration, data collection tracking and reporting, communications and media awareness, training and education efforts was. The reviewer then concluded that the changing out of partners (dropping out and recruitment of new ones) may have affected the overall budget, so DOE should confirm that the budget was indeed on track.

The fourth reviewer reiterated this comment, indicating that the resources should be more than enough, but with so many hands in the pot, that it was difficult to judge.

Southeast Propane AutoGas Development Program: Al Christopher (Virginia Department of Mines, Minerals and Energy) – arravt065



Reviewer Sample Size

This project was reviewed by six reviewers.

Question 1: Does this project support the overall DOE objectives? Why or why not?

The first reviewer found that this project estimates oil displacement of 4 million total gallons at the conclusion of the project and already has displaced 1 million gallons of gasoline.

The second reviewer also noted that 1 million gallons of petroleum fuel have already been displaced, and an estimated 4 million gallons per year to be displaced when project is complete based on 1,200 vehicles.

The third reviewer remarked that the petroleum displacement numbers are high, and will increase above preliminary estimates as more vehicles have been deployed than the initial estimates.

The fourth reviewer remarked that this project is the largest propane gas project in the country and far exceeded its initial goals and will be converting at least 1,200 vehicles from many various public and private fleets. It is projected to displace 4 million gallons of gasoline a year.

Another reviewer also noted the displacement of 4 million gallons of fuel, and would like to know whether the project is achieving these projections. This reviewer noted the 1,200 conversions, and would like to know how many are done. The reviewer also noted 35 stations.

The final reviewer remarked that it somewhat helps petroleum displacement if the LPG is made from natural gas instead of petroleum. However, according to the reviewer, this is unknown.

Question 2: What is your assessment of the approach to performing the work? To what degree are technical barriers addressed? Is the project well-designed, feasible, and integrated with other efforts?

Reviewers had mostly positive feedback on the approach. The barriers identified have been addressed and the strategy for deployment was very good, stated one reviewer. This reviewer said that the project was unique based on the fact that the project was deploying vehicles over the entire southeast region.

The second reviewer claimed that there were no real technical barriers, but instead organizational in trying to get fleets to add these vehicles. However, this appears to be going very well.

Another reviewer observed 35 stations throughout the Southeast to service 34 participating fleets (up from 14 originally planned), 1,200 vehicles (up 138 from planned). This reviewer observed that a contractor provides both the conversion of all the vehicles at a center established for the project and installs the refueling equipment/trains operators etc. Deployment has proceeded at a strong pace even while expanding the scope of the project with additional non-DOE resources. This reviewer also noted an aggressive marketing and outreach to expand even further in the future using model of autogas usage in Europe which is much greater than in the United States.

The fourth reviewer mentioned that there would be ten Clean Cities coalitions impacted by this project. The project should be done with deployment by August and is on target for completing the project on time. This reviewer likes the road show concept to further promote long-term sustainability.

The fifth reviewer commented that the strategy and execution has been well-planned and developed.

According to the sixth reviewer, the project appeared to leverage the DOE Clean Cities funding almost four-to-one, which was truly impressive [DOE Program Clarification: The formal government cost share value is $8.6 million and the recipient cost share is $10.4 million.]. This reviewer also stated that there were 35 propane stations donated for this effort, and the partners reached out to fleet customers all over their geographic footprint and appeared to be really successful at including any group that was willing to retrofit their vehicles. It was mentioned that the partners' presentation testimonial video and education materials including the road show in ten Southeastern states and national media coverage would further recruit other fleet owners to choose to convert their vehicles to propane.

Question 3: Characterize your understanding of the technical accomplishments and progress toward overall project and DOE goals.

Reviewers were pleased with the progress of this project. According to the first reviewer, the program is deploying vehicles at a fairly good pace. The second reviewer remarked that the progress in this project has been excellent. There are nearly half of the vehicles already put into service and the project has displaced over 1 million gallons of gasoline. The third reviewer observed that there were several major barriers early in the project, but project partners have done a good job overcoming those barriers.

The fourth reviewer noted that the project would be over 60% completed as of AMR compared to the original scope of the project as approved for grant by DOE. This reviewer stated that even with the expansion of the project, deployment is apparently on track for completion by August 2012, only two months behind ARRA's overall deadline and the original project milestone in the application. Despite expansion from 14 to34 fleets and despite delays relating to EPA certification of conversions and addition of additional vehicle platforms, the project sponsors were able to meet substantially increased stations and fleet deployment by first setting up stations for private use and addressing issues for public access afterwards, which was a reasonable adjustment/accommodation.

The fifth reviewer noted that the project is on target for accomplishing goals by August 2012. This reviewer liked the video of users that show the success of running fleets on propane, but it could have had more data to support their statements. The reviewer also noted that the project has 35 stations, that 1,200 vehicles should be deployed by August 2012, and suggested following up to verify this happens. The reviewer noted that the project currently is at 60% completion. The project is also encouraging fleets to make their own investments over the course of the grant, and that 13 to 34 fleets are now involved in the project. The project has over-delivered on matching funds. The matching funds do the installation of stations, while grant funds just pay for procurement of conversions.

The final reviewer mentioned that the Southeast Propane Autogas Development Program project has increased the number of cars the grant originally was funded to convert. Additionally, the team creatively leveraged the federal grant funds to achieve more vehicles being eligible to be converted. Recruiting 35 service stations to support this initiative was very aggressive, and the reviewer also noted impressive participation from partners. The testimonials from police officers were very powerful and had a high level of integrity.

Question 4: What is your assessment of the level of collaboration and coordination with other institutions?

The first reviewer commented that the collaboration and coordination has been excellent. Having the project go through the entire Southeast corridor is outstanding. The second reviewer noted many collaborating entities from the appropriate fields including 11 Clean Cities coalitions, 34 fleets, numerous state and local governments, etc. The reviewer noted that the project is essentially on-track despite having 36 sub-recipients. The third reviewer observed a great list of partners and good media coverage. According to the fourth reviewer, the Southeast Propane Autogas Development Program has partners from universities, municipalities, the private sector and over ten Clean Cities coalitions. It appears that the partners have all worked together to leverage the grant funding to creatively and aggressively expand the project scope and participation. The fifth reviewer noted that the project partners have done well to communicate the success of the project and will continue to do so. According to the final reviewer, the project is working well with their deployment partners, but there is not any university or lab data analysis.

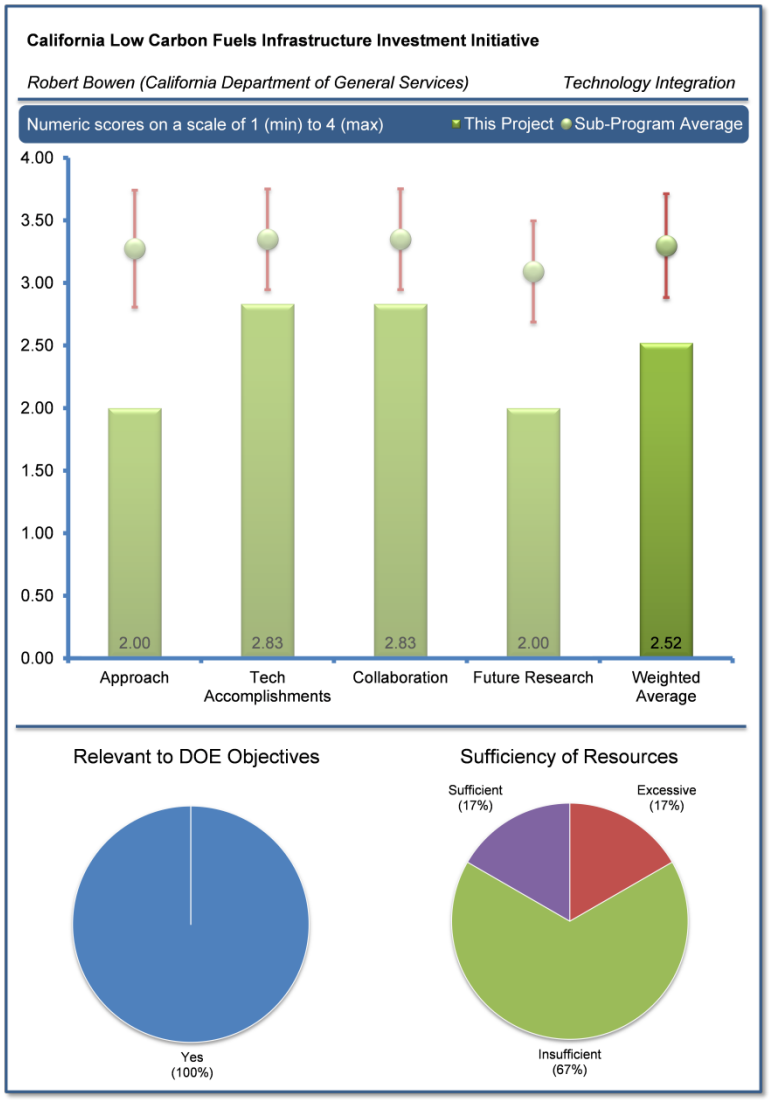
Question 5: Has the project effectively planned its future work in a logical manner by incorporating appropriate decision points, considering barriers to the realization of the proposed technology, and, when sensible, mitigating risk by providing alternate development pathways?

The first reviewer observed that the plan is to continue deploying vehicles. According to the second reviewer, the future activities call for all of the vehicles to be deployed in 2012 and should allow the project to meet its goal of 4 million gallons of oil displacement. It will be exciting to see the results of the detailed data that is being collected in the project. The third reviewer remarked that future activities will complete deployment by a projected date of August 2012, and that the project will continue aggressive outreach and marketing, opening up private stations to public access, and increase focus on data collection. The fourth reviewer noted several more Road Shows to further promote stations and the net savings for these stations to get them to procure more vehicles and more fuel savings and long term sustainability. This reviewer concluded by commenting that this is a great overall project. The fifth reviewer found that future plans are well developed. The sixth reviewer mentioned that the educational materials, testimonials video, media launch and roadshow into ten Southeastern states would enable taxpayers to learn about commercializing and deploying propane fleet technologies and related petroleum displacement, greenhouse gas elimination and cost savings.

Question 6: How sufficient are the resources for the project to achieve the stated milestones in a timely fashion?

Five out of the six reviewers found that the resources that were provided were sufficient. One of the reviewers noted that the project over-delivered on matching funds, and praised the project on the outstanding job of its resource management [DOE Program Clarification: The formal government cost share value is $8.6 million and the recipient cost share is $10.4 million.]. Another reviewer commented that the resources in this project are sufficient. According to the third reviewer, resources apparently are sufficient judged by progress and expansion of project. A fourth reviewer commented that resource use appears to be sufficient. The fifth reviewer found that funds are excessive. This reviewer said that the Southeast Propane Autogas Development Program team appeared to have leveraged their grant funds in a manner to optimize the highest and best use for this award. It appeared to this reviewer that the team was very resourceful and created a program that researched and recruited strong contributing members to be able to execute and grow such an ambitious project [DOE Program Clarification: The formal government cost share value is $8.6 million and the recipient cost share is $10.4 million.].

California Low Carbon Fuels Infrastructure Investment Initiative: Robert Bowen (California Department of General Services) – arravt082



Reviewer Sample Size

This project was reviewed by six reviewers.

Question 1: Does this project support the overall DOE objectives? Why or why not?

According to the first reviewer, this project estimated that it would displace 66 million gallons of gasoline and diesel fuel and so far has displaced over 2 million gallons of fuel.

The second reviewer remarked that although only 16 of the 75 stations have been constructed, over 500,000 gallons of biodiesel and 1.75 million gallons of E85 have been dispensed, providing support for much greater annual petroleum reduction as more stations are completed.

The third reviewer agreed that the project meets DOE objectives, but notes that there are still questions about E85 and petroleum reductions in the full cycle. The fourth reviewer commented that the project will displace petroleum with E85 if the project ever proceeds towards objectives, which is questionable.

The fifth reviewer observed that 50% cost share is provided by Propel, who did not have funds and therefore caused the project to stall. This reviewer cautions DOE that the project is already out 40% of funds on 16 stations yet there are 59 stations left to be installed. This reviewer also mentioned that the project would create 108 jobs, has already displaced 528,000 gallons of biodiesel and 1,744,000 gallons of E85, and has 21,000 tons of CO_2 equivalent reductions.

The final reviewer stated that the project supports the overall DOE objectives of petroleum displacement, but the execution of the project has been stalled of late. This reviewer recognized that while this project initiative is aggressive and impressive in so far as California did not permit this type of vehicle technology, biodiesel, until this year, it is unfortunate timing given the expiration of the ethanol federal tax and financing challenges the cost share applicant has encountered. The reviewer also mentioned that the private cost share was to be provided by Propel and that they would know soon if some of its financing can be secured. Obviously, these financing challenges have prevented this project from achieving its stated goals of 75 stations as only 16 were completed, and only 1 of the 16 were completed this year. The reviewer also noted that Propel has had tremendous success securing contracts for over 130 retailers so that provides Propel tremendous site flexibility if the financing comes through and may enable this project to catch-up. This reviewer also observed that the project's job creation is reported as 108. The project displaced petroleum with 528,000 gallons of biodiesel, and 1,744,000 gallons of E85 over the past 12 months. The reviewer also observed that the project has displaced 21,000 tons of CO_2 in a recent 12 month period and the total project was estimated to displace 187,000 tons of CO_2 annually.

Question 2: What is your assessment of the approach to performing the work? To what degree are technical barriers addressed? Is the project well-designed, feasible, and integrated with other efforts?

The first reviewer mentioned that many barriers have been addressed given that there are 130 signed contracts and over 100 California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA) approvals. Also, a major barrier was private company cost share which had not been met yet and had caused major delays.

The second reviewer agreed that the strategy was sufficient, but that the ethanol industry has been hit by the loss of its federal tax credit. This has stalled the market while retailers and Propel look at whether or not there is still a market. Financing has proven to be difficult. However, this reviewer observed that the project has over 130 signed contracts with retailers, and this is promising. The reviewer pointed out that Propel is in the process of securing financing, which should help get them back to building stations. This reviewer cautioned DOE not to give out funding until that is secured.

The third reviewer expressed a concern that the cost of the stations themselves appeared high at $430,000 each, which was way out of line with anything seen anywhere else on any other project. The reported costs from successful station installers, etc. has held up the project, possibly along with problems siting stations. This reviewer commented that this should have been foreseen and the deployment strategy should have been different or at least included other contingencies. Additionally, this reviewer noted that contracts are said to exist on 130 potential location sites as contingencies, yet the project is way behind schedule. The reviewer concluded by stating that the project plan and report have been long on hype, short on specifics and short on performance.

According to the fourth reviewer, the project partners did have a strategy for finding additional project partners when Propel had to cease station construction. However, there appears to be no other organization that can provide the same services as Propel, keeping the project stalled for a long time frame.

The fifth reviewer expressed confusion as to what stations and alternative fuel infrastructure will be built. Only 16 of 75 stations have been completed.

The final reviewer noted that given the financing obstacles, state regulatory challenges and federal tax credit expirations, it seemed like this strategy was very risky and should have been altered once these hurdles were apparent. According to this reviewer, while this project initiative is aggressive and impressive in so far as California did not permit this type of vehicle technology, biodiesel, until recently, and it is unfortunate timing given the expiration of the ethanol federal tax, once these facts, including the financing challenges the cost share applicant has encountered, were known, a revised strategy should have been developed. Given that Propel is responsible for the 49% cost share and has these contracts with high-profile and well financed retailers, it might be worth researching if Propel could leverage these retailers and get them financially engaged in some of the station's construction costs. Finally the reviewer identified that it was estimated that a station would cost approximately $316,000 and the costs appeared closer to $450,000. Again, once it was discovered that the costs of the stations were higher than projected, it would have been advisable for the strategy to have been revised to reflect the higher costs along with other hurdles identified.

Question 3: Characterize your understanding of the technical accomplishments and progress toward overall project and DOE goals.

One reviewer stated that the progress has been slowed due to the lack of funding from Propel, but once the funding is provided, there is a good plan to get stations online fairly quickly. The second reviewer noted that only 16 of the project's 75 stations have been completed as of May-June 2012, the deadline for deployment under ARRA conditions. This reviewer thought that the reasons for the delays were readily anticipatable, and that the deployment schedule now would not allow for the two-year data collection and reporting required by the ARRA grants.

The third reviewer commented that B20 is now available in California, which was not available a few years ago. The project has less than 25% of stations completed. This reviewer observed that all 16 existing stations are privately owned; in the past Propel leased stations. Now they are purchasing the stations outright. This reviewer is not sure if this is a trend or not. For this reviewer, the technical problem is really related to financing and not the ability to install stations.

The fourth reviewer observed that while early progress was going well, the project has been stalled for some time as Propel looks for additional funding to complete the remainder (59) of the stations. Similarly, the fifth reviewer noted that only 16 of 75 stations have been completed due to funding problems. It appeared to this reviewer that matching funding was never in place at project inception.

The final reviewer observed that Propel has excelled at securing 130 contracts with high-profile retailers for stations. At this stage, the project has 108 jobs associated with it and initially projected 450 when entire 75 stations completed. Also, this was an aggressive project scope given California's late acceptance of this vehicle technology. The reviewer noted that the project was heavily dependent on one private cost share company that has encountered financing problems. According to this reviewer, this technology, biodiesel, may not be cost-effective at this time given the over capacity of natural gas but it is necessary for long term diversification, but may explain some of the unexpected financing problems. Propel hopes to learn about securing some additional financing soon and hopefully this will work out. However, this reviewer suggested that DOE needs to monitor this project closely because it has reimbursed approximately 42% of project costs and Propel has only invested approximately 31% of costs. This reviewer noted that CEC is a partner in this project also and they have contributed approximately 18% of costs. It seemed to this reviewer that infrastructure costs are way too high. This total project funding of approximately $21.5 million was for 75 stations, only 16 have been constructed, and only 1 station was constructed in 2012. It does not seem like there will be enough funding for the 75 stations unless costs for the station technology, permitting, construction labor, etc. comes down drastically. This reviewer concludes that it does not appear that much progress towards overcoming these barriers have been mitigated, and the success of rescuing as much of this project as possible should be determined soon and is heavily dependent on Propel securing its outside private funding.

Question 4: What is your assessment of the level of collaboration and coordination with other institutions?

According to the first reviewer, in spite of the project delays, which were out of the control of the PI, the project clearly demonstrated the recognition and ability to communicate progress/barriers to all project partners and interested parties. The second reviewer perceived that the number of suppliers, site operators and government agencies in the project shows very good collaboration and coordination. The third reviewer commented that there have been lots of agreements but not much progress, so it is difficult to weight the value of the agreements. Similarly, the fourth reviewer noted a reasonable list of collaborating participants, but it has been insufficient to carry forward the project, obtain permitting in timely way, obtain financing for applicable station costs, etc. The fifth reviewer found that the project has great partners. But the project needs to leverage these partners to provide funding and reduce Propel's investment. This reviewer cites 7-Eleven, Quizno’s and Circle K as a few examples of partners.

The final reviewer mentioned that the collaboration on this project was quite good. Propel secured high-profile national partners such as 7-Eleven, Quizno’s, Circle K, Zipcar, ADM, Cargill, and Tesoro just to name a few. According to this reviewer, it would be worth Propel’s effort (if it has not been done already) to see if these companies would be able to help finance some of the station costs at their facilities to try and move this project forward. Quite possibly these partners may have other assets that could be contributed, that could enable stations to be built and reduce Propel's expenditures. Additionally, this reviewer added that Propel has secured 130 contracts in 5 major markets of California including: San Francisco, Sacramento, Los Angeles, Orange County and San Diego, and acknowledged that collaborating with all these companies and local governments required a tremendous amount of coordination and collaboration. This reviewer observed that a lot of work has been done on the front end of this project and due to reasons stated above of late, the project has been stalled. Propel is hopeful that it has secured additional funding to complete the project but in the meantime this reviewer recommended that Propel compile all the relevant summary information for DOE on the contracts, sites, partners, municipal government offices worked with, and points of contact information, etc. in a user friendly summary manual format, should DOE want to reference it in the future.

Question 5: Has the project effectively planned its future work in a logical manner by incorporating appropriate decision points, considering barriers to the realization of the proposed technology, and, when sensible, mitigating risk by providing alternate development pathways?

Reviewers expressed concern about future activities. According to the first reviewer, the future activities hinge on Propel coming up with the funds necessary to complete their cost share. If Propel obtains the funds, the project should be able to install many of the planned stations. The second reviewer noted that proposed future activities hinge on the ability of Propel to secure additional project funding, especially since no replacement/alternative partners have been found. The third reviewer found that the project is significantly behind schedule and it appears the industry partner has come up with needed capital, making the future of this project shaky at best. The fourth reviewer remarked that proposed activities are merely to complete the project two years behind schedule on the new model, taking on faith that it will get on (the new) track soon in the future.

The fifth reviewer cautioned that the project has a lot of work to still do. The project is less than 22% done based on the original proposal, and is waiting for funding or financing to continue work. This reviewer cautioned DOE not to expend more funding.. There have been discussions of looking at other partners to replace Propel or to use the funds differently. But right now the project is still with Propel. This reviewer would like to better understand how Propel is promoting the E85 and biodiesel, and would like to know how the volume estimates compare to the actual volumes.

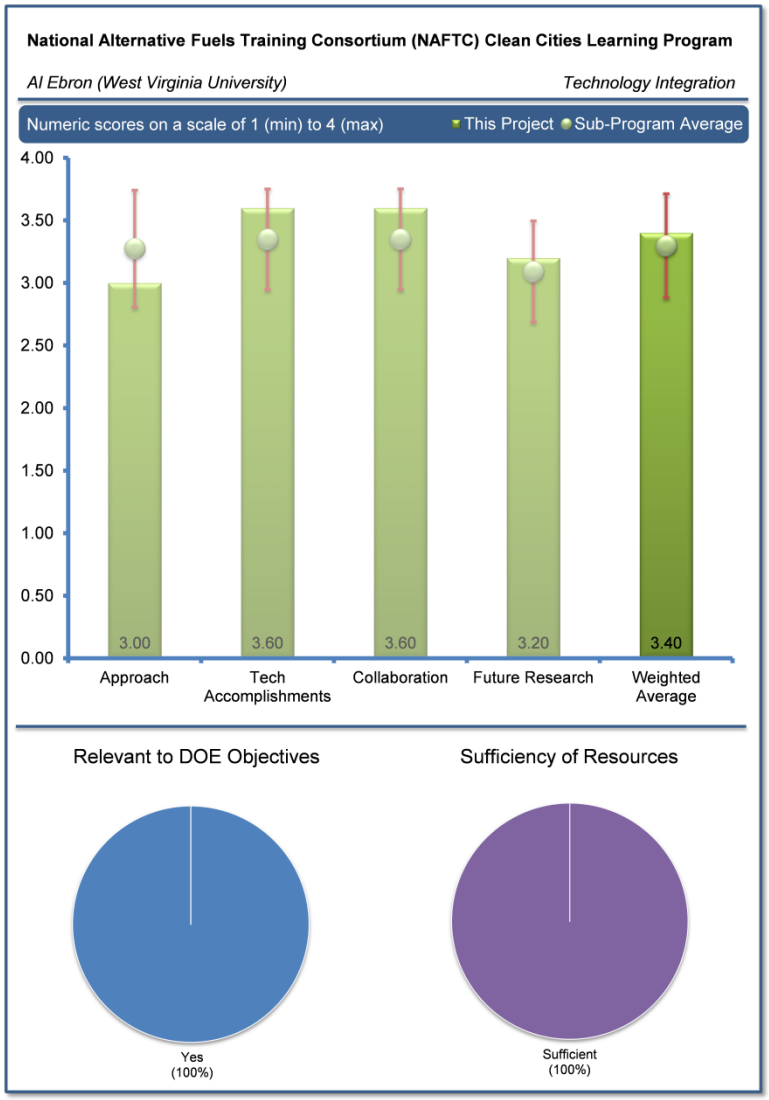
The final reviewer remarked that it does not seem like the project has incorporated the set-backs that have been encountered during the first few years of the grant. According to this reviewer, it seems highly unlikely that the project will be completed and 75 new stations will be built. This reviewer recognized that recent regulatory approvals have been secured, but they have taken a long time and it does not appear that there are contingency plans to make up for this lost time. The reviewer pointed out that this is an aggressive project scope given California's late acceptance of this vehicle technology. Additionally, it is heavily dependent on one private cost share company that has encountered financing problems. This technology, biodiesel, may not be cost effective at this time given the overcapacity of natural gas but it is necessary for long term fuel diversification but may explain some of the unexpected financing problems. Propel hopes to learn about securing some additional financing soon and hopefully this will work out. However, the reviewer recommended that DOE monitor this project closely because DOE has reimbursed approximately 42% of project costs and Propel has only invested approximately 31% of costs. This reviewer noted that CEC is a partner in this project and they have contributed approximately 18% of costs. It seemed to this reviewer like the infrastructure costs are way too high. This total project funding of approximately $21.5 million was for 75 stations and only 16 have been constructed, and only 1 station was constructed in 2012. It did not seem to this reviewer like there will be enough funding for the 75 stations unless costs for the station technology, permitting, construction labor, etc. come down drastically. The scope of this project should be evaluated to see if it is financially feasible to accomplish by June 2014. It does not appear that much progress towards overcoming these barriers have been mitigated, and the success of rescuing as much of this project as possible should be determined soon and is heavily dependent on Propel securing its outside private funding. The reviewer advised that this project team needs to have some education outreach materials and reference materials (if not already compiled) supplied to DOE should this project not be completed in its entirety. It would be a waste to lose all the good work that has been done on this project if it is not completed because so much work has been done to get it to the stage it is at now.

Question 6: How sufficient are the resources for the project to achieve the stated milestones in a timely fashion?

Four reviewers considered the project to have insufficient resources, one reviewer considered the resources sufficient and one reviewer considered resources to be excessive. For those reviewers who considered the project funding to be insufficient, one reviewer commented that DOE funds are sufficient, but partner funds are very insufficient. A second reviewer commented that obviously, financing is a key issue to this project that has been a problem. The project needs to get that under control. A third reviewer stated that programmatic resources appear to be sufficient, but the funding availability from the main project partner has obviously been insufficient. This reviewer would be interested to know whether there was any discussion to set up a different reimbursement process at the beginning of the project. It appeared to a fourth reviewer that the resources are insufficient to complete the whole project in a timely manner. Cost overruns, financing challenges and regulatory hurdles have slowed the project down tremendously. It appeared to this reviewer that even if Propel secures the funding, it will not be enough to build the 75 stations. This reviewer is hopeful Propel can get its financing and revise scope to execute on this award. Again, if Propel can work

with any of its strong partners to see if they would be willing to contribute to the station costs in order to drive their expenditures down that too seems like another option worth investigating. The reviewer who found that funds are sufficient remarked that funds are sufficient if Propel comes up with the funds needed to complete the project. The reviewer who found that funds are excessive remarked that although insufficient financing is supposedly a key excuse for the delays to date, the costs being allowed are way out of line compared to any costs seen anywhere for E85 installations, even allowing for the greater number of pumps, cost differentials for state of California, and Davis Bacon differentials. The reviewer questioned the distribution and timing of public versus matching contributions. The reviewer also expressed concern about having a single station developer.

National Alternative Fuels Training Consortium (NAFTC) Clean Cities Learning Program: Al Ebron (West Virginia University) – ti017



Reviewer Sample Size

This project was reviewed by five reviewers.

Question 1: Does this project support the overall DOE objectives? Why or why not?

The first reviewer found that the project supports individual and institutional awareness and knowledge of alternative fuel and electric-drive vehicles, and thereby encourages purchases of these vehicles. Greater market penetration of these vehicles will reduce petroleum use.

A second reviewer added that the program is designed to educate various audiences about the introduction, and changing vehicle landscape that now includes AFV's so from this perspective it does the job expected.

Another reviewer added that the training, education, outreach and awareness activities such as these are of value in providing AFV literacy to the public, as well as providing specific training to the workforce sector, thus accelerating mass market introduction and penetration of AFVs, resulting in the DOE objectives of petroleum displacement.

According to the fourth reviewer, the scope of the outreach program is large and has the potential to train many individuals, fleet managers, policy makers, first responders, about alternative fuels and advanced technology vehicles in multiple cities throughout the nation.

The final reviewer found that this project will not directly displace petroleum by putting vehicles on the road, but it will definitely help meet the displacement goals by educating and making people aware of alternative fuels.

Question 2: What is your assessment of the approach to performing the work? To what degree are technical barriers addressed? Is the project well-designed, feasible, and integrated with other efforts?

The first reviewer described the strategy this project has to educate and train people as excellent. This reviewer added that information about alternative fuels will be distributed effectively around the country through face-to-face workshops, marketing material, and train-the-trainer activities.

Another reviewer indicated that the strategy for deployment appears sound and workable with both first responder training and National AFV Day completed. The Petroleum Reduction Technologies workshops are ongoing, continued this reviewer, and include a number of different modules that take time to develop. But the reviewer also pointed out that the project appears to be behind schedule considering that the program has been ongoing since 2009.

The third reviewer observed that training is being provided for both trainers and first responders, and that direct public outreach, the website, and the online toolbox will reach potential vehicle purchasers.

The fourth reviewer expressed that the materials have been and are being reviewed by numerous parties, but questioned whether the communications strategy was such to promote wide acceptance of the modules. This reviewer inquired about how NAFTC would know the impact of the petroleum reduction manuals, and queries if there is a tracking system to know which communities, schools, etc., have used one or more of the modules. This reviewer assumed that an evaluation has been developed. Further, the same reviewer noted that the instructor guides do not have talking points, and queried how the training will reach greater audiences at high success rates if the instructors do not have clear instructions.

Question 3: Characterize your understanding of the technical accomplishments and progress toward overall project and DOE goals.

One reviewer stated that the project has made solid progress to date but do appear to be a bit behind on the introduction of Petroleum Reduction Course. The program has been ongoing since 2009 and would have been close to completion, but additional funding to revise and update specifically for vehicle recovery operation and salvage yard workers in regards to AFVs has pushed it back until 2013. This is the first responder part of the grant, not part of the petroleum reduction technologies program.

Another reviewer added that the training materials that have been prepared and the training through workshops and webinars including first responder training show very good progress for this project. A third reviewer noted that the project has delivered numerous workshops and webinars, first-responder training, and an AFV Odyssey Day report. The reviewer also observed a long list of publications and presentations. The final reviewer observed that the technical materials developed are extensive, peer reviewed, and meet the objectives of the grant.

Question 4: What is your assessment of the level of collaboration and coordination with other institutions?

Reviewers noted good collaboration across a wide range of stakeholders. The first reviewer stated that the project has very good collaboration with a variety of training centers, Clean Cities coalitions, and industry partners. A second reviewer added that the project has numerous partners that span a number of organization types and this is a very strong component of the program. The third reviewer also noted that the project is collaborating and coordinating with multiple community colleges, Clean Cities coalitions, and relevant industry partners.

A fourth reviewer noted that the project has collaboration with 12 NAFTC universities, 10 industry partners, and 12 Clean Cities. Additional collaboration is also underway with first responder associations, national educational associations at high schools and beyond who could help them benefit from the modules. According to this reviewer, the communications plan is currently being developed and could take care of reaching multiple audiences, and collaboration with OEMs is not extensive. This reviewer inquires if there was review by OEMs on the first responder manual.

Question 5: Has the project effectively planned its future work in a logical manner by incorporating appropriate decision points, considering barriers to the realization of the proposed technology, and, when sensible, mitigating risk by providing alternate development pathways?

One reviewer remarked that the planned future activities that will continue to educate the public through workshops and webinars will continue to make this project a success.

The second reviewer observed an appropriate continuation of existing outreach, education, and training activities. This reviewer added that recovery and salvage workers are suitable future targets for outreach, education and training.

A third reviewer found that the increased funding requires more time to finish the project and calls for more trainings.

According to the final reviewer, future activities include offering additional first responder training. This reviewer would like to know how additional revenue streams will be developed to pay to upgrade to the extensive modules. Much effort and resources

have gone into the modules for both the first responder and petroleum reduction training so it would be unfortunate if the materials could not be distributed far and wide and updated as appropriate.

Question 6: How sufficient are the resources for the project to achieve the stated milestones in a timely fashion?

All reviewers found resources to be sufficient. One commenter indicated that the increased scope required additional funds but that the existing resources appeared to be sufficient to finish the jobs required.

Another reviewer added that milestones are being met on a timely basis, but that the program is multifaceted and complicated. It was not clear to this reviewer that the modules would be promoted to a wider audience for greater use. This reviewer is not sure why the communications plan is being developed late in the grant cycle. It may be difficult to complete 38 workshops, 8 webinars, and 6 additional first responder trainings and an Odyssey Day Event by the end of FY 2013.

Section Acronyms

The following list of Acronyms cited within this section is provided as a reference for readers.

Acronym	Definition
ACUA	Atlantic County Utilities Authority
AFV	Alternative Fuel Vehicle
AMR	Annual Merit Review
APU	Auxiliary power unit
AQMD	Air Quality Management District
ARRA	American Recovery and Reinvestment Act
ASE	Automotive Service Excellence
B20	Biodiesel blend of 20% neat biodiesel
BD	Biodiesel
BPU	Board of Public Utilities
CAN	Controller Area Network
CARB	California Air Resources Board
CC	Clean Cities
CCSF	City College of San Francisco
CEC	California Energy Commission
CEC	Clean Energy Coalition
CEQA	California Environmental Quality Act
CMAQ	Congestion Mitigation and Air Quality Program
CNG	Compressed Natural Gas
CO2	Carbon dioxide
CTE	Career and technical education
DC	Direct Current
DEG	Diesel equivalent gallons
DEP	Department of Environmental Protection
DOE	Department of Energy
E85	85 percent Ethanol blend with gasoline
EFG	EV quick reference guide
EMS	Emergency medical services
EMT	Emergency medical technician
EPA	Environmental Protection Agency
EV	Electric Vehicle
EVSE	Electric Vehicle Supplemental (Supply) Equipment
FCV	Fuel cell vehicles
FOA	Funding Opportunity Announcement
FTE	Full time equivalent
GATE	Graduate Automotive Technology Education
GGE	Gasoline Gallon Equivalent
GHG	Greenhouse Gases

Acronym	Definition
GIS	Geographic Information Systems
GM	General Motors Corporation
gpy	Gallons Per Year
GTI	Gas Technology Institute
GVPD	Global Vehicle Development Process
H2	Hydrogen
HD	Heavy-Duty
HDV	Heavy-Duty Vehicle
HEV	Hybrid Electric Vehicle
IACP	International Association of Chiefs of Police
ICTC	Interstate Clean Transportation Corridor
INDOT	Indiana Department of Transportation
KCFC	Kentucky Clean Fuels Coalition
Kg	Kilogram
L	Liter
LDV	Light Duty Vehicle
LFG	Landfill Gas
LIE	Long Island Expressway
LNG	Liquefied Natural Gas
LPG	Liquefied Petroleum Gas
MD	Medium-Duty
MDV	Medium-Duty Vehicle
MEDC	Michigan Economic Development Corporation
MPG	Miles Per Gallon
MV1	A para-transport Vehicle Model
NAFTC	National Alternative Fuels Training Consortium
NEED	National Energy Education Development
NEPA	National Environmental Protection Agency
NEV	Neighborhood Electric Vehicle
NFPA	National Fire Protection Association
NGV	Natural Gas Vehicle
NOx	Oxides of Nitrogen
OEM	Original Equipment Manufacturer
PEV	Plug-in electric vehicle
PI	Principal Investigator
PM	Particulate matter
PR	Public relations
PUC	Public Utilities Commission
R&D	Research and Development
RFID	Radio Frequency Identification
RFP	Request for Proposal

Acronym	Definition
RNG	Renewable Natural Gas
ROI	Return on Investment
SANBAG	San Bernardino Associated Governments
SCAQMD	South Coast Air Quality Management District
SEO	State Energy Office
SME	Subject Matter Expert
UM	University of Michigan
UPS	United Parcel Service
VT	Vehicle Technologies
VTP	Vehicle Technologies Program
WM	Waste Management
WVU	West Virginia University