(1) Location	(2) Nature of Location	(3) BP1-BP2 Activities (Thru Mod 0009)	(4) BP3-BP5 Activities (Mod 0010)	(5) Land Administration
(PRIME) American Institute of Chemical Engineers, 120 Wall Street 23rd Fl., New York, NY 10005	Commerical office space	(HQ) Project administration for all sub-tasks in SOPO and other management activities including technical education and workforce development program	(HQ) Project administration for all sub-tasks in SOPO and other management activities including technical education and workforce development program	Private
The University of Alabama Dept. Met. & Matls Eng., NERC Building Tuscaloosa, AL35487	Dedicated University Laboratory Facility	**Task 8.7** Activities include electrochemical separation of metal from scrap using ionic liquids. Materials will be characterized using XRD, SEM, TEM and wet chemical methods. The work will be carried out untilizing the facilities and infrstrucural support housed in the NERC Research Building at the University of Alabama.	**Task 8.7** Continuing partner and activities that started in BP2. Activities include electrochemical separation of metal from scrap using ionic liquids. Materials will be characterized using XRD, SEM, TEM and wet chemical methods. The work will be carried out untilizing the facilities and infrstrucural support housed in the NERC Research Building at the University of Alabama.	State, University Campus
Apache		**Task 8.4** Only intellectual, academic, and analytical activities (no location needed)	**Tasks 8.4 and 8.8** (excluding task 8.8.11). Activities are only intellectual, academic, and analytical activities (no location needed)	
University of Arizona WEST Center2959 W. Calle Agua NuevaTucson, AZ 85745	WEST Center – Dedicated University Laboratory Facility	**Task 3.2.4** Activities would include desing, development, pilot-testing of a membrane-based process intensification face-to-face short course.	**Task 3.2.4** . Continuing partner that started in BP2 and has been a project partner since. BP3-BP5 Activities would include desing, development, pilot-testing of a membrane-based process intensification face-to-face short course.	WEST Center – State property
Auburn University, Department of Chemical Engineering, 212 Ross Hall, Auburn, AL 36849	University campus	**Task 8.4** Data/model development and analysis, process simulation/optimization studies, analytical evaluations, proof of concept verifications, feasibility estimations, and document preparation **Task 9.3** Data/model development and analysis, process simulation/optimization studies, and document preparation **Task 10.6** Data/model development and analysis, process simulation/optimization studies, and document preparation, analytical and thermodynamic analyses of catalyst samples and their vapor-liquid equilibrium working enviconments for feasibility purposes.	**Task 8.4, 9.3, and 10.6 are** Continuing from BP2. Activities include; **Task 8.4** Data/model development and analysis, process simulation/optimization studies, analytical evaluations, proof of concept verifications, feasibility estimations, and document preparation **Task 9.3** Data/model development and analysis, process simulation/optimization studies, and document preparation **Task 10.6** Data/model development and analysis, process simulation/optimization studies, and document preparation, analytical and thermodynamic analyses of catalyst samples and their vapor-liquid equilibrium working enviconments for feasibility purposes.	State of Alabama (land-grant university)
Clemson University Earle Hall 206 S. Palmetto BlvdClemson, SC	Dedicated University Building for Teaching and Research	**Task 2.7** Activities will include the development of mathematical models for chemical processes, computer code for simulating and optimizing these models, and dissemination activities (preparing papers, reports, presentations, etc.)	**Task 2.7.** Continuing partner that started in BP2. Activities will include the development of mathematical models for chemical processes, computer code for simulating and optimizing these models, and dissemination activities (preparing papers, reports, presentations, etc.)	State
Compact Membrane Systems (CMS) 5.7335 Water StNewport DE 19083	Industrial, Dedicated	**Task 5.7** Activities will include fabrication and analysis of a membrane devices including small discs, modules, and testing rigs	**Task 5.7**: Continuing partner that started in BP2. Activities will include fabrication and analysis of a membrane devices including small discs, modules, and testing rigs	private
Carnegie Mellon University Doherty Hall5000 Forbes Avenue Pittsburgh, PA 15213	University campus, Pittsburgh, PA	**Task 9.4** Optimization, software development, data analysis, modeling, and document preparation	**Task 9.4.** Continuing partner that started in BP2. Activies include optimization, software development, data analysis, modeling, and document preparation	Private

University of Delaware 250M ISEB Newark, Delaware 19716	Dedicated University Research and Development Facility	**Task 8.1** (FA) Leader for Focus Area - Intensified Process Fundamentals	**Task 8.1** Continuing partner that started in BP1 and has been a project partner since. Only intellectual, academic, and analytical activities (no location needed)	University
University of Delaware 355 ISE Laboratory 221 Academy Street Newark, DE 19716	Dedicated University Laboratory Facility	**Task 6.5** Activities will include the development computational models to predict thermodynamic and reactivity properties of oxides **Task 7.6** Activities will include design fabrication and testing of microreactors for laboratory scale bio-paraxylene production from biomass glucose. **Task 8.3** Activities will include design fabrication and testing of microreactors for laboratory scale bio-paraxylene production from biomass glucose. **Task 9.5** Software, database, mechanism building, and testing as outlined in the proposal.	**Task 6.5, 7.6, 8.3, and 9.5** Continuing partner that started in BP2 and has been a project partner sinceTask 6.5 Activities will include the development computational models to predict thermodynamic and reactivity properties of oxides **Task 7.6** Activities will include design fabrication and testing of microreactors for laboratory scale bio-paraxylene production from biomass glucose. **Task 8.3** Activities will include design fabrication and testing of microreactors for laboratory scale bio-paraxylene production from biomass glucose. **Task 9.5** Software, database, mechanism building, and testing as outlined in the proposal.	University of Delaware
University of Delaware 150 Academy Street, Colburn Laboratory, Newark, DE 19716	Dedicated University Laboratory Facility	**Task 6.5** Activities will include fabrication and evaluation of chemical looping reactors for methane, ethane and propane upgrade.	**Task 6.5:** Continuing partner that started in BP2 and has been a project partner since. BP3-BP5 Activities will include fabrication and evaluation of chemical looping reactors for methane, ethane and propane upgrade.	University of Delaware
University of Delaware Ogunnaike Laboratory 269 CLB Newark, DE 19716	Dedicated University Computer Laboratory	**Task 7.7** Calculations and simulations of reactive distillation column.	**Task 7.7** Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activites include Calculations and simulations of reactive distillation column.	State of Delaware
Dow Chemical The Dow DiamondCenter, 270 AbnerJackson Parkway, Texas 288 Frontage Road, Lake Jackson, TX 77566	Corporate building with laboratory and office space for industry partner of the project	**Task 5.4** Activities will include data analysis, processsimulation and validation of theoretical results	**Task 5.4** Continuing partner that started in BP2 and has been a project partner since. BP3-BP5 Activities will include data analysis, processsimulation and validation of theoretical results	Privately owned.
The Dow Chemical Company Freeport, TX	Existing Research Facilities in Dow Texas Operations Facility (Industrial Complex)	**Task 5.7, 6.5, 9.3, 9.4, and 9.5** Consulting, data analysis, modeling, and document preparation	**Task 5.7 (exluding Task 5.7.4, 5.7.8 & 5.7.14), 6.5, 9.3, 9.4, and 9.5** Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities are Consulting, data analysis, modeling, and document preparation. A separate EQ1 will be submitted for any field work in project 5.7	Private
The Dow Chemical Company Midland, MI	Existing Research Facilities in Dow Michigan Operations Facility (Industrial Complex)	**Task 6.5, 9.3, 9.4, and 9.5** Consulting, data analysis, modeling, and document preparation	**Task 6.5, 9.3, 9.4, and 9.5** Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities are Consulting, data analysis, modeling, and document preparation.	Private
The Dow Chemical Company Plaquemine, LA	Existing Research Facilities in Dow PlaquemineOperations Facility (Industrial Complex)	**Task 5.7** Consulting, data analysis, modeling, lab test, and document preparation	**Task 5.7 (exluding Task 5.7.8 & 5.7.14), 6.5, 9.3, 9.4, and 9.5** Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities are Consulting, data analysis, modeling, and document preparation. A separate EQ1 will be submitted for any field work in project 5.7	Private
EcoCatalytic LLC		**Task 5.6** Only intellectual, academic, and analytical activities (no location needed)	**Task 5.6**: Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities are Only intellectual, academic, and analytical activities (no location needed)	
ExxonMobil's Research and Engineering (EMRE) Technology Center, 1545 Rt 22, Annandale, New Jersey.	Industrial	**Task 5.5 and 8.5** Activities will include modelling, optimization, fabrication, testing and x-ray based characterization of membrane/catalyst systems	**Task 5.5 and 8.5** Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 Activities will include modelling, optimization, fabrication, testing and x-ray based characterization of membrane/catalyst systems.	Private

FAST International 620 Boston St. LaPorte, IN 46350	Company Laboratory Facility	**Task 7.5** Activities will include development and fabrication of GO membrane modules using GO membranes developed at the Georgia Tech site.	**Task 7.5** : Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities will include development and fabrication of GO membrane modules using GO membranes developed at the Georgia Tech site.	City
Georgia Institute of Technology 311 Ferst Drive NW Atlanta, GA 30332-0100	Dedicated University Research and Development Facility	**Task 9.1** (FA) Leader for Focus Area - Modeling & Simulation	**Task 9.1** Continuing partner that started in BP1 and has been a project partner since - BP3-BP5 activities are only intellectual, academic, and analytical (no location needed)	University
Georgia Institute of Technology Renewable Bioproducts Institute 500 10th St NW, Atlanta GA 30332	Dedicated University Laboratory Facility	**Task 7.5** Activities will include development and testing of GO membranes to concentrate black liquor feed streams.	**Task 7.5**: Continuing partner that started in BP2 and has been a project partner since. BP3-BP5 activities will include development and testing of GO membranes to concentrate black liquor feed streams	City
Georgia Institute of Technology School of Chemical & Biomolecular Engineering, 311 Ferst Drive, Atlanta, GA 30332	Dedicated University Laboratory Facility	**Task 9.6** Lab-scale testing of porous adsorbents for gases, vapors and liquids	**Task 9.6:** Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities include Lab-scale testing of porous adsorbents for gases, vapors and liquids	State
Georgia Institute of Technology Systems Laboratory, Woodruff School of Mechanical Engineering 771 Ferst Drive, Atlanta GA 30332	Research Laboratory,the campus of theGeorgia Institute ofTechnology, Atlanta GA	**Task 10.5** Laboratory-scale investigations of heat transfer enhancement.	**Task 10.5:** Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities include laboratory-scale investigations of heat transfer enhancement.	University System ofGeorgia
University of Houston S222 Engineering Bldg 1 4726 Calhoun Rd Houston, TX 77204-4004	Dedicated University Research and Development Facility	**Task 5.1** (FA) Leader for Focus Area- Chemical and Commodity Processing	**Task 5.1** Continuing partner that started in BP1 and has been a project partner since. Only intellectual, academic, and analytical activities (no location needed)	University
Heat Transfer Research,Inc. (HTRI) 165 Research Drive Navasota, TX 77868	Research andTechnology Center,Laboratory and BusinessOffice activities,Navasota TX	**Task 10.5** Research, laboratory work, data collection and business office operations. Heat exchanger will be operated attemperatures, pressures and flowrates to be determined with single component and binary process fluids.	**Task 10.5.** Continuing partner that started in BP2 and has been a project partner since. BP3-BP5 activities include Research, laboratory work, data collection and business office operations. Heat exchanger will be operated attemperatures, pressures and flowrates to be determined with single component and binary process fluids.	Private
Idaho National Laboratory Energy Innovation Laboratory775 University Blvd. Idaho Falls, ID 83401	Dedicated laboratory facility (leased)	**Task 8.7** Activities will be performed using existing small scale experimental equipment. Electrochemical cell testing will be performed at a small scale (100 mL or less) to minimize cost and materials usage. Other activities will involve system modeling involving existing computer capabilities.	**Task 8.7**: Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 Activities will be performed using existing small scale experimental equipment. Electrochemical cell testing will be performed at a small scale (100 mL or less) to minimize cost and materials usage. Other activities will involve system modeling involving existing computer capabilities.	DOE, leaseholder
IntraMicron, Inc. 368 Industry Drive,Auburn, AL 36832	Fiber Production Facility, Laboratory, and Office	**Task 8.4** Activities will include production and characterization of micro-diameter metal fiber. **Task 10.6** OSR lab experiments and data analysis	**Task 8.4 and 10.6** Continuing partner that started in BP2 and has been a project partner since - New BP3-BP5 activities are the same type and scale as previously reviewed activities.	Private
IntraMicron, Inc. 354 Industry Drive,Auburn, AL 36832	MFEC Manufacturing and Reactor Loading Facility	**Task 8.4** Activities will include the production of microfibrous media (wet-laid sheet formation, sintering) and the loading of microfibrous entrapped sorbent (MFES) reactors. **Task 10.6** OSR catalyst production	**Task 8.4 and 10.6** Continuing partner that started in BP2 and has been a project partner since - New BP3-BP5 activities: **Task 8.4** Activities will include the production of microfibrous media (wet-laid sheet formation, sintering) and the loading of microfibrous entrapped sorbent (MFES) reactors. **Task 10.6** OSR catalyst production	Private

IntraMicron, Inc. 28°21'40.5"N, 99°28'01.8"W Dimmit County, Texas	Pilot OSR T&E site	**Task 10.6** Collection of OSR performance data with perhaps a bit data analysis.	**TASK 10.6** Continuing partner that started in BP2 and has been a project partner since -BP3-BP5 activities - Collection of OSR performance data with perhaps a bit data analysis.	Private
SourGas 28°21'40.5"N, 99°28'01.8"W Dimmit County, Texas	Pilot OSR T&E site	**Task 10.6** Collection of OSR performance data with perhaps a bit data analysis.	**TASK 10.6** Continuing partner that started in BP2 and has been a project partner since -BP3-BP5 activities - Collection of OSR performance data with perhaps a bit data analysis.	Private
Iowa State University 1140E Biorenewables Laboratory Building 617 Bissell Road	Dedicated University Research and Development Facility	**Task 7.1** (FA) Leader for Focus Area - Renewable Bioproducts	**Task 7.1** Continuing partner that started in BP1 and has been a project partner since. Only intellectual, academic, and analytical activities (no location needed)	University
Iowa State University BioCentury Research Farm 1327 U Avenue Boone, IA 50036	Dedicated University Research and Development Facility	**Task 7.4** Pilot testing of continuous pretreatment of biomass using dilute sulfuric acid. Pilot testing of autothermal pyrolysis of pretreated biomass.	**Task 7.4** Continuing partner that started in BP1 and has been a project partner since - BP3-BP5 activities are Pilot testing of continuous pretreatment of biomass using dilute sulfuric acid. Pilot testing of autothermal pyrolysis of pretreated biomass.	University
Iowa State University Biorenewables Research Laboratory 617 Bissell Rd Ames, IA 50011-1098	Dedicated University Research and Development Facility	**Task 7.4** Initial physical and chemical characterization of the feedstock, including alkali content to determine required pretreatment levels. Chemical characterization of pyrolysis products such as ash, moisture, and sugar content in liquid products. Developing designs of demonstration-scale modules for previously tested unit operations in collaboration with Subrecipient Easy Energy Systems. Techno-economic analysis of the proposed system will also be conducted at this site.	**Task 7.4** Continuing partner that started in BP1 and has been a project partner since - BP3-BP5 activities include Initial physical and chemical characterization of the feedstock, including alkali content to determine required pretreatment levels. Chemical characterization of pyrolysis products such as ash, moisture, and sugar content in liquid products. Developing designs of demonstration-scale modules for previously tested unit operations in collaboration with Subrecipient Easy Energy Systems. Techno-economic analysis of the proposed system will also be conducted at this site.	University
Lubrizol Corporation Pilot Plant Facilities 29400 Lakeland Blvd Wickliffe, Ohio	Existing pilot scale laboratory facility	**Task 5.8** Activities will include acquisition of reaction kinetics for a set of dispersant chemistries; operation of laboratory-scale continuous tubular and cavitation reactors; evaluation of continuous thin-film strippinf and filtration; and modeling and	**Task 5.8** (excluding pilot plant construction and operation tasks 5.8.14, 5.8.16, 5.8.18) : Continuing partner that started in BP2 and has been a project partner since - New BP3-BP5 activities will include acquisition of reaction kinetics for a set of dispersant chemistries; operation of laboratory-scale continuous tubular and cavitation reactors; evaluation of continuous thin-film strippinf and filtration; and modeling	
Membrane Specialists LLC 2 Rowe Court,. Hamilton, OH 45015	Company Office, Workshop and Warehousing	**Task 7.5** Consultancy and advisory input to project activities via teleconference, or by visits to Georgia Tech site.	**Task 7.5**: Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities include Consultancy and advisory input to project activities via teleconference, or by visits to Georgia Tech site.	City of Hamilton
Metcer Coating Solutions Research Laboratory 200 West M.L.King Blvd., Suite 1000, Chattanooga, TN 37402	DedicatedLaboratory Facility	**Task 8.7** Engineering support activities will be performed withexisting equipment. Product characterization will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the existing computer facilities for process modelling, process optimization and lab to pilot scale test transition design.	**Task 8.7:** Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities include Engineering support activities will be performed withexisting equipment. Product characterization will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the existing computer facilities for process modelling, process optimization and lab to pilot scale test transition design.	City
University of Michigan 3020 H.H. Dow Building Ann Arbor, MI 48109	Dedicated University Research and Development Facility	**Task 6.1** (FA) Leader for Focus Area- Natural Gas Upgrading	**Task 6.1** Continuing partner that started in BP1 and has been a project partner since. Only intellectual, academic, and analytical activities (no location needed)	University

University of Michigan North Campus Research Complex (NCRC) 2800 Plymouth Road,Ann Arbor, Michigan.	University of Michigan Campus	**Task 8.5** Activities will include design, fabrication, x-ray/microscopy based characterization and testing of membrane/catalyst systems.	**Task 8.5**: Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities will include design, fabrication, x-ray/microscopy based characterization and testing of membrane/catalyst systems.	State
University of Minnesota CHARACTERIZATION FACILITY 12 Shepherd Labs100 Union St. S.E.Minneapolis, MN 55455	Dedicated University Laboratory Facility	Task 5.5 Activities will include the characterization of membarnes using x-ray diffraction and electron microscopy.	**Task 5.5:** Continuing partner that started in BP2 and has been a project partner since . BP3-BP5 Activities will include the characterization of membarnes using x-ray diffraction and electron microscopy.	State, private
University of Minnesota 209 Kaufert Laboratory 2004 Folwell Ave.	Dedicated University Research and Development Facility	**Task 7.1** (FA) Leader for Focus Area - Renewable Bioproducts	**Task 7.1** Continuing partner that started in BP1 and has been a project partner since. Only intellectual, academic, and analytical activities (no location needed)	University
University of Minnesota DEPARTMENT OF CHEMICAL ENGINEERING AND MATERIALS SCIENCEAmundson Hall 440 and 481421 Washington Ave. SE, Minneapolis, MN 55455-0132	Dedicated University Laboratory Facility	**Task 5.5** Activities will include fabrication and performance testing of zeolite membranes on porous ceramic supports. Hydrothermal synthesis will be performed in Parr autoclaves, with typical volumes of 50-100cc, at temperatures of up to 180oC and autogeneous pressure. The authoclaves will be placed in ovens that are located inside walk-in hoods. Membrane performance testing (permeation rate measurements) will be performed using an atmospheric pressure permeation set up located inside a hood. Typical flowrates of the mixture fed to the membrane during testing are 100cc/min (STP) of He/xylene mixtures with xylene partial pressure of up to 20kPa.	**Task 5.5:** Continuing partner that started in BP2 and has been a project partner since. BP3-BP5 Activities will include fabrication and performance testing of zeolite membranes on porous ceramic supports. Hydrothermal synthesis will be performed in Parr autoclaves, with typical volumes of 50-100cc, at temperatures of up to 180oC and autogeneous pressure. The authoclaves will be placed in ovens that are located inside walk-in hoods. Membrane performance testing (permeation rate measurements) will be performed using an atmospheric pressure permeation set up located inside a hood. Typical flowrates of the mixture fed to the membrane during testing are 100cc/min (STP) of He/xylene mixtures with xylene partial pressure of up to 20kPa.	State, private
University of Minnesota Department of Chemical Engineering and Materials Science Amundson Hall 421 Washington Ave SEMinneapolis MN 55455	Academic Institution	**Task 5.7** Computer simulations and mathematical analysis.	**Task 5.7:** Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities include computer simulations and mathematical analysis.	State, private
University of Minnesota Dauenhauer Laboratory 432 Amundson Hall 421 Washington Ave. SE Minneapolis, MN 55455	Dedicated University Laboratory Facility	**Task 7.7** Activities will include liquid phase catalysis experiments and kinetic measurements. Liquids sampled from small reactors (<1 L) will be analyzed by chromatography. Catalyst particles (<1 gram) will be analyzed via spectroscopy and titration.	**Task 7.7:** Continuing partner that started in BP2 and has been a project partner since. BP3-BP5 Activities will include liquid phase catalysis experiments and kinetic measurements. Liquids sampled from small reactors (<1 L) will be analyzed by chromatography. Catalyst particles (<1 gram) will be analyzed via spectroscopy and titration.	State of Minnesota
North Carolina State University EB I911 Parners WayRaleigh NC. 27606	DedicatedUniversityLaboratory Facility	**Task 5.6** Activities will include synthesis, chericterization, and reaction testing of redox catalyst for the oxidative dehydrogenation of ethane. Subtasks will also include reaction testing of enthylene oligomerization to liquid fuels.	**Task 5.6:** Continuing partner that started in BP2 and has been a project partner since. BP3-BP5 Activities will include synthesis, chericterization, and reaction testing of redox catalyst for the oxidative dehydrogenation of ethane. Subtasks will also include reaction testing of enthylene oligomerization to liquid fuels.	NCSU/State
North Carolina State University EB III911 Oval Dr,Raleigh, NC NC 27606	DedicatedUniversityLaboratory Facility	**Task 5.6** Activities will include and the combustion of hydrocarbon rich exaust gas in an spark ingintion engine.	**Task 5.6:** Continuing partner that started in BP2 and has been a project partner since. BP3-BP5 Activities will include and the combustion of hydrocarbon rich exaust gas in an spark ingintion engine.	NCSU/State
NETL 3610 Collins Ferry Rd, Morgantown, WV 26505	NETL research laboratory owned by DOE. It is located in Morgantown, WV.	**Task 6.7** Activities will include microwave reactor design and testing at small scale. A bench scale demonstration will be performed using variable frequency microwave plasma reactor.	Continuing partner that started in BP2 and has been a project partner since - New BP3-BP5 activities are the same type and scale as previously reviewed activities.	Government Owned

Oregon State University Advanced Technology and Manufacturing Institute (ATAMI) 1110 NE Circle Blvd Corvallis, Oregon 97330	User facility with design, build and test laboratories	**Task 10.1** (FA) Leader for Focus Area - Module Manufacturing, Cost modelling, component design, material studies **Task 10.4** Cost modelling, component design, material studies **Task 10.6** Activities will include developing cost models andconducting experimental validation of consequent near-term and long-term strategies for producing microfibercomponents and modules **Task 8.4** Activities will include developing cost models and conducting experimental validation of consequent near-term and long-term strategies for producing microfiber components and modules **Task 8.6** Fabrication and testing of separator hardware technology	**Task 10.1, 10.4, 10.6, 8.4, and 8.6** Continuing partner that started in BP1 and has been a project partner since. BP3-BP5 activities include: **Task 10.1** (FA) Leader for Focus Area - Module Manufacturing, Cost modelling, component design, material studies **Task 10.4** Cost modelling, component design, material studies **Task 10.6** Activities will include developing cost models andconducting experimental validation of consequent near-term and long-term strategies for producing microfibercomponents and modules **Task 8.4** Activities will include developing cost models and conducting experimental validation of consequent near-term and long-term strategies for producing microfiber components and modules **Task 8.6** Fabrication and testing of separator hardware technology	Hewlett Packard(OSU has a 25 year lease on this facility from HewlettPackard)
Oregon State University		**Task 3.2.3** Only intellectual, academic, and analytical activities (no location needed)	**Task 3.2.3:** Continuing partner that started in BP2 and has been a project partner since. BP3-BP5 activities are Only intellectual, academic, and analytical activities (no location needed)	
Oregon State University CBEE, Gleeson Hall2115 SW Campus WayCorvallis, OR 97331	Oregon State University chemical engineering laboratory	**Task 8.6** Chemical treatment and numerical simulation	**Task 8.6:** Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities include Chemical treatment and numerical simulation	State of Oregon
University of Pittsburgh 931 Benedum Hall Pittsburgh, PA 15261	Dedicated University Research and Development Facility	**Task 6.1** (FA) Leader for Focus Area- Natural Gas Upgrading	**Task 6.1** Continuing partner that started in BP1 and has been a project partner since. Only intellectual, academic, and analytical activities (no location needed)	University
University of Pittsburgh Veser Laboratory 913 Benedum Hall,Pittsburgh, PA	DedicatedUniversityLaboratory Facility	**Task 5.8** Activities will include acquisition of reaction kinetics for a set of dispersant chemistries; operation of laboratory-scale continuous tubular and cavitation reactors; evaluation of continuous thin-film strippinf and filtration; and modeling and simulation of reactor or process.	**Task 5.8:** Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 Activities will include acquisition of reaction kinetics for a set of dispersant chemistries; operation of laboratory-scale continuous tubular and cavitation reactors; evaluation of continuous thin-film strippinf and filtration; and modeling and simulation of reactor or process.	Private
University of Pittsburgh 940 Benedum Hall Pittsburgh, PA 15260	Dedicated University Laboratory Facility	**Task 6.7** Activities will include catalyst formulation development, synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst characterization will also be performed at University of Pittsburgh	**Task 6.7:** Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 Activities will include catalyst formulation development, synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst characterization will also be performed at University of Pittsburgh	Private owned
Pacific Northwest National Laboratory, Richland WA 99352	Dedicated Federal Laboratory Space	**Task 10.1** (FA) Co -Leader for Focus Area - Module Manufacturing **Task 10.4** Cost modelling, component design, material studies, fabrication subcontracts	**Task 10.1 and 10.4** Continuing partner that started in BP1 and has been a project partner since - BP3-BP5 Task 10.1 (FA) Co -Leader for Focus Area - Module Manufacturing Task 10.4 Cost modelling, component design, material studies, fabrication subcontracts	DOE
Process Systems Enterprise (PSE)		**Task 9.3 and 9.5** Only intellectual, academic, and analytical activities (no location needed)	**Task 9.3 and 9.5** Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities are Only intellectual, academic, and analytical activities (no location needed)	

Rutgers University Department of Chem. Eng. C148 laboratory 98 Brett Road Piscataway, NJ	Dedicated University Laboratory Facility	**Task 8.3** Activities will includea) spectroscopic characterization of materials preparedb) catalytic evaluation of materials prepared	**Task 8.3:** Continuing partner that started in BP2 and has been a project partner since. BP3-BP5 Activities will includea) spectroscopic characterization of materials preparedb) catalytic evaluation of materials prepared	State University	
Rutgers University Department of Chem. Eng. C253 laboratory 98 Brett Road Piscataway, NJ	Dedicated University Laboratory Facility	**Task 8.3** Activities will include the lab-scale synthesis of various catalytic materials. Computational activities including process simulation and optimization	**Task 8.3:** Continuing partner that started in BP2 and has been a project partner since. BP3-BP5 Activities will include the lab-scale synthesis of various catalytic materials. Computational activities including process simulation and optimization	State University	
Secat Inc. Process Laboratory1505 Bull Lea Road Lexington, KY 40511	DedicatedLaboratory Facility	**Task 8.7** Activities will be performed using existing equipment. The Al scap electrode materials fabrication and characterization will be performed. Process efficiency will be assessed using the existing process calculation facilities.	**Task 8.7:** Continuing partner that started in BP2 and has been a project partner since. BP3-BP5 Activities will be performed using existing equipment. The Al scap electrode materials fabrication and characterization will be performed. Process efficiency will be assessed using the existing process calculation facilities.	City	
Shell Technology Center Houston 3333, Highway 6 South Houston TX-77082	Industrial Site - currently operational	**Task 9.3** Activities will include methane pyrolysis experiments and analysis of produced solid carbon	**Task 9.3** (exluding tasks Task 9.3.16, 9.3.17): Continuing partner that started in BP2 and has been a project partner since. BP3-BP5 Activities will include methane pyrolysis experiments and analysis of produced solid carbon	Private	
Shell		**Task 6.7** Only intellectual, academic, and analytical activities (no location needed)	**Task 6.7**: Continuing partner that started in BP2 and has been a project partner since. BP3-BP5 activities are Only intellectual, academic, and analytical activities (no location needed)		
Sironix Renewables 454 N. 34th Street Seattle, WA 98103	Shared laboratory research building	**Task 7.7** Activities include operation of a bench scale reactive distillation column. Analysis of liquids via chromatography.	**Task 7.7**. Continuing partner that started in BP2 and has been a project partner since. BP3-BP5 Activities include operation of a bench scale reactive distillation column. Analysis of liquids via chromatography.	Private Ownership of Building by Icogenex	
Savannah River National Laboratory (2.7)		**Task 2.7** Only intellectual, academic, and analytical activities (no location needed)	**Task 2.7**: Continuing partner that started in BP2 and has been a project partner since. BP3-BP5 Only intellectual, academic, and analytical activities (no location needed)		
Texas A&M University 3122 TAMU Room 200 College Station, TX 77843-3122	Dedicated University Research and Development Facility	**Task 9.1** (FA) Leader for Focus Area - Modeling & Simulation	**Task 9.1** Continuing partner that started in BP1 and has been a project partner since. Only intellectual, academic, and analytical activities (no location needed)	University	
Texas A&M University Frederick E. Giesecke Engineering Research Building 1617 Research PkwyCollege Station, TX 77843-3372	University Campus	**Task 9.3** Activities will include computational model preparation, design, and analysis – based exclusively in silico.	**Task 9.3** Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 Activities will include computational model preparation, design, and analysis – based exclusively in silico.	State	
Texas Tech University MER 212 and 209 labs located,2500 Broadway, Lubbock, TX 79409	Laboratories on Texas Tech University campus – Good condition.	**Task 2.7** Activities would include design, development, testing and documentation of novel process modeling methodology and process models for intensified chemical processes. Planning, design, development, testing and documentation activities would occur in laboratories on Texas Tech University's campus at 2500 Broadway, Lubbock, Texas 79409.	**TAsk 2.7**: Continuing partner that started in BP2 and has been a project partner since. BP3-BP5 Activities would include design, development, testing and documentation of novel process modeling methodology and process models for intensified chemical processes.	Texas Tech University – State property	ttu
University of Illinois at Urbana-Champaign(UIUC) Department of Mechanical Science and Engineering, 1206 West Green Street Urbana, IL 61801	Computing facilities,UIUC, Urbana, IL	**Task 10.5** Simulation and modeling	**Task 10.5** - (Excluding 10.5.8) Continuing partner that started in BP2 and has been a project partner since. BP3-BP5 activities are Simulation and modeling.	University of Illinois	

University of New Hampshire ,UNH John Olson Advanced Manufacturing Center121 Technology Drive Durham, NH	Dedicated University Laboratory Facility	**Task 10.4** Activities will include numerical simlations and high rate forming trials of the laminae.	**Task 10.4**. Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 Activities will include numerical simlations and high rate forming trials of the laminae.	Goss International (UNH has a 5 year lease on this facility from Goss International)
University of South Carolina Swearingen Engineering Center, Room 3C09 301 Main Street Columbia, SC 29208	Dedicated University Research and Development Facility	**Task 8.1** (FA) Leader for Focus Area - Intensified Process Fundamentals	**Task 8.1** Continuing partner that started in BP1 and has been a project partner since. Only intellectual, academic, and analytical activities (no location needed)	University
University of South Carolina Ritter Laboratory301 Main StreetColumbia, SC 29208	Dedicated University Laboratory Facility	**Task 8.4** Activities will include the design, development, fabrication and laboratory testing of pressure swaing adsorption (PSA) gas separation equipment using MFES and traditional packed beds. A "model" gas mixture will be tested consisting of CO2 and CH4. All labs are equipped with fume hoods for venting of the gas streams.	**Task 8.4:** Continuing partner that started in BP2 and has been a project partner since - New BP3-BP5 activities are the same type and scale as previously reviewed activities.	State
University of Texas at Austin 200 E Dean Keeton St. Stop Austin, TX 78712-1589	Dedicated University Research and Development Facility	**Task 5.1** (FA) Leader for Focus Area- Chemical and Commodity Processing	**Task 5.1** Continuing partner that started in BP1 and has been a project partner since. Only intellectual, academic, and analytical activities (no location needed)	University
The University of Texas at Austin McKetta Department ofChemical Engineering, 200 East Dean Keeton St., Austin, TX78712	Dedicated university building offering office space for the researchers working on the theoretical component of the project	**Task 5.4** Activities include the development of mathematical models, computer simulations and optimization calculations, as well the preparation of reports, publications and presentations.	**Task 5.4**: Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities include the development of mathematical models, computer simulations and optimization calculations, as well the preparation of reports, publications and presentations..	On the campus of The University of Texas at Austin. State property.
The University of Texas at Austin, Process Science andTechnology Center, J.J.Pickle Research Campus, 10100 Burnet Road,Austin, TX 78758	Dedicated university laboratory with pilot plant and control room facilities for research	**Task 5.4** Activities will include experimental campaigns for pilot plant testing of the operating strategies developed in the project	**Task 5.4**: Continuing partner that started in BP2 and has been a project partner since. BP3-BP5 Activities will include experimental campaigns for pilot plant testing of the operating strategies developed in the project	On the campus of The University of Texas at Austin. State property.
The University of Texas at Austin EER Building Austin TX 78712	Dedicated University Laboratory Facility	**Task 6.6** Activities will include preparation and characterization of novel nanocomposite membranes based on recently discovered metal organic framework (MOF) materials and related nanoparticles having outstanding separation properties for removal of acid gases (e.g. CO2) from natural gas.	**Task 6.6**. Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 Activities will include preparation and characterization of novel nanocomposite membranes based on recently discovered metal organic framework (MOF) materials and related nanoparticles having outstanding separation properties for removal of acid gases (e.g. CO2) from natural gas.	State
UTRC		**Task 8.3** Only intellectual, academic, and analytical activities (no location needed)	**Task 8.3:** Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities are Only intellectual, academic, and analytical activities (no location needed)	
West Virginia University Engineering Science Building at WVU 395 Evansdale Dr. Morgantown, WV 20506	Dedicated University Laboratory Facility	**Task 6.7** Activities will include small scale microwave catalytic reactor design and testing. Zeolite based, electromagnetic sensitive catalysts will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst characterization will be carried out to elucidate reaction mechanism.	**Task 6.7**: Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 Activities will include small scale microwave catalytic reactor design and testing. Zeolite based, electromagnetic sensitive catalysts will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst characterization will be carried out to elucidate reaction mechanism.	West Virginia State owned
Texas Tech University MER 115 and 212, 201D located,2500 Broadway, Lubbock, TX 79409	University Campus	Not active in BP1/BP2	**Task 8.8**. activites include characterization of water samples, studies of fouling and scaling on membrane surfaces, and Constructing MVC-MD prototype for future testing at remote sites	Texas Tech University – State property

Texas Tech University MERC RM 212 (ffice) and MERC 210 (offices) located,110 Boston Ave Lubbock, TX 79409	University Campus	Not active in BP1/BP2	**Task 8.8**. Developing first-principles thermodynamics and process simulation models; development of membrane system designs	Texas Tech University – State property
Texes Tech University, ME209 located at Mechanical Engineering 2703 7th St, Lubbock, TX 79409	University Campus	Not active in BP1/BP2	**Task 8.8**. activites include characterization of water samples, studies of fouling and scaling on membrane surfaces, and Constructing MVC-MD prototype for future testing at remote sites	Texas Tech University – State property
Universtiyh of Arkansas, Department of Chemical engineering 1475 West Cato Springs Road, Fayetteville AR 72703	Dedicated University Laboratory Facility	Not active in BP1/BP2	**Task 8.8** - Developing model produced waters for testing, membrane fouling studies, and fabricatoin of prototype testing equipment	University
University of Pittsburgh, Li Laboratory 913 Benedum Hall Pittsburgh, PA 15261	Dedicated University Laboratory Facility	Not active in BP1/BP2	**Task 10.7** - lab scale Design, fabrication and testing of 3D-printed membrane on water/organic solutions	University
Lubrizol Corporation Pilot Plant Facilities 29400 Lakeland Blvd Wickliffe, Ohio	Industrial pilot plant and chemical research facility in support of Lubrizol manufacturing	Task 10.7 not active in BP1/BP2	**Task 10.7** - Collection of wastewater for testing at the University of Pittsburgh	Private