

Summary Minutes of the
U.S. Department of Energy (DOE) and Council on Environmental Quality (CEQ)
Carbon Dioxide Capture, Utilization, and Sequestration Federal Lands Permitting Task Force
Carbon Dioxide Capture, Utilization, and Sequestration Non-Federal Lands Permitting Task Force
Joint Meeting of Appointed Members
U.S. Geological Survey (USGS), Reston, Virginia and Hybrid on Zoom
May 21–22, 2024

Summary of Meeting

The first meeting of the members of the Carbon Dioxide Capture, Utilization, and Sequestration (CCUS) Federal Lands Permitting Task Force and the CCUS Non-Federal Lands Permitting Task Force (Task Forces) was held jointly at the USGS Facility in Reston, Virginia on May 21 and 22, 2024, with additional members and observers joining virtually by Zoom. The meeting began at approximately 9 a.m. ET. Participants included 28 members of the Federal Lands Task Force and 27 members of the non-Federal Lands Task Force (refer to the appendix for a list of member participants). The meeting was attended by leadership and staff in DOE Fossil Energy and Carbon Management (FECM) and CEQ, and members of the public, press, and industry. The meeting began with opening remarks by the USGS host, CEQ Chair Brenda Mallory, DOE Assistant Secretary of FECM Brad Crabtree, Task Force Chairs, Professor Tara Righetti and Dr. Julio Friedmann, and introductions of all participating members. The first-day morning session also included presentations to provide background information on the Federal Advisory Committee Act (FACA), the USE IT Act Duties,^{1 2} Federal permitting, and progress on USE IT Act. The remainder of the meeting included presentations and discussions on issues related to the USE IT Act duties. The meeting also included a public comment period.

Day 1–May 21, 2024, 9 a.m.—4:30 p.m. Eastern Time

Opening Remarks and Introductions

Dr. David Applegate, Director, USGS, opened the meeting with a welcome to the facility and brief overview of USGS building and history.

Christina Waldron, Designated Federal Officer (DFO), Department of Energy, thanked everyone for their participation and called to order the meeting of the Permitting Task Forces at 9:10 a.m. ET. She addressed housekeeping issues and introduced the opening speakers.

Brenda Mallory, Chair, Council on Environmental Quality (CEQ). Mallory expressed appreciation and gave opening remarks. Mallory stated that President Biden and Vice President Harris have been leading the most ambitious climate change, environmental justice and clean energy agenda in history, noting the

¹ USE IT: Utilizing Significant Emissions with Innovative Technologies

² Consolidated Appropriations Act of 2021, Pub. L. 116–260, div. S, §102(d)(2)(D)(iv)(I)–(VIII), (Dec. 27.2020). Full text of USE IT Act duties is available at the CCUS Permitting Task Forces website: <https://www.energy.gov/fecm/use-it-act-carbon-dioxide-capture-utilization-and-sequestration-ccus-permitting-task-forces>.

Biden-Harris Administration's goal of achieving a carbon pollution-free power sector in the United States by 2035 and net-zero emissions economy-wide by 2050.

Mallory highlighted that the Federal government is taking advantage of this once-in-a-generation opportunity to tackle the climate crisis while creating good-paying jobs and protecting public health; and that carbon management projects will be necessary to achieve the President's goal of net-zero greenhouse gas emissions by 2050. She referenced Congress's direction to the Administration to advance carbon management technology, and CEQ's subsequent guidance to Federal agencies to facilitate reviews associated with the deployment of carbon capture utilization and storage projects and to promote efficient and responsible development and permitting of carbon management projects at an increased scale, in line with the Administration's climate, public health and environmental justice goals. She noted that when done responsibly, these projects have the potential to reduce pollution and create good-paying jobs in communities across the country.

Mallory discussed the Biden-Harris Administration's commitment to ensuring that carbon management projects are designed, built and operated safely and responsibly and in a way that reflects the best science and responds to the needs and input of local communities.

Mallory concluded by stating it is critical that we advance the clean energy transition that centers justice and equity while working to decarbonize the hardest-to-abate sectors and spurring low-carbon manufacturing and innovation across the country.

Brad Crabtree, Assistant Secretary, DOE Office of Fossil Energy and Carbon Management (FECM).

Crabtree opened with thanks and greetings. He commented on the timeline since the USE IT Act legislation, the urgency of the moment, given what is known from the Intergovernmental Panel on Climate Change and the International Energy Agency's analysis: that economy-wide deployment of carbon management projects and infrastructure, alongside energy efficiency and dramatically accelerating deployment of renewables and other low carbon energy sources, all will be necessary to achieve net zero greenhouse gas emissions by 2050; we simply cannot meet our global emissions reduction targets without carbon capture and storage (CCS).

Crabtree characterized the progress since large-scale capture and injection of carbon dioxide (CO₂) began in the United States over a half century ago, noting that carbon capture is currently deployed across multiple industries, with 14 commercial scale projects operating in the United States today, and that the projects in operation collectively permanently store on the order of 20 million tons of CO₂ per year. He clarified that of the over 200 commercial carbon management projects announced to date in response to the U.S. Federal \$45Q tax credit, only a small number of those projects will store their CO₂ through enhanced oil recovery.

Addressing pipelines, Crabtree commented that we have over a half-century experience with large-scale pipeline transport of CO₂; over 5,000 miles of CO₂ pipelines have been built in the United States to date. Crabtree commented on the strong track record of safety, especially compared to other large-scale infrastructure, and the Biden-Harris Administration's coordinated efforts to address pipeline siting and emergency response.

Acknowledging that the deployment of carbon management at climate scale is no longer fundamentally a challenge of innovation or technology, Crabtree discussed challenges with permitting, a necessary and rigorous process that presents a timing challenge. He urged the current task forces to use this

unparalleled opportunity to advance a permitting reform to keep pace with broader infrastructure deployment. Crabtree noted that the USE IT Act legislation is the culmination of years of bipartisan work in Congress together with consistent support from stakeholders across the political spectrum in all regions of the country. He noted that the same diversity of stakeholders that made the USE IT Act possible, is represented in the membership of the Task Force's meeting here.

Crabtree closed by stressing that community engagement will be fundamental to the success of the task forces' work. He emphasized: That means incorporating community and stakeholder concerns comprehensively in your recommendations. This includes the priorities and concerns of disadvantaged communities on the Gulf Coast who fear that carbon capture projects at refining chemical and power plants will merely perpetuate pollution they've experienced for generations. It also includes Alaskan Native corporations and Western tribes that support carbon management projects as a way to sustain traditional energy production on which their livelihoods depend as well as create entirely new economic opportunities such as direct air capture. And it includes farmers, ranchers, and local officials in the northern plains who oppose the use of eminent domain in the siting and development of CO₂ pipelines on private land. These examples of both opposition and support span the entire political spectrum and diverse regions of our country and they highlight a stark reality: there is simply no path forward either for particular carbon management projects or broader-scale deployment without crafting approaches to project development and permitting that can engage local communities and stakeholders as partners in the process. Crabtree stated that it is essential for the success of individual projects and to our collective efforts to tackle climate change, and it is why we are transforming how we do our work at DOE to put local communities, workers and stakeholders at the center of our efforts. A key factor in determining which projects we support is whether those projects will provide tangible improvements in both the environmental and economic circumstances of affected workers.

As Crabtree thanked members for their critical participation, he emphasized the members' ability to come together respectfully and collaboratively and make common ground recommendations to help the government chart a viable path forward that enables the widespread development, permitting and deployment of carbon management projects and infrastructure that is so urgently needed to meet our climate goals.

DFO Waldron introduced the chairpersons of the task forces.

Tara Righetti, Professor of Law and Occidental Chair in Energy and Environmental Policies, University of Wyoming and Chair, Federal Lands Task Force, opened by noting her conviction that CCUS is an essential technology to assuring the decarbonization of the energy and industrial sectors and that it can be deployed in a manner that is safe, environmentally sustainable, and just. She commented on the current status of technology: that we are at the point of knowing that CO₂ can be safely and permanently sequestered underground and emphasized that effective alignment of resources and governance will be essential to meeting climate goals.

She discussed the need for access to Federal lands, including onshore lands and submerged lands in the outer continental shelf; noting that these lands contain storage resources that will be critical to achieving carbon sequestration at scale. This may be through the grant of storage rights in large contiguous blocks or in small, fragmented parcels that are necessary to unlocking storage potential on adjacent private and state-owned lands. These lands also have differing demographic and land use issues that require special consideration.

Federal lands have multilayered and complex histories. They're important working landscapes and places for both reverence and recreation. Integrating CCUS into these lands therefore may involve a broader group of stakeholders and developing efficient and non-duplicative permitting processes will require alignment between the government's proprietary and regulatory functions and the permitting frameworks in the states where Federal lands are located. Land management agencies have already begun to unpack these issues and create pathways for storage. Righetti closed by noting the need to work together in a cooperative spirit, to listen and learn from each other and to be innovative and solution oriented.

Dr. Julio Friedmann, Chief Scientist, Carbon Direct and Chair, Non-Federal Lands Task Force, opened by commenting on diversity of perspective: This diversity of background, of geography, of origin is our strength, and he plans to tap into that and capitalize on that as we do our work here together. He reflected on how far carbon management has come, and its purpose, to remove emissions and reduce emissions. He reflected on IPCC findings, goals for 2050 and 2030, challenges ahead for the United States and Europe, and emphasized, regarding the enormous task, that we are behind. He referenced Lawrence Livermore National Lab's *Roads to Removal* report, noting its critical work looking at carbon removal opportunities in every county of the United States. Friedmann commented on key Federal actions: First, we had the 2018 improvements in §45Q, then the Bipartisan Infrastructure Law, then the Inflation Reduction Act (IRA) provisions. Regarding the work ahead on permitting, he noted that the task forces need to get to the county level zoning boards and local committees, and the need to really understand communities by listening to what their needs and concerns are and do our level best to address them. In addition, he noted the importance of private capital, finance, and risk reduction—to get these things done in a way that delivers returns as well as delivers reductions and removals. Friedmann closed by encouraging the members to make friends as we go around the room, and take advantage of the opportunity to do this work and to use the diversity of experience, intellect and sensibility that this group represents.

Member introductions: Members each stated their name, employer/affiliation, and one or more USE IT Act duty that aligns with their area of expertise, work or interests.

Federal Lands Task Force

Lily Barkow, groundwater section manager at the water quality division at the Wyoming Department of Environmental Quality Division. Wyoming is proud to have issued their first three Class VI Permits in December.

Jeremy Moddrell, United Association, a labor union that represents workers and the piping industry. Organization represents over 380,000 workers across the United States and Canada. Specifically works in the transmission pipeline and gas distribution department. Duty that best fits his organization is anything that has pipeline in it; such as duty V, priority pipelines.

Eric Bingham, Land Use Director from Rock Springs, Wyoming, representing local governments. Helped draft a lot of the renewable energy regulations that are in Sweetwater County. Area of expertise is CCUS permitting approaches and best practices.

Tristan Brown, Deputy Administrator of the Pipeline and Hazardous Material Safety Administration (PHMSA), noted PHMSA's interest in any task force work on pipelines, including duty V. PHMSA sets

Federal standards for pipeline safety regulations. PHMSA does not permit or decide siting on pipeline regulations.

Matt Fry, Senior Policy Manager with the Great Plains Institute, from Wyoming. Duties: all, but prioritize I, II, and III.

Jenny Joyce, Senior Principal in Geoscience at Exxon Mobil. Currently supports low-carbon solutions, the organization helping to ensure high technical standards for carbon storage projects within Exxon Mobil. Most interested in duties I and VI.

Jan Sherman, Chief Development Officer for Carbon Vert, a small project developer focused on transport and storage opportunities in the US; prior to that spent over 30 years in Shell developing large energy projects. Has a lot of experience in both Federal and non-Federal lands offshore and onshore. Noted interest in duties VI and VII.

Shannon Williams, Associate Vice President of Climate and Energy at the National Wildlife Federation, based in the DC area. National Wildlife Federation is a national nonprofit organization, conservation-based, and member-based. In terms of the mission of this task force: orderly, efficient, and responsible deployment of carbon management, National Wildlife Federation would lean in on the responsible, but in favor of all of them. And in terms of areas of interest, prioritizing duties V and VI, priority pipelines, and looking for ways to fill gaps in regulation.

Mark de Figueiredo, Director of the Office of Policy, Analysis, and Engagement in the Office of Carbon Management for the U.S. Department of Energy. Previously a regulator with the U.S. Environmental Protection Agency. Noted interest and expertise in duties I, II, and III.

Sasha Mackler leads the energy program at the Bipartisan Policy Center (BPC) and will be serving as vice chair with Righetti for this task force. Has been a developer of carbon capture projects. Now, at the BPC, is focused on many dimensions of the Federal policy approaches to scaling carbon capture. Noted duties that have a Federal overlay, particularly those related to permitting, financing, pipelines, and on the gaps in Federal policy.

Tip Meckel, Bureau of Economic Geology, State of Texas. Sixth-generation Texan, from an immigrant family over 200 years ago; has been working on energy in the state of Texas for the past 17 years at the Gulf Coast Carbon Center, which is part of the Bureau of Economic Geology. Work includes developing the resources for new leases in state offshore areas. Recently part of a research partnership funded by DOE, exploring storage opportunities in the greater Gulf of Mexico.

Sherry Tucker, Capture Point. Capture Point is in the business of capturing CO₂ from existing industrial facilities, transporting by pipeline and sequestering underground. Capture Point currently does all three. Have a very large project in central Louisiana which is now in the permitting phase. Project has an active ongoing environmental justice program which was inaugurated last August and had its first graduating class. Primarily interested in duty I. Also note that she permitted the Greencore Pipeline, which is the largest CO₂ pipeline in the United States. Noted that pipeline permitting is easy compared to Class VI permitting.

Bill Carum, Executive Director of the Pipeline Safety Trust, formed after a pipeline tragedy in Bellingham, Washington. Organization works to keep people in the environment safe from the risks of pipelines and

that includes CO₂ pipelines. In terms of duties, most interested in those related to pipelines as well as the gaps in regulatory frameworks. And ensuring that safety is considered in the permitting process.

Julie Murphy, Director of the Colorado Energy and Carbon Management Commission. The commission in Colorado is the former oil and gas conservation commission; last session the organization was broadened to include the authority to pursue class VI permitting primacy, gas storage and deep geothermal. Redeploying existing expertise. Focus is on duties I through III.

Jason Lanclos, Energy Director in the state of Louisiana at the newly named Department of Energy and Natural Resources. Louisiana is the 3rd state to receive class VI permitting regulatory primacy; we're at a critical time to lean in on pushing these things forward. Folks are showing up and interested in investing in solutions.

Nichole Saunders, Director and Senior Attorney with the Environmental Defense Fund (EDF). Manages carbon management or CCS portfolio of work. EDF is primarily focused at this moment on the safety and climate and environmental integrity of projects across the carbon management sphere. Noted duties I and VI as area of interest. Also noted a strong interest in many of the other duties.

Matt Rota, Senior Policy Director for Healthy Gulf, based in New Orleans. Organization represents folks throughout the Gulf states; has been around for a long time advocating for clean waters, wetlands and community involvement and making sure communities are being put first. Noted a lack of community members present and that the people that are going to be impacted by this are not well represented in this room. Noted duties I and VI as areas of interest.

Jim Powell, Federal representative to the Southern States Energy Board, a 16-state and two-territory interstate compact. Membership includes mostly governors and state legislators. Strong focus on energy and technology. Also had a multi-decade career with the U.S. Department of Energy.

Ken Jackson, Carbon Zero. Focused on the Federal lands, the organization is looking at several projects for sequestration. Our company was born out of an exploration production offshore oil and gas company.

Jack Andreasen, Manager of Carbon Management, Breakthrough Energy, a technology organization looking to advance all climate technologies to net zero by 2050. Noted duties I and VI as areas of interest.

Stacey Noem, Bureau of Safety and Environmental Enforcement within the Department of the Interior. Primarily focused on CCUS on the outer continental shelf. Rulemaking is underway. Noted duties I and VI as areas of interest.

Jim Kendall, Bureau of Ocean Energy Management. Regional Director out of New Orleans. Working on the carbon sequestration rule. Noted duties I and VI as areas of interest. Also noted that he's heard the terms environmental justice, diversity, engagement, and partnering, all incredibly important, but one word that's been missing is education, noting that we can't talk just among ourselves; we have to make sure the people outside this building know what we're talking about because the subject matter is complicated and technical.

Sallie Greenberg, principal of Sallie Greenberg Consulting, formerly at the Illinois State Geological Survey where she spent 25 years focused on duties I and VI; also has expertise in stakeholder engagement.

Indra Dahal, Bureau of Land Management, Engineer.

Al Collins, retired, formerly Chief Policy Officer at Occidental's Low Carbon Ventures Division and worked on policies that enable projects and project development. Interests are in duty I—really important that we inventory what's working. To make sure that communities and public buy into what we're trying to do. Also noted duty IV, which bookends duty I.

Federal Lands Task Force—Members on Zoom

Raven Goswick, reservoir engineer with Aka Energy Group, a wholly owned subsidiary of the Southern Ute Indian Tribe located in Colorado. Over 20 years of experience in oil and gas, the last five specific to carbon sequestration. Noted duty III as area of interest.

Mark Spalding, President of the Ocean Foundation. Very interested in the outer continental shelf. Area of expertise is international ocean policy and law, blue carbon, ocean heritage, blue economy finance and investment, and coastal and marine philanthropy. Noted duty I, with a special interest in engaging stakeholders, and prior informed consent is something that his organization cares a lot about. Also noted interest in duty IV because of work on blue economy investing in finance and thus asking which of these technologies not only has efficacy and timeliness but actual commercial value. Also noted duty VI, due to training as a lawyer.

Non-Federal Lands Task Force

Scott Heiner, representative in the legislature, state of Wyoming. Was involved with CO₂ utilization as an engineer in the oil and gas business for utilization for enhanced oil recovery and in West Texas and then in Wyoming. Now we've started formulating some rules and regulations in Wyoming for CO₂ pipelines. An opportune time for us in Wyoming.

Matthew Warren, International Brotherhood of Electrical Workers, labor organization representative. Interest in decarbonizing the power sector.

Kyle Henderson, United Association of Plumbers and Pipefitters (UA). Born and raised in Paduca, Kentucky. As a UA International Representative, covers the states of Tennessee, North and South Carolina, and also works for the Commonwealth of Kentucky. Noted his interested in the task force duties related to piping.

Jarad Daniels, leads the Global CCS Institute (GCCSI), which is focused on international collaboration and knowledge sharing across all forms of carbon management. Before that, spent over two decades at the U.S. Department of Energy, specifically in the Office of Fossil Energy working on carbon management. Hopes to be supportive and responsive to most of the duties across the task force.

Rich Garman, North Dakota Department of Commerce, Division of Economic Development and Finance. Noted interest in duties IV and VII among others. North Dakota Department of Commerce is tasked with bringing new wealth into the state of North Dakota. Prior to working in the economic development field for North Dakota, spent 31 years in the coal fired power plant industry. North Dakota has Class VI permitting primacy, two wells actively sequestering CO₂, and has 11 other permits out right now.

Mark de Figueiredo, Director, Office of Policy, Analysis, and Engagement, serving also on the Non-Federal Lands task force.

Laura Brannen, Nature Conservancy. Leads Federal climate policy for the organization and works on CCS policy. As an organization that has a presence in all 50 states, interested in anything that touches down

on the landscape and could impact the landscape and the communities that we live and operate and partner with. Noted interest in duties I through VI.

Tyson Todd, State of Utah Trust Lands Administration. State agency that generates revenue for our beneficiaries; large, land-holding agency with about 3.4 million surface acres. Interested mostly in duties associated with project development permitting and regulatory framework.

Ashleigh Ross, head of commercial development and policy, Carbon America. Carbon America is a full value chain CCS project developer and also has a capture technology and operation at the National Carbon Capture Center. Twenty-two years CCS experience, including ConocoPhillips and BP before joining Carbon America. Noted interest in duties related to topics other than pipelines.

Kristen (Kris) Carter, Assistant State Geologist for the Pennsylvania Geological Survey, which in the Commonwealth is associated with the Department of Conservation and Natural Resources. Expertise in reservoir characterization and subsurface mapping as would pertain to carbon storage project siting and evaluation. Noted interested in duties I and II. As a representative of the Commonwealth, which is home to millions of acres of public lands, very significant natural gas industry development and an economy that is very industry heavy. Keenly interested in seeking the best practices for land use management both above ground by way of pipeline siting and all of the infrastructure related to that as well as below ground -the geologic formations that will store the CO₂.

Blake Canfield, Executive Counsel for the Louisiana Department of Energy and Natural Resources. Agency works mostly the regulatory side as well as some of the land management issues. Noted interest in task force duties I, II, III, and VI.

Poh Boon Ung. GCCSI. Spent 12 years at BP working a lot of these issues. This is his third Federal advisory committee—worked on both the NPC hydrogen and CCS studies. In terms of interest, noted GCCSI can contribute to all duties and specifically duties I and VI.

Virginia Palacios. Executive Director of Commission Shift, a statewide advocacy organization based in Texas, focused on accountability at the Railroad Commission of Texas. Organization focuses on conflicts of interest, orphaned wells, and geologic storage, and ensuring that the public is engaged in their processes. Ninth-generation Texan. There are about 1,400 inactive unplugged wells in her county alone. Getting geologic sequestration right in that kind of an environment is really important to me. Noted that when she looks at maps of proposed pipeline routes, can see her house on it. These activities could impact her directly; wants us to all be thinking about this kind of development as if it could happen in all of our backyards. Another principle that is really important for us to all consider is free prior and informed consent. Noted that the education piece is really important.

Andrew Duguid, Vice President, Advanced Research International. While most of these duties are important, background is most aligned with duty I. Been doing CCS for about 20 years and Class VI permitting since about 2011. Several permit applications under our belt.

Bob VanVoorhees, Executive Director of the Carbon Sequestration Council, which was established as primarily an organization of petroleum companies and electric utilities cooperating on looking at the regulatory framework for CCS. Has spent a lot of time working on model regulatory frameworks in the United States through the World Resources Institute and the International Standards Organization, actually helping get legislation passed, and setting up actual regulatory frameworks. Works with companies trying to navigate CCS regulatory process.

Sarah Ryker, USGS Associate Director for Energy and Mineral Resources. Federal scientist, not Federal regulator—USGC provides technical assistance in many of these areas. In particular, USGS has a long history in providing geoscience on subsurface pore space as a resource and in the data and modeling required to understand the capacity and the risks in implementing and scaling geologic storage.

Keith Tracy, Chief Commercial Officer of Elysian Carbon Management. Organization is a carbon capture, pipeline and storage project developer, but also owner operator. Has 15 years' experience capturing CO₂ emissions and developing capture projects and pipelines. And owning and operating those capture plants and those pipelines. Grew up on a farm and ranch in Oklahoma, where oil and gas production and pipelines were going across the ranch; very familiar from the perspective of the landowner, which is a perspective that needs to be considered. Noted interest in duty related to financing projects.

Alexander Spike, Air Alliance Houston, longest lasting air pollution nonprofit in Houston area. Organization maintains air quality monitoring network to directly challenge industry on the pollution they put in the air, and challenges reluctant regulators to do better. Spike manages organization's work around carbon management. Referenced report on community awareness about carbon management, and questioned community consent if information is lacking.

John Thompson, Clean Air Task Force. Currently serves in three capacities: leads global carbon management program and carbon fuels program, and is designing industrial impact area work. Regarding duties, expressed interest in all and particularly VII and VIII.

Kevin Connors, assistant director for regulatory compliance and energy policy at Energy & Environmental Research Center (EERC) at the University of North Dakota; a non-teaching business unit of the university. DOE recently awarded the Heartland Hydrogen Hub to a team including EERC. EERC has been successful in the carbonSAFE program; also manages the Plains CO₂ Reduction (PCOR) Partnership, which is one of four regional initiatives with funding from DOE. EERC also received funding from North Dakota for that program and has over 250 private and public partners in that regional consortium. We're partnered with the University of Wyoming School of Energy Resources and the University of Alaska Fairbanks Institute of Northern Engineering. In the PCOR partnership, for the past 20 years, performing applied research, which includes outreach and education, as well as our focus today is accelerating commercial deployment. Also work directly with our commercial partners at the EERC developing carbon storage projects in and near North Dakota. EERC has been the technical lead on all six storage permits that have been approved in North Dakota. Six pore space units. Can contribute quite a bit to the permitting process. Prior to working at EERC, worked for the state of North Dakota for over eight years, led state efforts to apply for and receive Class VI permitting primacy, helped stand up that program. We're on our way to a million tons stored via Class VI permits as a state, and EOR in the southwestern part of the state.

Non-Federal Lands Task Force—members on Zoom

Richard Esposito, R&D program manager at Southern Company located at National Carbon Capture Center. Been working in CCS for about 20 years. Been involved in Class VI permitting and involved in building two CO₂ pipelines; both of them are decommissioned at this point. Represent an emitter, which will have to apply CCS, which is a big decision for us as a company to do that. Introduced a phrase: PBC, permitting before construction. Note long-lead-time items. It's really important that we get this right so that industry has the confidence to go ahead and start. Building out \$500 million to \$1 billion carbon capture plants.

Catherine Coleman Flowers, Founding director of the Center for Rural Enterprise and Environmental Justice. Organization is located in Hudson, Alabama. In addition to that, serves as the co-vice-chair of the White House Environmental Justice Advisory Council. Brings perspective from the community level. Specialty is Environmental Justice and Community Engagement, and making sure that we do no additional harm.

Lorelei Oviatt, Director of planning for Kern County, California, based in Bakersfield. Represents the Kern County Board of Supervisors. Located at the center of oil and gas in California. Has expertise from over 30 years of permitting for oil and gas, alternative fuels, wind and solar. Right now permitting the first CCS projects in California through full environmental impact reports. Received first permit from EPA region 9 for Class VI. Her expertise is in local concerns and permitting. Ranchers, farmers, mineral owners, pore space owners, and just average people who want to understand these new kinds of projects and be sure that we are taking care of the air, of their families. Not just education, but engagement. Permitting that doesn't hold up the project but makes it a better project. Very interested in contributing to I, II, and VI.

Sarah Saltzer, Stanford University, manages the Stanford Center for Carbon Storage. Has 25 years of oil and gas experience and five years in CDCS. Most interested in providing technical assistance to states. Expressed interest in duty III. Also, duty I part B, engaging stakeholders early in the permitting process.

Michael Turner, Director of Strategic Initiatives and Finance at the Colorado Energy Office. Helped lead and stand up the Colorado CCUS Task Force in 2020. Hopefully some best practices and lessons learned can be leveraged from that Initiative. Particularly focused and interested in duty V: state financing and funding opportunities for CCUS.

Tristan Brown, PHMSA, also serves on both task forces.

Presentation: Introduction to Federal Advisory Committee Act (FACA) and review of the USE IT Act

Christina Waldron, DFO provided an overview of the Federal Advisory Committee Act (FACA) and reviewed the basics on how a FACA committee is organized, including structure, roles and responsibilities of members. She then provided background on the USE IT Act, highlighted recent milestones leading to the first meeting of the Task Forces, and reviewed the duties, which are outlined in the Charter and based directly on the USE IT Act.

Remarks: Federal permitting and progress on USE IT Act: CEQ Report to Congress and Guidance

Sarah Leung, Director for CCUS, CEQ, provided an overview of CEQ's work in connection with CCUS and the USE IT Act, and highlighted CEQ's CCUS Guidance to Federal Agencies and CEQ's CCUS Permitting Report among other key accomplishments. She noted that CCUS is a critical component of the Biden-Harris Administration's U.S. long-term climate strategy and emphasized the recent historic investments in CCUS made possible by the Bipartisan Infrastructure Law and Inflation Reduction Act. Leung provided additional background on CCUS permitting, including a discussion of the Biden-Harris Administration's creation of the interagency Buy Clean Task Force, context on the existing regulatory framework, and a summary of some announcements related to CCUS from Federal agencies.

Friedmann and Righetti provided wrap-up comments to end the morning sessions.

Lunch Break

Session: Inventorying Federal and state approaches and best practices to facilitate reviews of CCUS projects and pipelines

Presentation: Key issues to consider—Matthew Fry, Senior Policy Manager of Carbon Management, Great Plains Institute

Fry presented some of the challenges CCUS faces, summarizing: We have not deployed many projects and we need to deploy a lot of projects to meet the climate objective. He highlighted regulatory challenges, cautioning that the term “streamline” can make folks think that you're cutting corners and not doing a good job. For the Wyoming Pipeline Corridor Initiative (WPCI) project, which took ten years to develop, he pointed to a slide that showed the multiple requirements, authorizations, reviews, and statutes that were triggered. He commented that there is a lot of redundancy in the processes and suggested the group look for opportunities to improve.

Regarding Class VI permitting, he commented on the number of Class VI well applications submitted to EPA relative to the number of wells authorized, and the Federal process as one place to make improvements. He commented on the Primacy process, which can take three or more years. He called on the group to look at improvements to Class VI permitting to shorten the timeline, whether through additional support, financial support, body support, or just making the application process smoother, noting that the primacy states are authorizing wells in roughly a third of the time as EPA.

Noting the large amount of geologic storage opportunity on Federal lands, Fry showed a slide and discussed some challenges associated with developing projects on Federal lands, given agency processes and statutory requirements and procedures, including NEPA.

Fry said the concept of permanence has been a challenge for Federal land management agencies at least to date, noting:

- Both the Class VI permit and IRS §45Q tax credit require permanence.
- How to obtain rights necessary for permanence is not procedurally clear at all the agencies currently.
 - Currently some Federal agency actions are underway, which may address permanence.
 - Task force could potentially make recommendations to the Federal land management agencies on how they may address permanence. Including for Federal agencies associated with offshore.

Fry discussed pipelines, commenting: to be successful in meeting climate objectives, have to build pipelines, noting:

- Modeling/analyses of needed pipeline infrastructure—many existing analyses (e.g., GPI; Princeton; others). Referencing slides, showed recent GPI work, including pipeline modeling in

the mid-continent, for a scenario of 300 million metric tons, and recent analysis in the mid-Atlantic area of source-to-sink opportunities that would require pipeline infrastructure.

- Most analyses to date conclude that roughly 60,000 miles of additional pipelines are needed to meet our climate objectives.
- Centralized siting authorities. Currently no procedural avenues; some entities, particularly states, that generally don't want more centralized authority.
- An issue for the task forces to consider and potentially provide recommendations is how to build the needed pipeline infrastructure.
- Pipeline pre-planning—referencing Fry's prior role with state of Wyoming, he described the Wyoming Pipeline Corridor Initiative (WPCI), which involved working with the Federal government to authorize roughly 2,000 miles of CO₂ pipeline within the state. WPCI was pipeline pre-planning Wyoming did in response to the Clean Power Plan. There's an opportunity for other states to take this on (pre-siting, pre-permitting associated with projects).
- State or Federal financing for pipeline pre-planning—not every legislature will be as forward thinking and provide the financing to do a project like this. Maybe we could consider opportunities for the Federal government to support states and moving forward with processes like this. Wyoming's example was successful in streamlining as the state did a little bit of the pre-siting and pre-permitting associated with these projects.

In closing, Fry mentioned public perception of CCUS: we're not doing a good job of informing the public. He acknowledged historical challenges that we have to consider as we move a project forward. He observed a lack of trust and lack of respect for project developers, for the government. Suggested looking at ways to potentially utilize non-governmental entities as well as academia to provide education and information to frontline communities and entities in general. He proposed that states and local governments have an opportunity to provide information because communities don't always know who's who within their boundaries, and provide information, to shift the talking points from the serious misinformation that we're seeing out there in the public domain. He emphasized that we need to do a better job of accurately informing the public as to what's going on, what these projects are doing, why they're doing it, and the opportunities that they present.

Presentation: CCUS policies related to public lands—Indra Dahal, Bureau of Land Management

Dahal presented Carbon Sequestration Policy Development Overview for Public Lands (refer to presentation), and shared the following information and comments:

- Approximately 1/10th of the United States is Federal land. Varying ownership entails varying jurisdiction, a “checkerboard,” of entities holding mineral rights and surface ownership, including Federal, state, and private.
- BLM is using its existing authority under the Federal Land Policy and Management Act (FLPMA) and Right of Way (ROW) processes to authorize a specific piece of public land for carbon sequestration. Dahal explained that the Mineral Leasing Act (MLA) doesn't allow for pore space authorization.
- He reviewed the CCUS projects currently going through stages of approvals at BLM.
- He discussed the challenges for CCUS on public lands, including:
 - how to determine fair market value of pore space, given the limited publicly available data. BLM is working with the Appraisal and Valuation Services Office (AVSO) as required by law.

- units of pore space: volume rather than linear surface.
- multiple agencies involved, which creates a need for coordination, including with EPA, the permitting agency,
- Can work on notification system, for example to notify oil and gas interests regarding mineral ownerships in the vicinity.
- distinction for BLM between enhanced oil recovery—to increase production and develop leases—and permanent sequestration; §45Q addresses both. BLM manages EOR under MLA and CCS under FLPMA.
- availability of open pore space and impact on existing oil and gas reservoir.
- plume boundary.
- availability of data for sharing and verification—sufficient data may be available but for various reasons (e.g., different agencies, data are proprietary), data aren't shared; can work through this issue.

Presentation: State approaches—Lily R. Barkau, Natural Resources Program Manager, Wyoming Department of Environmental Quality. Barkau presented Wyoming Underground Injection Control Class VI Permitting Collaboration for Federal and Interstate Lands, and provided the following comments:

- EPA Underground Injection Control (UIC) Program and State Primacy—currently, 34 states have primacy over certain classes of the UIC wells. Barkau emphasized the importance of the years of experience of many state regulators with many well classes, and the associated process knowledge and technical expertise.
- Wyoming's UIC Program—Wyoming has primacy over all classes I–VI. There is a long history of regulating deep disposal wells in Wyoming, which has relevance to Class VI permitting. Oil and Gas Conservation Commission oversees Class II.
- Wyoming's UIC Class VI Permitting Process—For Class VI, there is a lot of education needed so in Wyoming they encourage an informational meeting for operators interested in a Class VI permit to come in very early in the process and talk often during the process. Barkau listed all the steps in their process and commented that unitization process for our Class VI wells is managed through their oil and gas commission. They have a good working relationship. They don't issue the authorization to inject until the unitization of that pore space is complete, as required by state statute. Barkau commented that pipelines are very important because it could impact a permit. For example, how far one can move a well if there are pipeline issues.
- Private land ownership in Wyoming, the surface owner owns the pore space. Statutes prohibit a unitized area from being operated by anyone other than the unitized group. Unitization requires written consent from at least 80% of the pore space; a lot of our projects in Wyoming are reaching almost a hundred percent of pore space agreements.
- Lease agreements are managed through our Office of State Lands and Investments.
- Wells were recently permitted in the southwest area, heavily Federal lands. Referring to slide, Barkau pointed out the Area of Review relative to BLM, private and state lands, and also noted that there were mineral interests in the area.

Needed state and Federal collaboration:

- Is BLM ROW needed prior to applying for a Class VI permit, or the other way around? And what is the process for working with state/Federal/private landownership for a project? What is the process for unitization?

- Currently Wyoming is working with BLM to establish a memorandum of agreement; roles and responsibilities for permits and notifications. A key item of the MOU is the remediation of any oil and gas well that's been identified. If previously authorized by BLM, even if they're long gone, the applicant has to work with BLM regarding that well bore, following a guidance document, which is also being worked on by the Interstate Oil and Gas Compact Commission. Other items in MOU: non-exclusive right of way, so any applicant that comes in first can apply; it doesn't become exclusive until there is a Class VI permit to trigger that authorization to inject.
- Notification when application is received—consistent with established practice of the UIC Class I program, her organization notifies oil and gas commission and BLM early when application is received. Wyoming asks are there Federal lands involved? Minerals in area of review?
- When a permit application is received, the state and BLM are also looking at financial assurance requirements to avoid duplicating those efforts and not requiring double bonds.
- A process for ROW and Class VI permit transfers—what does that look like?

Interstate Collaboration

- In Wyoming, they are considering what happens if a CO₂ plume or storage project crosses a state boundary. The UIC process is for the protection of underground sources of drinking water; we need to take into consideration not just our state, but neighboring states because we want them to contact us and work with us if they had a project coming into our state. One-mile buffer Wyoming has established to start notifications and processes. When working with a neighboring state, notice is required.
- Interstate projects may be challenging but key topics have been identified. For example, information sharing (e.g., state and Federal) is very important—how, when, and what?
- Corrective action program. Other issues for Wyoming: Transfer of liability and long-term stewardship.
- State's Class VI permitting website provides location of applications, permits, information, and forms.

Presentation: State Approaches—Jason Lanclos, Director, Louisiana Department of Energy and Natural Resources. Lanclos provided an overview of state work on Class VI permitting primacy and other CCUS issues. Lanclos noted:

- Third state to be given regulatory primacy for Class VI wells. Other well classes beginning in 1982.
- Permitting challenges and pipeline challenges, states across the country will face, task forces can weigh in.
- In Louisiana, like Texas, a bulk of CO₂ emissions come from industry and manufacturing sector. Renewables are increasing significantly, and the state is looking at all solutions, and has had a comprehensive plan. CCUS, a lot of time and resources to make sure state is ready. Louisiana has 58 applications.
- Class VI primacy application took over six years. They focused on efficiencies. Streamlining is the wrong term because it's not cutting corners, it's adding staff.
- State emphasis on education, a huge piece. Working with universities across state, and community college system to train future scientists and engineers. Research universities doing clean energy programs, including curriculum specifically about CCUS. He noted these programs

will benefit state regulators and industry, to have trained people who understand complex geological modeling.

- Number of existing CO₂ pipelines and need for thousands more miles to be permitted will require the right staff and working with Federal partners to solve the complex problem of emissions management with infrastructure investment.
- Lanclos referenced an LSU program award that will support the required infrastructure—an NSF award, FUEL: future use of energy in Louisiana, which involves 50 institutions working on issues including CCUS.
- Need to continue supporting local and community engagement. For Class VI permitting, until primacy, her organization did not have that role, so there has been a disconnect. How do we make sure developers are focusing on it and state has program. Where is the backstop for reliable information for public and community leaders? Lanclos suggested a focus on academia. Polling suggests people trust tech and academic experts and their assessment of geological formations for CO₂ storage. So, moving forward is to support research institutions and involve them in permitting process to inform the decision-making.
- For large complex projects, suggested making sure community has resources, that they understand how things fit together. Most work is to be done at local level. Local officials fielding questions need to have a clear understanding, which will take work to develop.
- Not that states do it better than EPA, but they understand their own state's complex geology, and kids grown up in-state want to make it better.
- Lanclos recognized colleague Blake Canfield, who was instrumental in running pore space working group, and complex legislation to stand up CCS program. Critical in negotiation of state lands agreements to enable new industry to emerge. For a traditional oil and gas state like Louisiana to try to come up with pore space agreement, not easy but making progress negotiating a lot of state land leases.
- Offshore—Expressed excitement for the task force to help solve issues of Federal lands, as operators have been approaching the state, wanting to inject CO₂ offshore, asking questions about process and which agencies. Louisiana is making progress and Lanclos emphasized the need for task forces to look at offshore CCUS as well.

Remarks: Best Practices for Engaging Communities—Catherine Coleman Flowers, Center for Rural Enterprise and Environmental Justice

Flowers began by noting that she is coming from the community engagement perspective, and summarized some of the concerns and ideas that came out of a three-day forum in October last year in Alabama hosted by the Center for Rural Enterprise and Environmental Justice and the Aspen Institute, to discuss what meaningful community engagement looks like. She highlighted concerns of many impacted people, especially in the EJ community, about CCUS technologies, and a need for and historic lack of balance between pursuing decarbonization goals and properly engaging in communities. Concerns stem from their many unknowns and rush timelines that have not been conducive to any meaningful trust building. One concern is that the fossil fuel industry will continue to benefit from this new system but will be less inclined to move away from fossil fuels in the first place, and some feel there is a risk that the same people and groups will continue to benefit, and the same people and groups will continue to be harmed. Given this perspective, Flowers proposed to figure out how do we get to a place of trust, and trust building. Forum participants also suggested that mandating phase-out plans for these fossil fuel industries may be one way to mitigate this concern, rather than expanding their life cycle.

Flowers then highlighted the forum participants' perspectives on some foundations of meaningful Community Engagement playbook, commenting:

- Number one is trust. A major issue in communities that have experienced harm. Trust building and listening to communities and their needs is a critical step, and that this commitment to listening should be embraced throughout the project's life cycle.
- Education. To establish a common set of definitions and shared understanding to ensure that all parties are working from the same set of facts. Not just educating communities about what the industry wants, but also educating industry about the community, what their concerns are and what they've already experienced. And also educating the communities about their companies, their services and funding and how they see it contributing to the long-term benefit of the community.
- Timelines. Develop a mutual understanding that this process will take time and they might need to build out multiple timelines that encompass the engagement processes.
- Local universities. Local universities and specifically their medical branches were identified as important players in educating and engaging communities as they can be helpful in translating between communities and tech companies on the health impacts. They are a network of professionals who are familiar with the community and often have already built trust within the community. Participation from historically black colleges and universities as well as tribal institutions.
- Oversight, enforcement, accountability, and financing.
 - Adequate compensation
 - Recognition for community members who are also experts in their own spaces.
 - Look at local community ownership, and whether or not their board seats are given to people from the community, dividends.
 - These were some of the suggested ways in which trust could be built and also as an investment in the project from the community themselves because often times people extract from the community, but they don't give a lot back in support.
 - Offer complete transparency in the funding process for these projects.
- Participants. Call for broader view of the communities that are going to be impacted by these projects.

Flowers concluded by noting the complete report of these discussions is due to come out in a couple of weeks or so. Flowers reiterated that communities want to be involved from the design to the implementation of the project. In the past, there hasn't been full transparency; some communities feel that they've been left out of decision-making; Flowers noted that it is not too late to go back and develop those meaningful relationships and the community benefits plan is more than building a Boys and Girls Club or one's favorite charity while disregarding everything else that's happening in those communities. Flowers suggested the Task Forces form a subgroup to work on what meaningful community engagement looks like.

Facilitated discussion and next steps—all Task Force Members

Righetti highlighted examples of successes mentioned so far: WPCI pipeline pre-planning effort, MOU development between Wyoming and BLM, and collaboration in Louisiana around education and workforce.

Capacity building: **Righetti** heard members' comments on need for capacity building; suggested support to state and local agencies. **Friedmann** also noted hearing comments on the need for capacity building, and to engage experts at many levels.

Trust building: **Friedmann** noted a trust gap, people don't necessarily trust the agencies. They don't necessarily trust the governments. They don't necessarily trust the companies. **Palacios** remarked that in Texas, railroad commissioners are elected, and largely funded by companies they regulate, and concerns about conflicts of interest. **Flowers** stated that one reason for distrust that exists is a lot of us have never been to those communities; we aren't the ones that have been impacted. They aren't the ones sitting at the tables and making decisions and certainly will not profit from grants or projects. If anything goes wrong, they're still on the front lines. Proposed that doing no additional harm is part of the guidelines that we recommend. A **member** noted that one source of distrust is around pore space pricing. Everybody's trying to figure out what fair market value is. There is no such thing as fair market value because it depends on all the other components of the value chain.

Where do we need consistency? **Righetti** asked members to comment on where do we need consistency—across state processes or between state and Federal processes, and where will heterogeneity of approaches be workable or possibly even beneficial? **Murphy** mentioned technical standards and common language. To the extent that government can align in how it is approaching community, it will lessen confusion. **Oviatt** suggested that we need to weave those differences into a framework, not a one size fits all, even though that's what companies want, they want certainty, and that there is an end to the process, and a way through it. Communities want to understand what the environmental impacts are. Who are these companies? Are they going to be here later when something goes wrong? So that's the kind of framework to put together to give the industry more certainty for the billions of dollars that investors want to put into it, and giving communities more of a sense of what these projects actually mean. She suggested communities may be wondering: What kinds of impacts are there? Are there safer ways to do it that we can recommend? **Andreasen** remarked that homogeneity can play a role in having a clear overarching regulatory and legal framework for all pore space nationwide, as it doesn't exist currently across all jurisdictions within the United States. And then allowing for different individual policies that can flow from the regulatory or legal framework. For the issues of pore space ownership, long-term liability, transfer, purpose depending on the jurisdiction and the constituencies that are being represented in those areas, those policies have an incredible amount of flexibility within them.

A **member** mentioned land acquisition and some of the property-based rules that fall outside of the UIC program, and asked, what are some strategies or opportunities where we may be able to improve alignment between land liability and permitting frameworks?

Another **member** mentioned consistency in pore space pricing, pipeline rights of way, and commented that there is land speculation activity going on; some landowners may try to extract as much rent as they possibly can. Recommended that the task force work on consistent practical and equitable compensation for pore space owners.

Ross asked what if we put in place an incentive for our stakeholders meant to properly account for pore-space and pipeline rights of way? If we established a policy like that, we could be looking at a completely different framework for stakeholders where they know that they're getting appropriate, consistent, and equitable compensation.

Under- or over-engaging communities: **Murphy** noted in the upstream oil and gas sector, there are at least four different decisions that her commission makes. Suggested that to burden a community with looking at those four different points for the same project is an unfair demand on resources. And when you multiply that across the value chain from emissions to transport to storage for CCUS, we're amplifying that impact. How can we bring a project together and have a more singular conversation with the community so they don't feel like they're being recruited and overused. **Rota** noted that if streamlining things means you are reducing decision points from three down to one, that's two fewer opportunities for the public to weigh in, and emphasized his position that it's vital that at each level the public can weigh in. Rota argued that the task force shouldn't be reducing the reducing the number of public comment periods, or the amount of public involvement.

Well-plugging standards: **Palacios** commented on consistency: well plugging requirements guidelines and technical procedures, and lack of Federal standards. For inactive oil gas and injection, wells throughout the United States are inconsistent, can create risks especially in CCUS injection; proposed a Federal abandoned well administration. Proposed a Federal standard that would require active operators to plug their inactive wells, and consistent technical standards for how it is done, and regarding Class VI permitting, elevating the abandoned wells that are inside the project AORs. **Meckel** responded: Class VI permitting requires well-plugging. **Duguid** noted that he has been working on Class VI permitting for a long time; old wells are always an issue, but the Class VI regulation requires plugging, even if state plugging requirements might differ. He argued a uniform set of requirements would not work because the local geology differs. If the permit applicant can't show actual plugging records and an actual plug, they are likely going to have to re-enter those wells and plug them. For CCS, abandoned wells are not going to be an issue with respect to plugging them. A **member** stated that there is a need for verification; has ideas to partner with Federal, state and private for funding to address the issues. **Murphy** noted that Colorado has implemented a lot of plugging standards, API puts out a lot of plugging standards; expectations around well review. **Barkau** stated that Class VI permitting requires abandoned wells to have a very thorough evaluation. But the issue of identifying these wells and if they're missing the appropriate borings, would work with the other agencies that permitted the wells. One question her agency has faced is: how do you re-enter those wells when you're the applicant of the Class VI well, but you are not the owner or operator of that previously permitted well. May not have been plugged and abandoned to a Class VI permitting standard. Applicants are trying to go and re-enter those wells for corrective action and to bring those into standards; difficulty because they're not the original owners. A **member** remarked that based on anecdotal and actual experience in the field, re-entering some of these wells can sometimes cause more problems, based on uncertainties about well conditions, and applying a lot of new stresses to that well that may change the conditions. Suggested putting burden on operator to make decision on re-entering a well because it's very costly and can result in problems. **Esposito** noted that re-entry is not easy or cheap. Sometimes it doesn't work; you can make it worse. If something is to apply across the board, it must reflect different geologies and in different types of wells that are drilled. Some sites for storage are going to be close to oil and gas fields [where there are pre-existing and abandoned wells] because the geology is good. Is there ability to tap into Federal funds to address?

Streamlining and efficiencies in Federal authorizations: **Fry** mentioned that for Federal authorization processes, particularly NEPA, could utilize cooperating agency status to bring in other expertise. Very helpful to have access to baseline information from diverse voices. Suggestion for planning process, an area to improve is to diversify who's allowed to participate in the cooperating agency status. Suggestion that all relevant Federal agencies should be more involved in authorization processes from beginning to end. To avoid, at the end of the day, 'I didn't know this was happening', which then requires additional analyses on the back end. Using cooperating agency status can help us provide some efficiencies that do not take opportunities away from the public. **Dahal** stated that BLM participates in inter-agency meetings, and notes that each agency's goal and objective is different. For example, EPA's is to protect drinking water, and BLM's is to protect minerals. It is not one of EPA's processes to notify BLM regarding minerals. Agencies can better coordinate on these, and operators can give that kind of feedback. Working through projects and having meetings with operators, BLM has received good points from operators, which BLM can incorporate.

State Primacy: **Tucker** noted that as somebody who has three Class VI permit applications that have been deemed complete and are in technical review, state primacy is absolutely critical to effective and efficient permitting. She discussed Capture Point's experience working with the regulators for its two permits in Louisiana, which were transferred from Region 6 to the Louisiana Department of Energy and Natural Resources (LDENR). The experiences differed greatly. Capture Point was able to communicate with the LDENR permit reviewers in an active and ongoing way. Tucker emphasized that the EPA member of this task force is not here today. **Flowers** noted that she is very concerned because she has talked to people that have lived in states that are seeking or have received primacy and they don't have a good history of environmental justice outcomes. She has been through Cancer Alley, met people in those communities. Need to be conscious of the environmental injustices that have occurred in the past and still do exist. **Oviatt** noted that primacy may have worked for Louisiana. Added that in California, Region 9 is fantastic and she doesn't particularly want the state of California to take over UIC. She noted that we have to be careful and understand that states are different. In California, it's very difficult to permit, but Oviatt is proud to say she's been successful getting things built, including working through requirements such as evaluating environmental impacts. Oviatt commented that the task force needs to weave the differences into a framework.

Offshore: **Joyce** commented on permitting gaps. Noted that her organization is developing projects in state waters in the Gulf of Mexico. If you put a permanent structure on the sea floor for oil and gas, it's covered by the Railway Commission or the Department of Natural Resources for state waters. But if it's a platform, a permanent structure for non-oil and gas, then you have to go through a lengthy Army Corps of Engineers process. First identify gaps and in-between permits, like this, in advance, then we can solve them by leveraging expertise in this group. Another issue: pore space ownership for the Outer Continental Shelf (OCS) has not been transparently discussed. **Tucker** noted that \$45Q doesn't cover offshore costs. **Joyce** responded that her organization is working in state waters in Texas and Louisiana, doing projects, and it is not more expensive. **Saunders** remarked that as we look at a transition from onshore through state waters into offshore, there are some questions still at play on jurisdictional issues that this group could clarify. The Class VI permitting focus is on protecting an underground source of drinking water (USDW), what are the implications in the offshore context where there might not be a USDW, but it's not the outer continental shelf and it's state waters. It's either EPA permitted or state

permitted. Task forces can address the important gray areas and outstanding questions, like this, at least identifying the need to clearly and concisely address those.

In closing this session, the Chairs made comments. Righetti asked the members to consider subcommittee interest. She noted that we're not going to be able to solve all of these issues in this room with the time that we have, but initially we can gather data, gain some common understanding of issues, identify pinch points. Friedmann offered ideas for well plugging, including a decommissioning fund of some sort, and an atlas of options, rather than a uniform standard, with templates for different geologies and regions for accelerating well plugging. Friedmann also requested more discussion on data sharing and capacity building, such as what training programs are needed.

Session: Developing common approaches to state-level CO₂ pipeline regulation and oversight

Presentation: Key issues to consider / CO₂ pipeline regulatory landscape—Jarad Daniels, CEO, GCCSI.

Daniels noted that GCCSI provides fact-based advocacy, knowledge sharing, thought leadership to accelerate deployment of commercial deployment of carbon management technologies broadly. He summarized the pipelines needed based on different analyses. He noted legal and regulatory state-of-play, as just one part of the overall process. CO₂ pipelines in state statutes—states differ on siting decision making, common carrier status, and eminent domain requirements. He raised challenges associated with CO₂ pipeline development: revenue model, definition of CO₂, definition of common carrier. Daniels touched on pipeline safety, noting CO₂ pipelines have a robust safety history despite incidents. He emphasized the need for community engagement and referenced the number of guidelines already in existence. He noted opportunities for reducing co-pollutants, and highlighting co-benefits of CCS, in addition to local economic benefits. He closed by noting GCCSI's recent publication, *Building Our Way to Net-Zero: Carbon Dioxide Pipelines in the United States*.

Presentation: CO₂ pipeline safety—Tristan Brown, Deputy Administrator, Pipeline and Hazardous Materials Safety Administration. Brown noted that PHMSA has oversight of nearly 3.4 million miles of pipelines in the United States, and nearly one in 10 goods that are classified as a hazardous material and transported via truck, train, plane, vessel, automobile, drone, or other mode of transportation. PHMSA sets and enforces Federal safety standards, conducts R&D, and engages with the public. For perspective, Brown mentioned the hundreds of thousands of miles of natural gas distribution and gathering lines that have been added to the pipeline network across the United States in recent years. PHMSA's role is safe design operations and maintenance of these facilities—not permitting or siting. He noted that PHMSA doesn't yet have standards for CO₂ as gas phase, but is working on a proposed rulemaking, which would update Federal regulations for CO₂ pipelines. As noted, the rule does not include siting or prescribing a location. Brown noted that in the past, PHMSA has worked with local communities on issuing guidance to mutually protect people from pipelines and vice versa, with the National Association of Counties. There may be renewed interest.

Brown noted that PHMSA is currently going through its reauthorization bill. Some ideas from the task forces may involve Congress changing laws. This is one instance where Congress is scheduled to update the law, so is an opportune time to share perspectives from the members' stakeholder organizations.

Brown commented that siting rests largely with individual states and counties through which the pipeline will operate, even if interstate pipeline. Although PHMSA does not site pipelines, it does provide technical assistance to siting authorities. Brown acknowledged that PHMSA typically has not engaged in

NEPA processes, as a result of its limited capacity, but highlighted that PHMSA has brought on new staff with NEPA experience, to build out its capacity to support and be a resource to permitting and siting authorities as needed.

Brown commented that PHMSA will exercise and use its authorities to ensure the safe operations of lines that are being built, and noted Pipeline Safety Trust's important role, to ensure new infrastructure is not built unless it is meeting minimum safety standards. Brown then discussed his travel to Satartia, Mississippi, after the 2020 incident, where he met with victims and first responders. There were standards in place, but a lot of those standards were not met. PHMSA completed a Finalized Failure Investigation Report, issued a civil penalty on the operator, did lots of public engagement about the current rule, to learn, mitigate risk, and address everything that went wrong in that incident. Brown noted that since the incident and subsequent engagement and investigation, PHMSA imposed new safety measures for CO₂ pipelines. Brown concluded by noting his appreciation for everybody's continued engagement about pipeline safety.

Facilitated Discussion

Federal Energy Regulatory Commission (FERC): **Heyck-Williams** asked if FERC will be involved in the meetings of the task force at all. **Waldron (DFO)** responded that we do not have an appointed member from FERC on either task force, but FERC could be invited as a speaker, and they could contribute to subcommittee work.

Eminent domain: **Carter** asked about Daniels' slide with the different aspects of pipeline regulatory approaches, and the source of information about Pennsylvania. **Daniels** noted that source was a NARUC 2023 report.

Zoning standards and setbacks: **Caram** identified a regulatory gap, noting a long-held opinion that states can adopt zoning standards and setbacks for pipelines. PHMSA is prohibited from doing so, and there are lawsuits in counties in Iowa for trying to do so.

Impurities: **Caram** noted a regulatory gap related to impurities, noting that the economic regulation of some pipelines limits the impurities in pipeline contents. For CO₂ pipelines this is a gap, which is important to fill because impurities can cause corrosion. Friedmann added that in the Satartia incident, the pipeline was carrying CO₂ contaminated with hydrogen sulfide.

Pipeline corridor pre-planning: **Rota** commented on PHMSA geohazards bulletin, and the significant geohazard risks in the coastal wetlands or internal wetlands, which are in hurricane- or tornado-prone areas. Suggested identifying some natural areas, such as coastal wetlands in restoration, to be off limits to some risky infrastructure. **Collins** highlighted the model of pre-planning developed for the pipeline corridor in Wyoming, noting it wasn't around a specific project, but more of a coordinated approach about how to manage CO₂ pipelines within a state. May be useful for developers and citizens to think bigger than a specific project, areas like wetlands could be avoided, it's not about drawing a straight line. **Brannen** agreed with the importance of planning. Suggested looking more holistically across a region in terms of where are the demand centers for capture, and where are the opportunities for storage, and prioritizing those with greatest climate benefit and greatest need; this could be a mechanism to reduce impacts and reduce the need for some pipelines. Suggested a subgroup to develop criteria for prioritizing those pipelines. Can you co-locate/re-use existing pipeline corridors, to minimize new impacts on communities or landscapes, through planning. **Murphy** noted that transparency or

centralizing decision making would be challenging. But centralizing project planning and data sharing might be something that could be explored in non-regulatory process, or pre-planning environment. IT tools could help communities see big pictures and help regulators see their role. **Heyck-Williams** suggested inviting state wildlife agencies into pipeline pre-planning. They don't have permitting authority or siting authority, but they have a lot of expertise in how to avoid, minimize, and mitigate harm to different sensitive ecosystems, especially wildlife habitat. Consider requiring that they be part of certain decisions.

Engagement: **Duguid** remarked that technical issues can be addressed. Need solutions to countering half-truths and misinformation. **Saunders** noted that in response to earlier comment about over-burdening communities, in context of engagement, how communities may be asked to educate and participate with operators, repeatedly, agrees it can burden those communities. With respect to pipelines, information is needed across the value chain. When there is a hub and projects are connected/related, agencies could do a better job of bringing all big-picture information together, and all relevant authorities together so if one can't answer a question from the public, the other agency is there to answer, in one room. **Caram** referenced comments about distrust and maybe some misinformation, and plugged American Petroleum Institute (API)'s recently published Recommended Practice (RP) 1185, on Best Practices for public engagement about pipelines. He noted that it's a good document, and a lot of what we're hearing about distrust and misinformation could be addressed by operators, following the principles in that standard, guiding principles around transparency. He suggested that it really pushes operators to share more information than they have in the past. API RP 1185 emphasizes two-way education, and really listening.

Pipeline safety inspections and enforcement: **Tracy** asked about Federal enforcement vs state-level and intra- vs interstate; noted that duty II focuses on state level, so to what extent PHMSA regulations are implemented at the state level? **Brown** responded that it depends on the state—PHMSA has agreements with some states but not all. For some, PHMSA reviews state inspections processes and procedures, provides funding to some states for inspections. Congress just gave more funds for more rigorous enforcement programs. Ultimately PHMSA has backstop authority in all cases to enforce Federal pipeline safety regulations and ensure compliance. PHMSA uses a host of redundant tools to ensure that the inspections in a given state occur, that they're rigorous, and that where there are issues of non-compliance, PHMSA enforces those rules. There is room for improvement; still issues of non-compliance, and additional build-out, so need for additional resources. Mentioned again reauthorization process. **Friedmann** noted that at Satartia, there were rules in place but not enforced. **Brown** clarified that there were rules in place that PHMSA did enforce after the incident. He noted that a lot of community concern is focused on how to prevent an incident. Can dissuade some bad actions with enforcement but fines only go so far. Other tools include inspections, etc. **Palacios** noted that in Texas, too few inspectors for number of pipeline miles. Asked if it is possible to require minimum number of inspectors per mile. **Brown** noted that PHMSA bases inspection frequency on many factors: compliance history of operator, proximity to population, high consequence area, age of pipeline, etc., so highest risk lines receive the most attention and inspection. Engaged with Pipeline Safety Trust and others about those issues. Multi-pronged approach to reduce risk, and address issues people have raised.

Offshore pipelines, CO₂ transport by ship, and intermodal hubs: **Member** commented that offshore CO₂ pipelines exist in the North Sea now. The rest of world is developing ships, floating ships will be operational in the North Sea soon, and southeast Asia is planning ships. In the Gulf of Mexico, CO₂ pipelines on the inner shelf may make sense. But possibly our offshore CO₂ may be delivered for OCS CCS

by ship, not pipeline. Task forces may need to work on how we integrate offshore intermodal transport hubs.

Amine slip: **Esposito** asked about the scope of the duty, whether emissions from the CO₂ capture process permitting is included. He noted that from a carbon capture perspective, EPA really doesn't have clear emissions limits for amines or degradation products, which leaves some uncertainty. He commented that technology vendors are pushing the limits of reducing them, if not completely. **Palacios**, referencing a fertilizer plant in Texas and one of the pain points with capture being the amines and the ammonia, acknowledged that CO₂ capture offers possibility of co-benefits, and requested acknowledgement that there is also potential for increasing co-pollutants and indirectly increasing other hazardous materials. **Friedmann** commented that a large international workshop was held in 2011, and publication in 2012, addressing amine slip. He noted that amine slip appears to be extraordinarily low risk; though that does not include the production and manufacture of those things, which was part of your point, but the actual risk associated with amine slip is near zero.

Data transparency: **Rota** responded to the reference to API RP 1185 and access to information, stating that coordination between agencies and also coordination with agencies and public is important. He feels that it is arduous to get information from government agencies—FOIAs and state agencies' sunshine laws, and hopes that this task force will advocate for having data readily available to the public around CCS pipelines and other CCS facilities. He expressed an understanding that there are proprietary things that can't be shared, but noted his organization has had trouble trying to find out how many boreholes are in or even where the area of review is going to be on some of these proposed CCS projects. He noted that this is vital information for the public to know, if the ground underneath where they live could be impacted. **Carter** noted that on data availability, dataset access, her organization shares that concern as well. She noted if you're not already familiar, DOE has made several FOA awards to state surveys. There are several projects being deployed now in Pennsylvania, which partnered with West Virginia, Michigan, etc., to be providing web-based tools to provide the kind of data needed about a particular area in advance of a carbon storage project, and the kind of data sets that are needed to do the due diligence review and site assessment. **Duguid** noted in response to comment about not being able to access data about where are the boreholes in the area of review of the project - is the concern around when you get that data? The data will become public, maybe the comment was about not getting it soon enough. He explained that the reason for that is because when a permit application is submitted there is a back-and-forth process with EPA, and the proposed project area of review can change in response to the technical review, until the review is complete.

Public right of refusal: **Rota** noted that the communities that he works with in Cancer Alley in southwest Louisiana are tired of their comments not being acted upon. His organization feels that consent in permitting processes is vitally missing; there is no option for it to not happen. He suggested that when a permitting process begins, it is assumed the project is going to happen in some form and 99.9% of the time it does happen and does get permitted. His organization believes that if the community doesn't want it, for good reasons, it shouldn't happen. **Duguid** remarked that the maps that were shown this morning on where storage is are probably overly rosy regarding where you can do storage. He explained that there are whole portions of those maps that you can't do projects, which means the places you can do projects are going to be at a premium. If every community says no, we can't solve this problem. He suggested that the task force figure out processes to work through this. **Ross** mentioned that a variety of developers are pursuing projects. Some projects have committed to giving the communities go/no go decisions. Many of us are committing to incorporating as many principles of consent-based siting as we

can. One of the real challenges is giving a community a go/no go decision for a commercial entity is a very, very challenging thing to do. She suggested that how to do that is some of the work of the task force.

Barkau cautioned about a one-size-fits-all solution. She commented on Wyoming's process of notifying the public, and noted that all permits, applications are online. Agency engagement includes meeting with county commissioners, keeping our legislators involved, meeting with our interest groups. Her organization meets with certain interest groups yearly to give updates on a project. She cautioned not to generalize because there are states like Wyoming that are actively working with our communities to do this, and not all permits will get approved. Wyoming denied a Class VI permit because it was not going to be protective of our citizens and our environment. Recommended not generalizing, and not applying a one-size-fits-all approach.

General comments:

Palacios commented on a specific natural gas pipeline project that is not for CO₂, but felt the concerns relate to all pipelines, including the lack of emergency responders/trauma care in the rural area, need for local public meetings in the rural area, advanced information, language services relevant to the area, and from a neutral third party such as a state agency if appropriate.

Collins commented on utilization as a long-term vision, and noted that the task force could communicate the long-term vision, and offer local prosperity, create jobs and products from CO₂, not just storage.

Heyck-Williams suggested incorporating natural infrastructure, or other sorts of green aspects into the project sites to the extent possible. Might make it more appealing visually, and also provide other nature and climate co-benefits. **Righetti** thanked members and provided summary comments: differences in state regulations for routing include differing approaches to addressing common carrier and open access requirements, and that can differ on Federal lands depending on the right-of-way granting authority and it can differ under state condemnation laws as well. Suggested it is a topic as Task Force moved forward.

Public comment period, virtual—pre-registered speakers

Waldron noted that members of the public were invited to pre-register to offer an oral statement to one or both task forces. The Zoom producer introduced each speaker and explained that each speaker was allotted three minutes.

Toby Mack, President of the Energy Equipment and Infrastructure Alliance (EEIA). Noted that their members build and operate pipelines of all kinds throughout North America and that he appreciates this opportunity to make recommendations to the task forces on ways to facilitate and accelerate the build-out of the CO₂ pipeline network that will be essential to large scale capture and sequestration of CO₂ from industrial processes and power generation.

He recommended that state regulatory bodies permit rulings have primacy over local or county level ordinances that seek to impose control over project siting beyond conditions set forth in the state utility board or commissions grant of a route permit. Local jurisdictions should not have the power to block projects through such actions. As ordinances or zoning restrictions imposing draconian project setback requirements that render siting impossible or impractical, either before or after a route permit has been granted by the state regulatory body.

He also recommended that state regulatory bodies be required to act promptly on a project permit application within a reasonable time that also allows for thorough assessment of environmental impacts and meaningful public input into the review process. He noted that in most cases, a one-year review and decision timeframe will allow for orderly and thorough review while affording the project developer and his contractors a reasonable degree of certainty that a decision will be issued in a manner that allows for orderly and cost-effective planning, preparation, acquisition, and allocation of construction assets. Similarly, he argued, a timely disposition must be mandated for any judicial challenges to granted permits, again, necessary for early and efficient project planning and execution.

Mack stated: An example of a priority project, critical to meeting carbon reduction goals is the 2,400 mile five-state project proposed by Summit Carbon Solutions to capture and sequester approximately 16 million tons of CO₂ annually from ethanol refineries in the upper Midwest that will be otherwise vented into the atmosphere. He expressed concern that navigating the patchwork of different individual state permitting processes is adding substantial cost and delay that threatens a project currently offering the greatest immediate potential for carbon reduction in the world.

He noted that EEIA appreciates this opportunity to share their recommendations and looks forward to continuing support of the task force's efforts to facilitate the creation of large-scale CCS and CO₂ pipelines needed for implementation.

Susan Thomas, Director of Legislation and Policy for Just Transition Northwest Indiana, an environmental justice organization working with the largely black, brown and low-income communities of northwest Indiana. Noted that her organization is a proud member of the Climate Justice Alliance and helped write the EJ framework for three studies released by the Institute for Environment and Energy Research, headed by its president and foremost hydrogen CCS expert, Dr. Arjin Makajani, and Dr. Tom Hurstbach out of Stanford, in which nine organizations from across the United States wrote the EJ framework all in agreement with the science that CCS and CCUS is a dangerous false solution. Also noted that her organization testified at the White House Environmental Justice Advisory Council against CCS and applauded when the WHEJAC working group on carbon capture voted unanimously to oppose this dangerous undertaking. She's encouraged that Catherine Coleman Flowers of WHEJAC is here but expressed discouragement that EJ communities are underrepresented, and will be impacted the most.

Noted that a report of all community conversations in this process must be made public, not just a mandatory box that is checked, but transcripts of the dialogues that happened and implementations that occurred from their input is needed.

Noted that she agrees with the burgeoning list of scientists and community organizations that CCS only benefits the fossil fuel industry for continued oil and gas projects. She expressed a mistrust in the oil and gas industry, commenting that they are "bad actors" that knew about the dangers of climate change and plastics decades ago, and are now writing legislation for the GOP presidential candidate to benefit themselves, which has now thankfully come under scrutiny. She called for independent verified community safety plans for any and all permits. She noted Satartia as only one example of many CCS failures that have occurred across the globe. She asked who will be providing oxygen packs to those in surrounding communities or electric emergency vehicles in case of ruptures? State agencies here routinely ignore oversight and enforcement of permits to the benefit of industry. She offered the example of Sulphur Louisiana. She expressed mistrust of BP, with its history of global pollution, and plans to inject tons of CO₂, a never before amount attempted. On an earthquake fault line. She commented on

motivations, to reap massive tax credits of \$23.5 billion, and asked, is it any wonder folks are shaking in their shoes? They are alarmed by the massive amounts of water necessary for CCS, which can increase power plant water requirements from 56 to 90%. Even green hydrogen will take billions of gallons of water to produce in an age of water scarcity.

Maggie Coulter, senior attorney at Center for Biological Diversity's Climate Law Institute. Thanked everyone for the opportunity to provide comments to the CCUS Permitting Task Forces. Focused primarily on requirements for robust community engagement processes for these proposed carbon capture projects and CO₂ pipelines. Commented that carbon capture projects often actually increase localized air pollution, which disproportionately poisons low-income black, brown, and indigenous communities where fossil fuel industry infrastructure is frequently located. Suggested that even companies whose facilities may utilize carbon capture acknowledge that it is detrimental to air quality given the increase in energy and chemicals it would require at sites to which it is applied as noted in their permit applications. Suggested that these emissions cause health problems including brain damage, asthma, heart attacks and cancer, and low-income communities and communities of color are disproportionately impacted by these harms. In February of 2022, the CEQ proposed an interim guidance to assist Federal agencies with the regulation and permitting of CCUS activities in the United States. Commented that despite numerous comments requesting that CEQ strengthen that guidance to better consider and protect communities, CEQ has not done a finalized version of its guidance. Stated that EPA and states with primacy for Class VI injection wells currently rely on CEQ's non-final guidance, and called for more robust review, incorporating meaningful input from impacted communities and the authority to deny Class VI permits upon a finding of adverse impacts and risks to communities.

The speaker commented that inadequate and fragmented regulation of the carbon capture industry has made it difficult for communities to understand and obtain information about CCS projects that may affect them, and questioned the whole-of-government coordination of CCS and transport. Commented that at present multiple agencies from Department of Energy, IRS, PHIMSA and the Army Corps of Engineers have responsibilities for funding, permitting and oversight; yet there are disconnects between agencies and programs. Commented that the Army Corps of Engineers promoted the streamlining of its permitting processes through its nationwide permitting process rather than individual permit review. Speaker's position is that nationwide permitting is not appropriate for CO₂ pipelines stretching thousands of miles and crossing thousands of water bodies. Disagreed with a one-size-fits-all approach of nationwide permits that could hinder the public's ability to obtain information and provide meaningful analysis and input on the unique dynamics of pipeline crossings on individual waterways. Without adequate access to information about proposed projects or clarity on the state and Federal permitting processes involved, nor the option of denying permits or CO₂ pipeline proposals, so-called community engagement processes only serve to check a box merely playing lip service to environmental justice community concerns and doubling down on environmental justice sacrifice zones.

Lisa Ritzert, an affected landowner in Iowa, noted that in her world with regard to hazardous CO₂ pipeline projects, clarity, transparency, credibility and public engagement are not reality. Incentivizing CCS as a nascent industry for rapid and robust build-out in populated areas with regulation inadequacy is of serious concern. Speaker feels that community stakeholders were blindsided by pipeline companies and political influencers, and the public has been inundated with pipeline misinformation, advanced by politicians, heavily lobbied and receiving large campaign donations from pipeline actors. Followed by legislative blockades for needed public and resource safety around a new state industry. The public has been burdened by this project into their lives yet pushed out of discussion, trampled on and is at an

extreme disadvantage in the entire process. The cart has been put before the horse and a circular mess has been created. The Federal government is in process of improving CO₂ pipeline safety regulations, and leaves siting authority to states and local governments. The state of Iowa's regulatory body, the Iowa Utilities Board, does not have a hand in siting. In three years, the state has made zero advancements or changes in regulations by the state regulatory body or the state legislature to protect people and resources with this world's largest hazardous CO₂ pipeline bearing down on the population. Local governments are being sued by the pipeline company for setback ordinances. Speaker commented that the world's largest CCS project intended by the Federal government to reduce CO₂ was courted into a state that has not even acknowledged climate change, has no climate action plan, has not considered alternatives, and has turned down Federal money for research on this front. Speaker suggested that the sales pitch has morphed from climate benefit to ethanol savior to sustainable aviation fuel and CO₂ fracking, and argued taxpayers deserve better accountability and public benefit for their money. She does not understand how energy- and water-intensive projects are being piecemealed and pushed forward with no comprehensive public cost benefit analysis, and no comprehensive environmental impact studies in capturing biogenic CO₂ from ethanol facilities. Speaker's assessment is that the creation of anthropogenic CO₂ in construction and operation is not beneficial with the cost of water depletion and carbon while consuming high-value food-producing land. Federal, state, local, and public collaboration and cooperation are non-existent from her perspective. Speaker concluded by commenting that the task force is a late start but welcomed. More public voices need to be brought into the decision-making fold and a pause or moratorium should be placed on CO₂ pipeline projects until goals mentioned here today are put into action.

Friedmann gave wrap-up comments about process and indicated that the Chairs will take a little time to plan the subcommittees' processes. He emphasized the need to work toward solutions, and **Waldron** closed the meeting for the day.

Adjournment—Day 1. The meeting adjourned at 4:35 p.m.

CCUS Federal Lands and Non-Federal Lands Permitting Task Forces

Joint Meeting of Appointed Members

Minutes of Meeting

Day 2–May 22, 2024, 9 a.m.—12 p.m. Eastern Time.

Waldron convened the meeting at 9:05. **Friedmann** provided brief opening remarks.

Session: Identifying priority CO₂ pipelines needed to enable efficient, orderly, and responsible development of CCUS projects at increased scale

Presentation: Key issues to consider, and DOE tools to support decision-making—Bob Smith, Program Manager, Carbon Transport, DOE FECM

Smith began by reviewing high-level issues to be considered and steps involved in analyzing pipeline routes, which include: data gathering, analysis and optimization. He previewed the tools, which support route optimization and may be useful for those working with safety regulators, navigating environmental reviews, and working with communities. The tools support developers' seeking to be flexible, to enhance proposed project based on input from stakeholders.

Smith presented a brief overview of the three publicly-available models the Department developed and makes available for analyses and community engagement efforts:

- SimCCS pipeline network model, part of larger platform developed by Los Alamos National Lab provides integrated pipeline system design and network optimization. Provides modeling of the network characteristics and cost analysis at national, regional, and commercial scales. It can account for disadvantaged communities and environmentally sensitive areas.
- CO₂ Pipeline Transport Cost Model, developed by the National Energy Technology Laboratory (NETL) – an Excel-based financial model that provides revenue and cost analysis of CO₂ pipelines, based on pipeline lengths, flow rates, and operational factors.
- Smart CO₂ Transport-Route Planning Tool and Database, developed by NETL with expected release this summer of 2024 – open-source tool that identifies potential routes and evaluates corridors using an underlying geodatabase. Uses start and end locations, and offers optional preset CCS project locations.

The following questions and answers were exchanged after Smith's presentation:

- How frequently are underlying databases updated, in terms of point sources, etc.?
 - SimCCS is almost real-time updated, from new capture sources, EPA databases, and more.
- How are routes calculated (e.g., deterministic routing functions, or AI)?
 - SimCCS and route tool use machine learning.
- Does DOE provide training modules or courses?
 - Each slide has links to pages allowing anyone to download the tool and user guides and find opportunities to get more information. Staff are available to answer any questions.
- Could these tools integrate with permitting-level information?

- Tools support developers to be prepared, such as for rigors of environmental and safety reviews, and making changes to project based on community engagement learnings and feedback.
- Route tool considers topography changes, and considers landslide-prone areas also.
- What is source of layers of disadvantaged communities and environmentally sensitive areas?
 - They are among the 50+ layers, although not sure the exact definition or data source.
- If there are other data at state level or private sector – could there be mechanisms to get new data to tool developers?
 - Yes, tool is evolving, improvements are incorporated.

Engaging Communities Panel

Remarks: Jeremy Moddrell—United Association (UA) of Journeymen and Apprentices of the Plumbing and Pipe Fitting Industry. Moddrell noted that his union has 380,000 members and would be involved in CO₂ pipeline construction. As its members would economically benefit from the CCUS industry's growth, the presentation focused on community engagement efforts and observations. Moddrell commented that UA has significant community engagement efforts and has been successful at boots-on-the-ground approach. For example, union officers attend engagement meetings in support of projects. When UA members who are residents speak in support, as direct community stakeholders, they can testify about actual benefits in their local economy, and how skilled labor can ensure correct, safe construction both for workers and public. The Union's involvement with a high school apprentice program called Career Technical Education (CTE) was highlighted. Details were shared about building goodwill and trust in areas affected by construction projects and in school districts from which the workers are recruited.

Remarks: Al Collins—retired, formerly Oxy Low Carbon Ventures, Occidental. Collins shared his experience in industry about project development and execution, providing additional dos and don'ts. He told the story of a prior company who thought they knew what was best for the community before engaging them. The developer thought highly of a proposed golf course, but it did not fit the needs of the community. Noted that the better way is to engage the community and develop relationships. He recommended starting by learning the background and history of the community and the geographic area. Do the appropriate technical work to understand the geology, pore space, and project requirements. Later, when technical information is ready to share, conduct in-person engagement. Have listening sessions, use tools to disseminate information such as dedicated phone lines, websites, and scheduled meetings; partner with local community leaders as well as faith based and environmental justice organizations, and use community events to have a presence to share factual information and the benefits of the project. Understand the burdens of the community, then look for ways to alleviate these burdens if possible. Building trust is absolutely critical to success. Noted that trust is not purchased; it is rented, every day and that small groups of three to five people are helpful. Also noted that small actions make a difference in the community. The talk noted the importance of staying humble, not arriving with preconceived notions, and being empathetic.

Remarks: Shannon Heyck-Williams—Associate Vice President of Climate and Energy, National Wildlife Federation. The NWF was described as a network of independent organizations with highly localized concerns. Heyck-Williams noted she is not representing a specific community, but referred back to the previous day's comments on how a Wyoming community may look at a CO₂ pipeline as an economic opportunity, while one in Louisiana sees yet another environmental burden and safety risk. This was captured in a quote from the talk, "we all have different truths and they are all true."

Reflections on effective engagement were then shared:

- Early engagement, before any permits are issued, is ideal.
- Holistic community engagement is not synonymous with the contract negotiations involving individual landowners, who may have competing interests. Without the broader engagement, conflict with the affected parties may be exacerbated rather than avoided since transparency is not highlighted.
- Local officials may be influenced by industry interests or other financial motives, so engagement must be broader.
- Research must be done before meeting with the community, so that its truths can be better understood. Respected institutions can act as impartial liaisons and should be identified.
- Developers should innovate to achieve greater community buy-in by local shared ownership, data monitoring, etc.
- Project communications must be disseminated in all spoken languages; it should not be assumed that all community members have access to the internet.

Facilitated Discussion

The speakers were followed by a question and commentary period, which included the following comments.

Priority pipelines: Several members asked for the group to define Priority. **Thompson** emphasized using data and models to identify priority pipelines, and cautioned that a model for siting oil and gas pipelines may not be an appropriate model for CO₂ pipelines. Encouraged the group to borrow approaches from other infrastructure processes. What can we learn from transmission lines? What can we learn from highways? Subcommittees should use lessons learned, not just from oil and gas.

Resources for community engagement: **Tucker** referenced GPI's toolkit to develop community engagement programs, and noted the five-minute video for CapturePoint's Vernon Parish project. **Ung** suggested the Task Forces refer to the recent National Petroleum Council report on Harnessing Hydrogen, Chapter 7, which addresses community benefits. **Friedmann** suggested the task forces should summarize best practices for community engagement; many groups (e.g., GPI) have already developed these.

Righetti suggested, if a program is not already available, support be available to develop proactive engagement guides to capture how a community wants to be engaged, which would help eliminate duplicative processes of discovery for each project, and ensure that priorities originate locally and are being communicated consistently.

Ross commented that some feedback from communities surprised them, that there could be too much engagement; noting that one county commissioner was very clear about not over-engaging his community. She cautioned not to go in with assumptions about a community's biggest concern; they found in one community it was road damage, not pipeline safety. **Ross** also encouraged the group to consider policies beyond community benefit agreements and best practices, to benefit stakeholders and address concerns.

Referencing Moddrell's presentation, a **member** commented that the workforce to build the priority CO₂ pipelines does not exist everywhere, so worker development should be part of the community engagement discussions.

On community engagement, **Duguid** cautioned about careful climate communication, providing personal examples, and suggested the group could develop educational materials that illustrate CCUS business models that put \$85/ton into perspective.

Eminent Domain: On the role of eminent domain and priority pipelines, **Heiner** commented that in many states eminent domain is for public need and necessity; asked whether climate change is a public need and necessity, to be able to take private property rights.

Chairs Righetti and Friedmann provided summary comments on the panel and discussion on Priority Pipelines, noting panelists were asked to focus on engagement topics and how to get communities to support pipelines. They also emphasized that the USE IT Act duty V is to identify priority pipelines that would result in scaling up CCUS projects, places where infrastructure doesn't exist and is needed, or where it is lower risk.

Session: Identifying Federal and state financing mechanisms available to CCUS project developers

Righetti opened the session by reading the USE IT Act duty VII.

Presentation: Federal financing mechanisms—Bob Smith, Program Manager, Carbon Transport, DOE FECM. Smith discussed Federal financing mechanisms for carbon transport. He noted that the Bipartisan Infrastructure Law (BIL) is funding multiple opportunities for which carbon transport systems are eligible through the Office of Fossil Energy and Carbon Management and the Office of Clean Energy Demonstrations. Transport pre-front end engineering design (FEED) studies, not funded by the BIL, were discussed. Pre-FEED studies support advancements in infrastructure engineering and conceptual design needed for large-scale projects. Smith provided context for Pre-FEED and FEED studies awarded so far, which are focused on multimodal hubs.

Smith explained that the \$100 million FEED study allocation in the BIL offers the opportunity to move beyond the conceptual phase. These awards are in their third release cycle. The first Funding Opportunity Announcement (FOA) was limited to pipelines, the second was for any single mode of carbon transportation, and the third is open to all transport modes. He noted that the total CO₂ transportation capacity of FEED study award recipients to date is 344 million metric tons per year.

Smith discussed the BIL-supported CIFIA program, which authorizes \$2.1 billion and establishes a credit loan subsidy of \$20 billion. The objective of this program is to financially enable the growth of large capacity common-carrier CO₂ transport infrastructure. Smith then discussed the steps and timelines associated with applications to the program. Project eligibility requirements are available through the guide on the webpage. Smith summarized timelines, which vary based on scale of project. Timelines include cover activities including credit approval and NEPA environmental review.

Smith highlighted that the funding opportunity announcement for the second part of the CIFIA program was released at the beginning of May 2024, involving "future growth grants." This assists projects that are seeking to expand their originally-designed capacity (e.g., inches to diameter). Smith summarized the application process and timelines. After Smith concluded his presentation, a single question was asked: Are funds being accessed, used? Smith replied that the program was just recently fully opened through

the released FOA, and commented that the program may be still gaining momentum with expanded awareness of loans and future growth grants.

Presentation: Jim Powell—Federal representative to the Southern States Energy Board. Powell provided an overview of the Southern States Energy Board which is comprised of 16 states and two territories. The Southern states Energy Board has approximately 20 projects ongoing. They have developed legislation tracking reports related to energy and environmental issues. They also have an interactive digest on their website to learn about state legislation. The speaker provided two legislative updates from the member states: Texas was not able to pass legislation that added CCUS to its emissions reduction program, but Oklahoma passed a Senate bill with state grants for hydrogen production from fossil fuels using CCUS.

Remarks: Michael Turner—Director of Strategic Initiatives and Finance, Colorado Energy Office. Turner noted that Colorado began a CCUS task force in 2020 to spur the technology's deployment. It was a year-long initiative that brought together industry, social justice stakeholders, and government officials. The goal of this group was to make the state ready to apply for Federal CCUS funding.

Regarding state initiatives, Turner noted that the Colorado Clean Air grants program committed \$25 million over five years for industrial decarbonization. It has been two years since the program was created, and it has distributed almost all of its funds. There is also a CAP program that is funding three or four CCUS projects that have not yet been publicly announced. Colorado has a goal to reduce industrial CCUS emissions by 20 percent by 2030. Finally, there is the Carbon Management Roadmap which is designed to attract project developers.

Turner noted that in its State Energy Office, Colorado has staff dedicated to pursuing Federal awards, and a CarbonSAFE project recently received \$32 million in Federal funds. State officials are determining whether utilizing DOE's loan guarantee office will help increase the number of projects. While it would offer low-interest financing and work well with the Colorado Green Bank, it could be a significant administrative burden on state resources.

Remarks: Rich Garman—Deputy Director of Economic Development and Finance, North Dakota Department of Commerce

Garman shared North Dakota’s activities and approach on CCS project financing. The state has defined pore space, long-term liability over sequestration sites after a 10-year period and received regulatory primacy over Class VI wells. He noted that "innovation over regulation" is an unofficial motto in state government. The state has a non-binding goal of being carbon neutral by 2030 and its geology is favorable to CO₂ storage.

Three state entities were mentioned: the Clean Sustainable Energy Authority, the Renewable Energy Council, and the Lignite Research Council. All are overseen by the North Dakota Industrial Commission. The speaker estimated that in the last seven years, the Commission has administered \$100 million in grants and \$450 million in loans for CCUS projects. North Dakota has a state bank to mitigate risk.

Chairs Righetti and Friedmann provided reflections to close the session: The duty is to identify Federal and state financing mechanisms, including data gathering. Righetti noted that she would like to interpret the duty more broadly to include consideration of what parts of CCUS value chains need incentives and funding. She noted that states are not equally resourced and cost sharing may be needed to receive some Federal funds.

Due to time constraints, no facilitated discussion took place.

Session: Inventorying CO₂ conversion activities and developing recommendations on how to develop and research CO₂ capture technologies

Friedmann started the session and introduced Ron Munson.

Presentation: CO₂ capture research and development—Ron Munson, Technology Manager, Point Source Carbon Capture Program, DOE National Energy and Technology Laboratory

Munson provided an overview of Department of Energy Fossil Energy and Carbon Management point source carbon capture and carbon dioxide removal (CDR) research and development. Research is first done in the simulated environment and then moves to small-scale pilot testing. Tests are done at the National Carbon Capture Center in Alabama and the Wyoming Integrated Test Center. On an international level, larger-scale projects are demonstrated at the Technology Centre Mongstad in Norway. Following large-scale pilot testing with actual flue gas, demonstration testing is performed on fully integrated systems, which include transportation and storage. Techno-economic analyses are concurrently conducted. The speaker noted that various DOE offices (ARPA-E, FECM, and OCED) are involved in testing, depending on the technology readiness level.

Munson noted that NETL is currently developing a mobile testing facility that can be taken to point-source emitters and examine performance issues related to criteria pollutants and material degradation. One key area mentioned is the byproducts produced with the solvent degradation. Another is ensuring capture performance during flexible operations with more frequent ramping and shutdowns.

Munson further noted that that four key development focus areas are power retrofits, net-zero flex power, industrial retrofits, and integrated industrial decarbonization. DOE FOA 2614 provides funding opportunities for CCUS and CDR projects.

Presentation: CO₂ conversion and utilization in commercial products—Tom Dower, Vice President of Public Policy, LanzaTech

Dower presented on CO₂ conversion and utilization in commercial products, focusing on LanzaTech's portfolio and market. Dower noted that LanzaTech began in New Zealand in 2005 and now is a U.S.-based company. He described LanzaTech as a carbon capture and transformation company, noting carbon is the foundation of our material world. It's in the products that we use. The company is focused on carbon utilization to convert waste above-ground carbon into useful products and fuels, chemicals and materials. They have six commercial-scale facilities and convert captured gas to ethanol (and then other products) using microbial digestion. He discussed the technology and facilities. They estimate they are currently able to convert half a million tons of waste carbon emissions into 300,000 tons of ethanol per year. They estimated a large market for waste-produced ethanol, jet fuel, and other materials from ethanol.

Dower noted that the Company is pursuing synthetic biology and using artificial intelligence to directly produce higher value chemicals using modified bacteria. Dower concluded by saying that LanzaTech sees every waste as a resource, including CO₂ from direct air capture.

Facilitated Discussion

A question was posed about LanzaTech's community engagement regarding Freedom Pines ethanol-to-jet-fuel facility. They utilized a former DOE-supported facility that was closed to bring jobs back to the community in Georgia.

Rota emphasized the importance of considering energy and water use for CO₂ capture and conversion/utilization projects. **Dower** noted that each technology is unique and requires varying levels of energy and water, but their processes use carbon monoxide at ambient temperature and so there is no input energy needed for pre-processing.

A **member** commented that "waste CO₂" will become archaic terminology since it will become an input for high-value products; Dower agreed.

Saunders commented: although it may be low-risk, amine slip is still possible. Noted a 2023 workshop. EDF advocates for more monitoring technology to ensure risks are mitigated. Noted that Norway and UK have permit limits.

Duguid commented that permitting needs to happen quickly or projects die. Three years for a permit typically kills projects. They don't need R&D or funds, just to progress rapidly.

Sherman commented on perspectives, including waste cycle, the waste captured could have feedstock value to others. This is different from capture as we've been thinking about it. **Dower** responded that policies to recognize and encourage the capture and use would be helpful for advancing the utilization of waste emissions. **Dahal** commented on CO₂ produced during hydrogen production, and Dower responded that life cycle tools are used to evaluate the net CO₂.

Friedmann closed the session and began a meeting recap.

Meeting RECAP

Friedmann expressed gratitude to all participants for their valuable contributions.

Emphasizing the importance of efficiency, orderliness, and responsibility, Friedmann noted that while the focus has predominantly been on responsibility, it's crucial to balance time and attention among all three aspects. Achieving this balance is challenging but necessary.

Moving forward, ideas and proposals should encompass all three elements. Friedmann highlighted the need to move beyond philosophical discussions and focus on practical, actionable outcomes. Proposals should aim to generate tangible results.

Righetti recapped next steps. She noted that the chairs will convene to review and synthesize the feedback from the meeting. They will explore the possibility of establishing subcommittees and determine the most effective methods for communication and selection within the Task Force. With eight broad duties outlined, addressing all of them will demand a significant level of effort. Prioritization and focus will be necessary, requiring a narrowing down of priorities and the identification of a sequence of actions to guide the Task Forces' efforts.

Mackler reinforced the need to focus on what is practical. How can CCS be accelerated? Choosing the priorities is needed. Policy, markets, financial support are some areas. This is not to add to existing but to streamline existing policy.

Friedmann will be collecting reports to share, including those from the National Academies and other sources. Closed with a reminder of the Task Forces' purpose.

Waldron provided brief closing comments and thanks to all who supported the meeting.

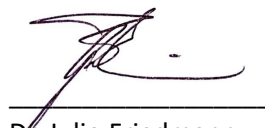
Meeting adjourned at 12:01 p.m.

Respectfully Submitted:

Christina Waldron
Designated Federal Officer

I hereby certify that these meeting minutes of the May 21–22, 2024 CCUS Permitting Task Forces meeting are true and correct to the best of my knowledge.


Professor Tara Righetti
Chair, CCUS Federal Lands Permitting Task Force


Dr. Julio Friedmann,
Chair, CCUS Non-Federal Lands Permitting Task Force

Appendix—Meeting Participants

CCUS Federal Lands Permitting Task Force, Members Participating, May 2024

Tara K. Righetti, Chair

Sasha Mackler, Vice Chair

Jack Andreasen

Lily R. Barkau

Eric Bingham

Tristan Brown

Bill Caram

William (Al) Collins

Indra Dahal

Mark de Figueiredo

Matthew J. Fry

Raven A. Goswick

Sallie E. Greenberg

Shannon Heyck-Williams

Kenneth S. Jackson

Jenny Joyce

James (Jim) Kendall

Jason Lanclos

Timothy "Tip" A. Meckel

Jeremy Moddrell

Julie M. Murphy

Stacey L. Noem

Jim Powell

Matt Rota

Nichole Saunders

Jan B. Sherman

Mark Joseph Spalding

Sherry Tucker

CCUS Non-Federal Lands Permitting Task Force, Members Participating, May 2024

S. Julio Friedmann, Chair

Laura Brannen

Tristan Brown

James Blake Canfield

Kristin M. Carter

Kevin C. Connors

Jarad Daniels

Mark de Figueiredo

Andrew Duguid

Richard A. Esposito

Catherine Coleman Flowers
Rich Garman
Scott D. Heiner
Kyle Henderson
Lorelei Oviatt
Virginia E. Palacios
Ashleigh N. (Hildebrand) Ross
Sarah J. Ryker
Sarah D. Saltzer
Alexander Hume Spike
John W. Thompson
Tyson Todd
Keith Tracy
Michael Andrews Turner
Poh Boon Ung
Robert F. VanVoorhees
Matthew Warren

Non-Member Speakers and Agency Representatives Present

Christina Waldron, DFO, DOE
Dr. David Applegate, Director, U.S. Geological Survey
Brenda Mallory, Chair, Council on Environmental Quality (CEQ)
Brad Crabtree, Assistant Secretary, DOE Office of Fossil Energy and Carbon
Sarah Leung, Director for CCUS, CEQ
Bob Smith, Program Manager, Carbon Transport, DOE FECM
Ron Munson, DOE National Energy and Technology Laboratory
Tom Dower, LanzaTech

Individuals of the public who provided an oral statement:

Toby Mack
Susan Thomas
Margaret Coulter
Lisa Ritzert

A handwritten signature in black ink, appearing to be 'Lisa Ritzert', with a long horizontal flourish extending to the right.