U.S. DEPARTMENT OF ENERGY | Fossil Energy and Carbon Management



Responsible Carbon Management Initiative Resources

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Introduction

The Responsible Carbon Management Initiative (RCMI or Initiative) is a U.S. Department of Energy (DOE) Office of Fossil Energy and Carbon Management (FECM) initiative that aims to encourage project developers and others in industry to pursue the highest levels of safety, environmental stewardship, accountability, community engagement, and societal benefits in carbon management projects. On August 11, 2023, DOE announced a **Request for Information** soliciting input from all stakeholders on the Initiative and draft Principles for Responsible Carbon Management Projects (Principles). The comment period closed on September 30, 2023.

In response to the Request for Information, DOE received 84 comments on the RCMI and draft Principles. Two of these commenters requested that their comments not be published; the remaining comments are available **here.**

FECM thoroughly reviewed all comments received. Commenters' feedback was incorporated into the updated language of the Responsible Carbon Management Initiative Principles and considered in the development of these Resources. The ten updated Principles are below, with additional information and resources accompanying each Principle.

Principle I: Community Engagement

Project developers will conduct robust, early, and consistent outreach to and engagement with parties who are or may reasonably be affected by project deployment and will share project-related information in a timely and transparent way. Project developers will include robust two-way communication in their community engagement plans. Engagement plans should include robust information and training on carbon management technology risks and benefits, so that host communities can understand and weigh the potential opportunities and risks of hosting a project, including health, social, economic, environmental, and cultural effects.

Project developers will work with host and reasonably affected communities to identify and implement mechanisms for accountability to help empower communities throughout the process of project development and deployment.

Project developers will create opportunities to provide input through meaningful engagement that is flexible and responsive to community needs throughout the project, and they will establish and communicate clear processes for modifying aspects of the project in response to community and worker priorities and concerns.

Background

Community engagement is critical to responsible carbon management. In alignment with the Biden-Harris Administration's commitment to advance environmental justice and equity, DOE is dedicated to ensuring that all DOE-funded carbon management projects carefully address societal considerations and impacts, emphasizing early, active, and meaningful engagement with communities. Carbon management projects are required to develop Community Benefits Plans to ensure local community members are engaged in and benefit from project implementation.

However, community engagement, trust-building, and accountability between project developers and communities are not responsibilities exclusive to federally-funded projects. The Responsible Carbon Management Initiative is intended to encourage and support the growth of meaningful two-way engagement as a standard practice for projects across the carbon management sector regardless of funding source.

Resources: Understanding the Principle

Resource	Source	Principle Relevance	More Information
Domestic Engagement Framework	U.S. Department of Energy	Understanding two-way engagement	This document establishes FECM's vision for meaningful engagement across and between stakeholder groups, including environmental justice communities, Tribes, rural communities, labor, and others. Project developers can also find useful examples of putting engagement principles into practice in the table at the conclusion of the Framework.
Best Practices: Public Outreach and Education for Geologic Storage Projects	U.S. Department of Energy	Guidance for "robust, early and consistent outreach and engagement"; education	Provides best practices for early engagement planning, including stakeholder mapping, outreach strategies, and developing educational materials. Case studies offer real-world examples of engagement successes and challenges. NETL published a set of updated Best Practices Manuals (BPMs) in 2017. The BPMs are interconnected, and together they are intended to provide a holistic approach to carrying out a geologic storage project, from inception to completion.
Creating a Justice40 Plan, pages 6-7	U.S. Department of Energy	Defining and identifying "parties who are or may reasonably be affected by project deployment"*	To identify reasonably affected parties, project developers are encouraged to consult Step 1 of Conducting an Energy and Environmental Justice Assessment – Assess Impacted Communities and Groups (pages 6-7) from the U.S. Department of Energy's guidance document for funding applicants, Creating a Justice40 Plan. (See also: Additional Guidance, below this table).
Creating a Community and Stakeholder Engagement Plan	U.S. Department of Energy	Guidance for creating "robust two-way community engagement plans."	This resource for funding opportunity announcement applicants provides helpful information for building community engagement plans and collaborating with communities and other stakeholders.

Resource	Source	Principle Relevance	More Information
Community Benefit Agreement Toolkit	U.S. Department of Energy	Provides guidance for creating a community benefit agreement as an accountability mechanism between project developers and communities	A potential outcome of DOE-funded projects' Community Benefit Plans are formal, legally-binding Community Benefit Agreements: agreements signed by community benefit groups and a project developer identifying the community benefits a developer agrees to deliver in return for community support of the project. Non-DOE-funded projects can implement these or similar formal agreements to empower communities and ensure their input is carried through project development and deployment.
Guidelines for Community Engagement in Carbon Dioxide Capture, Transport, and Storage Projects	World Resources Institute	Guidance for creating "robust two-way community engagement plans"	These guidelines focus on community engagement around carbon capture and storage projects and guidance for creating timelines, discussing risk, and other key components of community engagement. It also includes useful case studies.
American Petroleum Institute Recommended Practice 1185 – Public Engagement in Pipeline Construction and Operations	American Petroleum Institute	This recommended practices document provides guidelines and best practices for pipeline companies to build upon existing programs, or establish and implement new stakeholder engagement, with the goal of facilitating meaningful dialogue throughout the life of a pipeline.	This standard provides a framework for operators to incorporate comprehensive and effective engagement best practices into existing operations and new project developments while allowing members of the public to engage with pipeline companies that operate in their community.

*To identify reasonably affected parties, project developers are encouraged to consult Step 1 of Conducting an Energy and Environmental Justice Assessment – Assess Impacted Communities and Groups (pages 6-7) from the Department of Energy's guidance document for funding applicants, Creating a Justice40 Plan.

Principle II: Workforce Development and Quality Jobs

Project developers will seek to create jobs with family-sustaining wages and commensurate benefits, predictable schedules, a safe work environment, and the assurance that workers will have a free and fair chance to join or form a union. Project developers will prioritize recruitment from local communities and underrepresented or economically marginalized populations, as well as working with local contractors.

Project developers will seek out partnerships with local labor and workforce organizations to support workforce recruitment, training and retention, and to support workforce transition and employment for dislocated workers. Project developers will support workers' career mobility, including providing long-term employment for workers when possible. Project developers will collaborate with communities to identify and remove barriers to ensure that training and job opportunities are accessible to all qualified persons regardless of income, race, color, sex, national origin, Tribal affiliation, or disability.

Background

Job creation, quality, and access are important to the successful transition of the American energy sector – and key to responsible carbon management. The Workforce Development and Quality Jobs principle aims to guide project developers in building equitable staffing strategies that benefit workers and their communities.

Resources: Understanding the Principle

Resource	Source	Principle Relevance	More Information
U.S. Energy and Employment Report (2023)	U.S. Department of Energy	Published by DOE's Office of Energy jobs, this annual report offers useful information on energy and infrastructure workforce characteristics and demographics, including race, gender and union membership across sectors.	Based on surveys of tens of thousands of U.S. energy sector employers, the U.S. Energy and Employment Report is a comprehensive summary of national and state-level energy jobs. This report helps contextualize carbon management in the larger energy labor market, reporting by industry, technology, and region with data on unionization rates, demographics, and employer perspectives on growth and hiring.
Job Quality Toolkit	U.S. Department of Commerce	Defines a high-quality job and identifies the drivers of job quality. Offers guidance on multiple aspects of workforce development, including recruiting, health and safety, and provision of benefits.	This guide is a useful tool for leaders and organizations to improve the quality of every job, and offers strategies and actions to help small-to-medium sized organizations recruit and retain a high-performing workforce.

Resource	Source	Principle Relevance	More Information
Building Pathways to Infrastructure Careers: Framework for Preparing an Infrastructure Workforce	U.S. Department of Labor	Offers a framework for all workforce stakeholders to engage the public workforce system in implementing the Bipartisan Infrastructure Law with strong workforce commitments and proven strategies that produce high-quality education, training, and employment opportunities for all workers.	This resource offers information on the U.S. Department of Labor grants; apprenticeship and other labor programs; and a set of Good Jobs Principles that can help carbon management project developers form robust plans for hiring, pay, benefits, and workplace safety to support workers.
Tools for Building an Equitable Infrastructure Workforce: Gender Equity Strategies as a Model	U.S. Department of Labor	This toolkit provides guidance on strategies and best practices for recruiting and retaining women in construction, manufacturing, and clean energy jobs – from creating hiring plans to retaining a diverse workforce.	This toolkit focuses on and provides useful guidance for recruiting women, who are underrepresented in the energy sector, and can also be used as a framework for recruiting other underrepresented groups, including strategies for identifying and removing barriers to entry and building partnerships with trade and labor organizations.
Workforce Development Guide	The White House	Provides information on important federal funding and other resources project developers can utilize to undertake workforce development activities, including U.S. Department of Energy programs.	This guide provides an overview of federal funding resources to support equitable workforce development including funding included in the Bipartisan Infrastructure Law and key federal funding sources outside of law to support workforce development. The guide is intended for cross-sector stakeholders, including employers, who are investing in and implementing workforce development strategies and programs.

Principle III: Tribal Engagement

Project developers will recognize Tribal sovereignty and self-determination. Developers will work to understand the treaty and reserved rights of Indian Tribes prior to engagement and will engage with Tribes through channels designated by the Tribal government and in a manner that respects Indigenous knowledge and a Tribe's discretion to keep certain cultural practices and knowledge private. Developers will inform Tribes of the risks and benefits of proposed projects that may impact them. When necessary, developers will retain Tribal liaisons who are knowledgeable of Tribal histories, especially regarding energy development, Tribal cultures, and Federal Indian law.

Background

Tribal nations are essential partners in the pursuit of the country's ambitious energy goals. Tribal consultation is critical for carbon management projects that will be hosted by, local to, or otherwise affect tribal communities. While *Tribal Consultation* often means government-to-government relations between Tribal governments and the United States, here we refer to carbon management project developers' direct engagement with Tribal governments. Project developers need to understand and recognize tribal sovereignty – tribes' inherent ability to self-govern – and the policies and governance structures unique to the tribes they will engage with. This includes developing a working knowledge of mineral, treaty, and other rights of Tribes.

Resources: Understanding the Principle

Resource	Source	Principle Relevance	More Information
Department of Energy Guidance for Addressing Interactions with Indian Tribes in Funding Opportunity Announcements/ Other Transaction Solicitations and Financial Assistance and Other Transaction Agreements	U.S. Department of Energy	Provides important context on how funding opportunity announcements are structured to help identify whether project applications could potentially impact Tribes.	This Financial Assistance/Other Transaction Letter is intended to compliment the consultation requirements of the National Environmental Policy Act and National Historic Preservation Act by ensuring applicants and recipients are proactively identifying and addressing Tribal impacts.

Resource	Source	Principle Relevance	More Information
First Steps: A Resource for Engaging with Indigenous Communities in STEM	U.S. Department of Energy	Provides guidance for consulting with Tribes in a manner that respects Tribal sovereignty.	While geared towards education professionals seeking to engage with Indigenous entities to support Indigenous youth in Science Technology Engineering and Math (STEM) education, this resource provides helpful basic guidance for engaging with Tribes on most any project, including: • Recommended research and questions to answer *before* initiating contact with Tribes • Avoiding bringing preconceived ideas or assumptions to the engagement process • Understanding a Tribe's historical perspectives The document also includes a variety of additional resources helpful to non-Native individuals or organizations.
Tribal Treaty Rights Consultation Best Practices Flow Chart	U.S. Department of the Interior Bureau of Indian Affairs	Provides a sequence of actions for engaging with Tribes and, in particular, addresses how to identify applicable Tribal treaties that may apply to a project area. Treaty-ceded lands may be located far from a Tribe's existing reservation.	This flow chart offers helpful guidance for carbon management project developers to research *before* they engage with Tribes: • Whether their project has the potential to impact a natural or cultural resource for a Tribe • Applicable treaty, reserved, or other tribal rights related to the project area • Which Tribes may be affected by the project
Bureau of Indian Affairs' Best Practices for Identifying and Protecting Tribal Treaty Rights, Reserved Rights, and Other Similar Rights in Federal Regulatory Actions and Federal Decision-making	U.S. Department of the Interior Bureau of Indian Affairs	Provides important context and information on Tribal treaty and reserved rights.	This report outlines legal principles and best practices for integrating the consideration of Tribal treaty and reserved rights into federal agencies consultation processes.

Resource	Source	Principle Relevance	More Information
Tribal Leadership Directory	U.S. Department of the Interior Bureau of Indian Affairs	A resource for implementing the first steps of Tribal consultation.	This Tribal Leadership directory can help project developers identify the Tribal offices and staff to contact to begin the Tribal consultation process.
U.S. Domestic Sovereign Nations: Land Areas of Federally-Recognized Tribes	U.S. Department of the Interior Bureau of Indian Affairs	Provides a map of the land areas of federally recognized Tribes.	Provides a map for project developers' reference of Bureau of Indian Affairs Regions, Land Area Representation, Alaska Native Villages, Tribal Statistical Areas, and other visual representations of Tribal lands.
White House Memorandum on Uniform Standards for Tribal Consultation	The White House	Defines and details how Tribal consultation is conducted in the United States.	This memorandum provides important context regarding the Nation-to-Nation relationship between American Indian and Alaska Native Tribal Nations and the United States.
California Air Resources Board 2018 Tribal Consultation Policy	California Air Resources Board	This external resource provides guidance for understanding the meaning of consultation, determining when Tribal consultation is appropriate, scoping, and other steps in Tribal consultation planning.	This policy guide, designed for the use of California Air Resources Board employees, can provide a useful template for project developers in creating a Tribal consultation plan.
Declaration on the Rights of Indigenous Peoples	United Nations	The Declaration is, per the United Nations' Office of the High Commissioner on Human Rights, "the most comprehensive instrument detailing the rights of indigenous peoples in international law and policy, containing minimum standards for the recognition, protection and promotion of these rights."	The Declaration promotes indigenous peoples' full and effective participation in all matters that concern them. It also ensures their right to remain distinct and to pursue their own priorities in economic, social, and cultural development. The Declaration explicitly encourages harmonious and cooperative relations between States and indigenous peoples.

Principle IV: Environmental Justice

Through all phases of carbon management deployment—including siting, design, construction, operation, and decommissioning—project developers will pursue fair treatment and meaningful involvement of all people regardless of income, race, color, sex, national origin, Tribal affiliation, or disability.

Project developers will embrace environmental justice principles and comply with applicable Federal requirements and guidance on these issues. This includes taking into account any environmental and health impacts that burden disadvantaged communities with disproportionate air, water, and land pollution risks. To the extent feasible, project developers will maximize benefits and minimize risks to reasonably affected communities and include protections for them in their proposal plans. In particular, project developers will consider the cumulative impacts on communities hosting carbon management projects.

Background

Environmental justice – defined by the U.S. Department of Energy as the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies – is a core concept for responsible carbon management.

Implementing environmental justice principles in decision-making helps ensure that people:

- Are fully protected from disproportionate and adverse human health and environmental effects (including risks) and hazards, including those related to climate change, the cumulative impacts of environmental and other burdens, and the legacy of racism or other structural or systemic barriers; and
- Have equitable access to a healthy, sustainable, and resilient environment in which to live, play, work, learn, grow, worship, and engage in cultural and subsistence practices.

Resources: Understanding the Principle

Resource	Source	Principle Relevance	More Information
Energy Justice Dashboard	U.S. Department of Energy	This tool can help project developers get a sense of whether disadvantaged communities are local to their project; what burdens and challenges that community may be experiencing; and how these challenges may change across different localities.	This tool is intended to allow users to explore and produce reports on census tracts that the U.S. Department of Energy has categorized as disadvantaged communities. The tool shows census tracts categorized as disadvantaged communities in blue and federally recognized tribal lands and U.S. territories in green. When users select a census tract they can view its top 10 burden indicators, and a full report with values for all 36 burden indicators. Additional information for federally recognized tribal lands and U.S. territories is forthcoming.

Resource	Source	Principle Relevance	More Information
Climate and Economic Justice Screening Tool	White House Council on Environmental Quality	Supports identification of disadvantaged communities that may be impacted by a carbon management project.	The screening tool provides an interactive map and uses datasets that are indicators of burdens in eight categories: climate change, energy, health, housing, legacy pollution, transportation, water and wastewater, and workforce development. The tool uses this information to identify communities that are experiencing these burdens.
EPA Memorandum on Environmental Justice Guidance for UIC Class VI Permitting and Primacy	U.S. Environmental Protection Agency	Provides information for complying with federal environmental justice requirements and guidance regarding Class VI wells.	This memorandum and guidance serve as EPA's operating framework for identifying, analyzing, and addressing environmental justice concerns in the context of implementing and overseeing all underground injection control permitting and primacy programs, including primacy approvals.
EJScreen: Environmental Justice Screening and Mapping Tool	U.S. Environmental Protection Agency	Supports identification of disadvantaged communities that may be impacted by a carbon management project.	EJScreen is EPA's environmental justice mapping and screening tool, which provides a nationally consistent dataset and approach for combining environmental and demographic socioeconomic indicators. EJScreen users choose a geographic area; the tool then provides demographic socioeconomic and environmental information for that area.
Eco-Health Relationship Browser	U.S. Environmental Protection Agency	Supports project developers' accounting for environmental and health burdens and effort to maximize benefits and minimize risks of carbon management projects.	This tool illustrates scientific evidence for linkages between human health and ecosystem services. It provides information about several of our nation's major ecosystems, the services they provide, and how those services, or their degradation and loss, may affect people.
The Center for Disease Control's Social Vulnerability Index Interactive Map	Centers for Disease Control	The Social Vulnerability Index is an additional tool to help project developers, researchers, and other project partners understand and contextualize the specific challenges to disadvantaged communities in a project's vicinity.	This index provides at-a-glance information on social vulnerability indexes across the United States at the county level. Zooming in and selecting for different information layers shows the location and proximity to the project site and nearby communities of streets and roads, hospitals, day care centers, nursing homes and more.

Principle V: Environmental Responsibility

Project developers will thoroughly evaluate, seek to avoid, and mitigate environmental impacts using best practices with respect to project planning, implementation, monitoring, and closure. Project developers will publish environmental analyses and project monitoring data in a way that is timely and easy for the public to access. Environmental analysis will include energy use and life-cycle environmental impacts, including greenhouse gases (GHGs), to ensure that projects meet their intended emissions reduction goals.

Background

Environmental responsibility means ensuring that carbon management projects are fulfilling their intended purpose and reducing or removing greenhouse gas emissions for the benefit of Earth's climate, while also preventing and mitigating negative environmental impacts from that project to the greatest extent possible. This is achieved through conducting lifecycle analysis; monitoring, reporting, and verification (MRV); environmental impact studies; and other analyses which quantify projects' impact on greenhouse gas emissions and, the environment. This Principle is intended to guide project developers' efforts to adhere to the highest possible standards for environmental monitoring, analysis, and reporting throughout the life of their project.

Resources: Understanding the Principle

Resource	Source	Principle Relevance	More Information
Carbon Dioxide Utilization Lifecycle Analysis Guidance Toolkit	U.S. Department of Energy	Provides resources for conducting lifecycle analysis and analyzing impacts for carbon dioxide utilization projects.	Includes guidance documents and templates for carbon dioxide utilization, as well as training resources for conducting life cycle analyses more broadly.
FECM'S Best Practices for LCA of Direct Air Capture and Storage	U.S. Department of Energy	Provides resources for conducting lifecycle analysis and analyzing impacts for carbon dioxide removal, specifically direct air capture and storage projects.	Includes comprehensive guidance for data collection, analysis, and interpretation for direct air capture projects.
United Nations Framework Convention on Climate Change (UNFCCC) Tool for Monitoring, Reporting and Verification of Emissions, Reductions and Removals	United Nations Framework Convention on Climate Change	Offers a robust and thorough set of recommendations and practices for establishing MRV protocols, including ensuring conservativeness, managing uncertainty, and other key factors in an effective MRV methodology.	This document covers high-level considerations around MRV and can guide project developers in the process of developing and applying the protocols for their project. It can also introduce non-expert stakeholders to MRV. More information on MRV is available from the UNFCCC here.

Resource	Source	Principle Relevance	More Information
NETL: Best Practices: MVA for Geologic Storage Projects	U.S. Department of Energy	Provides guidance for monitoring, reporting, and accounting for geologic carbon storage projects.	Covers a comprehensive set of monitoring strategies for geologic storage to confirm carbon dioxide stored underground stays there. Includes detailed information on assessing risk and conducting risk-based monitoring. The National Energy and Technology Laboratory published a set of updated best practices manuals in 2017. The best practices manuals are interconnected, and together they are intended to provide a holistic approach to carrying out a geologic storage project, from inception to completion.
EPA's Greenhouse Gas Reporting Program (GHGRP) Subpart RR page	U.S. Environmental Protection Agency	Provides comprehensive information pertaining to monitoring, reporting and verification for carbon storage projects and implementation information as required by the EPA.	Subpart RR of the GHGRP requires EPA-permitted carbon storage projects to develop and implement an EPA-approved monitoring, reporting, and verification plan; report data such as the mass of carbon dioxide received for injection and the mass of carbon dioxide injected, produced, or leaked to the surface; report the mass of carbon dioxide sequestered using a mass balance approach; and report annual monitoring activities.
Geologic Sequestration of Carbon Dioxide: Underground Injection Control (UIC) Program Class VI Well Project Plan Development Guidance Page 23: Testing and Monitoring Plan	U.S. Environmental Protection Agency	Outlines actions for monitoring carbon dioxide injection and plume activity, as well as corrosion, ground water quality, and surface air and/or soil gas to confirm that geologic carbon storage projects are not causing adverse environmental impacts.	This guidance covers comprehensive testing and monitoring for environmental impacts before and alongside monitoring to track injected carbon dioxide.

Principle VI: Air, Water, and Soil Quality

Project developers will implement operational practices or equipment to monitor and mitigate potential non-greenhouse gas air and water emissions. Monitoring and reporting will be inclusive of criteria and hazardous air pollutants and nitrosamines. Project developers for carbon dioxide storage projects will thoroughly evaluate risks and avoid impacts to soil, groundwater, and surface waters, including marine resources.

Background

In concert with the Environmental Responsibility Principle, the Air, Water, and Soil Quality Principle is intended to provide project developers with guidance for monitoring and mitigating environmental impacts, focused on non-greenhouse gas emissions.

Resources: Understanding the Principle

Resource	Source	Principle Relevance	More Information
NETL Best Practices: Site Screening, Site Selection, and Site Characterization for Geologic Carbon Storage Projects	U.S. Department of Energy	Provides comprehensive best practices for the initial process of identifying sites for secure geologic carbon storage, including site screening which can help identify potential risks or impacts to natural resources such as water and soil.	The National Energy Technology Laboratory published a set of updated best practices manuals in 2017. The best practices manuals are interconnected, and together they are intended to provide a holistic approach to carrying out a geologic storage project, from inception to completion.
EPA Vulnerability Evaluation Framework for Geologic Sequestration of Carbon Dioxide	U.S. Environmental Protection Agency	This publication can help carbon storage project developers identify conditions that could cause adverse impacts to air, water, or soil and develop processes to prevent and address those impacts.	The vulnerability assessment incorporated in the EPA's Vulnerability Evaluation Framework is developed to systematically identify those conditions that could increase the potential for adverse impacts from geologic carbon storage, regardless of likelihood or broad applicability. It is not a quantitative, probabilistic risk assessment tool, but rather examines conditions that lead to increased or decreased susceptibility to consequences.

Resource	Source	Principle Relevance	More Information
Water Quality Standards Handbook	U.S. Environmental Protection Agency	Provides extensive information on EPA water quality standards and how they apply to U.S. waters – important context for carbon management project developers working with Tribes and local governments on a plan for water quality protection.	The Water Quality Standards Handbook is a compilation of EPA's water quality standards program guidance including recommendations for states, authorized tribes, and territories in reviewing, revising, and implementing water quality standards.
Water Quality Criteria	U.S. Environmental Protection Agency	Provides access to the EPA's water quality criteria, informed by the latest scientific knowledge on the impacts of pollutants on human health and the environment.	Offers a diverse set of resources for EPA water quality criteria, including National Recommended Water Quality Criteria tables for both human health and aquatic life. The tables include nitrosamines, ammonia and aldehydes.
Geologic Sequestration of Carbon Dioxide: Underground Injection Control (UIC) Program Class VI Well Project Plan Development Guidance Page 23: Testing and Monitoring Plan	U.S. Environmental Protection Agency	Outlines actions for monitoring corrosion, ground water quality, and surface air and/or soil gas to confirm that geologic carbon storage projects are not causing adverse environmental impacts.	This guidance covers comprehensive testing and monitoring for environmental impacts before and alongside monitoring to track injected carbon dioxide.
Council on Environmental Quality Carbon Capture, Utilization and Storage Guidance	White House Council on Environmental Quality (CEQ)	The recommendations included in CEQ's guidance are geared towards federal agencies, but focus on transparency, public engagement, quantifying environmental impacts, and other issues relevant to carbon management project deployment. This guidance helps contextualize the RCMI in the larger effort to advance responsible carbon management.	In 2022, consistent with the Utilizing Significant Emissions with Innovative Technologies (USE IT) Act, CEQ announced the availability of and sought comment on an interim guidance document, "Carbon Capture, Utilization, and Sequestration Guidance," to assist Federal agencies with the regulation and permitting of carbon capture, utilization, and sequestration activities in the United States.

Resource	Source	Principle Relevance	More Information
Council on Environmental Quality Carbon Capture, Utilization and Storage Report to Congress	White House Council on Environmental Quality (CEQ)	This report provides an overview of federal permitting information for carbon management projects, which includes review requirements, a comprehensive set of guidance documents, and best practices resources from federal agencies. This report also includes helpful insights on public engagement around carbon capture, utilization and storage in the United States, as well as a public engagement index that may be useful to project developers.	This 2021 report from CEQ to the U.S. House of Representatives provides an inventory of existing permitting requirements for carbon capture, utilization, and sequestration deployment, and most importantly, identifies best practices for advancing the efficient, orderly, and responsible development of carbon capture, utilization, and sequestration projects in the United States at increased scale.

Principle VII: Health and Safety

Project developers will site, design, construct, and operate their projects in a safe and secure manner that adheres to relevant specifications and is protective of human health, including worker and public health and safety.

Background

This principle is designed to guide carbon management project developers in proactively identifying and incorporating health and safety plans into their project design.

Resources: Understanding the Principle

Resource	Source	Principle Relevance	More Information
Best Practices: Risk Management and Simulation for Geologic Storage Projects Section 2: Best Practices for Risk Management	U.S. Department of Energy	Offers carbon management project developers leading geologic storage projects a thorough reference for risk management, including identifying and quantifying risks, creating effective models, and developing risk management plans that support health and safety.	DOE engaged with technical experts in the Regional Carbon Sequestration Partnership (RCSP) Initiative to update its best practice manuals for geologic storage projects. The best practice manuals are intended to disseminate knowledge gained through the RCSP Initiative and to establish uniform approaches for carrying out successful projects.
Occupational Safety and Health Administration (OSHA) Recommended Practices for Safety and Health Programs	U.S. Occupational Safety and Health Administration	This resource is a helpful, ground-level guide to creating a worker safety and health program at a carbon management project site.	OSHA's Recommended Practices are designed to be used in a wide variety of small and medium-sized business settings. The Recommended Practices present a step-by-step approach to implementing a safety and health program, built around seven core elements that make up a successful program.

Resource	Source	Principle Relevance	More Information
Geologic Sequestration of Carbon Dioxide: Underground Injection Control (UIC) Program Class VI Well Project Plan Development Guidance Page 10: Area of Review (AoR) and Corrective Action Plan	U.S. Environmental Protection Agency	Owners or operators of Class VI injection wells must perform corrective action on all improperly plugged wells identified within the delineated AoR for a geologic carbon storage site in order to ensure that they will not serve as conduits for fluid movement into underground sources of drinking water. This guidance is part of the EPA UIC program's purpose in prioritizing the protection of underground sources of drinking water and public health through safe drinking water.	This section of the Class VI Well Project Plan Development Guidance covers in extensive detail how to determine an AoR for a carbon storage site to ensure all potential impacts to underground sources of drinking water are considered, as well as how project developers should conduct corrective action to protect underground sources of drinking water.

Principle VIII: Emergency Response

Project developers will develop emergency preparedness, response and remediation plans that include timely emergency alert provisions, make the plans publicly available, and provide training and resources to local emergency responders.

Background

As part of a growing industrial sector, carbon management project developers must prioritize and clearly communicate emergency response plans to build trust with host and local communities.

Resources: Understanding the Principle

Resource	Source	Principle Relevance	More Information
Emergency Preparedness and Response: Getting Started	U.S. Occupational Safety and Health Administration	Provides general guidance for emergency preparedness and response planning for general, construction, and maritime industries, which can help form the basis of a co-created emergency plan for carbon management projects.	This OSHA resource includes key requirements for industries, including means of egress, hazardous materials handling, personal protective equipment use, and more, as well as guidance for the creation of emergency action plans.
Geologic Sequestration of Carbon Dioxide: Underground Injection Control (UIC) Program Class VI Well Project Plan Development Guidance Page 51: Emergency and Remedial Response Plan	U.S. Environmental Protection Agency	Describes the requirements for emergency response plan development and implementation under EPA's UIC Program.	This information, along with the other sections of the Project Plan Development Guidance, can help community leaders and other stakeholders in projects understand what the EPA's requirements are and discuss accountability around risk and emergency planning with project developers.

Principle IX: Transparency

Project developers will implement robust mechanisms for transparency—before, during, and after the project ceases. In particular, project developers will ensure that the siting process is open to community input and be transparent about how community input will be solicited and incorporated.

Project developers will work with communities to identify the types of data that will be collected and shared with the public, including level of detail, frequency of monitoring and reporting, response to findings, and means of disseminating information. This includes transparently and rigorously adhering to all applicable regulatory requirements for protecting human health and the environment, applying best practices developed by regulatory authorities or other standard-setting bodies, and timely public reporting of any regulatory violations.

Background

Transparency builds trust between carbon management project developers and communities. Information sharing can help other communities and stakeholders see and understand the impacts of carbon management projects in other locations and contexts.

Resources: Understanding the Principle

Resource	Source	Principle Relevance	More Information
Geologic Sequestration of Carbon Dioxide: UIC Program Class VI Well Recordkeeping, Reporting, and Data Management Guidance for Owners and Operators	U.S. Environmental Protection Agency	This document is designed to provide guidance to Class VI injection well owners or operators and their representatives regarding recordkeeping, reporting, and management of data associated with Class VI projects.	Includes detailed information on recordkeeping requirements for each phase of a Class VI injection well project, from before the well is constructed to after injection is complete and through post-injection site care.
Principles for Responsible Data Handling	Internet Society	This resource provides guide points for managing, sharing and using data that carbon management project developers can use to develop their own protocols around transparency and information handling.	These principles and recommendations are geared towards governments and organizations in a position to collect digital data. However, they can provide a useful frame of reference for project developers and stakeholders to decide together what, how much, and when information should be shared.

Principle X: Long-Term Stewardship

Project developers of carbon dioxide storage projects will develop closure and post-operational monitoring and reporting plans and ensure financial responsibility for any future stewardship.

Background

This Principle, primarily focused on carbon dioxide storage, directs project developers to ensure such projects are managed appropriately after injection is complete. With the risk of carbon dioxide leakage, a key concern for host and local communities, long-term site monitoring and care is important for maintaining trust. In addition to post-injection site care required by the EPA, and depending on the project and the agreements the project developer has formed with communities, this Principle may encompass long-term:

- risk management and remediation plans;
- insurance provisions; and
- soil and water quality analysis.

Resources: Understanding the Principle

Resource	Source	Principle Relevance	More Information
EPA UIC Program Class VI Well Plugging, Post-Injection Site Care, and Site Closure Guidance	U.S. Environmental Protection Agency	Comprehensive guidance from the EPA on the requirements of the UIC Program for the long-term management of geologic storage sites after injection is complete.	This guidance is part of a series of technical guidance documents that the EPA is developing to support owners or operators of Class VI wells and UIC Program permitting authorities in the implementation of the Class VI Rule.
Underground Injection Control (UIC) Class VI Program Financial Responsibility Guidance July 2011	U.S. Environmental Protection Agency	Lays out the financial requirements under the UIC for carbon storage projects, which are designed to ensure such projects have the financial resources to conduct well plugging, post-injection site care, corrective action in the event of leaks and the development and implementation of emergency response plans.	Covers the totality of activities that carbon storage project developers are responsible for under the EPA's UIC program.

Resource	Source	Principle Relevance	More Information
Plains CO2 Reduction (PCOR) Best Practices Manual: Monitoring for CO2 Storage	Energy and Environmental Research Center	Provides comprehensive information on carbon storage site monitoring which can be a useful reference for project developers when planning for post-injection monitoring and site care.	This best practices manual describes lessons learned and best practices for monitoring carbon storage projects derived from extensive PCOR Partnership regional characterization and field demonstration experience. The guide is intended to provide guidance to project developers, regulators, and other stakeholders in evaluating and developing carbon storage opportunities.

Terminology and Further Information

Accountability mechanism: Accountability mechanisms hold carbon management project developers accountable to host and local communities. Accountability mechanisms may include community benefit agreements, transparency commitments, or other agreements or contracts.

Cumulative impacts: The U.S. Environmental Protection Agency describes cumulative impacts as "chemical stressors in environmental media (air, water, land) and non-chemical stressors (e.g., social determinants of health, extreme weather events) [that] aggregate and accumulate over time from one or more sources in the built, natural, and social environments, affecting individuals and communities in both positive and negative ways." In communities, particularly those already overburdened, disproportionate impacts can arise from unequal environmental conditions and exposure to multiple stressors. Additionally, changes in climate can exacerbate many of these disproportionate impacts.

Disadvantaged community: The U.S. Office of Management and Budget's Interim Implementation Guidance defines a *community* as either: (1) **Geographic:** a group of individuals living in geographic proximity (such as census tract), or (2) **Common condition:** a geographically dispersed set of individuals (such as migrant workers or Native Americans), where either type of group experiences common conditions.

For the "geographic" definition of community, pursuant to the Interim Implementation Guidance and the U.S. Office of Budget and Management (OMB) guidance **M-23-09**, the U.S. Department of Energy recognizes as disadvantaged those census tracts identified by the White House Climate and Economic Justice Screening Tool (CEJST), which is located at **https://screeningtool.geoplatform.gov/**.

For the "common condition" definition of community, federally recognized tribal lands and U.S. territories are categorized as disadvantaged in accordance with OMB's Interim Implementation Guidance.

Environmental Justice: As defined by the U.S. Department of Energy's Office of Energy Justice and Equity, environmental justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation and enforcement of environmental laws, regulations, and policies. Learn more from DOE's Environmental Justice Explainer.

Environmental Justice Community: This term may be used to refer to communities that have been burdened by past environmental harms and/or are experiencing those harms now, in addition to the impacts of climate change. "Environmental justice community" may also be used in conjunction with the term "disadvantaged community."

Family-sustaining wages: Family-sustaining wages, along with commensurate benefits and the free and fair choice to join a union, are a key component of what the U.S. Department of Labor defines as "good jobs." See Building Good Jobs in the US: Tools for Employers, Workers and Government.

Life cycle analysis: By design, life cycle analysis (LCA) provides a holistic perspective of the potential environmental impacts of a product or process across the different life cycle phases. This includes the extraction of raw materials through the end-of-life or final phase of a product or project. Emissions to the environment (air, water, and land) are translated to a variety of potential impacts ranging from climate change to human health. See DOE Best Practices for Life Cycle Assessment (LCA) of Direct Air Capture with Storage (DACS).

Host community: The term 'host community' may be used to describe the community (or communities) that are geographically close to, share resources with, and/or would be most impacted by a carbon management project. It may also be used to describe the community (or communities) with which a carbon management project developer establishes an accountability mechanism, such as a community benefit agreement, for a project.

Marine resources: Marine resources can include both physical resources (such as minerals) and biological resources (such as fish and algae) and can include any resources that are found in oceans – including coastal areas, open ocean and deep waters – that are useful to humans. This description is informed by the United Nations' Sustainable Development Goals, Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development. Learn more here.

Reasonably affected parties: Reasonably affected parties may be considered any "communities or groups may be impacted by a particular project." (see page 6 of Creating a Justice40 Plan). How this is defined will be unique to each project, and may be influenced by factors like project type (i.e., a single point-source carbon capture facility, compared to a multiple miles-long carbon dioxide transport pipeline), location, and community characteristics (whether a community is hosting the project [see below], geographic proximity to the project, or whether the project shares public infrastructure needs like electricity, roads, and bridges with a particular community). Environmental justice, the existing and cumulative burdens communities or groups may already be facing, and whether a community is disadvantaged as defined by the Justice40 Initiative are also critical considerations (see Principle III, Environmental Justice).

Two-way engagement: Two-way engagement refers to a dialogue where there is back-and-forth, open, and equal exchange. While in some instances there is need for one-way communication (i.e., where one party is transmitting information), focusing on two-way engagement and structuring engagement activities in this way allows the people researching, developing, and deploying clean energy technologies to be responsive to social needs and priorities. Learn more from DOE's Domestic Engagement Framework.

Tribal sovereignty: Tribal sovereignty refers to the inherent ability of tribal nations to self-govern. In the United States, tribal sovereignty ensures that any decisions about the tribes with regard to their property and citizens are made with their participation and consent.

U.S. DEPARTMENT OF
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Fossil Energy and
Carbon Management