Engaging Stakeholders on State Clean Hydrogen Efforts

A Clean Hydrogen State Working Group Tool

NASEO
National Association of State Energy Officials

Breakthrough Energy

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Introduction

As State Energy Offices continue to explore opportunities in clean hydrogen, effective and inclusive stakeholder engagement will be essential. While strategic clean hydrogen deployment has the potential to reduce greenhouse gas emissions, create good-paying jobs, and spur economic development, the technology involves some perceived and actual risk and has prompted concern and pushback from stakeholder groups, including environmental non-profits and environmental justice organizations.[1,2] Common concerns about hydrogen include safety risks associated with the gas's increased flammability range (compared to natural gas), the potential for leakage given the small size of hydrogen molecules, and the amount of water needed for low-carbon hydrogen production.[3,4] Conducting equitable and genuine stakeholder engagement early in the project or program design process can not only establish buy-in, but also improve outcomes, ensure community benefits are realized, and enable the success of future projects. Intentional and comprehensive stakeholder engagement is particularly critical in the clean hydrogen context because the technology is relatively new, poses some potential safety and environmental risks, and requires strong facilitation and communication skills to engage the public. Given the range of projects, programs, and policies across different states and regions, engagement will also need to be tailored to address specific community needs.

Many of the 56 State, Territory, and District of Columbia Energy Offices[1] are leading hydrogen development activities in their states and on a multi-state and regional basis for their governors. State Energy Offices also play an important role in educating and convening stakeholders (including investor-and-consumer-owned utilities, community-based organizations, and local governments) on various energy policies and programs, oversee the development of State Energy Plans, and provide policy recommendations to

1 Referred to going forward as "State Energy Offices" for the purposes of this report.

the Governor. On hydrogen specifically, many State Energy Offices facilitate or develop state roadmaps, regional hydrogen hubs, and working groups. Given their convening role and leadership on clean hydrogen initiatives, State Energy Offices have an opportunity to engage communities and stakeholder groups through initial planning and ongoing policies, programs, and investments. These engagements offer stakeholders a chance to inform the state's clean hydrogen approach early on, while educating the public and providing a forum for continued engagement as the market develops. Involving stakeholders in state planning and program design processes can also lay the groundwork for successful community engagement with project developers and other partners going forward. State Energy Offices can also support stakeholder engagement surrounding the development of individual projects by convening stakeholders and helping build trust and foster better communication between developers and community members. By integrating equitable stakeholder engagement practices across hydrogen planning, programmatic, and project development activities, State Energy Offices can help make siting and permitting processes more efficient and lead to positive outcomes for both the community and the developer.

This *Engaging Stakeholders on State Clean Hydrogen Efforts* tool aims to guide State Energy Offices in planning for, implementing, and evaluating stakeholder engagement efforts surrounding clean hydrogen activities by providing a framework, examples of successful strategies, and additional models and best practices to consult. Given the limited number of case studies on stakeholder engagement related to clean hydrogen, the tool builds on research and examples from the deployment of similarly complex energy technologies, such as carbon capture, utilization, and storage (CCUS) and offshore wind. The tool intends to support states engaging stakeholders on a broad spectrum of clean hydrogen activities, including hydrogen roadmaps, policy and program development, and implementation of the Regional Clean Hydrogen Hubs. While engagement strategies may vary depending on the type of clean hydrogen project or initiative, the guiding principles and best practices in this tool are intended to apply to all clean hydrogen infrastructure, from production, to transportation and storage, to end use. Depending on the state's goals and the type of clean hydrogen program or policy under consideration, the types of stakeholders State Energy Offices engage will also vary. For the purposes of this tool, the term "stakeholders" refers to the collective of individuals and groups potentially impacted by state clean hydrogen activities and decisions.[2]

Preparing for Stakeholder Engagement

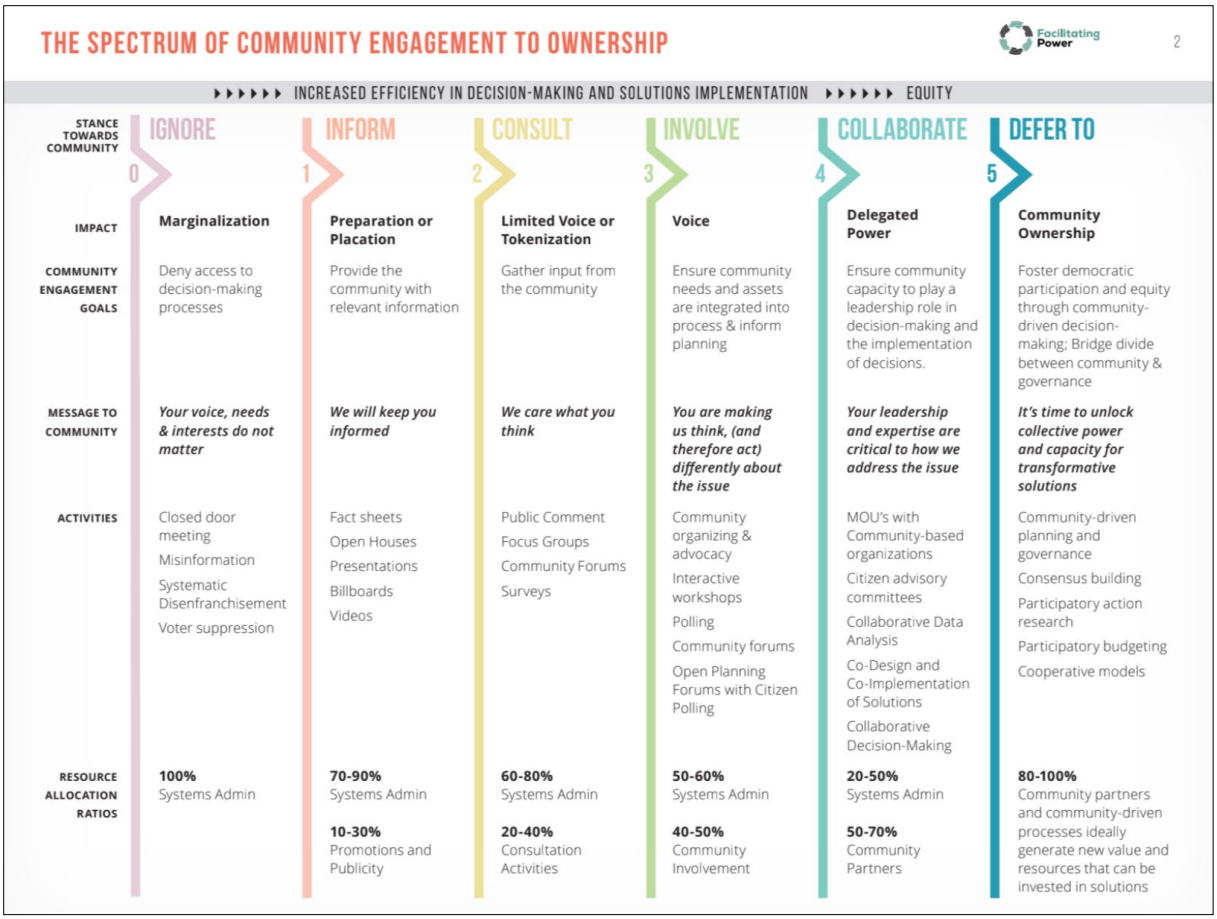
Creating a detailed stakeholder engagement plan can help State Energy Offices ensure engagement efforts are meaningful, comprehensive, and lead to successful project and community outcomes. While stakeholder engagement plans often include high-level goals and vision statements, useful plans will also lay out proposed methods, detailed roles and responsibilities, and metrics to evaluate the success of engagement efforts. However, it may not be necessary to design a clean hydrogen stakeholder engagement plan from scratch. State Energy Offices can consider leveraging state clean hydrogen roadmapping activities, working groups, or task forces when developing a stakeholder engagement plan.

2 DOE's 2013 Guide to Community Strategic Energy Planning defines stakeholders as "all of those individuals and organizations that may be affected by the actions that result from [decisions]" (www.energy.gov/sites/prod/files/2014/05/f15/cesp_guide.pdf.)

States can also build off existing stakeholder engagement strategies and tailor best practices for use in the clean hydrogen context. For example, the Hawaii State Energy Office leveraged the ongoing success of the Energize Kākou,[5] and Clean Energy Wayfinder[6] programs to engage communities during the development of the Community Benefits Plan for the Integrated Hawai'i Pacific Hydrogen Hub. This approach can also help prevent stakeholder fatigue and break down silos across different programs and initiatives.

Whether adapting existing plans or designing new ones, the Spectrum of Community Engagement to Ownership (see Figure 1 below), developed by Facilitating Power, can help State Energy Offices develop clean hydrogen engagement plans that are more responsive to community needs. In particular, the resource can assist states with assessing current engagement practices and identifying ways to move toward a more equitable and collaborative model that results in genuine partnership with the impacted community. The diagram below outlines the progression of engagement types from marginalization to community ownership. State Energy Offices can use this tool to analyze the effectiveness of current engagement strategies, set goals for future engagement, and determine resources and capacity needed to implement new strategies. Facilitating Power also provides guidance on how to apply the spectrum to the policy development processes (See Pages 9-11).[7]

Figure 1: The Spectrum of Community Engagement to Ownership[8]



The steps outlined in the U.S. Department of Energy's "Guidance for Creating a Community Benefits Plan for the Regional Clean Hydrogen Hubs" can also help guide states—including those not involved in hub awarded projects—in developing a clean hydrogen stakeholder engagement strategy.[9] The table below lists the DOE-suggested steps as well as NASEO-compiled examples and resources for each step that may be helpful to states as they plan for stakeholder engagement.

DOE Engagement Plan Step[10]	Examples and Resources
Perform a social characterization analysis.	The Alliance for Renewable Clean Hydrogen Energy Systems (ARCHES) Community Benefit Plan includes a "community social characterization assessment" (p. 4-6), which includes an analysis of disadvantaged communities where ARCHES has proposed sites. The analysis used CalEnviroScreen[11] and the Disadvantaged Communities Reporter[12] to consider community metrics such as: income inequality, air quality and related health issues, and pollution levels. The assessment also incorporated energy resiliency and energy cost data and concerns, as well as public opinion data.[13] The U.S. Department of Energy Fossil Energy and Carbon Management Office also provides guidance on creating a social characterization analysis (p. 4-5).[14] In addition to data and metrics, direct conversations with community leaders and local groups early on can provide context on current and cumulative environmental, social, or economic burdens the community may be facing. These conversations can also reveal existing perceptions and trust levels among community members and help identify potential barriers to accessing future engagement opportunities.
Identify stakeholders, especially those that are most impacted by project development.	Potential stakeholders to engage may include: • Community-based organizations • Local government leaders • Environmental justice organizations • Faith leaders • Local NAACP chapters • Neighborhood associations • Local environmental organizations • State and local workforce boards • Unions and trades organizations • Community and technical colleges, local universities, and research centers, including HBCUs and other minority-serving institutions • State, local, and/or regional economic development organizations or chambers of commerce • Hydrogen producers, transporters, supply chain companies, and off-takers • Additional state government agencies (environmental, economic development, education, transportation, utility regulatory authorities) • Tribal Nations (keeping in mind that engaging Tribal Nations requires government-to-government collaboration; Tribal Nations should not be viewed as simply another stakeholder as they are sovereign nations.)

DOE Engagement Plan Step[15]	Examples and Resources
Identify goals for stakeholder engagement.	DOE recommends choosing goals that follow the SMART framework (Specific, Measurable, Achievable, Relevant, and Time-bound). The SMART framework can help states operationalize equity principles into actionable stakeholder engagement goals and strategies so that equity is embedded throughout the process. To support two-way engagement, states can reference the Spectrum of Community Engagement to Ownership (see Figure 1 above) when selecting goals for engagement. States can also ask stakeholders what their goals are upfront to help align expectations and make sure engagement methods and strategies meet stakeholder needs and preferences. When developing goals, it is also important to consider the extent to which stakeholders can influence a given policy, program, or project and identify specific opportunities for stakeholders to inform their development.
Choose methods of stakeholder engagement suited for those goals and **prepare a timeline.**	Engagement methods and timelines will depend on the goals identified, the needs of stakeholders being engaged, and the phase of the project, program, or policy. Different stakeholders may also require different methods as there is no "one size fits all" approach to stakeholder engagement. To understand communities' preferred engagement methods, the Minnesota Department of Commerce Division of Energy issued Community Energy Collaboration Grants to community-based organizations to "develop an equitable process (or multiple processes) to engage communities in state-level energy planning."[16] Potential methods to consider include: • Advisory groups, working groups, or task forces with community representatives • Interactive planning workshops • Regular "office hours" to answer questions and receive feedback • One-on-one meetings • Listening sessions • Town hall meetings • Focus groups • Discussions facilitated by a third party • Fact sheets, website materials, video explainers • Surveys and public feedback portals
Specify roles for who will be responsible for conducting engagement activities and continuing relationship-building with community organizations.	The Energy Division within the Washington Department of Commerce (State Energy Office) hired a Renewable Fuels Public Engagement Specialist to lead engagement activities related to hydrogen and renewable fuels policy development and program implementation. (See Appendix for job description.)[17] Many of the Regional Clean Hydrogen Hub awardees have also developed and published community engagement organizational charts that outline roles and responsibilities for each individual or group involved in engagement activities related to the hub and how they will interact. (See page 2 of the ARCHES Community Benefit Plan for an example)
Identify feedback and evaluation strategies that will measure whether engagements are successful.	The Midwest Alliance for Clean Hydrogen Hub has a "Community Engagement Dashboard" to establish transparency and report on Community Benefit Plan and Justice40 progress.[18] The ARCHES hub also has a "Community Benefits Monitoring Team." See Evaluating Stakeholder Engagement section for more examples and case studies.

DOE Engagement Plan Step[19]	Examples and Resources
Specify the resources needed to carry out the engagement plans.	Potential resources needed could include: • Dedicated staff time for planning, coordinating, implementing, and evaluating stakeholder engagement efforts • Materials, technology, and venue space needed for engagement activities and educational resources • Consultant or third-party facilitator time States may also want to set aside resources to compensate stakeholders for their time and expertise and make participation more accessible, especially for underserved groups (i.e., by offering transportation stipends or on-site childcare). For example, the New York State Energy Research and Development Authority (NYSERDA) has developed a process for compensating stakeholders from or representing disadvantaged communities.[20] Graduated reimbursement amounts vary based on the time spent participating. Washington also allows state agencies to compensate people with low incomes or who have lived experience for participation in class one groups (such as working groups, task forces, and committees). The state's Office of Equity has developed Community Compensation Guidelines for agencies, which include legal considerations, best practices, details on eligible activities, mechanics for reimbursement, and reporting requirements.[21]

The Connecticut Hydrogen Task Force report outlines several recommendations to enable more equitable and effective community engagement, many of which align with the best practices for planning stakeholder engagement described above. For example, the Task Force recommends that the state legislature provide funding to expand engagement and lower the participation burden for community members. The report notes that the funding could compensate communities for their "time and resources, such as technical expertise and consulting services to develop community benefits agreements."[22] To make engagement opportunities more accessible, the Task Force highlights the importance of "meeting communities where they are (e.g. by holding local meetings at places of worship, schools, community centers, etc.), holding meetings on the weekend or during evenings when more working people can attend, providing outreach materials in accessible languages spoken in the community, providing options for in-person and remote meetings, recording and transcribing meetings for later viewing online, and providing free food, childcare, and compensation for people who participate in community meetings."

Best Practices for Implementing Stakeholder Engagement

After developing a stakeholder engagement plan, State Energy Offices will need to begin executing the plan, often in collaboration with partners, such as developers, local governments, non-profits, and other state agencies. While best practices for effective stakeholder engagement will vary based on the goals and scope of the engagement plan, this section aims to provide states with guiding principles, examples, and case studies across multiple types and stages of clean hydrogen stakeholder engagement, from initial outreach and education to two-way engagement activities and coordination with project developers. The examples and case studies are meant to provide ideas and offer lessons learned. States and their partners will likely need to adapt and tailor these approaches to meet specific community needs and project goals.

Initial Outreach and Education

Prior to or in conjunction with more collaborative, two-way stakeholder engagement activities, states may want to consider developing and distributing educational and outreach materials. While *educating* stakeholders should not be conflated with *engaging* with stakeholders, it can be an important step given the complexity of the technology and the types of concerns stakeholders may raise. According to results from a survey conducted by EFI Foundation, stakeholders who reported greater familiarity with hydrogen were also more optimistic about the potential benefits of the Community Benefit Plan process required for the Regional Clean Hydrogen Hub program.[23]

To level the playing field and ensure stakeholders are empowered to participate meaningfully in future engagement activities, states may want to consider providing educational resources before or at the start of a stakeholder engagement activity or workshop. For example, NYSERDA hosted a half-day educational webinar in 2022 to kick off a "State of the Science" series.[24] The kickoff webinar included an introduction to hydrogen, an overview of hydrogen activities in New York, a discussion of climate and environmental justice considerations, and several "primer" sessions on topics such as hydrogen production methods and safety considerations. The event was intended to provide stakeholders with foundational knowledge to allow for continued engagement and conversations on hydrogen opportunities in the state and region. The Kentucky Office of Energy Policy also has a "Hydrogen 101" website, which answers foundational questions, such as "What is hydrogen used for?" and "How is hydrogen made?"[25] The resource also links to existing maps, datasets, factsheets, and other additional resources where stakeholders can learn more. In developing educational resources, states may want to refer to and build off of the U.S. Department of Energy Hydrogen Program's "Frequently Asked Questions About Hydrogen and Fuel Cells" resource, which answers some of the most common questions about hydrogen in a paragraph or two, with references to scientific and governmental studies to support claims and offer additional learning opportunities for stakeholders.[26]

Given the range of stakeholders involved, the educational materials developed will need to be tailored to "meet communities where they are."[27] In order to develop resources that best meet the needs of various stakeholders and community members, states may want to host listening sessions, organize focus groups, or collect feedback via a survey. These types of engagements

can both inform the initial drafting of materials and help refine future materials. Potential methods for making educational resources more accessible include: using simple language and avoiding jargon or acronyms, utilizing visuals or diagrams, and/or using analogies to compare an aspect of the technology to a concept with which the stakeholder is more familiar. Materials should also be available in the language(s) spoken by the community.

A report by the U.S. Department of Energy National Energy Technology Laboratory (NETL) outlines several best practices for developing high-quality outreach materials based on lessons learned from the Regional Carbon Sequestration Partnership (RCSP)'s experiences conducting public outreach related to geologic CO_2 storage projects:[28]

- Relate specifically to the interests of the community
- Be easy to read and understand
- Be visually appealing
- Include the main message at the beginning and end
- Be developed by credible research, researchers, and institutions
- Be relevant to audience and attention grabbing
- Tell a story
- Include a call to action for the audience, when appropriate
- Incorporate available feedback from the intended audience
- Have continuity and consistency with other outreach materials
- Appeal to multiple learning styles (visual, auditory, etc.)
- Include an opportunity for the public to interact and be involved in learning about CO_2 storage

NETL also compiled several case studies from the RCSP's engagement efforts, which provide examples of the principles above in practice. The West Coast Regional Carbon Sequestration Partnership (WESTCARB) used visual aids and analogies in their communication materials to help the public grasp key aspects of geologic storage of CO_2. For example, because most people cannot picture the size of a 2,000-ton subsurface CO_2 plume, the WESTCARB team compared it to the volume of water in a community swimming pool.[29] Another group, the Southwest Regional Partnership on Carbon Sequestration, utilized focus groups to understand the public's main concerns and questions prior to developing educational resources and then conducted additional focus groups to collect feedback on the draft materials, which informed the messages and delivery formats used to develop the final outreach materials.[30]

Offering hands-on experiences for communities to understand the technology better, especially when the technology has not yet been widely deployed, can also be an effective education strategy. For example, the Midwest Geological Sequestration Consortium created demonstration kits and used a 3-dimensional model to explain how CO_2 is stored in a deep saline reservoir. These physical tools provided an opportunity for a range of stakeholders – from farmers, to business leaders, to legislators – to learn about the technology. The NREL team noted that "when stakeholders did not know who to approach or what questions to ask, these models provided an easily accessible way to ask questions."[31]

In addition to physical demonstrations and models, it may be helpful to use diagrams or visualization technologies to show stakeholders what the physical project or connective infrastructure would look like in their neighborhood or region. For example, the Hawaii State Energy Office worked with the LAVA Lab at the University of Hawaii to develop the Hawaii Advanced Visualization Environment Nexus (HAVEN), a 3D visualization tool to help decisionmakers and stakeholders understand energy resource planning data and compare the impacts of different scenarios.[32] Visualization tools can be especially helpful when explaining the hub concept. For example, Third Way developed renderings of potential Direct Air Capture (DAC) hubs and hydrogen hubs to help illustrate the physical impact of energy infrastructure.[33]

Figure 2. Rendering of a Direct Air Capture Hub by Third Way[34]

Figure 3. Rendering of a Hydrogen Hub by Third Way[35]

Co-designing State Policies and Programs with Stakeholders

In addition to providing education and conducting initial outreach and listening sessions, inviting stakeholders into the decision-making process whenever possible can help build trust and ensure programs and policies create the benefits communities want to see, while avoiding or addressing risks perceived by community members. State Energy Offices can include stakeholders in roadmapping or program development processes early and often to provide ongoing opportunities for input and make sure the outcomes reflect community needs. For example, both Michigan and Oregon[36] incorporated stakeholder workshops into their roadmapping efforts. The University of Michigan Center for Sustainable Systems (CSS), with funding from the Michigan Economic Development Corporation and the University Office of Research, organized an in-person workshop that brought together over 70 stakeholders to develop a framework for the *Hydrogen Roadmap for the State of Michigan*. The list of stakeholders included and the agenda from the workshop can be found in Appendix A and Appendix B of the report.[37] The Oregon Department of Energy (the State Energy Office) incorporated stakeholder engagement and outreach throughout the development of the *Renewable Hydrogen in Oregon* study. ODOE initially reached out to a broad range of stakeholders (including all nine federally recognized Tribes in the state) to inform them about the study and used social media, blog posts, and newspapers to share opportunities to participate and stay up to date on the study's progress. ODOE also held two stakeholder workshops, posted the slides and recordings publicly, and allowed the public to submit additional written and verbal comments after each workshop.[38]

State Energy Offices can also involve stakeholders in decision-making by setting up an ongoing advisory group or task force made up of key stakeholders and community representatives. This type of engagement helps build relationships and trust with stakeholders by providing regular and ongoing channels for two-way engagement, rather than a one-time stakeholder event. State Energy Offices have coordinated or been involved in various hydrogen working groups or advisory committees in preparation for or as a part of the Regional Clean Hydrogen Hub opportunity. For example, the Kentucky Office of Energy Policy (the State Energy Office) created the Kentucky Hydrogen Hub Working Group,[39] and the Alaska Energy Authority (the State Energy Office) participates in a working group organized by Alaska Center for Energy and Power at the University of Alaska Fairbanks.[40] The Alaska Hydrogen Working Group is open to the public and has engaged over 200 individuals through virtual and in-person events and exchanges, including representatives from industry, state government agencies, academia, and Native Alaskan Villages.[41] The working group provides an informal space for stakeholders across the state to learn about hydrogen and discuss opportunities and challenges for hydrogen deployment in Alaska.[42] The group also provided input on the *Alaska Hydrogen Opportunities Report*, which identifies opportunities for clean hydrogen in the state and outlines equity and social considerations to ensure clean hydrogen activities benefit communities and support Indigenous rights and values.[43] Regional Clean Hydrogen Hub boards can also serve as a more formal advisory group. For example, the Pacific Northwest Hydrogen Hub board includes representatives from labor, the Sierra Club, and Tribal Nations.[44]

Although not specific to clean hydrogen, the Colorado Energy Office and the Hawaii State Energy Office have developed new models or "playbooks" for community engagement that

could be applied in the hydrogen context. For example, the Colorado Energy Office is working to move towards a "co-design" model for engagement within its Weatherization Assistance Program (and later across all programs), which involves hosting day-long, in-person roundtables each quarter to listen to community members and understand their needs, priorities, and ideas. The roundtables include breakout groups related to specific program design topics, in which Colorado Energy Office staff are participating only to listen and answer clarifying questions. Optional prompts are provided to help guide the discussion, and staff provide reminders about the limits to the Weatherization Assistance Program's flexibility (i.e., income limits and federal vs. state funding allowances).[45] Setting these expectations upfront and providing transparency about the extent to which the stakeholders can affect the policy, project, or program design will be especially important in the clean hydrogen context.

In Hawaii, the State Energy Office launched an effort called "Energize Kākou," which includes a framework and playbook for HSEO's ongoing engagement with communities.[46] The playbook builds on Native Hawaiian values as a foundation for engagement and includes guidance and best practices for designing a community engagement plan, promoting engagement opportunities and inviting stakeholders, executing engagement activities, and following up with stakeholders. The playbook also distinguishes between three types of engagement, one of which is "Co-creation, Building Community Ownership," and offers example objectives, methods, roles, and tools needed for each engagement type.[47]

While many of the more collaborative, two-way approaches to community engagement take time and additional resources to plan and implement, the community trust and relationship-building that often result from these types of engagement could have a significant impact on the success of clean hydrogen policies and programs.

Communicating the Risks and Benefits of Clean Hydrogen

Whether during initial outreach or as part of more in-depth conversations with stakeholders, states and their partners will need to be able to understand and articulate the benefits and potential risks of clean hydrogen. In particular, states will want to consider all potential impacts of a given clean hydrogen project, program, or policy and how these impacts may interact with existing burdens and historic inequities experienced by a community. As part of the *Green Electrolytic Hydrogen and Renewable Fuels: Recommendations for Deployment in Washington* report to the Washington state legislature, the Washington Department of Commerce identified the main environmental and energy justice concerns across the hydrogen economy: from production to distribution and storage, to end use and decommissioning.[48] States may also want to consider existing stakeholder views on clean hydrogen when communicating about the risks and benefits. Given the increased news coverage on hydrogen in recent years, many stakeholders may already have questions, concerns, or misconceptions about the technology and how it may impact their community. Preparing accurate and easy to understand messages that are tailored to a particular audience, relevant to the specific project or policy being considered, and consistent across different communicators will be essential to building stakeholder trust and laying the groundwork for meaningful engagement.

While hydrogen risks and benefits will vary based on state goals and specific projects, several resources exist to help states and their partners communicate the benefits and risks of

clean hydrogen. For example, the U.S. Department of Energy developed a "DOE Hydrogen Program Responses to Common Questions & Concerns about Hydrogen" resource to improve transparency and respond to concerns about clean hydrogen. The questions and issues addressed in the resource were compiled by the Hydrogen Program Energy and Environmental Justice Working Group based off public listening sessions and Requests for Information (RFIs) and were answered with support from experts across multiple DOE offices. States can build off and tailor these answers to anticipate questions and respond to specific concerns from their communities and stakeholders.

The concerns addressed by the report include:[49]

1. Hydrogen production via steam methane reforming (SMR) produces more greenhouse gas emissions than other hydrogen production methods.
2. Hydrogen combustion applications produce health-harming air pollutants such as nitrogen oxides (NOx).
3. Hydrogen is a less efficient option to replace fossil fuels for heating and cooking in homes and buildings and does not out-perform batteries for light-duty vehicles.
4. The fossil fuel industry is the primary driver for hydrogen production, and producing hydrogen from fossil fuels will only encourage further investment in the sector.
5. Investments in supply chains based on fossil fuels may result in stranded assets
6. Carbon capture and storage is a) energy-intensive, b) expensive, and c) has not been proven effective at reducing emissions.
7. Existing pipeline infrastructure is not equipped to carry large volumes of hydrogen without creating safety hazards. Construction of new pipelines would further burden frontline communities and be very expensive.
8. Hydrogen leakage mitigation and detection are nascent areas with limited reliable technology, and hydrogen in the atmosphere can worsen global warming.
9. Water usage for electrolysis can be devastating in water-short areas of the United States.
10. Regional Clean Hydrogen Hubs and local hydrogen projects will increase residential energy prices.
11. Could the Regional Clean Hydrogen Hubs increase emissions or pollution?
12. Will front-line communities be included in hydrogen-related projects, and will they have a say in how projects are sited?

In addition to these questions, another key concern stakeholders may have relates to the safety of hydrogen production, transport, storage, and use. DOE provides a response to this question in its Frequently Asked Questions, which could be used as a starting point.[50] However, states and their partners will likely want to expand on this response and incorporate language and relevant mitigation actions into state roadmaps, state policy and regulatory frameworks, and state and local safety protocols — including State Energy Security Plans. States can also refer to the NASEO resource on Developing Clean Hydrogen State Roadmaps (p. 27) for additional insights on potential challenges of clean hydrogen deployment, including transport, water use, leakage risks, and cost. Lessons learned from stakeholder engagement and public perceptions

towards carbon capture and storage technologies indicate that trust in operators and regulators can have a significant impact on risk perceptions. In particular, the study notes that "risks become more acceptable if there is the perception that regulation will protect, monitoring will be robust, and that operators will be genuinely operating to [maximize] safety."[51]

While explaining safety processes clearly and providing evidence-based information in response to concerns can help reduce fears and correct misinformation, stakeholders' risk perceptions depend on a much wider set of factors that states may want to consider when developing messages and communication plans. In its framework for effective risk communication, the U.S. Environmental Protection Agency (EPA) outlines five factors that influence how an audience responds to a risk communication message and ideas for integrating these factors into communication and engagement strategies.[52] For example, a lack of trust may undermine a stakeholder group's ability to hear and respond to a message. EPA recommends "establishing shared values early in a communication" to help build trust or selecting a communicator who already has trust with the community or stakeholder group. EPA also stresses the importance of empathy in responding to stakeholder concern – even if the perceived risk does not align with the actual scientific or technical risk.[53]

While the resources and strategies above are designed to help address common concerns and potential risks of clean hydrogen technology, it is also important to effectively communicate the benefits of clean hydrogen deployment. Similar to the risks, the benefits of clean hydrogen may vary by specific project, program, or policy. However, potential benefits could include state economic and workforce development opportunities, fuel diversification, lower emissions from hard-to-decarbonize sectors in the state, cleaner air, and improved energy security and resilience. The NASEO report, Developing Clean Hydrogen State Roadmaps resource describes many of these benefits in detail, and NASEO's State Strategies to Develop and Support the Emerging Clean Hydrogen Workforce tool includes guidance on and examples of job demand estimates and workforce development opportunities. Importantly, when discussing job and economic development benefits with communities, states and their partners will want to be careful not to over-promise and ensure community members, especially residents of disadvantaged communities, are not forced to choose between jobs and any health or environmental risks associated with a clean hydrogen project.

Discussions on the benefits of clean hydrogen can also be two-way and incorporate community ideas and feedback, particularly when projects or programs involve or require a Community Benefit Agreement. By working with communities to understand which benefits would be most valuable, quantifying the anticipated benefits, outlining planned investments in the community, and regularly reporting on the outcomes of those investments, states can build accountability and transparency throughout the stakeholder engagement process.

Finally, the Community Benefit Plans developed for the DOE Regional Clean Hydrogen Hub opportunity articulate the number and type of benefits expected from various clean hydrogen projects and could be helpful to reference when describing the benefits of other clean hydrogen efforts. For example, the ARCHES Community Benefit Plan projects $2.95 billion per year in health cost savings, over 200,000 new jobs, and 326 tons less of PM_{10} and $PM_{2.5}$ each year. The ARCHES plan also outlines the hub's dedicated investments in these benefits, with $150 million set aside for community benefits and $229 million for workforce development

and community education.[54] An RMI report on "Delivering Equitable And Meaningful Community Benefits Via Clean Hydrogen Hubs" provides additional examples of potential benefits and metrics categorized by the Justice40 policy priority with which they align.[55]

Involving Communities in Project Development

Meaningful and proactive stakeholder engagement can not only lead to more inclusive policy and program decision-making; it can also provide a framework for more equitable project development. Large infrastructure projects, like clean hydrogen, tend to succeed when developers proactively engage with community members. As partners or potential funders of clean hydrogen projects, State Energy Offices can assist project owners in planning for and implementing effective stakeholder engagement and offer developers insight into community dynamics in order to help garner support and ensure the project aligns with state and local priorities. State Energy Offices can also share lessons learned from early and ongoing engagement with community members to ensure developers are aware of existing concerns, community needs, cumulative impacts, trusted messengers, and appropriate outreach and engagement methods or formats. The Regional Clean Hydrogen Hub networks and other state and regional working groups can serve as a forum for states to coordinate with developers and other partners so that communities can participate in each stage of policy and project development. For example the Pacific Northwest Hydrogen Hub has an engagement lead for each "node" within the hub project.[56]

States can also provide developers with clear guidelines or requirements for stakeholder engagement, particularly if the state is funding the project. For example, the New York State Energy Research and Development Authority (NYSERDA) requires Stakeholder Engagement Plans as part of their offshore wind procurement process and created a guide to help developers in planning for and implementing stakeholder engagement activities. The *Guiding Principles for Offshore Wind Stakeholder Engagement* resource outlines ten principles to set expectations for developers and ensure alignment with the Climate Act's goals for building an inclusive clean energy economy (See Appendix for a list of the ten principles).[57] In Washington, the *Green Electrolytic Hydrogen and Renewable Fuels: Recommendations for Deployment in Washington* report developed by the Department of Commerce identifies four interdisciplinary frameworks developers could use as a guide prior to or in concert with community engagement efforts to ensure environmental and energy justice principles are considered throughout project development.[58]

State Energy Offices may also help developers effectively engage with stakeholders by developing and supporting equitable frameworks for siting clean hydrogen projects. While siting decisions are typically made at the local level, State Energy Offices can develop guidance documents, model ordinances, or checklists for local governments that emphasize the importance of stakeholder and community engagement and embed engagement activities into local processes. State Energy Offices could also work with local governments and interested developers to engage community groups and local residents well in advance of the formal siting process. Engaging communities early in the process—prior to making a decision about where a project will be sited—can help developers build trust and allow community members to take more ownership over the project.

Community Benefit Agreements

State Energy Offices can also encourage developers to negotiate a Community Benefit Agreement (CBA) or other formal agreement, such as a Project Labor Agreement (PLA)[59] to ensure the project benefits reflect community members' needs and build in transparency and accountability throughout the project's lifetime. The U.S. Department of Energy Office of Energy Justice and Equity (formerly known as the Office of Economic Impact and Diversity) defines a CBA as "an agreement signed by community benefit groups and a developer, identifying the community benefits a developer agrees to deliver, in return for community support of the project."[60] While CBAs can be incorporated into Community Benefit Plans (CBPs), CBAs are distinct from CBPs because they are legally binding and enforceable contracts between community benefit groups and a developer. In the context of a CBA, "community benefit groups" are groups or coalitions of groups (such as neighborhood associations, local businesses, community-based organizations, environmental groups, local unions, or faith-based organizations) that together work to represent the community impacted by the developer's proposed project.[61]

While CBAs take time and resources to develop and negotiate, when executed well, the process typically results in greater benefits for both developers and communities. Developers benefit from a CBA by receiving public support from community members, which reduces project development risk and may help the project receive state or local approval. Communities benefit from CBAs because the process provides an opportunity for greater community involvement in or ownership of the project, allowing community representatives to shape the project benefits and ensure developers' commitments are kept. A survey of labor groups, disadvantaged communities, environmental justice groups, and Tribes conducted by EFI Foundation found that 86% of respondents would be more likely to support Regional Clean Hydrogen Hub (H2Hub) projects that use some form of a binding agreement to ensure community benefits.[62]

Examples of benefits communities may wish to include in a CBA include:[63]

- Job creation,
- Local and diverse hiring and training commitments,
- Living wage and other benefits,
- Education partnerships, between developers and community schools,
- Support for local small businesses,
- Improvements to open spaces, parks and playgrounds,
- Affordable housing and rehabilitation,
- Support for senior centers and child-care facilities, and
- State and/or local economic incentive packages.

To encourage the development of CBAs, State Energy Offices could incentivize or require developers to negotiate a CBA for clean hydrogen projects receiving state funding, if allowable under state procurement rules. For example, in response to the recommendations developed by the Connecticut Hydrogen Task Force, the Connecticut state legislature passed Public Act 23-156,[64] which includes a provision that requires all hydrogen projects have a Community Benefit Agreement (CBA) in place.[65] Similarly, Maryland's Clean Energy

Jobs Act (2019) requires all offshore wind projects in Round 2 of the application period for Offshore Wind Renewable Energy Credits (ORECs) to execute a CBA.[66,67] State and local governments can also support productive CBA development by informing community coalitions about proposed or upcoming project developments, explaining the benefits of CBAs to developers, and respecting the negotiation process.[68]

Existing Community Benefit Agreements in the offshore wind industry offer helpful examples of benefits and CBA structures that could be replicated for clean hydrogen projects. For example, Vineyard Wind (an offshore wind developer) signed the first offshore wind CBA in the U.S. with Vineyard Power Cooperative (a local community group) in 2015. Vineyard Power Cooperative is a member owned 501-c-12 non-profit representing 1,400 households and businesses on Martha's Vineyard and was formed with the goal of "keep[ing] the benefits and control of our renewable energy resources within our island community."[69] As part of the CBA, Vineyard Power Cooperative agreed to support the project by advocating for offshore wind legislation in the state, supporting education and outreach, and offering guidance on permitting and financing processes.[70] In return, Vineyard Wind agreed to investigate opportunities for local job creation and community ownership of a portion of the wind farm's capacity. Vineyard Wind also agreed to consult with Vineyard Power regularly to discuss additional community benefits and receive input from community stakeholders on each phase of the project development. The project also received additional points during the U.S. Bureau of Ocean Energy Management auction for having a CBA in place.[71]

More recently, South Fork Wind and Sunrise Wind (both joint ventures between Ørsted and Eversource) signed Host Community Agreements with local towns in New York. These agreements differ from CBAs because they are typically between a municipality and a developer, rather than a community and a developer. However, the terms agreed upon in these Host Community Agreements indicate that the projects will provide significant benefits to the communities. For example, the South Fork Wind agreement designates a fisheries liaison for the lifetime of the project, and the community investments agreed to in the Sunrise Wind agreement will provide $10 million for a new National Offshore Wind Training Center and a new Operations and Maintenance Hub in Suffolk County.[72] To see more examples of CBAs and understand best practices at each phase of the CBA (from planning and negotiation to implementation and monitoring), states can look to a report by the Clean Air Task Force, which emphasizes the importance of "clear and specific commitments," ongoing accountability mechanisms, and ensuring the community partner to the agreement is representative of the entire community.[73] An RMI analysis includes additional examples of both successful and unsuccessful CBAs and offers insights into potential pitfalls, including situations in which a developer goes out of business, or when state or local incentives significantly outweigh the community benefits delivered through the CBA.[74]

Evaluating Stakeholder Engagement Efforts

Effective and equitable stakeholder engagement tends to be iterative, and therefore requires ongoing evaluation and adaptation based on stakeholder feedback and needs. Because there is no "one size fits all" approach to stakeholder engagement, evaluation methods will depend on the objectives set and the needs and communication preferences of the community or stakeholder group. State Energy Offices will likely need to review engagement strategies on a regular basis to determine whether they are meeting the state's identified SMART goals and prepare to adjust plans and engagement methods as needed – or adapt the SMART goals based on community feedback. For example, State Energy Offices could use surveys before, after, and at regular intervals throughout the process to gather community input on engagement methods and use the findings to update plans for future engagement activities. States could also track the number of instances where community input is reflected in the policies or program design.

The National Energy Technology Laboratory (NETL) outlines several ideas for evaluating stakeholder engagement efforts based on lessons learned from the Regional Carbon Sequestration Partnership engagements:[75]

- Informal telephone calls and/or routine interviews with key stakeholders both within the local host organization and in the community
- Tracking attendance at meetings and events
- Post-event surveys that are completed by attendees (the RCSPs have used both hard copy forms at meetings and follow-up email forms)
- Tracking the number of inquiries and the project response to stakeholder questions, concerns, and feedback.
- Reviewing of media coverage, especially noting the tone of coverage in local media and social media (e.g., blogs, Twitter, and Facebook)
- Information posted on project websites to discuss the project and provide a platform for public interaction on a more spontaneous basis
- Evaluations at public meetings, workshops, and seminars to assess the suitability of meeting content, outreach, and to identify other concerns and suggestions

In addition to the options above, State Energy Offices could use Facilitating Power's *Spectrum of Community Engagement to Ownership*[76] to self-evaluate and reflect on which level of engagement their activities fall into and how to move towards more collaborative, community-driven methods, if possible. For example, the Energy Division within the Minnesota Department of Commerce (State Energy Office) utilized the Spectrum to assess the Department's level of engagement with Tribal Nations in Minnesota. As a result, the Minnesota State Energy Office committed to implementing a number of new strategies to more meaningfully engage with Tribal Nations, including participating in a government-to-government training and inviting a tribal liaison to attend regular leadership meetings. Facilitating Power also provides guiding questions and activities to help state and local governments evaluate current stakeholder engagement activities (See page 14).[77]

Source: Istockphoto/Ivan Gonzalez

Conclusion

As State Energy Offices continue to explore opportunities for clean hydrogen, effective and inclusive stakeholder engagement will be paramount. Conducting meaningful, two-way engagement early and often in the program or policy design process is not only essential for securing stakeholder support but also for improving outcomes, ensuring community benefits, and enabling the success of future initiatives. This is especially critical in the context of clean hydrogen, given its complexity and potential safety and environmental concerns. Effective stakeholder engagement early on can also help streamline siting and permitting processes and avoid delays in project development timelines. In their role convening stakeholders and leading the development of energy plans, policies, and programs, State Energy Offices have a unique opportunity to engage communities and stakeholder groups when designing clean hydrogen policies and programs. State Energy Offices can also help facilitate more equitable engagement between developers and community members. By involving stakeholders early on in policy and planning efforts and working with developers to encourage more robust community engagement, State Energy Offices can help build trust and allow for community ownership in decision making as the clean hydrogen market develops.

Appendix

Example Job Description for a Community Engagement-Focused Role

Description

Apply Early! First review of applications begins on May 31, 2023.
*****Applications in response to this posting will be considered for both this position and the Clean Transportation Public Engagement Specialist (MA4) position.*****

At the **Department of Commerce (Commerce)**, we are creative, collaborative, and trusted. We identify opportunities to deliver critical funding and services to strengthen communities, we cultivate an environment in which we continuously learn, and we own our work.

The **Energy Division (Energy)** works to drive the clean energy transformation so that Washington prospers.

The **Hydrogen & Renewable Fuels Public Engagement Specialist (MA4)** works within the Energy Policy Office of the Energy Division and reports to the Senior Energy Policy Specialist for Hydrogen and Renewable Fuels. This position supports the Energy Policy Office as the lead on all public engagement activities for hydrogen and renewable fuels policy development and program implementation, as part of the activities of the Office of Renewable Fuels. This will include collaboration with Commerce's Office of Economic Development and Competitiveness, the agency's Tribal Liaison, and others.

Public engagement is a fundamental aspect of policy development and program management in the Energy Division's hydrogen and renewable fuels work, including contributing work related to the Pacific Northwest Hydrogen Association, funding programs, decision package and legislative development, and bill analysis.

This posting may be used to fill other vacant positions within 60 days once position is filled.
Duties

Plan, implement, update, and maintain hydrogen and renewable fuels education and engagement plans, in consultation with key agency staff.

- Plan and implement outreach and engagement work for the Energy Division as part of the activities of the Office of Renewable Fuels, which includes but is not limited to:
  - Website content development and maintenance;
  - Listening sessions, focus groups, interviews, surveys, and other engagement activities;
  - Development of technical assistance materials;
  - Other strategies identified as beneficial to plan development, implementation, updates, and maintenance.
- Create and maintain a tool to track progress toward strategies and tasks identified in the hydrogen and renewable fuels education and engagement plans. Regularly analyze results and review with supervisor and key agency staff to determine and take actions to address gaps in progress.
- Analyze information collected from public engagement activities and advise key agency staff on public engagement and information work.
- Analyze public information needs and advise supervisor on website updates, briefing papers, and related support resources for hydrogen and renewable fuels information and state and federal funding opportunities.

Plan, implement, update, and maintain engagement and outreach activities and content needed to implement hydrogen and renewable fuels projects and funding opportunities.

- Contribute to planning and implementing public outreach related to hydrogen and renewable fuels funding and proposed projects supported by Commerce. This will include but is not limited to:
  - Working in coordination with Commerce partners to support public and community engagement activities related to hydrogen and renewable fuels, such as the Pacific Northwest Hydrogen Association;
  - Public engagement, outreach, and marketing for hydrogen and renewable fuels funding and project opportunities in consultation with energy division communications staff;
  - Listening sessions, focus groups, interviews, surveys, and other engagement activities;
  - Development of technical assistance materials;
  - Other strategies identified as beneficial to effective development and implementation of hydrogen and renewable fuels projects supported by Commerce.
- Planning and implementing public engagement in ways that are consistent with relevant best practices or requirements related to community engagement, including but not limited to:
  - Commerce's Community Engagement Plan;
  - Community Benefits Plan requirements for relevant federal funding opportunities;
  - Justice40 Initiative for relevant federal programs and funding opportunities
- Analyze information collected from public engagement activities and advise supervisor on funding and project opportunities.

Create and maintain connections with hydrogen and renewable fuels stakeholders.

- Develop and maintain current subject matter expertise about hydrogen and renewable fuels by reading and analyzing industry publications, attending meetings and events, and connecting with experts and organizations with information about hydrogen and renewable fuels.
- Create and maintain a list of hydrogen and renewable fuels stakeholders and experts (companies that may produce or use hydrogen or renewable fuels, electric utilities, counties and cities, tribal governments, zero-emission vehicle manufacturers, labor unions, climate and environmental justice advocates, community-based organizations, ports, transit agencies, academics and researchers, and more). Hold introductory meetings, continued conversations, and provide connections to policy and program staff.
- Attend and speak at meetings and events on behalf of the Energy Division to provide information on hydrogen and renewable fuels work.

Ensure hydrogen and renewable fuels policies and programs include outreach and engagement components that comply with the HEAL Act, provide benefits to overburdened communities and vulnerable populations, and supplement other Commerce community engagement and communications work.

- Meet regularly with HEAL Act implementation staff, Commerce's Chief Equity Officer, Commerce's Tribal Liaison, and other relevant Energy Division staff on public engagement and tribal consultation to review existing and emerging hydrogen and renewable fuels policies and programs for compliance with the HEAL Act.
- Ensure hydrogen and renewable fuels public engagement activities are coordinated with work by Commerce's community engagement team, including attending regular meetings and establishing clarity for stakeholders on Commerce points of contact.
- Write and create public engagement materials, including message frameworks, presentations, fact sheets, website and email content, and graphics. Request review of materials and creation of graphics from relevant Commerce communications staff in a timely and thorough way.

Develop and track public engagement metrics as part of the division's work to measure success.

- Work with Energy Division leadership team to establish, regularly review, and update metrics of success for hydrogen and renewable fuels engagement strategies, including benefits provided to overburdened communities and vulnerable populations.
- Write a public engagement work plan that identifies strategies for meeting metrics of success and regularly update the plan with work completed and tracked metrics.

Qualifications

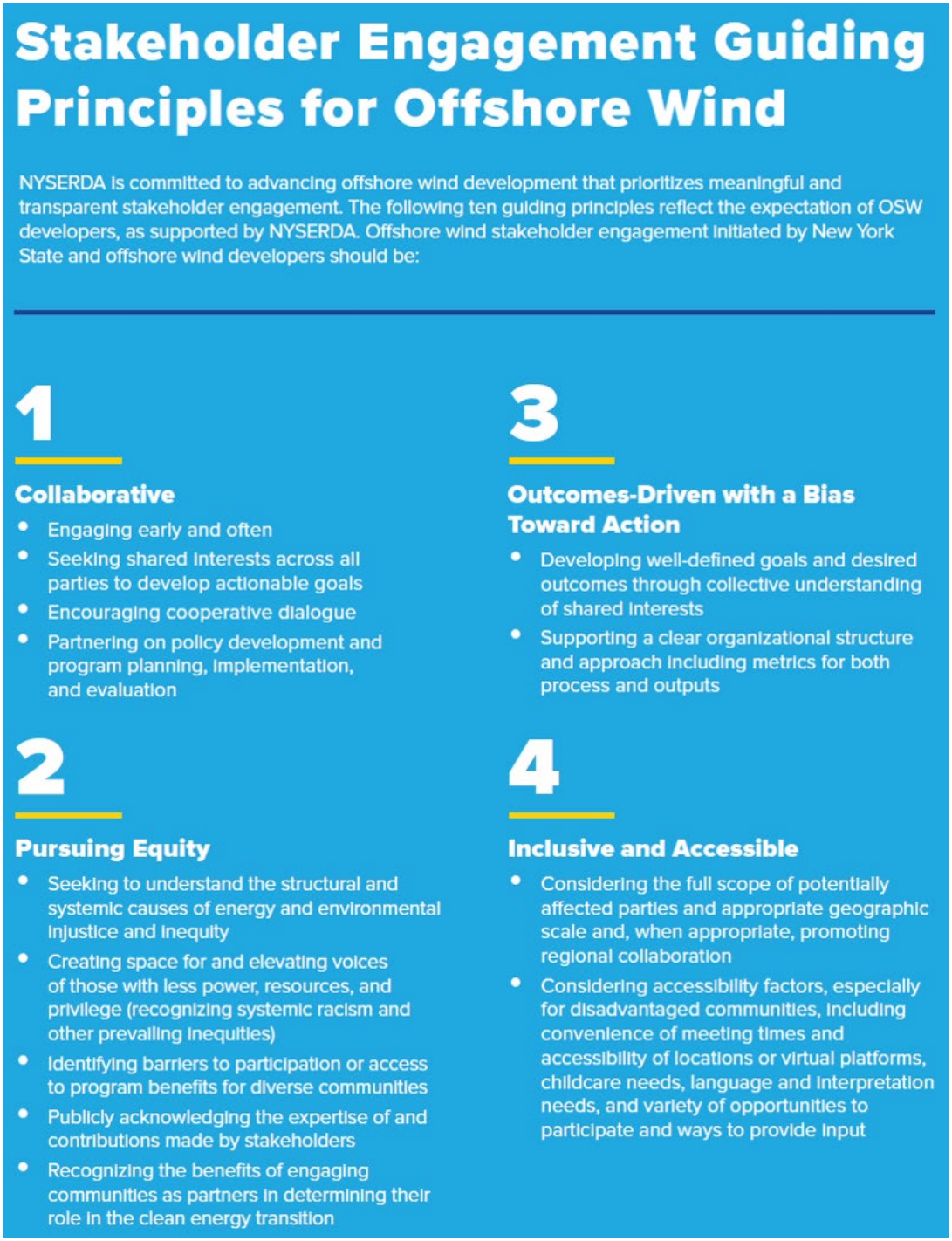
Required Qualifications:

- **Bachelor's degree**. Experience may substitute for education.
- **Four years of experience** or more in public engagement work through public relations, marketing, customer management, public services, non-profit services, consulting services, advocacy, political campaigns, community organizing, or other similar communications work with external audiences.
- Ability to communicate clearly with diverse groups, including senior level management, elected officials, subject matter experts, and other interested parties.
- Experience communicating complex policy concepts in terms easily understood by those without expertise, including the use of plain language.
- Ability to develop, or work with technical staff to develop, public engagement materials, including message frameworks, presentations, fact sheets, website and email content, and graphics.
- Experience putting into practice equitable processes and pursuing equitable outcomes, including language accessibility.
- Experience measuring success and tracking metrics, including using data to support continuous performance improvement and data-driven decision making.
- Comfort with public speaking at in-person or virtual events and meetings.
- Proficiency with MS Office software.
- Ability to think strategically and connect the big picture and details.
- Excellent time management and a strong sense of personal accountability.
- Ability to contribute positively and professionally in a team environment

Preferred/Desired Qualifications:

- Policy expertise in hydrogen production or uses, clean and/or renewable fuels, electric utilities, or other related fields.
- Experience working with consultants or as a consultant.
- Experience working in a rapid-response environment.
- Experience utilizing public opinion research, including understanding statistics or survey design.
- Experience working with state or local legislative process.
- Experience working with language translation services.

New York State Energy Research and Development Authority's Guiding Principles for Offshore Wind Stakeholder Engagement:[78]



5

Open, Transparent and Accountable

- Acknowledging the knowns and unknowns, clarifying assumptions and intentions upfront and throughout the process
- Identifying impediments to progress, tracking and reporting commitments and progress
- Making materials and resources available to the public to the greatest extent feasible
- Clearly communicating decisions made and reasons why to all participants as well as the general public

6

Diverse and Representative

- Considering and incorporating a variety of interests, points of view and expertise
- Seeking broad representation across impacted geographies, industries, socio-economic groups, races, ethnicities, cultures, and organizations of differing sizes

7

Supported

- Demonstrating an understanding of the importance of a long-term commitment to stakeholder engagement and allocating resources to continuously support strong engagement and project initiatives

8

Driven by Whole-Systems Thinking

- Acting as local stewards alongside communities in helping communities meet their self-determined goals with regard to community health, resiliency, local emissions, and a green economy in a way that reflects and respects local wisdoms, traditions, and cultures
- Working across sectors to implement solutions with sustainable and mutually-reinforcing benefits

9

Flexible

- Identifying multiple pathways to the desired outcomes and adapting approaches to address emerging issues as needed and in different ways based on what works best within the agreed-upon organizational structure

10

Proactive in Decision Making

- Considering all aspects of offshore wind energy resources, ecosystems, and stakeholders
- Considering the relative impacts, risks, and challenges against the benefits and opportunities provided by cost-effective and responsible offshore wind energy

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