2021 DECARBONIZATION DIALOGUE

Consensus-based recommendations for federal decarbonization policy

KEYSTONE POLICY CENTER

GREAT PLAINS INSTITUTE

OVERVIEW

The Decarbonization Dialogue, facilitated by Keystone Policy Center and Great Plains Institute, convened experts from different sectors to develop recommendations for near-term federal policies to drive economy-wide and equitable decarbonization. These recommendations were developed by stakeholders with diverse interests and reflect months of dialogue between and among sector-specific working groups. They were publicly launched in February 2021.

The Decarbonization Dialogue focused on the power, transportation, and agriculture sectors, recognizing the potential for near-term decarbonization in these sectors, the interrelated nature of the sectors, and Keystone and Great Plains Institute's subject matter expertise. Recommendations are both cross-cutting and sector-specific and prioritize impact on emissions and political viability with consideration for equity, cost, economic recovery, and other factors.

Without knowledge of which party would be in control when this effort concluded, the Decarbonization Dialogue was designed to provide a bipartisan, collaborative set of recommendations that could quickly inform debate around climate and decarbonization action regardless of which party was in the majority and who was in the White House. The release of this report comes on the heels of the inauguration of President Biden and the start of a new Democrat-controlled House and Senate. Since January 20, 2021, the Biden Administration and lawmakers are already taking up many of the recommendations that were addressed during the Dialogue, capitalizing on the stimulus efforts and tailwinds from a new political environment to advance core priorities for decarbonization. Whether focused on core principles and general considerations or specific policy ideas, these recommendations offer substantive guidance, supported by bipartisan and diverse interests, that decision-makers can act on today.

Dialogue Participants organized into three working groups focused on power, transportation, and agriculture working groups. The recommendations are accordingly organized into cross-cutting and sector-specific recommendations. While they are organized by sector, the recommendations reflect many months of cross-sector dialogue. Note that the recommendations are not in order of priority; they are listed in the order that the Dialogue Participants found most logical.

An accompanying supporting report provides background on the Dialogue's recommendations, including information on scope, process, participants, and the nature of the discussions that generated the final recommendations.

The Keystone Policy Center and Great Plains Institute are deeply grateful to the funders, participants, advisors, and staff who participated in the Decarbonization Dialogue. This effort was funded by the William and Flora Hewlett Foundation, ClearPath, Walmart, CPS Energy, and Corteva Agriscience.

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CROSS-CUTTING RECOMMENDATIONS

While there are many areas of overlapping interest among the power, transportation, and agriculture recommendations, the following cut across and would provide the foundation for the others:

1) Expand urban and rural broadband infrastructure to provide a foundation for the technological advances that will enable deeper decarbonization in the power, transportation, and agriculture sectors.

2) Enhance cybersecurity to ensure resilience in power, transportation, and agriculture systems as the economy moves toward decarbonization.

3) Accelerate deployment of clean technology and climate resilient infrastructure by establishing a national climate bank, with a designated and significant percentage of funding going to low-income communities, frontline communities, and communities of color.

4) Increase funding and initiatives for specific technologies—including but not limited to hydrogen, natural and technological carbon removal, and long-duration storage—that are critical to the future resilience and decarbonization of the power, transportation, industry, building, and agriculture sectors.

5) Seek coordination at the federal level through a mandate to work on these proposed solutions across departments and agencies (e.g., Department of Agriculture (USDA), Department of Energy (DOE), Department of Transportation (DOT), Environmental Protection Agency (EPA), Federal Energy Regulatory Commission (FERC), etc.).

6) Identify opportunities to **standardize measurement and verification of emissions and emissions reductions** so that measurement and verification tools and the data they produce are affordable, accessible, and interoperable across emerging digital platforms.

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POWER RECOMMENDATIONS

The objective of these recommendations is to facilitate access to reliable, low cost, clean electricity across the entire country. Policies and legislation implemented in response to these recommendations should prioritize benefits to and reflect consultation with low-income, environmental justice, and rural communities whenever possible. They should also address tribal lands and reflect consultation with Indigenous communities whenever appropriate.

1) Consider core principles in development of carbon policy.

- Align power industry and stakeholders on federal energy policy that addresses the power sector and achieves meaningful and timely emissions reductions. Any such policy should promote technology development and be market-based, equitable, cost-effective, and complementary with policies that address other emitting sectors in the economy.
- Implement the Energy Act of 2020 in partnership with the private sector and in a manner that is equitable, cost-effective, and complementary with policies that address other emitting sectors in the economy.

2) Harness the value of existing nuclear assets.

- Recognize the zero-carbon value of nuclear energy and invest in necessary technology to keep existing nuclear plants online, where they are needed to meet reliability and emission-reductions goals.

3) Harness the value of hydropower.

- Accelerate development of hydropower technologies and practices to improve generation efficiency, environmental performance, and solar and wind integration.
- Improve U.S. dam safety.
- Increase basin-scale decision-making and access to river-related data.
- Improve the measurement, valuation of, and compensation for hydropower flexibility and reliability services and support for enhanced environmental performance.
- Advance effective river restoration through improved off-site mitigation strategies.
- Improve federal hydropower licensing, relicensing, and license surrender processes to preserve and/or expand the clean power output of all existing hydropower.
- Advocate for increased funding for U.S. dam rehabilitation, retrofits, and removals.
- Remove regulatory and financial barriers for low head hydro.

Note: These recommendations borrow heavily from recommendations from the Uncommon Dialogue on Hydropower's joint statement of collaboration.

4) Accelerate clean energy innovation.

- Ensure implementation and expansion of the Energy Act of 2020 and generally support the research, development, and demonstration of clean technology. Prioritize technologies needed to drive global decarbonization, with a specific focus on technologies the International Energy Agency has identified as necessary to reach mid-century emission goals but remain at early stages of development, like advanced nuclear, carbon capture, carbon dioxide removal, and low-carbon hydrogen (from renewables, fossils with carbon capture, and nuclear).
- Empower ARPA-E to scale up awardees from lab and bench-scale to commercial scale and provide the annual resources necessary to launch multiple new programs while providing the capacity to advance multiple applicants to commercial scale annually.
- Facilitate technology transfer through new strengthened commercialization initiatives, such as DOE demonstrations, regional innovation partnerships, the Small Business Innovation Research program, and other incentives, models, and infrastructure to support public/private partnerships.
- Establish a function at/role for DOE for systematically demonstrating clean energy projects at commercial scale.
- Supercharge investment in innovation and deployment of long-duration storage (including technologies well beyond chemical storage/batteries) and long-distance delivery transmission lines.
- Extend, expand, or create new financial incentives to catalyze and deploy clean energy sources, efficiency, transmission, non-generation options, and carbon capture and storage, with clear definitions for what kind of sources qualify (e.g., based on market share or viability or qualities like flexibility, carbon intensity, reliability, etc.) and a clear timeline for ramping down as the technology becomes market competitive. Tax credits should be inclusive across utilization, monetizable, and transferrable.
- Implement the Energy Sector Innovation Credit, a permanent, technology-inclusive tax incentive structure that will onboard generations of diverse, profitable clean power technologies. The credit should be inclusive across utilization, monetizable, and transferrable.
- Engage environmental justice communities in clean energy RDD&D by creating a DOE Energy Justice and Democracy Program and prioritizing diverse participation in all DOE programs.

• Authorize a national critical minerals research program at the DOE and direct the department to develop a national strategy for securing critical minerals in the clean energy and electric vehicle supply chain in an environmentally, economically, and socially responsible way.
• Provide significant funding for DOE to pursue research into sustainable recycling of batteries, alternatives for lithium-ion batteries in electric vehicles (EVs) and grid-scale energy storage, and demonstration projects that integrate used EV batteries into the grid.

5) Deploy available tools and technology for near-term impact.

• Ramp up deployment of tools and technology on the shelf, especially for conservation, efficiency, and distributed energy resources.

- Expand the Federal Weatherization Program, with enhancement of the program to include new measures and actions that incorporate concepts of Grid-Interactive Efficient Buildings (GEB).
- Provide funding, via direct or block grants, for schools, hospitals, and other public, non-profit facilities to undertake maintenance and capital projects aimed at reducing energy, reducing emissions, and introducing GEB. Incorporate emissions reduction benefit as a competitive screen for applicants.
- Establish a Climate Buildings Corps, whose personnel would be available to state, local and non-profit building owners for conduct of a “climate audit.”
- Establish energy/carbon intensity standards for buildings, which would be mandatory for federal buildings and serve as models for non-federal buildings
- Create a federal grant program to fund immediate action by state and local governments to undertake a review and revision of building codes and standards for purposes specifically related to changes in energy/carbon intensity of new and retrofitted buildings. Make additional funding for implementation and enforcement.
- Revise existing federal “recognition” programs (such Energy Star), or create new ones, to expand the scope to include types of energy efficiency beyond traditional (embedded) efficiency to demand response, load flexibility, system efficiency, etc.

- Revise any federal definition of "clean energy" to include all types of energy efficiency to facilitate a more holistic approach to buildings, distributed energy resources, microgrids, etc.
- Encourage energy conservation through public education and voluntary standards.

• Optimize power supply and delivery, including deployment of distributed energy resources (inclusive of baseload renewable energy resources), to maximize opportunities for decarbonization at the distribution level.

• Establish a state, local, and municipal matching funding program to deploy new technologies, with a focus on regulated markets, public power utilities, and rural electric cooperatives.

• Finance innovative decarbonization technologies through a reform of the DOE Title XVII Loan Guarantee Program with an expanded portfolio and more flexible financing mechanisms.

6) Modernize transmission planning to drive decarbonization and equitably distribute costs and benefits.

• Bolster federal leadership for broad and long-term transmission planning in consultation with states and other stakeholders.

- Task and, if needed, authorize FERC to develop a framework for cost allocation that better balances costs among beneficiaries.
- Explore the role of states in the transmission planning process and, if needed, recommend a more active role than they have now.
- Direct FERC to develop a comprehensive, long-range electric infrastructure transmission planning rule and implement such other rules and regulations as are necessary to achieve established federal emissions targets and support any state policies that establish more stringent standards. These rules and regulations should consider the results of the Interconnection Seam Study and different state-based approaches to planning and standardize some priorities across states, regions, and interconnections.
- Work with planning entities to incorporate consideration of greenhouse gas emissions and national climate goals in the evaluation of the benefits of a proposed project.

- Amend the Federal Power Act so that the goals of the National Interest Electric Transmission Corridors program help achieve national climate goals.

• Enhance transmission and distribution infrastructure to ensure reliability, resiliency, and physical and cyber security while supporting electrification, managing changing load patterns, and integrating long-duration storage, including hydrogen.

• Direct FERC to incentivize grid-enhancing technologies (e.g., dynamic line ratings, topology optimization, and power flow control).

• Utilize existing authority, smart siting in low-impact areas, and a screen to avoid negative impact on environmental justice communities to site additional transmission, with a focus on opportunities on agricultural lands, federal public lands, highway and rail rights of way, reclaimed minefields, and brownfields. This should include undergrounding of transmission lines in cases where there are significant climate risks to overhead lines, and it is otherwise practical and cost-effective to do so.

7) Modernize regulatory review and permitting processes to support innovative new technologies and rapid deployment.

• Create a program to enable communities interested in economic development to volunteer to be considered for generation, transmission, and other infrastructure projects, possibly through opportunity zones.

• Continue to modernize the Nuclear Regulatory Commission's regulatory framework to ensure that next generation nuclear plants can be deployed successfully to support decarbonization.

• Ensure carbon capture permitting requirements do not hinder development.

• Consider other environmental review requirements and other aspects of FERC not directly tied to transmission that should be revised.

8) Support cost-effective transitions that are just and equitable in fossil fuel-dependent communities.

• Where planned or accelerated retirements of fossil fuel generation assets occur, federal and state legislators and regulators should consider policies that support the local workforce and economy, while mitigating the impact of associated costs on customers, taxpayers, and communities.

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TRANSPORTATION RECOMMENDATIONS

The objective of these recommendations is to decrease emissions from the transportation sector today while planning for and investing in the transportation technology, systems, and infrastructure needed for the future. Policies and legislation implemented in response to these recommendations should prioritize benefits to and reflect consultation with low-income, environmental justice, and rural communities whenever possible. They should also address tribal lands and reflect consultation with Indigenous communities whenever appropriate.

1) Establish a national low carbon fuel standard, with exemptions for fuels used in certain applications.

• Develop a national low carbon fuel standard (LCFS) to build on the Renewable Fuel Standard.

- The standard should set a technology- and feedstock-neutral benchmark for liquid and non-liquid fuels tied to a lifecycle assessment of the carbon intensity of the fuels. The carbon intensity standard should become more stringent (lower) over time.
- The standard should credit practices that reflect the best-available science about the carbon intensity of fuel production, farming practices, land use and land cover changes, and crop productivity.
- The standard should include guardrails to prevent conversion of any sensitive lands with high carbon sequestration and biodiversity value.
- The standard development and life cycle assessment should be transparent public processes informed by all stakeholders, including agricultural producers.
- Consideration should be given to allow for both individual participation as well as aggregate enrollment through intermediaries (e.g., farm data managers) but with care to avoid putting either pathway at a disadvantage.
- For renewable liquid fuels, the LCFS should reward entities in the value chain, including farmers and producers, that use climate-smart practices that reduce carbon emissions, store soil carbon, and reduce nitrous oxide emissions.
- An LCFS should allow other low-carbon fuels, such as shipping and aviation fuels and heating oils, that meet the carbon intensity standards to qualify for credits. These sectors could become potential growth areas for low-carbon fuel demand.
- The LCFS should complement other zero-emission vehicle (ZEV) programs and greenhouse gas emissions standards for on-road vehicles.

2) Continue driving emissions reductions with efficiency and performance standards.

• In developing efficiency and performance standards, use the following principles for standard development:

- Focus on reducing the intensity of carbon emissions.

- Create long-term certainty to provide businesses with a planning horizon by including a known schedule of performance requirements over a long timeframe.
- Build in continuous improvement, so the standards strengthen over time to avoid stagnating and failing to deliver.
- Focus on outcomes, not technologies, to avoid restricting innovation, by prioritizing physical outcomes that provide companies the greatest latitude for innovation so they can seek out the least expensive or most efficient means of achieving the standard.
- Prevent gaming via simplicity and avoiding loopholes.
- Ensure standards are clear and easy for consumers to understand, providing opportunities for the general public and companies to better understand the benefits and drawbacks of different vehicles and fuels.

Note: These principles borrow heavily from guidance on vehicle performance standards from Energy Innovation.

3) Incentivize and accelerate electrification of fleets, ports, and personal vehicles.

- Transition the vehicles in the federal fleet to ZEVs.
- Transition the fleet of 500,000 school buses to ZEVs by providing subsidies or incentives.
- Subsidize the electrification of public transit buses and trains.
- Create a grant program to support fleet conversion for small businesses and nonprofit organizations with little or no tax liability.
- Support the electrification of the nation's freight and logistics sector through an annual competitive grant program that supports the integration of EVs and alternative fuel vehicles at ports and intermodal facilities.
- Create a tax credit for new zero emission medium- and heavy-duty commercial vehicles.
- Electrify ports using a grant program to push port operators to invest in cleaner technologies.
- Study the extent to which accelerated vehicle retirement could contribute to transportation emissions reductions and how to design a potential vehicle replacement incentive program, building on the lessons learned from the 2009

"cash-for-clunkers" policy, as well as the experience of certain state programs. Such a study should consider how a vehicle replacement incentive program might maximize emissions reductions, interact with existing federal incentives like the ZEV tax credit, grow the ZEV market with a particular focus on expanding access for disadvantaged groups, and pursue a reasonable degree of cost-effectiveness.

• Reform the Light-Duty EV Tax Credit to make it more accessible to more consumers and encourage the expedited manufacturing and adoption of EVs in the passenger vehicle market. Provide consumers with the alternative option of a cash-on-the-hood rebate instead of the credit to reduce barriers to access.

4) Anticipate future infrastructure needs and stimulate transitions to lower carbon transportation.

• Increase funding for the nation's rail network to maintain a state of good repair; establish new or improved intercity, commuter, or higher-speed passenger rail corridors; and ensure that rail infrastructure projects account for the effects of climate change.

• Increase funding for public transportation to reduce the maintenance backlog and expand public transit access.

• Continue to provide funding and incentives to support biofuels infrastructure, including for programs like USDA's Higher Blends Infrastructure Incentive Program and the Biofuel Infrastructure Partnership at USDA.

• Reform and enhance the existing Alternative Fuel Infrastructure Tax Credit.

• Establish a federal grant program within the Department of Transportation to fund installation of public EV chargers along the National Highway System.

• Establish a federal grant program within DOE to reimburse public and private entities for EV supply equipment installation costs at workplaces, multi-unit dwellings, and parking facilities.

• Establish a federal grant program within DOE and the Department of Housing and Urban Development for Section 8 and Section 202/811 properties to fund electrical retrofits of old single- and multi-family housing for EV charging compatibility.

• Exempt EV charging stations from the ban on commercial activities at Interstate rest stops.

• Establish a national building code that requires all new residential construction to support EV charging.

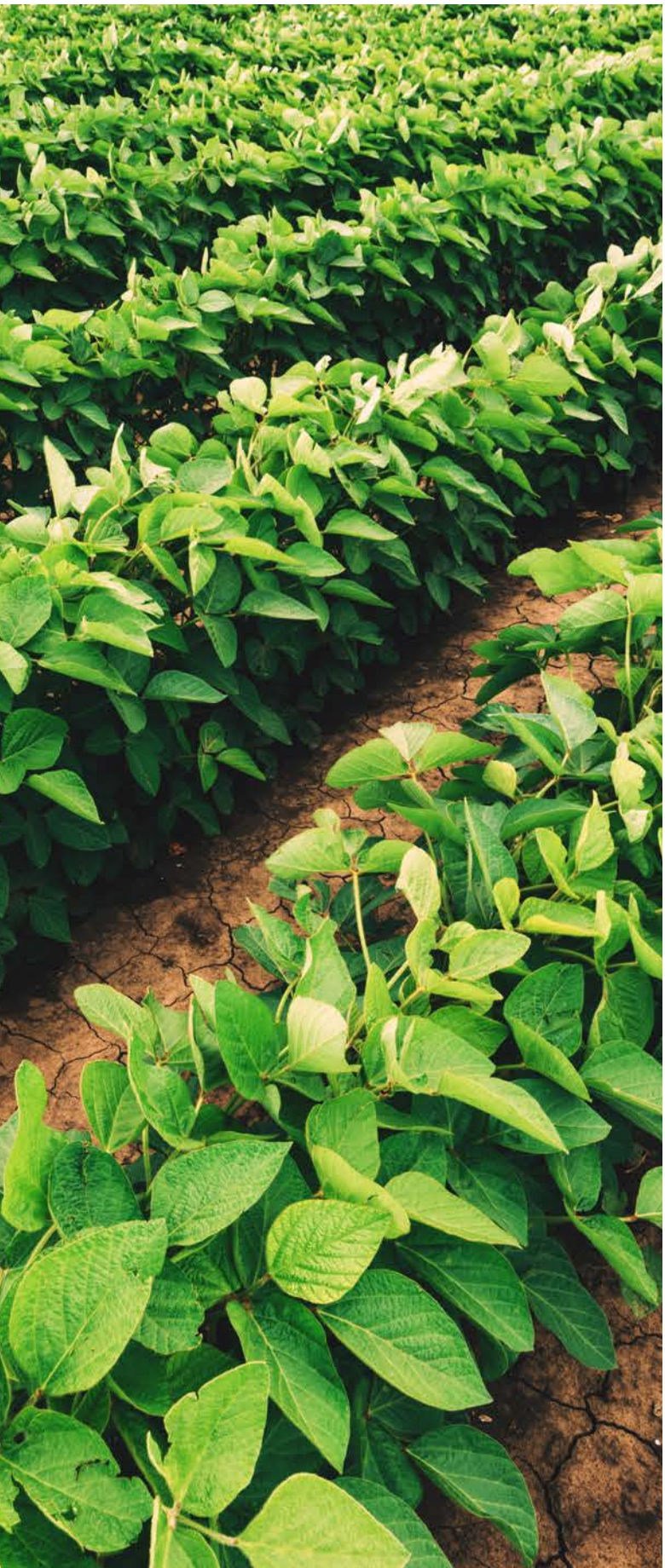
- Adopt federal "dig once" guidelines that require interagency coordination of infrastructure projects to ensure that investments in a state of good repair are complementary with investments in public transit, EV infrastructure, smart transportation surfaces, and broadband.

5) Address supply chain needs, especially for batteries, by investing in domestic manufacturing and recycling.

- Expand grant programs and/or loan guarantees to U.S. companies, including the Advanced Technology Vehicle Manufacturing program, to construct new or retool existing U.S. facilities to manufacture EVs and associated infrastructure.
- Revive the 48C Advanced Manufacturing Tax Credit to provide an investment tax credit to re-equip, expand, or establish domestic manufacturing facilities in the battery storage and transportation technology sectors.
- Authorize a national critical minerals research program at DOE and direct the department to develop a national strategy for securing critical minerals in the clean energy and EV supply chain in an environmentally, economically, and socially responsible way.
- Provide significant funding for DOE to pursue research into sustainable recycling of batteries, alternatives for lithium-ion batteries in EVs and grid-scale energy storage, and demonstration projects that integrate used EV batteries into the grid.

6) Invest in RDD&D for hydrogen and other technologies.

- Increase federally supported RDD&D to make high-efficiency, zero-emission, long-range trucks commercially viable.



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AGRICULTURE RECOMMENDATIONS

The objective of these recommendations is to call attention to opportunities for agricultural producers to advance decarbonization, especially where such opportunities present voluntary solutions for farm owners/operators and are shared with the power and/or transportation sectors. Policies and legislation implemented in response to these recommendations should be crafted in consultation with agricultural producers and communities with disproportionately high environmental burdens; enhance farm profitability; be based on sound science and analysis that accounts for affordability and feasibility of the transition for producers as well as the full life cycle of products; and create opportunities for states to coordinate in and among themselves.

This is not an exhaustive list of necessary policy measures to wholly address barriers to the full potential for agriculture to contribute to decarbonization, but they represent a list of agreed-upon guidelines and approaches that are bipartisan in nature, have real potential to achieve decarbonization results, and do not harm farm profitability. Some topics remain important to take up (e.g., addressing funding and risk related to land access to better incent and make more feasible climate smart practices on rented land), but more time and dialogue would be necessary to arrive at consensus-based solutions to these systemic challenges.

1) Augment working lands conservation programs to better reward carbon and climate smart practices and ecosystem services.

- Start a USDA-administered carbon bank, possibly including incentives for ecosystem services, to pay farmers for their carbon and greenhouse gas reduction, sequestration, and removal practices. A successful carbon bank should stabilize the value of carbon and ecosystem services for farmers and advance science-based, consistent, and cost-effective measurement and verification processes.
- Incentivize carbon reduction and sequestration practices alongside the full suite of ecosystem services by requiring federal conservation programs to document and reward the co-benefits of environmental conservation and farm resiliency (e.g., water quality, soil health, soil conservation, biodiversity, etc.) and the practices adopted primarily for climate benefits.
- Incentives for carbon and greenhouse gas reduction and removal practices should not displace existing farm finance programs and funding for climate smart practices (i.e., conservation programs in Title II of the Farm Bill).
- Support efforts to advance the development of indicators to move from practice-based incentives to performance-based outcomes and compensation for decarbonization and ecosystem services.
- Develop a tax credit similar to 45Q that delivers transferrable and refundable credits to U.S. farmers for qualified investments in climate mitigation, carbon sequestration, and other ecosystem services. The credit should allow flexibility for producers and be subject to publicly available policy guidance developed by the USDA in consultation with producers for measurement and verification.

2) Amend existing or enable future policies to address agricultural waste streams together with agricultural inputs in a combined organic waste recycling, wastewater treatment, and power strategy.

- Further invest in research and appropriate incentives to select the best on- and off-farm approaches and technologies for removal and recovery of nitrogen and phosphorus from animal manure.
- Incentivize emissions reductions at fertilizer manufacturing facilities and incentivize the inclusion and use of recycled nitrogen and phosphorus.
- Combine treatment of food waste, livestock waste, municipal organics, and agricultural woody biomass to produce compost for use as a soil amendment.

- Remove barriers to transporting manure from on-farm sources to on- or off-farm sinks.
- Promote the use of manure and food waste for biofuels production as a waste management strategy (versus crop residues, which should be left on the field).

3) Prioritize agricultural research and development that aims to increase farm productivity and resilience along with mitigation and adaptation strategies.

- Support agricultural research and development for new technologies and practices that enable farm systems to better respond to heat stress, drought, flooding, and other forms of environmental volatility.
- Support agricultural research and development to better quantify the changes in the carbon-nitrogen cycle for agricultural practices.
- Leverage private sector R&D trends and investment and couple with more public research. Protocols should be developed to enable the safe and fair sharing of data to inform analysis and science while protecting the data privacy of individual producers.
- Coordinate research across DOE and USDA for development of more climate-friendly products (e.g., research into feed efficiencies that also have a carbon benefit).

4) In addition to in-field management practices, support on-farm opportunities for decarbonizing energy use on and off the farm.

- Support the availability of multiple pathways to decarbonize on-farm energy use based on optionality and site-specific, science-based outcomes, in lieu of generalized or prescriptive approaches that do not optimize for fullest greenhouse gas emissions reduction or consider cost to the farmer.
- Track and incentivize technologies and innovative approaches, such as agrivoltaics, that enable optimization of both farm productivity and energy generation.
- In addition to renewable power generation, programs should support innovation and incentives that allow farmers to produce and use biofuels on-farm.
- Programs should map and align land conversion from agriculture to power to accomplish positive co-benefits such as the retirement of marginal land and the planting of pollinator habitat.

- Create pathways for overcoming hurdles specific to transmission and siting of distributed power production on agricultural lands and in rural areas (e.g., coordinating with federally owned utilities to develop collaborative approaches).
- Analyze and address near-term constraints that are limiting the ability of the power sector to install new renewable power generation.

5) Promote cross-departmental coordination to enable faster implementation of feed-based responses to enteric fermentation.

- Enteric fermentation strategies and solutions could offer a significant reduction in methane emissions in the next decade and should not be left out of any decarbonization strategy. Additional research focus and inter-agency support is needed to further develop and facilitate this potential.

DIALOGUE PARTICIPANTS

A multi-discipline, diverse stakeholder group shaped the recommendations in this document, as part of a steering committee and/or sector-based stakeholder groups. The following individuals participated in the Decarbonization Dialogue in the following capacities, with support from their respective colleagues.

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