

**LEGAL PATHWAYS TO
DEEP DECARBONIZATION
IN THE UNITED STATES:
SUMMARY AND
KEY RECOMMENDATIONS**

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Editors

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- State legislatures could allow utilities to charge ratepayers for the cost of industrywide hiring halls and for retaining that bridges the gap between workers' old skills and new occupations. (Ch. 24 App. A)
- State legislatures could require wind, solar, or energy efficiency companies to give hiring preference to displaced coal or coal-fired utility workers within future renewable energy portfolio standards or energy efficiency mandates, while also establishing wage standards that improve job quality in renewable and energy efficiency jobs. (Ch. 24 App. A)
- State legislatures should promote the creation of more clean energy jobs in coal country. (Ch. 24 App. A)
- State legislatures could adjust commercial forest management programs to more directly integrate deep decarbonization objectives, particularly related to regeneration, regulation (or prevention) of conversion of feedstock forests to other, non-forested uses, and regulation of greenhouse gas-emitting technology utilized during the feedstock cultivation process. (Ch. 25)
- State legislatures should designate a lead agency with responsibility for coordinating the various permitting processes for renewable gas gathering pipelines. (Ch. 26)
- State legislatures could provide tax credits or grant funding to stimulate investment in research and development focused on the costs and benefits of pre-transport processing of feedstocks. (Ch. 27)
- State legislatures should adopt measures that would stimulate investment in barge and rail transport—such as tax incentives or additional public investment in intermodal facilities—to allow increased use of rail transport for feedstock production. (Ch. 27)
- State legislatures should adopt measures that would stimulate investment in biofuels receiving terminals—such as tax incentives or grants for eligible terminal improvements—to facilitate increased use of rail transport for biofuels delivery. (Ch. 27)
- State legislatures should include combined heat and power in their state renewable portfolio standard or energy efficiency resource standards. (Ch. 27)

- State legislatures should provide incentives to encourage the construction of pipelines that are dedicated to the delivery of ethanol and biofuels. (Ch. 27)
- To achieve carbon dioxide removal at the necessary scale within a relevant time frame, state legislatures should significantly boost the funding available to support negative emissions technology research proposals. (Ch. 29)
- State legislatures should consider adopting a fertilizer fee that could both encourage more judicious use of fertilizer and help fund training on how to ensure no yield losses with less fertilizer and other climate-friendly agricultural practices. (Ch. 30)
- State legislatures should amend state forestry laws to recognize the importance of considering carbon capture and climate change adaptation in management decisions regarding state forests. (Ch. 31)
- State legislatures should consider a modest carbon tax or greenhouse gas cap-and-trade program that recognizes private forest carbon capture as an emission offset, exempts emissions from sustainably produced biomass, and also imposes a tax burden on those who deforest their land through conversion. (Ch. 31)
- State legislatures should adopt legislation mandating that state and local government agencies identify measures to reduce hydrofluorocarbon emissions. (Ch. 34)

Local Governments

- Local governments should assess all near-term decisions against long-term goals and viable pathways to achieve them, balancing replacing retiring fossil fuel based infrastructure with available low-carbon technologies, in order to help minimize carbon lock-in and stranded assets. (Ch. 1)
- Local governments should engage in integrated planning based on the efficient and transparent sharing of information between stakeholders, many of whom have not historically coordinated their efforts. (Ch. 1)
- Local governments should address generational-scale lifestyle changes in two ways: playing offense, particularly when policymakers confront forks in the road where some lifestyle shifts could facilitate deep

- decarbonization, and playing defense by heading off lifestyle shifts that could undermine deep decarbonization. (Ch. 3)
- Local governments should adopt and implement policy measures to reduce demand for energy services, not just to reduce the energy needed to supply those services. (Ch. 3)
- Local governments should adopt and implement specific strategies that target increased uptake of more energy-efficient home equipment technologies, including green leases and improved life-cycle cost information for retailers and householders. (Ch. 3)
- Local governments should consider using specific strategies to increase adoption of household-level renewable energy systems and purchases of products with low life-cycle emissions, such as informal marketing through neighborhoods and social networks and targeted marketing to environmentally minded consumers. (Ch. 3)
- Local governments should further use, test, and evaluate specific strategies for motor vehicle efficiency, including improved energy labeling and vehicle fleet buyers' use of supply chain pressure. (Ch. 3)
- Local governments should further use, test, and evaluate specific strategies to increase the uptake of energy-efficient buildings, including energy audits of existing homes and energy rating systems for new homes. (Ch. 3)
- Local governments should further use, test, and evaluate specific strategies to reduce carbon emissions from the use of existing and new home equipment and buildings, including provision of monthly feedback and implementation of information campaigns. (Ch.3)
- Local governments should further use, test, and evaluate strategies for reducing carbon emissions from the use of existing and new motor vehicles and other forms of transportation, including provision of immediate fuel use feedback devices and development of eco-driving education programs. (Ch. 3)
- Local governments should coordinate with federal and state governments, as well as corporations and businesses, to carefully plan technological change inducement programs. (Ch. 4)
- Local governments should support financing of carbon reducing technologies through the issuance of green bonds. (Ch. 5)

- More local governments should assess the benefits of a comprehensive renewable energy plan that takes into account multiple stakeholders (i.e., cost to consumer, grid integration, and private investment). (Ch. 5)
- Whenever a local government has jurisdiction over an energy project participant, it should use its authority to require reporting of carbon performance information on an ongoing basis. (Ch. 6)
- Local governments could adopt laws with more ambitious goals (e.g., zero waste), intermediate targets and timetables for achieving these more ambitious goals, and means of achieving them. (Ch. 7)
- Local governments should adopt laws that other local governments have adopted on the waste problems posed by products, packaging, food scraps, and industrial waste. (Ch. 7)
- Local governments must adopt decarbonization laws that comply with international trade rules. (Ch. 8)
- Local governments should avoid adopting decarbonization laws that contain local content requirements. (Ch. 8)
- If a local government designs a decarbonization law that contains local content requirements, it should meet the national treatment requirements under Article III of the General Agreement on Tariffs and Trade. (Ch. 8)
- If a local legislature decides to adopt a local content requirement for decarbonization, it could limit the requirement to government procurement, particularly if it is linked to decarbonization policies or protection of public health. (Ch. 8)
- All cities should consider adoption of benchmarking ordinances, as well as energy audit and energy savings implementation measures. (Ch. 9)
- Cities should adopt and fully enforce city building energy-efficiency codes (unless preempted by state law). (Ch. 9)
- Cities should develop an integrated suite of energy efficiency policies that combine, co-ordinate, and synthesize a full suite of complementary energy efficiency policies, including mandatory minimum energy efficiency standards, voluntary labeling and incentive programs that further increase produce energy efficiency levels over time, tax incen-

tives, and other complementary energy efficiency policies that are part of a larger set of decarbonization policies. (Ch. 9)

- Cities should establish city tax deductions or credits for the purchase of energy-efficient equipment. (Ch. 9)
- Cities should establish financing programs for energy efficiency. (Ch. 9)
- Local legislative bodies should require energy use disclosures for larger commercial buildings (e.g., buildings larger than 50,000 square feet and multifamily buildings), and require benchmarking information to be made publicly available in a format that is easy to understand so that it can be readily used in rental and purchase decisions. (Ch. 10)
- Within the authority granted to them under state law and state building code requirements, local legislative bodies should adopt advanced building and energy codes that drive down carbon use in buildings. (Ch. 10)
- Local governments should expand publicly owned forests by acquiring and reforesting private lands, focusing on lands rendered economically unproductive by the effects of climate change. (Ch. 13)
- Localities should alter or eliminate sprawl-inducing zoning provisions, such as minimum lot and house sizes, and revamp zoning and building code requirements to promote more compact, mixed-use development. (Ch. 13)
- Localities should eliminate free on-street parking, raise parking rates (and consider demand-based parking prices that change to maintain a certain percentage of vacant spaces), and amend zoning regulations to trim the amount of free parking developers are required to provide. (Ch. 13)
- Localities should pursue reforms that better link transportation and land use, including targeting transportation funding and planning resources to encourage transit-oriented development. (Ch. 13)
- Metropolitan planning organizations should include greenhouse gas assessment in their policies and reorient transportation planning to advance decarbonization. (Ch. 13)
- Cities should establish programs and regulations to facilitate residential charging infrastructure. Local government incentives should encour-

age owners of multiunit dwellings to add access to electrical outlets in parking areas. (Ch. 14)

- Local governments can call upon current alternative vehicle owners to educate potential consumers about alternative fuel vehicles. (Ch. 14)
- Local governments should allocate funding and institute regulations to incentivize electric vehicle charging in residential spaces. (Ch. 14)
- Local governments should assist in research and development toward the goal of reducing battery costs. (Ch. 14)
- Local governments should consider prioritizing support for expanding the faster growing market (i.e., electric vehicles), rather than trying to promote a lagging hydrogen fuel cell vehicle market. (Ch. 14)
- Local governments should continue to expand financial and other support infrastructure for expanded use of electric vehicles. (Ch. 14)
- Local governments should proactively address safety standards, regulations, and liability regimes for autonomous vehicles. (Ch. 14)
- Local governments should increase investment in freight transportation infrastructure. (Ch. 15)
- Local governments should educate those involved in their tree planting campaigns about the impacts tree shadows can have on distributed generation solar energy systems and provide guidance about how to pick tree species (e.g., those with lower maturation heights or those with less sun-blocking foliage or branches) and where to place them to minimize their negative impacts. (Ch. 19)
- Local governments should provide incentives for planned communities to install district heating infrastructure in newly built or remodeled mixed-use zones so that residential construction could take advantage of waste heat. (Ch. 19)
- Local governments should promote the creation of more clean energy jobs in coal country. (Ch. 24 App. A)
- Localities should expand climate change planning and modeling to: (1) analyze what it would take to make workers and regions dependent on carbon jobs whole; and (2) develop plans to achieve a level of equity and “shared prosperity” that would unite community members behind a common battle to reduce carbon emissions. (Ch. 24 App. A)

- Local zoning boards should amend their rules to specifically address the development of renewable gas production facilities, unless their definitions of industrial or manufacturing uses are already sufficiently broad. (Ch. 26)
- Local governments should adopt measures that would stimulate investment in barge and rail transport—such as tax incentives or additional public investment in intermodal facilities—to allow increased use of rail transport for feedstock production. (Ch. 27)
- Local governments should adopt measures that would stimulate investment in biofuels receiving terminals—such as tax incentives or grants for eligible terminal improvements—to facilitate increased use of rail transport for biofuels delivery. (Ch. 27)
- Local governments, through their own purchasing, advertising, or public support, could also encourage a wider range of whole or minimally processed plant-based options, and other climate-friendly options, at restaurants. (Ch. 30)
- Local governments should enact in-use restrictions that prohibit idling of all vehicles, but particularly heavy-duty diesel vehicles. (Ch. 32)
- Local governments should update and amend their green purchasing program requirements to eliminate purchases of hydrofluorocarbon-containing equipment where other low-global warming potential and more energy-efficient alternatives are available on the market. (Ch. 34)
- Local governments should use life-cycle climate performance accounting in their energy efficiency programs and regulations. (Ch. 34)
- When designing and implementing cap-and-trade programs, regional authorities should incentivize nitrous oxide emission reductions from agricultural and livestock sources by providing offset credit for such reductions. (Ch. 35)

Companies, Associations, NGOs, and Other Private Entities

- Private actors should assess all near-term decisions against long-term goals and viable pathways to achieve them, balancing replacing retiring fossil fuel based infrastructure with available low-carbon technologies, in order to help minimize carbon lock-in and stranded assets. (Ch. 1)
- Private actors should engage in integrated planning based on the efficient and transparent sharing of information between stakeholders, many of whom have not historically coordinated their efforts, in order to successfully achieve deep decarbonization. (Ch. 1)
- Corporations and other private organizations should consider using specific strategies to increase adoption of household-level renewable energy systems and purchases of products with low life-cycle emissions, such as informal marketing through neighborhoods and social networks and targeted marketing to environmentally minded consumers. (Ch. 3)
- Corporations and other private organizations should further use, test, and evaluate specific strategies for motor vehicle efficiency, including improved energy labeling and vehicle fleet buyers' use of supply chain pressure. (Ch. 3)
- Corporations and other private organizations should further use, test, and evaluate specific strategies to increase the uptake of energy-efficient buildings, including energy audits of existing homes and energy rating systems for new homes. (Ch. 3)
- Corporations and other private organizations should adopt and implement specific strategies that target the increased uptake of more energy-efficient home equipment, including green leases and improved life-cycle cost information for retailers and householders. (Ch. 3)
- Corporations and other private organizations should further use, test, and evaluate specific strategies to reduce carbon emissions from the use of existing and new home equipment and buildings, including provision of monthly feedback and implementation of information campaigns. (Ch. 3)
- Corporations and other private organizations should further use, test, and evaluate strategies for reducing carbon emissions from the operation of existing and new motor vehicles and other forms of transportation, including provision of immediate fuel use feedback devices and development of eco-driving education programs. (Ch. 3)
- Private-sector decisionmakers should address generational-scale lifestyle changes in two ways: playing offense, particularly when policymakers confront forks in the road where some lifestyle shifts could