

# Clean And Competitive: Opportunities For U.S. Manufacturing Leadership In The Global Low-carbon Economy

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# OVERVIEW: AN INTEGRATED CLIMATE-MANUFACTURING STRATEGY

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- The United States needs an integrated national strategy to address the twin challenges of bolstering its manufacturing sector and averting climate change.
- Timely federal research, development, and demonstration (RD&D) and deployment policies targeted to specific manufacturing industries could create comparative advantage, expanding domestic investment and employment.

# SILOED POLICIES: CLIMATE AND MANUFACTURING

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- Manufacturing and climate have largely been dealt with in separate policy silos.
- In fact, they are deeply interconnected.
- Industrial emissions account for more than 30 percent of global emissions.
- The drive to reduce them will retool global manufacturing.



Source: [Marcin Jozwiak on Unsplash](#)

# SEIZING THE OPPORTUNITY

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- Transformations in the core technologies and business models of major industries can radically alter the international competitive positions of companies, regions, and nations.
- To seize the opportunity created by the global shift to clean manufacturing, the United States should leverage the nation's strength in science and technology.
- Federal investment should be carefully targeted toward industries and technologies in which domestic producers are most likely to succeed against international competitors.

# FOUR OPPORTUNITIES

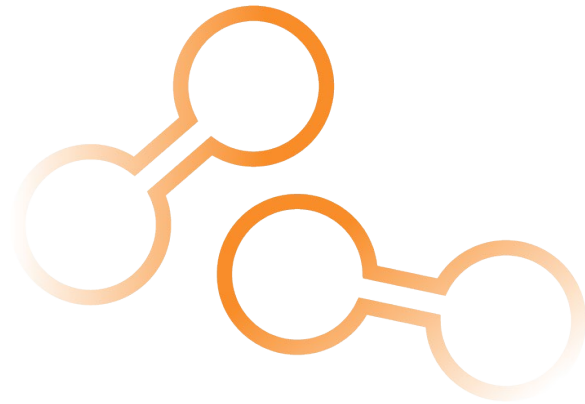
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- A joint research team from ITIF, Boston University, and Fraunhofer USA conducted interviews and expert workshops.
- We identified four opportunities to strengthen U.S. competitive advantage that have largely been overlooked:
  - Hydrogen production
  - Heating, cooling, and drying equipment
  - Chemicals production and recycling
  - Biotech-based alternatives to meat and dairy products

# HYDROGEN PRODUCTION

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- Hydrogen, the lightest element, is a versatile energy carrier with the potential to perform many functions in a low-carbon economy, but current hydrogen production is carbon-intensive.



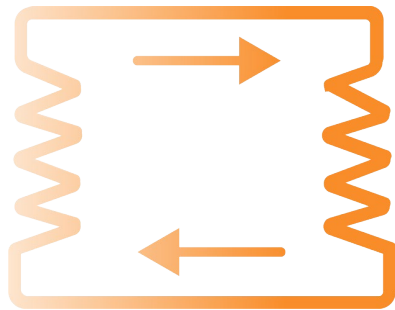
- A federal policy agenda should include:
  - Shifting DOE’s focus toward industry, energy storage, and heavy-duty transportation uses
  - Funding a portfolio of pilot- and commercial-scale demonstration projects or clean hydrogen “hubs”
  - Establishing more effective production tax incentives
  - Expanding range of technologies eligible for DOE Loan Programs Office assistance



# HEATING, COOLING, AND DRYING EQUIPMENT

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- Heating, cooling, and dehumidifying buildings, and providing low-temperature heat in industrial processes, are responsible for significant greenhouse gas emissions.



- A federal policy agenda should include:
  - Establishing ambitious heat pump cost and performance goals
  - Focusing on innovation in new refrigerants, next-gen heat exchangers, drilling/piping for geothermal heat pump systems, novel electric drying systems, and low-temperature industrial processes
  - Funding pilots and first-of-a-kind demonstrations of zero-emission industrial processes
  - Providing loans and financial assistance to manufacture advanced heat pumps domestically
  - Expanding appliance standards to include a wider range of commercial and industrial equipment and consideration of system efficiency

# CHEMICALS PRODUCTION AND RECYCLING

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- Worldwide demand for chemicals made from oil and gas is growing rapidly, driven by increases in demand for plastics, as well as fertilizers, synthetic fabrics, paints, and many other products.



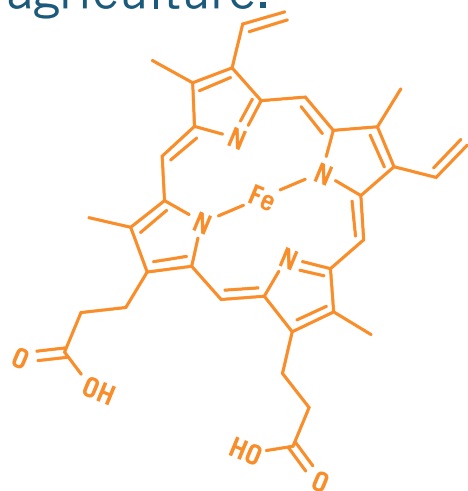
- A federal policy agenda should include:
  - Investing in R&D to create plastics and other chemicals that can be recycled more cheaply and easily and improved infrastructure for recycling plastics
  - Developing crops and microorganisms to produce feedstocks for bio-based chemical manufacturing
  - Funding public-private partnerships to build and operate large-scale test facilities
  - Creating a product labeling system that reflects climate impacts
  - Establishing “buy clean” programs for low-emission chemicals



# BIOTECH-BASED ALTERNATIVES TO MEAT AND DAIRY PRODUCTS

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- Proteins made by microbes in fermenters and animal cells cultivated in bioreactors could substitute for many meat and dairy products, displacing emissions from agriculture.



- A federal policy agenda should include:
  - Providing more support from USDA for research on alternative proteins
  - Providing public funding for testbed facilities
  - Developing a Manufacturing USA innovation institute for alternative protein production technology
  - Focusing regulations on potential risks of new products
  - Adding alternative proteins to federal nutrition support programs
  - Assisting farmers/ranchers in joining alternative protein supply chains

# CONCLUSION

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- The United States should respond to the twin challenges of rebuilding a vibrant, inclusive economy and accelerating progress toward net-zero emissions by adopting an integrated strategy that features policies that target specific industries that have a high potential for both emissions reduction and high-quality job growth.
- The United States will not be alone in seeking to develop such industries, and success is not guaranteed, but if it adopts a sophisticated strategy, tailored to the opportunities and barriers each industry faces, the United States has an excellent chance to provide global leadership on climate that strengthens its manufacturing sector and economy as well.

# MORE INFORMATION

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- [“Clean and Competitive” report](#)
- [“Clean and Competitive” webinar](#)
- [“Widening the Lens” workshops](#)
- [ITIF Clean Energy Innovation Policy Program](#)
- [Boston University Institute for Sustainable Energy](#)
- [Fraunhofer USA Center for Manufacturing Innovation](#)
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