

Electricity & Climate Change— Interconnected

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American Council for an Energy-Efficient Economy



The American Council for an Energy-Efficient Economy is a nonprofit 501(c)(3) founded in 1980. We act as a catalyst to advance energy efficiency policies, programs, technologies, investments, & behaviors.

Our research explores economic impacts, financing options, behavior changes, program design, and utility planning, as well as US national, state, & local policy.

Our work is made possible by foundation funding, contracts, government grants, and conference revenue.

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Directions for energy efficiency & climate change

- After a decade of low energy prices, oil, gas & electricity increasing
- Climate also impacting energy supplies & resilience
- Growing concerns about climate change by investors, politicians & companies
- Congress, administration, and state & local governments taking steps to reduce GHG emissions
- These developments make the case for energy efficiency even more important
- So much going on—can be hard to keep track & plan actions

Emerging energy crisis

- Production down due to COVID & economic pressures
- Prices for gas & oil at recent highs
- U.S. now coupled to world gas price
- Gas prices being reflected in electricity rates
- Tight fuel markets causing electricity outages in China & Europe
- Limited storage could cause pain this winter

Benchmark Index Costs of a Barrel of Oil



Source: FactSet • By The New York Times

Climate is changing & challenging energy systems

- Extreme weather is challenging energy systems
- Industry source of emissions (*process*) & part of the solution (*demand-side*)
- New focus of industrial decarbonization
- Electrification offers a path to respond to climate change for many sectors of the economy
- We need to get all parts right for the sake of the future



Climate is driving a need for a more resilient electric future

- Climate change effects are challenging electric systems with fires, floods, storms & extreme temperatures
- Economic losses of interruptions are increasing, contributing to supply chain disruptions
- Climate change is also making energy access a life-safety concern
- Some customers relying on distributed resources to assist in reliability, ride-through & recovery

Increased policy focus on reliability, resilience & recovery

- Vulnerability of electric transmission to weather & fires is becoming a risk
- “Accepted market truths,” such as the reliability of natural gas, being called into question by recent supply interruptions
- Investment & financial communities are beginning to ask about reliability risk exposure



Source: Institute for New Economic Thinking

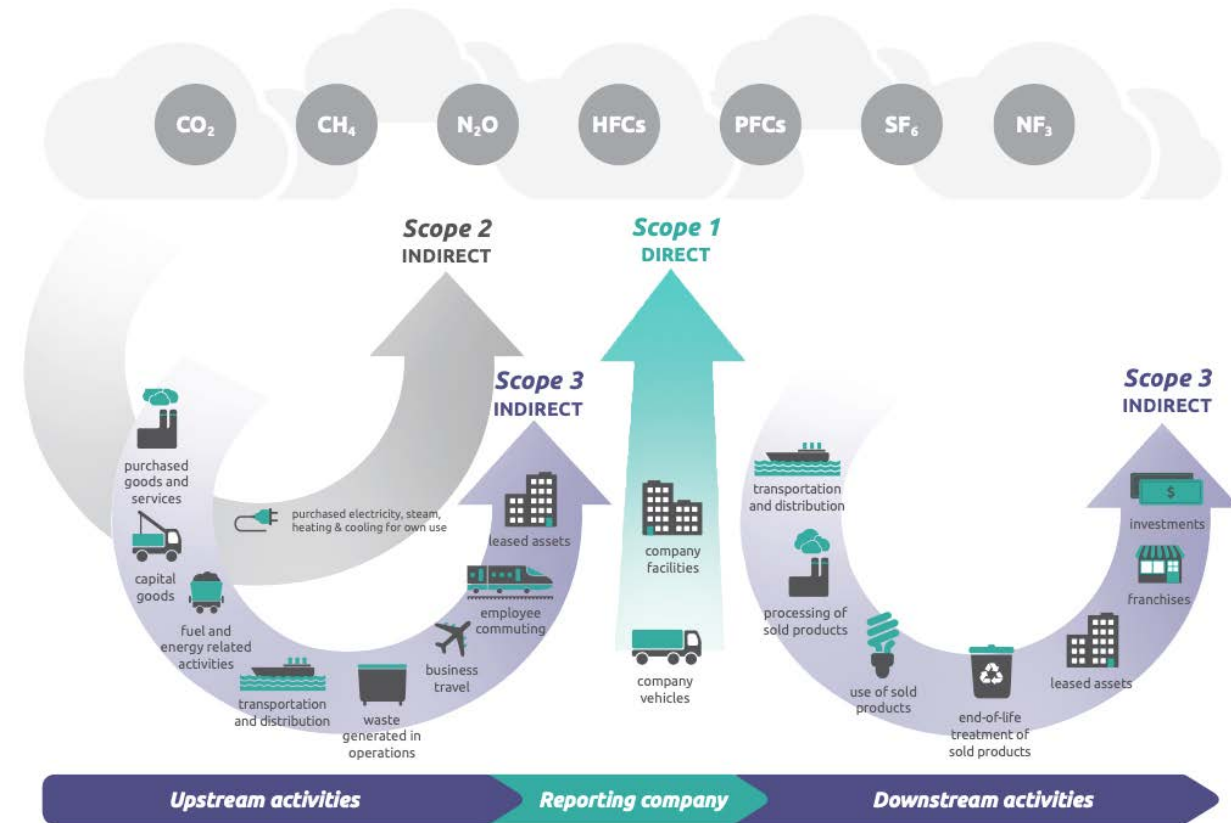
Corporate environmental, social & governance (ESG)

- Pressure from investment & government to reduce corporate carbon footprint
- Increased focus on carbon embodied in products
- Limited understanding of contributions from the supply chains (*footprint*) & in use of products (*handprint*)
- Data and accounting emerging as a challenge—need to be “good enough” but not unduly burdensome



Carbon accounting

- Pressure for disclosure & reporting
- Applies to both Scope 1 & 2 but growing pressure on Scope 3—supply chain & downstream
- Customers asking for supplier data
- SEC considering rule of reporting
- Congress considering embodied carbon requirements for building materials
- Need to account for both product & use-phase emissions



Source: [WRI/WBCSD 2013](#)

Federal industrial policy landscape

- Bipartisan infrastructure bill
- Fiscal Year 2022 appropriations (and beyond)
- Reconciliation resolution—partisan
- Bipartisan “China Trade” bill?
- Initiatives from agencies and White House
 - **DOE Advanced Manufacturing Office**
 - **FTC environmental disclosure and reporting guidelines**
 - **Embodied carbon reporting**

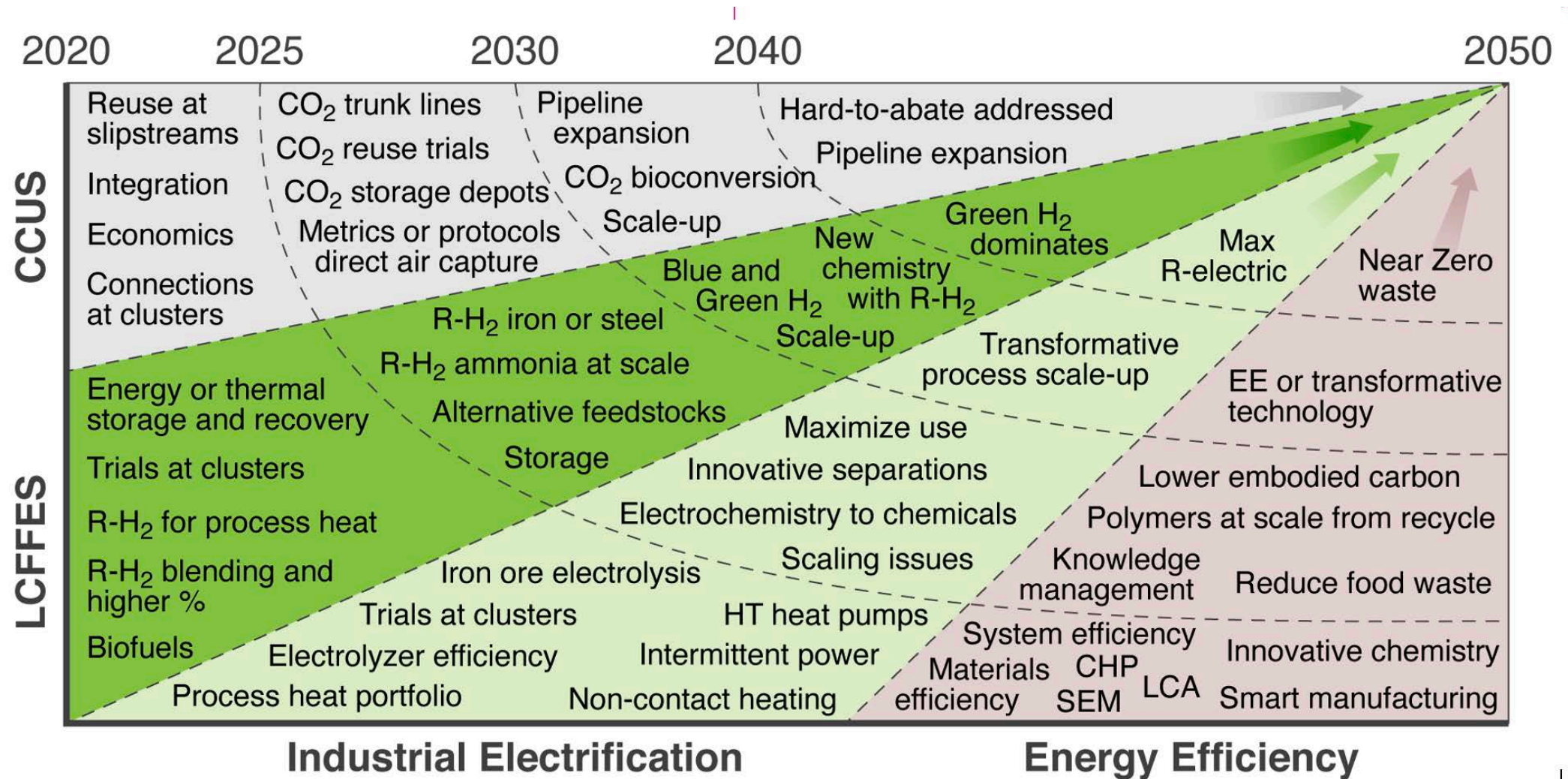
Federal actions on industrial decarbonization

- *Energy Act of 2020* provided new authorization and funding for industrial decarbonization including RD&D, CCUS, H₂, and implementation
- Multiple recent funding announcement from DOE/AMO enabled by FY21 and *Energy Act*—new *Industrial Decarbonization Institute*
- ~50% proposed increase in DOE/AMO budget for FY22
- Multiple provisions in bipartisan Infrastructure Bill including RD&D, demonstration, energy efficiency, and deployment
- Additional technology, market & investment provisions under consideration for other legislative vehicles

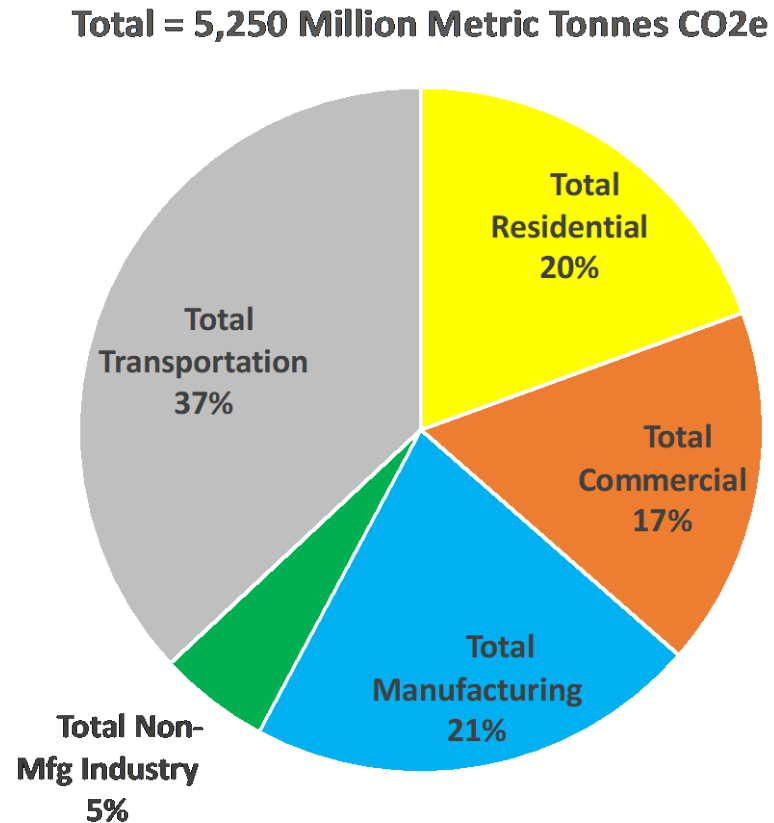
Industrial investment proposals

- First three—DOE to co-fund the first-three commercial-scale applications of transformative industrial technologies
- Investment in strategic facilities—DOE or Treasury grants or tax credits to support major carbon emissions & pollution reducing upgrades at energy-intensive manufacturing facilities
- Industrial clusters—DOE competitive grants to consortia working on decarbonization & supply chain challenges facing regional industrial clusters
- Grants for existing technologies—DOE provide grants for under-utilized technologies to support efficiency, emissions reductions, and competitiveness
- Deployment incentives—DOE establishes a Sustainable Industry Rebate Program to assist with investments by industrial facilities in energy efficiency & greenhouse gas emissions reductions
- Energy management—DOE assists medium & large industrial firms with energy management & decarbonization.
- Grants or tax credits to deploy clean industrial technologies—aid companies in commercial applications of industrial emissions reduction technologies under the *Clean Industrial Technology Act*

Pillars for industrial decarbonization



Electrification: role in reducing GHG emissions



- IF we decarbonize electricity, electrification of fossil-fuel uses can be part of economy-wide climate strategy
- Paths & challenges differ by sector
- Choices involve trade-offs between sectors
- Sequencing & maintaining optionality critical to these decisions

Electrification: challenges in the transition

- Maintaining grid stability with integration of more variable generation & increasing peaks in electricity demand
- Electrification changing electricity demand patterns
- Scaling of supply & demand technologies to meet market demands
- Limits on battery production capacity—allocation to stationary & mobile uses
- Changing infrastructure needs & investments required
- Addressing equity with required investments for transition & energy costs—buildings, transportation & industry

Unique industrial electrification challenges

- Complexity of industrial systems & supply chains
- Scale of increased electric demand
- Thermal process requirements—
temperature limits & magnitude of demand
- Integration with electric grid
- Scale of required investments
- Addressing shift away from fossil fuel
feedstocks
- Dealing with changing product demands—
demand side



Insulation's role in climate response

Benefits:

- Reduces Scope 3 downstream emissions
- Increased energy prices improves economics
- Reduces size of zero-carbon resource investments
- Improves end-user resilience

Challenges:

- Increases embodied carbon emissions of manufacturers & supply chain
- Not sexy

Suggested directions for NIA & members

- Track policy developments & directions
- Work with customers on climate change & economic case for insulation
- Engage with the SEC disclosure & reporting regulations and embodied carbon of building materials activities
- Develop business cases for investing in insulation:
 - **Climate change**
 - **Economics**
 - **Resilience**
- Engage with policy-makers

Tracking developments

A lot is going on, so it can be challenging to stay current on developments & opportunities. Here are some free ways to stay engaged:

- Energy News Network: <https://energynews.us/category/digest/national/>
- AMO News: <https://www.energy.gov/eere/amo/listings/amo-news>
- Be on the lookout for AMO *Industrial Decarbonization Roadmap*
- Follow ACEEE: <http://www2.aceee.org/I/310911/2017-08-25/24dj2>
- Join ACEEE's Industrial Decarbonization Convening: email aHoffmeister@aceee.org to sign up

2021–2022 Upcoming Conferences

Behavior, Energy, and Climate Change	November 8-10, 2021	Virtual
Hot Water Forum	March 21-23, 2022	Atlanta, GA
Energy Efficiency Finance Forum	May 23-25, 2022	White Plains, NY
Summer Study on Energy Efficiency in Buildings	August 20-26, 2022	Pacific Grove, CA
Behavior, Energy, and Climate Change	November 13-16, 2022	Washington, DC



Questions

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