



Opportunities in Infrastructure for Deep Decarbonization

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Breakthrough Energy

Breakthrough Energy is a network of initiatives founded by Bill Gates, fully dedicated to helping humanity avoid a climate disaster.

Through investment funds, philanthropic programs, policy advocacy, and other activities, Breakthrough Energy is helping to scale the technologies and solutions needed to reach net-zero emissions by 2050.

We do this work through the following programs:

- Breakthrough Energy Catalyst
- Breakthrough Energy Fellows
- Breakthrough Energy Ventures (BEV)
- BEV Europe and BE Solutions Canada
- Breakthrough Energy Sciences
- Breakthrough Energy U.S. Policy & Advocacy



Getting to Zero

GETTING TO ZERO REQUIRES:

Understanding the Problem

- The world emits **51 billion tons** of greenhouse gases per year. We need to get to **zero by 2050**.
- **The Five Grand Challenges:** electricity, agriculture, manufacturing and industry, transportation, and buildings.

Developing Solutions

- Policy solutions can lower the **Green Premium**, the additional cost of choosing a clean technology over one that emits more greenhouse gases.
 - Governments can make carbon-based options more expensive, make the cleaner versions cheaper, or both.

Working Together

- We need to change the way we live, across nearly every sector of the economy.
- Through infrastructure, we have an opportunity to advance groundbreaking innovations and policies to get us to zero.

The Five Grand Challenges



ELECTRICITY

How We Plug In (28%)

We need to find new ways to generate, store, and use low-carbon electricity while scaling up existing technologies like wind and solar, advanced nuclear power, geothermal energy, and thermal generation with carbon capture.



TRANSPORTATION

How We Get Around (29%)

From EVs to low-carbon fuels, getting transportation to zero requires a complete transformation of the way goods and people get around.



MANUFACTURING & INDUSTRY

How We Make Things (24%)

To get to zero, we need clean electricity and production processes. When that's not possible, we need carbon capture, utilization, and storage (CCUS) and direct air capture technologies.



BUILDINGS

How We Live (8%)

From greener materials to cleaner industrial processes, we must find ways to build and use buildings without emitting carbon.



AGRICULTURE

How We Grow Things (11%)

Getting to zero while meeting growing food demand requires reducing fertilizer use, improving soil management, cutting methane emissions from livestock, and minimizing consumption and waste of high-carbon foods.

Manufacturing and Industry

Several sector-specific barriers are preventing low-GHG options from being deployed in the industrial sector:

- Technological limitations exist for decarbonizing process emissions and high temperature heat
- Firms lack access to capital due to long-term investment thinking, fragmentation of product value chains, and high upfront capital costs of new equipment
- Commodity markets lack differentiation of lower-carbon industrial goods with Green Premiums
- Lack of developed carbon markets and regulatory uncertainty hinders investment in new technologies

To get this sector to net-zero, policy action needs to encourage the development and deployment of new technologies.

POLICY FOCUS AREAS



Electrification



Low-Carbon Fuels



Energy & Material Efficiency



Carbon Capture



Oil & Gas Methane

Buildings

Operational emissions can be reduced over time by taking steps like installing more energy-efficient systems.

Embodied emissions are locked in place as soon as a building is built. So, we ultimately can't decarbonize buildings without decarbonizing manufacturing at the same time.

- Over the next decade, embodied carbon will account for 74% of emissions from new construction
- GSA's Office of Federal High-Performance Green Buildings is already taking steps to reduce the embodied emissions of federal building projects by:
 - Using the best-performing materials
 - Using whole building life cycle assessment

We need policies to accelerate these transformations.

POLICY FOCUS AREAS



Low-Carbon Building Materials



Electrification



Energy Efficiency

How Congress Can Help

Address technology gaps

- RD&D funding and support
- Fiscal incentives for clean technologies

Create market demand

- Federal Buy Clean policy

Facilitate large-scale deployment

- Embodied carbon codes and standards for federal buildings
- Emissions-based performance standards for industrial products and processes

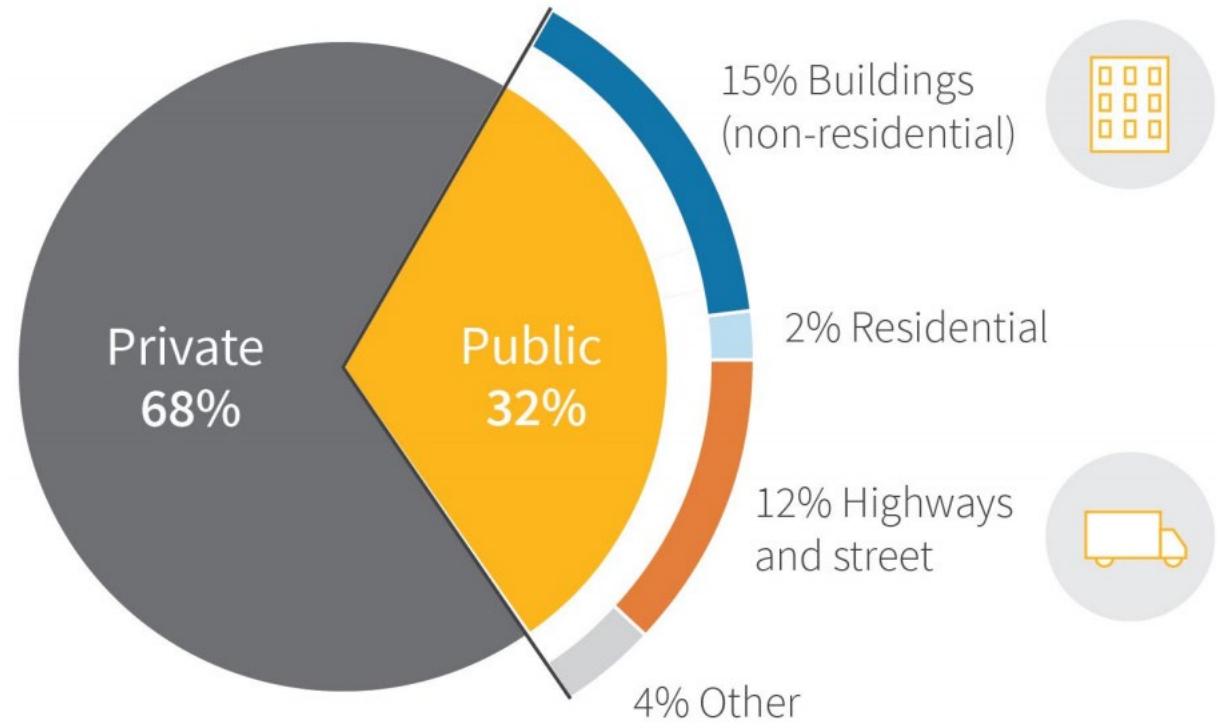
Supply-side push

Demand-side pull

The Power of Public Procurement

Public procurement policies can create large markets for demand of lower-carbon goods and significantly reduce emissions.

Between 2008-2018, public projects accounted for 32% of the embodied emissions of construction in the United States.



Source: [Carbon Leadership Forum](#)

Demand-side: Buy Clean

Buy Clean is a set of public procurement policy instruments aimed at infrastructure and building materials to rapidly reduce GHG emissions from government entities.

It is also a powerful tool to incentivize the purchase of low-carbon materials from manufacturing suppliers.

Under Buy Clean, Congress can use disclosure, incentives, and standards to leverage public purchasing power to create demand for low-carbon materials and ultimately shift the market.

Buy Clean Transparency Act of 2019

- Requires transparency in reporting the GHG impacts of products procured by federal contracting agencies

CLEAN Future Act – Buy Clean

- Enhances the transparency, quality, and availability of data to calculate embodied emissions of commonly procured infrastructure products and materials
- Establishes Buy Clean standards for federally funded infrastructure projects
- Creates a voluntary labeling program to identify and promote products with significantly lower embodied emissions than comparable products

Supply-side: Funding & Incentives

To reach our net-zero goals, we need clean energy innovation.

The success of an innovation strategy depends on policies that incentivize R&D and encourage the deployment of emerging technologies.

Congress can provide:

1. Increased R&D funding for industrial emissions
2. Increased funding and support for demonstration
3. Tax credits to spur innovation and boost manufacturing

American Jobs in Energy Manufacturing Act of 2021

- Extends and modifies the 48C tax credit to boost investment in clean energy manufacturing, recycling, and industrial facilities.

American Jobs Plan – Demonstration & Innovation

- Calls for \$15 billion in demonstration projects, including utility-scale energy storage, CCS, and hydrogen.
- Calls for \$35 billion in climate innovation funding

Resources from Breakthrough Energy & Our Partners



Breakthrough Energy Federal Policy Playbook

We enlisted some of the world's top scientists, entrepreneurs, environmentalists, and experts to map out the most practical paths to reaching net-zero emissions: breakthroughenergy.org/us-policy-overview.



Industrial and Buildings Emissions

- CRES Forum: [Issue Brief: Reducing Industrial Emissions](#)
- Columbia University: [Low-Carbon Production of Iron & Steel: Technology Options, Economic Assessment, and Policy](#)
- Renewable Thermal Collaborative: [Low-Carbon Renewable Thermal Technology Solution: Policies to Support Development and Deployment](#)



Buy Clean & Other Policies

- Carbon Leadership Forum: [Embodied Carbon Policy Toolkit](#)
- Third Way: [Smarter Procurement: Federal Construction Spending is a Huge Opportunity to Advance National Goals](#)
- NRDC: [Smart Procurement Policies Can Help Decarbonize Concrete](#)
- ClimateWorks: [Achieving a sustainable U.S. infrastructure bill: New pathways to fully decarbonizing cement and concrete](#)
- ClimateWorks: [Build Clean: Industrial Policy for Climate and Justice.](#)
- WRI: [INSIDER: Designing Low-carbon Product Standards for Cement and Steel in the United States](#)
- Rhodium: [Clean Products Standard: A New Approach to Industrial Decarbonization](#)



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Thank you