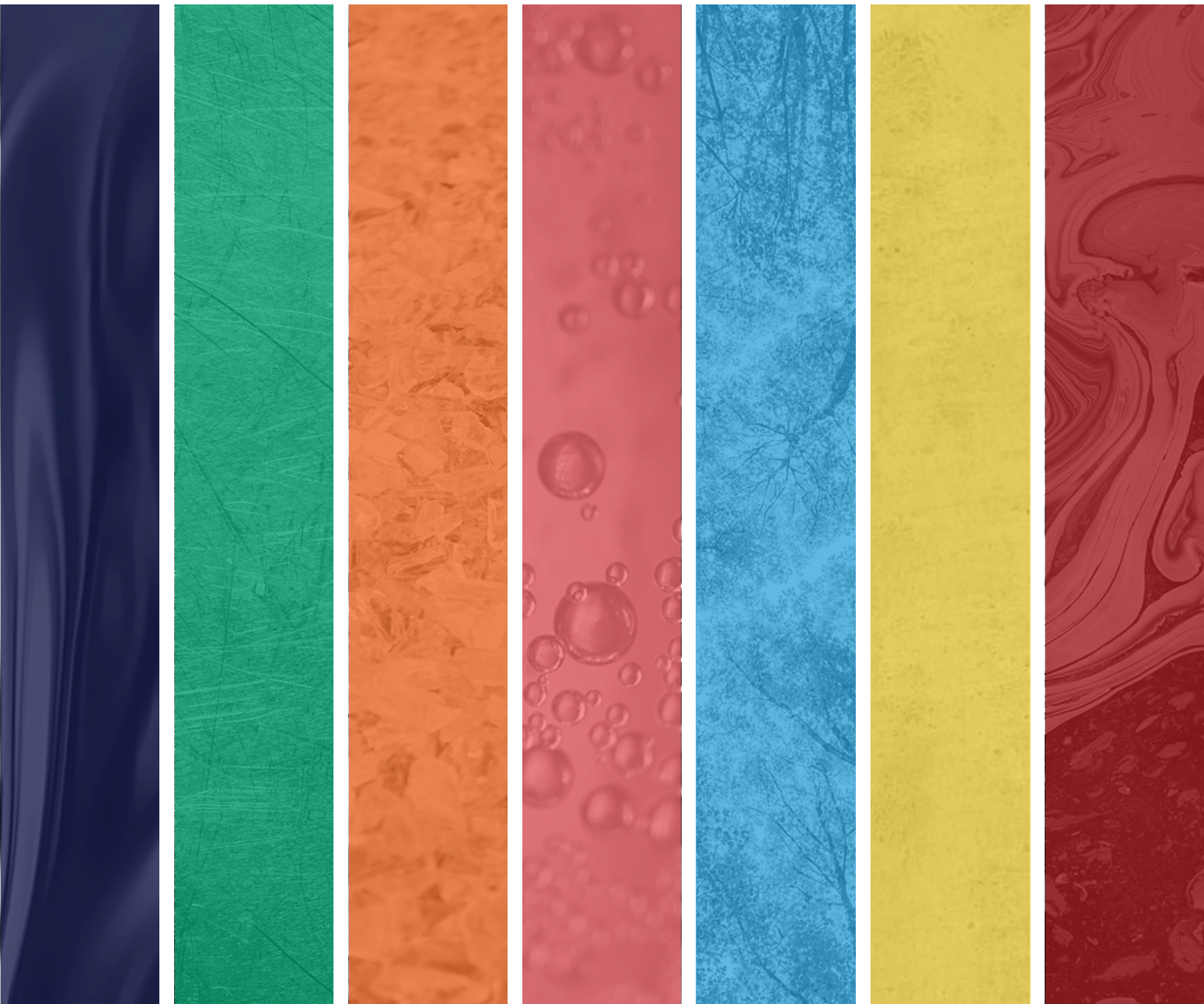
Incentives



2.4 Incentives

Overview
Economic incentives are among the most common policy tools governments deploy to promote decarbonization.[119] Incentives can be fiscal (e.g., tax credits, tax exemptions, subsidies) or offer competitive financing (e.g., low-interest loans, loan guarantees, low-cost insurance) to help industry defray the upfront cost of an efficiency or technology investment. Incentives in the form of competitive grants are also quite common.

State actions
States can design incentives to cover all pillars of industrial decarbonization or target specific adoption of low-carbon technology and fuels, low-carbon manufacturing and retooling, low-carbon appliances and equipment, or energy or material efficiency improvements. Most state incentives to date have focused on improving industrial energy efficiency through a combination of financial and technical assistance.[h] Many states fund their programs through federal sources, carbon market revenues, or utility ratepayer funds, although large-scale industrial decarbonization projects may require more creative financing solutions (***Box 1***).

- *Efficiency*
    - Financial Incentives: States commonly offer a suite of incentives for industrial facilities to invest in energy efficiency improvements (e.g., **Massachusetts's** Mass Save Program,[120] **New Jersey**'s Large Energy Users Program,[121] **Wisconsin's** Focus on Energy Large Energy Users program[122]). Other forms of incentives include cost-sharing for hiring energy management personnel (e.g., **New York's** On-site Energy Manager Program[123]).
    - Grants: **California's** Food Production Investment Program,[124] **Colorado's** Clean Air Program Grants,[125] **Delaware's** Energy Efficiency Industrial Program,[126] **Maryland's** Commercial, Industrial & Agricultural Grant Program,[127] **Maine's** Commercial and Industrial Custom

[h] Technical assistance is described in further detail in ***2.6 Supporting Policies & Actions***

Program, [128] **Mississippi's** Industrial Energy Efficiency Program, [129] **New York's** Commercial & Industrial Carbon Challenge [130]

- Rebates: **Minnesota's** Conservation Improvement Program, [131] **Oregon's** Energy Trust industry programs [132]
- Loans: **Delaware's** Energy Efficiency Investment Fund, [133] **Minnesota's** Green Business Loan Program and Trillion Btu Program, [134] **Tennessee's** Energy Efficiency and Renewable Energy Loan Program [135]

- *Electrification*
  - Financial Incentives: Some states offer incentives for industrial facilities to install on-site renewable energy, either as standalone programs (e.g., **New York's** NY-Sun Program, [136] **New Hampshire's** Commercial & Industrial Solar Incentive Program [137]) or paired with their energy efficiency programs (e.g., **Maine**, [138] **Massachusetts**, [139] **Minnesota** [140]).
  - Grants: **Colorado's** Clean Air Program [141] provides grants to facilities that install renewable energy or undergo "strategic electrification," which would involve converting fossil fuel-powered equipment or process to electric fuel. **New York's** Commercial & Industrial Carbon Challenge [142] provides grants for projects that reduce manufacturing emissions and energy use through beneficial electrification or installing on-site renewable energy systems.
- *Low-carbon fuels & feedstocks*
  - Financial Incentives: **Washington** created a tax exemption for producing renewable and electrolytic hydrogen. [143]
  - Grants: **Colorado's** Clean Air Program [144] provides grants for projects that produce or utilize "clean hydrogen," with an explicit priority for green hydrogen. **New York's** Commercial & Industrial Carbon Challenge provides grants for projects that reduce manufacturing emissions and energy use with low-carbon fuel technologies. [145]
- *Carbon capture, utilization, and storage (CCUS)*
  - Grants: **Colorado's** Clean Air Program [146] provides grants for carbon capture projects on industrial facilities and direct air capture. **New York's** Commercial & Industrial Carbon Challenge provides grants for projects that reduce manufacturing emissions and energy use with carbon capture technologies. [147]
- *Procurement*
  - Financial Incentives: **New Jersey** created tax incentives for residential and commercial properties that utilize lower-carbon concrete, [148] while **Colorado** established a sales and use tax exemption for "decarbonizing building materials." [149]

- Grants: **Oregon's** Department of Transportation is required to create grant program to assist manufacturers in preparing or submitting EPDs. [150]

Box 1: Financing and funding mechanisms for large projects

Industrial decarbonization solutions tend to require substantial capital investments in large-scale projects. States can consider a variety of financing and funding approaches that leverage joint financing with public and private partners, as summarized in a recent white paper[151] and adapted here for illustrative purposes:

- **Pursuing blended finance options**. Transformative industrial technologies can cost upwards of $1–1.5 billion per project, so coordination among multiple federal and state agencies is important to maximize impact on major projects. At the federal level, the U.S. DOE Loan Programs Office (LPO), Small Business Innovation Research (SBIR), and Small Business Administration (SBA) may offer helpful financing options.
- **Packaging projects to better attract financing.** Grouping projects into portfolios that appeal to financial institutions may help secure their participation and financing. Focusing on this element may also align with state interests in leveraging private financing to a greater degree in industrial decarbonization and deployment projects. This approach could also help de-risk a group of technology projects that have common barriers.
- **Leveraging commercial financing, philanthropy, and community development financing institutions**. Green bonds have been successfully used to scale clean energy projects. For example, the Delaware Sustainable Energy Utility (DESEU) developed the first scalable green bond in 2007, creating a platform to standardize, aggregate, and scale efficiency and renewable energy investments.[152] Green banks use market development strategies along with private investors to accelerate the commercialization of key clean energy technologies. There are 21 green banks across the country. Green banks can be established through various legislative directives, structures, and funding sources (including grants, carbon market revenues, and electricity rate charges). In their decade-long history, green banks have proven a very effective means for deploying public and private capital. Since 2011, state green banks have produced $7 billion in clean energy investment, with almost $1.7 billion invested in 2020 alone. This funding has also catalyzed overall investment by about 3.7 times the amount of green bank investment in 2020.[153]

Gaps and opportunities

Most state incentive programs for industry have focused on energy efficiency and neglected support for the major emissions opportunities of other decarbonization pillars. However, the passage of the *Inflation Reduction Act of 2022* added a host of new tax, grant, and financing incentives to support industrial electrification, low- and zero-carbon process heating, CCUS, and production of low-embodied-carbon materials (see ***Appendix A: New Federal Investments and Programs***). State policy gaps include:

- *Electrification, Low-carbon fuels & feedstocks*
    - States largely lack programs that focus on incentivizing reductions in industrial GHG emissions through electrification and low-carbon fuel technologies, as existing programs tend to reward performance based on energy usage, regardless of the source of energy. **Louisiana,** [154] **Michigan,** [155] and **Washington** [156] have all proposed developing programs that support and incentivize these efforts in recent climate or clean energy action plans.
- *Carbon capture, utilization, and storage (CCUS)*
    - With current technology and policies, CCUS is typically not financially viable for industrial plants (unless they produce pure streams of CO_2). [157] States can play an important role in developing incentives that improve the economics of carbon capture for industrial facilities. Policies can include grants and loans for related infrastructure, off-take agreements, and tax incentives for CCUS. [158] The *Inflation Reduction Act's* adjustments to the 45Q CCUS tax credit may provide a significant boost to the economics of these projects. [159]
- *Procurement*
    - Material embodied emissions information and data are essential to developing effective procurement policies. Driven largely by voluntary efforts in the green buildings industry and some state and local policies, environmental product declarations (EPDs) have emerged as the foundational tool for disclosure and transparency of environmental footprints, especially as it relates to the embodied carbon of commodity materials. EPDs play an important role in quantifying Scope 3 supply chain emissions, a growing focus for meeting sustainability goals. [160] However, EPDs are not based on consistent facility-specific data, are not intended to compare products, are not intended serve as the basis for a regulatory program, are not yet widely available across regions or for all relevant materials, and developing EPDs has high upfront costs. [161] **California** is understanding these EPD limitations through its initial implementation of the *Buy Clean California Act* and is seeking other data sources and improvements to EPDs to support program implementation. States can support manufacturers with financial and technical assistance programs to help expand the availability and quality of EPDs, a proposal mentioned in **Washington's** clean energy action plan. [162]

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