ACEEE Fact Sheet

American Council for an Energy-Efficient Economy

Transforming Industrial Technologies by Catalyzing Demonstrations at Scale

APRIL 2021

ACEEE proposes a new program in the Advanced Manufacturing Office of the U.S. Department of Energy (DOE) to co-fund the first three commercial applications of new transformative industrial technologies.

THE IMPACT POTENTIAL OF REDUCING INDUSTRIAL ENERGY USE AND EMISSIONS

- Industry accounts for more than 25% of U.S. energy use and greenhouse gas (GHG) emissions.
- Many new technologies are being developed to transform industrial processes and achieve large reductions in both energy costs and emissions. These can help the United States be a leader in key global markets.
- This package builds on lessons from prior federal programs to spur new technologies.[1]

ADDING THE MISSING LINK TO THE ENERGY ACT OF 2020

- Enacted in December 2020, this law establishes a research, development, and demonstration (RD&D) program to (1) increase the technological and economic competitiveness of U.S. technologies and manufacturing and (2) reduce emissions from the industrial sector.
- However, once new technologies are developed, they are often considered too high-risk by potential adopting firms. Because these investments can cost $100 million dollars or more for a single project, it is challenging to convince companies to invest in initial applications of new technologies at scale. What's needed is a policy initiative to greatly accelerate and scale up the deployment of transformative low-carbon technologies.

ILLUSTRATIVE POTENTIAL PROJECTS

- Examples of transformative technologies that could be aided by this new RD&D program include the following:
    - Inert anode aluminum production (reducing energy use and eliminating CO_2 emissions)[2]
    - Iron reduction using hydrogen instead of carbon (reducing CO_2 emissions ~95% relative to current technologies)[3]
    - Indirect calcination for cement (reducing CO_2 emissions ~70% relative to current technologies)[4]

KEY INITIATIVES OF THE PROPOSED FIRST-THREE PROGRAM

- Provide federal cost-sharing grants for the first three production-scale installations of new technologies selected for their ability to transform energy use and emissions in key industries. Investing in these technologies will help save money, reduce emissions, and improve the competitiveness of U.S. industry.
- The Advanced Manufacturing Office at DOE would select projects through an annual competitive solicitation.

- The program would be open to new industrial process technologies that meet the following criteria: (1) have been demonstrated as technically viable at pilot scale; (2) are able to reduce energy use or GHG emissions at least 20% relative to current technologies; (3) once fully deployed in the United States, could reduce total industrial energy use or emissions by at least 1%.
- Incentives could be grants or loan guarantees. The amount of the federal incentive would be negotiated by DOE and capped at 60% of project cost for the first commercial installation of a new technology, 45% for the second installation, and 30% for the third.
- Public dissemination of project results and lessons learned would be part of each project, with details negotiated on a project-specific basis in order to protect proprietary and competitive information of both the technology provider and technology implementer.

COST AND IMPACT

- We recommend an annual authorization of at least $500 million in order to fund multiple projects each year.

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[1] See D. Hart, *Building Back Cleaner With Industrial Decarbonization Demonstration Projects* (Washington, DC: Information Technology & Innovation Foundation: 2021). itif.org/publications/2021/03/08/building-back-cleaner-industrial-decarbonization-demonstration-projects.

[2] See J. Heimgartner, "Revolutionary Aluminum Process Eliminates Emissions, Produces Oxygen," Engineering.com, May 27, 2018. www.engineering.com/story/revolutionary-aluminum-process-eliminates-emissions-produces-oxygen.

[3] See Dialogue on European Decarbonization Strategies (DEEDS), *Industry: Iron and Steel* (DEEDS, 2020). deeds.eu/wp-content/uploads/2020/05/Iron-and-Steel_web.pdf.

[4] See the website of Leilac ("Low Emissions Intensity Lime and Cement"), a project of the European Union Horizon 2020 Research & Innovation. www.project-leilac.eu/.