

Accelerating Innovation & Competitiveness in Industrial Clusters

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ACEEE proposes a new program in the U.S. Department of Energy to advance the competitiveness, resilience, and effectiveness of industrial clusters and their related supply chains while catalyzing innovation and accelerating technology adoption.

THE IMPORTANCE OF INDUSTRIAL CLUSTERS AND SUPPLY CHAINS

- Industry accounts for over 25% of U.S. energy use and greenhouse gas (GHG) emissions. It also contributes 11.4% of U.S. GDP and provides 12.5 million well-paying jobs (8.5% of the workforce).
- Industrial companies in several sectors (e.g., chemicals, steel, and refining) are frequently concentrated geographically in clusters, where a network of facilities, suppliers, service providers, specialized infrastructure, academic collaborators, and so forth find or develop favorable resources, transportation, and workers.
- These clusters can enhance productivity and competitiveness, spark innovation, develop talent, and accelerate knowledge development.
- Industrial clusters, their supply chains, their jobs, and their local economies have been challenged by foreign competition; limited research, development, and demonstration (RD&D); COVID-19 shocks; and a cascade of system failures from natural disasters (e.g., hurricanes, the Texas freeze in February 2021).

ACEEE'S PROPOSAL TO ACCELERATE INNOVATION

- The proposed program would strengthen clusters by fostering RD&D, developing innovative technologies, spurring trials and demonstrations, and accelerating deployment of advanced and future technologies (e.g., new energy sources, smart manufacturing, processes with lower lifecycle environmental impact).
- This initiative parallels successful reinvestment in clusters abroad. For example, the Port of Rotterdam's 10 refineries and 45 chemical companies reduced GHG emissions 4.2 million metric tons over the past 2 years – bolstered by public funding and university connections – enabling the port to catalyze [technological and business innovation](#).

IMPROVING THE AGILITY, EFFICIENCY, AND RESILIENCE OF SUPPLY CHAINS

- The cascade of system failures across power, water, transportation, and telecommunications witnessed during recent natural disasters (e.g., Hurricane Harvey, the February 2021 Texas freeze) shows the fragility of complicated, just-in-time supply chains with high dependence on foreign-made critical materials, industrial components, and health-care products.
- The proposed program would provide technical assistance to integrate additional industrial companies and supply chain partners that return production to the United States into clusters using smart and agile industrial systems. The program would also expand market access for new products and improve tracking, communication, and transportation.

STIMULATING ECONOMIC AND WORKFORCE DEVELOPMENT

- The proposed program would foster economic development, job creation, and workforce training near clusters by providing focused employment opportunities for those in

- neighboring low-income and disadvantaged communities via collaboration with minority-serving institutions (e.g. Historically Black Colleges and Universities, Hispanic-Serving Institutions) and with Industrial Assessment Centers.
- The clusters would minimize environmental impacts by partnering with neighboring communities, adopting advanced technologies for minimizing waste and emissions, and working with local communities to validate the improvements.

UPDATING INFRASTRUCTURE

- The program would examine utility, feedstock, transportation, and other infrastructure needs and pursue improvements.
- The program also would develop strategic infrastructure designs and capabilities, including repurposing equipment; advancing sources of energy, water, and other utilities with smaller environmental footprints; and retiring outdated assets.

HOW THE PROGRAM WOULD WORK

- The Department of Energy would issue a request for proposals (RFP) every two years for regional consortia of eligible industrial companies, supply chain partners, institutions of higher learning, and other entities (e.g., state and local governments, councils of governments, and economic development authorities).
- Criteria for support would include the expected improvements in cluster competitiveness, advanced-technology adoption, environmental and public health benefits, job creation, and infrastructure reliability.
- There would be a requirement for consortia to cost-share while receiving federal funds.
- Progress would be evaluated annually with funding renewal considered after two-year increments, up to a maximum of three cycles per consortium. Every two years, based on availability of funds, additional consortia could be added.

TOTAL COST

- Authorization would be \$100 million for the first year, building to \$400 million in the fourth year and continuing across 10 years, with a total investment cost of about \$3 billion. If appropriations are less, the program would be scaled to the available resources.