



Industrial Demonstrations Program – Flexible Fuel Electric Hybrid Glass Furnace Demonstration

The Industrial Demonstrations Program, managed by the U.S. Department of Energy (DOE) Office of Clean Energy Demonstrations (OCED), aims to accelerate decarbonization projects in energy-intensive industries and provide American manufacturers a competitive advantage in the race to lead the world in low- and net-zero carbon emissions manufacturing. To advance industrial decarbonization, OCED sought applications for up to \$6 billion in funding to support the demonstration of transformational technologies necessary to reduce emissions in the U.S. industrial sector. Following negotiations, in September 2024, OCED awarded the Flexible Fuel Electric Hybrid Glass Furnace Demonstration project with more than \$720,000 to begin Phase 1 of the project, located in Toledo, OH.



Project at a Glance – Phase 1

- » **Total OCED Cost Share:** Up to \$45.1 million
- » **Phase 1 Total Project Amount:** \$1,443,555*
- » **Phase 1 OCED Award Amount:** \$721,778**
- » **Phase 1 Scope of Work:** Planning, permitting, design, and other development activities
- » **Phase 1 Timeline:** Up to 9 months
- » **Recipient:** Libbey Glass is a glass tableware manufacturing company
- » **Project Location:** Toledo, OH
- » **Start Date:** October 2024

*Represents the total project cost for Phase 1.

**Represents OCED's cost share for Phase 1. Additional funding for this project is subject to future award negotiations at the end of each project phase.

About This Project

The Flexible Fuel Electric Hybrid Glass Furnace Demonstration project, led by Libbey Glass, plans to replace four regenerative furnaces with two larger hybrid electric furnaces at Libbey's facility in Toledo, OH. The project expects to reduce the carbon intensity of the facility by up to 50%. The project aims to reduce the carbon dioxide emissions in the glass melting process by up to 90%. The hybrid furnaces combine the benefits of oxygen fuel with electric melting to reduce nitrogen oxide emissions by an estimated 85% and replace up to 80% of the melting energy with electricity. Because glass tableware such as drinking glasses have some of the highest glass product standards, this project could demonstrate the viability of electrification and alternative fuel use for the entire glass industry.

During Phase 1 of the project, Libbey Glass will conduct preliminary design and contracting activities, provide documentation and reports necessary for OCED to complete the National Environmental Policy Act (NEPA) review, and carry out preliminary meetings with workforce and community groups in the area.

OCED will provide oversight of the Flexible Fuel Electric Hybrid Glass Furnace Demonstration project by evaluating the status and quality of implementation at each phase of the project. Through its phased approach to project management oversight, OCED will review and evaluate the project's progress, including community benefits, which impact OCED's decision to continue to provide federal funding and allow a project to progress to the following phase.

Flexible Fuel Electric Hybrid Glass Furnace Demonstration Project Fact Sheet

Project Site

The Flexible Fuel Electric Hybrid Glass Furnace Demonstration project is located at the Libbey Glass Toledo Plant in Toledo, OH.

Community Benefits Commitments

Community benefits commitments are a key component of the Flexible Fuel Electric Hybrid Glass Furnace Demonstration project. These commitments are informed and developed in consultation with local communities to mitigate potential impacts of this project and maximize local community benefits. The Flexible Fuel Electric Hybrid Glass Furnace Demonstration project plans to implement these commitments through:

- Reducing criteria air pollutants of the Toledo, OH, facility, including nitrogen oxides, sulfur oxide, and particulates, and supporting the Justice40 initiative by completing a Justice40 Assessment and Implementation Strategy during each phase.
- Generating approximately 268 construction jobs and meeting with relevant labor unions for project construction, including Building and Construction Trades Unions, and providing documentation of steps taken toward negotiated agreements.
- Working with unions, including the United Steelworkers and International Association of Machinists and Aerospace Workers, and local education institutions to expand its apprenticeship programs for skilled trades, including electricians and master tradesmen, to increase employment and advancement opportunities in the local community.
- Advancing diversity, equity, inclusion, and accessibility goals for apprenticeship and co-op programs.
- Sharing project information publicly to support engagement, accountability, and transparency.

More details on the Flexible Fuel Electric Hybrid Glass Furnace Demonstration project's community benefits commitments can be found in the [Community Benefits Commitments Fact Sheet](#).



Glass manufacturing line

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Industrial Demonstrations Program Goals

U.S. industry is a backbone of the nation's economy, producing the goods critical to everyday life, employing millions of Americans in high-quality jobs, and providing an economic anchor for thousands of communities. Yet the sector's energy- and carbon-intensity contributes to nearly one third of the nation's carbon dioxide emissions, representing a unique and complex challenge to achieving a carbon-free economy. Decarbonizing the U.S. industrial sector will require equally unique and innovative technological solutions that leverage multiple pathways, including energy efficiency, electrification, and alternative fuels and feedstocks such as clean hydrogen. The Industrial Demonstrations Program includes new, emerging technologies that aim to help produce clean steel, cement, chemicals, and other materials used in our nation's roads, bridges, transmission lines, electric vehicles, solar panels, wind turbines, and everyday lives, which in turn, benefit every American.



Libbey fluted glass in production

Contact

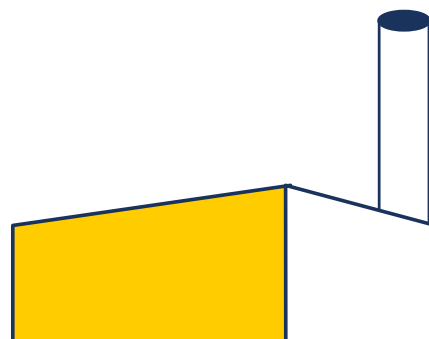
Program Email: engage_industrialdemos@hq.doe.gov

OCED Media Email: OCEDNewsroom@hq.doe.gov

More Resources

Website: energy.gov/oced/IDP

Office of Clean Energy Demonstrations: energy.gov/oced



The U.S. Department of Energy established OCED to help scale the emerging technologies needed to tackle our most pressing climate challenges and achieve net-zero emissions by 2050. OCED's mission is to deliver clean energy demonstration projects at scale in partnership with the private sector to accelerate deployment, market adoption, and the equitable transition to a decarbonized energy system.