OCED
Office of Clean Energy Demonstrations

THE OFFICE OF
CLEAN ENERGY DEMONSTRATIONS

Industrial Demonstrations Program
Southern Regional Community Briefing

04/15/2024

Office of Clean Energy Demonstrations

U.S. Department of Energy

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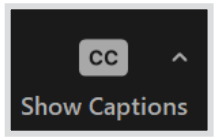

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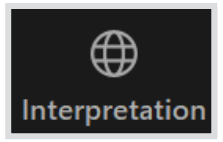

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Is this webinar being recorded?

No, this webinar is not being recorded.

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Yes, a copy of the presentation slides will be shared via email with registrants and on the OCED website within the next week.

Southern Regional Briefing Agenda

- **(6:00-6:30 pm ET) DOE and Industrial Demos Program Overview**

- **(6:40-7:10 pm ET) Project Overview Group 1**
  - Kraft Heinz, Columbia, MO
  - Summit Materials, McIntyre, GA; Sulphur Springs, TX; Elmendorf, TX
  - Vale USA, Gulf Coast
  - Eastman Chemical Company, Longview, TX
  - Unilever, Sikeston, MO

- **(7:10-7:25 pm ET) Q&A**

- **Project Overview Group 2 (7:25-7:55 pm ET)**
  - The Dow Chemical Company, Gulf Coast
  - Orsted P2X US Holding LLC, Texas Gulf Coast
  - AMERICAN Cast Iron Pipe Company, Birmingham, AL
  - United States Pipe and Foundry Company, Bessemer, AL
  - International Paper Company, Mansfield, LA

- **(7:55-8:10pm ET) Q&A**

- **(8:10-8:40pm ET) Project Overview Group 3**
- SSAB, New Augusta, MS
- BASF Corporation, Freeport, TX
- ExxonMobil Corporation, Baytown, TX
- T.EN Stone & Webster Process Technology, Inc., Gulf Coast
- Brimstone Energy, Inc., TBD

- **(8:40-8:55pm ET) Q&A**

- **(8:55-9:00 pm ET) Closing Comments**

OCED Overview

OCED Mission

Deliver clean energy technology **demonstration projects at scale** in partnership with the **private sector** to **accelerate deployment**, **market adoption**, and the **equitable transition** to a decarbonized energy system.”

INDUSTRIAL DEMONSTRATIONS PROGRAM SELECTION SNAPSHOT

OCED
Office of Clean Energy Demonstrations

$20+ BILLION
Total Funding
(Federal and private cost shares)

OVER
14 MILLION METRIC TONS
of avoided emissions annually

85% would reduce criteria air pollutants
(28) PROJECTS

TENS OF
THOUSANDS
total jobs

with
19 committed to union labor
PROJECTS

Selectees Delivered on Ambitious Program Priorities

Deep Decarbonization	**Target:** 50 – 75% emissions reductions per project	**Result:** Average **77% reduction** in carbon intensity & ~**14+ million MT CO2e reduced** annually
Timeliness	**Target:** Accelerate decarbonization into this decade	**Result:** Average performance period of **less than 6 years**
Market Viability	**Target:** Spur follow-on investment in lower-embodied carbon goods	**Result:** **35+ products** to be produced with lower embodied emissions; multiple with premium offtake agreements in place today
Community Benefits	**Target:** Select projects with the greatest benefit for the greatest number of people	**Result:** **85% of projects** improve air quality; investment will create **tens of thousands of jobs** across the United States

Community Benefits

Selectees described strategies and methods of accountability to ensure:

- Meaningful, two-way community and labor engagement
- Diversity, equity, inclusion, and accessibility
- Benefits to the surrounding community
- Quality jobs and workforce development
- Furthering the Justice40 Initiative

By **prioritizing community benefits**, we can ensure the next chapter in America's energy story is marked by greater justice, equity, security, and resilience.

The Inflation Reduction Act supports this goal by giving priority to projects that provide the **greatest benefit to the greatest number of people in nearby communities**.

Community & Labor Engagement

Diversity, Equity, Inclusion, & Accessibility

Greatest Benefit for the Greatest Number

Investing in the American Workforce

Justice40 Initiative

Community Benefit Commitments - Implementation Requirements per Phase

**CBPs are considered alongside assessments of engineering, procurement, and construction; business development and management; permitting and safety; and technical data and analysis.*

Negotiations Conducted

Go/No-Go Decisions

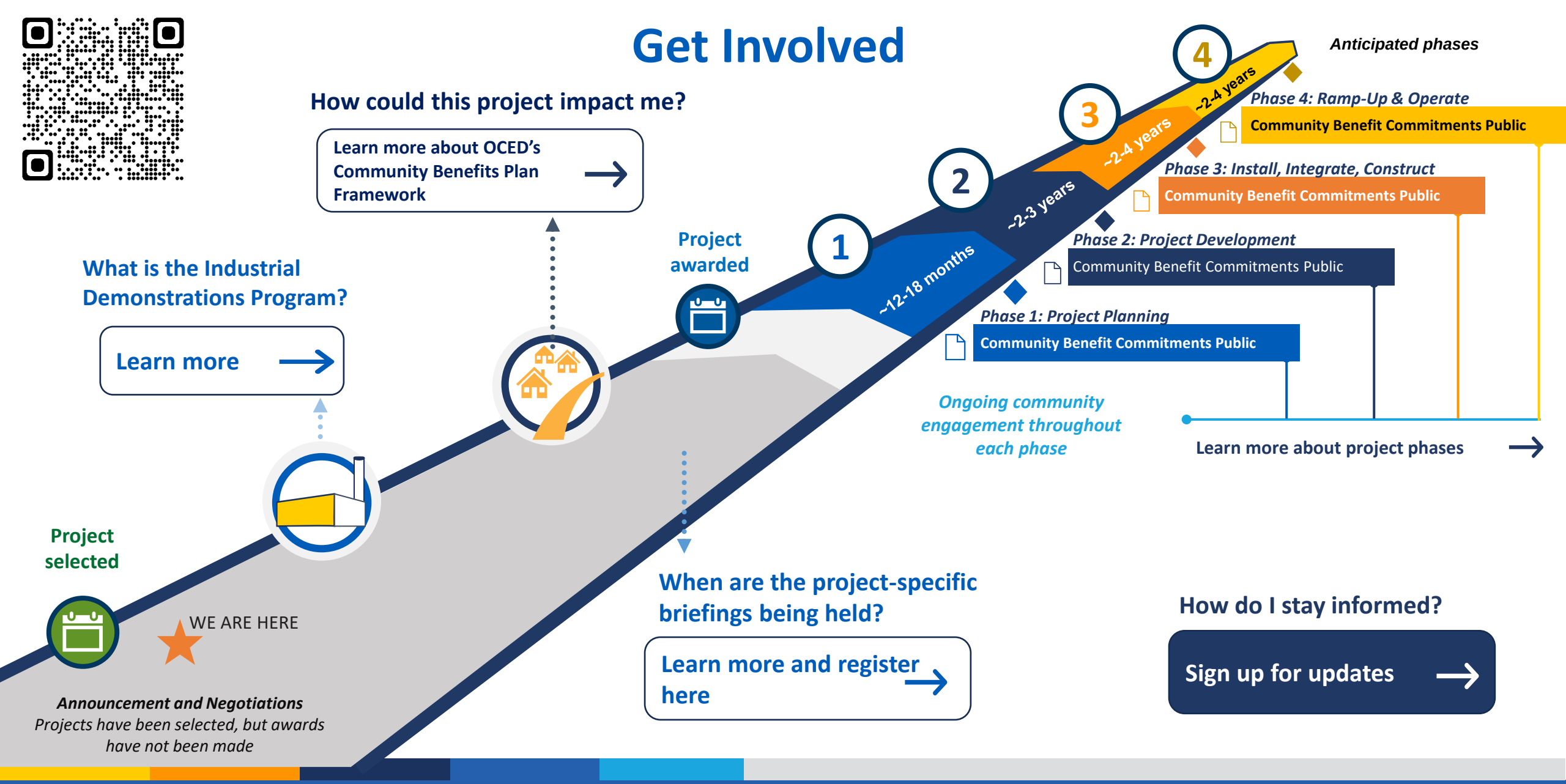
Get Involved

How could this project impact me?

Learn more about OCED's Community Benefits Plan Framework →

What is the Industrial Demonstrations Program?

Learn more →



Announcement and Negotiations
Projects have been selected, but awards have not been made

When are the project-specific briefings being held?

Learn more and register here →

How do I stay informed?

Sign up for updates →

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Community Benefit Commitments Public
Go/No-Go Decisions

Next Steps – Negotiations

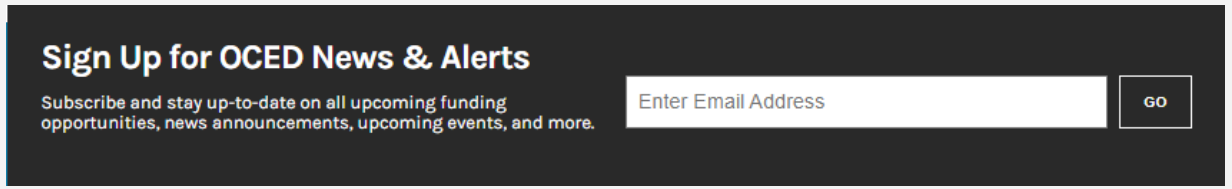
Award Negotiations: OCED will begin the negotiations process with project selectees.

After Award: ***IF the projects receive an award (successful negotiations)***

- Awarded projects will enter into a cooperative agreement with OCED
- Phase 1: Detailed Project Planning begins
  - OCED will work with the awarded project partners starting in Phase 1 to ensure compliance with the National Environmental Policy Act (NEPA)
  - Local communities (state, local and community stakeholders) will have the opportunity for ongoing engagement with OCED and the awardee(s)

For more information

- **For questions regarding IDP projects email engage_industrialdemos@hq.doe.gov**
- **OCED Website & Newsletter Sign-up energy.gov/oced**
  Scroll to bottom to sign up here:



- **OCED Exchange (RFIs, NOIs, and FOAs) oced-exchange.energy.gov**
- **Follow us on LinkedIn linkedin.com/company/doe-oced/**

IDP Resources

Industrial Demonstrations

- Program Page
- Press Release
- Overview of Selected Projects
- Local Engagement Opportunities
- OCED CBP fact sheet

Additional Resources

- NEPA Resources
- Industrial Decarbonization Pathways to Commercial Liftoff Reports
- DOE Industrial Decarbonization Roadmap

Justice40 Resources

- Justice40 Initiative
- Energy Justice Dashboard (BETA)
- Climate and Economic Justice Screening Tool

Projects in the Southern Region

Ground Rules for Discussion

- The projects are grouped into three sets of five so attendees can participate for the projects they are specifically interested in learning about.
- Representatives have 5 minutes each to cover their projects.
- After each set of projects, we will answer questions posed in the Q&A feature, moderated by the third-party facilitator.
- Submit questions using the Q&A feature.
  - You can also see and upvote other questions that have been asked.
- Reserve judgement
- One idea at a time
- It is okay to build on the ideas of others
- Clarifying questions are okay

Project Set 1

6:40 – 7:10 pm ET

- Kraft Heinz, Columbia, MO
- Summit Materials, McIntyre, GA; Sulphur Springs, TX; Elmendorf, TX
- Vale USA, Gulf Coast
- Eastman Chemical Company, Longview, TX
- Unilever, Sikeston, MO

Delicious Decarbonization: Integrated Electrification and Energy Storage Solutions for KH Plants in the U.S.

The Kraft Heinz Company

Project Overview

Columbia, MO

- Kraft Heinz is one of the largest Food and Beverage companies in the world with an unparalleled portfolio of iconic and new brands
- In 2021 KH was named 'Industry Mover' by S&P Global Sustainability Yearbook; Commitment to achieve Net Zero by 2025
- Columbia, MO plant was built in **1985** and expanded in 1990, 1995. Home to **Oscar Mayer Hot Dogs**, produces all hot dog volume
- Contributes 11% of GHG emissions on our Net Zero DOE project which encompasses 10 sites

Technology Snapshot

- Transition natural gas boilers/water heaters → electric
  - Natural Gas accounts for 60% of energy consumption, used for steam generation
- Install solar PV and solar thermal collector
- Recover waste heat via heat pumps and heat exchanges
- Transition all procured electricity to 100% renewable sources
- 2024/2025: Eng. Feasibility studies & project dev. Construction 2026-2029, Operational: 2029

Federal Cost Share

~ $8.7 MM

Value and Impacts

- BL 2022 CO2e emissions: **28,447 MT**, will be reduced by 99%
- Decarbonization design/approach will be shared with broader meats industry to inform net zero strategies in that sector

Carbon Emission Reductions

99% of CO2e emissions will be reduced

Delicious Decarbonization: Integrated Electrification and Energy Storage Solutions for KH Plants in the U.S.

The Kraft Heinz Company

Community Benefits | This project will allow us to:

- Generate **29 construction jobs** and 1-2 permanent jobs, while also enhancing workforce development and training centers.
- Create a **Community Engagement Steering Committee** at the Columbia Plant to solicit and act on feedback from community stakeholders and plant employees regarding any concerns about the project.
- Invest in and continue to support the promotion of **DEIA initiatives** for hiring and services through inclusive candidacy and job types.
- Compliment **local ESG** goals:
  - **City of Columbia** aims to reduce GHG emission 35% by 2035, 80% by 2050, and 100% by 2060
  - **City of Refuge** provides employment to global refugees; refugees are ~50% plant workforce
- Expand and enhance **existing community partnerships**:

	Boone Co. Local Emergency Planning Committee; Columbia Regional Wastewater Treatment
	City of Refuge, a non-profit organization helping refugees and immigrants, through which the plant offers job placement, assists employees with benefits and employment related matters, as well as sponsors and organizes the Taste of Columbia annual cultural food tasting festival; relationship with Regional Economic Development Inc. to assist with job opportunities that support upward economic mobility for the residents of Columbia and Boone County
	University of Missouri-Columbia College of Engineering partnership to provide students with projects for their capstone during which they spend time at the plant for training and research; seat on State Tech (Linn, MO)'s Automation and Robotics Technology Advisory Committee

Delicious Decarbonization: Integrated Electrification and Energy Storage Solutions for KH Plants in the U.S.

The Kraft Heinz Company

Contact Information

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Low-Carbon Calcined Clay Cement Demonstration

Selectee:
Summit Materials, Inc.

Location:
Port Deposit, Maryland; McIntyre, Georgia; Elmendorf, Texas; Sulphur Springs, Texas

Federal Cost Share:
Up to $215.6 million

Image credit: Summit Materials

Proposed Activities:

- Will assess the construction of four new calcination facilities to demonstrate the viability of displacing high-emitting, limestone-based cement with a clay-based product
- Use the project's range of sites to showcase this demonstration's replicability with diverse clay sources and cementitious products around the country
- Reduce approximately 1 million metric tons of carbon emissions per year
- Create over 4,000 direct, indirect, and induced jobs across the four sites during the project lifetime
- Negotiate Community Workforce Agreement or Project Labor Agreement for the construction phases at each site
- Provide tailored local workforce training investments

Low-Emissions, Cold-Agglomerated Iron Ore Briquettes

Vale USA LLC, US Gulf Coast (site TBD)

Project Overview

Cold-Agglomerated Iron Ore Briquette Plan

- A novel, cold-agglomerated iron ore briquette facility – 1.5mpta with potential for modular scale-up to 3.0mtpa.
- Co-location with DRI/HBI facility, to provide a cleaner alternative to traditional iron ore pellets.
- Commercial operations by 2029, potential for replication within this decade.

Technology Snapshot

- Proprietary “cold-agglomeration” process, result of nearly 20 years of R&D.
- Chemical bond instead of metallurgical bond with low energy intensity.
- Wide range of fines are suitable for briquetting as sinter feed and pellet feed.
- Potential to utilize site-generated fines (from pellets, DRI/HBI, flue residues).

Federal Cost Share

Up to $282.9 million

Value and Impacts

- Addresses supply demand for cleaner ore-based metallics for US steel production.
- Scalable through modular design and replicable through co-localization.
- Circular economy and synergies with co-localization.
- Air pollutant reductions (near elimination of SOx emissions, reduction in CO2 and NOx).

Carbon Emission Reductions

60% less CO2, 99% less Sox, 23% less NOx

Low-Emissions, Cold-Agglomerated Iron Ore Briquettes

Vale USA LLC, US Gulf Coast (site TBD)

Community Benefits

- Up to 200 jobs during operations, with up to 1,000 during peak construction. Training network expanded. Outreach to workforce non-union and union groups. Increase in sector-based apprenticeships and access to senior, skilled positions.
- Engagement with leading entities in workforce-training; technical research, professional skills, community-based climate resilience, food security, and outreach to locally-owned SME and veteran-owned suppliers, among others.
- Community Advisory Panel to be created to ensure holistic stakeholder engagement and local involvement.
- Translate Vale's vision and targets on DEIA to local context. Leverage experience working with traditionally disadvantage communities in Brazil, Canada, Indonesia.
- Technological approach and industrial process is broadly speaking lower-risk on particulates, material inputs, water use, overall local environmental burden.

Low-Emissions, Cold-Agglomerated Iron Ore Briquettes

Vale USA LLC, US Gulf Coast (site TBD)

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Polyethylene Terephthalate Recycling Decarbonization Project

Longview, Texas

Project Overview

Eastman

- Global specialty materials company that produces a broad range of products, headquartered in Kingsport, Tennessee
- Employs approximately 14,000 people around the world and serves customers in more than 100 countries
- Operates one of the world's largest material-to-material recycling facilities with plans to invest ~$2.25B on three facilities

Technology Snapshot

- Construction of a first-of-its-kind plastic molecular recycling facility integrated with low-carbon renewable energy, capable of taking waste streams that are typically landfilled or incinerated and turning them into virgin-quality polyethylene terephthalate (PET)
- Approximately 100KMT of output capacity, with >90% material yield through the recycling process back to virgin polymers to serve a range of end markets from food and beverage to medical to high-quality fibers

Federal Cost Share

Up to $375 million

Value and Impacts

- Molecularly recycled PET will reduce the consumption of fossil fuels, keep plastic waste out of the environment, and deliver on brand owner commitments to significantly reduce their carbon footprints
- Through the deployment of novel thermal heat batteries and onsite solar, the planned project will demonstrate zero carbon process heat at an industrial scale
- With PepsiCo as an early adopter committed to significant offtake from the plant, the project will catalyze the decarbonization of the consumer packaging industry

Carbon Emission Reductions

Create products with greater than 70% lower carbon intensity than traditional fossil-based virgin PET

Polyethylene Terephthalate Recycling Decarbonization Project

Longview, Texas

Community Benefits

- Generate ~1,000 temporary construction jobs and ~200 permanent jobs
- Expand state-accredited apprenticeship program
- Launch DEIA programming to strengthen inclusive leadership capability of diverse teams
- Broaden partnerships with women, minority, and/or veteran-owned businesses
- Minimize environmental impact through off-grid solar and renewable heat generation via thermal batteries and next-generation molecular recycling
- Activate a community-led vision by the creation of Branches of Hope; a newly developed non-profit community center for centralized outreach to the underserved and workforce development training
- Maintain two-way communication on quality job creation, site management, and environmental impact mitigation strategies through the Community Advisory Panel, Branches of Hope, and additional channels

Image Credit: Eastman

Polyethylene Terephthalate Recycling Decarbonization Project
Longview, Texas

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Image Credit: Eastman

Decarbonization of Unilever Ice Cream Manufacturing

Unilever, Covington TN; Sikeston MO; St. Albans VT; Waterbury, VT

Project Overview

Ice Cream Manufacturing

- With over 100 years of experience in delivering smiles, we plan to continue this for many more years to come, with our people and planet first.
- We make some of the most loved ice cream brands in the country including Ben & Jerry's, Breyers, Talenti, Magnum, Klondike, Good Humor, Popsicle and Yasso.

Technology Snapshot

- Replacing a natural gas boiler with electric boilers and industrial heat pumps using waste heat recovery across the 4 sites.
- Implement in a phased approach across the next 5 yrs

Federal Cost Share

Up to $20.9 million

Value and Impacts

- Create 240-300 construction jobs
- Pilot application of heat pumps in an industrial application across different geographies and loading requirements.
- Reduce emissions and create training and upskilling opportunities

Carbon Emission Reductions

Reduce emissions by more than 14,000 metric tons per year, with a pathway to address 100% of heat related emissions

Decarbonization of Unilever Ice Cream Manufacturing

Unilever, Covington TN; Sikeston MO; St. Albans VT; Waterbury, VT

Community Benefits

- Create 240-300 construction jobs and retain ~2200 permanent jobs including transitioning some existing jobs to clean energy jobs.
- Continue serving each site's local community through previous partnerships, such as Milk with Dignity (VT) and the Tipton County Manufacturing Council (TN)
- Develop and deliver training program with employees and OEMs while leveraging existing partnerships with local technical schools.
- Community engagement through local townhalls / community centers while leveraging partnerships with community leaders.
- Prioritize local small businesses/ minority owned/ women owned through bid processes
- Reduce air emissions such as particulate matter

Decarbonization of Unilever Ice Cream Manufacturing

Unilever, Covington TN; Sikeston MO; St. Albans VT; Waterbury, VT

Contact Information

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Question & Answer Set 1

7:10-7:25 ET

Project Set 2

7:25-7:55 pm ET

- The Dow Chemical Company, Gulf Coast
- Orsted P2X US Holding LLC, Texas Gulf Coast
- AMERICAN Cast Iron Pipe Company, Birmingham, AL
- United States Pipe and Foundry Company, Bessemer, AL
- International Paper Company, Mansfield, LA

Novel CO_2 Utilization for EV Battery Chemical Production

The Dow Chemical Company | U.S. Gulf Coast

Project Overview

Dow U.S. Gulf Coast

- Dow is one of the world's leading materials science companies.
- The project will be located at one of Dow's manufacturing sites in the U.S. Gulf Coast region.
- The project will leverage the expertise and capabilities of Dow's world-class operations.

Technology Snapshot

- Captures ~100,000 metric tons/year of carbon dioxide to produce Lithium-Ion battery (LiB) electrolyte solvents to be used in electric vehicles and power storage.
- Plan to utilize blue H_2 and low emissions power for targeted 75+% carbon dioxide intensity reduction.
- Anticipated completion by 2029.

Federal Cost Share

Up to $95 million

Value and Impacts

- Produce low carbon battery electrolyte solvents facilitating the production of approximately 4 million electric vehicles annually.
- Onshore essential EV LiB battery material supply to create a secure domestic supply chain and increase U.S. economic resiliency.
- Estimated area job creation ~ 600+ construction jobs and ~ 50 permanent jobs.

Carbon Emission Reductions

*Avoiding 100,000 metric tons per year of CO_2 is equivalent to the annual emissions of ~22,000 cars**

*Greenhouse Gas Emissions from a Typical Passenger Vehicle | US EPA

Novel CO_2 Utilization for EV Battery Chemical Production

The Dow Chemical Company | U.S. Gulf Coast

Community Benefits

- Generate ~600 construction jobs, ~50 permanent jobs, and grow Dow's U.S. Department of Labor Apprenticeship Program.
- Collaborate with education institutions, consortia, and economic development organizations on curriculum, mentorship, and access that leads to jobs for disadvantaged communities.
- Solidify a Near Neighbor group (within 5 miles of the site) in addition to Dow's long-standing Community Advisory Panel for information sharing, two-way dialogue, and measurement of social impact.
- Partner with local chambers of commerce and collegiate partners to promote DEIA initiatives for hiring and business services through inclusive candidacy, supplier diversity programs, and reducing barriers to entry (e.g., childcare).
- Reduce carbon dioxide emissions and create solutions to improve water access and quality.

Image Credit: [Dow]

Novel CO_2 Utilization for EV Battery Chemical Production

The Dow Chemical Company | U.S. Gulf Coast

Contact Information

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Other Method of Contact

Dow.com Protecting our Climate

To contact OCED about this project, please email us at
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Image Credit: [Dow]

STAR E-METHANOL

Ørsted P2X US Holding LLC, Texas Gulf Coast

Project Overview

Ørsted

- Ørsted develops, constructs, and operates offshore and land-based wind farms, solar farms, energy storage facilities, and bioenergy plants, with 5 gigawatts of land-based capacity in the US (enough to power over 3.5 million homes)
- Ørsted's Power-to-X Americas team is focused on developing green hydrogen and e-fuels to decarbonize industries that are hard-to-electrify, or where renewable energy isn't a feasible or effective solution

Star e-Methanol Snapshot

- A large-scale e-methanol production project that can substantially reduce the carbon footprint for hard-to-electrify sectors currently relying on products derived from fossil fuels, e.g. shipping and chemicals
- Using Texas-based sources, the e-methanol production will use green hydrogen (produced through water electrolysis powered by onshore wind and solar projects) and biogenic carbon captured from an industrial facility
- Up to 300,000 metric tons of e-methanol will be produced per year, providing a large-scale solution for net-zero carbon fuel use

Federal Cost Share

Up to $100 million

Value and Impacts

- US industrial and transportation sectors account for ~65% of US greenhouse gas emissions, and Star e-Methanol will demonstrate a pathway to decarbonize these hard-to-electrify sectors
- The fuel from Star e-Methanol can be used in multiple applications, including (1) marine shipping fuel, which would reduce CO_2 emissions by 90+%, (2) an input in sustainable aviation fuel, or (3) chemical production

Carbon Emission Reductions

422,000 metric tons of CO_2 per year, equivalent to 100,000 cars off the road per year

STAR E-METHANOL

Ørsted P2X US Holding LLC, Texas Gulf Coast

Community Benefits

Beyond decarbonization, Ørsted's investments in Texas and in the e-fuels industry will create new American jobs and deliver economic value and benefits to local communities.
– Melissa Peterson, Head of Onshore and P2X Americas at Ørsted

- Star e-Methanol is estimated to create 300 construction and 50 permanent **jobs**
- Ørsted is partnering with the **University of Houston** to implement a **robust community benefits plan** that incorporates workforce development training, enhances STEM at educational institutions, and supports environmental justice initiatives
- The decarbonization of the chemical production process will demonstrate a **pathway for reducing emissions in surrounding communities** impacted by industries relying on fossil fuels

Image Credit: Ørsted

STAR E-METHANOL

Ørsted P2X US Holding LLC, Texas Gulf Coast

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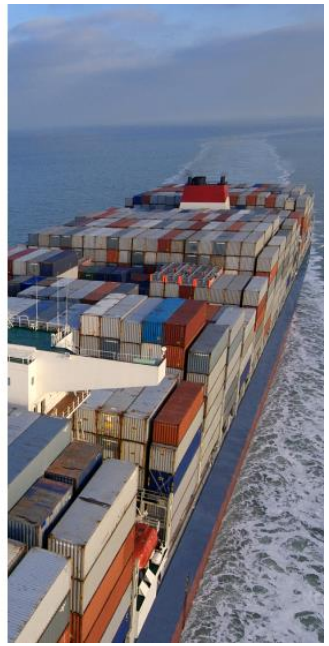

Image Credit: Ørsted

To contact OCED about this project, please email us at
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"Right Way" Next Generation Melt Project

AMERICAN Cast Iron Pipe Company, Birmingham, Alabama

Project Overview

Our Facility

- Founded in 1905, AMERICAN manufactures ductile iron pipe, valves, hydrants and spiral-welded steel pipe for the waterworks industry and steel pipe for the energy and carbon capture industries.
- AMERICAN currently employs about 1,600 people in Birmingham; 2,900 people at its ten manufacturing and research facilities in seven states.

Technology Snapshot

- Replace AMERICAN's existing single cupola furnace with four coreless induction furnaces.
- Scheduled for completion in 2027. Currently working on equipment design and installation drawings.
- First of several initiatives planned over the next five to seven years to improve the company's carbon footprint and sustainable manufacturing processes.

Federal Cost Share

Up to $75 million

Value and Impacts

- Reduce the facility's melting/holding process CO_2e emissions by 95%.
- Source energy from cleaner and more renewable sources.
- Increase the company's melting capacity by 25% to meet growing demand for AMERICAN's products in the water and wastewater markets.
- Help retain higher paying jobs at the Birmingham facility.
- Total project investment is $185.4 million; economic impact is estimated to be $357 million.

Carbon Emission Reductions

Reduce the facility's melting/holding process CO_2e emissions by 95%.

"Right Way" Next Generation Melt Project

AMERICAN Cast Iron Pipe Company

Community Benefits

- Mission: Do things the "Right Way" by treating customers, employees and communities the way we want to be treated.
- Direct reduction in the Birmingham facility's CO2e emissions and emitted particulate matter, promoting the overall health and well-being of neighbors and employees alike.
- Establish a Community and Labor Engagement Task Force to keep stakeholders informed, obtain feedback and track the status of our Community Benefits Plan.
- Continued support for four neighborhoods that surround our facility – ACIPCO-Finley, Hooper City, North Birmingham and Smithfield Estates. Community gardens established in three of these neighborhoods.
  In 2023, about 2,000 pounds of produce were harvested and given to neighbors in need.
- An estimated 80-100 jobs will be created for this and other projects to increase production capacity.
- Employees have access to excellent benefits as well as opportunities for on- and off-site professional development and education – Eagan College, apprenticeships and tuition reimbursement.

Image Credit: AMERICAN Cast Iron Pipe Company

“Right Way” Next Generation Melt Project

AMERICAN Cast Iron Pipe Company

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Learn More

Visit our website at https://american-usa.com/news/

To contact OCED about this project, please email us at

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Image Credit: AMERICAN Cast Iron Pipe Company

Iron Electric Induction Conversion Project

United States Pipe and Foundry Company, Bessemer, Alabama

Project Overview

Alabama Works, Bessemer, Alabama

- U.S. Pipe® manufactures high-quality water and wastewater transmission products
- Founded in 1899 and celebrating 125 years at the Bessemer site
- U.S. Pipe is part of The QUIKRETE® Companies

Technology Snapshot

- Replace a coke-fired furnace with electric induction melting furnaces
- State-of-the-art technology both more efficient and more sustainable than coke-fired alternative
- Estimated completion in 2027

Federal Cost Share

Up to $75.5 million

Value and Impacts

- Combines time-tested innovations in resilience with market leading sustainability to create an unrivaled long-term solution for our nation's water and wastewater infrastructure needs
- Improves safety and creates operational efficiencies
- Eliminates CO2e emissions from melting process

Carbon Emission Reductions

This upgrade will result in a 73% carbon intensity reduction facility wide

Iron Electric Induction Conversion Project

United States Pipe and Foundry Company

Community Benefits

- U.S. Pipe has proudly built a 125-year relationship with the Bessemer community. This Project should extend it for another 125 years.
- U.S. Pipe has received positive feedback for the Project from local stakeholders, including the City of Bessemer, Jefferson County, and the Alabama Departments of Commerce (DOC) and Revenue (DOR)
- Generate over 200 construction jobs, upskill 36 employees to higher-skilled and higher paying roles and provide leadership development opportunities for many others
- Sponsor 2-3 STEM scholarships plus an internship program for low-income students in the Bessemer area.
- Continue collective bargaining agreements with United Steelworkers (USW), International Association of Machinists and Aerospace Workers (IAM), and the International Brotherhood of Electrical Workers (IBEW).
- Improve air quality with significant reductions in PM (particulate matter), NOx (nitrogen oxides), SOx (sulfur oxides), CO (carbon monoxide) and VOC (volatile organic compounds) for nearby communities

Iron Electric Induction Conversion Project

United States Pipe and Foundry Company

Contact Information

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Person of Contact

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Other Method of Contact

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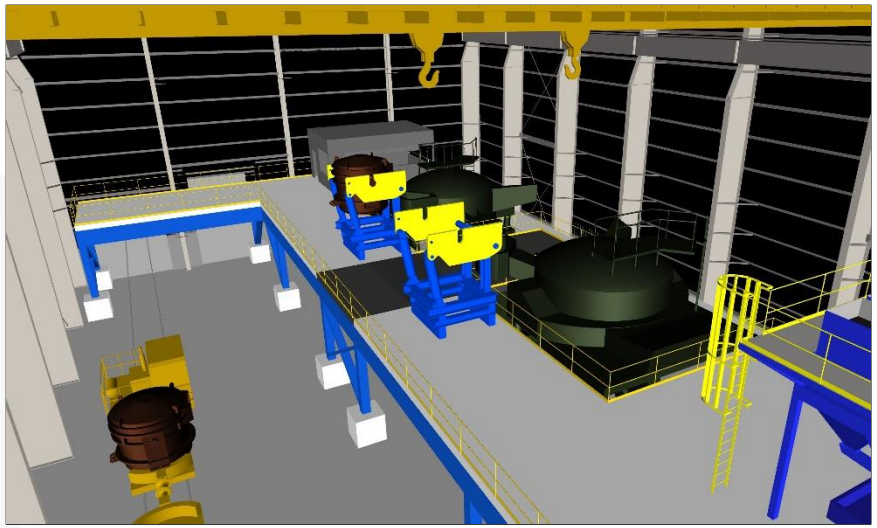

Decarbonization of Black Liquor Concentration through Energy Efficient Membrane Separation

International Paper and Via Separations - Mansfield, LA

Project Overview

International Paper's Mansfield Mill

- Fully integrated pulp and paper mill producing approximately 1.6 million tons/year of renewable finished product
- Began operations in 1981; currently employs approximately 700 people
- OSHA Voluntary Protection Program (VPP) Star-Certified site

Via's Membrane Separation Technology

- Membrane technology offers 80-90% reduction in joule-for-joule separation compared to existing evaporators
- Energy and chemical savings + potential operational benefits
- Electrification of a traditionally heat-intensive process

Federal Cost Share

Up to $46.6 million

Value and Impacts

- Improve economic competitiveness of American paper manufacturing
- Generate ~100 construction jobs and support 700 existing jobs at the mill
- Reduce CO2e emissions by 81% per kg water removed
- Reduce fossil fuel consumption at the Mansfield facility
- Support International Paper's water reuse program

Carbon Emission Reductions

Eliminate 250,000+ ST CO2e by 2050.

Decarbonization of Black Liquor Concentration through Energy Efficient Membrane Separation

International Paper and Via Separations - Mansfield, LA

Community Benefits

- **Workforce and job training**: Building the pipeline of future talent and interests in sustainable manufacturing and STEM education
- **Community engagement:** Establish community advisory council to enable two-way communication and feedback
- **Community investment:** Continue to identify critical community needs and assess opportunities for community-driven projects that align with IP's signature causes and experience
- **Diversity and inclusion/Justice 40:** Support diversity and inclusion initiatives with employees and community; sponsor research efforts to analyze Justice40 project impact
- **Reduce greenhouse gas emissions** with the potential to scale across other pulp and paper mills and other industrial sectors

International Paper's Mansfield, Louisiana Mill

Decarbonization of Black Liquor Concentration through Energy Efficient Membrane Separation

International Paper and Via Separations - Mansfield, LA

Contact Information

Project Email

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Point of Contact

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Shreya Dave (Via)

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Image Credit: Via Separations

Question & Answer Set 2

7:55-8:10 ET

Project Set 3

8:10-8:40pm ET

- SSAB, New Augusta, MS
- BASF Corporation, Freeport, TX
- ExxonMobil Corporation, Baytown, TX
- T.EN Stone & Webster Process Technology, Inc., Gulf Coast
- Brimstone Energy, Inc., TBD

Hydrogen-Fueled Zero Emissions Steel Making

SSAB: Mississippi, Iowa

Project Overview

SSAB Overview

- SSAB is a global steel company headquartered in Stockholm, Sweden; 16,000 employees in >50 countries
- North American HQ and steel mill located in Mobile, Alabama; North American R&D and steel mill located in Montpelier, Iowa. Processing facilities in Houston, TX, St. Paul, MN and Ontario, CAN

Technology Snapshot

- Develop commercial-scale green hydrogen-based steel production capability
  1. MS: Construction of HYBRIT® fossil-free Direct Reduced Iron (DRI) technology utilizing 100% green hydrogen from Hy Stor Energy
  2. IA: Expansion of steelmaking capabilities to utilize the hydrogen-reduced DRI
- `25-'26 Construction; `26-'27 Commissioning & Ramp-Up

Federal Cost Share

Up to $500 million

Value and Impacts

- Introduce fossil-free sponge iron production to the U.S.
- Produce low CO_2 emissions steel solutions for use in critical end-use markets
- 81% reduction in overall GHG emissions compared to traditional DRI production and normal cradle-to-gate global warming potential.
- 55% reduction in GHG emissions at SSAB Iowa facility in Montpelier

Carbon Emission Reductions

81% overall reduction in Greenhouse Gas (GHG) emissions

Hydrogen-Fueled Zero Emissions Steel Making
SSAB

Community Benefits

- Generate ~6,000 construction jobs and 540 permanent jobs across Mississippi and Iowa, while also enhancing workforce development and training centers.
- Invest in the immediate and future workforce through quality job creation, advancing diversity, equity, inclusion, and accessibility through the implementation of our industry leading program “Stronger Together.”
- Contribute to the Biden-Harris Administration’s Justice40 Initiative.
- Eliminate 81% of GHG emissions from a so-called “hard-to-abate” sector.
- Solicit and support local vendors, contractors, and sub-contractors for the project as well as subsequent facility operations.
- Provide STEM-focused summer camp scholarships and curriculum development for high school students in underrepresented communities.

Steel coupon produced with fossil-free sponge iron

Hydrogen-Fueled Zero Emissions Steel Making
SSAB

Contact Information

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SSAB mill, located in Montpelier, IA

Syngas Production from Recycled Chemical Byproduct streams

BASF Corporation, Freeport, Texas

Project Overview

BASF Freeport, Texas

- BASF Freeport is one of BASF's largest manufacturing complexes with more than 1,700 people and 27 manufacturing plants, including many world-scale facilities

Technology Snapshot

- Recycle liquid byproducts from existing production processes into syngas to be used in downstream production at BASF Freeport site
- Through plasma gasification and renewable power, BASF plans to reduce need for natural gas-fired incineration, reducing CO_2 emissions from targeted incineration
- Proposed start of construction: September 30, 2026

Federal Cost Share

Up to $75 million

Value and Impacts

- BASF Freeport plans to transition from natural gas to renewable electricity for energy needs where possible, thereby improving sustainability and reducing emissions
- Low carbon syngas production would be transmitted through the entire value chain, allowing production of lower product carbon footprint paints, adhesives, flooring and construction-related products

Carbon Emission Reductions

By reducing incineration, we avoid approximately 60,000 tons of CO_2 equivalent emissions per year. This is equal to GHG emissions from ~7,800 homes' energy use for one year.

https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator#results

Syngas Production from Recycled Chemical Byproduct streams

BASF Corporation, Freeport, Texas

Community Benefits

- Generate approximately ***350 construction jobs and 8 permanent jobs***, while also enhancing workforce development and training centers.
- BASF Freeport is part of a local ***Community Advisory Panel.*** We will provide ***quarterly project updates*** to gather feedback to steer project execution.
- BASF Freeport will work with local ***Brazosport College*** to increase opportunities in its Process Technology, Welding and other training programs with scholarships and supplies.
- Each year more than 1,000 children participate in ***Responsible Care Week*** to learn about the chemical industry. BASF will expand our modules ***focused on decarbonization and sustainability*** with representatives to discuss the energy transition taking place.
- BASF will ***promote DEI efforts over the course of the project*** internally/externally. BASF DEI training is required for all contractors hired through the project.
- BASF is committed to seek opportunities for ***diverse suppliers and contractors.***

Syngas Production from Recycled Chemical Byproduct streams

BASF Corporation, Freeport, Texas

Project Email

FreeportCommunications@basf.com

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Baytown Olefins Plant Carbon Reduction Project

ExxonMobil, Baytown, TX

Project Overview

Baytown Olefins Plant

- Started operations in 1979 and is one of world's largest olefins plants
- Produces 10 billion pounds/year of ethylene, propylene, & butadiene which are the building blocks for many products that society depends on (plastic food storage, diapers, fabrics, auto plastic components, child car safety seats, tires, etc.)

Technology Snapshot

- Upgrading high-heat equipment to accept low carbon hydrogen in place of natural gas: furnaces, gas turbine generators, industrial steam boilers, heat recovery steam generators, and associated piping / instrumentation
- Project construction start in 2026

Federal Cost Share

Up to $331.9M

Value and Impacts

- Demonstrates clean hydrogen fuel switching in the largest ethylene plant in the U.S.
- Improves air quality for local community through reduction of NOx pollutants
- De-risks one of the most viable decarbonization solutions for large, existing industrial facilities, proves the use of clean hydrogen in industrial processes, and provides a pathway for decarbonizing the chemical industry

Carbon Emission Reductions

Avoiding 2,500,000 tons / year

Baytown Olefins Plant Carbon Reduction Project

ExxonMobil, Baytown, TX

Community Benefits

- Creates 400 new construction jobs, 15% of which would be offered U.S. Department of Labor approved apprenticeships
- 140 current plant workers would be trained in the use of hydrogen
- Creation of 3 flagship programs in the local community:
  - **Craft Apprentice Training Center** to expand non-traditional educational pathways for residents
  - **Teen Engineering & Tech Center** for hands-on learning and academic support in STEM fields
  - Local business development program including a **Small Business Support Center** to help build the capacity of local businesses

Image Credit: Robert Seale

Baytown Olefins Plant Carbon Reduction Project

ExxonMobil, Baytown, TX

Contact Information

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Image Credit: ExxonMobil Baytown

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Project SECURE (Sustainable Ethylene from Carbon Utilization with Renewable Energy)

Technip Energies (T.EN) Stone & Webster Process technology Inc., Houston, TX and LanzaTech, Inc., Skokie, IL

Project Overview

**If your site is still being determined, please share information on where you are in the process.*

Technip Energies

- *Facility site selection in progress; will be located in the Gulf Coast of the U.S.
- 60+ years of operations in the energy industry as successful engineering and construction leader
- Global organization headquartered in Paris and has portfolio of over 85 leading proprietary technologies

LanzaTech

- Carbon recycling leader since 2005, headquartered in Skokie, IL
- Technology at commercial scale since 2018, in operation at 6 plants globally
- Abated over 400,000 tonnes CO2 to date (and counting)

Technology Snapshot

- CO_2 is captured from the ethylene furnace stack
- LanzaTech's bio-recycling technology transforms carbon dioxide into ethanol
- Technip Energies' Hummingbird® technology converts the ethanol into sustainable ethylene
- 42 months running project planning, development and construction

Federal Cost Share

Up to $200 million

Value and Impacts

- Green products produced and impacts on average American
- Reduction in carbon emissions resulting in decreased environmental exposure
- Production of valuable Green Ethylene
- Downstream industry implications or off-take commitments, etc.
- Resource efficiency, by recycling carbon emissions into valuable products; this project promotes sustainable use of resources, aligned with a circular economy

Carbon Emission Reductions

Avoiding 100,000 tons per year CO2 emission equal to 25,000 cars per year

Project SECURE (Sustainable Ethylene from Carbon Utilization with Renewable Energy)

Technip Energies (T.EN) Stone & Webster Process technology Inc., Houston, TX and LanzaTech, Inc., Skokie, IL

Community Benefits

- Generate 200 construction jobs and 40 long-term jobs focused on local and underrepresented groups, while improving workforce development and training centers.
- Enhance air quality by reducing permitted levels of air pollutants, such as particulate matter, and greenhouse gasses.
- Investment in local workforce development and the potential increase in local business activities associated with Project SECURE can lead to an overall economic boost for the community.
- Enhancing Job Accessibility, DEIA initiatives strive to remove barriers to employment for underrepresented groups, creating a more diverse workforce that reflects the local community's demographics.
- Multiple avenues for community involvement include participating in community advisory boards, engaging in workforce development initiatives, and providing feedback through community engagement sessions including listening sessions, town halls, public forums and stay informed about project forums and environmental monitoring

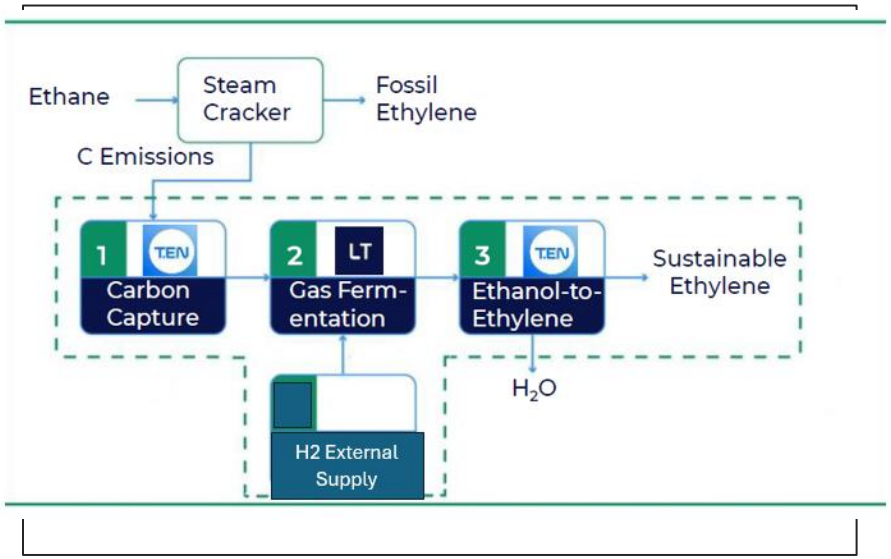

Image Credit: [XX]

Project SECURE (Sustainable Ethylene from Carbon Utilization with Renewable Energy)

Technip Energies (T.EN) Stone & Webster Process technology Inc., Houston, TX and LanzaTech, Inc., Skokie, IL

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[Please type response here…..]

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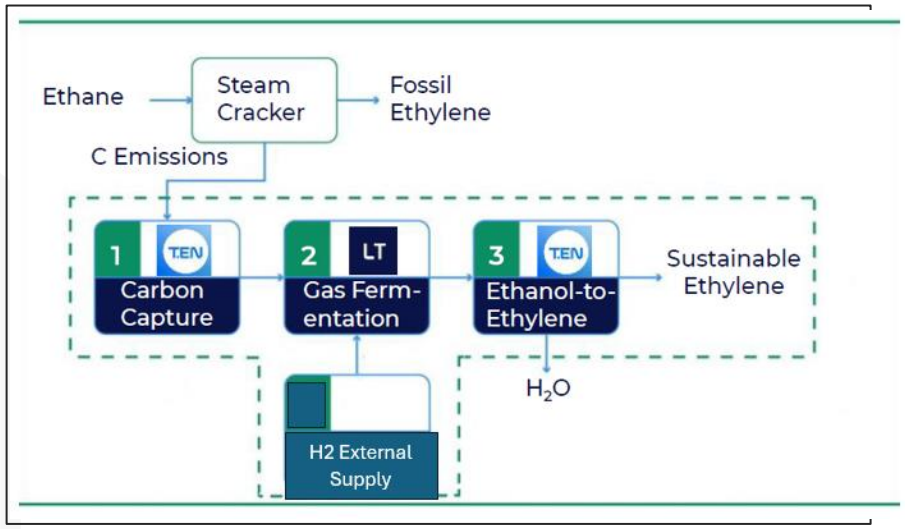

Image Credit: [XX]

Deeply Decarbonized Cement

Location TBD (In site selection in North Carolina and Nationwide)

BRIMSTONE

Project Overview

Deeply Decarbonized Commercial-Scale Cement Plant

- Brimstone is a climate tech company dedicated to eliminating CO_2 emissions from industrial materials, beginning with cement.
- The project represents the first commercial-scale plant to deploy Brimstone's deeply decarbonized process for producing the type of cement used in virtually all construction worldwide—ordinary portland cement (OPC)—along with co-products, notably supplementary cementitious materials (SCM), an ingredient also used to reduce the carbon footprint of concrete.
- The project will produce 140,000 tonnes of decarbonized OPC and SCM per year.

Technology Snapshot

- Brimstone reduces CO_2 in two ways: (1) replaces limestone—which accounts for ~60% of OPC emissions—with calcium silicate (2) uses waste magnesium to directly capture CO_2 from the air. The process is deeply decarbonized across a range of energy scenarios—and carbon-*negative* when relying on clean energy.
- Construction is slated to begin three years from award.

Federal Cost Share

Up to $189 million

Value and Impacts

- The Brimstone process—which uses a widely-available feedstock, produces widely-used materials, and deeply decarbonizes OPC under current energy assumptions and pricing—is designed for low cost, replicability, and global climate impact.
- At industrial scale, the process is designed to sell materials at cost-parity with commodity prices, avoiding reliance on permanent subsidies or carbon taxes.

Carbon Emission Reductions

120,000 tonnes of CO_2 per year
Equal to 26,000 cars per year

Deeply Decarbonized Cement

Brimstone Energy, Inc.

Community Benefits

- This project is estimated to generate up to 100 permanent jobs across a range of skill levels and 450 construction jobs.
- Brimstone is engaging actively with the United Steelworkers, the leading industrial union in North America, as a union partner, and has a neutrality agreement in place.
- Brimstone continues to analyze sites, including in North Carolina. After finalizing the site, Brimstone expects to initiate robust workforce development partnerships to transition community members to the clean industrial jobs available at the plant and in the growing clean economy.
- Among other steps, Brimstone will establish a Community Advisory Council to further surface and advance community concerns, encompassing workers' rights, smart growth and environmental justice, and workforce development.

Image Credit: Jose Romero

Deeply Decarbonized Cement

Brimstone Energy, Inc.

Contact Information

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Current Project Contact

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Other Company Information

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Image Credit: Brimstone

Question & Answer Set 3

8:40-9:10 ET

Thank you!

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