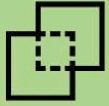


SESSION 2

2024 JISEA Annual Meeting
Feb. 26–27, 2024



SESSION
2

Technology-Society Interface

Day 1: 2:15–5:15 p.m.

OVERVIEW

Attendees will hear from and interact with panelists, presenters, and each other to identify key trends at the clean energy technology-society interface.

GOALS / OUTCOMES

Articulate challenges across the RDD&D process, such as barriers to equity and siting practices, and prioritize opportunities for partnerships and further exploration.



Presentation

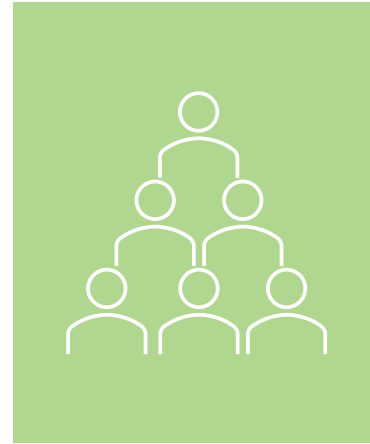
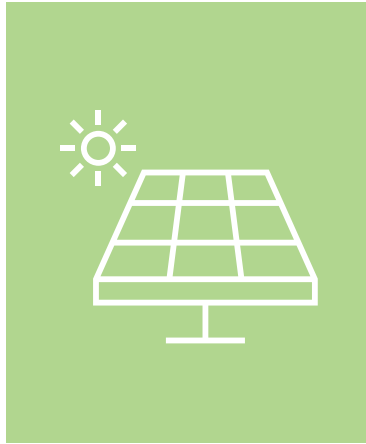


Panel

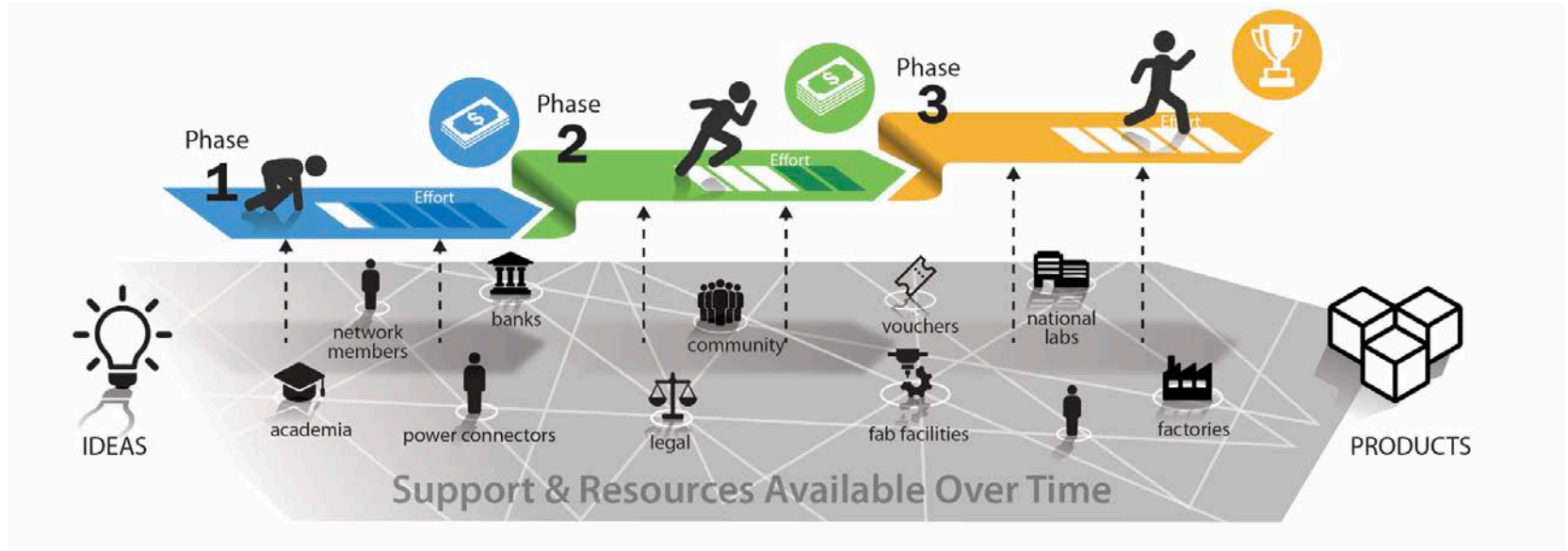


Small Groups

Some Context Setting



More Context Setting



Poll #1

What society-tech challenges do you personally face or work on?

Waiting for responses ...

Go to

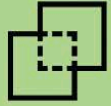
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SESSION
2

Technology-Society Interface

Day 1: 2:15–5:15 p.m.



Maria Curry-Nkansah

Sr. Research Advisor
NREL



ELECTRIFIED PROCESSES FOR
INDUSTRY WITHOUT CARBON



Source: Bladerunner and Starcraft Green Steel

Electrified Processes for Industry without Carbon (EPIX)
\$140+ Million DOE Clean Energy Manufacturing Institute

Vision – Electric heating is economical and supports manufacturing decarbonization ***everywhere for everyone.***

Goals

- Embody DEIA
- Close knowledge and training gaps to de-risk industrial deployment of electric heating technologies
- Leverage broad industrial consortia
- Operate industrially relevant **testbeds (cement, steel, chemicals and refining, food processing and pulp and paper)**
- Demonstrate cost parity of electric heating when compared to Levelized Cost of Heating with fossil fuels with CCUS



**Maria
Curry-Nkansah**
Chief Diversity
Officer



17 USA Manufacturing Institutes (academia, industry, national labs and others)



ELECTRIFIED PROCESSES FOR
INDUSTRY WITHOUT CARBON



<https://www.manufacturingusa.com/institutes>

DEIA and Workforce Development



EPIXC DEIA and WFD Management Team



Maria Curry-Nkansah
Chief Diversity Officer



Robin Hammond
Chief Workforce
Development Officer



Kristen Parrish
Co-Director DEIA



Wafa Hozien
Co-Director DEIA



Vincent Torres
Director WFD

Energy Transition in Real Time- The Why?

Appalachian Mountains- Coal Country

- For almost a century coal powered America, made millionaires and at its peak employed 883,000
- Today roughly 43,600 people work for the industry
- Significant energy and economic shifts from coal to natural gas
 - High unemployment and lost pensions (due to bankruptcies)
 - High poverty rates
 - High numbers of children below the poverty line (45-50% in many counties)
 - Highest per capital Opioid epidemic
 - Legacy health issues due to PM 2.5 and exposure to other toxins
 - Extreme soil and water pollution
 - Improved air quality due to coal mining and coal-fired plant closures



But.....

Even if a community has clean air; if there are no jobs or economic development you have cascading effects leading to widespread poverty entrapment.



WFD +



1 Train-to-Jobs



2 Work-Integrated Experiences



3 Career Pathways

Arizona Salt River Materials Project

Missouri S&T Steel Testbed Project

Principle 1
Meaningful Diverse Leadership

Principle 2
Selecting Projects with DAC Benefits via High Impact Assessment

Principle 3
Union and DAC Participation in RD&D and EWD Efforts

Principle 4
Underrepresented Group Participation in RD&D*

Principle 5
IEDO and other DOE Office Collaboration on DEIA Related Topics

Principle 6
Inclusion of Women, Veteran, & Minority-Owned Businesses & Community

DEIA 7 Principles

Building A Diverse Workforce Development Ecosystem

Principle 7
Continuous Improvement of DEIA via Policies, & Smart Metrics

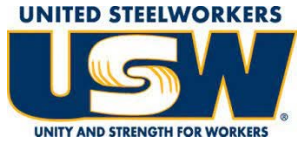
Port Arthur, Texas Project

*(Undergraduate, Graduate, and Faculty Internships)



Career Pathway Support

What is the Institute's role and depth of training?



Career Path Strategy		
Skill Level	Activity	Curriculum Developers and Training Providers
Professional Skills <ul style="list-style-type: none"> Undergraduates Graduates Post docs Faculty 	Professional Position	<ul style="list-style-type: none"> Universities National Labs
	Corporate Internships	<ul style="list-style-type: none"> Industry
	Research Internship	<ul style="list-style-type: none"> KAAAs/KTAs
Reskill/Upskill <ul style="list-style-type: none"> Incumbent Workers Veterans Transition Workers 2yr credential 	Journeyman	<ul style="list-style-type: none"> Industry Unions
	Apprentice	<ul style="list-style-type: none"> Community Colleges Community WFD
	Pre-Apprentice	<ul style="list-style-type: none"> Trade Associations KAAAs/KTAs
Low/New Skills <ul style="list-style-type: none"> GED Aged out of Foster Care Formally Incarcerated HS Teachers 	Entry Level positions	<ul style="list-style-type: none"> Community WFD Groups High Schools
	Basic Math Skills	<ul style="list-style-type: none"> Unions Industry
	Life Skills/Wrap Around Services	<ul style="list-style-type: none"> Trade Associations Community Colleges KAAAs/KTAs

HIGHER SKILL

LOWER SKILL

Diversified WFD Port Arthur Jumpstart Project



**Texas Golden Triangle
Empowerment Center**

- Port Arthur
- Beaumont
- Orange



**Salt River Materials Navajo
Cement Project**

- Puma, Arizona



Missouri Steel Testbed

- Rolla Missouri
- Tuskegee Alabama
- Montgomery Alabama

Diversified Workforce Development Jumpstart Program

Bridging gaps between GED and higher skills opportunities

- Provide pathway to well-paid jobs
- Co-Create high school, community college and university **curriculum**
- Leverage existing services (e.g. universities, local empowerment centers for training and wrap around services)
- Support summer National Lab, University and Manufacturing Internships

Increasing manufacturing job access for neighborhoods

- Assess and mitigate barriers to success
- Facilitate collaborations to co-develop employment strategies between residents, community organizations, unions, community colleges, universities, high schools, trade associations, and industry members

Supporting apprenticeship job training and placement

- Electricians, mechanical engineers, process operators, process control engineers/technicians, safety coordinators, installation and maintenance engineers/technicians (e.g. electrified boilers, furnaces and heaters etc.)



Diversified WFD Port Arthur Jumpstart Project

Texas Golden Triangle Empowerment Center

Community Profiles for Port Arthur, Beaumont and Orange

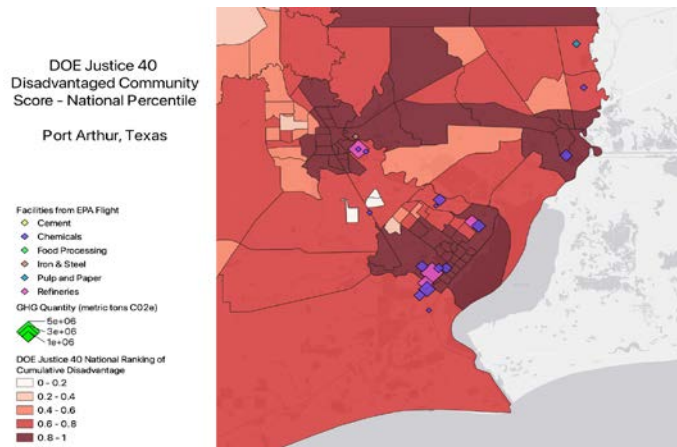
- Frequent power outages
- High unemployment and poverty
- Fence line DAC communities, vulnerable to health risks from air toxins

Infrastructure

- Training facilities (e.g., multiple 10,000 ft² training facilities)
- High annual training community participation (1200-10,000 community members trained each year)
- Industry recognized job training certifications
- Ability through partnerships to create Accredited or customizable employer driven curriculum

Community Needs

- Diversified Workforce Training
- Entrepreneurial investments
- High paying high quality jobs in local plants
- Better air quality

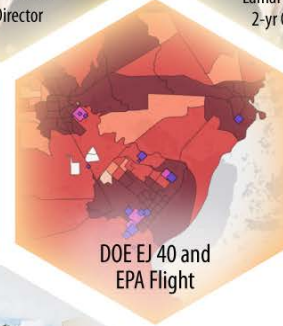
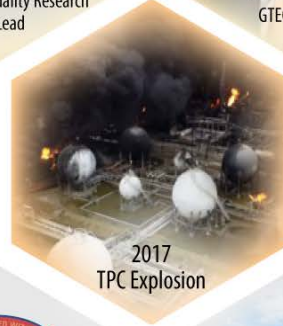


Diversified WFD Port Arthur Jumpstart Project *(cont.)*

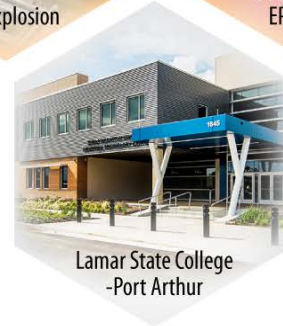
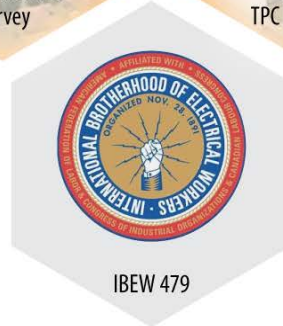
Principle 1 Meaningful Diverse Leadership



Principle 2 Selecting Projects with DAC Benefits via High Impact Assessment



Principle 3 Union and DAC Participation in RD&D and EWD Efforts



Electrical Worker Bootcamp and Apprenticeship to Jobs Program

Diversified WFD Port Arthur Jumpstart Project (cont.)

Principle 4

Underrepresented Group Participation in RD&D (Undergraduate, Graduate, and Faculty Internships)



Principle 5

IEDO and Other DOE Office Collaboration on DEIA Related Topics



Principle 6

Inclusion of Women-, Veteran-, & Minority-Owned Businesses and the Community at Large



Diversified WFD Port Arthur Jumpstart Project *(cont.)*

Principle 7

Continuous Improvement of DEIA via Policies, Training and Smart Metrics for Monitoring



Air and Water Quality/
Water Resiliency



Health Impact
Analysis



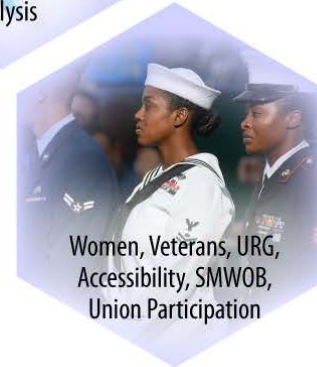
High Quality
DAC Jobs



Level of HBCU/TCU/
HSI/MSI Faculty
Participation



Level of HBCU/TCU/
HSI/MSI Student
Participation



Women, Veterans, URG,
Accessibility, SMWOB,
Union Participation

Smart Metrics

Fence-Line Community Air, Water and Soil Quality Correlation to Health Impacts

Baseline:

- ✓ PM 2.5
- ✓ NOx
- ✓ SOx
- ✓ VOCs
- ✓ Waste Generated
- ✓ Forecast Impact on Air, Water and Soil for Target Area

- ✓ Baseline Relevant morbidities and mortalities
- ✓ Correlate with industry toxins
- ✓ Forecast technology impact
- ✓ Scholarly Article

- ✓ # of DAC members enrolled in WFD training (40% of total)
- ✓ Number of DAC members complete WFD training
- ✓ # of DAC members in Union Apprenticeships
- ✓ # DAC members in 2 year programs
- ✓ # DAC members employed in family supporting jobs
- ✓ Scholarly Article

- ✓ # of Underrepresent Faculty Participation
- ✓ Under Represented Faculty in Leadership Roles
- ✓ # of Underrepresented faculty on scholarly articles

- ✓ # of Underrepresent Student Participation
- ✓ Under Represented Students in RDD Roles
- ✓ # of Underrepresented Students on scholarly articles

- ✓ # Female Participants
- ✓ Female Participant Roles
- ✓ # Male Participants
- ✓ Male Participant Roles
- ✓ Other Sexual Orientations
- ✓ Other Sexual Orientation Roles
- ✓ Self Described Ethnicity

Smart Metrics



Diversified Workforce Metrics



ELECTRIFIED PROCESSES FOR
INDUSTRY WITHOUT CARBON

<https://www.energy.gov/eere/articles/doe-selects-arizona-state-university-lead-new-institute-drive-industrial>

Poll #2

As clean energy grows, what human-related implications we should be thinking about?

(Society-Tech Interface)

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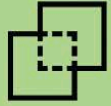
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SESSION
2

Technology-Society Interface

Day 1: 2:15–5:15 p.m.



Lynn Abramson
Clean Energy
Business Network



Helen Bertelli
Women+ in
ClimateTech



Salina Derichsweiler
SunShare



Monique M. Dyers, P.E.
Ensign Energy Consulting, LLC



David Karabelnikoff
Alliance for Tribal Clean Energy

Group discussion!

- Table Topics
- 13 tables!!
- Deliverable = synthesis

1. **Siting**
2. **Geopolitical issues**
3. **Community impacts**
4. **Access to capital (economics)**
5. **AI/ML**
6. **Equity/justice**
7. **Research innovations & feedback loops**
8. **Wild Card!!**



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Poll #3

What society-tech opportunities emerged from the discussions?

Waiting for responses ...

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Poll #4

AFTER THE GROUP DISCUSSIONS...

How do you feel now?

Waiting for responses ...

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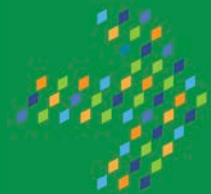
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Thank you!

We invite you to the virtual JAM24 synthesis meeting on April 8, 2024, 11:30 a.m.–1 p.m. MT.

Join us via Microsoft Teams by visiting
bit.ly/JAM24-synthesis

NREL/PR-6A50-89106

www.jisea.org

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