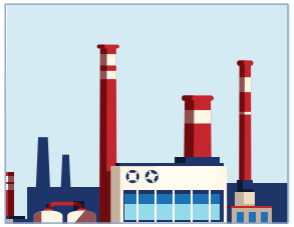
Capacity Building for Energy Assets

Bhima Sastri
Director, Energy Asset Transformation
Office of Fossil Energy and Carbon Management
US Department of Energy

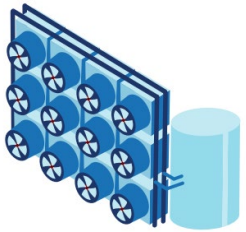
November 19, 2014

OFFICE OF FOSSIL ENERGY AND CARBON MANAGEMENT (FECM)

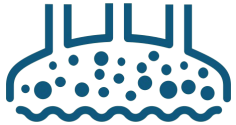
The Carbon Management Office within FECM, where this program resides, supports solutions to minimize the environmental impacts of fossil fuels & industrial processes while working towards net-zero emissions. Priority areas include:



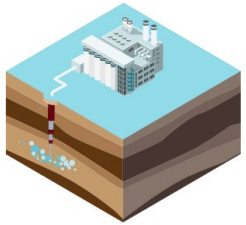
Point source capture



Carbon dioxide removal



Carbon conversion



Carbon transport and storage

H_2 with carbon management

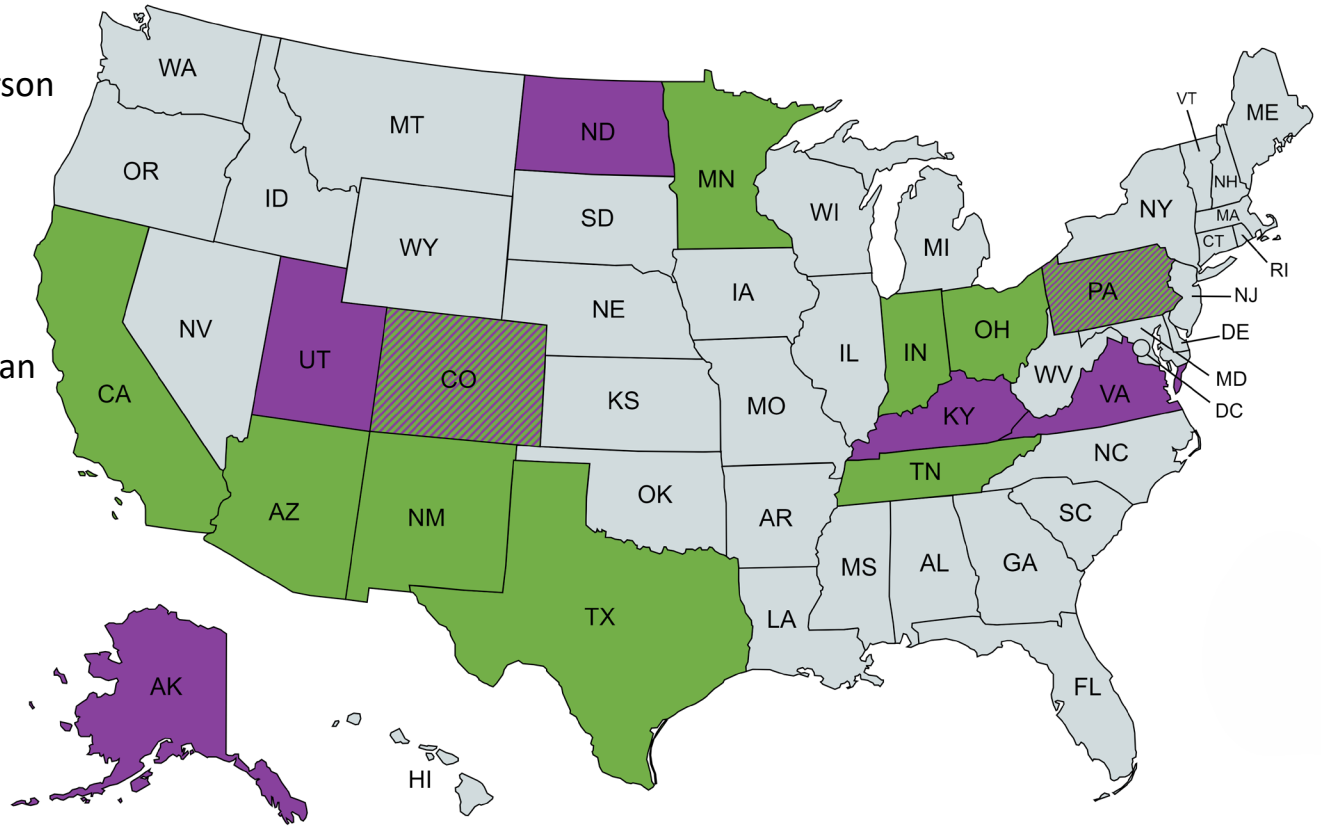
ENERGY ASSET TRANSFORMATION PROGRAM

- The program helps communities that have energy assets that are retired or are set to retire to develop new alternatives that can sustain the jobs and tax base.
- Currently, 22 communities across the US are working to develop roadmaps on how they will address these new alternatives to energy assets and how they will sustain the jobs and tax base as they plan to move to a sustainable future.

ENERGY ASSET TRANSFORMATION AWARDEES

First Cohort

- Alaska Municipal League - Nils Anderson
- CART and Glen Lyn - Bruce Mutter
- Craig Station, CO - Matt Solomon
- Floyd County KY - Ruthie Caldwell
- Grow Rural PA - Deborah Pontzner
- City of Beulah, ND - Granville Brinkman
- Shippingsport, PA - Lew Vilotti
- Southeastern Utah - Jade Powell



Second Cohort

- New Florence, PA - Jonathan Smith
- Clairfield, TN - Tonia Brookman
- Fruitland, NM - Tim Gibbs
- Evansville, IN - Tyler Stock
- Cohasset, MN - Tamara Lowney
- Joseph City, AZ - Bryan Fields
- Ashtabula, OH - Anthony Basil
- Shippenville, PA - Joshua Brock
- Laredo, TX – Dr. Khaled Enab
- Frackville, PA - Bobby Hughes
- Riverside, CA - Bryan Wong
- Pueblo, CO - Frances Koncilja
- Harrisville, PA - Daniel Brockett
- Winslow, AZ - Nick Brokeshoulder

U.S. Department of ENERGY

REPURPOSING ENERGY ASSETS CREATES OPPORTUNITIES

Repurposing Energy Assets

Support the US's Energy Transition Goals and Reduce Costs *(to Utilities and Consumers)*

- Avoided costs from decommissioning *(reduced environmental remediation costs, structural demolition may not need to occur)*

Ensure Equitable Energy Transition

- Re-energize Local Community
- Replace tax revenue and restore jobs
- Create new opportunities in communities impacted by the energy transition

De-risk New Energy Assets

- Less capital investment required for land *(zoning, water rights, etc.)* and auxiliary infrastructure *(transmission, etc.)*
- Provide readily available workforce

Trade & Industry Development: Upcycling Power Plant Benefits (Sept 2013)

STRATEGIES TO TRANSITION

Which Repurposing Option is Right?

Energy and non-energy pathways

Energy Options

- Natural gas
- Renewable electricity (wind, solar, biomass, geothermal)
- Synchronous condenser
- Thermal energy storage
- Nuclear
- Hydrogen/ammonia and other fuels
- Biofuels

Non-Energy Options

- **Manufacturing** (steel, EV's..)
- **Metal / mineral processing** (lithium, copper, and others) and **recovery of rare elements**
- Industrial parks
- Logistics hubs
- Data Centers
- e-Recycling

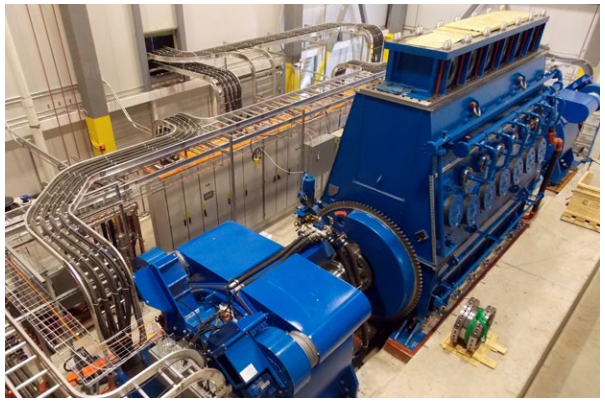
…Some options depend more on having supply chains in place or supporting infrastructure

EXAMPLES OF REPURPOSED ENERGY ASSETS (5-10 YEARS)

Green Repowering of Coal Plants

Repurposing Coal plant in Kemmerer, WY- Terrapower.

Pumped hydro or CAES energy storage in inactive coal mines



Repurposing out-of-use coal mines into pumped hydro or compressed air energy storage facilities to store electricity.

Hydrogen storage or CAES in inactive O&G wells

Repurposing one of the 2.7 million inactive oil and gas wells in the US for compressed air energy storage or Hydrogen storage allows for cheaper storage than above ground tanks.

Bill Gates' TerraPower to build its first nuclear reactor in Wyoming coal town (cnbc.com)

PARTNERSHIP INTERMEDIARY AGREEMENTS (PIA)

DOE Program Offices

- Defines problem statement, program goals, and requirements
- Provides ongoing technical guidance and project oversight
- Funds the effort (via Golden Field Office)

Intermediary (EnergyWerx)

- Awards funding when milestones are met
- Manages performers' adherence to DOE goals and requirements
- Facilitates market research, outreach, webinars
- Manages administrative tasks

Performers

- Perform work
- Provide documentation
- Communicate with EnergyWerx and DOE and respond to feedback

TARGET AUDIENCE FOR THE FECM PIA OPPORTUNITY

People/Organization who will receive the funding (Main)

1. Community Colleges, including Historically Black Colleges and Universities or Minority Serving Institutions, or other educational entities recognized by the U.S. Department of Education's Office of Civil Rights.
2. Local economic development entities.
3. Community based organizations and NGOs; and
4. Local elected officials from municipalities (mayor's office). Labor unions
5. Labor-management organizations,
6. Worker organizations that represent workers in energy communities, and workforce development entities involved in administering the public workforce system.

Supportive Stakeholders (Secondary)

- Asset owners
- Asset operators
- Academia
- Consultants
- Private companies
- Environmental groups
- Local/Federal Government
- State
- Developer (small – medium)

Asset Candidates

- Energy Assets (power plants, coal mines, oil/gas well lands)
- Retired or are planning to retire (2009-2032)

EXPECTATIONS FROM THE PIA

Communities will come together for a common goal to repurpose Energy Assets with an emphasis on workforce retention and development.

Meet with stakeholders.

- *Local Government*
- *Energy Asset Owners*
- *Financiers*
- *Energy Engineering, Sustainable Economic Development, Groups*
- *Equitable transition Groups*
- *Community Advocacy and Planning Groups*
- *Coalition Building Groups*
- *Research & Policy Analysis Groups*
- *Economics and Workforce Development Division*
- *R&D Entities close by*
- *Grant writers*

Find Faculty Coaches in and around your community such as:

- *Energy Transition Community Planner*
- *Utility Union Leader*
- *Regulatory expert*

You need to come together with project goals…

- *A shared understanding of the importance of unlocking the potential for new opportunities in the communities*
- Help communities transition to sustainable solutions.
- Create a group that constitutes **local decision-makers and advocates.**
- Create a draft proposals to garner support and funding from various sources.

Community

Assets

Technologies

Owners

Investors

U.S. Department of ENERGY | Office of Fossil Energy and Carbon Management

COLLABORATIVE APPROACH

DOE is facilitating communication between community, asset owners, and other stakeholders through this Funding Opportunity

Join Our Ecosystem which collects potential data and provides convenient notifications for future opportunities.

IMPACTS

Provide

Enduring economic benefits for communities and the private sector alike, with support from the federal government

DOE and the general public with a central repository of information around Energy asset repurposing.

Inform

Inform DOE as well as other communities and help reach the net zero goal

Spur greater input and participation from industry in helping reach the net-zero future

Generate

Generate ideas for communities on best ways to work together to adopt new technologies and find ways for these communities to continue to thrive beyond current operations!

FECM CROSSCUTTING WORKFORCE PROGRAMS

University Training and Research

Education and Training

Early-Stage R&D

Building R&D Capacity

Preparing the Future Workforce

ORISE Internship Programs

Hands-On Experience

Mentorship

Connecting Theory to Practice

MICKEY LELAND ENERGY FELLOWSHIP PROGRAM

- A **10-week, paid** summer research program for Science, Technology, Engineering, and Math (STEM) students
  - Undergraduate student: $750/week; Graduate student: $850/week
- Receive **mentorship** from DOE scientists and engineers
- Provide **hands-on experience** complementing course of study and connect **theory to practice**
- Increase **confidence**, enhance **communications skills**, and promote **critical thinking** and **problem solving**

MLEF PROGRAM

ELIGIBILITY

- Be at least age 18
- Be a U.S. Citizen
- Have a minimum 2.8 GPA
- Be enrolled full-time in a STEM degree program at the Associate, Bachelor's or Master's level at the time of application.
- Must be a college sophomore or higher

REQUIREMENTS

- Commit for the full 10-week program
- Attend orientation and present research findings at the Technical Forum

Summer 2025 applications due January 21, 2025

U.S. Department of ENERGY | Office of Fossil Energy and Carbon Management

NETL INTERNSHIP PROGRAMS

Opportunities for current students and recent graduates

PROFESSIONAL INTERNSHIP PROGRAM (PIP)

- Current undergraduate or graduate student in good standing at a regionally accredited college/university or a post-baccalaureate within 2 years of graduation
- Minimum GPA of 2.5/4.0
- At least 18 years of age at the time of the appointment

POSTGRADUATE RESEARCH PROGRAM (PGRP)

- Have earned/about to receive master's or doctoral degree
- Graduate who received master's degree within the last 3 years or doctorate within the last 5 years

Search "PIP" or "PGRP" on Zintellect

www.netl.doe.gov/education/internships

New opportunities in critical minerals!

- Chemical/Environmental/Industrial Engineering
- Process/Chemical/Civil/Environmental Engineering
- Economic Geology; Resource/Mineral/Environmental Economics
- Organic, Inorganic, Physical, Analytical Chemistry; Geochemistry/Biogeochemistry
- Extractive Metallurgy

DOE FACULTY RESEARCH OPPORTUNITIES

NATIONAL ENERGY TECHNOLOGY LABORATORY

NETL Faculty Research Program

Opportunity for faculty to collaborate with principal investigators at **NETL facilities**.

For full-time regular permanent faculty member at an accredited college/university with a research interest in NETL core R&D areas.

Office of Science Visiting Faculty Program

- Opportunity for faculty to collaborate at **one of 15 participating DOE National Labs** for (1) research or (2) teaching initiative.
- For full-time (U.S. citizen) faculty members from institutions historically marginalized in STEM research (non-R1/R2, except for R2 HBCUs).

U.S. Department of ENERGY | Office of Fossil Energy and Carbon Management

FACES
Faculty-Applied Clean Energy Sciences

Faculty-Applied Clean Energy Sciences Program

- Opportunity for faculty to collaborate with principal investigators at the **National Renewable Energy Laboratory.**
- For full-time regular permanent faculty member at Minority-Serving Institutions.
- Faculty will develop scalable education modules on topics like community engagement, human behavior, energy and environmental science, and artificial intelligence

OTHER RESOURCES AVAILABLE FOR COMMUNITIES THAT HAVE CLOSING ENERGY ASSETS

U.S. Department of ENERGY

FEDERAL RESOURCES FOR PROPERTY REINVESTMENT

- Site Readiness
- Planning
- Basic Infrastructure
- Workforce
- Energy Repurposing
- Non-Energy Economic Development

U.S. Department of ENERGY

Thank you!

Dr. Bhima Sastri

Director, Energy Asset Transformation

Bhima.Sastri@HQ.DOE.GOV