

ITC

WYOMING

INTEGRATED

TEST CENTER

Next Generation Technology
for Today's Energy

Why Wyoming?



The Goals

How to keep coal viable and an important part of Wyoming's economy while addressing societal concerns over carbon emissions?

Can we turn a liability into an asset?

Let's position Wyoming as a leader on solutions!

Wyoming efforts

2008

HB0089: Ownership of subsurface pore space

Specifying and clarifying ownership of subsurface pore space

HB0090: Carbon capture and sequestration

Creates a regulatory scheme for geologic CO₂ storage

2009

HB0057: Ownership of pore space-dominance of mineral estate

Carbon capture and sequestration

HB0058: Responsibilities of injectors and pore space owners

Establishes ownership and liability of CO₂ at injection site

HB0080: Sequestration site unitization

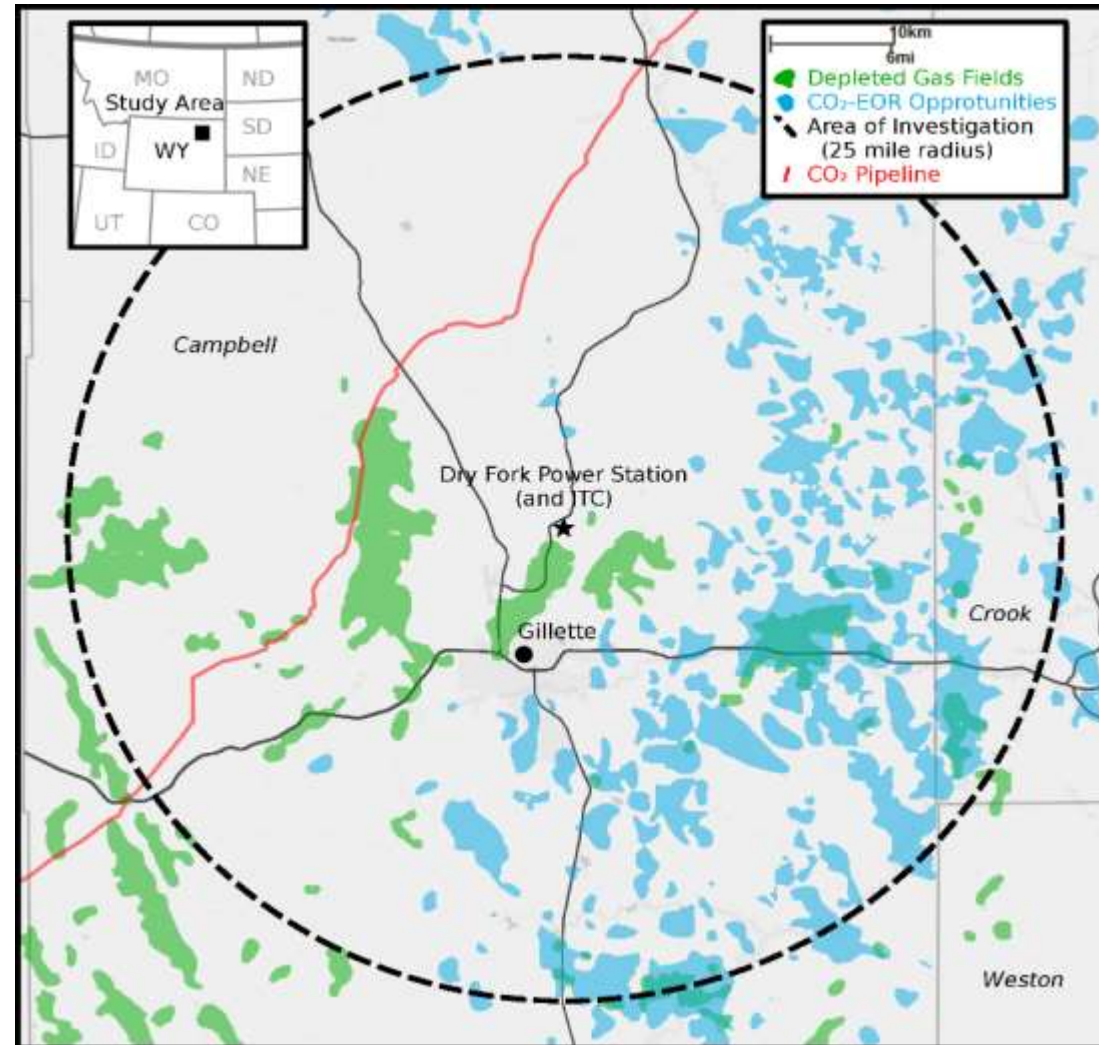
Adopts new procedure for “unitizing” geologic sequestration sites used for the sequestration of CO₂

2010

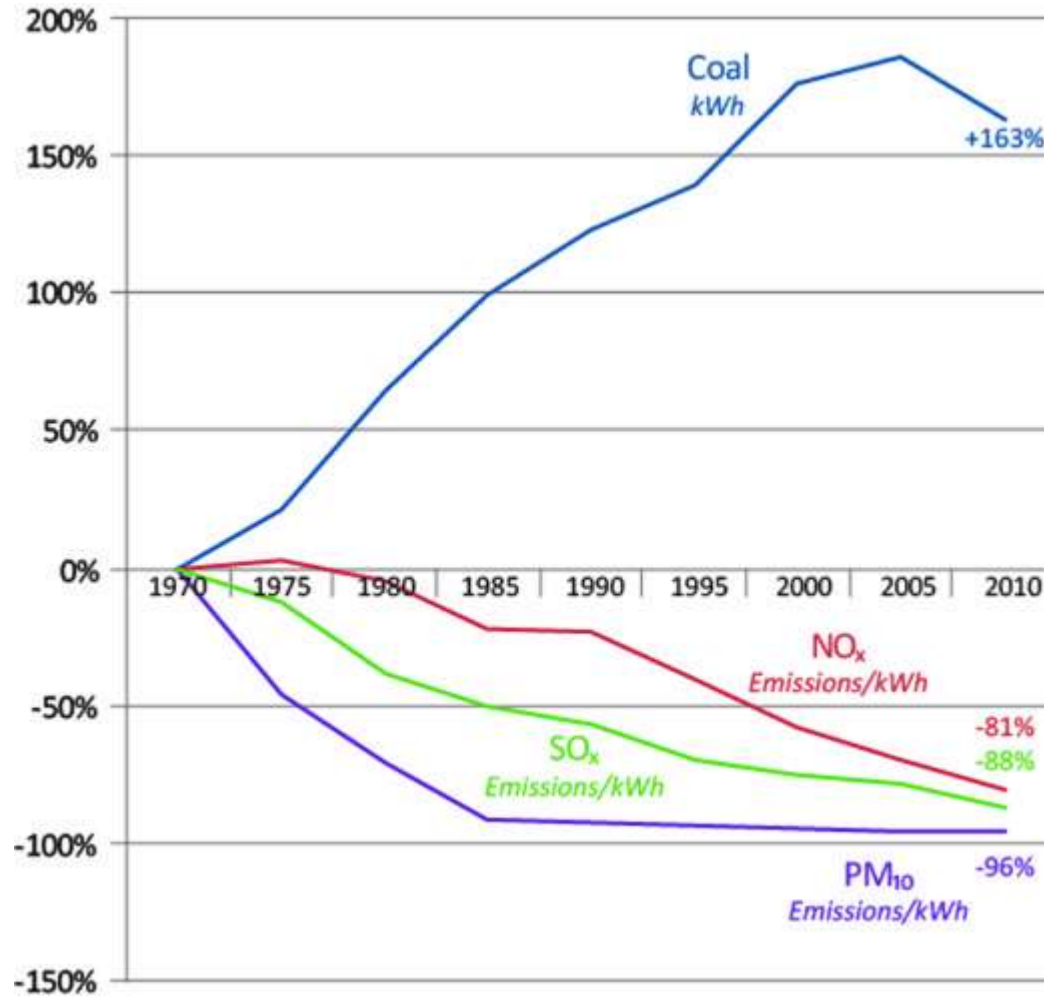
HB0017: Carbon sequestration-financial assurances and regulation

Establishes the Wyoming geologic sequestration special revenue account

CO₂ Needs Near ITC



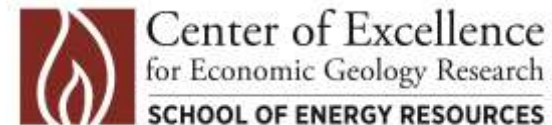
Technology works...



Develop the pieces

Message, Basic Research, Scale-up, Commercialize

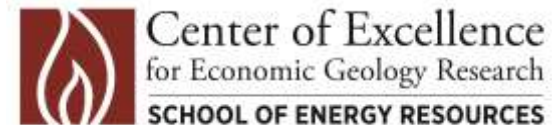
- University of Wyoming School of Energy Resources
- Center for Economic Geology Research
- Enhanced Oil Recovery Institute
- Wyoming Integrated Test Center
- Wyoming Pipeline Corridor Initiatives
- ENDOW



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The ITC

- One of the world's largest post-combustion demonstration scale test facilities
- 20+ MW of coal derived flue gas from the Dry Fork Power Station
- Simple design minimizes costs, provides flexibility & quick turnaround times
- Designed for maximum flexibility and scalability for testing

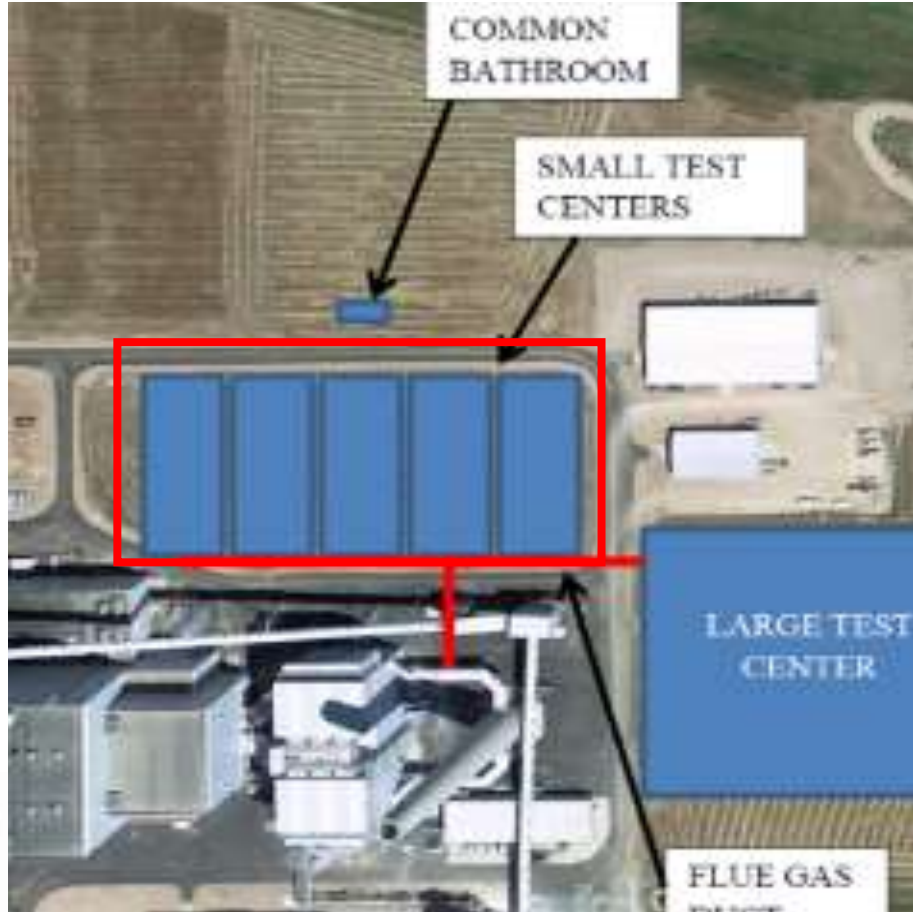


Who is invested in the ITC?

- State of Wyoming - \$15 million
- Basin Electric – Host at Dry Fork Station
- Tri-State G&T - \$5 million
- National Rural Electric Cooperatives Association - \$1 million
- Wyoming Infrastructure Authority – Managing Entity
- Black Hills Corp. and Rocky Mountain Power providing technical expertise and in-kind contributions
- XPRIZE Foundation



Site of XPRIZE competition - Small Test Bays



XPRIZE is a temporary tenant of the ITC and at the completion of the competition, the space will be available to new testers.

Small Test Bay



XPRIZE competition



Breathe (Bangalore, India) – Led by Dr. Sebastian Peter, the team is producing methanol, a common fuel and petrochemical feedstock, using a novel catalyst.



Carbon Capture Machine (Aberdeen, Scotland) – Led by Dr. Mohammed Imbabi, the team is producing solid carbonates with applications to building materials.



C4X (Suzhou, China) – Led by Dr. Wayne Song and Dr. Yuehui Li, the team is producing chemicals and bio-composite foamed plastics.



Dimensional Energy (Ithica, NY, USA) – Led by Jason Salfi, the team is using artificial photosynthesis to produce environmentally responsible polymers and chemical intermediaries for industrial partners.



Carbon Upcycling UCLA (Los Angeles, CA, USA) – Led by Dr. Gaurav Sant, the team is producing building materials that absorb CO₂ during the production process to replace concrete.

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Large Test Bay



Large Test Bay



Large Test Bay Potential Tenants





TDA Research

- TDA – based in Wheat Ridge, CO
- Hybrid membrane/sorbent test system
- Registering company with the State of Wyoming
- In permitting discussions with DEQ
- Testing onsite this fall!





JCOAL – KHI



- July 2016 – State of Wyoming - JCOAL (Japan Coal Energy Center) MOU
- April 2017 – WY delegation meetings in Japan
- Sept. 2017 – JCOAL/UWSER conference in Gillette
- March 2018 – WY delegation meetings in Japan
- April 2018 – Announcement of JCOAL-KHI (Kawasaki Heavy Industries) test at ITC – dry sorbent, fixed bed technology
- May 2018 – Japan Ministry of Environment, JCOAL and KHI trip to Gillette
- August 2018 – Feasibility trip to Gillette
- December 2018 – Met with US based EPC firms
- February 2019 – Wyoming permitting trip



Tenant Support and Operations

- Contract technical operations support
 - Engineering, permitting, site support
- Hladky Construction is site services contractor
- EPA/DEQ permit clarification for Basin Electric
- Contract negotiations
- Electrical service agreement with PreCorp
- Additional amenities and infrastructure
 - Emissions monitoring equipment
 - Control room
 - Natural gas line/steam boiler



Partnership & Business Development

- Partnership with National Carbon Capture Center
- Carbon180 & Carbontech Labs agreement
- Engaging with researchers and stakeholders
 - International Energy Agency
 - Pittsburgh Coal Conference
 - NETL Clean Coal Conference
 - GHGT – 14
- University of Wyoming School of Energy Resources
- International Carbon Capture Test Center Network
- American Jobs Project



Finding a pathway to commercialization is critical!

Policy and Finance Development

- Congressional Testimony
 - July 2017 – US Senate Committee on Environment and Public Works
 - July 2018 – US House Committee on Science
 - April 2019 – US House Committee on Energy and Commerce
- Engaging with researchers
 - International Energy Agency
 - Pittsburgh Coal Conference
 - NETL Clean Coal Conference
 - GHGT – 14
- New financing options
 - Foundations, high tech
 - Sovereign wealth funds



International Recognition



Peabody Clean Coal Leadership Award: Carbon Capture Pioneer
Presented at the PowerGen International Conference



“We live in a time where technological progress is almost boundless and opportunities across all energy sectors are wide-open. We can always do things better. Today we need not see renewables and conventional sources of energy as competitive. There is room for both if we have an open mind, and both are part of a solution. That is what we are about here in Wyoming.”

-Governor Gordon, WIA Spring 2019 Conference

Stay in Touch!

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