

State of Texas - Carbon and Capture Projects

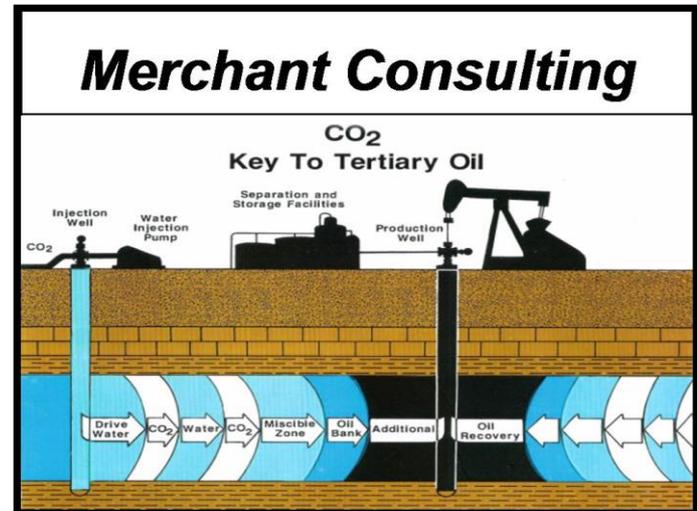
Two Shovel Ready Projects for 2017

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Texas Clean Coal Project Development

July 4, 2017 (Happy Birthday America)

Magnolia, Texas

Expected Coal-fired Power Plant Closures in 2017-18

In a report issued April 21, 2017 by the Institute for Energy Economics & Financial Analysis, 46 coal-burning units at 15 Power Plants across 16 states will close or greatly reduce production by 2018, resulting in a 30 million-ton decrease in demand for coal.

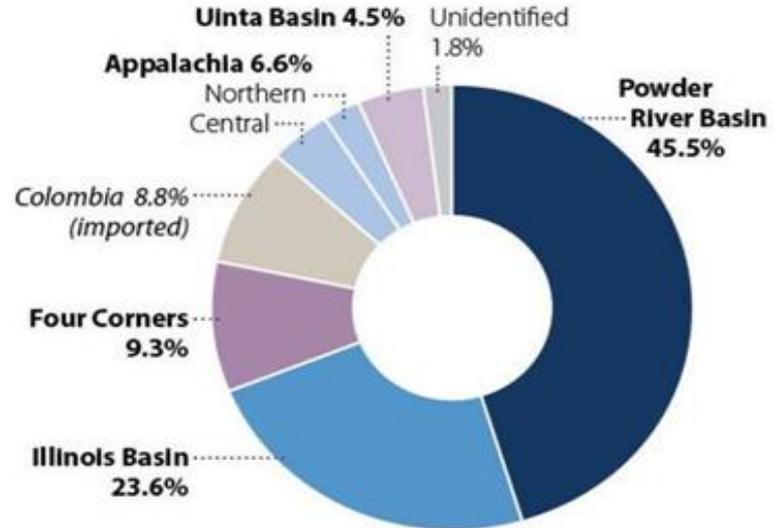
States include:

Colorado, Florida, Kentucky, Illinois, Massachusetts, Minnesota, Nevada, New Jersey, New Mexico North Dakota, Ohio, Tennessee, Texas, Virginia, West Virginia, and Wisconsin.

Wyoming - Powder River Coal Shovel Ready Coal Projects



Regional Impact of Coal Retirements in 2017-18
Based on 2016 coal delivery contracts and estimated unit coal use.



Wyoming - Powder River Coal Shovel Ready Coal Projects



Donald Trump wears a coal miner's protective hat while addressing supporters at a rally in Charleston, W.V., last May.

When you turn to a Solution to Wyoming's Coal Crisis, you might want to turn to **TEXAS** for a **CCS** Solution

Wyoming - Powder River Coal Shovel Ready Coal Projects



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The **Benefits would be:**

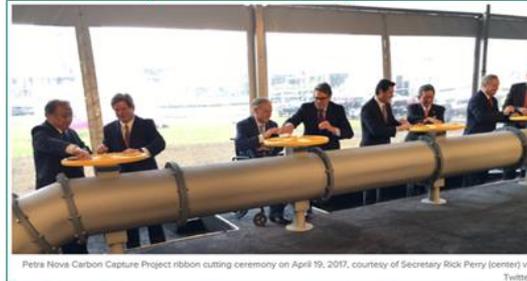
- 1. Jobs.... Jobs.... Jobs....**
- 2. Two 50 Year Long Life Projects**
- 3. Shovel Ready (Now)**

State of Texas – Petra Nova Plant

Petra Nova Plant – Washington Parish - Texas



Secretary Perry – April 19, 2017
CCS Ribbon Cutting Ceremony
CCS Project: On Budget/On Time



Petra Nova Clean Coal Plant is the very First Large Scale “Clean Coal” Facility in the USA

Petra Nova – November 2016

NRG and JX Nippon Oil & Gas

The first large scale U.S. “clean coal” facility was declared operational Tuesday – by the large energy firm NRG Energy and JX Nippon Oil & Gas Exploration Corp.

Their Petra Nova project, not far outside of Houston, captured carbon dioxide from the process of coal combustion for the first time in September, and has now piped 100,000 tons of it from the plant to the West Ranch oil field 80 miles away, where the carbon dioxide is used to force additional oil from the ground. The companies say that the plant can capture over 90 percent of the carbon dioxide released from the equivalent of a 240 megawatt, or million watt, coal unit, which translates into 5,000 tons of carbon dioxide per day or over 1 million tons per year. They’re calling it “the world’s largest post-combustion carbon capture system.”

“There are not many coal plants that are being built these days,” said Mauricio Gutierrez, the president and CEO of NRG. “We think that actually having an experience in installing a [carbon capture and storage] technology in existing

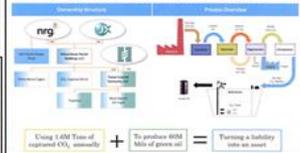
**On-Budget
 On-Time**

Congrats..

Petra Nova Plant – Washington Parish - Texas



A 240 MW carbon capture system (CCS) processing flue gas from a subcritical oil of WA Parish Unit 8 to capture approximately 1.6 million tons of CO₂ annually that will be used for enhanced oil recovery (EOR) operations on the Texas Gulf Coast beginning with the West Ranch field in 2016



In 2017, Rick Perry celebrated with the start-up of the Petra Nova Plant which represents the very First Large Scale “Clean Coal” Facility in the USA.

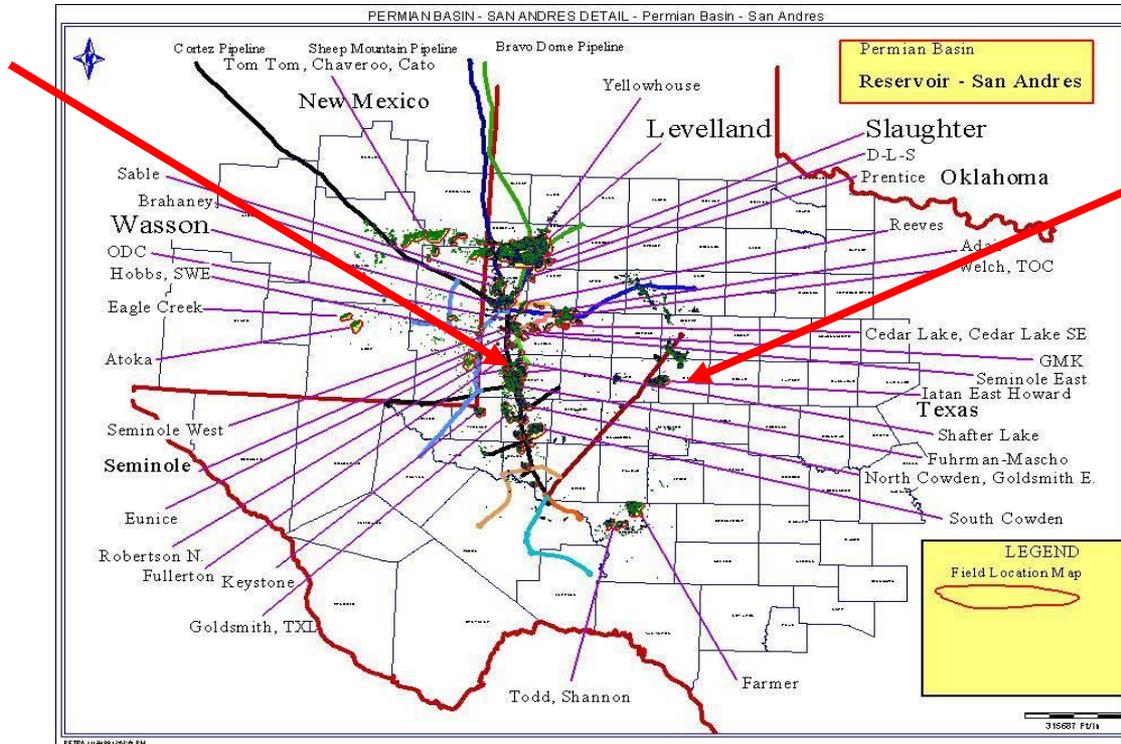
Permian Basin – Two Shovel Ready Clean Coal Projects

Odessa Texas

(Summit Power Plant)

Sweetwater Texas

(Tenaska Power Plant)



Between 2005 and 2015, two Permian Basin Power Plants utilizing Wyoming Powder River Coal as a source were designed, pursued, but later SHELVED

CO₂ Sequestration / EOR

Odessa Texas (Western Permian)

The Texas Clean Energy Project

Speaker: Eric Redman, President - Summit Power Group

1. Project will be built by Siemens, Fluor, and Linde as the equipment suppliers and construction contractors. The design engineering work is well underway.
2. Air permit will be granted by December 17 -- no one requested a hearing on it (cleanest permit in Texas history).
3. The project's long-term performance & availability to be guaranteed by Siemens.
4. The project has received a \$450 million cash grant from DOE and a \$313 million investment tax credit from the IRS.
5. Major lender banks have been selected, and several major investors are currently in discussions to become the majority or minority owners of the project.
6. Project is on schedule for completion of permits and contracts by mid-2011, financing in fall 2011, and start of construction right after financing.
7. Project will produce 200+ megawatts of power for sale, 500,000 tpy of urea (reducing imports by 10%), and 3 million tons per year of CO₂ captured for EOR, which should increase Permian Basin oil production by 6 to 9 million barrels per year.
8. 1200-1500 construction jobs expected through 2014, more than 100 permanent jobs when project is completed.



Construction: 2012 - 2014

Produce: 200 MW Power Plant

500,000 tons/year Urea

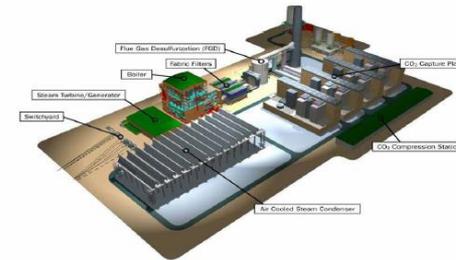
3 million tons/year CO₂

Sweetwater Texas (Eastern Permian)



Tenaska Trail Blazer Project

Speaker: Jeff James, Director of Business Development - Tenaska



- Clean energy: a cutting-edge power plant designed to capture 85-90% of its CO₂ (300 MMSCFD)
- Water conservation: will use highly water efficient dry cooling design
- Jobs and revenue: 1,500 jobs at peak of construction - 100+ for operation Construction will inject more than \$742 million in economic activity in Nolan County
- Enhanced energy security:
- CO₂ for EOR in the Permian Basin - 17,500 tons per day of CO₂
- Secure power supplies for Texans: a 600 MW (net) pulverized coal-fueled electric generating station powering 600,000 homes
- Expect final Air Permit by end of this year – TCEQ draft agenda December 14, 2010
- Fluor CO₂ Capture Tech, Arch Coal 35% equity interest, Global CCS Institute grant

Construction: No Date Set

Produce: 600 MW Power Plant

6 million tons/yr CO₂

Two Shovel Ready Projects in Texas Currently Shelved.

Texas Clean Energy Project

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Odessa Texas (Western Permian)

Midland CO₂ Conference - 2009

Construction: 2012 - 2014

Produce: 200 MW Power Plant - 150 MMSCFD - 8,750 tons/day - 3 million tons/yr CO₂

Merchant Consulting - Midland CO₂ Conference - 2009

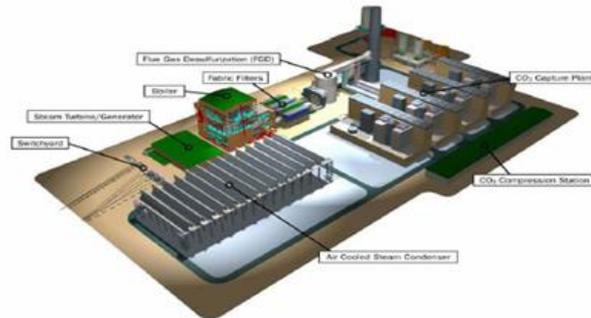
The Texas Clean Energy Project was designed to deliver CO₂ to the Central Basin Pipeline which supplies CO₂ to oil fields located on the Western edge of the Permian Basin

Tenaska Trail Blazer Project

TENASKA

Tenaska Trail Blazer Project

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Sweetwater Texas (Eastern Permian)

Midland CO₂ Conference - 2009

Construction: No Date Set

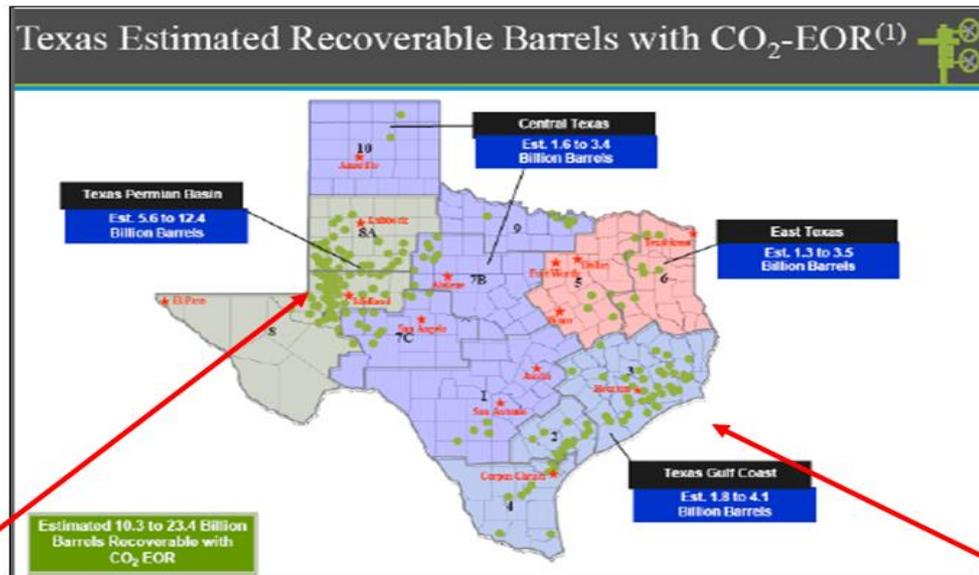
Produce: 600 MW Power Plant - 300 MMSCFD - 17,500 tons/day - 6 million tons/yr CO₂

Merchant Consulting - Midland CO₂ Conference - 2009

The Tenaska Trail Blazer Project was designed to deliver CO₂ to the CRC Pipeline which supplies CO₂ to oil fields located on the Eastern edge of the Permian Basin

Tertiary CO₂ Flooding Potential

“Size of the Prize - Texas”



Permian Basin – 6 to 12 Billion Barrel Target

(Produced over 1 Billion Barrels to date)

Texas Gulf Coast – 2 to 4 Billion Barrel Target

Texas Total – 10 to 23 Billion Barrel Target

Ref: Tracy Evens (Denbury, Blue Strategies)

Merchant Consulting - CO₂ Conference - 2009

When you look at the “Size of the Prize”, the state of Texas contains a tremendous potential for Tertiary Oil Recovery with CO₂ in the Future.

Note: Since 1972, over 1.3 Billion Barrels of CO₂/EOR Tertiary Oil have been produced from the Permian Basin with a 6 to 12 Billion Barrel EOR Target Potential with additional CO₂ Supply

Tertiary CO₂ Flooding Potential

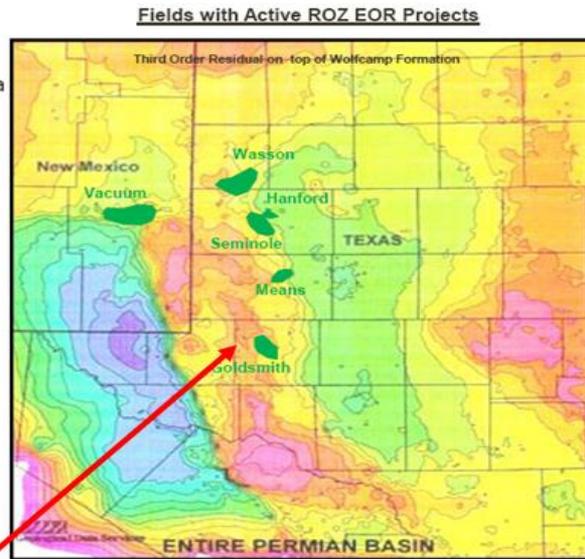
“Size of the Prize - Permian Basin ROZ”

ARI estimates 30 BBOOIP are sitting in ROZ zones in the Permian Basin alone.

- Large opportunity for EOR
- Big impact on West Texas Oil Industry
- Huge Potential Energy Resource for America

Active ROZ Projects

Seminole - Hess
Wasson - Oxy
Hanford - Fasken
Vacuum - Chevron
Means - Exxon
East Seminole - Tabula Rasa
Goldsmith - Legado



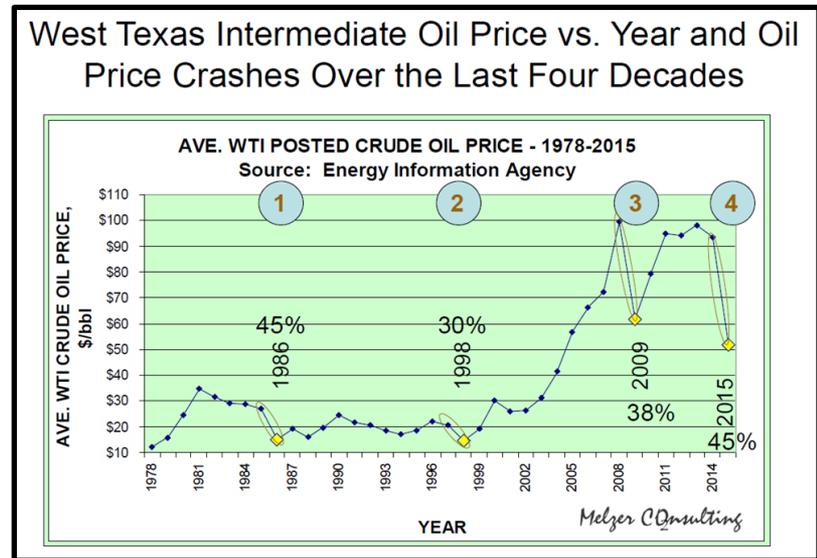
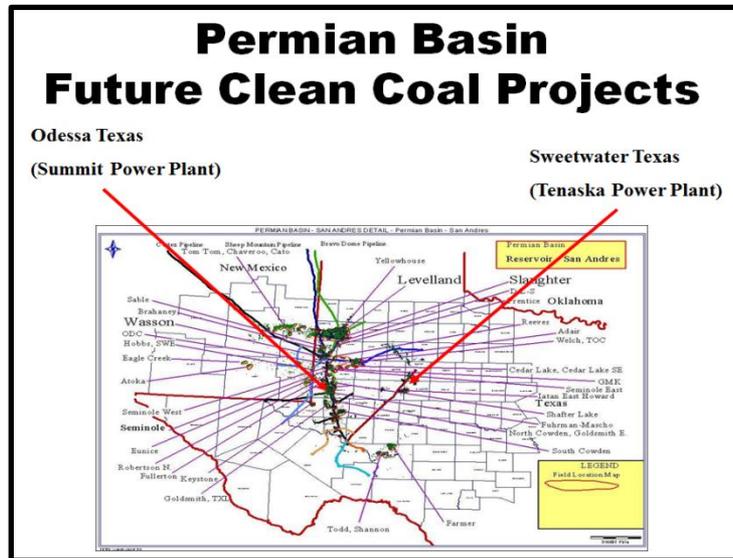
Ref: ARI ROZ Report

Advanced Resources International (ARI) Estimates – 30 Billion Barrel OOIP Target in ROZ

Merchant Consulting - CO₂ Conference - 2009

When you look at the “Size of the Prize”, the Permian Basin also contains a tremendous potential for Residual Oil Recovery (ROZ) way beyond Main Pay Oil Recovery with ROZ Tertiary Oil Recovery estimated at over 30 Billion Barrels of Oil-in-Place

The Question Becomes How do you Pay for it?



In the 1980's the Permian Basin Infrastructure was built and in 1986 oil price collapsed by 45%, just like in 2015. All major EOR projects still went forward and still continue today after many oil price adjustment periods through time. Today, over 90% of the Oxy's Major CO₂ Field Projects in the Permian basin still produce Tertiary Oil even in a challenging \$45 dollar oil price environment (Date: June, 2017).

Merchant Consulting Recommendations

Carbon Credit versus Investment Tax Credit in CO₂/EOR Projects

Facts:

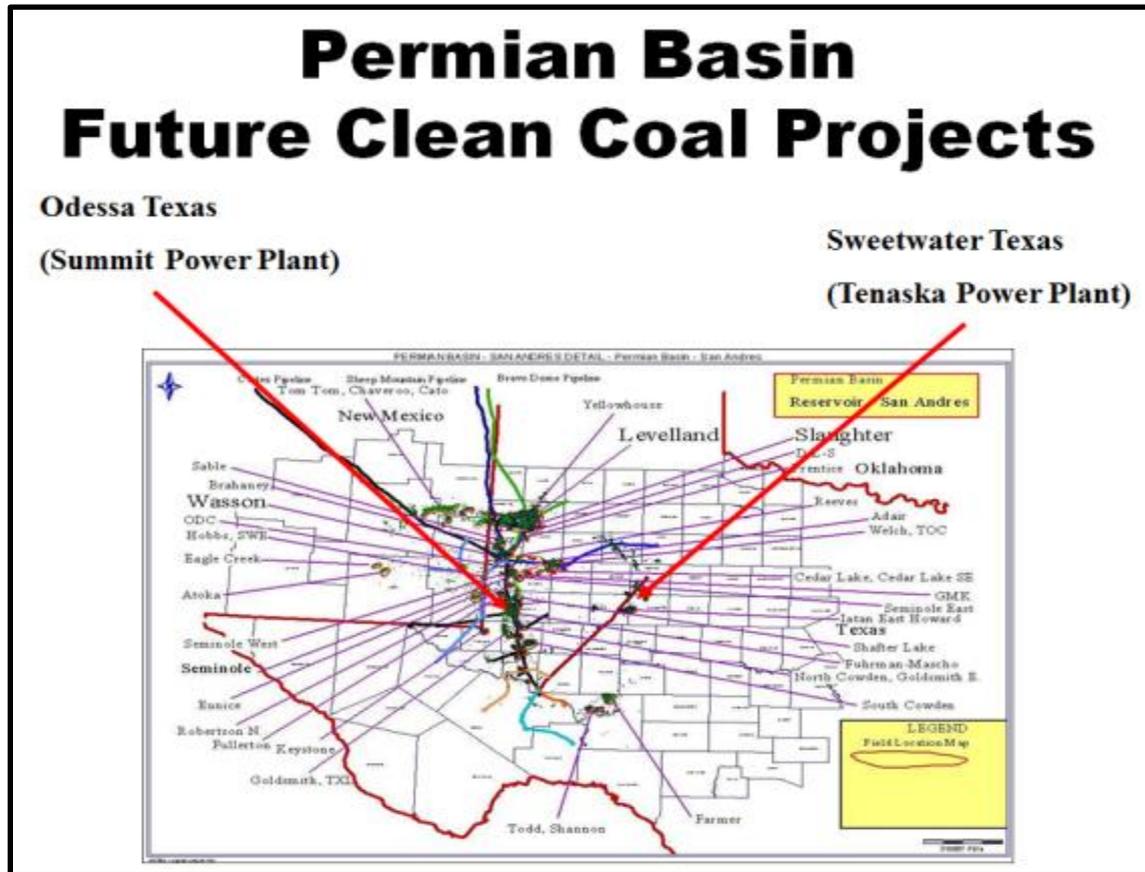
- 1. CO₂/EOR projects are highly frontend loaded economically with high capital costs associated with mostly the CO₂ Recovery Plant and Field Investments. These mostly occur at the beginning of the project. After installation, these infrastructures have in many cases lasted at least 45 years (Sacroc Unit) and with proper maintenance could last another 45 years into the future.**
- 2. The \$10/ton Carbon Credit offered by the Obama administration provides an incentive, but didn't help towards improving the economics of a CO₂/EOR project.**

Merchant Consulting Recommendation

In the 1980's, the Economic Incentive that drove the Major Oil Companies to move into Enhanced Oil Recovery projects in the Permian Basin was the EOR Tax Credit; whereby a 15% Investment Tax Credit could be applied for the first five years of project life. This approach improves economics over the \$10/ton Carbon Credit by providing the benefit up-front in the economic analysis instead of over time.

The Question Becomes

The Question becomes “Secretary Perry – You were successful at Petra Nova – Here are Two Shovel Ready Projects in Texas ready to keep Coal Miners Working – What’s next on your agenda?”



You made a promise to all the Coal Miners in America

Bragging Rights



Imagine: Three “Clean Coal Projects” in 2017

1. Petra Nova (Completed **On-time** and **On-Budget**)
2. Texas Clean Energy Project (**Shovel Ready**)
3. Tenaska Trail Blazer Project (**Shovel Ready**)

Make America Great Again for the Coal Industry

**Create JOBS in both the Powder River Basin in Wyoming
and the Permian Basin in West Texas**