



**Texas Clean Energy Project
A 400MW Power/Polygen Project
With 90 percent carbon capture**

**Clean Coal Industry Forum
Billings, MT**

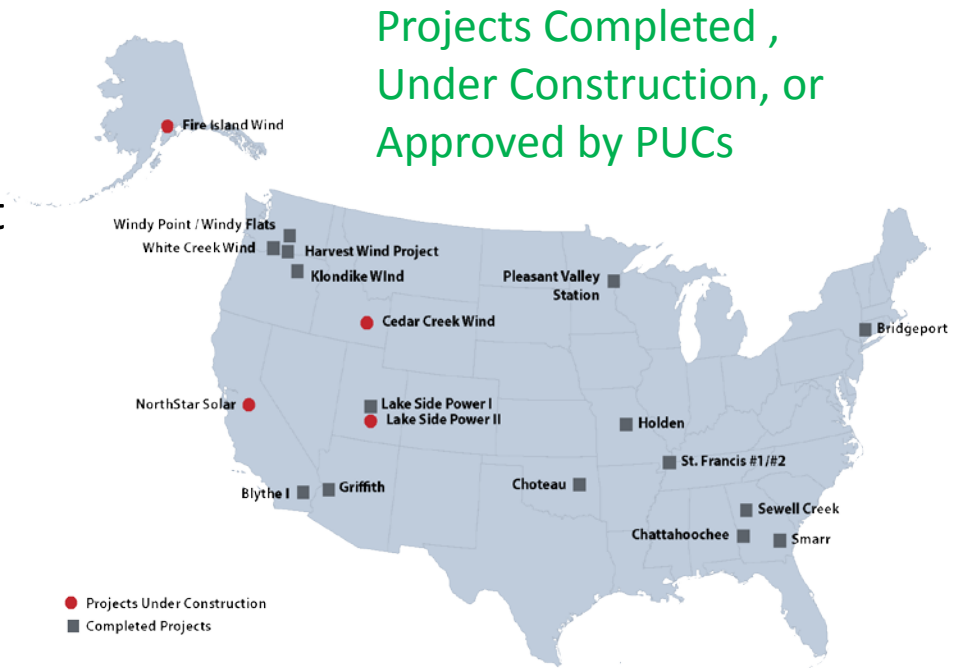
August 26th, 2015

Jason Crew, CEO, Summit Power Group

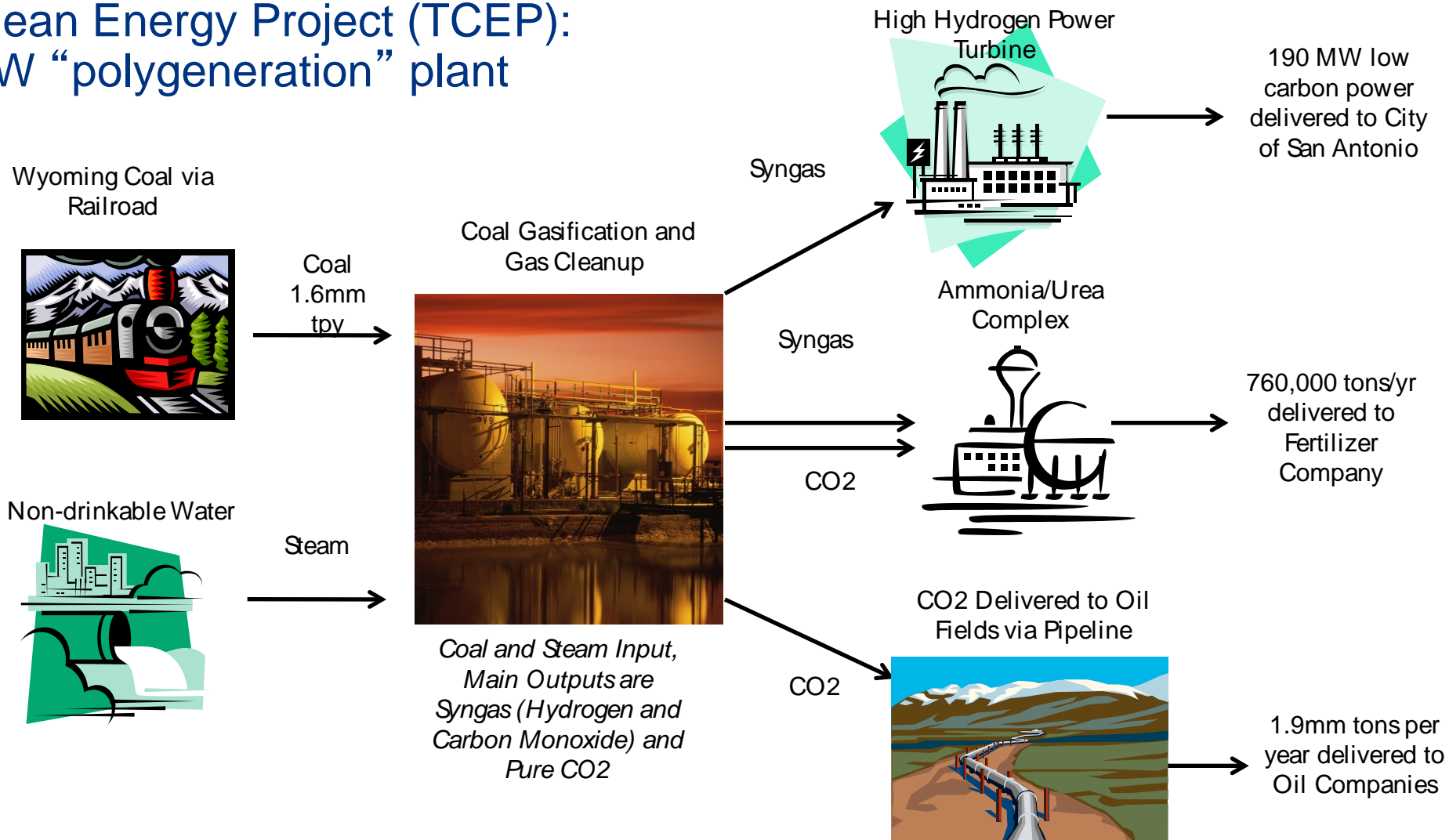
Summit Power



- Summit Power Group is a Seattle-based developer of clean energy projects
- Founded 23 years ago by former U.S. Secretary of Energy Don Hodel & COO of Department of Energy Earl Gjelde
- Summit's projects:
 - Over 7,000 MW completed
 - Over 2,500 MW in development
- Summit's principal project types:
 - Wind power
 - Solar power
 - Natural gas-fired power plants
 - Carbon capture projects



Texas Clean Energy Project (TCEP): A 400 MW “polygeneration” plant



Five Siemens gasifiers of TCEP-type on line in China



The Siemens gasifier



TCEP financing readiness & shovel-readiness



- All key permitting is now complete:
 - Record of Decision from US DOE on 9/29/11 (completes NEPA/EIS process)
 - Air permit issued 12/28/10 (no opposition/request for hearing)
- Off-take agreements completed & signed:
 - 100% of power sold to CPS Energy for 25 years (contract renewed 10/14)
 - 100% of CO2 sold for 30 years (two investment-grade offtakers)
 - 100% of urea sold for 20 years (confidential – to be announced)
- EPC Team Updating FEED (front end engineering + design) 1stQ 2015
 - EPC Team Members: China Huanqui Contracting & Engineering Corp. (HQC) + US partner in place (to be announced), and Siemens
 - Anticipated 2015 financial closing and groundbreaking
 - All of debt to be provided by the Export-Import Bank of China (Chexim); equity investors to be publicly disclosed in 3rdQ 2015

Where is the Project?



Site Location and Infrastructure

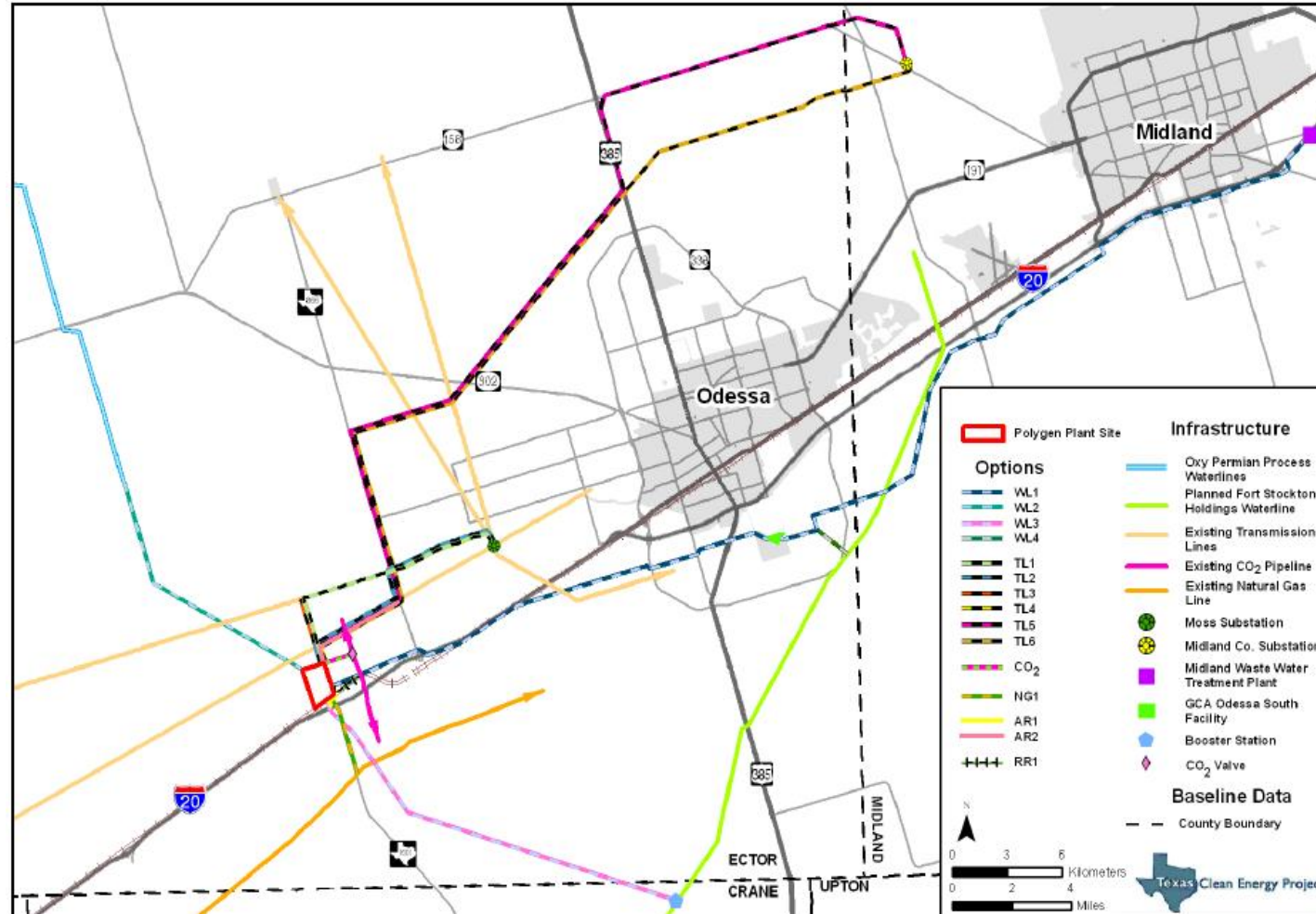


Figure 2.1. Polygen plant site and associated linear facilities.

The 600-acre site
(after a rain)



Four necessary acknowledgments



TCEP could not be built without US DOE financial support

- Although designed to be project financed, TCEP is still a first-of-a-kind plant DOE's grant funding significantly reduces the *net* cost to be project financed Yet TCEP is also a “reference plant” we believe can be replicated elsewhere

Support from the people of Odessa, Texas, has been unwavering

- No project of this size can succeed without strong local support

Support from national environmental groups has been essential

- EDF and CATF have supported from the outset; also strong relationship with NRDC. This has been immensely valuable in terms of process, not just politics

Good fortune, not genius, accounts for some key TCEP advantages

- Example: size “mismatch” between Siemens gasifiers & high-H₂ combustion turbine created extra syngas; this compelled polygen & led to urea production

Benefits (TCEP) from not burning coal: negligible SO_x, NO_x, PM



Annual emissions from all sources at site.

Context for forming Summit Carbon Capture



- It is important to commercialize CO₂ capture at large scale
- Capturing large volumes of CO₂ at a power plant is feasible
- Problem is where to put the CO₂ – and how to pay for its capture
- Today, U.S. (basically) doesn't pay for CO₂ capture & sequestration
- So today, EOR is the sole source for substantial CCS revenues (algae farms need CO₂ but consume relatively little)
- Moreover, building long new CO₂ pipelines eats up the revenue
- So “Stage 1” of large-scale CCS involves (1) locating capture plants where EOR infrastructure exists, and (2) dealing with oil producers
- Oil producers prefer natural (geological) CO₂ for several reasons
- TCEP provides lessons in how to compete with natural CO₂
- Major national environmental organizations support CO₂/EOR

$\text{CO}_2/\text{EOR} = \text{CCS} + \text{a bridge}$



- **CO_2/EOR has safe, reliable, high-volume history since 1972**
 - Especially in Permian Basin, this is not an experiment with more than 3,000 miles of dedicated pipelines
- **CO_2/EOR with MVA can be highly reliable form of CCS**
 - CO_2 can remain sequestered for more than 1,000 yrs (the TX standard)

Job Creation



- TCEP will create:
 - **1,500 to 2,000** construction jobs (groundbreaking 2015)
 - **150** full-time plant jobs (management, administration, operators, maintenance est.) when plant opens 2018
 - **200** additional skilled personnel during major maintenance periods every 3 years
 - **8,000** ancillary jobs created by TCEP vendors (manufacturing, engineering, permitting, administrative, shipping, purchasing, R&D positions)

Local Financial Support



- Local financial incentives include:
 - \$5 million jobs grant from Odessa Development Corporation (approved 1/25/10)
 - Donation of 600-acre site in Penwell by ODC (3/31/10)
 - 100 percent tax abatement for 10 years beginning 2013
 - Ector County (approved 5/23/11)
 - Odessa Junior College District (approved 6/23/11)
 - Ector County Hospital District (approved 7/12/11)
 - Ector County ISD (per Texas Tax Code, Chapter 313.025; approved 12-13-11)

Contact information



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