



Texas Clean Energy Project

Progress Report

Chris Kirksey, Summit Power Group, Inc.

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Snapshot of TCEP



- 400 MW “polygen” IGCC project w/ 90% carbon capture
- Siemens gasifiers & 1x1 F-class CCCT w/ high H₂ CT
- Located near Odessa site directly atop Permian Basin
- All components already in commercial use elsewhere; only the integration is new; intended as a reference plant
- Fixed-price, lump sum, turnkey EPC contracts complete
- Siemens & Linde will warrant long-term performance & availability under 15-year O&M Agreement
- 90% carbon capture rate yields \approx 2.5M std tpy of CO₂; CO₂ emissions only 20 to 30% of a natural gas CCCT’s

Update: TCEP is ready



Since last year's conference here in Midland:

- Permitting now complete:
 - Record of Decision from US DOE on 9/27/11 (completes NEPA/EIS process)
 - Air permit issued 12/28/10 (no greenhouse gas emissions limits)
- Off-take agreements now complete:
 - 100% of power sold to CPS Energy for 25 years (executed 12/4/2011)
 - 100% of CO2 sold for 30 years (three different buyers; market remains strong)
 - 100% of urea sold for 15 years (buyer is a huge fertilizer/chemical company)
- EPC contracts complete & will be signed this month: unique result
 - Siemens, Linde, and SK E&C are the EPC contractors
 - Lump-sum, fixed-price, turnkey EPC contracts (power block + chemical block)
- IRR range looks good for equity investment
- Bank syndicate (led by RBS) formed to obtain necessary debt

Off-take information



- Power sales agreement with CPS Energy (largest U.S. muni utility):
 - 195 MW of take-or-pay capacity; delivery point is nearby Oncor T-Line
 - Buyer pays fixed cost for capacity + agreed O&M charges for energy
 - Carbon content of power: less than 25% of that from a natural gas CCCT
 - *First time any utility has bought low-carbon power from a commercial-scale carbon capture power plant – a milestone in global environmental history*
- CO₂ sales (for 2.5 million tons per year of CO₂, take-or-pay):
 - Slightly different pricing formulas in each of three (3) contracts
 - Price is for each Mcf; average price somewhat higher than reported “market”
 - Buyer pays (a) transportation costs, plus (b) increases in compression costs
 - Buyer gets 100% of severance tax and sales tax benefits under HB 469
- Urea prices (all sold to one buyer under take-or-pay contract):
 - Agreed floor price with agreed formula for sharing market price above floor
 - Excellent market price outlook (plus ability to make liquid fuels in long term)

Status of Financing



- DOE \$450M award is now vested (can't be “clawed back”)
- \$313M Sec. 48A investment tax credit also vested via an IRS contract
- TCEP also qualifies for accelerated depreciation (5-year MACRS)
- Well over \$1 billion in total tax benefits (TCEP's “fourth product”)
- Financial model yields sufficient debt service coverage & returns
- Potential upside for equity investors:
 - Congress can eliminate \$157M tax on DOE grant (this is revenue neutral to US)
 - DOE has legal ability to provide more funds & ITC if/as/when available
 - TCEP's carbon credits expected to be saleable; decent prices forecasted
 - TCEP may receive cost-sharing payments from future replica projects
 - Price of oil may exceed \$70 per barrel! (The number used by the banks.)

CO₂ sales



- TCEP's captured CO₂ \approx 147,000 Mcf per day in normal operation
- Volume smaller than originally planned because we increased urea
- Russell Martin of Blue Source/Blue Strategies led our sales effort
- Sales negotiations were conducted on non-exclusive basis
- Buyers of this CO₂ will receive two large benefits under HB 469:
 - Oil severance tax cut to 25% (i.e., 50% of normal CO₂/EOR rate)
 - Sales tax exemption for CO₂ transport & injection equipment
- Connection to Kinder-Morgan's nearby Central Basin Pipe Line
- TBEG is in accord with MVA plan that Blue S devised for producers

Coal gasification is real:
5 TCEP-type units in China



Meanwhile . . .



- Summit has created Summit Carbon Capture, LLC (SCC)
- SCC will focus on (1) CO₂ capture plants, for (2) EOR, in first instance
- EOR is the current key to CO₂ capture plants; other CCS comes later
- The plants we currently plan include:
 - TCEP “replica” opportunities in Texas, elsewhere in U.S. & abroad
 - Natural gas-fired plants with post-combustion CO₂ capture
 - Surface facilities for underground gasification with CO₂ capture
 - Gasification facilities (without power production) with CO₂ capture
 - Facilities to capture CO₂ directly from the surrounding air
- But: **TCEP comes first!** Construction photos – see ‘em here in 2012!