

Coal Plant Conversion

Grimes Carbon Tech (GCT)

A net negative green technology company changing the world

September 2024



CAPER (Caustic, Aqueous-Phase, Electrochemical Reforming)

Distributed CAPER systems using low-grade waste heat to produce hydrogen on-site & on-demand with a zero or negative carbon footprint



CCR (Carbon Capture & Reuse Technology)

CCR technology that converts CO2 into Sustainable Aviation Fuel (SAF) at the cost of conventional, fossil-derived, Jet A fuel

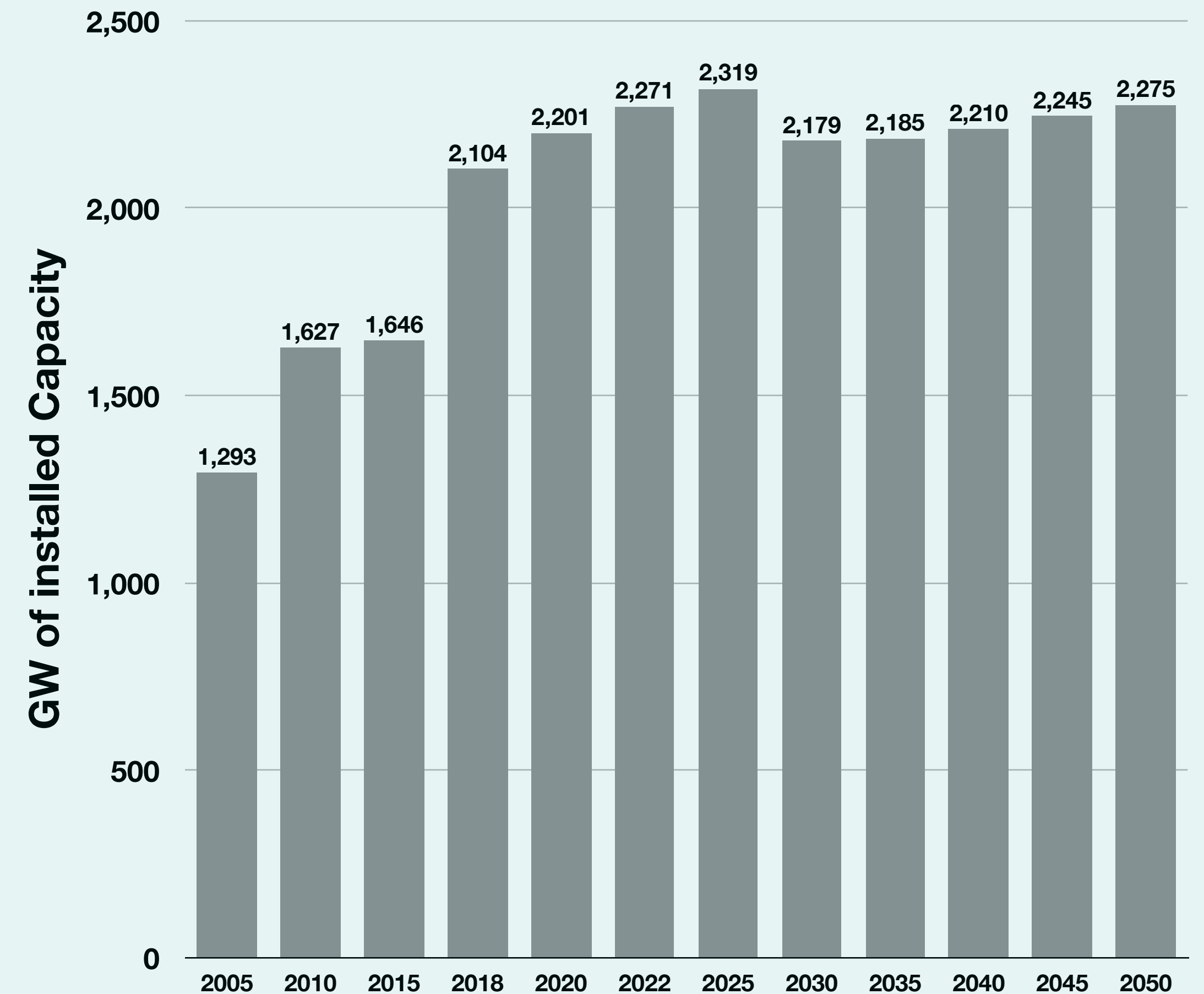
“The only problem with coal is burning it.” - Dr. Patrick Grimes

Coal plants are not disappearing overnight

The world's economy needs a new approach

- Today coal provides 27% of the world's total energy supply and 36% of its electricity.
- It also creates 40 % of global CO2 emissions.
- Coal is a major source of energy supporting economic growth in India, China and other developing economies.
- It is projected to stay at 36% through 2050 although the IEA calculates it has to drop to 12% by 2030 to meet the Net-Zero targets.
- Coal is the lowest cost source of the 24/7, baseload electricity needed to supplement intermittent wind and solar..
- Worldwide, 30 to 40 million jobs are dependent on coal.

World Coal Power Generation Capacity to 2050

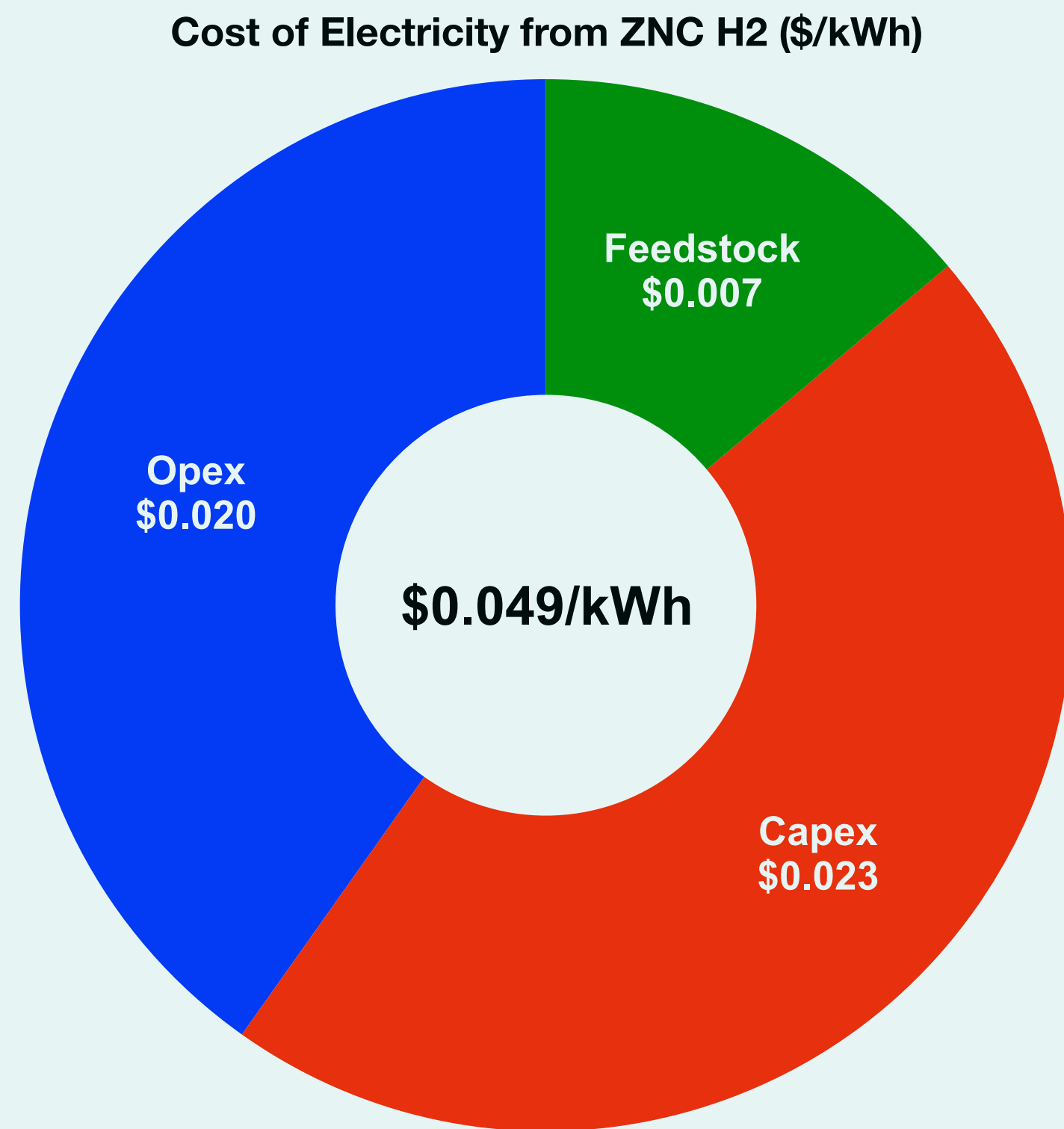


Source: IEA

GCT has the *only* method of making ZNC electricity & fuels from coal

Creates benign carbon slurry & humic soil amendment from pretreated coal

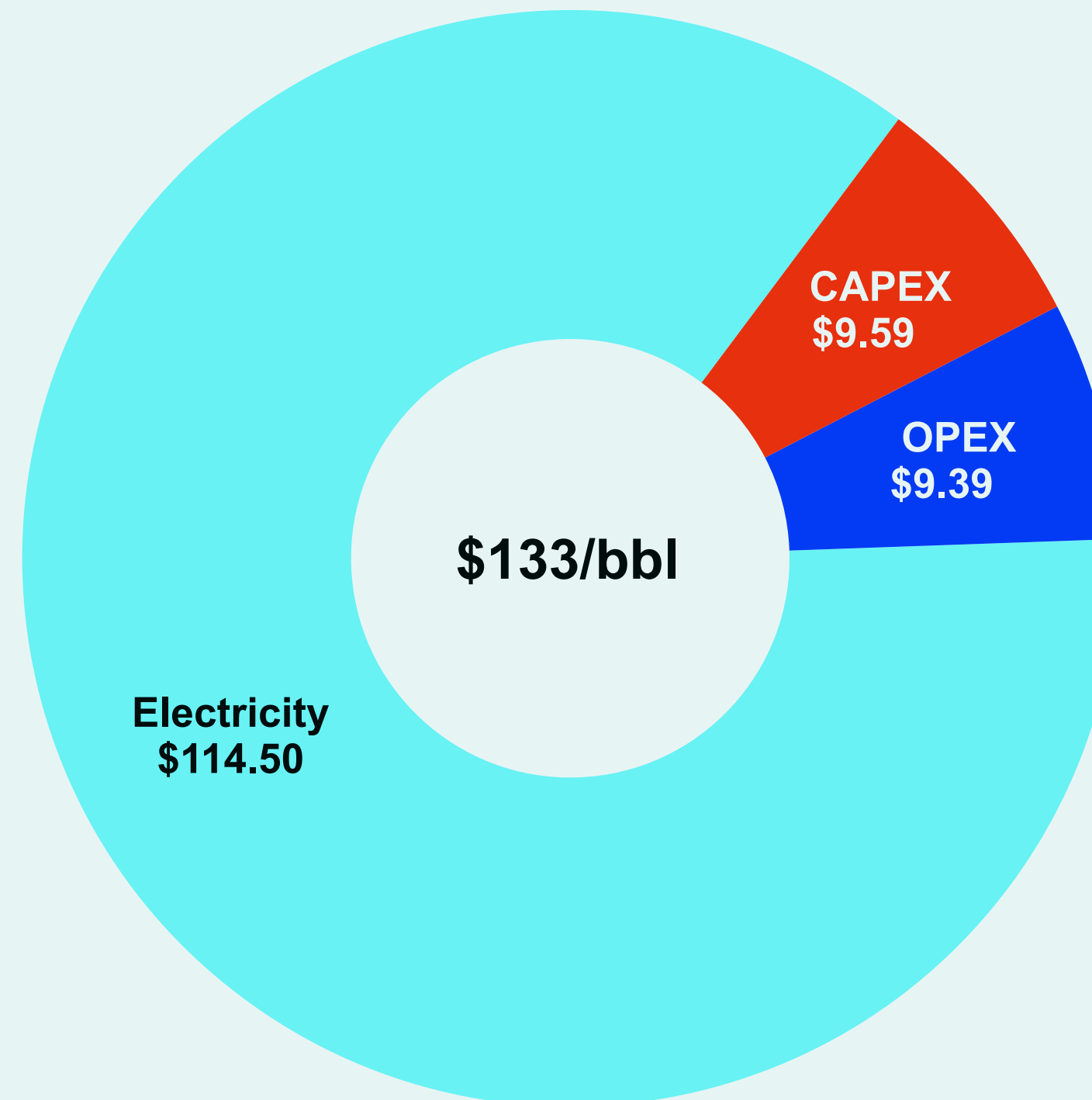
Cost of ZNC H2 & Electricity from Pretreated Coal



Assumptions:

- Illinois #6 coal @ \$45/ton
- 100% debt over 10 years @ 7%/year
- 55% efficient fuel cells

Cost of ZNC SAF (\$/barrel)



GCT ZNC coal process:

- Can use any coal, waste-coal & coal fines.
- Pretreatment creates a carbon slurry, humic materials and recovers rare earths.
- The carbon slurry is benign, transportable & stable for up to two years & can be fed into a CAPER to produce Green Hydrogen on demand.
- Fast, modular construction 'plug and play' systems can stack containers to create as much capacity as needed.
- Enables cost-effective repowering of coal plants at efficiencies up to 65%.
- CAPER can be coupled with CCR to use increased capacity to produce cost-competitive fuels

US DOE Conventional coal plant example

650 MW net output without carbon capture - 39% overall efficiency

Inputs



Waste
Coal

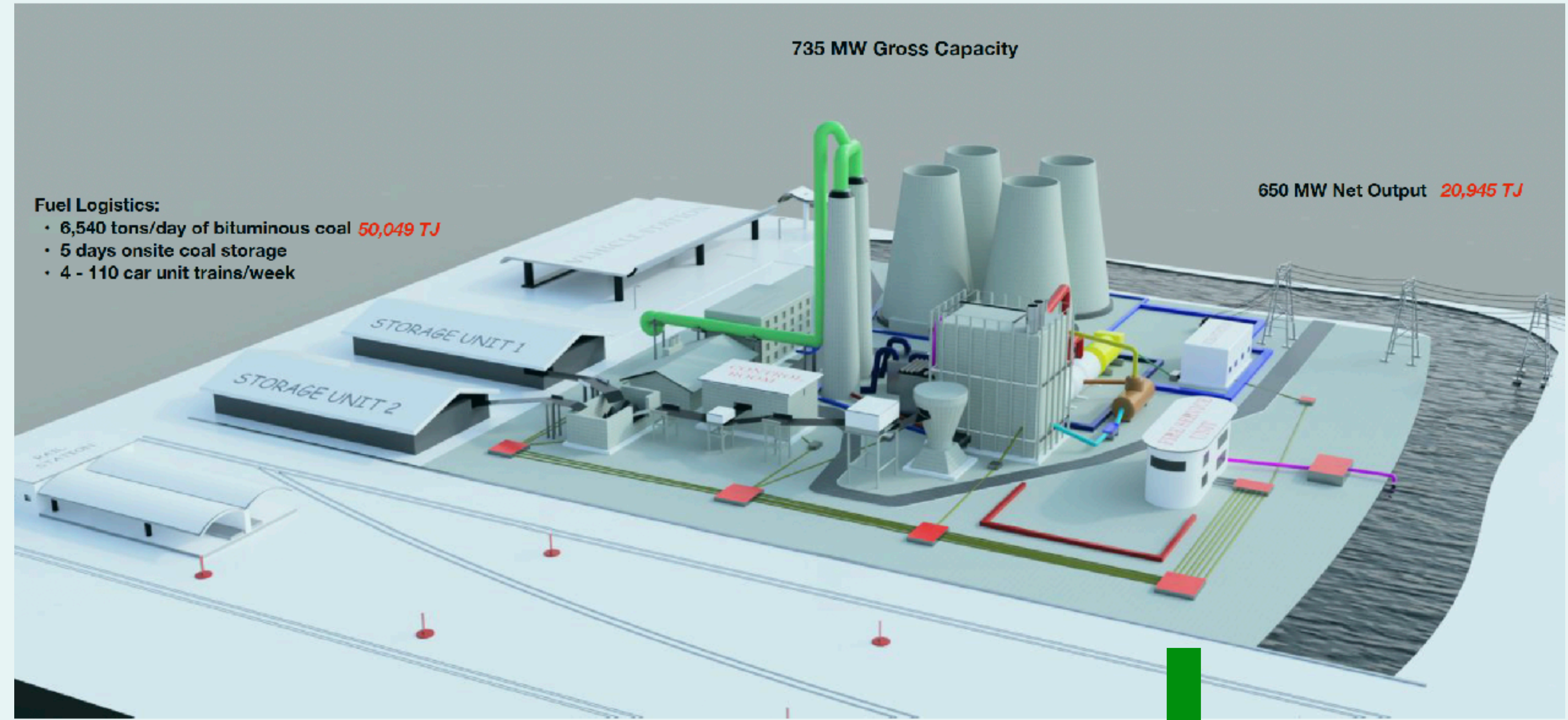


Coal



Coal
Fines

Conventional Plant without Carbon Capture



Coal Ash

Coal plant repowered with CAPER & steam generators - reuse turbines

Electrical efficiency increases to 42% including 100% carbon capture

Inputs



Coal



Waste
Coal



Coal
Fines

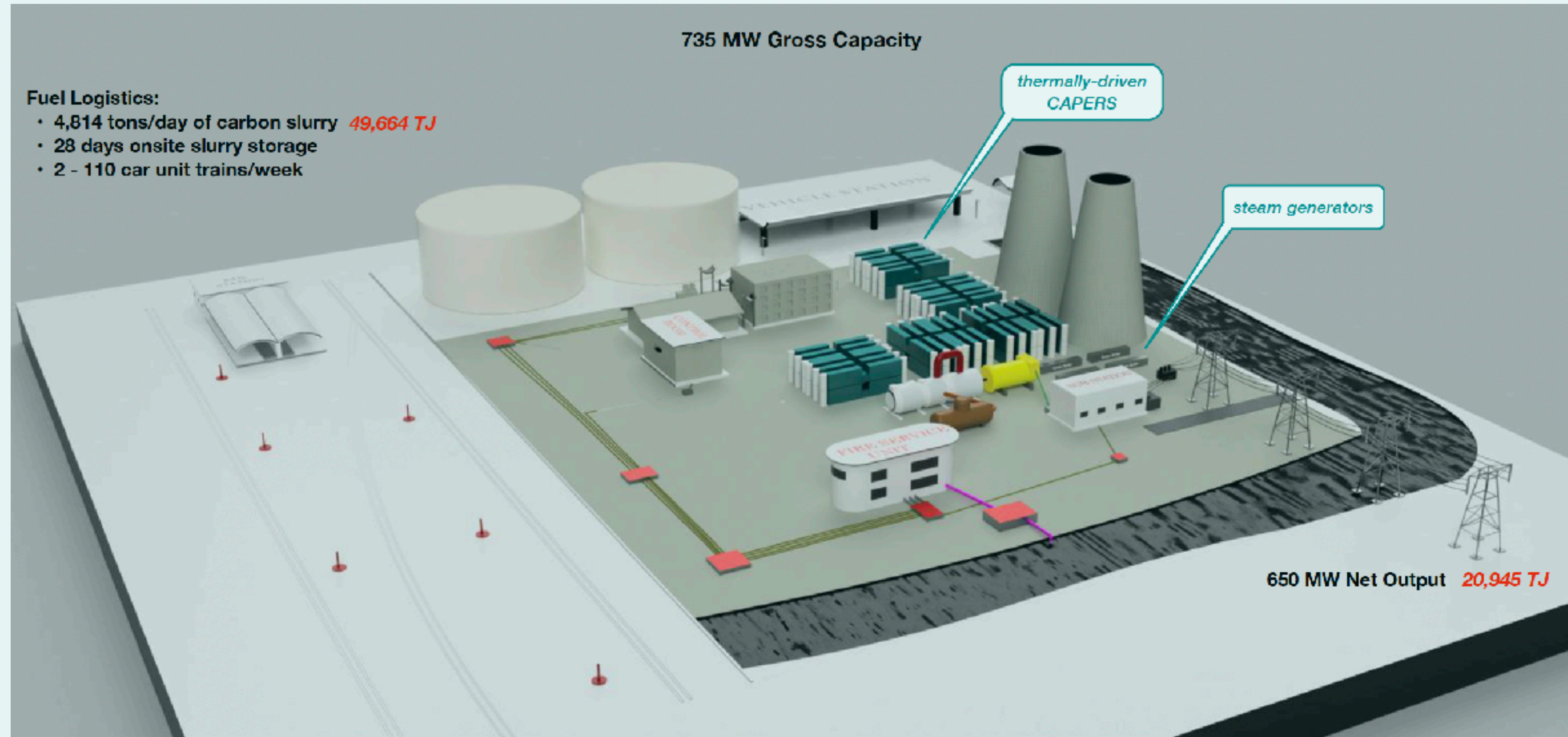


Water

Pretreatment

Coal
Slurry

Repower with CAPER & Steam Generators with 100% Carbon Capture



Humic Soil Amendment
Rare Earth Metals

Coal plant repowered with CAPER & Fuel Cells plus 100% carbon recycling

Efficiency increase to 57% including the production of 4,750 BPD of SAF

Inputs



Coal



Waste
Coal



Coal
Fines

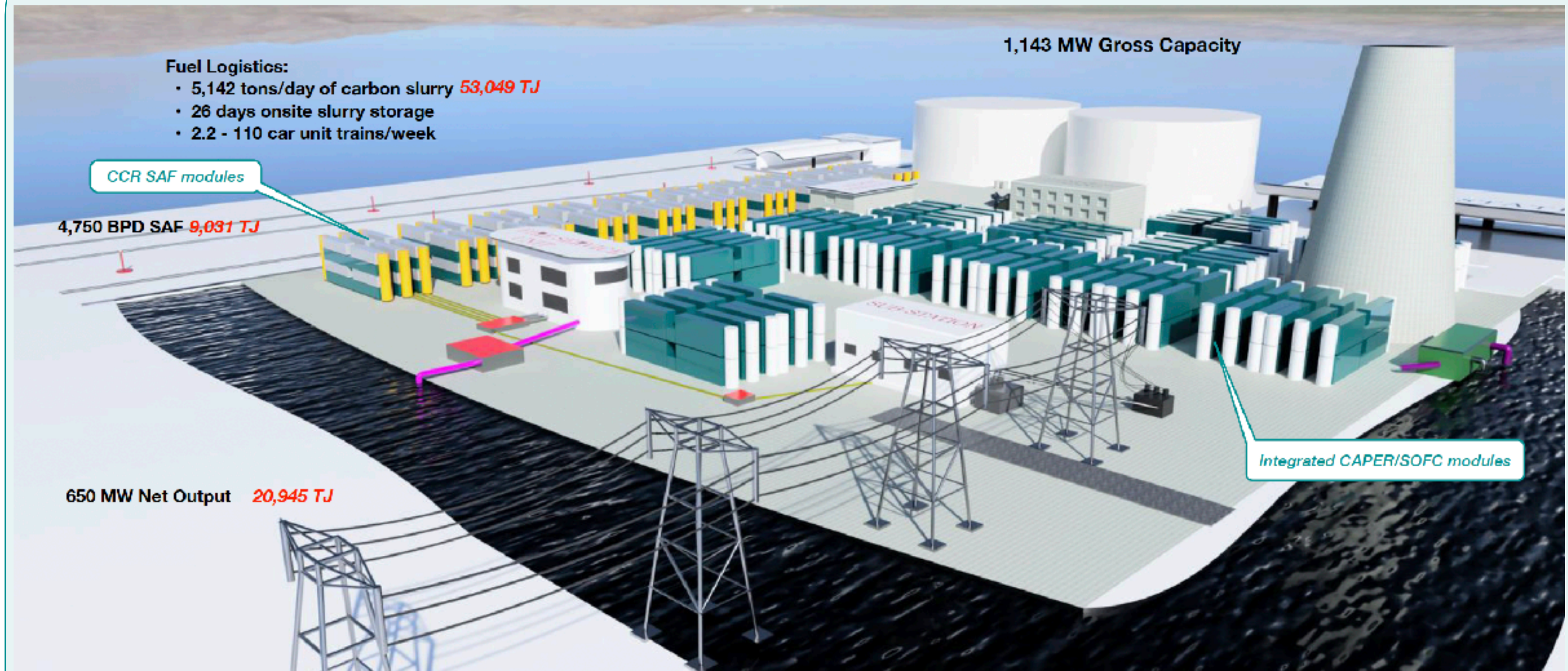


Water

Pretreatment

Coal
Slurry

Repower with CAPER & SOFC with 100% Carbon Recycling to SAF



All carbon recycled to 4,750 barrel per day of liquid fuels

Humic Soil Amendment
Rare Earth Metals