

CARBON-FREE ENERGY AT A CARBON BLACK PLANT

DTE VANTAGE

DTE VANTAGE'S ORION PROJECT

ORION ENGINEERED CARBONS

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BACKGROUND

- Orion Engineered Carbons' Ivanhoe Plant in Franklin, Louisiana generates carbon black to serve the tire and automotive industry
- DTE Vantage provides utilities and energy services to industrial, institutional and commercial customers across the U.S.
- DTE Vantage was engaged by Orion to evaluate a potential power generation system at their facility.

ENVIRONMENTAL DRIVERS

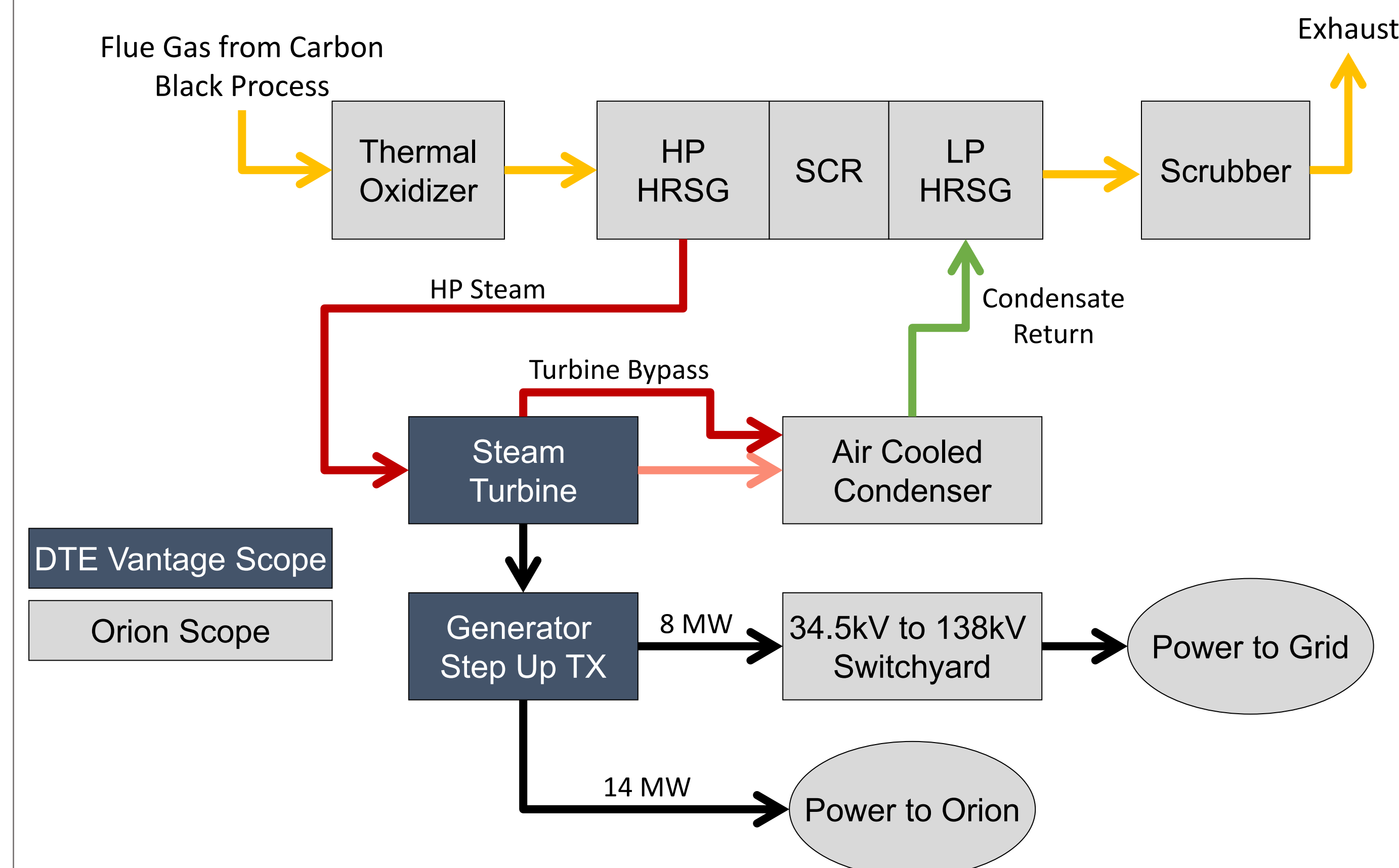
- Orion agreed to a consent decree with the EPA to reduce emissions by April 1, 2021
- The environmental controls required flue gas combustion and further treatment at reduced flue gas temperatures.
- Instead of exhausting the heat from the process to the environment, heat could be captured to generate steam and then power via a steam turbine
- Power generated could be used by Orion to reduce power purchased from the grid and lower their operating costs

PROJECT STRUCTURE

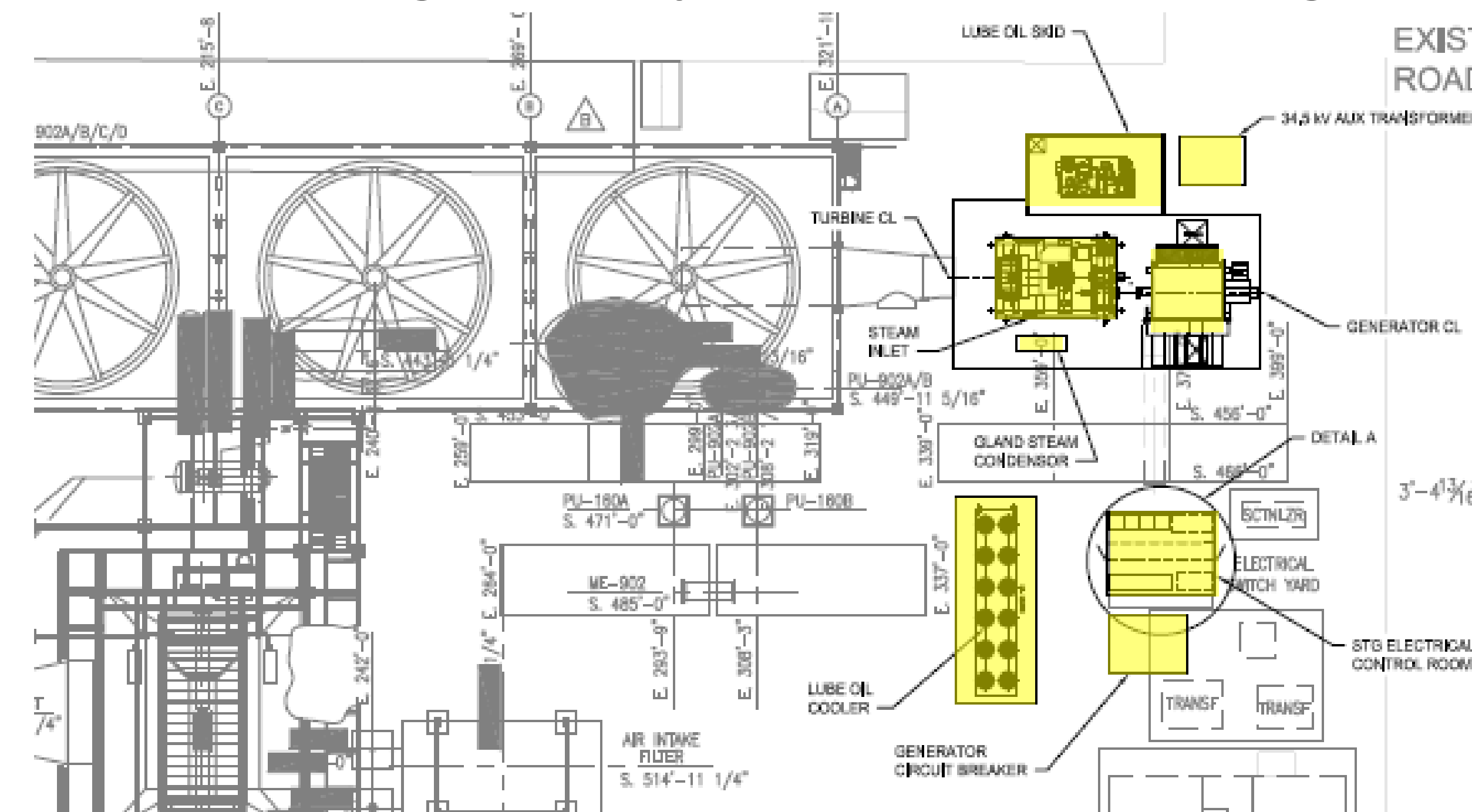
- DTE Vantage presented a third-party design, build, own, operate, and maintain (DBOOM) structure offering the following:
 - Project funding and facility ownership
 - Management of key team members (engineer and constructor)
 - Purchase of major equipment
 - Timeline assurance for commercial operation
 - Operation and maintenance (O&M) of equipment in scope with applicable performance guarantees
- DTE Energy Trading, a subsidiary of DTE Electric, markets gas and power throughout the U.S.
- DTE Energy Trading will market the excess carbon-free power generated to the grid**
- CLECO, the local utility serving Orion will construct a new switchyard (34.5kV to 138 kV) for importing and exporting power

| Contract Item | Contract Detail |
|-----------------|---|
| Capex | Vantage provides GMAX on construction cost |
| Capital Fee | Fixed for the project term |
| O&M Fee | Escalates per index throughout project term |
| Power Marketing | DTE Energy Trading markets power into MISO Power sales profits shared by DTE Vantage and Orion |
| Maintenance | Vantage performs routine and major maintenance |
| Performance | Vantage provide efficiency and availability guarantees |

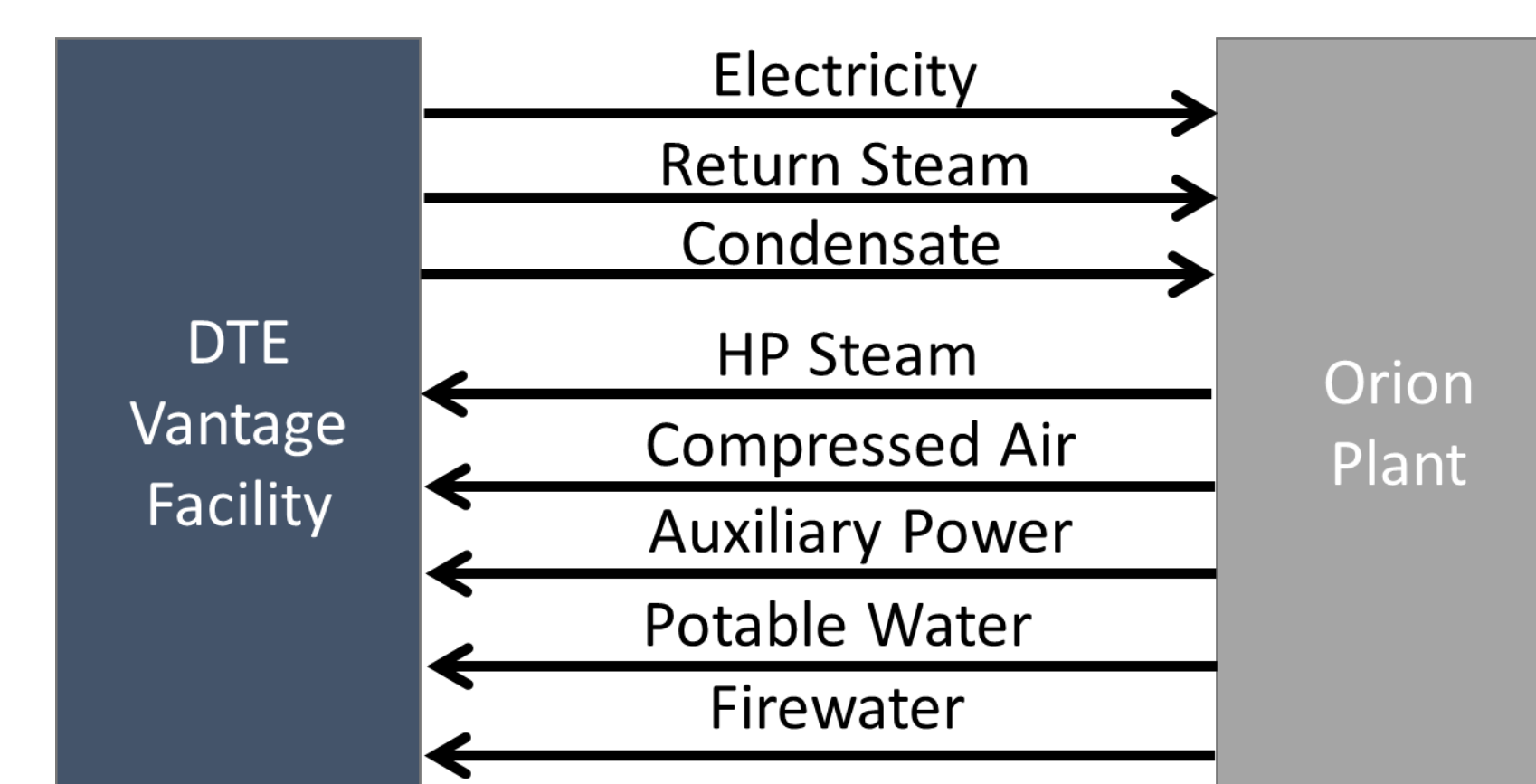
TECHNICAL SOLUTION



- Orion installed a new thermal oxidizer to oxidize hydrocarbons in the carbon black process flue gas emissions stream
- A new waste heat steam generator (HRSG) captures the waste heat and generates high pressure steam to be sent to a steam turbine
- SO₂ and NO_x removal equipment cleans the flue gas to comply with new EPA emissions limits
- DTE Vantage's steam turbine will generate carbon-free power
 - 14 MW of the generated power will be used by Orion**
 - 8 MW+ of the generated power will be sold to the grid**



- DTE Vantage's facility is integrated with Orion's operating plant
- The following utilities are shared between facilities



KEY BENEFITS

- Orion saves an average of \$5.2MM per year in electricity costs**
- Power generated is carbon-free, as all power is generated from waste heat
- 22 MW of carbon-free power offsets CLECO's power generation, **saving ~150,000 tons/year of carbon emissions**
- Phased project approach allowed Orion to meet EPA deadlines while maintaining the ability to install power generation later for economic and environmental benefits
- DTE Vantage's involvement allowed Orion to focus their time and capital on satisfying the EPA consent decree
- DTE Energy Trading's marketing of the power sales allows both Vantage and Orion to benefit from power sales incentivizing both parties to maximize output and operate efficiently

CURRENT STATUS

- Orion has complied with the EPA decree and the facility is operating with the new thermal oxidizer and air quality control equipment
- DTE Vantage's facility is currently under construction
 - Underground site work is complete
 - Steam turbine and generator have been delivered and installed
 - Generator step up transformer install is ongoing
 - Balance of plant work is ongoing
- CLECO substation is currently under construction and is to be completed in July 2022
- DTE Vantage expects to achieve commercial operation Q12023



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