

Solar Turbines – Energy Solutions Provider

World's Largest Manufacturer of Industrial Gas Turbines

(1 to 39 MW)



Subsidiary of Caterpillar Inc.

SINCE 1981



Installations in 100+ Countries

Direct End-to-End Sales and Service



65

Sales and Service Locations



16,700+

Gas Turbines Sold

7,000+

Gas Compressors Sold



Global Workforce

9,000+

Employees

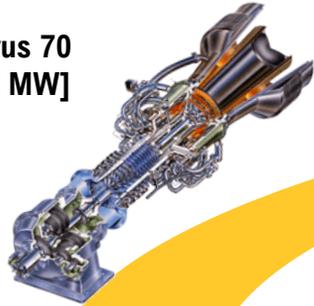


BUSINESS MODEL – End-to-End



Solar Turbines Products

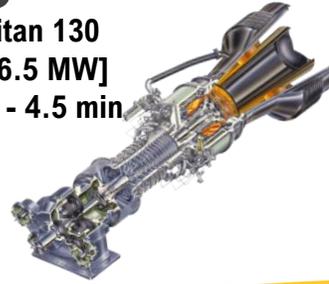
Taurus 70
[8.2 MW]



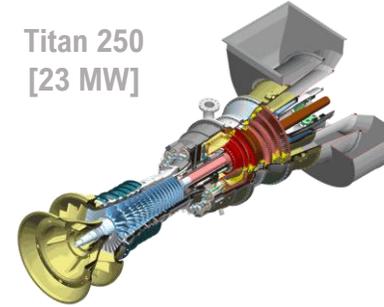
Mars 100
[11.3 MW]



Titan 130
[16.5 MW]
1.5 - 4.5 min

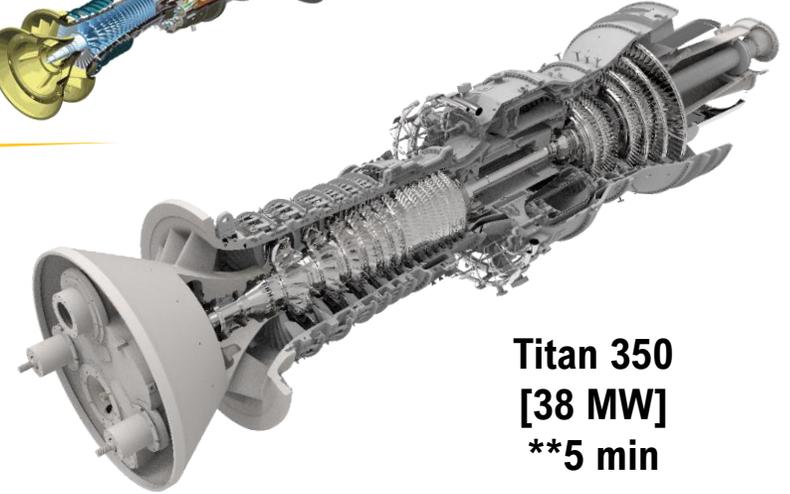


Titan 250
[23 MW]

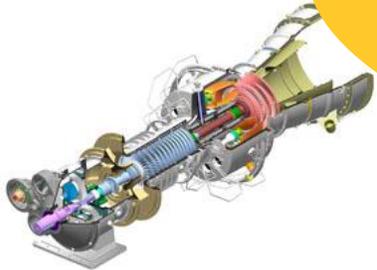


Power Range: 1 – 40 MW

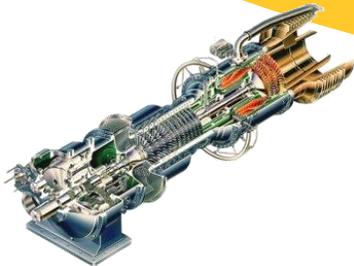
Titan 350
[38 MW]
**5 min



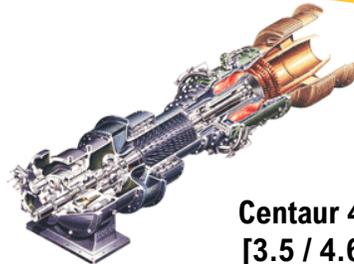
Taurus 65
[6.5 MW]



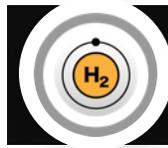
Taurus 60
[5.7 MW]



Centaur 40 / 50
[3.5 / 4.6 MW]
**35 / 65 sec



BEST IN CLASS SERVICE SUPPORT



HYDROGEN & FUEL FLEXIBILITY



CARBON CAPTURE, USE & STORAGE

Power Generation Module (PGM)

- 1 Turbine Air Inlet Filters
- 2 Package Ventilation Filters
- 3 Ventilation Exhaust Fans
- 4 Ventilation Inlet Fans
- 5 Enclosure Structure
- 6 Ladders & Platforms
- 7 Integrated Lube Oil Cooler
- 8 Integrated Lube Oil Demister
- 9 Electrical Equipment & On-skid Control Box



Solar Mobile Turbomachinery

SMT 60



Cat **SMT 130**

Fully integrated design

PARK, PLUG AND POWER

- Quick and Innovative Setup – Less Than 12 Hours
- No Concrete Foundation Required
- No Crane Lifts Required at Site
- Hydraulic Leveling System
- Rapid Alignment Technology

Bridge To Grid Use Cases

Bridge to Grid

- Confidently believes the Grid will support in a few years
- Back-up diesels in design

Key Criteria

- **Available** now
- Simple, **Relocatable**
- Reliable/**Uptime**

Microgrid Solution

- Rental
- Own - Sell or relocate



Solar Turbines
A Caterpillar Company

Bring mobile power to data center in
VA, USA

Bridge To Grid Use Cases – Longer Term



Long Term Bridge

- Grid can't connect for years
- Gov't regulation requires DC to have own power

Key Criteria

- **Efficiency**
- **Reliable/Uptime**

Microgrid Solution

- Combined cycle for efficiency
- Ready for **Renewable fuels**
- No diesel emergency backups

AI Load Profile – 400+ MW



Long Term Bridge

- Limited to no utility access
- First of its kind - aggressive load profile

Key Criteria

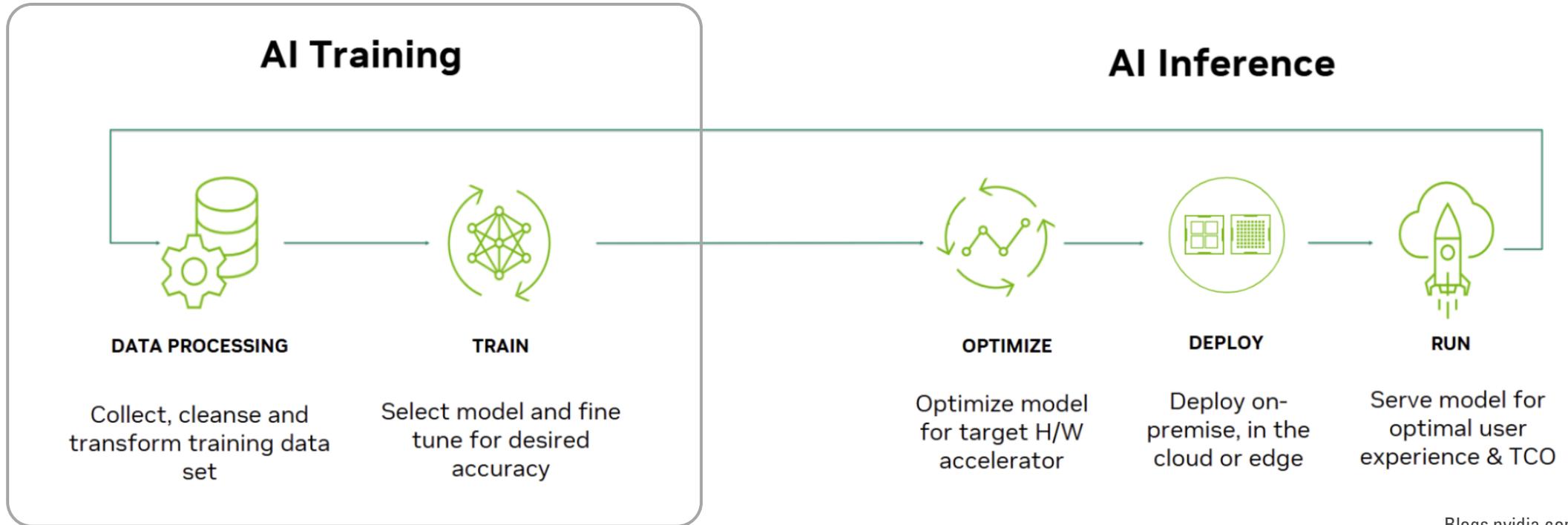
- Quick Delivery

Microgrid Solution

- BESS + Turbine solution to handle AI load swings

AI Data Center Load Challenge

COMPLETE POWER SOLUTION



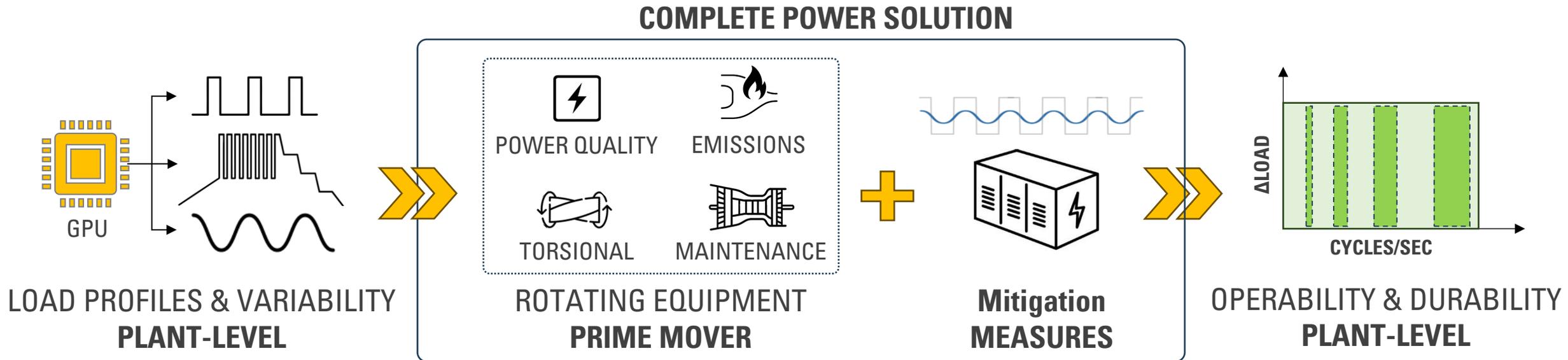
Blogs.nvidia.com, 2025

Deep learning (AI Training) is compute-intensive with rapidly fluctuating load demands

Complete power solution must support both modes

AI Training Load Challenges

COMPLETE POWER SOLUTION



Goal is to extend Prime Mover “no-go” zones within a wide operational envelope

Robust combined power solution will reliably support a wide range of load profiles

UNIT LEVEL: Rotating Equipment Areas of Interest

1 POWER QUALITY

Voltage and frequency response



Applied loads affect frequency and voltage outputs of the generator.

2 TORSIONAL LOADS & VIBRATION

Drivetrain and structural response



Applied loads impart torque into the shafts which can cause mechanical vibration.

3 EMISSIONS & OPERABILITY

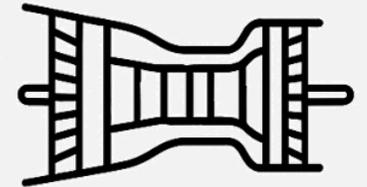
Combustor stability & Fuel Control



Rapid load transients trigger high emissions mode and can drive unnecessary cycling at higher frequencies.

4 EQUIPMENT DURABILITY

Maintenance schedule



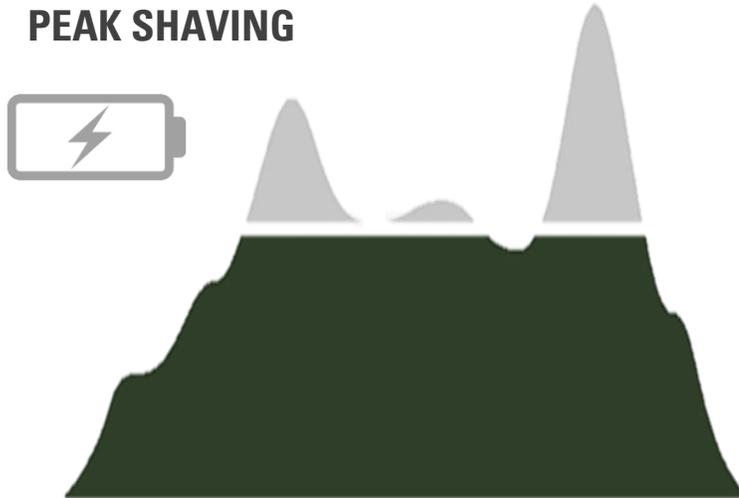
Rapid load transients will have more dynamic cycles on components compared to traditional operation.


CHALLENGES OF RAPID LOAD FLUCTUATIONS

Battery Energy Storage System (BESS)

BESS is the recommended system level countermeasures for turbines.

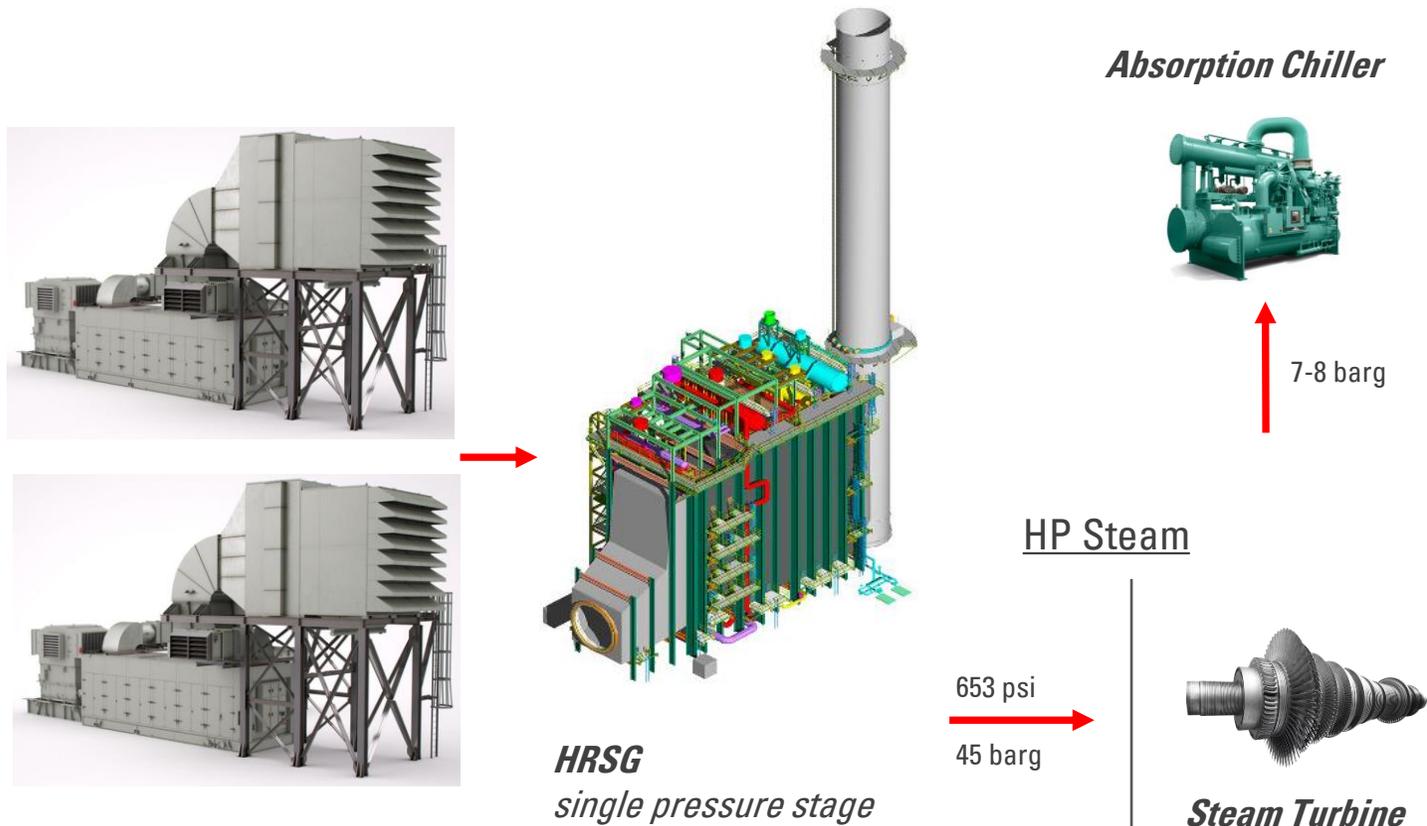
PEAK SHAVING



- Fast bi-directional inverter can peak shave, reducing impact to the turbine unit
- BESS provides backup power increasing availability
- 1:1 Sizing is recommended in Megawatts
- Solar is developing models and guidance for BESS application to assist customers in defining the best solution.

Design Considerations ✓ **Battery state of charge control strategy required**
✓ **BESS controls tuning for high frequency loads required**

Bridge To Grid Use Cases – Longer Term CCGT - CHP



- Variable chilled water production
- → only when needed

+

Decrease PUE

→ Produced chilled water decreases total Power need

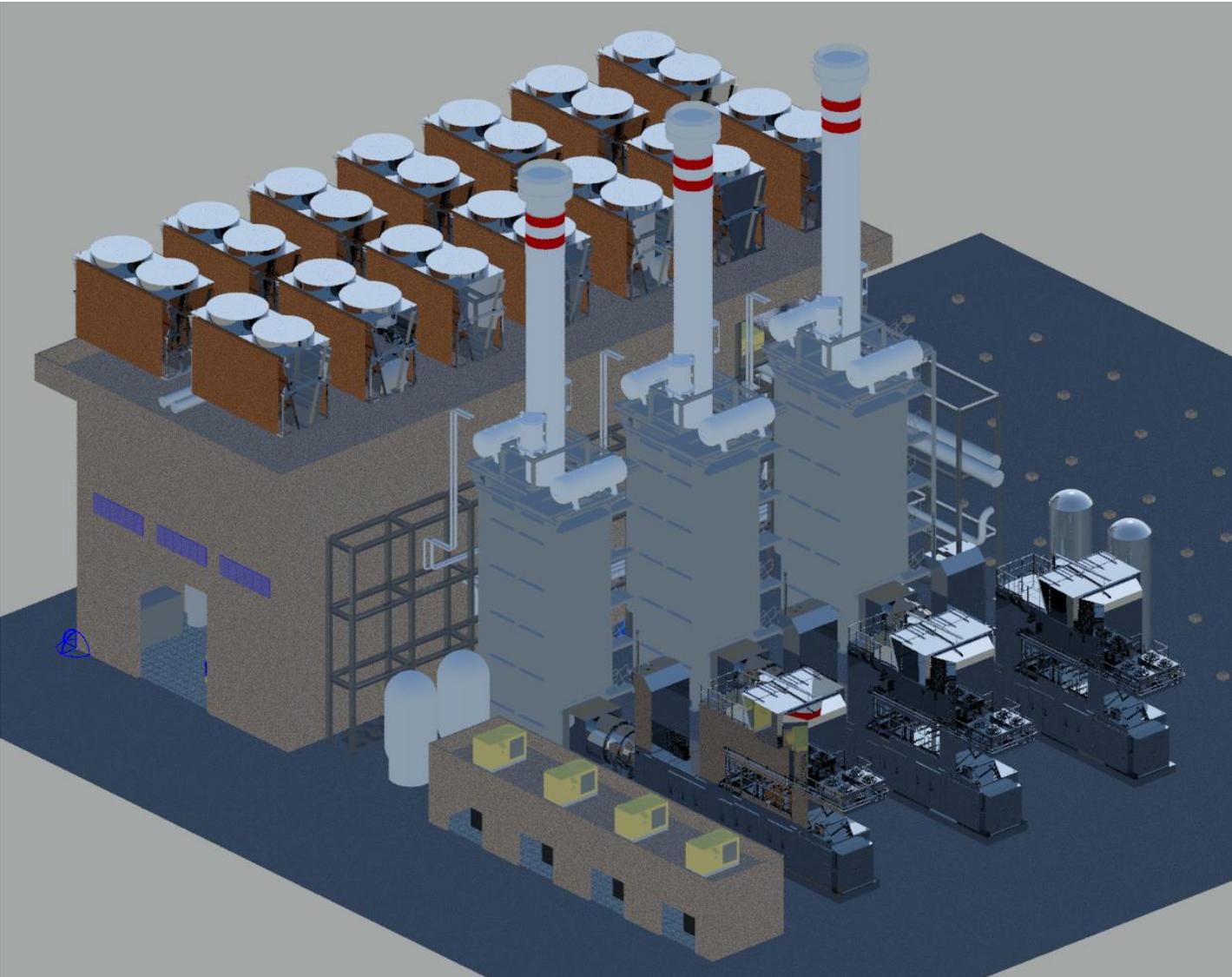
- High fuel efficiency support permits

Compact Combined Cycle Solution

POWER ONLY

3x T130 + 1x Steam Turbine

- Total gross power: ~68.5 MW
- Gross electrical efficiency: 49.4%
- **Total net power: ~65.9 MW**
- **Net electrical efficiency: 47.6%**
- **Net fuel utilisation: 47.6%**
- NOx emissions: 2 ppm
- CO emissions: 2 ppm
- Water consumption: almost 0 (blowdown)



Compact Combined Cycle Solution



POWER + CHILLED WATER

3x T130 + 1x Steam Turbine + Steam Chillers

- Total gross power: ~61.1 MW
- Gross electrical efficiency: 44.1%
- Gross fuel utilisation: 69.0%
- **Total net power: ~57.2 MW**
- **Net electrical efficiency: 41.2%**
- **Net fuel utilisation: 66.2%**
- NOx emissions: 2 ppm
- CO emissions: 2 ppm
- Water consumption: almost 0 (up to 95°F)

Summary

- Provide “Bridging” power solutions
- Power quality, stable operation with durability and clean emission
- Expanding capability to provide total energy needs: electrical and thermal energy

THANK YOU

Solar[®] Turbines

A Caterpillar Company