



Solar Turbines

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CHALLENGES of an EVOLVING WORLD

Enabling the Path to a Low-Carbon Future

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Solar Turbines*

IASI - October 2024

Agenda

- 1. Executive Overview**
2. Energy Transition
3. Gas Turbine Family
4. Summary



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EXECUTIVE OVERVIEW

October 2024

Powering the Future

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Solar Turbines – Energy Solutions Provider

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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

6,500+

Gas Compressors Sold



Global Workforce

9,000+

Employees



Mission critical power solutions

Best-in-class service network

Locally deployed for maximized uptime

POWER GENERATION

Caterpillar: Confidential Green

Partnering in the Energy Transition

Innovative Solutions for Today & Tomorrow

Products, Quality and Services

Turbine production, assembly and test

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U.S.

SAN DIEGO - HARBOR DRIVE

Corporate Offices

Engineering

Component Manufacturing



EUROPE

ŽATEC - REMANUFACTURING CENTER

since 2012

Added worldwide remanufacturing capacity

ŽEBRAK - EAME PRODUCT CENTER

since 2017

Added worldwide test capacity

Risk mitigation through redundancy

Reduced logistics time for European customers



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Reliable Gas Turbine operating experience

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Solar Turbines Gas Turbine Experience	Units Sold*	Billion Hours*
Compressor Sets	5,264	1.17
Mechanical Drives	2,751	0.69
Generator Sets	8,699	1.51
Total	16,714	3.37

*Population in excess of Units Sold and Hours Running

Hours reflect new unit sales

Effective: March 2024 © Solar Turbines Incorporated

POWER GENERATION

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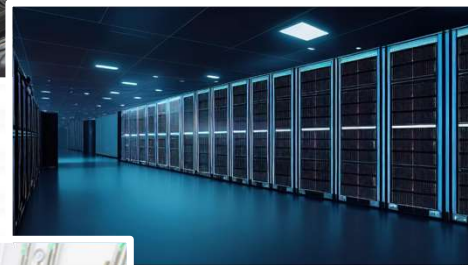
+2400 Gas Turbines in Power Generation

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+1200 GTs in Industrial CHP

- Pulp & Paper
- Chemical
- Pharmaceutical
- Food & Beverage
- Stones & Clay
- Refinery
- Tires & Rubber



+7.2 GW in Services

- Power plant
- Educational Services
- IT facilities
- Gov/Inst
- District Heating



POWER GENERATION

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The experience you can rely on

Remarkable success in Romania

- Power Generation in Romania since 2008
- Total Power Generation references in Romania: 28 units
 - ✓ Paper Mill
 - ✓ District Heating
 - ✓ Chemical Industry
 - ✓ Natural Gas Pipeline Compression Stations
- **Romanian Grid Code certification experience** in recent project, awareness on requirements and how to be successful in the compliance procedures.

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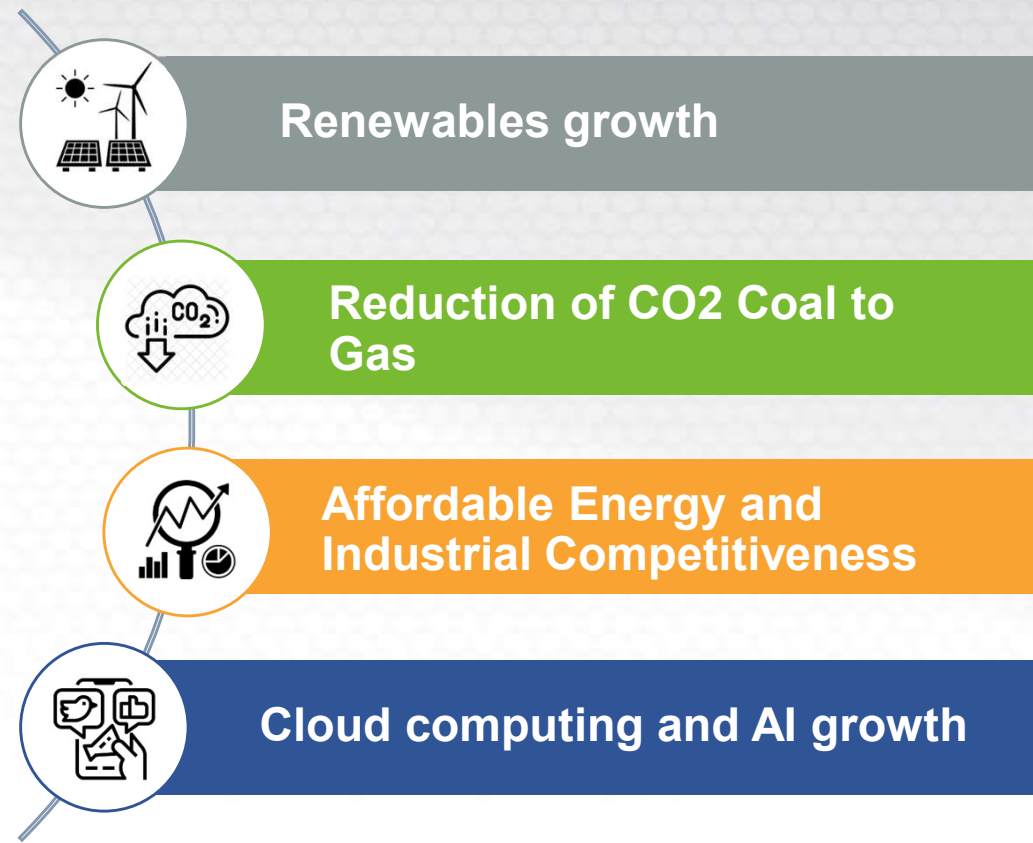
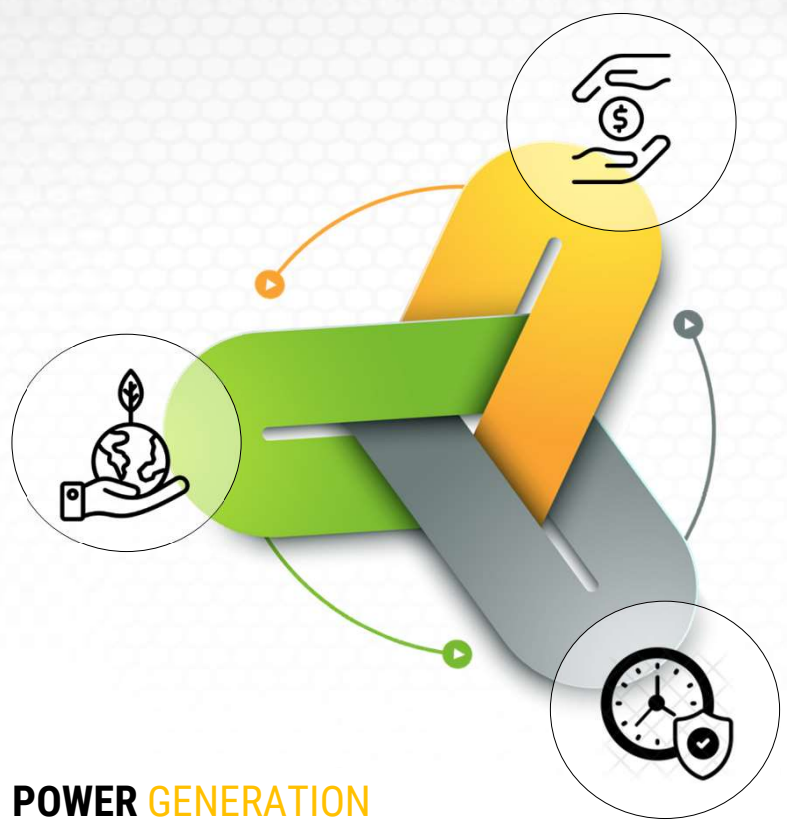
New Energy Challenges

The energy trilemma and the global energy macro trends

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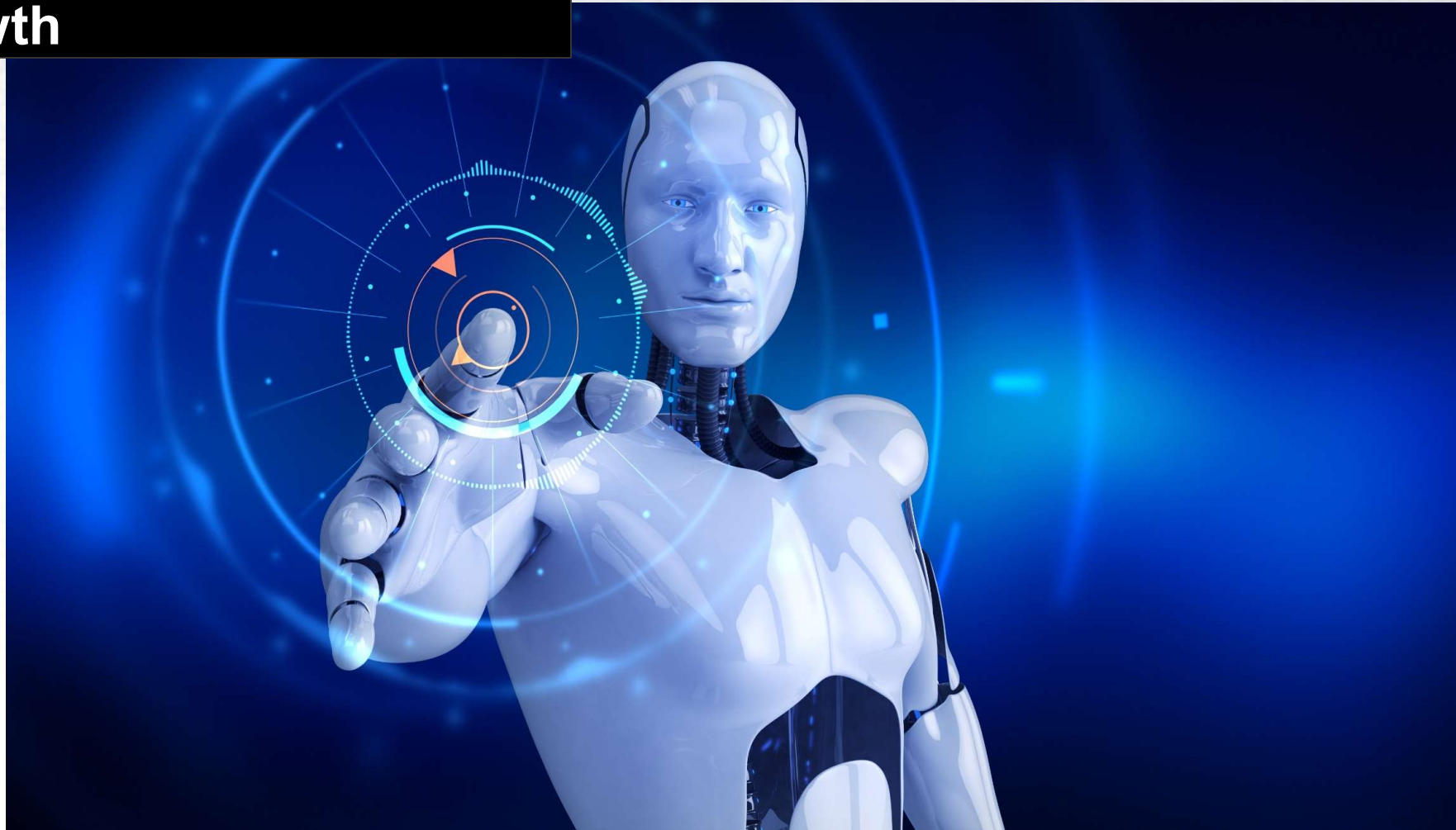
A successful energy transition requires a balanced mix of:
Affordability - Reliability - Sustainability



Natural gas supports the grid when renewables are not generating power



**Natural Gas supports data center
and AI growth**



Natural Gas CHP improves energy efficiency and lower emission in the industrial sector

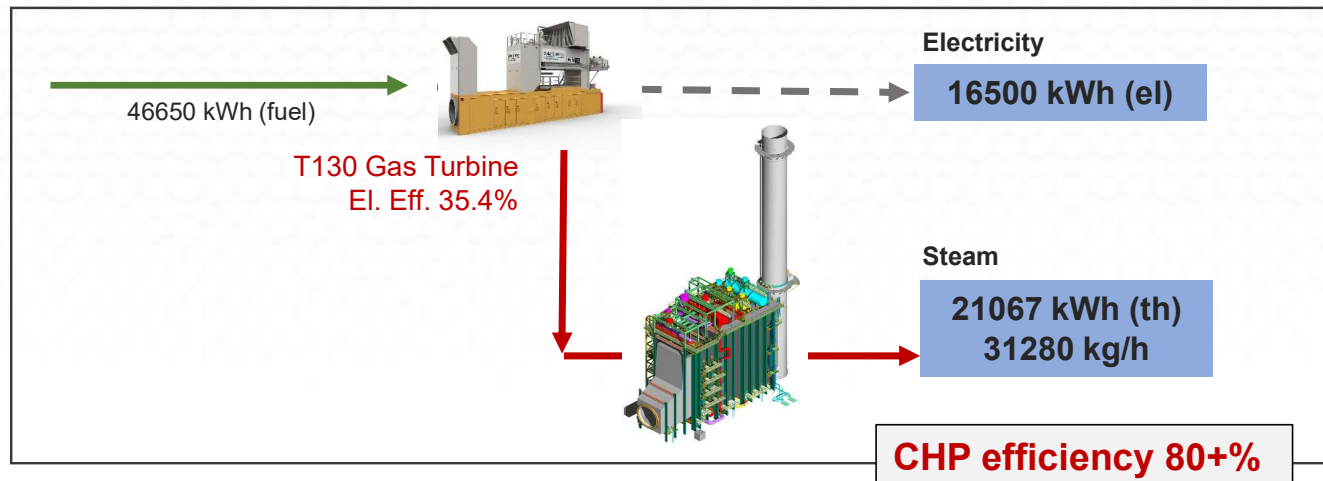
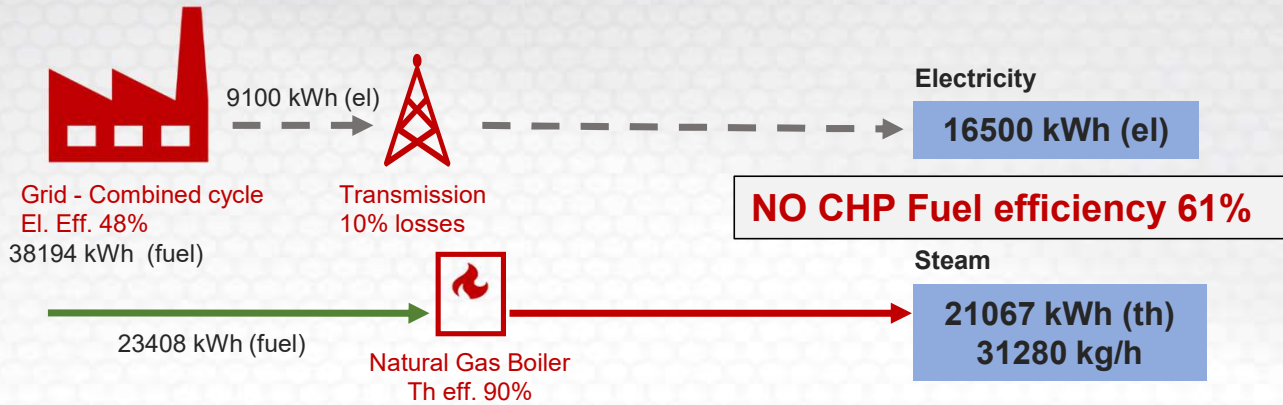


Benefits of Cogeneration – CHP vs Grid

Carbon Footprint and Efficiency

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2023 Elect. Carbon Intensity (average)



295 gCO₂/kWh → 77300 tCO₂/yr (*)



425 gCO₂/kWh → 95300 tCO₂/yr (*)



841 gCO₂/kWh → 153000 tCO₂/yr (*)

<https://app.electricitymaps.com>

(*) Included Natural Gas Boiler

Fuels Carbon Intensity

- Natural Gas: 185 gCO₂/kWh → 72500 tCO₂/yr
- bio-Gas: 20 gCO₂/kWh → 7800 tCO₂/yr
- Diesel: 250 gCO₂/kWh → 98000 tCO₂/yr
- HVO (Hydrogenated Vegetable Oil): 43 gCO₂/kWh → 16900 tCO₂/yr

<https://www.engineeringtoolbox.com/>

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Gas Turbine Family

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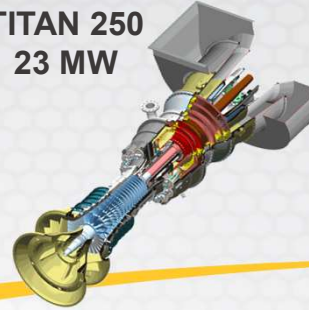
MARS 100
11.3 MW



TITAN 130
16.5 MW



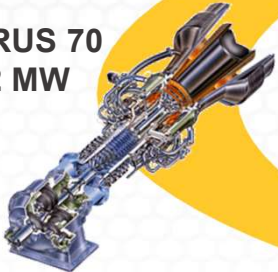
TITAN 250
23 MW



TITAN 350
34 -38 MW



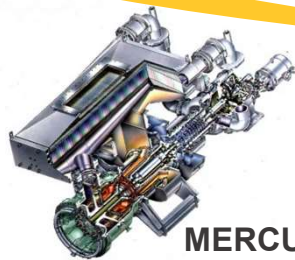
TAURUS 70
8.2 MW



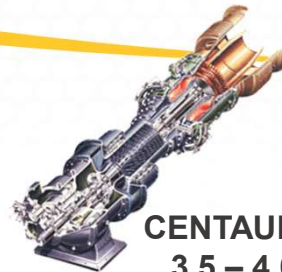
TAURUS 60
5.7 MW



MERCURY 50
4.6 MW



CENTAUR 40/50
3.5 - 4.6 MW



Power Range: 3.5 – 39 MW

- Large Turbine Portfolio
- **Hydrogen and Fuel Flexibility**
- SMART Micro Grid Connectivity
- Future ready solution
- Quick start (<5 min)

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Power Generation Module (PGM)

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Standardized Specifications

- Standardization for Power Generation
- Non-hazardous
- Modular
- Compact Footprint
- Standard Interfaces & Connections

PGM40	Powered by Centaur 40
PGM50	Powered by Centaur 50
PGM60	Powered by Taurus 60
PGM70	Powered by Taurus 70
PGM130	Powered by Titan 130



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A Sustainable Path Forward

▶ **Energy Transformation.**

▶ **Balancing the Trilemma**

▶ **Reduced Carbon Future**

Solar has the technologies to shape the energy transition NOW

THANK YOU

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