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COMPANY PROFILE

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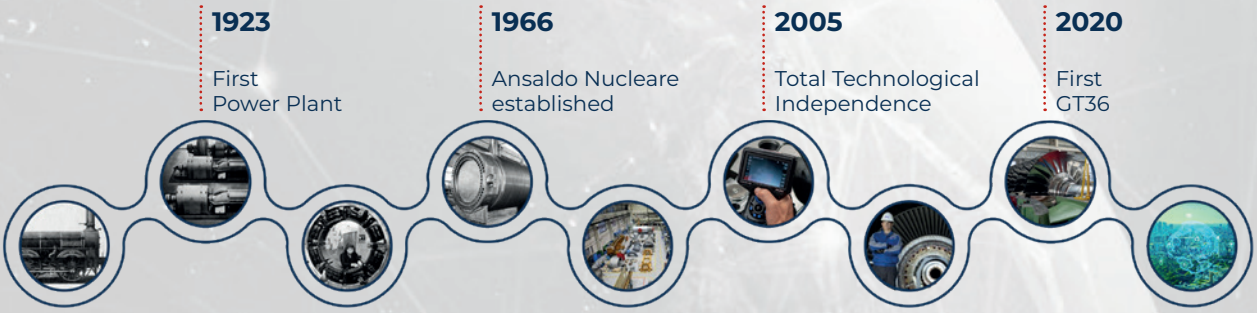
ANSALDO ENERGIA GROUP

Ansaldo Energia Group is an international leader in the field of power generation and a key player of the energy transition, a company 88% owned by CDP Equity, Cassa Depositi e Prestiti Group, a national promotion institution that has supported the Italian economy since 1850, and 12% by Shanghai Electric.
Our mission is to be always committed to a sustainable and innovative power generation with the aim to ensure a lower environmental impact and a high flexibility in energy production.



1853
Giovanni Ansaldo & Co. Established

1923
First Power Plant

1962
First Supercritical 600 MW Power Plant

1966
Ansaldo Nucleare established

1991
Ansaldo Energia established

2005
Total Technological Independence

2016
Acquisition of Alstom Advanced Gas Turbine Technology

2020
First GT36

2021
Ansaldo Green Tech established

Ansaldo Energia Group can supply components (gas turbines, steam turbines, generators), turnkey plants and the most innovative support service solutions to the electricity generation market. It is also active in the nuclear sector – from fusion to waste management – and supports its customers in the delicate phase of energy transition with green products and innovative storage solutions.

Ansaldo Energia currently employs over 3,200 people and has an international presence through local companies and branch offices in Italy, where the Group headquarters, Ansaldo Nucleare and Ansaldo Green Tech are, in China with the two joint ventures Ansaldo Gas Turbine Technology and Shanghai Electric Gas Turbine, in Switzerland, in the United Kingdom with Ansaldo Nuclear Ltd, and in the United Arab Emirates (Abu Dhabi). The broad-based presence allows the group to quickly react to customers' needs and to better offer them its rich value proposition.

POWER PLANT

Ansaldo Energia designs and supplies full Power Plants, providing Customers with engineering, project management, procurement, construction and plant commissioning. This all-inclusive approach is based on robust design, state-of-the-art turbines and generators (both manufactured in-house) and a full set of advanced, sustainable technical solutions that include the ability to burn hydrogen in the fuel mix.

Once the plant is in operation, Ansaldo Energia can ensure all maintenance and repair activities, supported by remote diagnostics tools. Existing plants can also be upgraded to improve sustainability and efficiency, or even fully revamped with the substitution of the power island and the renovation of all Balance of Plant auxiliary systems.

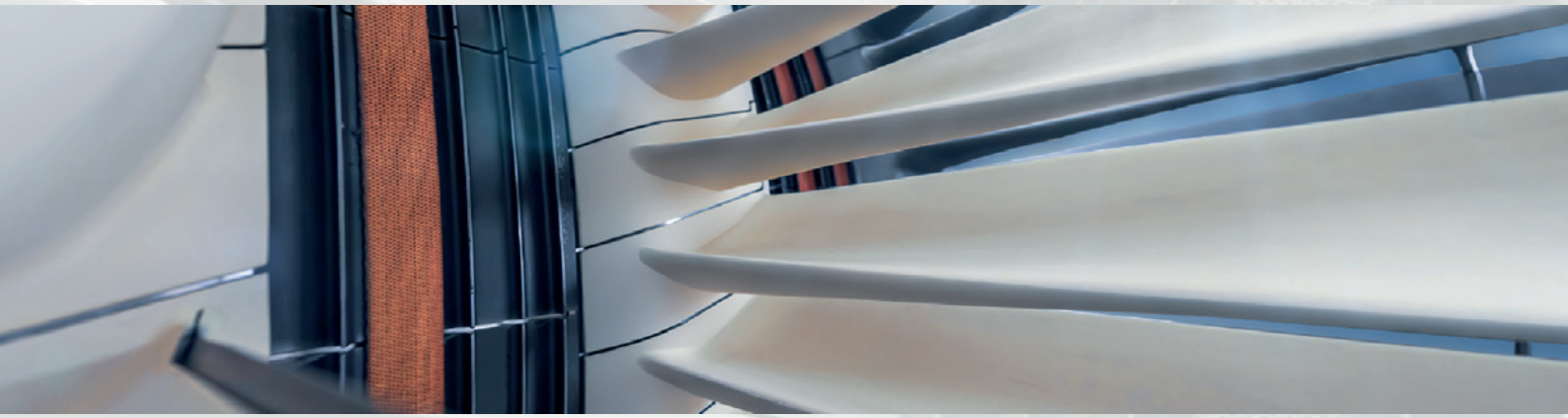
Flexibility is at the heart of the Ansaldo Energia's proposal. Pre-engineered modules are integrated into fully specific solutions – tailored on customers' needs (load operation, peak demand or cogeneration), grid requirements, local opportunities and constraints. Time-to-market flexibility is also offered with fast-track solutions for quick turnkey delivering.
Also, in order to promote plant acceptance, all facilities are designed to respect the local socio-cultural framework and minimize the environmental impact. Ansaldo Energia offer encompasses Open Cycle plants as well as Gas&Steam Combined Cycles and Energy-Transition Combined Cycles (adopting the innovative "Energy Dome" technology), Geothermal and Nuclear power plants.

This rich portfolio is based on proven global experience: since 1950 the total power of the plants equipped with Ansaldo Energia machines amounts to 43,500 MW, and since 2015 the Company has participated with different scopes of work to the realization of more than 40 mega-plants for over 1,000 MW.

Model	Module Power Size, MW	Total Power, MW	Scope of Supply
THERMAL PP	40 ÷ 1000	13,500	Power Island, EPC
OPEN CYCLE PP	> 80	8,00	Power Island, EPC
COMBINED CYCLE PP	> 120	26,000	Power Island, EPC
Total		**47,500**	

HEAVY DUTY GAS TURBINES

Ansaldo Energia offers E-, F- and H-class heavy-duty gas turbines with output ranging from 80 to 538 MW (ISO Power) for Open Cycle, from 120 to 760 MW for Combined Cycle and Combined Heat and Power applications.



Type	ISO Power (MW)		Frequency (Hz)
	Simple cycle	**Combined cycle** *(depending on configuration)*	
GT36-S5	538 (42.8%)	760÷1,525	50
GT26	370 (41.0%)	540÷1,083	50
AE94.3A	340 (40.3%)	495÷992	50
AE94.2	191 (36.8%)	287÷578	50
AE64.3A	80 (36.4%)	120÷243	50/60

All engines are characterized by well-tested design and advanced technology, and feature high performance, top flexibility, easy and reliable operation with low environmental impact; plus, their main working parameters can be controlled and adjusted remotely.

The control system and auxiliary equipment have also been designed to meet increasingly stringent eco-standards while optimizing maintenance plans, minimizing lifecycle costs and maximizing the return on investment.
Extraordinary flexibility and low minimum environmental load allow these turbines to operate as a real balancing unit, taking full advantage of their wide range of operation to compensate for the intermittence of renewables in the grid.

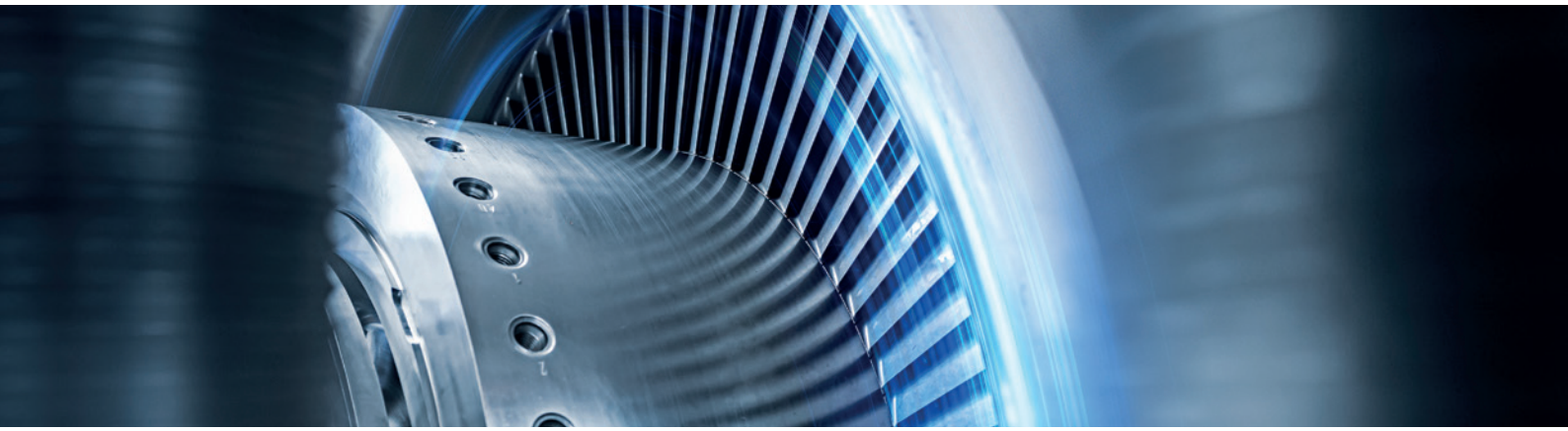
GT and AE turbines can endure frequent starts and stops or run in Reserve/Stand-by Mode with rapid ramp-up to Peak Mode, making them the optimal solution for grid stability and the ideal support for renewable power generation.

STEAM TURBINES

Steam turbines are the foundations on which Ansaldo was built: the Company was established in 1853 to support the development of the then-flourishing steam locomotive industry. Today's Ansaldo Energia steam turbine portfolio has been developed for application in most power generation technologies, from traditional fossil combustion to renewable energy:

- Steam power plants and Combined Cycle plants
- District heating, cogeneration and solar power facilities

Type	Series	Power range (MW)	Applications
REHEAT	RT30 MT15	150-1,000 90-300	Thermal fossil-fired Steam cycle Combined Cycle
NON-REHEAT	MT20 MT10	90-350 40-250	Cogeneration plants Solar Plants
GEOTHERMAL	GT	15-60	Geothermal cycles



Current production includes:

- Large ratings for reheat applications, respecting the highest steam parameters for supercritical and ultrasupercritical conditions
- Compact modules for smaller ratings
- Single- and two-cylinder models for non-reheat thermal cycles
- Geothermal steam turbines based on impulse design

Each steam turbine model is a combination of pre-engineered, well-proven modules of different sizes, providing a broad range of power ratings and applications in both 50 and 60 Hz markets. Modular design reduces both technical development and manufacturing time.

All models are assembled in our workshop – except the large low-pressure sections, which are most conveniently field-installed.

GENERATORS

Ansaldo Energia generators combine high performance and reliability with the worldwide experience gained in more than 1,300 applications – of which over 1,000 are of air-cooled generators (both round and salient pole rotors) and about 300 of hydrogen-cooled and hydrogen/water-cooled turbogenerators.

Their technology is continuously updated and improved by the Company's Research & Development department with the use of virtual design tools and finite-element 3D analysis of mechanical, electrical and ventilation behaviour. These activities resulted in increased power boundary for the specific type of cooling, highly flexible operating capabilities and top reliability.

Type	Range (MVA)	Applications
HYDROGEN-WATER-COOLED TURBOGENERATORS	Up to 1,200	Gas turbines Steam turbines
HYDROGEN-COOLED TURBOGENERATORS	Up to 700	
AIR-COOLED TURBOGENERATORS	Up to 440	Gas turbines Steam turbines Geothermal turbines
HYDROGENERATORS	Up to 420	Hydroelectric plants

All Generators can operate as
SYNCHRONOUS CONDENSERS

Ansaldo Energia Generators can be tailored based on project, location and technical requirements, and – according to the model – can suit a wide range of applications:

- Simple and Combined Cycle power plants
- Steam power plants (including Nuclear plants)
- Geothermal power plants
- Hydroelectric power plants
- Rotating Synchronous Condensers with or without flywheel

SERVICE

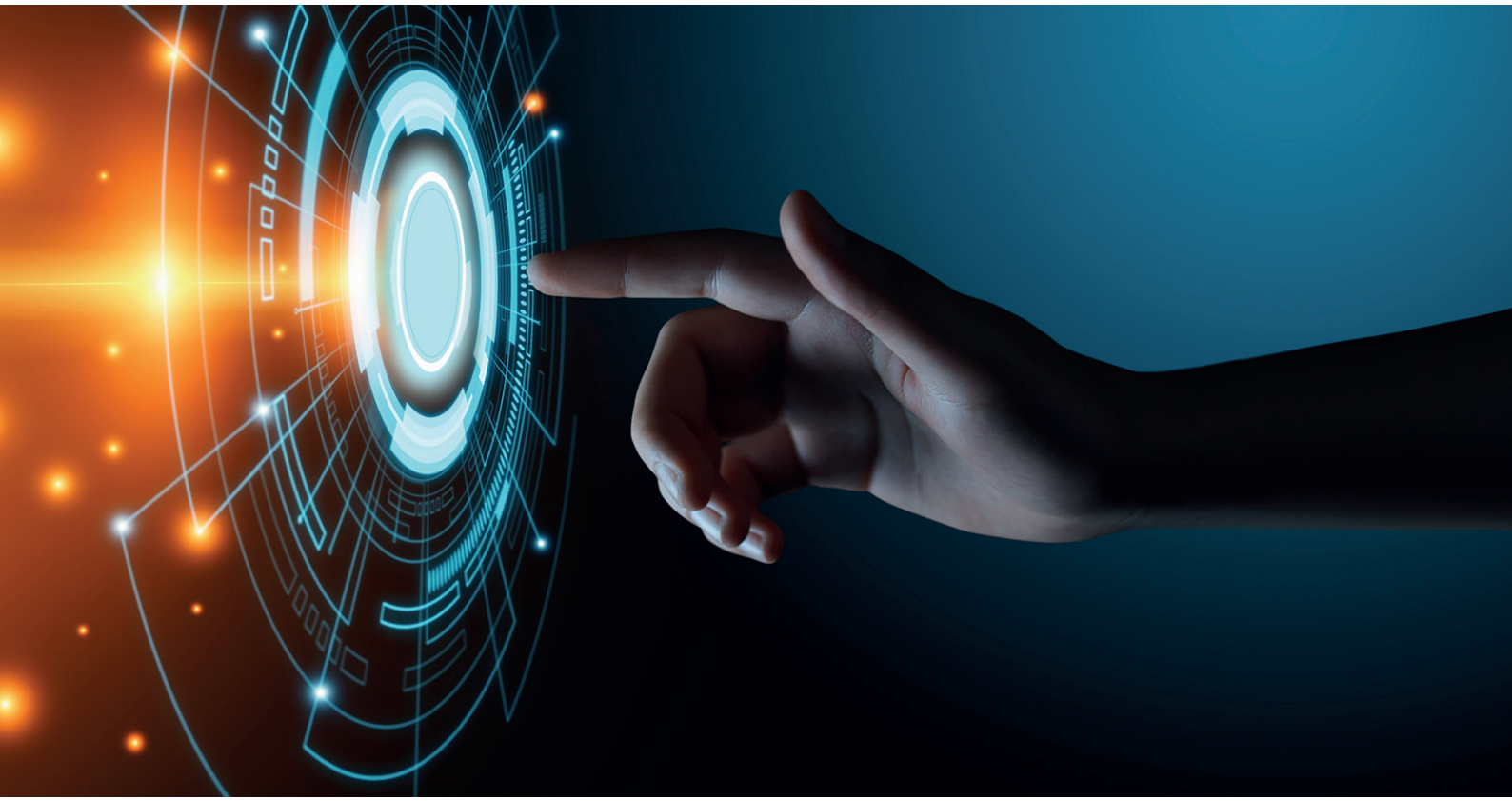
Ansaldo Energia Service is a global multi-platform service provider supporting safe, reliable operation and improvements for power generation equipment and plants.

As a proactive partner with access to the entire Ansaldo Energia product portfolio, Ansaldo Energia Service is a “one-stop shop” service provider, offering multi-technology solutions for efficiency, reliability, safety and emission compliance.

Its value proposition is based on the ability to develop the right solution for each specific Customer. By optimizing Customer profitability, uptime and expected plant life, Ansaldo Energia services enhance the value of existing assets.

The portfolio extends from single new and repaired components to field service activities – up to comprehensive upgrade packages. These include the Balance of Plant modifications needed to fully exploit improvement potential, enhance flexibility and safely manage new fuels such as hydrogen.

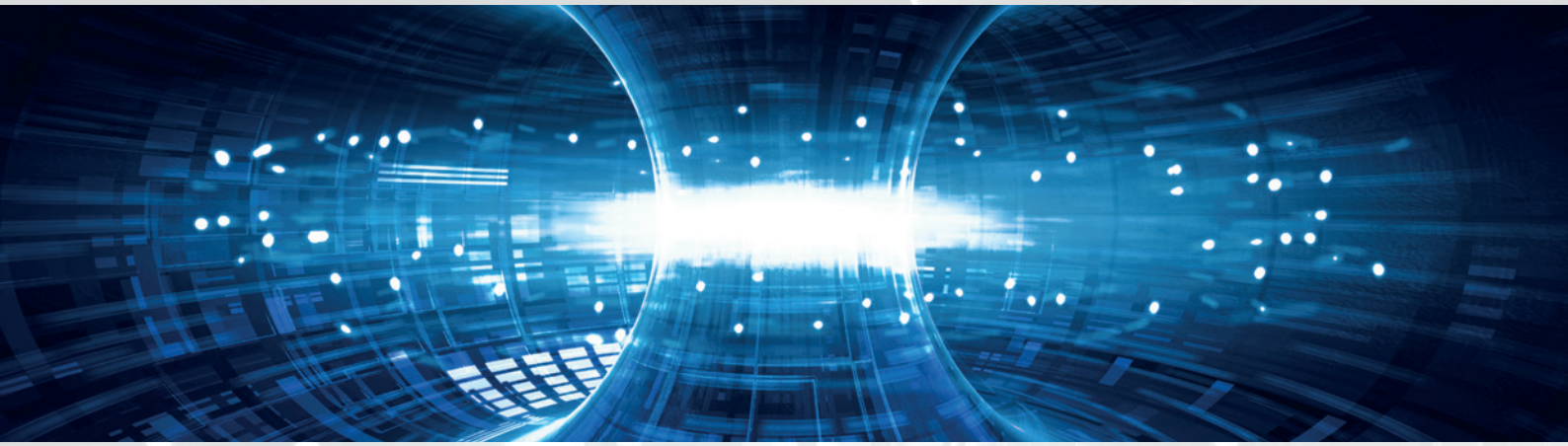
The entire Ansaldo Energia Service offering, including 24/7 assistance through the Integrated Plant Support system, is made available worldwide by the Company’s global organization.



NUCLEAR

Ansaldo Nucleare SpA, together with the subsidiary Ansaldo Nuclear Ltd (UK), operates under the name of Ansaldo Nuclear as a “One Stop Company” dedicated to nuclear power.

Nuclear energy is an essential component of the low-carbon economy. Half of the CO_2-free electricity generated in the European Union comes from its more than 120 nuclear reactors in operation. The contribution of these plants to the abatement of overall carbon emissions amounts to 700 million tons CO_2 per year.
Established in Genova in 1966 as Ansaldo Meccanico Nucleare SpA, in 1999 it became a division of Ansaldo Energia, and on 1 November 2005 it was transformed into an independent Company wholly owned by Ansaldo Energia.



Ansaldo Nucleare provides tailored design and engineering, manufacturing, assembly, testing, commissioning, on-site installation and integrated logistics services for all market segments in which it operates:
New Builds, Fusion, Plant Operation Assistance, Decommissioning and Waste Management.

Ansaldo Nucleare also has in place collaborations with Research Centers and Universities, offering public/private partnership opportunities to bridge the gap between fundamental research and industrial applications.

Ansaldo Nuclear Ltd is the largest independent turnkey provider of nuclear engineering, manufacturing and services in the UK, and part of Ansaldo Nucleare SpA.
The Company’s involvement in the nuclear industry began with the construction of the first nuclear reactor in the UK for the Dounreay Power Plant. Since then, Ansaldo Nuclear Ltd has supplied an extensive range of equipment and solutions to most UK nuclear power stations – including fuel route, remote handling, inspection equipment, encapsulation and waste handling.
Ansaldo Nuclear Ltd also operates in the defence sector.

SOLUTIONS FOR ENERGY TRANSITION

The green evolution of the Ansaldo Energia portfolio goes hand in hand with product diversification – intended to broaden the Group scope of activity and cover new power generation and preservation technologies.

This mission is assigned to Ansaldo Green Tech – a company focused on the energy transition business, incorporated in 2021 and fully owned by Ansaldo Energia – which has inherited from Ansaldo Energia specific know-how and capabilities.

The transition scenario calls for both innovation and continuity. Power generation is undergoing a structural revolution in terms of energy source mix: assuring grid stability and continuity of supply are, more than ever, vital.

In the years to come, electrification processes (e.g. in mobility) will further increase electricity demand; hence, the world economy will face a double challenge: increase the overall power output while replacing fossil sources with renewables. The growing share of renewables and their cyclic availability must be compensated with specific solutions to ensure grid stability and continuity of supply, such as energy storage technologies (including hydrogen) and grid management systems.
Load following and fast startup (peaker units) plants will keep playing an essential role during the entire transition.

The new scenario power producers and users are called to deal with four main areas:

1. Hydrogen, where electrolysers of different technologies are being developed, designed to offer a complete portfolio and able to meet the most diverse needs
2. Storage, for which both innovative “stand-alone” energy storage solutions and coupled to gas turbines are available
3. Ready-to-start products, already able to respond to the challenges of the transition, such as microturbines, synchronous condensers, geothermal plants, hydro generators

SUSTAINABILITY

The history of human-made energy has witnessed many breakthroughs. Industrial revolutions have all been inspired – and fueled – by a change in power generation technologies. The one we are going through is the first ecological transition, aimed at making best use of natural resources and zeroing climate-altering emissions.

Achieving CO_2 reduction objectives while at the same time guaranteeing grid continuity and maximum-efficiency power generation: this is the mission Ansaldo Energia is committed to.

To pursue these goals, the Company adopts an open, multi-technology approach. Decarbonization must exploit all available technologies and opportunities: from the production of green hydrogen powered by solar and wind, to the use of hydrogen as a non-carbon fuel for rotating turbomachinery; from innovative energy storage solutions to CO_2 capture and sequestration, till the fusion research programs in which Ansaldo Nucleare participates.

Ansaldo Energia has incorporated many of the targets of the UN 2030 Agenda for Sustainable Development into its ESG commitment: the Company's business approach, processes, actions and relations with the stakeholders all comply with these objectives.

OUR COMPANIES

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- **Power Plants** from the turboset package to the complete turnkey plant
- **Heavy Duty Gas Turbine** for open and combined cycle power plants
- **Steam Turbines** geothermal and CO_2 turbines
- **Generators** including also Hydrogenerators and Syncronous Condensers
- **Service**, a one-stop-shop for power generation equipment

ansaldo green tech

- **Transition Ready:** multi fuel microturbines – H_2 or BioFuel Ready Gas Turbine. Steam Turbine for Geothermal energy – Synchronous Condensers to Stabilize Grid
- **Energy Storage:** Innovative Electrochemical Storage solutions for Utility Scale – CO_2 battery systems – Energy Transition Combined Cycles (ETCC)
- **Hydrogen:** Electrolysers Manufacturing – Hydrogen Production Plants – Hydrogen Plant Maintenance

ansaldo nucleare

- Fusion
- Decommissioning & Radioactive Waste Management
- Small Modular Reactor and IV Generation
- Plant Operation Assistance
- EPC contractor

OUR PRODUCTS

Gas Turbine

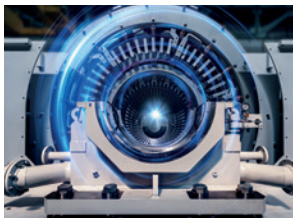
- GT36
- GT26
- AE 94.3 A
- AE 94.2
- AE 64.3

Steam Turbine

- 100-1000 MV

Generators

- UP TO 1200 MVA
- Hydrogenerators (up to 420 MVA)



Power Plant

- Plant design & Environmental Impact Analysis
- Design & Manufactoring
- Supply Chain
- Project Management
- Construction & Commissioning

Service

- Engineering & Field Service
- Long term Service Agreement
- Remote Monitoring & Data Analysis
- Digital Solutions

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