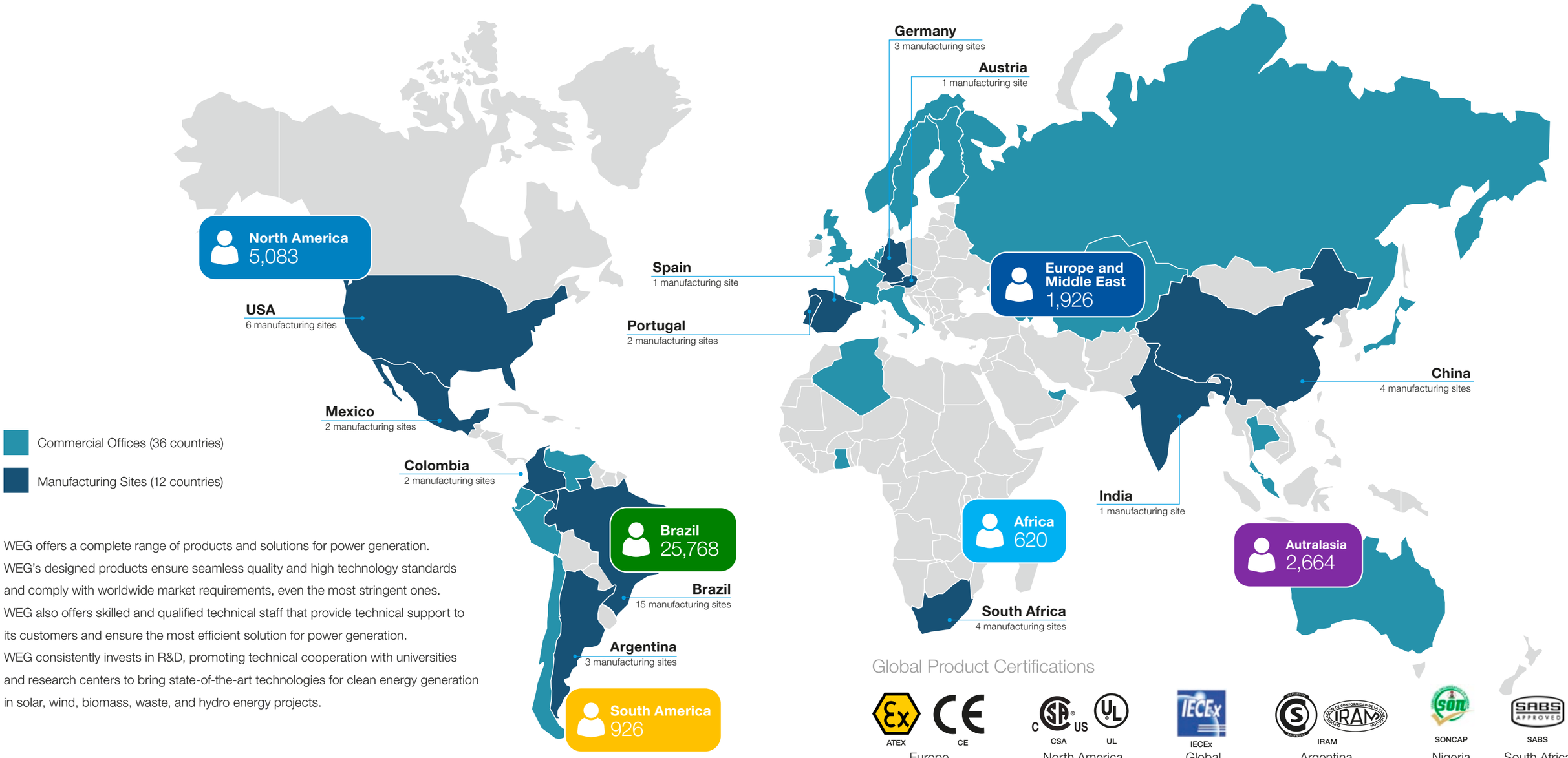
POWER GENERATION

Excellence in technologies and solutions

Motors | Automation | Energy | Transmission & Distribution | Coatings

Global Presence



WEG offers a complete range of products and solutions for power generation. WEG's designed products ensure seamless quality and high technology standards and comply with worldwide market requirements, even the most stringent ones. WEG also offers skilled and qualified technical staff that provide technical support to its customers and ensure the most efficient solution for power generation. WEG consistently invests in R&D, promoting technical cooperation with universities and research centers to bring state-of-the-art technologies for clean energy generation in solar, wind, biomass, waste, and hydro energy projects.

Whenever you need a **reliable supplier** of solutions for **Power Generation, count on WEG!**

WEG at a Glance

Over **19 million** motors manufactured annually

R$ 23.56 milion (2021)

36,900k employees

Global Product Certifications

ATEX, CE — Europe

CSA, UL — North America

IECEx — Global

IRAM — Argentina

SONCAP — Nigeria

SABS — South Africa

NEPSI — China

PESO / CCoE — India

ANCE

FIDE — Mexico

NOM

GOST — Russia, Kazakhstan, Belarus

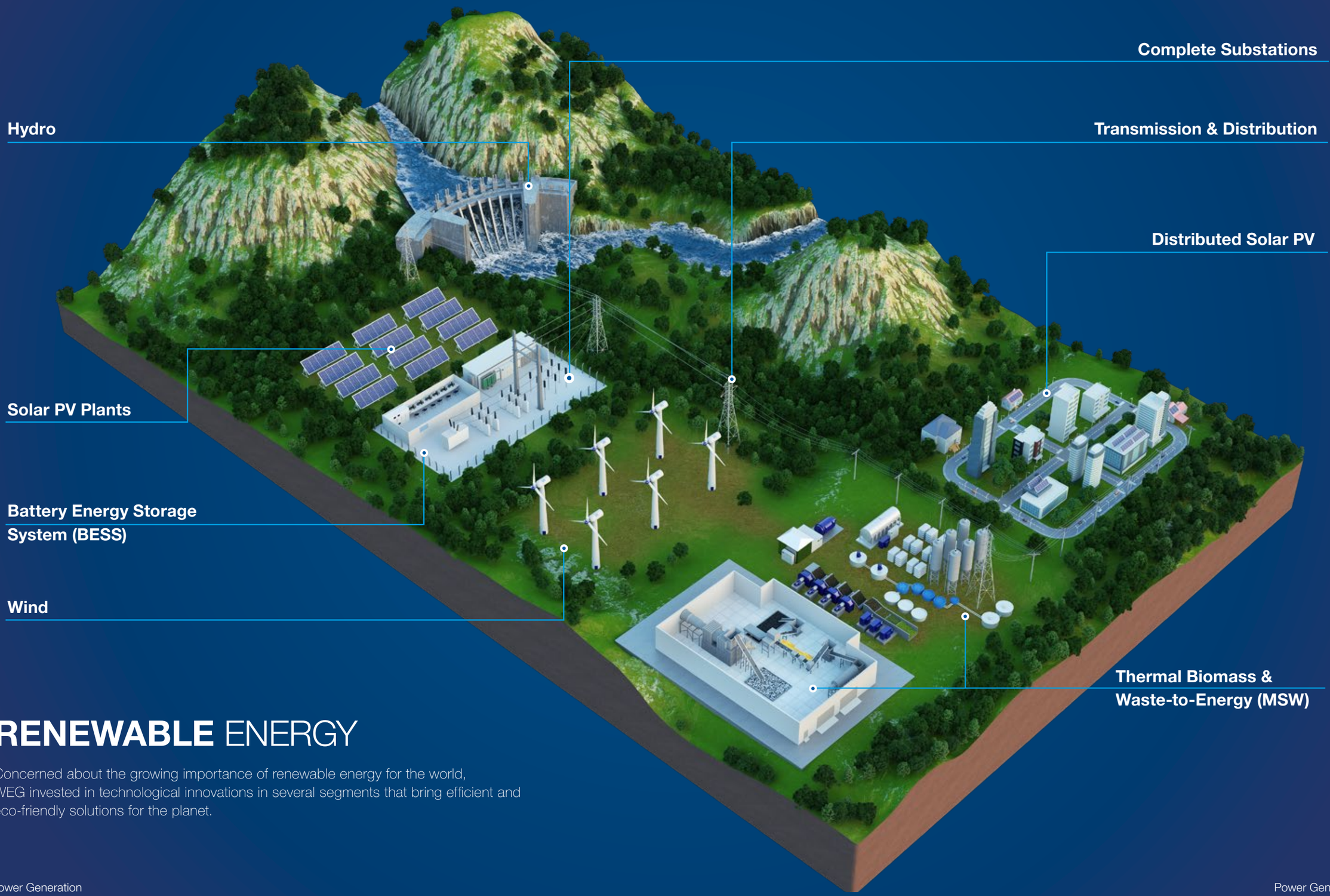
SASO — Saudi Arabia

INMETRO — Brazil

WEG Group Afilliated Companies

WEG AUTRIAL · BLUFFTON MOTOR WORKS WEG Group · E-M WEG Group · AKH WEG Group · WEG CESTARI REDUTORES · TGM Grupo WEG · GEREMIA WEG-CESTARI REDUTORES · MVISIA Grupo WEG · Balteau Grupo WEG · V2COM WEG Group · PAUMAR Grupo WEG · Pulverlux Grupo WEG · ZEST WEG Group · VOLTRAN WEG Group · watt drive WEG Group · PPI-Multitask Grupo WEG · BirminD

WEG Power Generation



RENEWABLE ENERGY

Concerned about the growing importance of renewable energy for the world, WEG invested in technological innovations in several segments that bring efficient and eco-friendly solutions for the planet.

Track-Record

ON POWER GENERATION

95,195 MW
installed worldwide

Wind power

Wind generation
2,1 MW
4,2 MW

aerogenerators
651 MW

wind generators
3,706 MW

Solar

Solar generation

40 solar farms
2,691 MW

Thermal power plants
(Cogeneration)

2 poles
200,000 kVA

4 poles
69,000 kVA

1,984 turbogenerators
38,945 MW

150,000 kW

1,216 steam turbines
13,419 MW

Gensets

Distributed power generation
25,000 kVA

221,779 alternators
41,733 MW

Hydro power plants

Micro hydro
30 MW

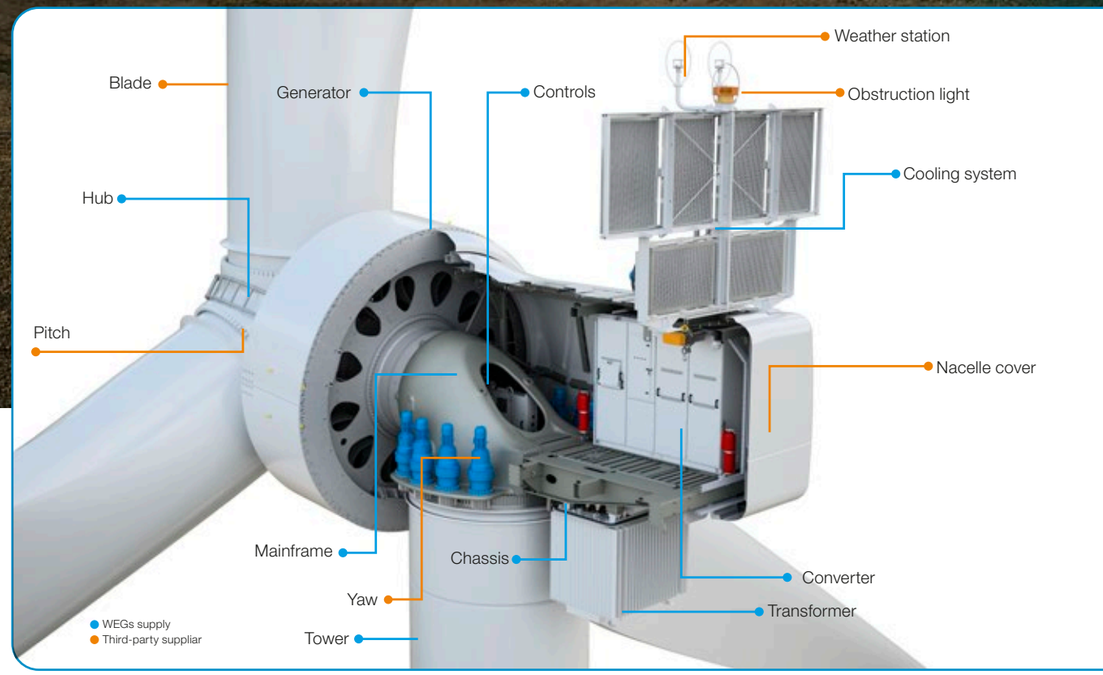
Small hydro
5 MW

Hydro
150 MW

3,088 hydrogenerators
8,120 MW

882 hydraulic turbines
2,505 MW

Wind Power



WEG's Vertical Integration assures world class quality and on-time delivery.

Wind Turbines AGW

WEG wind turbines uses high-reliability direct-drive concept (gearless). With a permanent magnet synchronous generator coupled with a full-power converter, it's capable of smooth interconnection and comply with grid requirements worldwide. It is designed for easy maintenance and uses a modular approach to assure high operational availability. State-of-the-art technology to bring value and reliability to WEG's customers.

	AGW147/4.2
Wind class[1)]	S
Annual average wind speed[1)]	9.0 m/s
Reference wind speed[1)]	37.5 m/s
Rated power	4,200 kW
Rotor diameter	147 m
Hub height	100 m or 120 m (steel) or 125 m (concrete)
Cut-in; cut-out wind speed	3 m/s ; 20 m/s

Note: 1) According to IEC 61400-1.

Scope of Supply

- Equipment (wind turbines)
- Site-delivery logistics
- Site-mounting and installation
- Commissioning and start-up
- Operation and maintenance

Engineering Services

- Micrositing optimization
- Mechanical load assessment
- Site-specific power curve
- 24/7 performance-driven monitoring
- Park controller features
- Condition monitoring system, predictive maintenance
- Third-party components assessment and repairing

Solar

Distributed Generation

In partnership with photovoltaic system integrators, WEG supply distributed generation kits, as well as offering immediate service and support for customers, besides investments in new facilities and / or maintenance of existing systems.

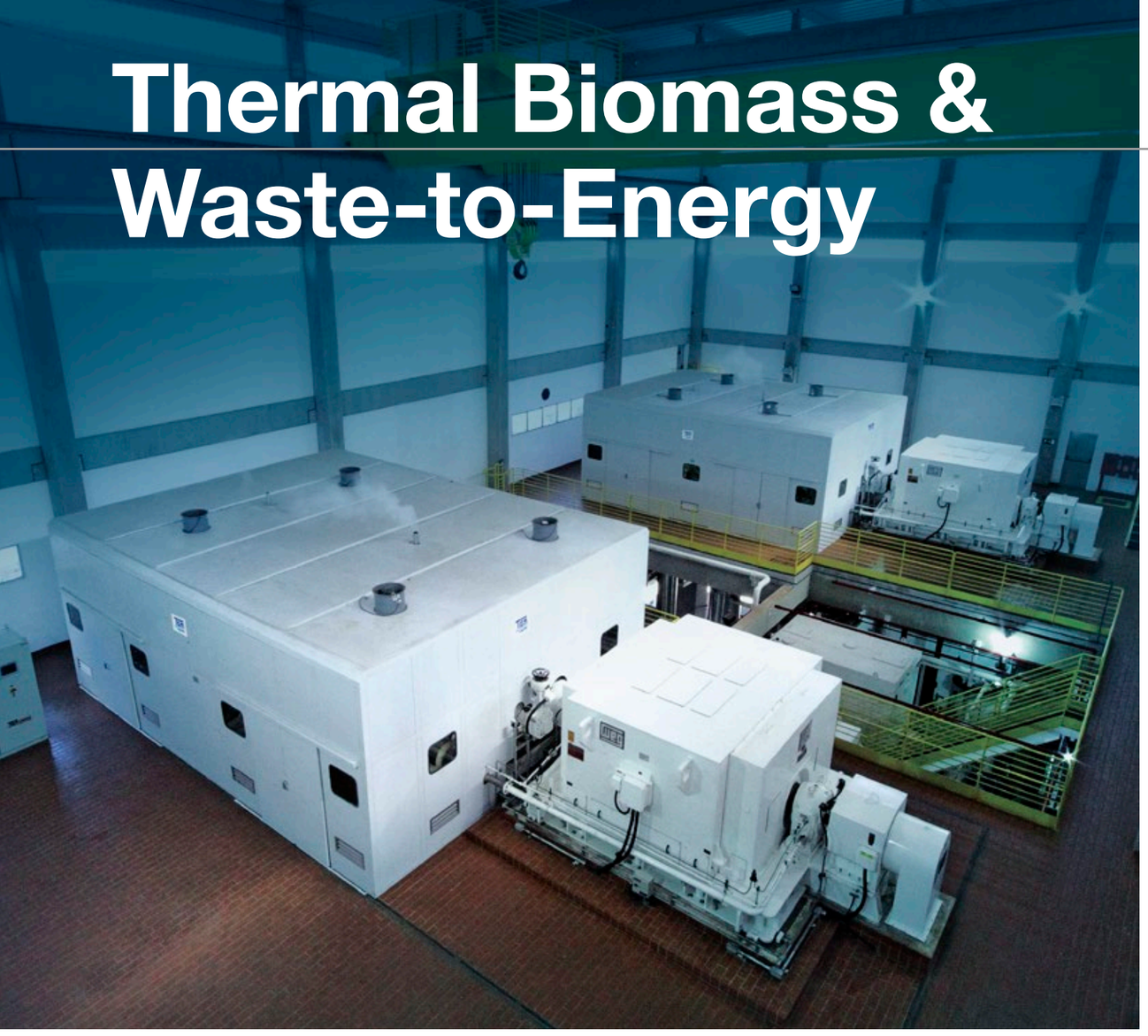
Centralized Generation

Solar plants are among the most competitive renewable energy sources in the world. It is a versatile source for multiple locations, has quick installation with low environmental impact.

To meet the market demands and adapt to the global search for renewable energy sources, WEG provides full equipment solutions for energy generation in solar plants.

For investors who wish to be ahead and contribute to a more sustainable world, WEG offers turn-key solutions, ensuring reliability and performance of solar plants.

Thermal Biomass & Waste-to-Energy



Thermal Power Generation

Due to the strong worldwide demand for renewable energy and the intense search for self-sufficiency, the customers are investing in thermoelectric power plants using biomass or even solid urban waste.
WEG, through constant investments in research, development, manufacturing, installation and after-sales services, is continuously increasing market-share supplying solutions including products such as steam turbines, gearboxes and generators for thermoelectric power plants. For a reliable, safe and profitable solution WEG offers a study of thermal balance with complete analysis of thermodynamic efficiency and electricity consumption, self-sufficiency, aiming to maximize and commercialize the exceeding energy. Another specialty is WEG's application engineering that integrates multiple equipment into a single solution in the application of thermoelectric power plants.

Biomass for Energy Recovery

Investments in maximizing efficiency and self-sufficiency are decisive factors for a company make their end products most competitive worldwide. Biomass is today an important fuel for steam generation and consequently electricity. WEG has developed solutions to use biomass as sugarcane bagasse, forest residues, waste from wood industry, bark and others.

Waste-to-Energy (MSW)

WEG offers complete solutions for power generation through the municipal solid waste (MSW) sector. The portfolio includes steam turbines, generators, transformers, substations, panels, automation, electric motors and others, which can equip different technologies for converting waste-to-energy, such as incineration and gasification.

Steam Turbines

They are used in electric power generation up to 150 MW with steam operating at inlet pressure up to 140 bar and temperature up to 540 °C.
With Modular constructions they ensure higher installation flexibility in each type of industrial process, always considering the practicality, safety, efficiency and mainly the economy.

Turbo Gearbox

With an important role in the 4-pole turbine-generator set, the turbo gear box is available up to 60 MW. The SuperTurbo line has an excellent semi-flexible gear coupling that provides better equipment safety and assembly.

Turbogenerators

Turbogenerators are designed for Thermal Power Plant applications with a wide power range up to 150 MW, designed based on WEG experience in the supply and sizing of steam or gas turbine-driven turbogenerators.

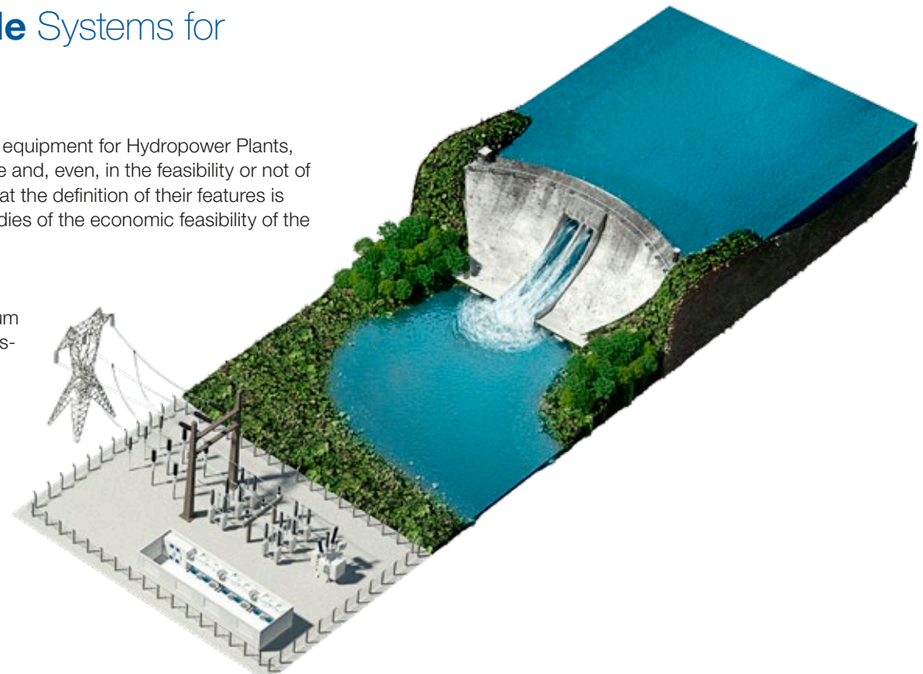
Hydropower

Turbines & Generators

Complete and **Flexible** Systems for Sustainable Energy

The Turbines and Generators are the largest equipment for Hydropower Plants, having an important play role in the final price and, even, in the feasibility or not of the project. Due to this it is very important that the definition of their features is done properly since the beginning of the studies of the economic feasibility of the project.

WEG delivers the full range of specialized equipment and services for Small and Medium Hydropower Plants: complete and flexible systems for sustainable energy.



Hydrogenerators

Hydro generators have a wide range of power and speed options based on WEG's experience in providing and designing hydro generators. The winding process adopted by WEG is specially designed and specified for the selected generation voltage. The hydro generator coils are made of rectangular copper wire or Roebel bars.

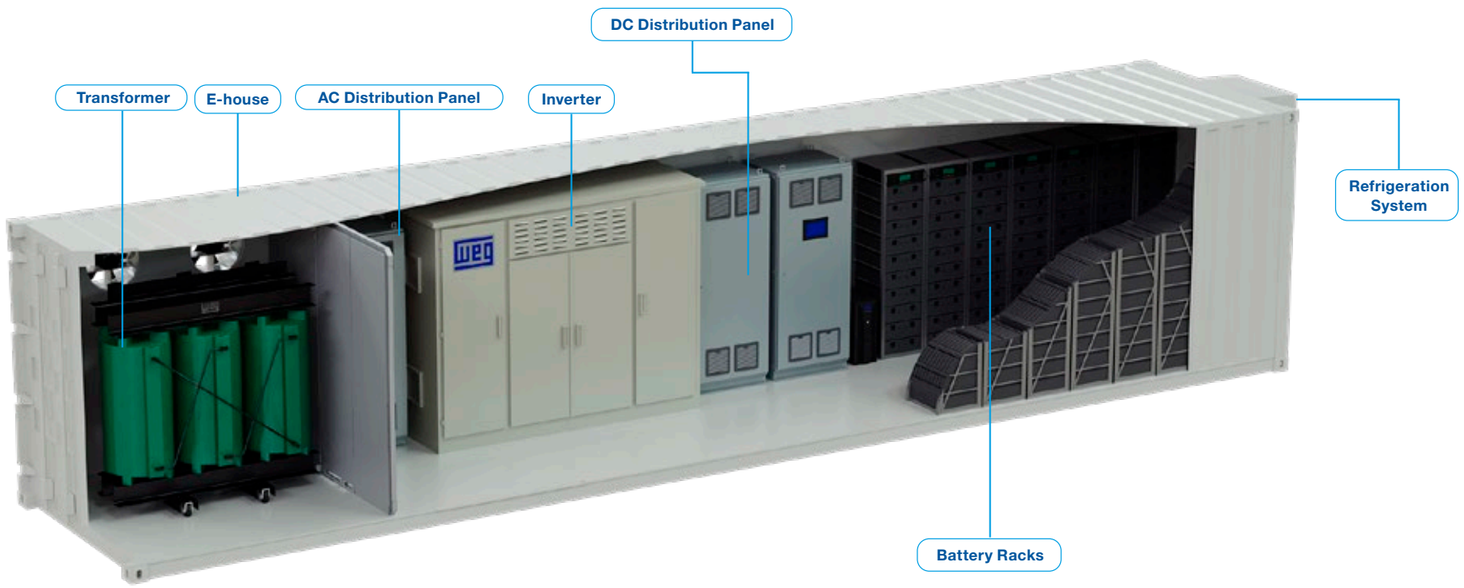
Output: Up to 150 MVA

Turbines (Kaplan, Francis, Pelton)

The hydraulic turbines and hydro mechanical equipment are highly reliable, and the efficiency is guaranteed by state-of-the-art equipment and qualified staff with extensive experience in the manufacturing process.

Output: Up to 50 MW

Battery Energy Storage



Energy Storage System (ESS) is a system combined of an energy management and control solution that coordinates operating modes and optimizes their operation, ensuring higher efficiency and utilization of energy resources, as well as operational flexibility and power supply reliability.

- Modular and customizable system
- Parallel operation with multiple power sources
- On-grid and off-grid operation
- Monitoring and remote control
- Complete energy management
- Real time operation setup
- Does not generate pollutants
- High energy density
- Integration with renewable generation sources
- High storage capacity
- Extended life time
- Low maintenance

Note: other modes can be implemented.

Modes of Operation

- Power Factor Regulation
- Peak Shaving
- Frequency Regulation
- Voltage Regulation
- Spinning Reserve
- Load Management
- Power Smoothing
- Energy Management
- Time Shifting
- Black Start
- Load Levering

Generator Sets

Realiable Power
for Demanding Applications

WEG offers a wide range of alternators to meet the requirements of different applications in virtually any environment. The alternators are specially designed according to the specific characteristics of each application so as to meet the customers needs: generator sets, wind turbines, turbogenerators (steam or gas) and hydrogenerators.

The use of a generator set ensures power supply regardless the power grid, which makes WEG alternators an excellent solution for emergency or continuous operation in maritime and ground applications.

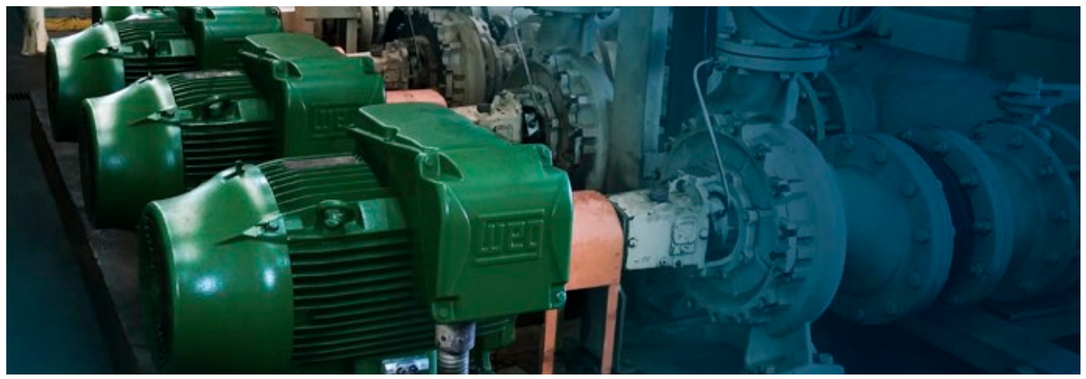
Output: Up to 20 MVA

Motors

Efficiency and **Reliability** for the Industry

Manufacturing state-of-the-art LV & MV electric motors is what WEG has been doing since its foundation. Regardless of the market segment, the company continues to dedicate extensive resources and effort in order to produce long-lasting electric motors so as to ensure reliability of production for your industry.

This is what sets WEG apart as the manufacturer of industrial motors compliant with the most demanding Power Generation application requirements.
With output power up to 50 MW and voltages up to 13.8 kV, it has flexible mechanical design associated with high operational reliability, which make our motors easy to be installed with extremely low downtime and service maintenance.
Our team of engineers has conducted extensive technical research to produce suitable products complying with the most respected industry standards, according to both NEMA or IEC.



Transmission & Distribution

Vertical production process aligned with the application of high quality raw materials and project customization, differentiate WEG Transmission and Distribution solutions for the power generation segment. Offering complete solutions, WEG provides the entire electrical package, including the construction of internal distribution networks, transmission lines and connection to local utilities, always accompanied by technical support.

Conventional Substations

WEG Substation Division has know-how and extensive experience designing and building medium and high-voltage electrical systems all over Brazil. It offers solutions for turnkey conventional substations, from the basic design to the detailed engineering design, comprising electrical studies, product and material supply and specialized works and services, which include commissioning and after-sales support, coordinating and integrating all the participants of the process.

Disconnectors

WEG offers competitive solutions for different needs in order to meet several technical requirements in 15 kV to 550 kV disconnectors. An economical and highly customized solution suitable for every substation layout, even within a limited space.

Power Transformers and Shunt Reactors

Available in voltage classes up to 550 kV they are designed to guarantee high performance in all applications.
The vertical manufacturing processes (production of the electrical insulating varnish, electric wires, tanks, insulating kits, coatings, etc.) is a remarkable characteristic and advantage of WEG, allowing broad quality control of the different production steps, as well as flexibility in lead times.

Oil Transformers and Dry Transformers

Oil and dry transformers with power up to 20,000 kVA and voltage class up to 36.5 kV. With quality assured, WEG is among the main manufacturers of this line, ensuring the preference of consumer market. Developed by an engineering team specifically dedicated to this range of transformers due to the particularities and requirements to meet each application, these products have dimensions optimized for the purpose of provide space saving installation.

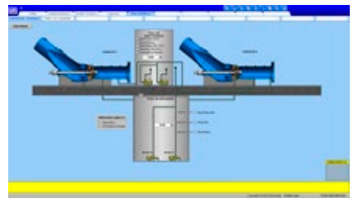
Automation Technologies

Integrated System

WEG automation equipment facilitates operation and control of power generation through system integration, thus ensuring security and reliability of information. Measurements for equipment maintenance management and production reports and energy consumption for generation, transmission and distribution companies.

Distribution, Control and Protection Panels
Made of steel lamination type PNW / LCW / CCM-03 with IP42 degree of protection, meeting IEC 60439 standard with TTA certification.

Medium Voltage Operation and Control Panels
They are factory assembled and tested for 2.3 kV voltages at 36 kV, nominal currents from 1,250 to 4,000 A, and symmetrical short-time current from 25 to 50 kA.
Designed to meet the demanding national and international standards NBR IEC 62271-200, with ease assembly and maintenance, thus as the flexibility to adapt to the different characteristics required by the market.



Supervision and Control
WEG supervision and control system enables full integration between operator and power station, providing visualization of power, voltage, temperature, pressure, lubrication and protection status variables of equipment. Maintenance is reduced due to the level of information presented through event logging, alarms, history, trend graphs and operation log. Energy production and consumption reports are available through an easily accessible database, enabling integration with management systems. The ease and flexibility of power control makes plant operation simple and effective.

Coatings

High **Resistance** and **Performance** Coatings

Hydropower Plants

High resistance to the corrosive effects with excellent impermeability and greater resistance to the mechanical abrasion caused by abrasive abrasion, are requirements met by WEG Coatings in the painting of floodgates, conduits and other hydroelectric equipment. We have developed a wide range of environmentally friendly power generation products with advanced technology to protect all types of substrates in new construction and maintenance for painting of hydromechanical equipment.

Products

WEGPOXI BLOCK N 2912 – Novolac technology of high-thickness, high solids and LOW VOC class.
WEGTHANE HPA 501 – Gloss polyurethane-based topcoat.
WEGPOXI CVD 323 – Application of zinc phosphate to protect external floodgates.
WEGPOXI 88 WET SURFACE 88 HT – High performance in applications on hydroblasted surfaces.
W-POLI HBD 453 / ERD 443 - Polyurea-based waterproofing protective coating.

Thermal Power Plants

Resisting corrosion and high temperatures are requirements for the coatings that will be used in thermal power plants. For this, the formulations have zinc-rich pigments to increase the anticorrosion resistance, as well as modified silicones, which guarantees resistance to temperatures up to 600 ºC (1112 ºF).

Wind Energy

In the segment of Wind Energy, WEG Coatings has wide range of solutions, from the painting of the blades and tower structure to the most diverse internal and external equipment of the plant. They combine the versatility of products that can be applied on diverse substrates, such as fibers, concrete, galvanized steel and plastic, and excellent anticorrosive protection and high performance.

Transformers

In order to serve this demanding market, WEG Coatings has developed high technology coatings and varnishes, ideal for application in all kinds of transformers. The industrial system meets the strictest resistance and performance tests required by the industry. Our products bear certifications of compliance with the requirements of ABNT Standards in addition to several homologations.

Service

Services and **Support** with the **quality** of WEG products

Protecting your investment means more than insuring the plant. It also means keeping your equipment in top condition to maximize service life. That's why you can count on WEG - the responsive company with comprehensive rotating equipment services and support.

WEG has earned a reputation for quality by supporting our customers with specialized technical product and services, and our ability to respond promptly to customer demands. Excellent service is assured by people who understand your equipment and process needs. Our experienced staff of service engineers can spot potential performance problems and recommend corrective action.

Continue to enjoy the benefits of first-hand product knowledge and problem solving capabilities by having us train your on-site staff. We can recommend ways to improve your equipment life time and maximize your equipment availability. With that in mind, WEG is pleased to present the following key benefits that will bring a safe and reliable operation for the electric motors in the most remote and toughest environmental conditions.

Retrofitting and Repowering Service Ranges

WEG also have the same facilities structure and standards to perform retrofitting and repowering services, extending the large equipment life time.

- DC generators and motors
- Three-phase induction motors
- Synchronous motors
- Turbogenerators
- Hydrogenerators
- Steam Turbines (24/7 service)
- Hydraulic turbines
- Wind turbines

Energy Efficiency

Identification of potential reduction of power consumption in electric motors, drives and deviations in the power factor, proposing solutions and defining the necessary retrofit. Results presented with individual return deadlines, making the decision flexible.

Recoverability Limit

Definition by means of technical and economic criteria of the feasibility to repair or replace the electric motors.
The work is performed with the help of a specific software application, analyzing the data of each plant, allowing the cost analysis of the life cycle of the motors.

Commissioning and Start Up

Bearing in mind the magnitude of the mining projects and complexity of the installed equipment, WEG offers specialized technical support for the installation, from beginning to end including supervision services. Also included is verification of equipment details and concept integration with the entire system.

Project Management

Complex mining projects usually require very strict control of technical documents, production schedule, inspections and logistic procedures. In those cases WEG offers dedicated staff structure to support tasks at different stages of the project execution. With these initiatives WEG provides clear and up to date information on the equipment manufacturing stages and keep all parties involved informed on the production and delivery progress.

Preventive Maintenance

Checkup and preparation of preventive plans according to maintenance concepts focused on reliability and adjustments according to operating conditions for each plant.

Sustainability

SDGs
Sustainable Development Goals

WEG, as a way of reaffirming its commitment to sustainability, has become a signatory of the Sustainable Development Goals. It is a voluntary initiative created by the UN that proposes coordinated global action between society as a whole - private sector, governments, civil society, among others - in order to achieve the SDG, as they are called. Membership also strengthens WEG's positioning and engagement in the face of challenges and opportunities with regard to a sustainable development. The SDG are deployed in 17 goals and 169 targets to be achieved by 2030.

WEG among the world's leading **clean energy companies**

CLEAN200™

As stated by Carbon Clean Report, the company stands out for the income obtained from low carbon products and services around the world.

Sustainability has been an integrated part of WEG's philosophy since its foundation. That is why awareness of environment protection has been a major concern in the company for the correct use of natural resources and the application of efficient energy solutions.

It is understood internationally, that the effective use of electric power significantly reduces environmental impacts with further cost savings and improved living standards. This is the path followed by WEG's continuous investments in technological innovation as well as development of premium efficiency electric motors and electronic products which are suitable to operate under increased performance, high productivity, low power consumption, and reduced operational costs providing outstanding benefits to its customers and to the environment.

Along its successful history, energy has been the company's focus while manufacturing reliable and highly efficient products that contribute to a global sustainable development.

We can't **predict** the future, but **we can see** it coming...

Global presence is essential, as much as understanding your needs.

Global Presence

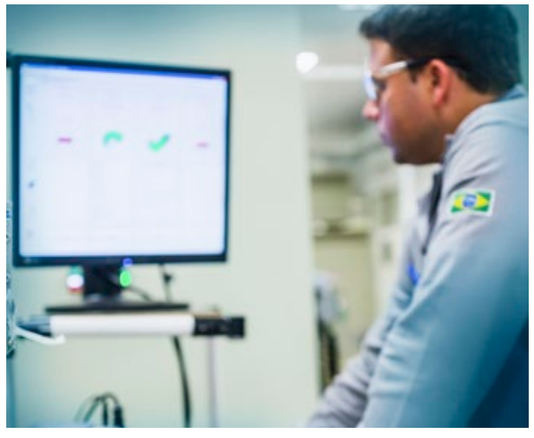
With more than 30,000 employees worldwide, WEG is one of the largest electric motors, electronic equipments and systems manufacturers. We are constantly expanding our portfolio of products and services with expertise and market knowledge. We create integrated and customized solutions ranging from innovative products to complete after-sales service.

WEG's know-how guarantees our ***Power Generation*** is the right choice for your application and business, assuring safety, efficiency and reliability.

Availability is to have a global support network

Partnership is to create solutions that suit your needs

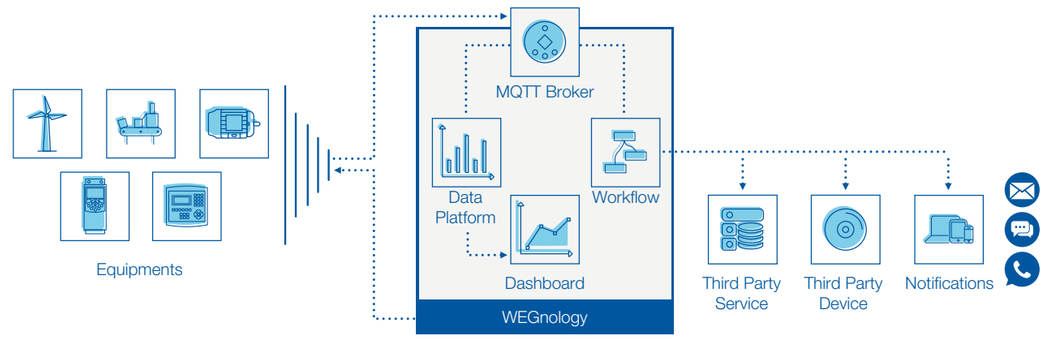
Competitive edge is to unite technology and innovation



WEGnology®

WEG IoT Platform

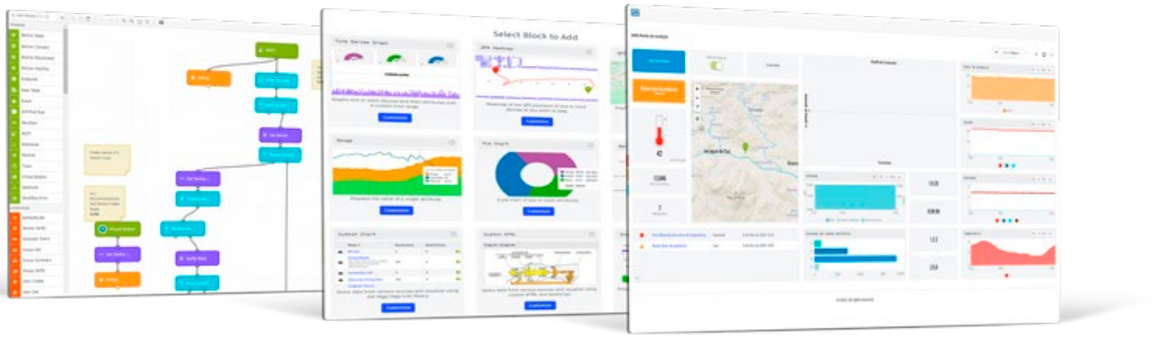
WEGnology® IoT platform is a powerful tool based on cloud computing especially developed to create connected solutions. The practical use of the tool, whether for simple or more complex applications, allows the creation of collaborative ecosystems, in addition to enabling the co-creation of solutions focused on the digitization of processes and gains in efficiency.



Highly scalable, the WEGnology® IoT platform has advanced resources for data collection, aggregation and view, allowing its application in the most varied segments, in addition to providing a better understanding of the large amount of data coming from factory floor devices, such as sensors , motors, actuators, drives, controls, among others.

Main Characteristics

- The drag and drop function in the visual workflow simplifies and accelerates the development of IoT solutions while streamlining the adaptations and adjustments according to the natural and constant evolution of the business logics;
- Easily customizable dashboards are built simply and quickly, meeting the business requirements;
- Geolocation and correlation between variables are also easily configured by the user. Multi-tenant applications, as well as specific domains or reports are also possible in the "organization" environment;
- The platform also allows data processing and transformation, numerical simulation, statistical modeling and machine learning through the use of Jupyter Notebooks.



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Cod: 50099863 | Rev: 01 | Date (m/y): 03/2022.

The values shown are subject to change without prior notice.
The information contained is reference values.