

# History of the Energy and Environment Businesses

Since its establishment in 1923, Fuji Electric has pursued innovation in energy and environment technologies for 100 years, contributing to clean energy, the stable supply of energy, energy saving, and automation.

We value the technologies, products and relationships of trust with a wide range of customers we have cultivated in the fields of industrial and social infrastructure to date, and going forward we will continue to respond to the energy and environmental issues faced by our customers.

|                                | Establishment period<br>Expansion of electricity demand for the modernization of industry |   | Post-war reconstruction to the high-growth period<br>Expanded demand for electricity stabilization for building electricity and railroad infrastructure and the development of industry |  | From the oil shock to the stable growth period<br>Expansion of energy saving demand due to the oil shock, expansion of automation demand  |  | Entering the era of the environment<br>Environmental measures in the industrial and social infrastructure fields proceeded against the background of environmental air pollution and other environmental problems |   | Delivery track record of main products*<br>(As of FY2022)   |  |  |  |   |
|--------------------------------|---|---|---|--|---|--|---|---|---|--|--|--|---|
|                                | 1923  | 1930  | 1950  | 1960   | 1970  | 1980   | 1990  | 2000  | 2010  | 2020   |  |  |   |
| <b>Clean energy</b>            |   | 1936<br>Built first hydraulic turbine, 4,850 HP Francis turbine<br>Delivered the first hydraulic turbine to the Uwanoshiro Power Plant (Tochigi Prefecture) |   | 1966<br>Began commercial operation of the Tokai Nuclear Power Plant (Built nuclear pressure vessels and other equipment) | 1977<br>Received an order for our first full-scale geothermal power generation facility (40 MW unit for El Salvador's electricity authority)<br>1979<br>Delivered Fuji Electric's first high head, large capacity pumped storage power generation facilities (the Cheongpyeong Pumped-storage Power Plant in South Korea) |  |   | 1998<br>Delivered 100 kW phosphoric acid fuel cells | 2010<br>A 140 MW geothermal power plant, the largest single-unit capacity in the world, started operation (The Nga Awa Purua Geothermal Power Station in New Zealand) | 2017<br>Delivered one of Japan's largest geothermal binary equipment (5,050 kW for the Takigami Binary Geothermal Power Plant) | <ul style="list-style-type: none"> <li>Hydro power generation<br/>745 units (24.1 GW)<br/>Japanese market share 3rd</li> <li>Geothermal power generation<br/>Flash 84 units (approximately 3.6 GW)<br/>Global market share 1st<br/>Binary 2 units (10 MW)</li> <li>Solar power generation (EPC)<br/>26 installations (approximately 0.4 GW)<br/>Japanese market share 2nd</li> <li>Fuel cells 100 units or more</li> </ul> |  |   |
| <b>Stable supply of energy</b> | 1924<br>Began manufacturing electrical machinery  | 1930<br>Began manufacturing mercury-vapor rectifiers  | 1925<br>Began manufacturing transformers<br>Delivered our first unit to a mining company  | 1954<br>Began manufacturing ultra-compact magnetic switches  | 1964<br>Delivered the first large capacity transformer rectifier S-Former   | 1974<br>Commercialized cast resin power transformers                           |   |   | 2012<br>Released PCSs for mega solar power generation systems (equipped with a new three-level module, the first commercialized in the world)                         | 2014<br>Released PCSs equipped with SiC  | 2022<br>Released transformers using natural ester oil  | <ul style="list-style-type: none"> <li>Substation equipment:<br/>Transformers 2,500 units or more<br/>Switchgear 11,000 units or more</li> <li>Cast resin transformers:<br/>100,000 units or more</li> <li>Large capacity rectifiers<br/>Approximately 300 units (approximately 28.1 GW)<br/>Global market share 1st</li> <li>ED&amp;C components<br/>Magnetic switches<br/>Japanese market share 1st<br/>Molded-case circuit breakers<br/>Japanese market share 2nd</li> <li>UPS<br/>Japanese market share top group</li> </ul> |   |
| <b>Energy saving</b>           |   |   |   |  |   | 1976<br>Began manufacturing the programmable controller (PLC) FUJILOG Series   |   | 1984<br>Released the PLC MICREX-F Series            |   |  | 2017<br>Delivered SiC-equipped main converters for Shinkansen trains   | <ul style="list-style-type: none"> <li>General-purpose inverters<br/>Japanese market share 2nd</li> </ul>  |   |
| <b>Automation</b>              |   |   |   |  |   | 1976<br>First in the industry to start manufacturing general-purpose inverters |   | 1989<br>Released IGBT-equipped inverters            | 2012<br>Developed an industrial inverter equipped with SiC-SBD, a first in Japan  |  |  | <ul style="list-style-type: none"> <li>IGBT module<br/>Global market share 3rd</li> </ul>  |   |
|                                |   |   |   |  |   | 1959<br>Began manufacturing silicon diodes                                     | 1975<br>Began manufacturing bipolar transistors   | 1988<br>Began manufacturing 1st-generation IGBTs    | 2010<br>Developed a new three-level converter circuit and a new three-level power module  | 2010<br>Developed SiC modules  | 2016<br>Began shipping direct water-cooled power modules for automotive applications (built-in RC-IGBT)  | 2018<br>Began shipping 7th-generation RC-IGBTs for industrial equipment  | <ul style="list-style-type: none"> <li>Vending machines<br/>6 million units or more<br/>Japanese market share 1st</li> <li>Open showcase<br/>700,000 units or more</li> </ul> |
|                                |   |   |   |  |   | 1969<br>Began manufacturing vending machines                                   | 1973<br>Released open showcases   | 1976<br>Released hot & cold vending machines        | 2011<br>Released hybrid heat pump vending machines  |  | 2023<br>Released the Sustainable Vending Machine Series  |  |   |

\* The market shares are the FY2022 results estimated by Fuji Electric. The market share of geothermal power generation is the result for orders received from 2000 onwards and the market share of solar power generation is the result for shipments of industrial PCS 500 kW class or higher from the application of FIT in 2012 onwards.