The EnerGia Group Companies

- **Electric power business, Electric power business support, etc.**
  - CHUDEN KOYO CO., LTD.
  - CHUDEN PLANT CO., LTD.
  - CHUGOKU INSTRUMENTS CO., INC.
  - CHUDEN KANRYO TECHNOS CO., LTD.
  - Chugoku Electric Power Australia Resources Pty. Ltd.
  - Chugoku Electric Power International Netherland B.V.
  - Chugoku Electric Power America, LLC
  - Demystic Support Chugoku Co., Inc.
  - CHUDEN ENGINEERING CONSULTANTS CO., LTD.
  - Chiba Power Corporation
  - Tempco Industrial Co., Ltd.
  - CHUGOKU KOATSU CONCRETE INDUSTRIES CO., LTD.
  - Satoh Electric Thermal Co., LTD.
  - Satoh Electric Corporation
  - Osaka ColdGen Corporation
  - KATA BIOMASS POWER CO., LTD.
  - AER WATTS & ENERGIA POWER YAMAGUCHI CORPORATION
  - AER WATTS & ENERGIA POWER CHIBA CORPORATION
  - CHUDENKO CORPORATION
  - The Chugoku Electric Manufacturing Company, Incorporated
  - OZUKI STEEL INDUSTRIES CO., LTD.
  - EAML Engineering Company Limited

- **Comprehensive energy supply operations**
  - Energia Solution & Service Company, Incorporated
  - Power Engineering and Training Services, Incorporated
  - MITSUSHAKA LNG COMPANY, LIMITED

- **Information and telecommunications operations**
  - Energia Communications, Inc.

- **Business and life support operations**
  - Energia L&B Partners Co., Inc.
  - Energia Business Service Co., Inc.
  - Energia Smile Co., INC.
  - The Energia Logistics Co., Inc.
  - ADEXUS Co., Ltd.
  - Energia Care Service Co., Inc.
  - CHUGOKU HEALTH AND WELFARE CLUB CO., INC.
  - Houseplus Chugoku Housing Warranty Corporation Limited

- **Reference: Electrical Safety**
  - Chugoku Electrical Safety Inspection Association

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**The Energia Group Companies**

- **Electric power business, Electric power business support, etc.**
- **Comprehensive energy supply operations**
- **Information and telecommunications operations**
- **Business and life support operations**
- **Reference: Electrical Safety**

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**The Chugoku Electric Power Co., Inc.**
Public Relations Communication Group
Regional Relations Division
No.15 Kitachokai, Minato-ku, Hiroshima 730-8701, Japan
TEL: +81-(0)82-544-2849 FAX: +81-(0)82-504-7006 URL: http://www.energia.co.jp/

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We devote our entire power to supporting the community and the future.
President’s Message

Along with facing an era of full-fledged competition due to the full liberalization of retail electric power sales, the electricity business has entered a period of change with the demands for legal separation from the transmission business by April 2020 and other pressures. In response to these environmental changes in the industry, we of the Chugoku Electric Group have instilled “Trust. Creation. Growth” as our new management philosophy.

The mission of our Group is to contribute to the sustainable development of society through group projects focused on the electricity business. Above all, since our inception our mission has been to “contribute to the development of the region by delivering a stable supply of good-quality, inexpensive electric power”.

To continue fulfilling our unwavering mission, moving into the future our Group will resolutely challenge new issues as one while responding in a flexible manner as the business environment undergoes great change.

We aim “to remain a corporate group chosen and trusted by society.” The trust we earn from our customers forms the foundation for all the business activities of our Group. We shall take the “voice” of our stakeholders, including our customers, seriously and believe that living up to their expectations with good faith will lead to gaining their trust.

We will contribute to the sustainable development of society by forming an accurate perspective of changes in the business environment, social demands, and customer needs and by continuing to grow ourselves.

Together with the Community

To remain a corporate group chosen and trusted by society.

Marashihe Shimizu
Representative Director
President & Chief Executive Officer

THE CHUGOKU ELECTRIC POWER CO., INC.

Responding with sincerity to feedback from customers

We aim to remain a corporate group chosen and trusted by society. The trust we earn from our customers forms the foundation for all the business activities of our Group. We shall take the “voice” of our stakeholders, including our customers, seriously and believe that living up to their expectations with good faith will lead to gaining their trust.

We will contribute to the sustainable development of society by forming an accurate perspective of changes in the business environment, social demands, and customer needs and by continuing to grow ourselves.

Organization Chart

Corporate Data

(As of March 31, 2018)

Corporate Name The Chugoku Electric Power Co., Inc.
Address (Head Office) 4-33 Komachi, Naka-ku, Hiroshima 730-8701 Japan
Date of Establishment May 1, 1951
Paid-in Capital ¥185,527 million
Number of Shares Issued 371,055,259 stocks
Number of Stockholders 124,114
Number of Employees 9,169

Electricity Sales (fiscal/2018)

<table>
<thead>
<tr>
<th>Service</th>
<th>Electric Lighting</th>
<th>Electric Power</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantity (GWh)</td>
<td>18,562</td>
<td>36,870</td>
<td>55,432</td>
</tr>
</tbody>
</table>

Sale Asset (Operating Residual) ¥1,227,470 million

<table>
<thead>
<tr>
<th>Number and Capacity of Electric Power Stations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal</td>
</tr>
<tr>
<td>Hydroelectric</td>
</tr>
<tr>
<td>Nuclear</td>
</tr>
<tr>
<td>New Energy Sources</td>
</tr>
<tr>
<td>Total</td>
</tr>
<tr>
<td>Capacity (MW)</td>
</tr>
<tr>
<td>12</td>
</tr>
<tr>
<td>99</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>114</td>
</tr>
<tr>
<td>53,752 GWh</td>
</tr>
<tr>
<td>4,631 GWh</td>
</tr>
<tr>
<td>0 Wh</td>
</tr>
<tr>
<td>5,146 GWh</td>
</tr>
<tr>
<td>63,529 GWh</td>
</tr>
</tbody>
</table>

Generated Output (fiscal/2018)

<table>
<thead>
<tr>
<th>Service</th>
<th>Thermal</th>
<th>Hydroelectric</th>
<th>Nuclear</th>
<th>New Energy Sources</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantity (GWh)</td>
<td>53,752</td>
<td>4,631</td>
<td>0</td>
<td>5,146</td>
<td>63,529</td>
</tr>
</tbody>
</table>

Transmission Lines

<table>
<thead>
<tr>
<th>Route Length</th>
<th>Underground</th>
<th>Overhead</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electric Lighting</td>
<td>641 km</td>
<td>7,915 km</td>
</tr>
</tbody>
</table>

Power Transmission & Distribution Company

- Service Offices
- Power Management Offices
- Network Service Center

Energy Sales Div.

- Energy Sales Centers
- Customer Centers
- Human Billing and Payment Inquiry Center

- Thermal Power Stations
- Nuclear Power Stations
- Temperature Management Center

Kaminoseki Nuclear Power Plant Project

- Nuclear Power Plant Construction Project
- Nuclear Power Plant Operations Project

- Corporate Finance and Procurement Div.
- Corporate Planning Div.
- Chugoku Hospital

- Compliance Promotion Div.
- Internal Audit Div.

- Human Resources Development Div.
- Property Management Div.

- Corporate Planning Div.
- Nuclear Energy and Technical Research Institute

- Region Office (Tottori, Shimane, Okayama, Yamaguchi, Tokyo)
- Audit and Supervisory Committee Members’ Office

Note: In this pamphlet, “fiscal 2018” refers to the year ended March 31, 2018.

In addition, “fiscal 2019” refers to the year ending March 31, 2019.
For the sake of our customers,
For the sake of our future,
Keeping our eyes on today and tomorrow,
And using our "Entire Power" for improvement.
A country with a self-sufficiency rate of 8%, Japan makes electricity.

The energy self-sufficiency of Japan, a country with almost no natural resources, is just 8%. The bulk of our energy relies on imports from overseas. We believe that it is essential to create electricity from the standpoint of “S+Es”.

The priority being “S”, securing safety and the simultaneous achieving of the three Es “Energy Security”, “Economic Efficiency” and “Environment”. We cannot rely on one specific power source to achieve this, and instead must take advantage of the best characteristics of each power generation method to create a well-balanced “energy mix”.

Creative Power

<table>
<thead>
<tr>
<th>Energy Resources</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal Power</td>
<td>Large amounts of power can be stably generated</td>
<td>Concerns about future procurement due to intense international competition</td>
</tr>
<tr>
<td>Oil</td>
<td>Easy to transport, handle and store</td>
<td>Power generation output is easy to adjust</td>
</tr>
<tr>
<td>Coal</td>
<td>Reserves are abundant and procurement is stable</td>
<td>Price is comparatively stable compared with other fossil fuels</td>
</tr>
<tr>
<td>LNG</td>
<td>Low CO2 emissions compared with other fossil fuels</td>
<td>Difficult to store for a long period and is expensive on a flexible basis</td>
</tr>
<tr>
<td>Renewable Energy</td>
<td>Permanent use is possible as a genuine domestic natural resource</td>
<td>Difficult to store for a long period and is expensive on a flexible basis</td>
</tr>
<tr>
<td>Hydroelectric</td>
<td>Efficient to convert renewable energy to electricity</td>
<td>Costs for building large dams are limited</td>
</tr>
<tr>
<td>Wind Power</td>
<td>Power can be generated continuously when demand is high</td>
<td>Due to low generation efficiency, extensive areas are required in order to generate in large quantities</td>
</tr>
<tr>
<td>Photovoltaic</td>
<td>Power can be generated continuously when demand is high</td>
<td>Due to low generation efficiency, extensive areas are required in order to generate in large quantities</td>
</tr>
<tr>
<td>Biomass</td>
<td>Double power generation is possible compared to other renewable energies</td>
<td>Costs for building large dams are limited</td>
</tr>
<tr>
<td>Nuclear Power</td>
<td>Large quantities of electricity can be stably generated</td>
<td>Requires rigorous safety measures since it poses immense risks in the event of an accident</td>
</tr>
</tbody>
</table>

Main Features of the Various Energy Resources

Environment

Safety

Economic Efficiency

Energy Security
We are involved in the construction of a coal-fired thermal power station utilizing cutting-edge methods of power generation.

We are using coal-fired thermal power as a power source playing a part in reducing environmental impact as much as possible while achieving the optimum energy mix. Currently, we are planning to construct the Misumi Power Station Unit 2. We are moving forward with the enhancement of operational reliability by applying the knowledge gained through the operating performance of Unit 1 of the Misumi Power Station, along with creating facilities which excel in terms of economic performance and environmental considerations by adopting USC* power generation, a state-of-the-art approach to power generation which uses the highest levels of technology possible. In addition, we are suppressing CO₂ emissions even further by burning fuel mixed with biomass fuel.

In May 2018, we completed the procedures for environmental impact assessment initiated in March 2016 and going forward we are aiming to commence construction in November 2018 and commercial operation in November 2020, while taking measures to preserve the surrounding environment.

*USC: Ultra Super Critical

We have introduced equipment that improves thermal efficiency in order to further increase power generation.

The thermal efficiency of our thermal power stations has improved through the introduction of the LNG combined cycle and ultra supercritical generation methods and other developments. (Thermal efficiency of 40.8% was achieved in fiscal 2018.)

Every 1% increase in our thermal power stations’ thermal efficiency leads to an annual fuel saving equivalent to roughly 200 million liters (fuel oil conversion), and moreover enables a reduction of around 600,000 tons in CO₂ emissions. We have been further improving our thermal efficiency by incorporating more efficient equipment when replacing aging systems. At the Yanai Power Station, we have been replacing the gas turbines, and at the Shin-Onda Power Station, we have replaced the steam turbines.

We are promoting the development of Clean Coal Technology to suppress the environmental impact of coal-fired thermal power stations.

Coal-fired thermal generation has excellent advantages in terms of supply stability and economy. In order to use it well into the future, we implemented the Osaki CoolGen Project, aiming to make a reality of an innovative low-carbon emitting coal-fired thermal power station that combines an ultimate form of high-efficiency coal-fired power generation that drastically cuts CO₂ (IGFC)*1 and CO₂ separation and recovery as technology for elevating operating efficiency and achieving clean operations.

This project comprises verification of oxygen-blown coal-fired integrated coal gasification combined cycle power generation (oxygen-blown IGCC)*1 (first phase), IGCC verification of CO₂ separation and recovery (second phase), and IGFC verification of CO₂ separation and recovery (third phase). The Osaki CoolGen Corporation, which we set up jointly with Electric Power Development Co., Ltd., began verification and test operation for oxygen-blown IGCC in March 2017. In addition, as of April 2018 we have begun construction work on IGCC verification and testing facilities for the second phase CO₂ separation and recovery.

The project is being conducted as a subsidized project for the Ministry of Economy, Trade and Industry (fiscal 2013-2016) and as a promotional service for the New Energy and Industrial Technology Development Organization (NEDO) (fiscal 2017 and onward).

*1 IGFC: Integrated Coal Gasification Fuel Cell Combined Cycle

IGFC is a technology that combines IGCC with fuel cells to further raise generation performance of IGCC.*2

*2 Oxygen-blown IGCC: Oxygen-blown Integrated Coal Gasification Combined Cycle

Oxygen-blown IGCC is a technology that generate coal using oxygen, thereby producing a product gas with hydrogen and carbon monoxide as main components, which generates electricity or a combined cycle using a gas turbine.

We procure fuel in an economic and stable manner.

With large increases in thermal fuel consumption due to the stoppage of operations at the nuclear power station and expansion of reusable energy, we are devoting our efforts to procure fuels in a coal-efficient and steady manner required for a stable supply of electricity, responding quickly and flexibly to trends in power demands and fuel costs. Specifically, we are diversifying our fuel suppliers and contracts, are easing restrictions on fuel quality, and are making additional procurement according to the trends in power demands. In addition, we are achieving stable operations through efficient material-handling systems which include using exclusive ships and common carrier arrangements with other companies.

Main Efforts

- Diversify fuel suppliers and contracts
- Use low-grade oil
- Develop new suppliers
- Secure long-term supply of high-quality coal from Boggabri Coal Mine in Australia and other areas as well as coal from nearby production centers and from other countries.
- Improve fuel procurement services
- Lower cost of fuel by diversification
- Lower costs related to fuel supply and transportation
- Change material-handling systems in our prize and other contracts
- Changes in the business environment

Thermal Power Generation
This generates electric power by burning coal, oil, LNG (liquefied natural gas) and other materials as fuel, creating high-temperature, high-pressure steam to rotate turbines connected to generators. It produces large amounts of electricity stably and is the power generation method most used in Japan to produce electricity.

We are devoting our efforts to technical development to improve thermal efficiency and reduce air emissions. In addition to conducting reliable fuel procurement and facility maintenance and management, we are promoting the development of Clean Coal Technology to suppress the environmental impact of coal-fired thermal power stations.
We take measures to prevent air pollution.

The gas discharged from the thermal power station contains various air pollutants such as sulfur oxides (SOx), nitrogen oxides (NOx) and dust that are said to cause acid rain. Various equipment including flue gas desulfurization equipment and flue gas denitrification equipment are installed to remove these pollutants.

**Sulfur Oxide (SOx) Measures**

The emission of sulfur oxides is suppressed by using fuel with low sulfur content or sulfur-free fuel such as LNG, and by installing flue gas desulfurization equipment that can remove 90% or more of generated sulfur oxides.

**Nitrogen Oxide (NOx) Measures**

To suppress the emission of nitrogen oxides generated from the power station, we have taken measures to improve combustion and have installed flue gas denitrification equipment that can remove 80% or more of generated nitrogen oxides.

**Dust Measures**

To collect the dust that is generated from the power station, we use electric dust collectors that utilize static electricity and filter type dust collectors. Together with the flue gas desulfurization equipment, we can remove 90% or more of the generated dust.

**SOx, NOx Emission Intensity (Transition of Emissions Per Amount of Energy Generated by Thermal Power)**

<table>
<thead>
<tr>
<th>Year</th>
<th>SOx Emission Intensity</th>
<th>NOx Emission Intensity</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>0.03</td>
<td>0.16</td>
</tr>
<tr>
<td>2013</td>
<td>0.02</td>
<td>0.15</td>
</tr>
</tbody>
</table>

Thermal power stations have been forced to continue high operation rates due to the stoppage of the nuclear power stations, and the time that power stations can be stopped for repairs is limited. Chugoku Electric works together with our Group companies and affiliates to prevent trouble by increasing monitoring of power generation equipment and carrying out preventive maintenance.

The power output of gas turbines drops when the temperature rises. Thus, we have installed gas turbine inlet air cooling systems on the Mitsuuma Power Station Unit 1 and the Fakunai Power Station Unit 1 to regain the power and ensure a stable power supply during the summer season.

**We cooperate with group companies and cooperative companies to ensure power supply during tight supply-demand periods.**

During relatively long power generation stoppage periods for regular inspections, we repair and replace facilities or equipment showing age-related degradation at thermal power stations.

In addition, before peak power demand seasons we perform inspections before heavy load periods, in which fluxes are repaired and waterways are cleaned over a comparatively short period. We will continue to maintain and improve our reliability through accurate inspection and repair equipment.
At the Operation Simulator Training Building located in the Fukada Athletic Park in the vicinity of the Shimane Nuclear Power Station, operation simulators that allow us to simulate the mechanical actions of the nuclear generators, turbines and generators are installed for operator training. Here, our operators repeatedly practice starting and stopping the reactors and the correct operations to be taken in accordance with types of trouble.

At the Engineering Training Building located in the power station, employees acquire the knowledge and skills necessary for servicing the equipment through systematic training of disassembly, inspection, assembly and testing of the machines, electrical and measuring instruments.

We conduct regular inspection, improvement, and tuning of equipment and facilities for safe and stable operation.

Nuclear power stations are composed of many pieces of equipment and facilities. Inspection and maintenance of each equipment and facility is extremely important for safe and stable operation. The operation simulators are installed as part of preventive maintenance. Instead of repairing such equipment after it fails, we inspect, service and adjust it at a specific interval or according to the state of the operating equipment. We also prevent recurrence of accidents and malfunctions by applying the results of inspections and tests conducted during daily maintenance activities and latest technical observations made based on evaluations of accidents and malfunctions at other stations.

Chugoku Electric has adopted the "Integrated Maintenance System" to use the PDCA cycle for maintenance activities and advance our maintenance and reduce human errors.

We conduct repeated drills for proper response work when trouble occurs.

At the Operation Simulator Training Building located in the Fukada Athletic Park in the vicinity of the Shimane Nuclear Power Station, operation simulators that allow us to simulate the mechanical actions of the nuclear generators, turbines and generators are installed for operator training. Here, our operators repeatedly practice starting and stopping the reactors and the correct operations to be taken in accordance with types of trouble.

At the Engineering Training Building located in the power station, employees acquire the knowledge and skills necessary for servicing the equipment through systematic training of disassembly, inspection, assembly and testing of the machines, electrical and measuring instruments.

We measure environmental radiation 24 hours a day as we implement strict radiation control.

Chugoku Electric and Shimane Prefecture periodically measure the concentrations of radioactive substances contained in the ocean water, soil and farm and marine products taken from around the Shimane Nuclear Power Station, and confirm that there is no effect to the surrounding environment. Environmental radiation is measured 24 hours a day with the monitoring post installed near the power station, allowing us to confirm that there are no problems. Measurement results obtained with this strict radiation control are disclosed on the Shimane Prefecture and Tottori Prefecture brochures and websites. We strive to suppress the amount of radiation that our employees are subjected to by automating systems, incorporating remotely controlled equipment and carrying out simulation training before starting work. The levels are significantly lower than legally designated radiation amounts.

We conduct recurrence prevention measures for improper occurrences at Shimane Nuclear Power Station.

In 2010, we found that some equipment of the Shimane Nuclear Power Station was not inspected according to plans. Subsequently we took measures to prevent recurrence of the direct causes. For the underlying causes, we have been engaged in measures to prevent recurrence centering on the two pillars of "Enhancement of the nuclear power quality management system" and "Promotion of nuclear power safety culture fostering activities".

At the Shimane Nuclear Power Station in June 2015, we detected that there was a problem with the flow meter which uses a mortar-filling for low-level radioactive waste. We lost the trust of many concerned people and take the matter very seriously.

In view of the problem of the flow meter used for mortar-filling of low-level radioactive waste, we steadily implement recurrence prevention measures that have been formulated, putting all our efforts into restoring trust. This is in addition to continuing the measures we have taken so far to prevent the recurrence of inspection deficiencies and other troubles.

* Monitoring post: Facility used to continuously monitor radiation levels in the surrounding environment.
Learning from the lessons of the accident at the Tokyo Electric Power Company’s Fukushima Daiichi Nuclear Power Station, we are implementing new regulation standards based on more severe scenarios.

Learning from the accident at the Tokyo Electric Power Company’s Fukushima Daiichi Nuclear Power Station: “Defense-in-depth”1, which is the fundamental ideology for nuclear power safety, has been strengthened. The Nuclear Regulation Authority enacted new regulatory requirements for nuclear power stations in July 2013. The new regulatory requirements have stricter assumptions for earthquakes and tsunami, and newly require measures for volcanoes, tornadoes and interior overflowing2. Counterm easures for severe accidents3 are now regulated, whereas previously they had been voluntary safety measures.

Status of Compliance for New Regulatory Requirements

Application documents for compliance verification of Shimane Unit 2 for the new regulatory requirements were submitted to the Nuclear Regulation Authority in December 2013 and the application is undergoing review. In addition, application for Shimane Unit 3 was made in August 2016. According to the revised Nuclear Reactor Regulation Law enforced in July, 2013, which specifies that in principle a nuclear power stations’ safety assurance as we steadily proceed with the decommissioning while gaining the understanding of people in the region.

We actively disclose information, aiming for nuclear power stations that are trusted.

We are taking measures to decommision Unit 1 of the Shimane Nuclear Power Station

According to the revised Nuclear Reactor Regulation Law enforced in July, 2013, which specifies that in principle a nuclear power stations’ operation period should be 40 years, Unit 1 of the Shimane Nuclear Power Station was shut down on April 30th, 2015.

On July 4, 2016, we submitted to the Nuclear Regulation Authority an application for our decommissioning plan for the station, which was approved on April 19, 2017. Currently, we are making preparations for the dismantling work, the first stage of the decommissioning. We are prioritizing safety assurance as we proceed with the decommisioning while gaining the understanding of people in the region.
Control Rod

Control rods contain material (boric acid or hafnium) which easily absorbs neutrons. The number of neutrons in the nuclear reactor can be controlled by taking in and out the control rods inside the fuel assembly, enabling them to function to adjust the output of the reactor. When a nuclear reactor has to be stopped in an emergency, all the control rods are inserted at once, stopping the fission chain reaction and shutting down the reactor.

Condenser

The condenser cools the steam after the turbine has finished rotating, returning it back again to its water state. By passing seawater acting as coolant through the 30,000 to 40,000 narrow tubes inside the condenser, steam can be cooled very efficiently.

Pressure Control Chamber

When pressure inside the reactor container or the pressure vessel rises due to the action of the steam and other factors in the water tank in the lower portion of the reactor container, the pressure control chamber lowers the pressure by channeling steam into the chamber and cooling it. Also, it is used as a source of water to cool the reactor in the event of an emergency.

Features of the Advanced Boiling Water Reactor (ABWR) at the Shimane Nuclear Power Station Unit 3 and to be Adopted by the Kaminoseki Nuclear Power Station

Building on the experience nurtured to date through the construction, operation and maintenance of power stations with conventional Boiling Water Reactors (BWFR), the ABWR is the culmination of technology developed by the government, manufacturers, and electric power companies to achieve a higher degree of safety and reliability.

Nuclear Reactor Building

1. Reactor Container
   A steel vessel which encloses the main nuclear reactor components. It is covered with thick concrete cladding and functions to confine radioactive material in the unlikely event of an accident.

2. Reactor Pressure Vessel
   Capable of withstanding high pressure, this is a steel vessel that stops radioactive material from leaking to the outside.

3. Fuel Assembly
   The fuel assembly is the component enclosed in an alloy tube called a channel box which contains bundles of fuel rods. Each fuel assembly used in the current Shimane Nuclear Power Station basically comprises 9 fuel rods held vertically and 9 horizontally inside a channel box.

4. Pellet
   The loaded uranium fuel can be used for about 4 to 5 years. One pellet can provide an ordinary household with enough electric power for approximately 8 months.

5. Fuel Rod
   Uranium 235 makes up only about 0.7% of the uranium found in nature. The remaining 99.3% is uranium 238 which is difficult to split. To be utilized as fuel, it uses “enriched uranium dioxide” with a 3% to 5% concentration of uranium 235. This is baked into the shape of approximately 1cm pellets with a diameter of approximately 1.2cm. Within its cladding are about 350 amorphous pellets and this is called a fuel rod.

6. Control Rod
   This mechanism by which steam is used to generate electricity is the same as that for thermal power generation.

7. Condenser
   The condenser cools the steam after the turbine has finished rotating, returning it back again to its water state. By passing seawater acting as coolant through the 30,000 to 40,000 narrow tubes inside the condenser, steam can be cooled very efficiently.

8. Pressure Control Chamber
   When pressure inside the reactor container or the pressure vessel rises due to the action of the steam and other factors in the water tank in the lower portion of the reactor container, the pressure control chamber lowers the pressure by channeling steam into the chamber and cooling it. Also, it is used as a source of water to cool the reactor in the event of an emergency.

Main Features

1. Houses the reactor recirculation pump inside the reactor pressure vessel. Further enhances safety by eliminating the large-diameter pipes used to circulate water inside the reactor.

2. Multiples the power source for the control rod drive mechanism into water pressure and electric drive. Under normal operation, the drive power for the control rod is electric. The drive power for emergency shutdown is water pressure, and safety and reliability are improved through the auxiliary support of an electric motor.

3. Adoption of ferro-concrete reactor container. By integrating the reactor container with the power station building, the entire center of gravity is lowered, further enhancing earthquake-resistance.

Mechanism for Nuclear Fission and Control

When neutrons come into contact with uranium 235, “nuclear fission” occurs, producing a massive amount of energy and new neutrons. Once nuclear fission commences, neutrons come into continuous contact with the uranium 235 and fission occurs continuously (chain reaction). Inside the reactor, the control rods and the uranium 238 which makes up over 99% of the fuel absorb the neutrons and act to regulate the chain reaction of the fission.
Hydroelectric Power Generation

Electricity can be generated by blocking and intaking water from a large dam or small diversion weir and utilizing the power of the flow of that water to turn a hydro turbine. Used since long ago, hydropower is a recyclable natural source of energy that does not release CO₂ when generating electricity. As we continue to use this precious water resource into the future, we will also take measures to use it more efficiently.

Hydropower is a renewable natural energy, and is effective for preventing global warming as it does not emit CO₂ during operations. For the Katsuyama Daini Power Station (Maniwa-cho, Okayama Prefecture) which started operating over 70 years ago in 1944, we replaced hydropower turbines and generators from 2015 to 2017 as measures to cope with the aging of the facility. The replacement project called for the adoption of high-efficiency turbines, raising maximum output to 9.9 MW, a 0.6 MW boost. In addition, we are also systematically servicing our existing facilities. Currently we are replacing the flood discharge gates* at the Odotani Dam (height 74m, Yamagata-gun, Hiroshima Prefecture) of the Takamagawa Power Station (51.5 MW, Yamagata-gun, Hiroshima Prefecture) prior to carrying out plans to replace the turbines and generators at the power station.

*Flood discharge gate: A flood gate to release dam water downstream.

We take measures to utilize hydropower effectively.

As we continue to use this precious water resource into the future, we will also take measures to use it more efficiently.
### Mechanism of Hydroelectric Power Generation

1. **Sluice Gate, Headrace Channel, Surge Tank, Penstock Pipeline**
   - The water used by a hydroelectric power station is brought in through a sluice gate, and then passes through a headrace channel and penstock pipeline on its way to be used by the water turbine. The surge tank is a facility to adjust the amount of water flowing through the headrace channel and the water used by the power station.

2. **Hydro Turbine**
   - Water flowing at high speed and pressure through the penstock pipeline rotates the hydro turbine with great force. The amount of flowing water is regulated by a governor in order to maintain the speed of the water turbine at a set rate, enabling electricity to be generated at a stable frequency.

### Types of Hydroelectric Power Stations

#### Conduit-type Power Station

- This is a method of generating electricity which involves building a diversion weir upstream in a river. Then water is channeled downstream through a gently sloping conduit, creating a difference in height with the river and generating electricity.

#### Dam-type Power Station

- This is a method of electric power generation by which a dam is built on a narrow river with high rock cliffs on either bank, and then water is stored in the dam and electric power is generated with the difference in height. Since this method utilizes water stored in the dam, it has the advantage of being able to adjust output in accordance with the required volume of electric power generated.

#### Dam and Conduit-type Power Station

- This method of power generation combines the dam-type and conduit-type. Electric power is generated by means of the combined differences in height created by the dam and the one achieved with the conduit. As with the dam-type power station, this method is able to adjust output in accordance with the required volume of electric power generated since it utilizes the water stored in the dam.

#### Pumped Storage-type Power Station

- This is a method of power generation where an upper reservoir and lower reservoir are built. During the night, when electricity consumption is low, water is pumped up from the lower reservoir to the upper one, and when electricity consumption is high during the day, it is released from the upper reservoir to the lower one. It acts as a storage battery by being able to store electricity in the form of water.

### Dam Types

#### Gravity Dam
- This is a dam which maintains water pressure through the weight of the concrete. Viewed from the side, it appears as a triangle and is the most prevalent in terms of number among all concrete dams.

#### Fill Dam
- This is a collective term for dams built up with materials such as rock, gravel, and soil. There is an earth dam made entirely of soil and also a rock-fill dam built with rock, soil, and similar materials.

#### Arch Dam
- Viewed from above, it is bow-shaped. It maintains water pressure by not only conveying water pressure built up in the dam to the bedrock below, but also by transmitting it to the bedrock on either side of the valley.

#### Buttress Dam
- This is a dam which maintains water pressure by means of thick walls that block water with buttresses supporting them from behind.
Renewable Energy

Photovoltaics, wind power, woody biomass, and similar types of energy sources are forms of renewable energy which can be used over and over again without running out. For Japan, which lacks energy resources, these are valuable sources of domestic energy which do not release CO₂ when generating power.

We are actively conducting research and technical development in order to maximize the possibilities which renewable energy offers.

Creating electricity using inexhaustible supplies of energy which contain so many possibilities.

We are promoting mixed-fuel power generation using coal and woody biomass.

Biomass is an organic material that plants generate with photosynthesis of inorganic water and CO₂, and thus it is a sustainable renewable energy.

Chugoku Electric started generation using coal and woody biomass mixed-fuel at the Shin-Onoda Power Station in August 2007. In fiscal 2010, we started the Forest Residue Biomass—Coal Mixed-Fuel Power Generation Verification Project, subsidized by the Ministry of Economy, Trade and Industry at the Shin-Onoda Power Station and Misumi Power Station. We then commenced full-fledged operation from fiscal 2014. In fiscal 2018, approximately 40,000 tons of woody biomass were used for mixed-fuel power generation, and CO₂ emissions were reduced by roughly 32,000 tCO₂.

We established business firms at two locations jointly with Air Water Inc. and at one location with HIROSHIMA GAS Co., LTD., constructing biomass power stations. Along with furthering the widespread use of renewable energy, this can also contribute to promoting the region by effectively using local forest resources as much as possible.

We are making efforts for mega solar power generation.

In December 2011, Chugoku Electric started operation of the Fukuyama Photovoltaic Power Station (3 MW), our first use of mega solar power generation. We started operations at the second power station, Ube Photovoltaic Power Station (3 MW) in Ube-shi, Yamaguchi Prefecture in December, 2014. Furthermore, we established the “Hiroshima Renewable Energy Promotion Limited Liability Business Partnership” jointly with Hiroshima Prefecture and our group company, Energia Solution & Service Company, Incorporated (ESS), setting up a mega solar business to return profits to the community. This was the first mega solar business co-operated by a local government and an electric power company in Japan. We are able to contribute to the local community while at the same time promoting the introduction of renewable energy by using returning profits from the power generation business to the community.

We conducted verification of the first domestic hybrid storage battery system.

On the Oki Islands the scale of the power grid is small. In order to introduce large amounts of renewable energy (photovoltaics or wind power) whose output fluctuates due to weather and other factors, it is necessary to have countermeasures in place to respond to fluctuating output as these have a tremendous effect. Chugoku Electric was selected for the Ministry of Environment’s subsidized project 2 to further introduce and expand the use of renewable energy in the Oki Islands. In September 2015 we constructed hybrid storage battery system (output: 6.2 MW) that combines two types of storage batteries with different special characteristics. In addition, we are conducting technical verification with regard to techniques for efficient management and control of discharging and charging the batteries until the end of March 2019, and are involved in resolving technical issues, along with expanding renewable energy capacity by about 8 MW. The technical verification conducted through the hybrid storage battery system, which combines NAS (sodium-sulfur) and lithium-ion batteries, is the first such innovative program in Japan.
From power station to customers. We support everyday life delivering electricity each day.

Electricity cannot be stored in large amounts. Thus, when electricity is needed, the required amount must be generated and distributed on a continuous basis so that the amount consumed equals the amount generated.

In order to supply the lives of its residents, the generated amount and flow of electricity are managed 24 hours a day, 365 days a year to ensure a supply of high-quality electricity to support society and the lives of its residents.
We take measures to reduce loss of electricity when it is transmitted.

Electricity losses occur when the electricity generated at the power station is delivered to our customers over transmission and distribution lines. By reducing these losses, we can suppress surplus power generation and reduce CO₂ emissions.

To reduce this transmission and distribution loss rate, Chugoku Electric has been advancing high-voltage transmission and distribution lines by expanding our 220 kV distribution line network. For further loss reductions, we are increasing the use of low-loss power lines and equipment and adopting power system-planning support systems that will help us reduce losses of 6 kV distribution lines.

**Transition of Transmission and Distribution Loss Rate**

<table>
<thead>
<tr>
<th>Year</th>
<th>6 kV</th>
<th>8 kV</th>
<th>10 kV</th>
<th>12 kV</th>
<th>13 kV</th>
<th>14 kV</th>
<th>15 kV</th>
<th>16 kV</th>
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<tr>
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<tr>
<td>2016</td>
<td>5.8</td>
<td>6.4</td>
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<td>5.1</td>
<td>4.8</td>
<td>4.6</td>
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<td>5.1</td>
<td>4.8</td>
<td>4.6</td>
<td>4.5</td>
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<tr>
<td>2018</td>
<td>5.6</td>
<td>6.4</td>
<td>6.0</td>
<td>6.1</td>
<td>5.8</td>
<td>6.2</td>
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<td>4.5</td>
</tr>
</tbody>
</table>

We support electric power consumption in urban areas through the use of underground power grids.

In order to send stable electricity to urban areas which require large amounts effectively and safely, we use 110 kV underground transmission lines. In addition, in response to the increasing demand for electricity in Hiroshima City, we use 220 kV underground transmission lines to achieve an absolutely stable supply of electricity. This 220 kV Hiroshima Central Line comprises our company’s exclusive cable tunnel section (approx. 25%) and a multipurpose underground utility conduit section (approx. 75%).

The multipurpose underground utility conduit is a concrete underground tunnel running below roads which was dug in order to consolidate lifelines indispensable for daily life, including electricity, gas, telephone, and water and sewer services. The distinct advantage of this section is that its maintenance can be conducted without having to dig up the road again.

**Cross Section Example of Multipurpose Underground Utility Conduit**

We promote the use of underground distribution lines in an effort to enhance the scenery.

Since 1986, we have been laying power cables underground with the aim of “securing safe and pleasant passageways” and “enhancing urban scenery.” In recent years, we have been laying the cables underground based on a cooperative system of three entities functioning as one, involving road administrators, power cable administrators, and concerned local parties so as to be able to meet social demands, such as those to “preserve historical townscapes” and “promote tourism.”

Electricity distribution facilities are monitored and controlled using distribution automation systems.

We introduced an “Automated Distribution System” and conduct remote monitoring and control of distribution facilities, performing switching operations for distribution lines mounted on power poles. With this system, when there is an accident or failure with the distribution lines, the system can detect the section where this occurred and automatically send electricity to areas outside the affected section, enabling us to conduct efficient restoration work.

Conducting wide-area management of electric power.

Across Japan, there are 9 areas connected through transmission lines. When an impending shortage of electricity is predicted, such as when supply and/or demand is constrained, negotiations for electricity are conducted according to instructions from the Organization for Cross-regional Coordination of Transmission Operators (a cross-regional organization). This results in a stable supply of electricity nationwide.

East Japan and West Japan Operate Under Different Frequencies

Since the Meiji Period when the country first introduced electricity, electrical frequency differed according to the region: East Japan adopted 50 Hz and West Japan 60 Hz. As a result, when electric power is traded between East and West, the frequency is converted by three frequency-converter stations to achieve a stable supply of electricity.

**Frequency Differences by Region**

- **50 Hz**
  - Chugoku
  - Kanto
- **60 Hz**
  - Hokuriku, Hokkaido
  - Tohoku
  - Kyushu

**Transition of Transmission and Distribution Loss Rate**

![Frequency Converter Station](image)
Transmission lines are supported by high steel towers and other structures. They play the role of sending massive amounts of electricity by connecting power stations and substations, as well as substations to other ones. One of the properties of electricity is that it can dissipate into the open air by becoming heat through the resistance of the transmission line. It is necessary to send high-voltages in order to reduce loss of electricity.

We have 500 kV, 220 kV, and 110 kV transmission lines sending electricity between power stations and primary substations. We also have 66 kV and other types of transmission lines which send electricity which has undergone step-down transformation at the primary substations to large factories, railways, and distribution substations.

In order to be able to cope with the demand for electric power in the Chugoku Region and interchange power beyond the area, we have installed two routes of 500 kV transmission lines, one on the San-yo side and the other on the San-in side, achieving a comprehensive transmission network.

### Structure of a Transmission Line

- **Power Line Example (500 kV)**
  - 3-phase 4-line type for joint usage of low-voltage lights and low-voltage power.
  - Lights: 100V / 200V, Power: 200V

- **Power Line Example (500 kV)**
  - 3-phase 4-line type for joint usage of low-voltage lights and low-voltage power.
  - Lights: 100V / 200V, Power: 200V

- **Transmission Tower Example (500 kV)**
  - Average steel tower height: approx. 60 m
  - Average steel tower weight: approx. 140 t
  - Steel tower site: approx. 1,400 ㎡
  - Insulator length: approx. 6 m

### Structure of a Substation

A substation adjusts voltages and sends electricity efficiently.

- **Transformer**
  - Equipment for transforming voltage.

- **Breaker**
  - Equipment to cut electric power when there is an accident or failure, and when transmitting or suspending electric power.

- **Disconnector**
  - Equipment to disconnect electrical circuits when repairing or inspecting transmission and distribution lines, and equipment such as power transformers and breakers.

- **Instrument Transformer**
  - Equipment (current transformers, voltage transformers) used to transform high voltage and large electric currents into low voltage and small electric currents in order to measure system voltage and currents.

- **Lightning Conductor**
  - Device to regulate abnormal voltage during lightning storms in order to protect equipment at substations.

- **Lightning Rod**
  - Device to regulate abnormal voltage during lightning storms in order to protect equipment at substations.

- **Overhead Ground Wire**
  - Device to regulate abnormal voltage during lightning storms in order to protect equipment at substations.

- **Overhead Line**
  - Device to regulate abnormal voltage during lightning storms in order to protect equipment at substations.

- **Substation**
  - A substation adjusts voltages and sends electricity efficiently.

### Structure of a Distribution Line

The electric power generated at a power station is delivered to customers through transmission lines and substations. The power lines that connect the last substation (distribution substation) to customers' houses, offices, factories, and other locations are called distribution lines.

Among the various distribution lines, there are special high-voltage lines (22 kV), high-voltage lines (6,000 V) and low-voltage lines (200 V and 100 V).

Electricity through high-voltage lines is step-down to 200 V and 100 V with power transformers mounted on poles and sent to customers' houses and offices through low-voltage lines. In addition, the lines branching off from distribution power poles to deliver electricity to customers' houses are called lead-in wires.

- **High-voltage Light Line**
  - 3-phase 4-line type for joint usage of low-voltage lights and low-voltage power.
  - Lights: 100V / 200V, Power: 200V

- **Pole Transformer**
  - Standard capacity is 5 to 100 kVA.

- **High-voltage Cutout**
  - Equipment with a fuse inside to cut off electricity on the high-voltage side of a transformer.
Our Group has made engagement in environmental matters a critical management issue and since 2015 has been undertaking a variety of environmental issues as one based on our "Chugoku Electric Group Environmental Action Plan".

Contribute to realizing a society that enables sustainable development through simultaneously achieving compatibility with the environment, stable supply of power, and profitability.

Always cherish the environment based on the following three policies and aim to be a corporate group trusted by our customers:

Chugoku Electric Group will:

1. Vigorously approach global warming countermeasures and other important issues such as promoting the formation of a recycling-oriented society and promoting local environmental conservation.

2. Contribute to building a society in harmony with the environment by providing customers with products and services that are environmentally friendly.

3. Actively implement two-way communications with local communities comprising dialog, activities, and other efforts related to environmental conservation.

A more abundant and comfortable life with electricity.

Electricity is something we “take for granted” in our lives. Chugoku Electric wishes to deliver electricity for the daily lives of our customers as reliably as possible.

To make their lives more comfortable, we are always thinking about what services we can offer. What we can do to aid community development.

Listen to our customers... get closer to local communities... and continue to think about the future of our customers and the community.

Chugoku Electric Group Environmental Action Plan

Our Group has made engagement in environmental matters a critical management issue and since 2015 has been undertaking a variety of environmental issues as one based on our “Chugoku Electric Group Environmental Action Plan”.

Basic Policy

Chugoku Electric Group will:

1. Contribute to realizing a society that enables sustainable development through simultaneously achieving compatibility with the environment, stable supply of power, and profitability.

2. Always cherish the environment based on the following three policies and aim to be a corporate group trusted by our customers:

Action Plan

1. Promotion of global warming countermeasures
2. Promotion of the formation of a recycling-oriented society
3. Promotion of local environmental conservation
4. Dissemination and encouragement of energy saving
5. Promotion of environmental communication
6. Implementation of environmental management
We have special rate plans under the concept of "Gutto Zutto. Energía."

With the full liberalization of retail electric power sales starting in April 2016, we have introduced special rate plans for our household customers. The aim is to create new value and grow together with local communities so we can live up to the expectations of our customers, as we endeavor to have customers choose our company over the others.

"Gutto Zutto. Club"

Our website for the "Gutto Zutto. Club" functions as a membership site where our customers can view their energy consumption and charges, use a rate simulator to learn what happens when they change their rate plan, and take procedures to enter into various contracts. The "Gutto Zutto. Plan" rate plans and point system can be accessed by becoming a member of the "Gutto Zutto. Club."

"Gutto Zutto. Plan"

We have economical and easy-to-use rate options which customers can select in accordance with their lifestyle in terms of energy consumption and usage times.

"Collaboration Menu"

With our "EnerGia Point Service" menu, customers can exchange the EnerGia Points they earned for products and services offered by partner companies operating in the Chugoku Region. In addition, they can take advantage of additional points, drawings, and other benefits only available to members.

"EnerGia Point Service"

This is a point system closely linked to the local area which enables customers to exchange the points they have earned through electricity usage and various website services for specialty products of the Chugoku Region, product coupons, and other rewards.

Sales of Electricity in Tokyo Metropolitan Area

From April 2016, Chugoku Electric has undertaken sales of electricity to households in the metropolitan area. While continuing to operate with the Chugoku Region as our hub, we aim to be a corporate group that “is chosen by communities and grows beyond communities” by engaging in new business activities in the Tokyo metropolitan area.

* Tochigi Prefecture, Gunma Prefecture, Ibaraki Prefecture, Saitama Prefecture, Chiba Prefecture, Tokyo Metropolis (excluding outlying islands), Kanagawa Prefecture, Yamanashi Prefecture, Shizuoka Prefecture (east of Fuji River)

Detailed information is available on our website. http://www.energia-support.com/
We respond to inquiries and requests from our customers quickly and appropriately.

Our Okayama and Hiroshima Customer Centers are places where customers can consult, make inquiries, and request start and discontinuance of electricity services when they move home or in other situations. These Customer Centers represent enhancements to our customer services, enabling us to field customers’ inquiries speedily, determine and analyze their needs accurately, reflect such needs promptly in our work, services, and so forth.

Overview of Customer Centers

<table>
<thead>
<tr>
<th>Center</th>
<th>Area Served/Provisioned</th>
</tr>
</thead>
<tbody>
<tr>
<td>Okayama Customer Center</td>
<td>Tokushima, Shimane, and parts of Hyogo and Kochi</td>
</tr>
<tr>
<td>Hiroshima Customer Center</td>
<td>Hiroshima, Yamaguchi, plus portion of Ehime</td>
</tr>
</tbody>
</table>

Through our “Customer Feedback System”, we reflect our customers’ opinions and requests in the field.

Each year the company receives some 23,000 comments including opinions, requests and criticism. This customer feedback is entered in our Customer Feedback System so that it can be rapidly transmitted to the relevant departments.

In addition, we provide opportunities for our employees to be affected by the customer’s feedback by introducing all employees to the feedback we receive from customers. This leads us to recognizing customers’ expectations of our company and increasing transparency towards customers’ interests. We strive to make use of the comments we receive from customers to help with improvement of our operations and thus to further raise the levels of our customer services.

We are introducing smart meters which are useful in conserving energy and electric power.

In accordance with statutory replacement schedules, Chugoku Electric began installing smart meters in October 2015, and will install them in every customer location with low-voltage contracts (approximately 5 million units) within our company’s service area, over about 9 years to the end of fiscal 2024. Also, along with the full liberalization of retail electric power sales and the start of various services, we install smart meters to accommodate customers who signed contracts which require the use of smart meters.

Furthermore, utilizing the functions of the smart meter, we are offering services, such as launching our “Gutto Zutto Club” membership website where customers can view their energy consumption and information transmission from power meters. Furthermore, by connecting it to home electric appliances or equipment, a customer can visually monitor the usage of electricity on a screen and can automatically control those electric appliances.

We provide recommendations to our corporate customers on effective ways to use energy.

Our “Energy Diagnosis Service” is targeted at our corporate customers. System energy consumption is measured and examined using our original energy diagnosis tools, and we will propose methods to improve operation of the equipment.

Chugoku Electric actively recommends a variety of measures for effective use of energy in all areas of our customers’ business from air conditioning to hot water supply. We also propose highly efficient systems for heat demands in the manufacturing processes of our industrial customers.

Information on power outages in the Chugoku Electric service area is available through our website and other means.

When power outages occur, information is posted almost in real time on our website regarding the “time of power outage”, “area affected by power outage”, “number of affected homes”, and other details. In addition, after we confirm information on the current local conditions surrounding the outage, we will promptly update details about the “status of response for restoration” and “restoration prospect”. In addition, if there is a disaster, we make announcements to the public about the status of restoration work through SNS (Social Networking Services).

*Excluded are power outages in single-home units caused by problems in interior wiring or lead-in wire.

We maintain recovery systems through transmission and distribution networks and damage forecasting.

Chugoku Electric has formed a network so an alternate transmission route can be established immediately if a disaster renders the normal route for the transmission lines that connect the power station and the substation, and the distribution lines that connect the substation to our customers’ homes unusable. We also have a system that, if the power fails in the distribution line, judges the faulty section automatically and sends the power to other sections if the equipment is damaged in a natural disaster. Chugoku Electric works quickly to assign staff according to the scale of damage. The state of damage is quickly analyzed and staff are selectively assigned to areas with heavy damage.

A system to predict possible damage from typhoons and snowfall is adopted. It is predicted that there will be damage over a wide range, staff standby at the repair base so that they can start patrols and restoration work as soon as possible.

We are conducting efficient repair support work using electric power pole searching and portable data transmission systems.

To achieve smooth mutual support between service offices, we have equipped our cars with car navigation systems with a utility pole position search function to guide patrol and repair vehicles to the correct destination.

We have also adopted a system that supports disaster restoration by using cellular phones to send data on equipment damage and progress of patrols to a system for automatic registration.

We conduct disaster prevention drills in anticipation of large-scale power outages.

Each year, Chugoku Electric holds a general disaster prevention drill assuming that a natural disaster has caused a large-scale power outage. We verify that information is relayed and restoration work is safely and swiftly carried out according to the disaster prevention work plan and various manuals.

We forge relationships with the Self-Defense Forces and other power companies in order to be able to respond quickly to disasters.

Chugoku Electric concluded a partnership agreement for natural disaster response with the Middle Army of Japan Ground Self-Defense Force and the Kure District headquarters of Japan Maritime Self-Defense Force in 2014 so that we can smoothly and promptly cooperate together in case of various disasters, including earthquake and typhoon.

By this agreement, mutual requests in the event of disaster will allow the Self-Defense Forces to support us in our activities and to supply electric power to our service area. When heavy rainfall disasters occurred in July 2018, we became engaged in recovery work receiving support from other power companies and cooperation from cooperative companies and local companies along with coordinating with local governments and related organizations. In addition, we provided support to Kisyu Electric Co., Ltd. by deploying high-voltage generator trucks for restoration work to cope with disasters brought about by the Kumamoto Earthquake that struck in April 2016.

When our company gets cooperation from the Self-Defense Forces, the governor must make a request for the Self-Defense Forces’ disaster response.
Thinking about the future of the earth.
Thinking about the abundance of nature close at hand.

We are developing and selling products made from coal ash produced from our coal-fired thermal power stations. In fiscal 2018, 140,000 tons of coal ash, equating to approximately 20% of the total coal ash produced, were turned into products. Development of Material to Improve Bottom Sediment using “Hi-beads”
Hi-beads is a product created by adding a small amount of cement and water to fly ash suspended in the gas of combustion boilers of a coal-fired thermal power station and gathered by an electric dust collector and then granulating it. With its outstanding environmental remediation capabilities attracting attention, Hi-beads are being used in public works and other projects as an environmental remediation material (sand capping material) in rivers in Hitachinaka Prefecture, Fukuyama Inner Port, Nakaumi (a lake located between Tottori and Shimane Prefectures), and other areas. With the development of granulated coal ash (Hi-beads) as a material to improve bottom sediment, in April 2018, research and development groups, including our company, received commendation for the “Development Category of the Prizes for Science and Technology” by the Minister of Education, Culture, Sports, Science and Technology.

We are involved in efforts for zero emissions in which we recycle the waste we generate through our business activities.

Aiming for power stations in harmony with nature, we implement environmental surveys and take proper measures.

We seek to achieve power stations in harmony with nature by examining from all angles the impact power stations have on the environment and taking proper measures. With the installation of artificial reefs in front of the seawall at the Shimane Nuclear Power Station Unit 3, the water has become shallower, allowing sunlight to easily penetrate through to the seabed, resulting in good breeding grounds and habitat for Ecklonia kurome and other types of seaweed as well as fish and shellfish. We conduct appropriate examinations of seaweed breeding to check that the aquatic plants are breeding properly.

We manage and maintain watershed protection forests which are useful for CO₂ absorption and prevention of sediment runoff.

To secure and use water necessary for hydropower generation on a continuing basis, we hold watershed protection forests covering approximately 1,600ha, upstream of the Yosha River and Takahashi River in Okayama Prefecture and the Oka River in Hiroshima Prefecture. We also maintain and manage the forests appropriately, including pruning and thinning the trees. A side from having functions to protect watersheds, these forests absorb CO₂ which can be a cause of global warming and prevent sediment runoff as well as possess many other functions, such as protecting the habitat for wildlife and vegetation.

We are developing and selling products made from coal ash produced from our coal-fired thermal power stations.

Eco-powder Utilized in Civil Engineering Structures

Eco-powder is a product made from specially-selected fine granules of fly ash which, when mixed with concrete, increases its strength and enhances its durability, along with enhancing fluidity. Utilizing these properties, Eco-powder is used in the construction of tunnels, bridge piers, and other civil engineering structures. In shotcrete for tunnel construction work, Eco-powder can suppress the generation of dust to improve the work environment when spraying the concrete.

With beautiful mountains and oceans spreading out in many directions, the Chugoku Region features a wealth of nature. To maintain this abundant environment, we at Chugoku Electric will continue our steady and diligent efforts to have each and every employee become involved in measures to prevent air pollution and reduce CO₂ emissions and to maximize whatever small effort they are able to make. We believe that the accumulation of these efforts will lead to preserving the environment for the entire planet.

Approach to the Environment

Volume of Industrial Waste* Produced by Ener Gia Group Companies and Volume Recycled (fiscal 2018)

<table>
<thead>
<tr>
<th>Item</th>
<th>Volume Produced</th>
<th>Volume Recycled (fiscal 2018)</th>
<th>Recycling Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coal Ash</td>
<td>698</td>
<td>627</td>
<td>98.8</td>
</tr>
<tr>
<td>Gypsum</td>
<td>185</td>
<td>0</td>
<td>100.0</td>
</tr>
<tr>
<td>General Waste</td>
<td>83</td>
<td>75</td>
<td>89.9</td>
</tr>
<tr>
<td>Total Waste</td>
<td>963</td>
<td>694</td>
<td>71.8</td>
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Values have been rounded off and may not correspond precisely with the totals.
*The waste we and our Group companies generate.

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*The waste we and our Group companies generate.

We are actively manufacturing and selling coal ash products through a Group company, CHUGOKU KOATSU CONCRETE INDUSTRIES CO., LTD., in addition to developing products and application technologies for civil engineering and construction materials and other products using the properties of the coal ash produced from our coal-fired thermal power stations.

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<td>71.8</td>
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</table>
Devoting our entire energy for regional development. Regional development leads to our development.

We wish to be a corporation that fulfills the expectations of its customers and continues to grow together with them. Striving to become “a Group which is chosen by communities and grows beyond communities”, we focus all our energies on contributing to the sustainable development of local communities.

Corporate Philosophy

Chugoku Electric’s Corporate Philosophy expresses the company’s vision. It is composed of the company’s key concept and management philosophy.

Key Concept

Ener Gia stands for a “new, bright, warm and dynamic society”, and signifies Chugoku Electric’s attitude towards achieving such a society.

Management Philosophy

Trust, Creation, Growth.

We take delight in earning the trust of our customers. We create an abundant future through energy. We will grow together with the community.
In order to meet our customers’ increasingly diverse needs, we are engaged in providing services that utilize the strengths of the Group. Such services have our electric power business as their core and comprise our comprehensive energy supply operations, information and telecommunications operations, and business and life support operations. We are working as a united Group to provide services that help to improve convenience and comfort for customers.

We took part in a coal-fired thermal power generation project in Malaysia, with overseas power generation business being positioned as one of our growth businesses.

In March 2016, we participated in a coal-fired thermal power generation project in Malaysia as part of our business expansion abroad. Through our knowledge and experience accumulated from constructing, managing and operating coal-fired thermal power stations, we will contribute to achieving a stable supply of electricity and a low-carbon society in Malaysia.

We took part in a natural gas-fired thermal power generation project in the US in May 2018.

The power generation company is in operation in the state of Connecticut. We acquired 16.2% ownership interests in the project through a newly established subsidiary*. This is our first participation in the power generation business in the US. The project is to sell electricity generated by a natural gas-fired thermal power station (Kleen Energy Power Station; 650 MW) owned by Kleen Energy Systems, LLC through the wholesale power market in the northeastern United States, and also to secure stable revenue through a long-term capacity agreement** concluded with a local electricity company.

*1 Chugoku Electric Power America, LLC, a wholly owned subsidiary of Chugoku Electric Power Co., Ltd.
*2 An agreement to receive revenue for the supply capacity amount (MW) expressed from the generated output (MWH).

In March 2016, we participated in a natural gas-fired thermal power generation project in Malaysia as part of our business expansion...
We will not allow the lessons of the past improper incidents to fade from memory. Firm in our resolve never again to repeat them, we are united as aGroup in promoting management that accords top priority to compliance, with our executives leading by example.

Collective Power

We are involved in cultivating human resources and building systems that can respond flexibly and effectively to change and create new value.

Cultivating Human Resources

In order to respond flexibly and effectively to changes in the business environment, we establish and share our ideals for human resources needed in the age of change.

Furthermore, as our employees refine their own personal qualities, we create systems for our employees with a diverse range of individually and expertise to be able to consolidate their individual strengths to continuously create new value.

Ideal Human Resources that are in Demand

In these changing times, we believe in the concept of “Thinking and acting by ourselves”.

- By “thinking by ourselves,” we mean focusing our wisdom and creating new value from the perspective of our customers.
- By “acting by ourselves,” we mean challenging and taking action with results determinant with regard to new and unprecedented issues and tasks.

Creating a Vibrant Corporate Culture

Chugoku Electric has established a clear personal management policy and aims to stabilize our human resources. Our policy allows our employees to work with sense of ambition and achievement, and utilize their capacities to aim for higher results.

Employing Diverse Human Resources

Every April, we hire new graduates (including those who have graduated within the past three years). We also have a mid-career recruiting policy to hire persons with advanced professional capacities and experience working in other companies, as well as foreign workers.

Employing Persons with Disabilities

Chugoku Electric supports the independence of persons with disabilities. We collaborate with schools and a public job placement office to continuously hire persons with disabilities. Our employment rate of persons with disabilities as of June 1, 2018 is 2.2% (legal employment 2.2%) In July 2016, we established Chugoku Electric Co., Ltd. with the aim of promoting the hiring of disabled workers.

Promoting the Active Participation of Female Employees

We are determined to create an environment where our female employees can positively participate in jobs based on aptitude and training plans. Capable and able women employees are actively assigned to administrative positions. As of the end of March 2018, there were 180 women in administrative positions (excluding doctors).

Activities to Support Work and Family

Chugoku Electric has various systems to support our employees’ work and family. Employees can take advantage of our temporary leave program, part-time employment program and night shift employment program to take care of children and the elderly. Our employees can also take a leave of absence or stagger their working hours to look after their children and the elderly. We are determined to create a better working environment for our employees, such as by lending out mobile personal computers to help parents on maternity or paternity leave develop their skills.

Energia Group promotes CSR activities.

In March 2006, the Energia Group enacted the “Energia Group CSR Charter of Conduct” setting forth the direction of the CSR activities and its eight principles as the foundation for company activities and conduct of all executives and employees in the Group. In the Through this Charter, we are promoting CSR activities that give priority to compliance.

Energia Group CSR Charter of Conduct

We believe that the Energia Group’s fundamental mission is to fulfill its duties as a member of the community and progressively contribute to the sustainable development of society through the Group operations whose mainstay is the electricity business. We further believe that the foundation for these is being trusted by our customers primarily, as well as by our stockholders and investors, our local communities, our business partners, our employees, and many others.

On the basis of such awareness, all of the executives and employees in the Group will promote CSR efforts in accordance with the principles of conduct below, aiming to be a corporate group that the community trusts and chooses.

Safety Assurance

Placing top priority on assuring safety, we will work to heighten safety consciousness and will ordinarily carry out the necessary measures.

Respect for Human Rights

With a spirit of respect for basic human rights underlying our business activities, we will strive toward the realization of a society in which human rights are protected and human rights are truly respected.

Promotion of Compliance

We will abide by relevant domestic and overseas laws, regulations and rules, and by the spirit thereof, and will promote fair business activity that are backed by ethics.

Rigorous “Customer-First”

Making it our basic principle to meet our customer's ever-changing needs, we will provide business activities that always put customers first, in ways such as providing high-quality products and services that meet their satisfaction.

Active Tackling of Environmental Problems

We will promote environmental management that actively engages in environmental preservation activities, so as to contribute to the realization of a society that is capable of sustainable development.

Contributions to Local Community Development

As a corporate group with roots in our region, we will contribute to the development of local communities, through many kinds of business activities.

Enhancement of Communication with Community

Through communication with broad sections of the community, we will strive to respond conscientiously to the community's comments and wishes and reflect them in our operations. We will also actively publish information so as to raise the transparency of our business activities.

Formation of Vibrant Corporate Culture

We will improve internal communication, and moreover will work to cultivate self-directing and self-reliant human resources, and to have skills handed down from seniors to juniors, so as to form a lively communicating, vibrant corporate culture.

The executives of the Energia Group, in the awareness that it is their own role to realize the Charter, will not only set examples in their own conduct but also will rigorously enforce the Charter so that all employees behave in accordance with it.

Our entire Group gives top priority to compliance in their management approach.

We will not allow the lessons of the past improper incidents to fade from memory. Firm in our resolve never again to repeat them, we are united as aGroup in promoting management that accords top priority to compliance, with our executives leading by example.

Declaration of Compliance Management Promotion

After introducing on the series of improper incidents involving our generation facilities that came to light in the fall of 2006, we determined to make “placing top priority on company compliance activities” the foundation of our management, and in June 2007 announced our resolve and stance in that regard through a Declaration of Compliance Management Promotion.

Chugoku Electric Corporate Code of Ethics

Directing the relationships of trust with the community that will form the foundation for the company’s business activities, we have formulated the Chugoku Electric Corporate Code of Ethics setting forth what actions are appropriate for Chugoku Electric as a corporation, and the employees who work in it, to take. Rigorous adherence to this code is being enforced.

Corporate Ethics Committee

As an advisory body for the Board of Directors, the Corporate Ethics Committee conducts discussions on matters relating to compliance and offers such proposals and opinions as may be needed. Three experts from outside the company are included in the membership, so that the committee receives information on social demands from a broad range of customers and the national society.

Corporate Ethics Inquiry Centers

“Corporate Ethics Inquiry Centers” have been established in the Corporate Ethics Division (within the company) and a law office (outside the company) as part of our whistleblower system. With this system, anyone involved in the operations of Chugoku Electric or its Group companies in Japan, or overseas, can have consultations regarding, breaches of law and other cases concerning corporate ethics.

Main Compliance Promotion Measures

In order to have the “top priority for compliance” consciousness thoroughly inculcated in all of us from top management to individual employees, we are carrying out compliance training and furthermore have designated November of every year as the Compliance Emphasis Month, during which we implement various measures on an intensive basis. In these ways, we are working to bring about an efficacious heightening of compliance consciousness.

We conduct “workplace situation and employees’ consciousness surveys” targeting all employees. The results of these surveys are used as input for assessment and improvement of compliance promotion measures, fed back into workplaces, and utilized in discussions and so forth aimed at the creation of better workplaces.

Declaration of Compliance Management Promotion

The Chugoku Electric Power Co., Ltd. will unite the efforts of the whole company to engage in promotion of compliance management, with our executives setting the example.

- We recognize that “compliance” means “valuing and abiding by social norms including ethics and morality”, and that engagement therewith is indispensable in order for an enterprise to continue its existence in the community.
- Based on such recognition, we will work with our whole strength to promote management that views as its foundation “placing priority on compliance in managing every business activity”, so as to meet the community’s demands for thorough power facility safety, stable supply of electricity, and low electricity rates.
- In order to realize “placing top priority on compliance”, we will abide by the code of conduct in the Chugoku Electric Corporate Code of Ethics, practicing daily the following “three actions” therein as required particular observance.

1. Consulting our conscience
   - We will examine our own actions in the light of our social conscience.
   - We will consult the rules without fail whenever we have any doubts about our work.

2. Speaking honestly
   - We will not keep doubts and problems to ourselves, but will talk them over with others in our workplaces and among organizational units.
   - We will explain matters voluntarily and appropriately to the community’s comments and wishes and our social conscience.

3. Actively correcting things
   - Where matters have been handled inappropriately, we will actively correct them without delay.
   - We will endeavor to revise any rules that do not match actual circumstances.
### Hydroelectric Power Stations

<table>
<thead>
<tr>
<th>Station (C)</th>
<th>River System</th>
<th>River</th>
<th>Power Station</th>
<th>Operation Start Date</th>
<th>Type</th>
<th>Output (MW)</th>
<th>Power Plant</th>
<th>No. of Units</th>
<th>System River Power Stations</th>
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### Photovoltaic Power Stations

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<tr>
<th>Photovoltaic Power Stations</th>
<th>Address</th>
<th>Operation Start Date</th>
<th>Max. Output (MW)</th>
<th>Moon Power Station</th>
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<td>3 MwPhotoStation, Ube-shi, Yamaguchi</td>
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</tbody>
</table>

### Main Hydroelectric Power Stations

- Ashizu Power Station (Shin-Ota Dam)
- Shin-Ota Power Station (Shin-Ota Dam)
- Takatsugawa Power Station (Shin-Nariwagawa Dam)
- Nabara Power Station (Shin-Nariwagawa Dam)
- Shin-Takatsugawa Power Station (Shin-Nariwagawa Dam)
- Higashina Power Station (Shin-Nariwagawa Dam)
- Hayamizu, Fuchu (Hayamizu, Kasai Dam)
- Inga, Nakahara (Inga, Kasai Dam)
- Takatsugawa, Kazusa (Takatsugawa, Kasai Dam)
- Shin-Nariwagawa Power Station (Shin-Nariwagawa Dam)
- Kasugagawa, Keno (Kasugagawa, Keno Dam)
- Takatsugawa, Kasual (Takatsugawa, Kasui Dam)
- Shin-Nariwagawa Power Station (Shin-Nariwagawa Dam)
- Kasugagawa, Keno (Kasugagawa, Keno Dam)
- Takatsugawa, Kasual (Takatsugawa, Kasui Dam)