

Iron recycling and greenhouse gas reduction for the realization of an advanced recycling-oriented society using graphite electrodes

Realization of our purpose

Resource circulation through iron recycling, greenhouse gas reduction through hydroelectric and wind power generation and utilization

The process of manufacturing iron, which is an important material that supports social infrastructure, from iron ore (blast furnace method) is one of the largest sources of CO₂ emissions. However, the electric furnace method, which melts and recycles scrap iron, is capable of reducing CO₂ emissions to 1/4, and is therefore an important process for a sustainable society. Resonac is the number one global manufacturer of graphite electrode materials, which are essential for the electric furnace method, and supplies stable and high-quality graphite electrodes manufactured in six plants around the world to steel manufacturers in various countries through local production and consumption. Currently, we are working on the greening of electrodes at these six plants, and in order to avoid emitting GHG emissions in the graphite electrode manufacturing process, we are promoting 100% green power generation with hydroelectric and wind power generation at our European plants. In addition, we have started to install solar cells on the roof of the plant in Malaysia. Our graphite electrodes will continue to support people's lifestyles through the recycling of iron products.

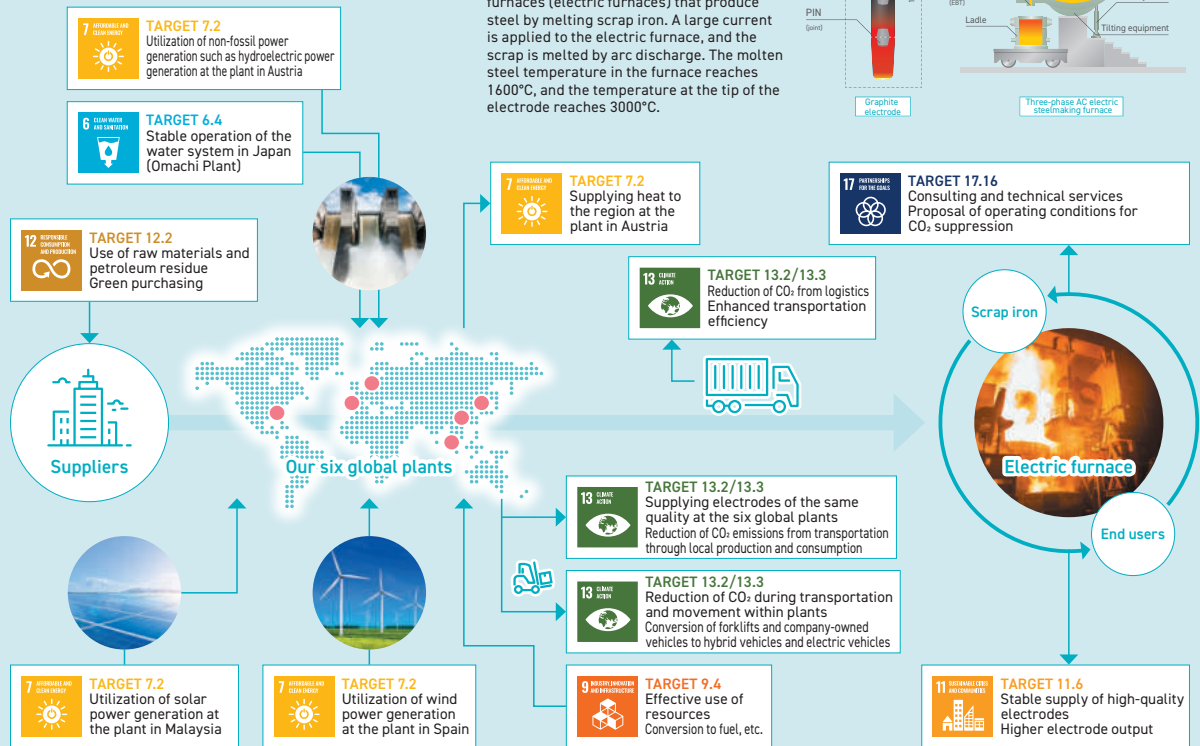
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Demonstrating our values

Co-creation with local communities

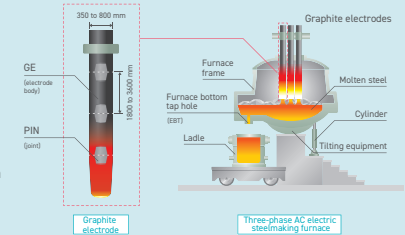
In Omachi City, where one of our domestic plants is located, agricultural production was being hampered by the low temperature of water from melted snow. Since 1954, we have been operating a 36 km-long water utilization system that includes three hydroelectric power stations, and by raising the temperature of water before using it for irrigation, we contribute to a stable water supply and improve yields for a wide range of local farmers. At our plant in Austria, waste heat after baking electrodes is supplied to the regional heating network in order to make effective use of it, contributing to the reduction of CO₂ emissions throughout the region, and in this way, Resonac is working on co-creation with local communities on a global scale.

Details of global co-creation



What are graphite electrodes?

Iron is familiar and indispensable to our lives, used in such things as cars and buildings. Graphite electrodes are used to recycle said iron. Graphite electrodes are used as electrodes in electric steelmaking furnaces (electric furnaces) that produce steel by melting scrap iron. A large current is applied to the electric furnace, and the scrap is melted by arc discharge. The molten steel temperature in the furnace reaches 1600°C, and the temperature at the tip of the electrode reaches 3000°C.



Comments from stakeholders

Mr. Leopold Schilcher, Mayor of Bad Goisern, Austria



The plant in Austria makes effective use of waste heat from electrode baking to provide a stable supply of heat to the regional heating network. Especially in the current energy crisis, this supply of regional heating unites more than 300 partner companies and local residents. In light of these efforts, Mr. Leopold Schilcher, Mayor of Bad Goisern, Austria, stated that he is proud to have such a reliable company as Resonac Graphite in the city of Bad Goisern, and that he believes Resonac Graphite brings benefits to the community with its innovative concept.

Mr. Leopold Schilcher, Mayor of Bad Goisern, Austria (center of photo)

Contribution to a digital society and reduction of environmental impact through copper clad laminates and solder resist

Realization of our purpose Spread of infrastructure with advanced electronic materials for semiconductors, advancement of digital communication technology, and reduction of environmental impact

As digital society progresses, digital communication technology using semiconductors has become essential for sustainable social development. Through the supply of high-performance advanced electronic materials for semiconductors, Resonac is contributing to AI technology that realizes new services and industrial processes using large amounts of data, next-generation wireless communication technology (5G, 6G, etc.), improved vehicle safety, improved transportation services and the spread of communications and transportation infrastructure, advancement in digital communication technology, enhanced device energy saving, and the reduction of environmental impact.

Demonstrating our values Higher functionality and resource conservation of electronic devices using copper clad laminates and solder resist, and co-creation through JOINT2

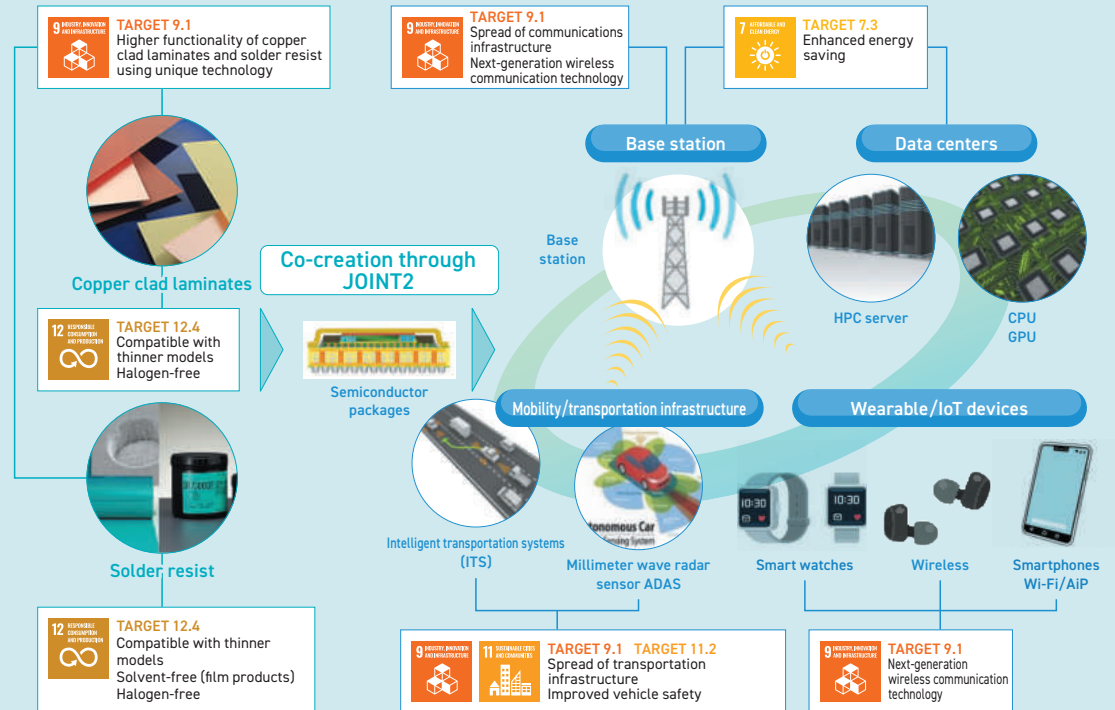
As electronic devices become lighter and smaller, we are developing cutting-edge technologies in a timely manner that can respond to thinner and higher-density semiconductor devices, while also supporting the sophistication of digital communication technology and contributing to the reduction of environmental impact. In addition to the conventional liquid type solder resist, we have developed film products that do not contain solvents, thereby reducing their environmental impact when used by customers, and by making them thinner, we are also contributing to resource conservation. For copper clad laminates, we have created high-performance substrate materials using our unique synthesis technology, contributing to the increased functionality of electronic devices. Moreover, since they can be applied to thin packages, they contribute to resource conservation. Both solder resist and copper clad laminates are halogen-free, which contributes to the reduction of environmental impact.

All of these materials contribute to the resolution of technical issues in production of next-generation semiconductor packages in collaboration with member companies of JOINT2, and realize co-creation with other companies through the supply chain.

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In 2023, Resonac's copper clad laminates (MCL-E-705G, 795G) received the General Award from the Japan Chemical Industry Association, and were commended as products that have contributed to the advancement of science and technology.

Contributing to a digital society with semiconductor materials



Comments from stakeholders

Mr. Koji Izumi, Division Manager of Global Purchasing Division, Strategic Corporate Planning Operation of IBIDEN CO.,LTD.

As digital transformation progresses, areas of data utilization will expand further, and the associated rise in data center investments is expected to increase demand for large, highly functional IC package substrates. A stable supply of highly reliable raw materials is essential in order to supply society with competitive IC package substrates that meet the needs for higher functionality and energy conservation. Resonac is an important partner that supports our manufacturing, from copper clad laminates with excellent warpage reduction and flatness, to highly reliable solder resist and photosensitive dry film such as Photec.* We hope to continue deepening our cooperation with Resonac in order to supply highly reliable products and reduce energy consumption and waste generation during production by improving production efficiency within our company.

*Photec is a registered trademark of Resonac.