JAPANESE STEEL INDUSTRY INITIATIVES TO CHALLENGE GLOBAL WARMING

Japanese steel industry approach to fighting global warming

The Japanese steel industry will achieve further improvements in its energy efficiency, which is already the highest in the world. In addition, while using Japan as a manufacturing and R&D base, the steel industry will provide eco processes, eco products and eco solutions to the world while making its close ties with manufacturers even stronger. The objective is to challenge global warming in many ways while contributing to economic growth and job creation in Japan.

How the Japanese steel industry fights global warming

The Japanese steel industry has achieved the world’s highest production process energy efficiency by developing major energy-conservation technologies and equipment and incorporating these advances in almost all manufacturing facilities.

Eco processes

Since the oil shock of the early 1970s, the Japanese steel industry has made large investments in continuous production processes, byproduct gas recovery, the recovery of exhaust heat, the reuse of waste plastics and other measures. Today, Japan’s steelmakers use major energy conservation technologies in virtually 100% of their operations, a rate that is far higher than in other countries. As a result, Japan has the highest energy efficiency in the world based on unit energy consumption data. Due to this high efficiency, there is very little potential for further reductions in CO2 emissions in the Japanese steel industry.

Japanese steelmakers collaborate with manufacturers to develop and sell worldwide high-grade steel that is vital to creating a low-carbon society. The use of finished products incorporating this steel is making a big contributing to lowering CO2 emissions. (Eco products)

Quantitative data is collected for five categories of high-grade steel (7.97 million tons) that is supplied for use in finished products. The five categories are automotive steel sheets, oriented electrical steel sheets, heavy plates for shipbuilding, boiler pipes and stainless steel sheets. In fiscal 2008, the use of these products reduced CO2 emissions by 14.87 million tons.

Japanese steelmakers supply a large share of the world’s high-grade steel in sectors where demand is certain to grow. Primary examples are high tensile strength sheets and electrical sheets for hybrid and electric cars; high-strength, corrosion-resistant pipes for ultra-super-critical boilers in coal-fired power plants; and forged steel and steel sheets for reactor pressure vessels and steel pipes for steam generators in nuclear power plants. High-grade steel like this is essential to the production of a variety of products that are vital to achieving a low-carbon society.

The Japanese steel industry helps lower global CO2 emissions by sharing outstanding energy-conserving technologies and equipment with steelmakers around the world. (Eco solutions)

The development of major energy conservation technologies by the Japanese steel industry and use of these technologies in other countries (China, Korea, India, Russia, Ukraine, Brazil, and others) is now
lowering annual CO2 emissions by a total of about 33 million tons. Furthermore, this figure is based only on technologies for major facilities like coke dry quenching and top pressure recovery turbines.

Collectively, eco processes, eco products and eco solutions have allowed the Japanese steel industry to lower annual CO2 emissions by about 66 million tons. This is about 5% of Japan’s total CO2 emissions in fiscal 1990 and about 33% of the Japanese steel industry’s total CO2 emissions.

The Japanese steel industry has established a close working relationship with manufacturers as a supplier of materials and components and a partner in the development and supply of finished products. This industrial collaboration underpins Japan’s strengths in manufacturing and technology and also holds the key to solving the problem of climate change.

**Objectives of the Japanese steel industry**

**Present – Medium-term**

Further advances in the energy efficiency of steel production processes, which is already the highest in the world (eco processes)

Contribution to CO2 emission reductions from the use of final products that incorporate the high-grade steel that is vital to achieving a low-carbon society (eco products)

Contribution to global CO2 emission reductions through the transfer and greater use (mainly in emerging countries) of state-of-the-art energy-conservation technologies (eco solutions)

**Medium/long-term**

Develop revolutionary steelmaking process

**Overview of initiatives**

**Eco processes**

For production processes, achieve further improvements in energy efficiency, which is already the world’s highest, by making the greatest possible use of state-of-the-art technologies.

The 2020 goal is a CO2 emission reduction of about 5 million tons (Reduction of CO2 emissions from 2020 BAU levels. Excluding the improvement in the electric power emission coefficient), assuming the greatest possible use of state-of-the-art technologies. This goal is based on 2020 crude steel production of 119.66 million tons, which is the long-term energy supply-demand outlook (recalculated) of the Comprehensive Resources and Energy Study Group.

**Eco products**

Help reduce CO2 emissions resulting from the use of finished products by developing and supplying worldwide the high-grade steel that is vital to achieving a low-carbon society.

One example is strong and rigid steel sheets that improve fuel consumption and safety in automobiles and allow building large ships that can operate safely. Another is steel pipes that withstand very high temperatures in order to achieve remarkable improvements in thermal power generation efficiency. High-performance electrical steel sheets greatly boost the efficiency of motors and transformers. In addition, a variety of high-grade steel plays a central role in making nuclear power safer and more efficient, building wind turbines and solar power generation equipment for the efficient use of renewable energy sources. By
supplying these materials, the Japanese steel industry is determined to achieve more dramatic reductions in CO2 emissions.

**Eco solutions**

Contribute to lowering global CO2 emissions through the transfer and greater use of state-of-the-art energy-conservation technologies and equipment.

The transfer to other countries of advanced energy conservation technologies used in Japan and widespread use of these technologies have the potential to lower annual CO2 emissions by 340 million tons (25% of Japan’s total emissions) worldwide.

**Develop revolutionary technologies**

The use of coal for the reduction of iron ore makes CO2 emissions unavoidable. As a step toward reaching the medium/long-term goals for 2030 to 2050, the Japanese steel industry plans to achieve a big reduction in CO2 emissions by using a revolutionary steelmaking process called COURSE50 (iron ore is reduced using hydrogen and CO2 is recovered from blast furnace gas).

**Global contributions (Contribution to the Hatoyama initiative)**

The Japanese steel industry has achieved concrete progress toward adoption of the global sectoral approach through activities involving the Japan-China Steel Industry Environmental Protection and Energy Conservation Technology Conference, Asia Pacific Partnership (APP; seven countries), World Steel Association (worldsteel; 60 countries) and other forums. Significantly, Japan chairs the steel task force of APP, which combines public- and private-sector activities. The steel task force has received high marks from member countries for sharing energy-conservation technologies, establishing common goals for efficiency, conducting an energy conservation diagnosis program, and conducting other activities. By supporting the transfer and use of its outstanding energy conservation technologies and facilities, the Japanese steel industry plans to make a big contribution to the Hatoyama initiative.

**Closing**

The Japanese steel industry is taking the above actions on its own initiative. Furthermore, the industry is working closely with the government, other industries and the Japanese public to create a low-carbon society. The industry aims to establish a unified roadmap that all parties can follow in order to develop the required technologies and enact concrete emission reduction measures (promotion of technology development and energy conservation measures; promotion of transfer and use to other countries of energy-conservation technologies and equipment; method for determining emission reductions from use of finished products using high-grade steel; promotion of ways to use waste materials effectively; and other activities).

Substantial long-term growth in global steel demand is expected because of economic expansion in the BRIC countries. The Japanese steel industry will meet this demand while continuing to take many actions to challenge global warming. The industry will use the world’s most efficient production processes to supply the high-grade steel that is vital to achieving a low-carbon society. At the same time, the steel industry will continue to transfer and encourage the widespread use of its outstanding energy-conservation technologies.
The Japanese steel industry believes measures that are not fair from a competitive standpoint and measures that restrict steel production would be detrimental to its ability to compete in global markets. Such measures would have a severe impact on the competitive edge of Japanese manufacturers. Japan would also suffer a loss of jobs and the entire economy would be affected. Furthermore, increasing steel production in emerging countries, where efficiency is low, would take the world in the opposite direction of the global measures needed to fight climate change.

This is why global warming initiatives must be based on targets that are fair for all major countries and be structured to preserve the fairness of competition worldwide.