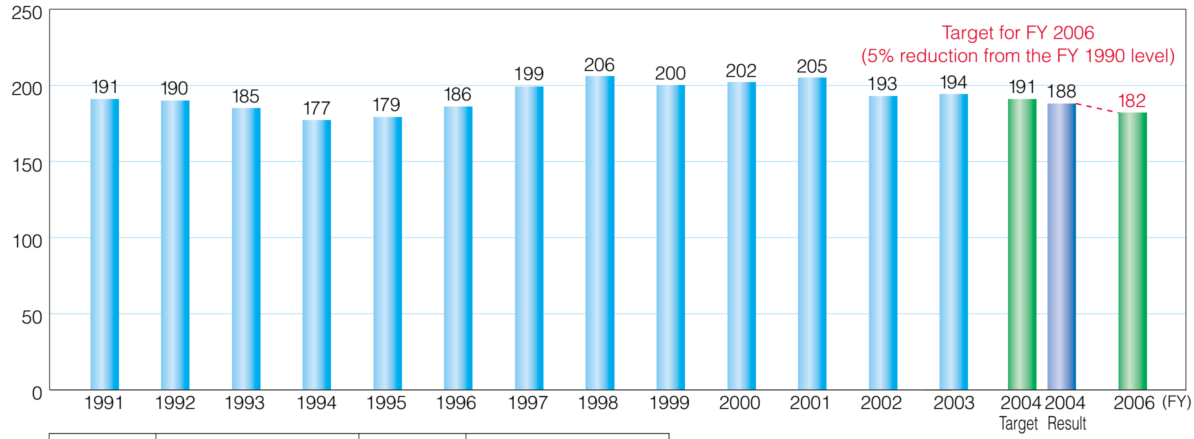
【Global Warming Prevention Activities】

Aisin works to cope with energy problems with a target of 5% reduction in carbon dioxide emissions

To help prevent global warming caused by carbon dioxide emissions, we have been developing energy-saving activities. Our target is to reduce carbon dioxide emissions by 5% from the FY 1991 level by FY 2006, in accordance with our medium- and long-term plan, the Third Environmental Action Plan.

■**Carbon dioxide emissions**

(units: thousand tons of CO_2)



Electricity	0.3817kg-CO_2/kWh	LPG	3.0094kg-CO_2/kg
Heavy oil	2.7000kg-CO_2/ℓ	Kerosene	2.5308kg-CO_2/ℓ
LNG	2.3576kg-CO_2/m³		

• The cogeneration system was evaluated using the CO_2 conversion factor for thermal power plants.

※ The metamorphic gas consumption for the heat-treating furnace has been revised tracing back to the FY 1991 statistics.

Activities during FY 2004

Our activities during FY 2004 were carried out aimed at reducing the emissions of carbon dioxide to 191,000 tons of CO_2. Despite an increased manufacturing volume, we succeeded in attaining the target by cutting the emissions of carbon dioxide by 8,600 tons of CO_2. Our major technological energy-saving approaches include development of an energy-saving hydraulic pump by using a pressure interlock inverter control system and introduction of a cogeneration system. At the management level, we incorporated actual energy-saving measures into our systems and instructed the factories to shut down equipment that was not in use. In recognition of its streamlining activities, the Anjo Plant won the Director's Award of the Central Japan Economic and Industry Bureau for Excellent Energy Control Company (Electricity Division). Three employees of the Anjo Plant won the Energy-saving Center Tokai Hokuriku Branch Manager's Award in recognition of their distinguished performance in the area of energy control.

Activities to Reduce the Emissions of Carbon Dioxide during FY 2004

With the aim of achieving the targets for FY 2004, our energy-saving activities have focused on cutting energy consumption and efficient use of energy.

We have implemented the existing energy-saving action plans across all factories. We have also chosen energy-saving models when old equipment needed to be refurbished or new equipment had to be installed. The specific energy-saving measures implemented will be described on the following pages.

Interview with an energy-saving promoter

Award for Distinguished Performance in Energy Control

Seiji Kimura, Nishio Plant

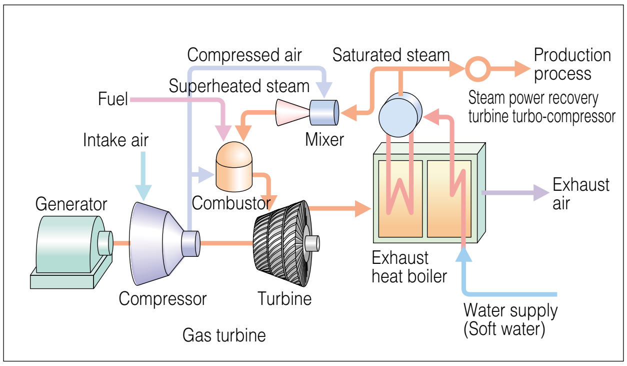
I have been dedicated to energy-saving activities for the last 22 years. I would like to take this opportunity to work toward new targets and to step up to an even higher level of energy saving.

●Energy-saving case 1

Installation of the 6200 kW gas turbine cogeneration system

Since the use of cogeneration systems is an effective way to cut emissions of carbon dioxide, we have been installing cogeneration systems since 1988. Recently, when a boiler needed to be replaced, we installed the 10th 6,200 kW gas turbine cogeneration system. In this system, the steam that is generated using exhaust heat is supplied to the steam power recovery turbine turbo-compressor and the production process, thus improving energy efficiency. Consequently, at the maximum levels of electricity and steam, 80% of total efficiency can be achieved, and a 6% reduction in carbon dioxide emissions is expected annually, compared to the level before installation.

■System flow



Entire view of the Nishio cogeneration system

●Energy-saving case 2

Energy saving of hydraulic pump by use of the pressure interlock inverter control system

- Carbon dioxide reduction: 40 tons of CO_2 per year
- Reduction effects: 1,320,000 yen/ year
- Investment: 5,000,000 yen for 42 units

The inverter control system has received attention as an energy-saving measure for hydraulic pumps. However, the cost effectiveness and performance efficiency of the inverter control system have restricted its application to a handful of large-type equipment. Many of the hydraulic pumps for processing and assembly equipment are small-type pumps around 3.7 kW, and there has been no proven record of using the inverter control system for small-type pumps. Thus, we have developed a system that delivers energy savings simply by attaching a pressure switch and an inverter panel on the hydraulic pump unit. In this way, we succeeded in incorporating the energy-saving inverter control system into small-type hydraulic pumps (2.2–7.5 kW) as we originally set out to do.

■Control system

Inverter
Pressure switch
Hydraulic pump unit

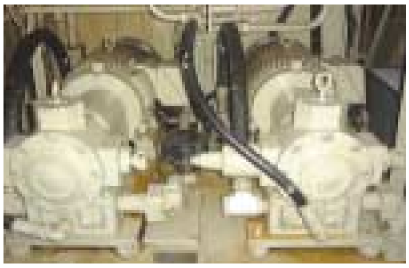
●Energy-saving case 3

Reducing standby power consumption by installing an accumulator

- Carbon dioxide reduction: 2.1 tons of CO_2 per year
- Reduction effects: 624,000 yen/ year
- Investment: 203,000 yen

Installation of an accumulator has helped compensate for a lack of pressure when the unit is turned on. By turning off one of the hydraulic pumps on standby, we succeeded in reducing electric power consumption.

■Hydraulic pumps and accumulator



Hydraulic pumps

Accumulator

●Energy-saving case 4

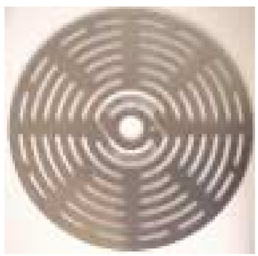
Modifying the valve seat of reciprocating compressors

- Carbon dioxide reduction: 82 tons of CO_2 per year
- Reduction effects: 2,588,000 yen/ year
- Investment: 5,000,000 yen

By changing the valve seat to an energy-saving metallic valve, the air discharge rate and the abrasion resistance have been improved, which is expected to provide a longer service life and noise control.

■Modified energy-saving metallic valve

Low-pressure side



High-pressure side