# Production



## Basic Approach

Aisin has established four "pillars" in its endeavors to reduce environmental impact to the minimum possible, based on the Environmental Charter, the Environmental Policy and the Third Environmental Action Plan;
①Measures to counter global warming, ②Management and reduction of environment-impacting substances, ③Reduction of waste materials and consevation of resources, and ④Streamlining of logistics.
These are shared with Aisin consolidated companies in Japan as mid to long-term targets.

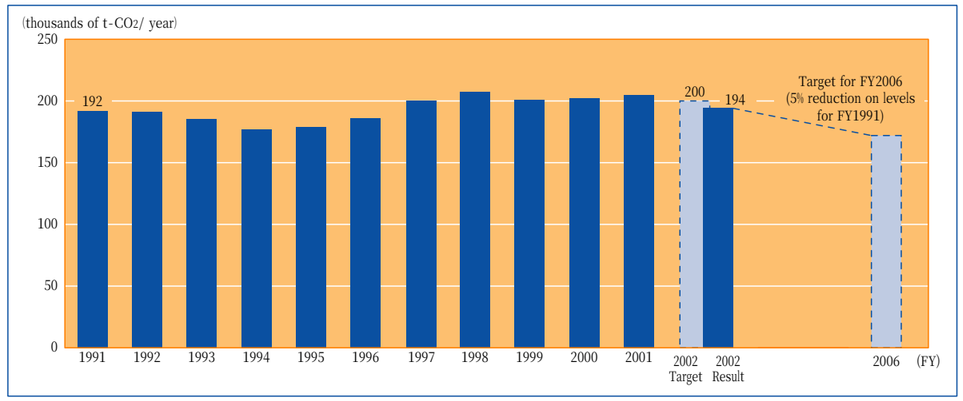
### Activity policy

| Measules to counter global warming | Legal-compliance activities and management and reduction of environment-impacting substances | Reduction of waste materials and conservation of resources | Streamlining of logistics |
|---|---|---|---|
| Efficient use of energy Increase in productivity, use of new technologies to prevent global warming | Improvement of regional environmental sustainability through strict self-imposed standards; reductions in volume of chemical substances emitted | Aiming zero emissions with "3R" (Reduce, Reuse, Recycle) | Prevention of global warming through raising the efficiency of distribution methods, and reduction in the amount of packaging materials used |

## Activities to Prevent Global Warming

We are currently promoting "Reductions in the amount of energy used" and "Efficient use" as measures that both allow us to respond to the problem of global warming, and also to implement the more effective use of energy resources. Our target is to reach a 5% reduction in the level of $CO_2$ emitted by FY2006 against the level recorded for FY1991, and we are pressing ahead with our energy saving measures in order to achieve this.

■Trends in $CO_2$ Emissions




※The conversion factors for $CO_2$ have been changed over from calculation of C to calculation of $CO_2$, using the figures shown below, and calculating back to FY1991. In doing this, cogeneration is evaluated using the $CO_2$ conversion factors for fire-powered electricity generation.
Electricity: 0.3817kg-$CO_2$/ kWh, Crude oil: 2.7000kg-$CO_2$/ 、
LNG: 2.3576kg-$CO_2$/ $m^3$, LPG: 3.0094kg-$CO_2$/ kg,
Kerosene: 2.5308kg-$CO_2$/

During FY2002, our energy saving activities achieved a saving of 12.8 thousand t-$CO_2$ (against a target of 12.5 thousand t-$CO_2$), representing a reduction in $CO_2$ emissions of 5% in comparison with the previous year. Our main improvements themes for the year were, on the technical front, reductions in the amount of LNG used through the implementation of more efficient combustion technology, and improvements in fluid pressure loss, allowing reductions in pump operation motive power.

On the management side, energy-saving patrols allowed us to prevent air leaks and other inefficiencies, while detailed management of the use of electricity on each line within the plants enabled us to shut down various pieces of equipment when not in use.
In addition to this, we also created $CO_2$ reduction scenarios with the intention of using them to help meet FY2006 targets, and evaluated these for their practicality, to strengthen our mid to long-term approach.

■$CO_2$-reduction Measures Taken During Fiscal 2002

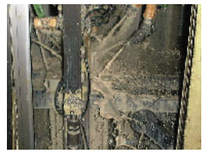
Aisin implemented various energy saving measures to facilitate "Reductions in the amount of energy used" and "Efficient use," with the aim of meeting our targets for FY2002.
These activities included the plant-wide implementation of our existing energy-saving themes, as well as the development and utilization of a small-scale incinerator burner, which can be used within our plants in conjunction with waste-heat recovery techniques to develop energy-saving technologies fostered by our Corporate R&D Division for our facilities. All these activities have helped us work towards energy savings. We are also proactive in replacing aging facilities with new, energy saving alternatives.
In our motive power process, we have introduced a cogeneration system alongside the building of new plant facilities, which allows us to use heat and electricity in an efficient way.

### [Casting] Heat-exchange single-unit burner allows energy saving in retention burner

Air used for combustion is heated using a plate fin, which in turn is heated using combustion exhaust gas, allowing a 30% or above reduction in the amount of gas used
(equipment developed by Aisin).

### [Machinery] Energy savings through coolant-pipe pressure-drop reduction

Through reducing pressure drop within pipes, we have been able to save over 50% of the electric power used to operate pumps.
・Reduction in pipe length, reduction in number of bends
・Increase in pipe diameter
・Reduction in size of nozzles



### [Lighting] Changeover to use of specular reflection inverter-type fluorescent lighting

In conjunction with our replacement of plant lighting, we changed over to inverter-type lighting, which has allowed us to achieve electricity saving of 60% and over.
・Specular reflection gives higher reflection efficiency
・Changed over from double to single lighting strips

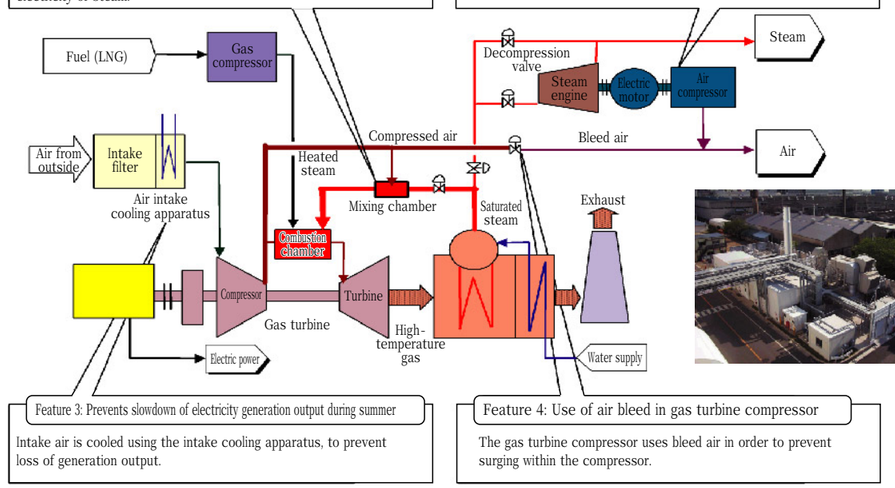
### [Motive Power] Introduction of thermoelectric variable-gas turbine cogeneration system

With the aim of improving the energy use efficiency of the whole plant, we introduced a "Thermoelectric variable gas turbine cogeneration system" into our Kariya Plant in May 2001. This is capable of producing heat and electricity together.

System flow and features

**Feature 1: Introduction of variable electricity/ steam output**
In line with the needs of the plant for electricity and steam, the cogeneration system varies the output of generated electricity or steam.

**Feature 2: Motive power recovery from steam decompression energy**
Motive power is recovered by a steam-run compressor using steam decompression energy




**Feature 3: Prevents slowdown of electricity generation output during summer**
Intake air is cooled using the intake cooling apparatus, to prevent loss of generation output.

**Feature 4: Use of air bleed in gas turbine compressor**
The gas turbine compressor uses bleed air in order to prevent surging within the compressor.