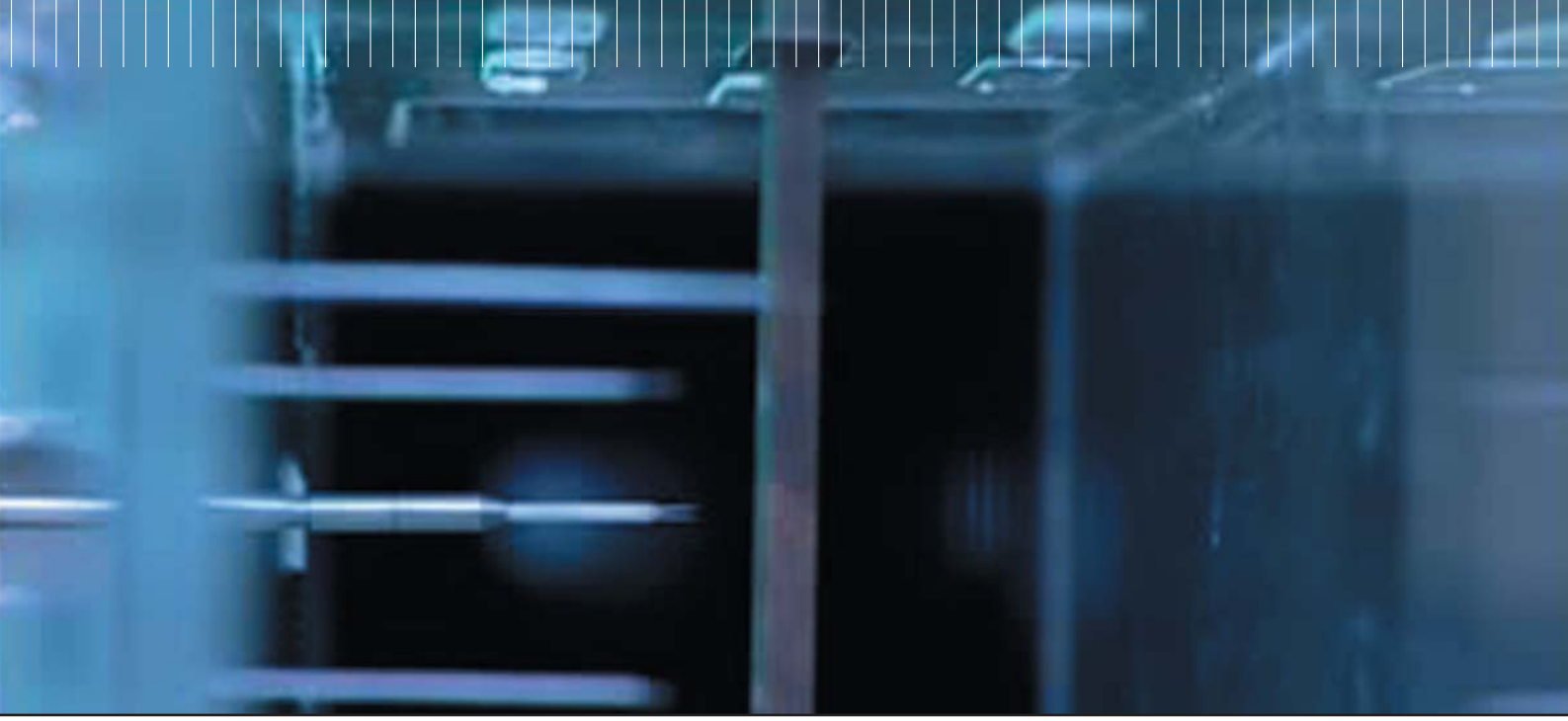

CEA

A device for the carrying out of flow measurements, installed on the Athene experimental research platform. Better understanding of the complex flows occurring in the major part of industrial processes results in gains in energy efficiency.

IV. ENERGY EFFICIENCY

World energy demand is constantly rising. This is a legitimate trend, insofar as access to energy enables enhanced quality of life and sanitation levels for populations.
On the other hand, such increased consumption generates effects that may be catastrophic for the future of the planet (climate change, environmental imbalance), should this growth conform to the patterns followed, up to recent times, by most industrialized countries.
Reduction of greenhouse gas emissions, development of new energy sources and energy efficiency are seen as the major challenges to be taken up for the world of tomorrow.
In France, the National Energy Debate indeed emphasized, in 2003, the requirement to control both demand for, and offer of, energy, through a strategic orientation law for energy. The French position corresponds to a slightly singular situation - and a privileged one, compared to other countries - owing to massive use of nuclear power for electricity generation. This option allows France to be responsible for a mere 2% of worldwide greenhouse gas emissions.
Real advances can nonetheless still be achieved as regards improved energy efficiency, particularly in the transportation and residential-tertiary sectors, following the lead, in this respect, shown by industry. These two sectors indeed account for over half of the country's CO_2 emissions (26% and 25% respectively).
With respect to transportation, the work carried out by CEA on the hydrogen pathway, energy converters, and electricity storage has been covered by the preceding chapters.
As regards housing, a topic addressed by one of the papers in this chapter, investigations at CEA concern integration of the various devices enabling value-added use of renewable energies.
At the same time, the organization is carrying through its activity in the extensive area of heat exchangers, allowing industry to benefit from improved understanding in the modeling of flows. An activity evidenced by advances in energy efficiency for many industrial processes, for the chemical industry or in glassmaking, for instance, but equally in housing, through new improvements in gas-fired boiler efficiency, in particular.
Investigations on new refrigeration technologies, for both domestic and industrial applications, round out the range of solutions CEA is contributing to make available to end users.