

This prototype of a 20 kW fuel-cell application is the first of its kind in Europe.



## FUEL CELL TECHNOLOGY

### Commercial application is one step closer

Since 2000, Wärtsilä has been developing fuel cell technology for both the distributed power generation and marine markets. In June 2006, a significant advance was achieved when the prototype of a 20 kW fuel-cell application was transferred to the Wärtsilä fuel-cell laboratory in Espoo, Finland.

Development of fuel cells is part of Wärtsilä's global R&D organisation within the Engine Division, increasing synergies within the development process and further enhancing both R&D and the commercialization of technologies that are developed.

Wärtsilä has been testing the functionality of Solid Oxide Fuel Cell (SOFC) technology in the power range of five kilowatts and below since 2004. According to **Erkko Fontell**, who is responsible for fuel-cell technology development, moving to a 20-kilowatt

power range is a concrete step towards commercialized application.

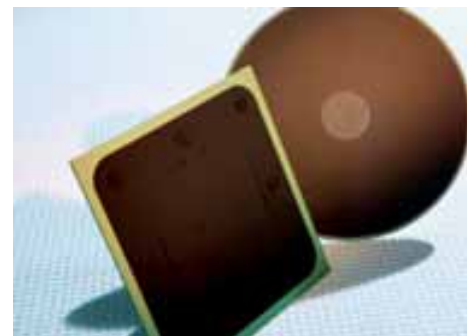
The prototype is the first of its kind in Europe – products with a power range of 20 kilowatts that use SOFC technology have not been developed previously. "This is an integrated power system which uses natural gas," says Fontell.

The next goal of the development programme will be units in the 50-kilowatt power range and in the long term, Wärtsilä will be developing a fuel cell application with a power rating of

250 kilowatts for use in combined electricity and heat production applications. Production costs will have to be reduced and fuel-cell life will have to be extended before full commercialization.

In the current decade, technology will be tested, developed and demonstrated. The first demonstration sites are currently being prepared. At the Vaasa Housing Fair in Finland, the preferred method for producing electricity and heat is to employ Wärtsilä fuel cells to burn gas extracted from waste sites. Wallenius Lines, a Wärtsilä customer, is interested in both fuel-cell applications and related technology, and several energy companies are following Wärtsilä's product development with considerable interest. Taking a wider view, full commercialization of the technology is expected to happen by 2015.

Wärtsilä is playing a significant role in development work in the fuel-cell industry. As well as being involved in the establishment of Finland's national fuel-cell strategy, the company participates in the planning of fuel-cell R&D in the EU's Seventh Framework Programme. Together with 15 other Finnish companies, Wärtsilä is part of the Fuel Cell Finland Industry Group established by Technology Industries of Finland.



Wärtsilä is playing a significant role in the fuel-cell industry.

### [ A CLEAN, EFFICIENT AND QUIET WAY OF PRODUCING ELECTRICITY ]

**1.** Fuel cells are **one of the most promising future technologies** for decentralized power generation.

**2.** SOFC systems are **fuel flexible**. In Wärtsilä's development programme, the focus is on **natural gas, methanol and a variety of biogases**.

**3.** Fuel cells **do not generate SO<sub>x</sub> emissions** as sulphur compounds must be removed before a fuel is burnt. **NO<sub>x</sub> and particulate emissions** are also minimal.