

- optimising radio-diagnostics so that the best possible images can be generated using as little radiation as possible.  
 - measuring the absorption of heavy metals by plants.

**Facilities**

The Institute's largest facility is the "Hoger Onderwijs Reactor" (HOR). This small nuclear research reactor provides different research

instruments with radiation to investigate small samples. The second major facility, the Van de Graaff electron accelerator, is used for more fundamental research in radiation chemistry. Other facilities include an intensive positron beam and experimental facilities for research with radionuclides, neutrons, electrons, positrons, x-ray and  $\gamma$ -radiation, etc.

**Education**

IRI has an inter-university function, providing Dutch universities with knowledge and expertise, e.g. in the area of ionising radiation, radiation measurement, radiation health physics, radiochemistry and the safe use of radioactive sources.

**More information:**  
[www.iri.tudelft.nl](http://www.iri.tudelft.nl)

**Japan's Energy Situation and Hitachi's Technologies for a Sustainable World**

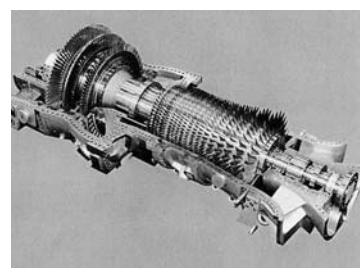
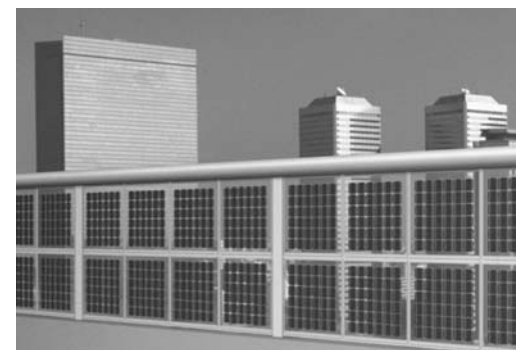
**Shigeru Azuhata**

From the perspective of energy security, Japan, which depends on other nations for its energy sources, relies equally on coal, gas, oil and nuclear generation for its electricity demands. After the oil

market is the key to reducing the price of electricity, but it is going slowly compared to markets in the EU and USA. Only 6.7GW (3% of total capacity) of electricity is supplied by independent power producers. Research and development in the field of power generation has implications for other areas, too. For example, technologies acquired in power generation are being applied to industrial and medical fields; these include high energy X-ray CT and proton beam therapy for cancer treatment.

*Dr. Shigeru Azuhata, the Chief Technical Officer of Power & Industrial Systems Group and the General Manager of Power & Industrial Systems R&D Laboratory of Hitachi Ltd., will give a presentation on Japan's energy situation and Hitachi's technologies for a sustain-*

*able world at the next EU Hitachi Science & Technology Forum.*



shock of the early

1970's nuclear generation showed the largest growth, but it faces the problem of public acceptance for the construction of new power stations. A long-term technical subject for fossil-fired units, which meet more than 70% of total electricity demand, is the improvement of plant efficiency, so as to minimize environmental emissions. The number of gas-fired combined cycle plants with high temperature gas turbines has increased rapidly during the past decade. The newest current supercritical coal power plant can achieve 42% efficiency with a steam temperature of 600°C. Coal-fired combined cycle plants face a big challenge to reduce their capital cost. Two PFBC (Pressurized Fluidized Bed Combustion) units of 250 and 350MW are commercially operating while an IGCC (Integrated Gasification Combined Cycle) unit is being developed. CO2 reduction is a critical issue of world energy supply. The renewable portfolio standard, which is targeting an increase in renewable energy generation of up to 1.35% of the total supply by 2010, imposes an obligation on electric retailers to use solar, wind, biomass, hydro and geothermal generation. Deregulation of the Japanese power

**Hitachi News**

After having worked for ten years in Europe, Dr. Masahiro Abe returned to Tokyo to take up his new function as General Manager of the Global R&D operation Office.. Dr. Abe has worked in the field of R&D in Dublin, Cambridge and finally London where he was General Manager of the Corporate Technology Group of Hitachi Europe Ltd. These duties will be taken over by Dr. Kazumasa Takagi, a former Chief Researcher at Hitachi's Advanced Research Laboratory.

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**The sustainable aspects of energy**

**Jeffrey P. Hardy**

Energy has deep and broad relationships with each of the three pillars of sustainable development — the economy, the environment and social welfare. As energy continues to grow, a key question concerning energy and sustainability is whether the world's economies can use less energy, and diversify and expand energy production, while maintaining economic growth and prosperity. With respect to the environment, energy production and use (including transport) accounts for 80% of anthropogenic greenhouse gas emissions. Since nearly 2 billion people are currently living without access to modern energy, social welfare in the future will depend on the ability to deliver commercial energy supplies to the developing world.

For the policy-maker, planning for a sustainable energy and transport future is a major priority. Choosing a path towards sustainable development will require broad societal consensus around the strategic choices of economic, environmental and social development. Transparency, stakeholder involvement and institutional flexibility will be key ingredients of any set of decisions. Different countries have the freedom to pursue different paths towards a variety of sustainable development options and they will require different policy mixes, likely incorporating fiscal, regulatory and research and development efforts to overcome barriers to the adoption of new approaches.

The continuity of energy supply, particularly electricity, will be essential in the 21st Century. While short-term interruptible supply may be feasible in certain circumstances, unexpected power cuts bear a high cost for society that cannot be ignored. The world's growing reliance on information technologies makes reliability even more critical. Energy availability requires a diversified energy portfolio consistent with particular national circumstances together with the means to harness potential new energy sources. It is generally agreed that various mixes of all currently available energy resources will be needed over the next fifty years and there is no case for the arbitrary exclusion of any source of energy.

Local pollution is a cause of harm to billions of people, especially in developing countries. Global climate change has become an important concern. The energy sector is one area in which new and readily available technologies have already reduced emissions and hold out prospects for future improvement. Of course, environmentally friendly technologies have to be developed, diffused, maintained and expanded in all parts of the world. Hence, there is a need to foster adequate local capacity to ensure



**Editorial note**

The optional visit preceding the Forum will take us to the nuclear reactor of the Delft University. Research is carried out in multiple fields offered by nuclear technology, outside the production of energy.

The Forum will take place in Antwerp a major port, a huge industrial center, a city well known for its artistic treasures and its many beer bars.

Many talented speakers will join us share their experiences, lead discussions so that, once more, our meeting will be fruitful and will contribute to the European debate on energy policy. We have prepared a backgrounder on the speakers and their organizations they work with.

For the sixth time, by the end of the meeting, we will ask for suggested themes for the 2004 Forum and, once more, we will be looking for volunteers who will help shaping the year 2004 agenda.

It will be good to see you all again in Antwerp.

**Norikiyo Koide**  
 General Manager  
 Hitachi Corporate Office, Europe

that the technologies can be used and maintained by local people. Energy resources must be produced and used in a manner that protects and preserves the local and global environment now and in the future.

Energy efficiency programmes are an important component of strategies to reduce the consumption of existing natural resources, while also allowing the economy to grow. Industry and government can work together to implement energy efficiency programs that save energy and money and improve air quality by increasing customer awareness of how to use energy wisely. Another major element of achieving improved energy efficiency depends on the development and diffusion of cost-effective technologies – which might require the introduction of minimum standards in energy equipment and service. Energy efficiency policies that use direct or indirect price mechanisms (e.g. removing subsidies, incorporating externalities) are the most effective in lowering energy consumption trends.

EU Hitachi Science & Technology Forum 2003, will attempt to address some of these issues with a seminar “Energy and its implications for a European Society.”

*Jeffrey P. Hardy is president of IDA consulting. This consulting company focus, among other competencies, on energy, environment, transport and sustainable development. (www.idaconsulting.com)*

## Review of the Forum speakers' organisations

**Mr. Jason Anderson** from **Climate Action Network Europe (CAN Europe)** which is a coordinating office, based in Brussels, for environmental groups in Western Europe working on climate change issues. CAN Europe runs an information service on climate change and coordinates policy on climate change at a European level as well as liaising with other groups in the global organization of Climate Action Network.

The overall goal of CAN Europe is to promote action to limit human-induced climate change to ecologically sustainable levels. Membership is open to all environmental NGOs that subscribe to the goals of CAN Europe and are active in the field of climate change. Today, Climate Network Europe has 82 member organizations.

CAN Europe also monitors and encourages the implementation of policies and measures that combat climate change in the EU as well as working with national NGOs to do the same at the member state level.  
*For more information : <http://www.climnet.org/>*

**Ms. Helen Donoghue** and **Dr Domenico Rossetti di Valdalbero** from the **European Commission**. Ms Donoghue works at DG Energy and Transport, Mr Rossetti di Valdalbero works at DG Research.

**Mr. John Scowcroft** from **The "Union of the Electricity Industry - EURELECTRIC"** – which is the association representing the common interests of the electricity industry at pan-European level plus its worldwide affiliates and associates.

EURELECTRIC has a threefold mission, which consists of :  
- contributing to the development and competitiveness of the electricity industry and promoting the role of electricity in the advancement of society;  
- providing a "center of strategic expertise", by identifying the common interests of its members and assisting them in formulating common solutions to be implemented and in coordinating and carrying out the necessary actions;  
- representing the industry in public affairs, in particular in relation to the EU institutions and other international organizations so as to promote the interests of its members in the political sphere and ensure awareness of the industry's policies

EURELECTRIC has a permanent international staff of some 30 employees based in Brussels, led by the secretary-general.  
*For more information : <http://public.eurelectric.org/Content/Default.asp>*

**Dr. Peter Tjan** from **EUROPIA** which is the European government affairs organization of the oil refining and marketing industry in the EU and EEA – it represents some 95% of total EU refining capacity. It represents the interests and concerns of its members with the EU institutions and with other European industrial and commercial organizations. The secretariat is located in Brussels, Belgium.

The main activities of EUROPIA arise from energy policy (including taxation), protection of the environment, and product quality. Specific current issues are the Auto-Oil programmes, Air Quality directives, the Acidification strategy, climate change, and some economic issues derived from EU competition legislation and the introduction of the EURO currency in 1999.  
*For more information : <http://www.europia.com/>*

**Mr. Dolf Gielen** from **The International Energy Agency (IEA)**, based in Paris, which is an autonomous agency linked with the Organisation for Economic Co-operation and Development (OECD). The IEA is the energy forum for 26 Member countries. IEA Member governments are committed to taking joint measures to meet oil supply emergencies. Its objectives are:  
- To maintain and improve systems for coping with oil supply disruptions;  
- To promote rational energy policies in a global context through co-operative relations with non-Member countries, industry and international organisations;  
- To operate a permanent information system on the international oil market;  
- To improve the world's energy supply and demand structure by developing alternative energy sources and increasing the efficiency of energy use;  
- To assist in the integration of environmental and energy policies.  
*For more information : <http://www.iea.org/>*

**Mr. Thierry de Bresson** from **Pechiney** which is the world's fourth largest producer and converter of aluminum:  
- It operates in all facets of aluminum production (bauxite, alumina, primary aluminum). Pechiney's electrolysis technique is recognized as one of the most efficient in the world.  
- Pechiney is also one of Europe's leading aluminum converters for transports markets, industrial applications, construction, household appliances and packaging.

Pechiney is also the world's third largest manufacturer of high value added specialty packaging, producing a range of products using several materials for the food, cosmetic and healthcare markets.

The Ferroalloys and International Trade businesses complete the Group's portfolio.

Pechiney has 320 manufacturing and sales facilities in 50 countries :

In 2001, Pechiney's Net Sales amounted to 10.7 billion Euros, with a Net income of 314 millions Euros. Pechiney has 31,300 employees worldwide  
*For more information : <http://www.pechiney.com>*

**Mr. Jean-Christophe Füeg** from the **Swiss Federal Office of Energy**.

Dr. Jan Kretzschmar from Vito, the Flemish Institute for Technological Research, is an independent research centre, which conducts customer oriented contract research and develops innovative products and processes in the fields of energy, environment and materials, and this for both the public and the private sector. Central to all projects are protecting the environment and encouraging sustainable use of energy and raw materials.

In 2001, Vito had an income of 19.04 million Euros of which 20% was generated by industrial contracts. It employs 465 persons. The institute also generated so far more than 1,000 publications, reports and other scientific communications.  
*For more information : <http://www.vito.be/english/index.htm>*

**Mr. Enzo Millich** is a **Consultant in European Affairs**.

## The Interfaculty Reactor Institute (IRI)

The Interfaculty Reactor Institute (IRI) of TU Delft is the Dutch national centre for radiation-related university research and education with the primary focus on the nuclear reactor, radionuclides and ionising radiation. IRI also places its specific facilities and expertise at the disposal of the community.

### Research

The Institute's principal scientific activities are materials research, neutron scattering, physical aspects of nuclear reactors, research in radiochemistry and radiation chemistry, medical and environmental research and research on systems and technologies for radiation detection. While much of this research is applied, ample attention is also given to fundamental research.

Recent research focus is on:

1) Materials, e.g.  
- the structure and behaviour of nanostructured materials for hydrogen storage.  
- Fischer-Trops catalysts using Mössbauer spectrometry.  
- the structure and magnetic properties of audiotape and videotape, with the objective of saving more information on them.

2) Sensors and instrumentation, e.g.  
- materials that emit light under the influence of radiation in order to use these materials to develop instruments that indicate what type of radiation dosages they have detected.

3) Energy and sustainable production, e.g.  
- the development of intrinsically safe reactors.  
- materials that could be used in solar cells.  
- the structure and properties of materials for batteries and superconductors.

4) Environment and health, e.g.