

New technology to control climate change

Technology and climate change programme (Climtech) 1999–2002



TEKES

Technology and climate change

New technology to control

Human activity increases the concentrations of greenhouse gases in the atmosphere. This changes the radiation energy balance of the Earth and leads to climate change and significant environmental changes over large portions of the planet.

There are no simple ways to control climate change. Thorough system changes are needed to decrease emissions.

Great demand is expected for new and advanced technologies.

Climate change is slow and difficult to control

Climate change and its control are very slow processes. The emission of the most significant greenhouse gas from human activity, carbon dioxide, causes atmospheric effects, which last for tens and even hundreds of years.

Investment lifetimes in power plants, industry, buildings and infrastructure are often of the order of 20 to 50 years. This limits the speed of controlling the impacts of greenhouse gases.

Restricting emissions

The objective of the Climate Convention (Framework Convention on Climate Change (FCCC), agreed in Rio de Janeiro in 1992) is to stabilise the concentrations of greenhouse gases in the atmosphere at a safe level.

The emission reduction requirements for the period 2008–2012 were agreed in



Combined production of electricity and heat from wood and waste fuels in the Forssa biomass power plant.



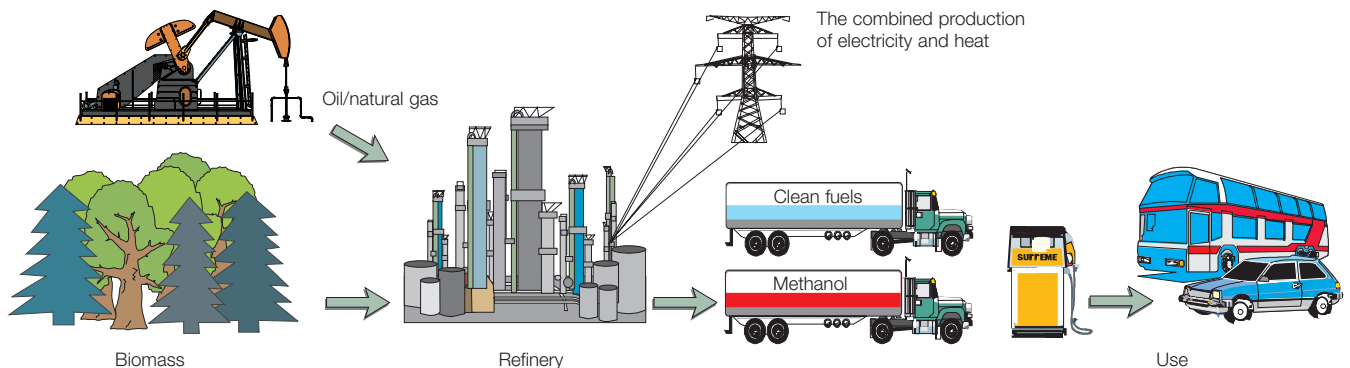
Fossil fuels can be replaced, for example, by wind power production.

Kyoto in 1997 for the industrialised countries between the different parties to the Climate Convention.

Meeting the Kyoto emission reductions will have only a small effect on the increase of carbon dioxide concentration in the atmosphere, although the commitments will put pressure on de-

veloping and improving energy systems and even on the economies of countries.

If we are to abide by the objective of the Climate Convention, stabilisation of atmospheric greenhouse gas concentrations, new tighter restraints on emissions will most likely be set after the



In transportation existing fossil fuels can be replaced by low emission fuels. A possible future process is illustrated. Vehicle technology and the use of vehicles contribute along with fuels to CO₂ emissions caused.

climate change



CLIMTECH PROGRAMME IN A NUTSHELL

Goals and tasks

Investigation of the development needs and applications of technologies that will limit climate change

- Perspective up to approximately 2030
- Improvement of current technology, new technologies and concepts
- Technology transfer

Support for the application and commercialisation of Finnish technology

- Evaluation of potential, economic significance, identification of barriers

Analysis of climate change control with the help of an overall picture

- Forecasting the effects of different emission limitation options and their commensurate comparison, external communications
- Identification of the most significant development fields and items

Application of the programme results

- Possibilities, as viewed from companies' perspectives
- National strategies (objectives, orientation)
- Emission targets (Finland, EU, global)

The programme will be implemented from 1999 to 2002 and with a total budget of FIM 15 million.

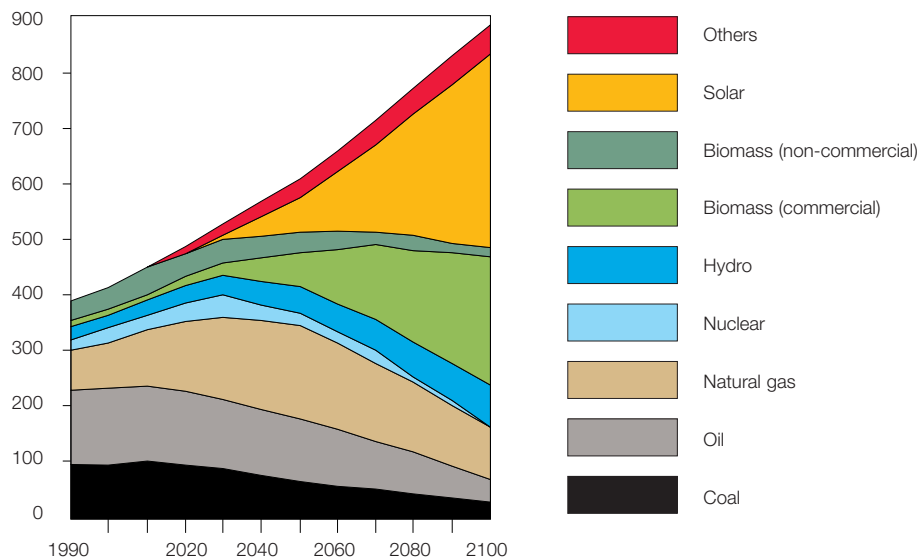
Organisation and implementation

Climtech is run as a framework programme. VTT Energy is responsible for the implementation of the programme and a steering group will guide and supervise the work done within the programme.

The programme will disseminate concise information to various parties. The information can be used in companies, which are developing climate control technology, in other research programmes and in the creation of strategies and setting of targets, both nationally and internationally.

Research assessments carried out within the programme will be requested directly from the researchers.

Exajoules per year (10^{18} J/a)



World primary energy production, in a scenario where strong controls on emissions and optimistic technological development are assumed. Scenario C1 from source IIASA/WEC Global Energy Perspectives, 1998.

2008–2012, first commitment period of the Kyoto Protocol.

Finnish technology to control emissions

Finnish energy technology utilises innovation extensively. The export of Finnish energy and environmental technology already exceeds such imports. However, the development and application of new technology takes time. Hence the development of new technology must be started early and needs to be viewed with the long-term picture in mind.

The use of technologies and systems developed and applied in Finland brings the possibility of limiting emissions when applied in, for example, the EU and other parts of the world.

The best technologies to control climate change

The technology and climate change programme investigates the development needs and possibilities of the technologies which can be applied to control greenhouse gas emissions and climate change. The programme includes both the control and limitation of emissions

within Finland as well as the use of Finnish technology to limit emissions elsewhere.

The timescale for the technologies studied extends beyond the first commitment period of the Kyoto Protocol to about 2030. Within this timescale the emission limits for developed countries will most likely be tightened and the emissions for developing countries will most likely also be limited.

In the technology and climate change programme the control of climate change is being analysed against the background of the overall picture. Forecasts are made on the requirements and possibilities for emission controls and these are weighed against their economic consequences. The programme is helping to identify the most important development fields.

The programme supports the implementation and the commercialisation of Finnish technology by assessing the prospects for application of the concepts and technology and their economic significance. The programme will also help to identify any restrictions on implementation.



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Further information

Programme Manager
Prof. Ilkka Savolainen
VTT Energy, P.O.Box 1606, FIN-02044 VTT, Finland
Tel. +358 9 456 5062, telefax +358 9 456 6538
Ilkka.Savolainen@vtt.fi

Senior Technology Adviser
Ms Raija Pikku-Pyhältö
Tekes
National Technology Agency
P.O.Box 69, FIN-00101 HELSINKI, Finland
Tel. +358 105 215 872, telefax +358 105 215 905
Raija.Pikku-Pyhalto@tekes.fi

Researcher
Mr Sami Tuhkanen
VTT Energy, P.O.Box 1606, FIN-02044 VTT, Finland
Tel. +358 9 456 5065, telefax +358 9 456 6538
Sami.Tuhkanen@vtt.fi

The most recent information on the programme is available from our web pages
www.tekes.fi/english/programm/climtech/
www.climtech.vtt.fi

TEKES – YOUR CONTACT FOR FINNISH TECHNOLOGY

Tekes' primary objective is to promote the competitiveness of Finnish industry and the service sector by technological means. Activities should diversify production structures, increase production and exports, and create a foundation for employment and social well-being.

Tekes supports applied and industrial R&D in Finland with about two billion Finnish marks annually. Tekes offers excellent channels for technological co-operation with Finnish companies, universities and research institutes.

Technology programmes – part of the innovation chain

The technology programmes for developing innovative products and processes, are an essential part of the Finnish innovation system. These programmes are characterised by close co-operation between industry, the universities and research institutes. The programmes also form a solid basis for international co-operation. Currently there are about 60 technology programmes.



TEKES

NATIONAL TECHNOLOGY AGENCY
P.O. Box 69, (Kyllikinportti 2), FIN-00101 Helsinki, Finland
Tel. +358 105 2151, Fax +358 9 694 9196
E-mail: tekes@tekes.fi
www.tekes.fi