



Courtesy Tore Filbakk

## Bioenergy in Norway

Guest Editorial by Olav Gislerud, ExCo Member for Norway



Large petroleum resources make Norway a net exporter of energy. The level of production of hydroelectric power is also high, with Norway producing 40% of the EU27 total in 2005 (ie. EU25 plus Norway and Cyprus). Net domestic energy consumption is only about 8% of primary energy production. Bioenergy constitutes 6% of domestic consumption, electricity 49% and petroleum products 45%. Hydropower, which is easy to access, clean and affordable, makes up a large share of the electricity consumed.



Courtesy Leif Kjølseten

Norwegian energy consumption increased by 15% between 1990 and 2006 (with the major increase being in non-renewable energy) mainly due to increased transport. Norway has extensive power-intensive industries and a high proportion of electric heating compared to other countries.

In order to fulfil its targets for greenhouse gas reduction and lower its dependency on hydropower (which is vulnerable to changing precipitation), Norway has set ambitious policies for climate change and energy efficiency and increased the production and use of other renewable energy sources, including bioenergy.

On 28 March 2008, the White Paper on Norwegian Climate Policy was adopted by the Norwegian Parliament with some amendments. The Norwegian climate change targets are to become carbon-neutral by the year 2030 and to reduce the annual greenhouse gas emissions by 15–17 million tonnes of CO<sub>2</sub> equivalent by

2020, including carbon uptake in forests. This implies that about two-thirds of Norway's total emissions reduction has to be met nationally. In 2005 the Norwegian greenhouse gas emissions were 54 million tonnes of CO<sub>2</sub> equivalent. The greenhouse gas reduction targets will be reached through broad economic measures, CO<sub>2</sub>-emission credits, CO<sub>2</sub>-tax, and a set of specific measures for different sectors and industries.

Over the last ten years Norway has had a policy to bring about an environmentally friendly change in energy production and use, and concrete targets have been set. These are to increase the production of environmentally friendly energy, or to save energy equivalent to 12 TWh/43.2 PJ between 2001 and 2010. Of this, at least 4 TWh/14.4 PJ will be central heating based on renewable sources of energy, including heat pumps and waste heat, and 3 TWh/10.8 PJ will be increased production of wind power. As a comparison the total domestic energy consumption was approximately 225 TWh/810 PJ in 2006.

The main measures in order to reach these targets are investment support and information and advisory services run by Enova SF. Enova has a yearly budget of approximately NOK 1.5 billion (EUR 181 million). In addition to Enova, Innovation Norway offers grants for development of bioenergy within the agriculture and forestry sector. In 2008 approximately NOK 40 million (EUR 5 million) has been allocated to the programme.

The primary objective of the Norwegian Research Council's R&D programme 'Clean Energy for the Future' (RENERGI) is to develop knowledge and solutions as a basis for ensuring environmentally friendly, economically efficient and effective management of the country's energy resources; a highly reliable energy supply; and internationally competitive industrial development related to the energy sector. The programme has an annual budget of about NOK150 million (EUR18 million). For 2008 about 2.5 million EUR has been granted to bioenergy/biofuel R&D projects.

In addition to the overall renewable energy and energy-saving targets, the government has proposed a national target of a 14 TWh/50 PJ increased use of bioenergy by 2020. A strategic plan for the achievement of this bioenergy target was launched on 1 April 2008. The main strategy is to increase the use of bioenergy for heating, followed by a balanced increase in the supply of wood- and forest-based fuels. In addition to the services and finances provided by Enova, Innovation Norway and the Norwegian Research Council, the strategy will be supported by the following range of measures:

- Establishment of a bioenergy forum lead by the Minister for Petroleum and Energy;
- Regulatory energy and climate planning by all municipalities;
- Compulsory water-borne heating distribution in public buildings above 500 m<sup>2</sup>;
- Removal of compulsory reduction in transmission tariffs for spot electricity used for central heating;
- Prohibition of instalment and replacement of oil-burners in new and existing buildings; and
- Development of efficient logistics and supply chains for forest and wood waste-based fuel.

For more information contact Olav Gislerud at [og@forskningsradet.no](mailto:og@forskningsradet.no)



Courtesy Helmer Belbo

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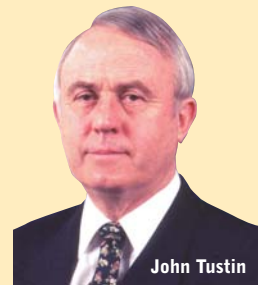
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# From the Secretariat

## ExCo61, Oslo, Norway



John Tustin

The 61<sup>st</sup> meeting of the Executive Committee was held in Oslo, Norway on 14-16 October, with Björn Telenius as Chairman and John Tustin as Secretary. The meeting was hosted by the Research Council of Norway. The Chairman expressed the appreciation of the ExCo to Olav Gislerud for the excellent meeting and study tour arrangements. Some of the outcomes of the meeting are detailed below.



Erik Eid Hohle, Manager (left), Arthur Wellinger, Switzerland and Petter Nilsen, Norway at The Energy Farm

### Changes in the Executive Committee

New Executive Committee Members are: Mr Ed Hogan, Canada; Mr Jean-Christophe Pouet, France; Mr Tadashi Kohno, Japan; Dr Elspeth MacRae, New Zealand; Dr Sandra Hermle, Switzerland and Mr Trevor Raggatt, United Kingdom. New Alternate Members are: Mr Jeff Karau, Canada; Mr Leonard Boniface, France; Ir Huub Halsema, The Netherlands; Dr Michael Jack, New Zealand; Mr Anders Johansson, Sweden and Mr Bruno Guggisberg, Switzerland.

### Election of Chairman and Vice Chairman

Dr Josef Spitzer, the Member for Austria was elected Chairman and Mr Birger Kerckow, the Member for Germany was elected Vice Chairman for the balance of 2008 and 2009.

### Task Participation for 2008

Japan, Austria and the European Commission all indicated that they will join Task 40 in 2008. Task participation by the Member Countries now totals 119. Task 29 was prolonged to 31 December 2009, with an annual budget of US\$98,000.

### ExCo61 Workshop

A very successful workshop titled 'Biofuels for Transport - Part of a Sustainable Future?' was well attended by ExCo Members, Task Leaders, and Observers from Norway. This was a joint event with Nordic Energy Research. Presentations were:

- Biofuel Sustainability in the Renewable Energy Directive: State of Play - Kyriakos Maniatis, European Commission, Belgium
- The US Perspective: Drivers and Sustainability Considerations - James McMillan, NREL, USA
- Brazil, EC and US Tripartite Work on Standards - Willie E. May, NIST, USA
- Sustainable Ethanol: What is the Context? - Per Carstedt, SEKAB, Sweden
- Will New Biofuels Provide the Solution? - Dominic Boot, VNPI, The Netherlands
- The Brazilian Perspective - Alfred Szwarc, UNICA, Sugarcane Industry Association, Brazil
- Biofuels: Is the Cure Worse than the Disease? - Richard Doornbosch, OECD
- Sustainability of Biofuels: Challenges - Sampsa Kiianmaa, WWF, Finland
- Resources and Competition Between Different Uses - Florian Kraxner, IIASA, Austria
- Environmental Issues of Biofuels - Uwe R. Fritsche, Oeko-Institut, Germany
- Carbon and Sustainability Reporting in the UK - Jessica Chalmers, Low Carbon Vehicle Partnership, UK
- Nordic Swan Initiative for Biofuels Labelling - Tormod Lien, Nordic Ecolabelling, Norway

These presentations are now available on the IEA Bioenergy website.

### Technical Coordinator Initiatives

Adam Brown, the Technical Coordinator, reported excellent progress on a range of new initiatives. A closer and more proactive relationship is being developed with IEA Headquarters and project collaboration with other Implementing Agreements has begun, eg. a project with RETD on 'best use of biomass'.

The Bioenergy Technology Review mentioned in Issue 19(2), has now commenced. The principal contractor is the Energy Research Centre of the Netherlands (ECN) which has formed a consortium with three other partners - E4Tech, Copernicus Institute of Utrecht University and Chalmers University of Technology. The review will provide a global perspective of the future potential for bioenergy, the main opportunities for deployment in the short and medium term, and the principal issues and challenges facing the development of the sector. It will cover the entire value chain of the different bioenergy pathways (to heat, electricity and CHP, and to transport fuels) and discuss within a global comparative approach their respective potential and opportunities. It will also focus on the fuel sources and technologies likely to be able to make a significant contribution to energy and environmental goals at a national, regional, or global scale. Although the review will build on technology position papers and other outputs from the IEA Bioenergy Tasks, it will be complemented by any other authoritative data and information that prove necessary to make it a coherent whole. A final report is expected by December 2008.

The proposal to develop a communication strategy was approved. A working group was formed to progress a number of projects in this area including technology briefs, position papers, Task communication strategies, Task websites, national distribution channels and links to 'influencer' organisations. It was generally agreed that IEA Bioenergy needed to work harder on distribution rather than just creating products.

A draft proposal for Contracting Parties to prepare a country report each triennium was discussed. It is envisaged that these would be supplemented by a 'synthesis and overview' report to be produced under contract. However, after discussion, it was decided that the country reports should be firmly based on the country statistics and information already supplied to IEA Headquarters. With this in mind the proposal will be revised for further discussion at ExCo62.

### Strategic Planning

The next ExCo meeting (October 2008) will include an internal planning workshop aimed at the new triennium, 2010-2012. The process for updating the IEA Bioenergy Strategic Plan will be agreed at this time. A similar planning meeting was held in Lucerne as part of ExCo53 and was judged to be most successful.



Viken Skog HQ. Courtesy K Müller



In conjunction with ExCo61, a total of 39 attendees participated in two excellent study tours.

Participants in the 'Industrial-scale bioenergy tour' travelled by bus to the town of Sarpsborg in the south of Norway. The focus of the visit was the Borregaard company, whose Director of Business Development, Gudbrand Rødsrud, welcomed the group and gave a series of presentations on what the company calls the 'World's Most Advanced Biorefinery'.

Borregaard, with 900 employees and €204 million annual sales, represents 10% of the Orkla Group's chemical business and is a global leader in wood-based chemicals. Wood is the main feedstock and more than 90% of the input ends up in products, the remainder being used to produce bioenergy. From the wood, fibres produce specialty cellulose, lignin is separated and vanillin produced, and hemicelluloses yield ethanol and yeast. Borregaard is the world's largest producer of ethanol from wood - 30-35 million litres/year. The company is a market leader in global niche markets, based on a strong portfolio of specialty products. Corporate R&D is centred in Sarpsborg, with specific research groups for each business area and a new biorefinery group.

A tour of the plant was provided by bus. The plant, consisting of 20 different production units, mostly linked to each other, occupies a 1.5 km<sup>2</sup> site along the Gloma River (Norway's longest river). Total energy use is 1600 GWh, of which 550 GWh comes from a waterfall on-site. There are three thermal energy plants, one producing 200 GWh/year from local sorted waste; one producing 50 GWh/year from bark, and one producing 150 GWh/year from bio-incineration of liquid product side-streams. A district heating plant is planned to use excess hot water from Borregaard to supply heat to the town of Sarpsborg. Energy costs are very high,

so the aim is to produce high-value-added products and the biorefinery concept fits well with this aim. The plant uses 1 million m<sup>3</sup>/year of wood, which comes in equal quantities from Norway and Sweden. Wood costs have increased recently, and other raw materials such as bagasse and straw are being considered. The pulping process is sulphite. There is no organic waste from the process for energy use. For the future, Borregaard will look for different products. It will probably continue to own and operate plants and processes, but will most likely have someone else producing ethanol and will concentrate instead on side-streams in joint ventures. The company focus may be simply on the lignin component or the hemicellulose component of wood.

After an excellent lunch hosted by Borregaard, the group continued by bus to the nearby historic town of Fredrikstad to visit a biodiesel plant being developed by Uniol AS. Mr Jon A. Duus, Managing Director, welcomed the group. Uniol is mostly under Norwegian ownership. The multi-fuel plant, producing 100,000 tonnes/year using BDI technology, will begin operation in early 2009. The capital cost of the plant is NOK 340 million. The feedstock will be mainly rapeseed oil, as well as soy oil, *Jatropha* oil, animal fat and used cooking oil. Process energy will come from a nearby municipal waste energy plant, and by-products from the process will be returned for biogas and bioenergy production. Savings in CO<sub>2</sub> with biodiesel relative to fossil fuels are estimated at 50-70%. Current biodiesel capacity in Norway is 70,000 tonnes/year and, at present prices, the export market is seen as more attractive than the domestic market.

Also at the Uniol site, Ms Anna Nord Bercke, Head of Bioenergy, gave a presentation on 'Biofuels in Statoil Hydro'. This company resulted from the merger of Statoil and Norsk Hydro in 2007. It is the world's third largest net seller of crude oil, producing 1.9 million barrels a day from 6.3 billion barrels of reserves. A small part of the company is working on 'new energy' technologies, including offshore wind energy and biofuels. Growth is projected mainly in offshore wind, less in biofuels, and later in carbon capture and storage and in hydrogen. The present focus, however, is on biofuels. The company is producing 100,000 tonnes/year of biodiesel from rapeseed in Lithuania in a joint operation. The intent is to build an international biofuel production portfolio, gaining position and competence with 1<sup>st</sup> generation technology up to 2013 and thereafter building long-term competitive advantage with 2<sup>nd</sup> generation technologies and feedstocks.

Participants in the 'Small-scale bioenergy tour' travelled by bus to Hønefoss for a visit to the Headquarters of Viken Skog, a major Norwegian forest owners' cooperative. Director, Stig O. Sørthe, made a most interesting presentation on his organisation -12,000 members over nine districts with a harvest of 2.3 million m<sup>3</sup> in 2007, and processing facilities consisting of a paper mill, saw mills, pellet plants and chip terminals. The party were also shown the new Headquarters building with its award winning architecture, innovative demonstration of timber engineering and decorative use of Norwegian timbers.

A visit to Hadeland Glassverk, a glassworks at Jevnaker, was followed by departure for Brandbu and The Energy Farm. Erik Eid Hohle, Manager, and his colleagues hosted the visit which comprised an overview, followed by practical demonstrations of a wide spectrum of modern bioenergy technologies. The Energy Farm is a private company but receives strong support from Government Ministries and organisations such as Enova. The party also received a very thorough and interesting briefing on the many services provided (information, demonstrations, courses and seminars, planning and consultancy etc.). The tour ended with a stop at a new 300 kW heating plant (feedstock is wood chips)

built by Finnish contractors into two shipping containers to provide hot water for an old people's home. Anders Fugleneb was the guide for this interesting item.

*LEFT: Heating plant built in shipping containers. Courtesy A Fugleneb, The Energy Farm*

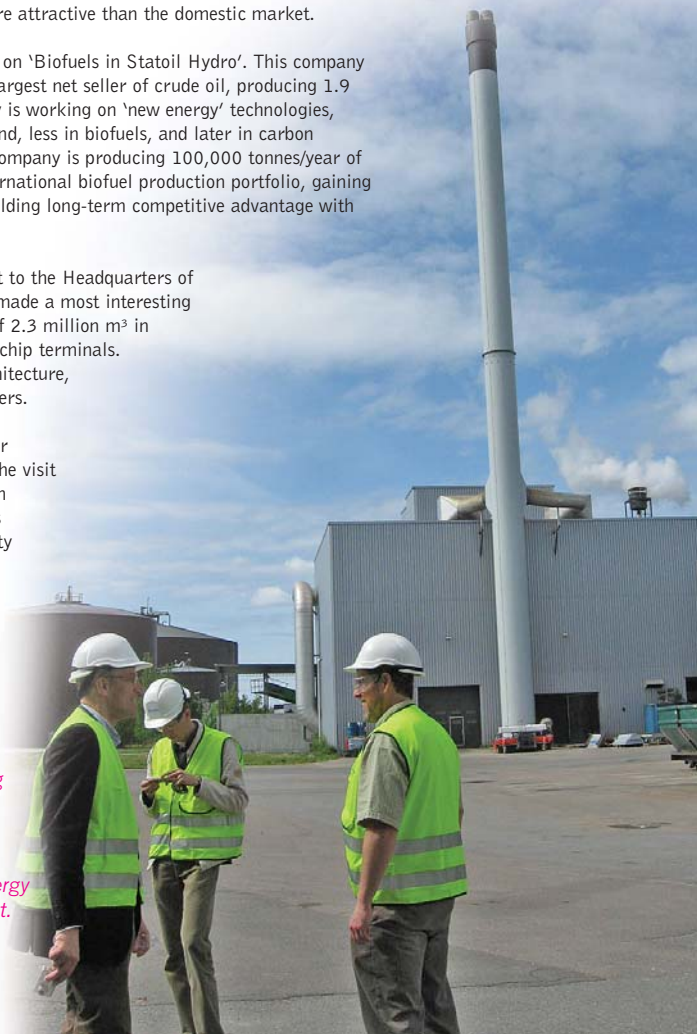
*RIGHT: Two of the three thermal energy plants at Borregaard Sarpsborg Plant. Courtesy J Richardson, Canada*



*The Energy Farm*

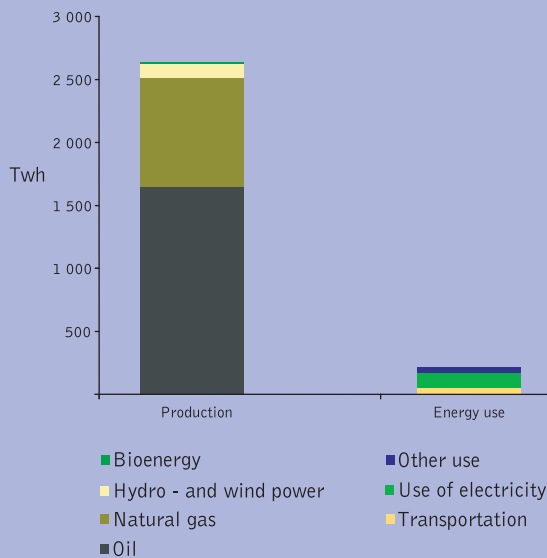


*Storage of purchased 'waste wood' at Borregaard Sarpsborg Plant. Courtesy J Richardson, Canada*

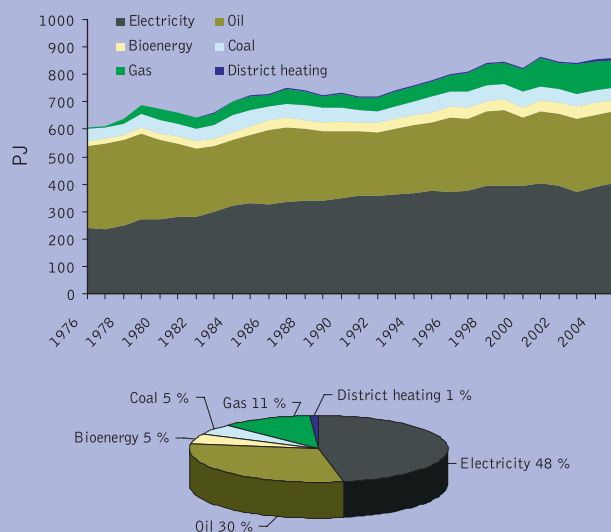


# Norway Energy Statistics

## Energy production and use



## Total energy consumption



## Renewable energy production

	Today	Projected
Hydroelectricity	120 TWh	135 TWh
Wind electricity	1 TWh	4 TWh
Bioenergy	16 TWh	25 TWh
District heating	2,5 TWh	4 TWh (<50% MSW)
Heat pumps	6 TWh	8 TWh
Tidal	0.5 GWh	?
Wave	70 MWh	?
PV	0.3 GWh	?

# Notice Board



*Sjaak van Loo, Task 32 leader, receives the first copy of the Chinese edition of the Biomass Combustion and Cofiring Handbook.*

## Task 32

From 31 March - 1 April 2008, Task 32 held their progress meeting in Beijing, China. A joint workshop was organised with Andrew Minchener, coordinator of the China EU Biomass (CHEUBIO) cofiring programme, to evaluate where and how European cofiring experience and technologies could be introduced in the Chinese market (where approx 60-70 GWe of coal capacity is added every year).

## Task 37

To coincide with its last business meeting on 17-18 April 2008 in Ludlow, UK, Task 37 organised with Probiogas UK a seminar entitled 'Co-digestion for an optimized production of biogas and fertilizer'. Fifty guests heard contributions on co-digestion, quality of digestate and biogas application as a fuel.

## Task 38

On 6-7 February 2008, Task 38 held a workshop, 'Transportation Biofuels: For greenhouse gas mitigation, energy security or other reasons?' The workshop covered types of 1<sup>st</sup> and 2<sup>nd</sup> generation transport biofuels, trends and policies; GHG lifecycle analysis with special regard to land use change issues and impact on soils; other local environmental and social impacts, including energy security; and the concept of sustainable biofuels. It included presentations from members of Task 33, Task 39, Task 37, Task 38 and Task 42 and from other invited speakers.

This was followed by a field excursion in Salzburg, Austria, which visited a state-of-the-art pulp mill with a methane recovery system from pulp sludge and a 15 MW CHP for wood waste and sludge residue ([www.m-real.com](http://www.m-real.com)). This was followed with a visit to a local biogas plant producing methane through fermentation of grass and manure. The recovered methane is fed into the grid, sold for use in vehicles and used to generate electricity with waste heat going to local farms ([www.gaskraft-reitbach.at](http://www.gaskraft-reitbach.at)).

The workshop programme and all presentations are available on the Task 38 website ([www.ieabioenergy-task38.org/workshops/salzburg08/](http://www.ieabioenergy-task38.org/workshops/salzburg08/)).

Task 38 was invited by the European Environment Agency to participate in an expert meeting on 'LCA greenhouse gas methodologies for bioenergy: beyond biofuels'. The meeting took place in Copenhagen, Denmark on 10 June 2008. Susanne Woess-Gallasch gave a presentation on Task 38 activities in this field. The background for this



meeting is the proposal of the European Commission for a 'Directive of the European Parliament and of the Council on the promotion of the use of energy from renewable sources' (COM(2008) 30 final). With this directive an EU-wide target of 20% renewables in the overall energy system by 2020 will be established. With regard to bioenergy, the focus should not be only on biofuels but also on electricity and heat production. This Directive includes 'Environmental sustainability criteria for biofuels and other bioliquids' and rules how to calculate the greenhouse gas impacts. The aim of the expert meeting was to bring together experts in the area of LCA GHG emissions from bioenergy to collect evidence and give guidance on coherent LCA methodologies for all bioenergy as well as adequate default value data for implementation.

## Sustainable Biofuels Consensus

*Contributed by Ralph Sims, Renewable Energy Unit, IEA*

A group of 15 people from various organisations including UNEP, FAO, IEA, UNICA, NGOs and business were pulled together for five days to produce a consensus statement on biofuels, their potential and sustainability issues. The activity was funded by the Rockefeller Foundation.

Several countries were represented, including Brazil and Mexico, but unfortunately participants invited from developing countries were unable to attend. However representatives from the Stockholm Environment Institute that specialises in sustainable development, and from the FAO, were able to cover this important area in relation to biofuels production.

A balanced view of biofuels resulted, clearly showing that sustainable production is paramount. There are good biofuels and bad biofuels, and, with good land and water management, there are good opportunities for many developing countries to produce their own transport fuels as well as food and fibre products.

Using the fuels internally in the South to offset ever-increasing imported oil costs makes sense, with opportunities to export any surplus production to the North. The Brazil model can be

replicated in part in some African countries and South/South collaboration is already underway. Greenhouse gas mitigation is feasible for some biofuels, but when direct and indirect land use change is included in the analysis, this is not always the case. Full details of the Consensus are available at:

<http://www.renewableenergyworld.com/rea/news/reinsider/story?id=52328>

## A Remarkable ExCo Record

Norway has a unique position in IEA Bioenergy, having been served by just two ExCo Members since it joined the Agreement in March 1979. Gunnar Wilhelmsen was the first and it could be said that he is one of the 'fathers' of IEA Bioenergy and served as Vice Chairman and Chairman of the Agreement between 1985 and 1987. He attended ExCo2 in Dublin in 1978 to organise Norway's membership and became the first Member for Norway. Gunnar continued in this role until 1989 (ExCo23) and served as Vice Chairman and Chairman of the Agreement between 1985 and 1987. From 1989, he was the Alternate Member and continued in this role until 1997. In total Gunnar attended 27 ExCo meetings.



*Dr Gunnar Wilhelmsen*

Olav Gislerud first became involved with the Agreement as the Norwegian representative for Planning Group C (harvesting and transport) from 1979. He later joined the ExCo as the Alternate Member in 1988 and took over from Gunnar as the Member for Norway in April 1989. He went on to be the Member for Norway for a record 19 years and served as Vice Chairman for six years and Chairman for two. In total he has attended 30 ExCo meetings, from ExCo24 in Lisbon in 1989 to the most recent meeting, ExCo61 in Oslo.

## M-real pulp mill, Austria



# Publications



## IEA Bioenergy Annual Report 2007

The latest Annual Report includes a special article by Adam Brown, Technical Coordinator, entitled 'Moving with the Times', a reflection on how IEA Bioenergy has evolved to meet the changing environment. The report is available for download at: <http://www.ieabioenergy.com/Library.aspx> or contact the Secretary to request a hard copy.

## The Availability of Biomass Resources for Energy

The summary and conclusions from the ExCo58 workshop 'Availability of Biomass Resources - The Likely Impact of Certification and Sustainability Criteria, and of the Kyoto and post-Kyoto Frameworks' have been published and are available on the IEA Bioenergy website at: <http://www.ieabioenergy.com/Library.aspx>



## Multiple Benefits from Sustainable Bioenergy Systems

The proceedings of a joint workshop of Tasks 30 and 31, held in Western Australia in August 2005, have been published as a special issue of 'Biomass & Bioenergy', Volume 31, Number 9. For information contact Oana Popescu at [opopescu@neo.tamu.edu](mailto:opopescu@neo.tamu.edu)



## Biomass Combustion and Cofiring Handbook

This second edition of the Task 32 handbook contains additional chapters on ash related issues and policies. The book can be ordered from Earthscan - see [www.ieabcc.nl/handbook.html](http://www.ieabcc.nl/handbook.html)

## Particulate Emissions From Biomass Combustion in IEA Countries

Nussbaumer, T., Czasch, C., Klippel, N., Johansson, L., Tullin, C.

This report provides an inventory of emissions from small scale combustion devices in Task 32 member countries. It contains quantitative data on emission factors from wood stoves and boilers and also assesses the influence of the measurement techniques on the results. The report can be downloaded from [www.ieabcc.nl](http://www.ieabcc.nl)

## Energy Technology Perspectives 2008 – Scenarios and Strategies to 2050

This publication responds to the G8 call on the IEA and its technology network to provide guidance on how to bridge the gap between what is happening with energy resources and what needs to be done to build a clean, clever and competitive energy future. It demonstrates how energy technologies can make a difference in an ambitious series of global scenarios to 2050 and it contains technology road maps for all key energy sectors, including electricity generation, buildings, industry and transport. Order a copy from the IEA Bookshop at: <http://www.iea.org/W/bookshop/add.aspx?id=330>



## World Energy Outlook 2008

With extensive data, detailed projections and in-depth analysis, WEO 2008 provides insights into the prospects for the global energy market and what they mean for climate change. It focuses on three issues facing the energy sector today - global crude oil and natural gas production prospects; post-2012 climate scenarios and energy poverty in resource-rich, Sub-Saharan countries, with energy projections to 2030, by region and by fuel. This report will be available from the IEA Bookshop in November 2008. See <http://www.iea.org/w/bookshop/add.aspx?id=353>



## Europe's Vulnerability to Energy Crisis

The growing dependency of Europe as a whole on energy imports and anticipated further increases in energy prices, reinforce the concerns about meeting the energy demands of the future. The objective of this study is to identify the threats leading to potential energy crises and suggest solutions for facing the related key challenges. Download a copy from the World Energy Council at: <http://www.worldenergy.org/publications/1231.asp>

## Renewables Make the Difference

This booklet from the EU Directorate-General for Energy and Transport summarises the use of renewable energies in the EU and projects energy targets (including renewables) to 2020. Download a copy of this report from the European Commission Energy Website at: [http://ec.europa.eu/energy/climate\\_actions/doc/brochure/2008\\_res\\_brochure\\_en.pdf](http://ec.europa.eu/energy/climate_actions/doc/brochure/2008_res_brochure_en.pdf)



## Biofuels for Transport - Global Potential and Implications for Sustainable Energy and Agriculture

This book provides a comprehensive assessment of the opportunities and risks of the large-scale production of biofuels and how they can reach their potential to strengthen energy security, promote economic development and protect the environment. It includes country studies from Brazil, China, Germany, India and Tanzania. Order a copy at: <http://www.worldwatch.org/node/5303>

## Biofuels: Making Tough Choices

Vermeulen, S., Dufey, A., Vorley, B.

This IIED paper looks at the serious trade-offs involved in the production and use of biomass-derived alternatives to fossil fuels. It provides a decision tree to guide the interdependent processes of deliberation and analysis needed for making tough choices in national biofuels development. Download the paper at the IIED Website at: <http://www.iied.org/pubs/display.php?o=17032IIED>

## Cost and Life-Cycle Analysis of Biofuels

The Institute for Energy and Environment (IE) has evaluated the cost and environmental performance of biofuels via a literature survey. Full and condensed versions of this study are available at: [http://www.ufop.de/publikationen\\_english.php](http://www.ufop.de/publikationen_english.php)





# Calendar of Events

## IEA Bioenergy Meetings

**Task 29** will be holding its next meeting from 28-31 October 2008 in Hiroshima City, Japan. Contact Keith Richards  
Email: [keith.richards@tvenergy.org](mailto:keith.richards@tvenergy.org)

As part of World Water Week, **Task 30** will hold a seminar, 'Water-related synergies and trade-offs: food and bioenergy' on 17 August 2008, in Stockholm, Sweden. Contact Göran Berndes  
Email: [goran.berndes@chalmers.se](mailto:goran.berndes@chalmers.se)

The joint workshop of **Tasks 31, 38** and **40** will take place from 14-19 September 2008 at Warwick University, Warwick, UK. The theme of the workshop is 'Woodfuel supply chain – sharing experience'. Included are field visits in the West Midlands and an Industry Day at the Association of Professional Foresters' International Forest Machinery Exhibition. Contact Jim Richardson  
Email: [jrichardson@on.aibn.com](mailto:jrichardson@on.aibn.com)

**Task 32** is organising a Task meeting and workshop on 'Next generation wood-fired stoves and boilers' for 20-22 October 2008. Registration is available at [www.ieabcc.nl](http://www.ieabcc.nl) or contact Jaap Koppejan  
Email: [jaap.koppejan@procede.nl](mailto:jaap.koppejan@procede.nl)

**Task 33** will hold its second Task meeting of 2008 on 15-17 October in Montreal, Canada. It will include a workshop on 'Merits of biomass gasification'. Contact Suresh Babu  
Email: [suresh.babu@gastechology.org](mailto:suresh.babu@gastechology.org)

The next meeting of **Task 36** will take place in Oxford, UK on 4-6 November 2008. Contact Grace Gordon  
Email: [Grace.Gordon@aeat.co.uk](mailto:Grace.Gordon@aeat.co.uk)

**Task 37's** next business meeting is scheduled for 5-8 October 2008 in Ontario, Canada. Contact Art Wellinger  
Email: [arthur.wellinger@novaenergie.ch](mailto:arthur.wellinger@novaenergie.ch)

The next **Task 39** meeting will be in Cork, Ireland from 15-17 September 2008. Contact Warren Mabee  
Email: [warren.mabee@ubc.ca](mailto:warren.mabee@ubc.ca)

**ExCo62** will be held at the Hotel Croatia, Cavtat, Croatia on 14-15 October 2008.

**ExCo63** will be held in The Netherlands on 12-14 May 2009.

**ExCo64** will be held in Belgium in October 2009.

**ExCo65** will be held in Japan in May 2010.

**ExCo66** is still to be decided.

**ExCo67** will be held in Finland in May 2011.

**ExCo68** will be held in Australia in October 2011.

## Other Events

**Energex**  
6-10 July 2008, Vienna, Austria  
Contact: AIMS  
Tel: +43 1 402 77 55  
Fax: +43 1 402 77 31  
Email: [energex2008@aims-international.com](mailto:energex2008@aims-international.com)  
Web: [www.aims-international.com](http://www.aims-international.com)

**World Renewable Energy Congress X**  
19-25 July 2008, Glasgow, Scotland, UK  
Contact: Prof. Ali Sayigh, WREN  
Tel: +44 1273 625 643  
Fax: +44 1273 625 768  
Email: [asayigh@netcomuk.co.uk](mailto:asayigh@netcomuk.co.uk)  
Web: [www.wrenuk.co.uk/](http://www.wrenuk.co.uk/)

**2008 Farm to Fuels Summit**  
30 July – 1 August 2008, Orlando, FL, USA  
Tel: +1 850 488 0646  
Email: [farmltofuel@doacs.state.fl.us](mailto:farmltofuel@doacs.state.fl.us)  
Web: [www.floridafarmltofuel.com/summit\\_2008.htm](http://www.floridafarmltofuel.com/summit_2008.htm)

**Short Rotation Crops Intl Conference: Biofuel, Bioenergy & Bioproducts from Sustainable Agricultural and Forest Crops**  
18-22 August 2008, Bloomington, MN, USA  
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Fax: +1 703 605 5133  
Email: [bstokes@fs.fed.us](mailto:bstokes@fs.fed.us)  
Web: [www.cinram.umn.edu/srwc](http://www.cinram.umn.edu/srwc)

**World Biodiesel Congress**  
26-28 August 2008, São Paulo, Brazil  
Contact: Agra Informa Ltd  
Tel: +44 207 017 7499  
Fax: +44 207 017 7599  
Email: [conferences@agra-net.com](mailto:conferences@agra-net.com)

**Renewable Energy Philippines**  
28-30 August 2008, Manila, Philippines  
Contact: DP Link Intl  
Tel: +65 6826 1289  
Fax: +65 6826 3373  
Email: [info\\_dpLink@yahoo.com](mailto:info_dpLink@yahoo.com)  
Web: [www.dp-link.com/exhibitions/REP2008/index.html](http://www.dp-link.com/exhibitions/REP2008/index.html)

**Forest Bioenergy – Fuel Supply Chains 2008**  
28-30 August 2008, Jyväskylä, Finland  
Contact: FINBIO  
Email: [bioenergy@finbio.fi](mailto:bioenergy@finbio.fi)  
Web: [www.bioforest.finbioenergy.fi/](http://www.bioforest.finbioenergy.fi/)

**Intl Training Workshop on Technology and Utilization of Biomass Gasification**  
1-20 September 2008, Yingkou, PR China  
Contact: Mrs. Xiao Yan Jing  
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Web: [//gasifiers.bioenergylists.org/yinkougasworkshop08](http://gasifiers.bioenergylists.org/yinkougasworkshop08)

**Biochar, Sustainability and Security in a Changing Climate**  
8-10 September 2008, Newcastle, UK  
Contact: Will McLean  
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Email: [will.mclean@whymangroup.com](mailto:will.mclean@whymangroup.com)  
Web: [//www.biochar-international.org/ibi2008conference.html](http://www.biochar-international.org/ibi2008conference.html)

**1<sup>st</sup> Aviation Conference**  
8-10 September 2008, Budapest, Hungary  
Contact: Richard Uchrin  
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Web: [//www.aviation-co2.com/index.htm](http://www.aviation-co2.com/index.htm)

**The Pacific Rim Summit on Industrial Biotechnology and Bioenergy**  
10-12 September 2008, Vancouver, BC, Canada  
Tel: +1 202 962 9200  
Web: [//www.bio.org/ind/pacrim/08/](http://www.bio.org/ind/pacrim/08/)

**Environmental Technology 08**  
10-12 September 2008, Helsinki, Finland  
Contact: Teija Armanto  
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Email: [teija.armanto@finnexpo.fi](mailto:teija.armanto@finnexpo.fi)  
Web: [www.finnexpo.fi](http://www.finnexpo.fi)

**Holzenergie-Symposium 2008**  
12 September 2008, Zürich, Switzerland  
Contact: Temas AG  
Tel: +41 71 446 50 30  
Fax: +41 71 446 50 82  
Email: [info@holzenergie-symposium.ch](mailto:info@holzenergie-symposium.ch)  
Web: [//www.holzenergie-symposium.ch/index.html](http://www.holzenergie-symposium.ch/index.html)

**Algae Biofuel Summit 2008**  
17-19 September 2008, New Delhi, India  
Contact: Summit Secretariat  
Tel: +91 11 65803335  
Fax: +91 11 42404335  
Email: [info@algaebiofuelsummit.com](mailto:info@algaebiofuelsummit.com)  
Web: <http://www.algaebiofuelsummit.com/>

**4<sup>th</sup> Intl Conference on Biomass for Energy**  
22-24 September 2008, Kyiv, Ukraine  
Tel: +38 44 453 28 56  
Fax: +38 44 456 60 91  
mail: [conference@biomass.kiev.ua](mailto:conference@biomass.kiev.ua)  
Web: [//www.biomass.kiev.ua/conf2008/index.php?lang=en](http://www.biomass.kiev.ua/conf2008/index.php?lang=en)

**BiomassWorld 2008**  
23-24 September 2008, Beijing, PR China  
Tel: +65 6346 9124  
Fax: +65 6345 5928  
Email: [sasha@cmtsp.com.sg](mailto:sasha@cmtsp.com.sg)  
Web: [www.cmtsevents.com](http://www.cmtsevents.com)

**The Impact of Biofuels on Commodity Markets**  
24-25 September 2008, Brussels, Belgium  
Contact: Agra Informa Ltd  
Tel: +44 207 017 7499  
Fax: +44 207 017 7599  
Email: [conferences@agra-net.com](mailto:conferences@agra-net.com)

**Intl Renewable Energy Conference 2008**  
7-9 October 2008, Abuja, Nigeria  
Contact: BAS Associates  
Tel: +234 802 304 1435  
Fax: +234 1 4973016  
Email: [info@irec-nigeria.com](mailto:info@irec-nigeria.com)  
Web: [//www.irec-nigeria.com/2008/](http://www.irec-nigeria.com/2008/)

**RENEXPO 2008**  
9-12 October 2008, Augsburg, Germany  
Contact: REECO GmbH  
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Fax: +49 7121 30 16 – 100  
Email: [redaktion@energie-server.de](mailto:redaktion@energie-server.de)  
Web: [www.energie-server.com](http://www.energie-server.com)

**Energy from Biomass & Waste**  
14-16 October 2008, Pittsburgh, PA, USA  
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Web: [//www.ebw-expo.com/index.htm](http://www.ebw-expo.com/index.htm)

**Green Energy Summit**  
16-19 October 2008, Bangalore, India  
Tel: +91 99015 08099  
Email: [info@greenenergysummit.com](mailto:info@greenenergysummit.com)  
Web: [//www.greenenergysummit.com/](http://www.greenenergysummit.com/)

**National Renewable Energy Marketing Conference**  
26-29 October 2008, Denver, CO, USA  
Contact: Rachael Terada  
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Web: [//www.renewableenergymarketing.net/](http://www.renewableenergymarketing.net/)

**World Ethanol 2008**  
3-6 November 2008, Paris, France  
Contact: Agra Informa Ltd  
Tel: +44 207 017 7499  
Fax: +44 207 017 7599  
Email: [conferences@agra-net.com](mailto:conferences@agra-net.com)

**2<sup>nd</sup> Intl Symposium on Energy from Biomass and Waste**  
17-20 November 2008, Venice, Italy  
Contact: Anne Farmer, EuroWaste srl  
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Email: [eurowaste@tin.it](mailto:eurowaste@tin.it)  
Web: [//www.venicesymposium.it/venice2008/venice.html](http://www.venicesymposium.it/venice2008/venice.html)

**Fuels of the Future 2008**  
1-2 December 2008, Bonn, Germany  
Contact: Thomas Siegmund  
Tel: +49 228 81002 22  
Fax: +49 228 81002 58  
Email: [info@bioenergie.de](mailto:info@bioenergie.de)  
Web: [www.bioenergie.de](http://www.bioenergie.de)

**Symposium on Renewable Energy and Water Productivity**  
7-9 December 2008, Manana, Bahrain  
Contact: UNIDO Energy  
Tel: +43 1 260 265 177

**Bioenergy Australia 2008**  
8-10 December 2008, Melbourne, Victoria  
Contact: Stephen Schuck  
Tel: +61 2 9416 9246  
Fax: +61 2 9416 9246  
Email: [sschuck@bigpond.net.au](mailto:sschuck@bigpond.net.au)

**Waste to Energy**  
10-11 December 2008, Bremen, Germany  
Contact: Hubert Borgmann  
Tel: +49 421 3505 347  
Fax: +49 421 3505 340  
Email: [wte@messe-bremen.de](mailto:wte@messe-bremen.de)  
Web: [//www.wte-expo.com/](http://www.wte-expo.com/)

## Objectives of IEA Bioenergy

IEA Bioenergy is an international collaborative agreement set up in 1978 by the International Energy Agency (IEA) to improve international cooperation and information exchange between national bioenergy RD&D programmes. IEA Bioenergy aims to accelerate the use of environmentally sound and cost-competitive bioenergy on a sustainable basis, and thereby achieve a substantial contribution to future energy demands.

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Task 29: Socio-economic drivers in  
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Task 30: Short rotation crops for bioenergy  
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Task 31: Biomass production for energy from  
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Task 32: Biomass combustion and co-firing  
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Task 33: Thermal gasification of biomass  
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Task 34: Pyrolysis of biomass  
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Task 36: Integrating energy recovery into  
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Task 37: Energy from biogas and landfill gas  
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Task 38: Greenhouse gas balances of biomass  
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Web: [www.ieabioenergy-task38.org](http://www.ieabioenergy-task38.org)

Task 39: Commercialising 1<sup>st</sup> and 2<sup>nd</sup>  
generation liquid biofuels from biomass  
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Task 40: Sustainable international bioenergy  
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Task 42: Biorefineries: co-production of  
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