



Bioenergy in the USA

Guest Editorial by Larry Russo, Former ExCo Member for USA

Over the last two years, biomass has taken the spotlight as President Bush has laid out increasingly aggressive goals for moving biofuels into the marketplace, to reduce the nation's dependence on foreign sources of energy and reduce greenhouse gas emissions from the transportation sector. President Bush has established a goal to reduce USA gasoline usage by 20% in the next ten years - called 'Twenty in Ten'.



USA will reach this ambitious goal by setting a mandatory fuels standard to increase the supply of renewable and alternative fuels such as ethanol. This standard will require 35 billion gallons (133 billion litres) of renewable and alternative fuels in 2017 which is nearly five times the legislated 2012 target. In 2017, this will displace 15% of projected annual gasoline consumption in USA.

In addition to expanding the use of renewable and alternative fuels, 'Twenty in Ten' also aims to reform and modernise corporate average fuel economy standards for cars and extend the current light truck standard. In 2017, it is estimated that increased fuel efficiency will reduce projected annual gasoline use by up to 8.5 billion gallons (33 billion litres), an additional 5% reduction in gasoline usage. These combined efforts in alternative fuels and fuel efficiency will enable USA to meet the goal to reduce gasoline usage by 20% in the next ten years.

Critical to achieving the 'Twenty in Ten' goal are the Department of Energy (DoE), the National Laboratories and university and industry partners working together. Biomass research has been a cornerstone of DOE's renewable energy research, development and deployment efforts over the last 25 years. Biomass, which includes agricultural and forestry residues, perennial grasses, woody energy crops, and post-consumer wastes, is unique among the renewable energy resources in that it can be converted to carbon-based fuels and chemicals, in addition to electric power.

Meeting these goals will require significant and rapid advancements in biomass feedstock and conversion technologies; availability of large volumes of sustainable biomass feedstock; demonstration and deployment of large-scale integrated biofuels production facilities; and biofuels infrastructure development efforts. In addition, the existing agricultural, forestry, and commercial sectors will be making the decisions to invest in biomass systems - from shifting land use, to building capital-intensive biorefineries, to establishing the infrastructure and public vehicle fleet for ethanol distribution and end use - in the context of economic viability and the needs of the marketplace.

DOE's national laboratory network is comprised of more than a dozen facilities including the National Renewable Energy Laboratory (NREL), Oak Ridge National Laboratory, Idaho National Laboratory and Pacific Northwest National Laboratory. These state-of-the-art R&D facilities provide the capability to perform cutting edge research which can be implemented into commercial technology to achieve the USA's aggressive bioenergy goals.

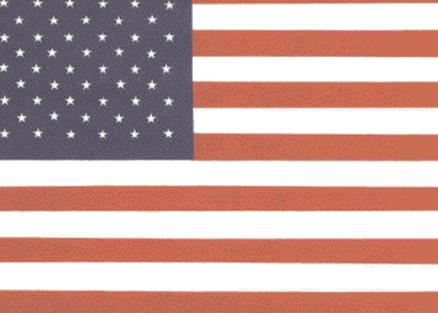
The ambitious USA goal of 'Twenty in Ten' is driving R&D efforts at the DOE to expand the market for biomass fuels. The efforts of the DOE and its laboratories such as NREL are helping to facilitate a more rapid deployment of biofuel technologies.

For more information on 'Twenty in Ten' visit: www.whitehouse.gov/infocus/energy/

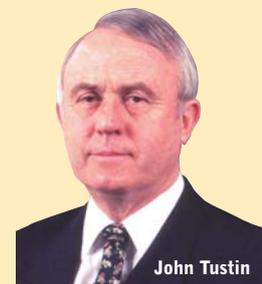
For more information on biomass research at NREL, visit: www.nrel.gov/biomass/



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From the Secretariat



John Tustin

ExCo59 Golden, USA

The 59th meeting of the Executive Committee was held in Golden, Colorado, USA on 25-27 April, with Kyriakos Maniatis as Chairman and John Tustin as Secretary. The meeting was hosted by DOE/NREL. The Chairman expressed the appreciation of the ExCo to Larry Russo for the excellent meeting and study tour arrangements. Some of the outcomes of the meeting are detailed below.

Changes in the Executive Committee

New Executive Committee Members are: Mr Birger Kerckow, Germany; Mr Sandile Tyatya, South Africa and Mr Paul Grabowski, USA. New Alternate Members are: Ms Birte Mesenburg, Germany and Mr Kazuyuki Takada, Japan.

Election of Second Vice Chairman

To strengthen the succession plan, the ExCo agreed it was desirable to elect a second Vice Chairman for 2007. In a close ballot, Ir. Kees Kwant, the Member for The Netherlands, was elected.

Participation in the Implementing Agreement

The participation of Italy in the Implementing Agreement ceased in December 2006. Korea and Turkey sent observers to ExCo59 and made presentations on their national RD&D programmes.

ExCo59 Workshop

A very successful workshop titled 'The Biorefinery Concept' was well attended by ExCo Members and Task Leaders. Presentations were:

- Commercialising biorefineries: the path forward - Larry Russo, DOE, USA
- Ensuring success through stage gate and beyond - Bob Wooley, NREL, USA
- Proving biochemical technologies at the pilot scale for integrated biorefinery development - Dan Schell, NREL, USA
- Biorefinery: from agriculture towards industrial applications - Ed de Jong, WUR, The Netherlands (Leader of Task 42)
- Developing and proving thermochemical technologies at the pilot scale for integrated biorefinery development - Dave Dayton, NREL, USA
- The IBUS concept: integrated biomass utilisation systems (co-production of electricity and bioethanol) - Børge Holm Christensen, Inbicon A/S, Denmark
- Incorporating conversion R&D and demonstrating for adaptation to an existing facility. Contrast barriers and successes in US versus EU deployment - Quang Nguyen, Abengoa Bioenergy, USA
- Incorporating conversion R&D and demonstrating for adaptation in an existing facility - Michael Ladisch, Aventine Bioenergy, USA
- Upgrading of by-products from biodiesel and the sugar industry by bioconversion and chemical catalysis - Thomas Willke, Federal Agricultural Research Center (FAL), Germany
- Overcoming the challenges of commercialising thermochemical R&D and pilot plant results - Prabhakar Nair, UOP, USA
- From R&D through piloting to commercialization: managing the process - Jim Spaeth, DOE, USA
- Biorefinery Development: the Iogen Story - Maurice Hladik, Iogen Corporation, Canada



Mr Nobuyuki Hara, Desk Officer for Bioenergy at IEA HQ (left) with Dr Soon-Chul Park from the Korean Institute of Energy Research

The presentations and a summary and conclusions from the Workshop are now available on the IEA Bioenergy website.

Technical Coordinator's Work Programme

Dr Adam Brown the Technical Coordinator (TC) made a comprehensive presentation of his work programme for 2007. The main focus will be policy-related deliverables (35%), Task coordination (20%) and responses to IEAHQ (15%). The TC has already been involved with IEAHQ by providing comments on ETE Briefs and two reports related to 'renewable heating and cooling technologies'. He is keen to develop a more proactive approach with IEAHQ rather than just responding to requests. He will review the scope for improved Task coordination in the Agreement, working closely with the Task Leaders. He said it was important to stay focussed on the goal of producing policy-related deliverables. At present there are US\$451,000 of uncommitted funds for the triennium ending December 2009. It will be important to have a very strategic approach on how these funds are applied.

The TC presented a proposal for 'technology reviews'. He said that, given the expert resources available to it, IEA Bioenergy is well placed to deliver an authoritative review of each of the main resource and technology trajectories of bioenergy. They would build on the technology position papers which have already been produced and could be of great value in informing both influential IEAHQ publications and national policies. The reviews could also help to develop an appreciation of the technologies most likely to be able to contribute significantly to sustainable energy supply on a global scale. It was agreed that this was an important multi-year, strategic direction for the Implementing Agreement.

Strategic Publications

The paper 'Potential Contribution of Bioenergy to the World's Future Energy Demand' prepared by Andre Faaij and the Tasks was presented for approval and will now proceed to publication.

The proposal for a paper titled 'Lifecycle Analysis of Biomass Fuels, Power, and Heat as Compared to their Petroleum-based Counterparts and Other Renewables' was approved. Production will be managed by Task 38. The aim is to cover key LCA aspects of bioenergy and to compare the most important bioenergy chains with their fossil and renewable competitors. The final draft will be available by December 2007.

Another strategic proposal - a 'Handbook of Pellet Production and Utilisation' - was also approved. Production will be managed by Task 32. The scope of the handbook will include international pellet markets as well as relevant international constraints and applications.

Energy Technology Essentials

IEA Bioenergy now has the opportunity to publish material in a new four page technical fact sheet series called Energy Technology Essentials (ETE's). Produced by IEAHQ, they are used at IEA Ministerial and other policy-type meetings. They will provide an excellent mechanism for communicating IEA Bioenergy information to the highest levels. At ExCo59, it was agreed that each Task produce an ETE instead of a Task Technology Report as a 'one-time-action'.

NREL

In conjunction with ExCo59, about 35 attendees participated in an excellent study tour organised by Larry Russo and his colleagues at the National Renewable Energy Laboratory (NREL). NREL is the US Department of Energy's main facility for renewable energy research and established the National Bioenergy Center in October 2000. The Centre's technologies are available for industry R&D to foster development of biomass conversion technology and biorefineries. The study tour was of core interest to the participants.



Dr Calvin Feik speaking to the tour group at the NREL Thermochemical Conversion Plant facility

Dr Mike Himmel conducted a tour of the Biomass Surface Characterisation Laboratory (BSCL). Advanced imaging of plant material provides insights into biomass recalcitrance, to help researchers unlock the embedded energy in plants. The philosophy is that by understanding the structural barriers of biomass - especially biomass surfaces - conversion processes can be taken to the next stage. The BSCL has electron and optical microscopes and other research tools, to probe biomass-to-energy processes at atomic and molecular levels. Such highly sensitive instruments must operate in a stringently controlled environment.

Dr Calvin Feik described the Thermochemical Conversion Pilot Facilities to the group. He said they were working on a wide variety of feedstocks, including agricultural residues and energy crops, with the feedstock often being in pelletised form. They also work on feedstocks supplied by industry and carry out parametric testing for individual companies. The Thermochemical Process Development Unit (PDU) can be operated in either gasification or pyrolysis mode. The half-ton-per-day thermochemical PDU is based on a fluidised-bed reactor coupled with a thermal cracker. This configuration is very flexible and can handle a range of process conditions to reflect product gas compositions of interest to industrial partners.

Particulate removal, secondary catalytic conversion, and condensation equipment are also available. The modular design of the facilities allows them to readily accommodate equipment supplied by research partners. Process mass balances are continuously computed from online data. Products and intermediates can be analysed by several methods.

Raw synthesis gas and pyrolysis vapours can be upgraded using the fluidised-bed catalytic reforming reactor. The integration of power generation applications with biomass gasification processes can be evaluated, for example, by testing product gas usage in internal combustion engines or micro-turbines. So can the production of fuels and chemicals in micro-catalytic reactors. These capabilities add up to a unique R&D facility for optimising and integrating thermochemical biomass conversion processes.

Dr Rick Elander conducted a tour of the Biochemical Conversion PDU which is the most widely used facility at NREL, as it allows testing and development of complete production processes. It is an integrated pilot plant for converting biomass (eg. corn stalks and cobs, sawdust and switchgrass) to ethanol at a rate of 900 kg per day of dry biomass and has been operating for 12 years. It was designed to provide a user facility to accelerate the development of processes for the conversion of a wide variety of lignocellulosic biomass types to ethanol. The objective is to perform routine maintenance and calibration activities to maintain the facility in a state of operational readiness for both internal and external customers. Such activity significantly improves the operability of the pilot plant and enhances its capability to supply necessary process performance data for customers. Fermentation trials can be performed with aerobic or anaerobic micro-organisms in batch, fed-batch, or continuous mode. The researchers are working to improve the efficiency and economics of the biochemical conversion process technologies by focusing their efforts on improving pre-treatment technology, breaking hemicellulose down to component sugars, and developing more cost-effective cellulase enzymes for breaking cellulose down to its component sugar.

Coors Brewery

The afternoon of the study tour was spent at Coors Brewery in Golden, the world's largest brewery on a single site, which was selected for its high quality rocky mountain water. The group was shown all the stages of beer making from steeping (preparing the barley for germination), germination and kilning of the barley; milling, brewing, fermentation and their unique sterile-fill process. There was time to taste the products, but the highlight was a special visit to the recently expanded ethanol plant.

Coors launched the ethanol operation in 1996 with a plant producing 1.6 million gallons of ethanol from brewing wastes which are piped from the brewery. With increasing ethanol demand Coors expanded the plant in 2005. The plant now produces in excess of 4 million gallons per year of 200 proof ethanol. This is accomplished through conventional processes which include: a low temperature cook section; enzymatic conversion of starches to fermentable sugars; yeast fermentation (two 250,000 gallon fermenters); stripping of ethanol from the mash; distillation; and molecular sieve dehydration of the alcohol. Coors produces 87,000 tons per year of brewer's grains on a dry-matter basis from the brewing process. These are currently sold as cattle feed in a wet and dry form.

Merrick, an engineering and architectural company, owns the plant and leases the land from Coors, who operate the facility. Valero Energy Corp. blends the ethanol produced into gasoline for its Diamond Shamrock stations in Colorado.

The study tour group outside the NREL Visitor Centre in Golden, USA



Task Focus

Task 33: Thermal Gasification of Biomass

Gas cleanup for biomass gasification

A technical hurdle that almost all gasification processes have to overcome is the development of economical and environmentally sound gas cleanup and effluent recycle and disposal processes. Raw product gases contain particulates, tars, ammonia, alkalis, chlorides and other impurities, which have to be almost completely removed before converting synthesis gas to fuels and chemicals.

In this context, Task 33 organized a workshop in Dresden, Germany to review the developments in raw gas cleanup. The research examples presented at this workshop show significant progress with both low- and high-temperature gas cleaning. The commercial applicability of these developments will evolve as these technologies are demonstrated over extended test periods and upon validation of techno-economic benefits.

Gas cleanup research in USA

Both conventional and advanced gas cleanup options are being pursued to remove tar, particulates and alkali metals from raw product gases. In addition to these contaminants, light hydrocarbons should be minimized or eliminated to avoid the energy-intensive reforming process and reduce the overall process costs. The ultimate objective of tar reformer research at NREL in Golden, Colorado is to reduce the cost of synthesis gas production. In support of this objective, NREL is testing and evaluating catalytic steam reforming of tars produced during gasification of biorefinery residues.

The Gas Technology Institute in Des Plaines, Illinois is using high-temperature glass melting technology to produce Olivine containing catalysts for in-situ removal of tars in biomass gasification. These tests, conducted over a range of 750-900°C, showed that 80% of naphthalene was decomposed at the lower temperature and near complete conversion was observed at 900°C. The Research Triangle Institute in North Carolina and its research partners developed a fluidized bed reactor containing a novel tri-functional catalyst that decomposes tar and remove NH₃ and sulphur compounds from raw synthesis gas over a temperature range of 600-700°C.

Gas cleanup research in Austria

The Technical University of Vienna, Austria has conducted research on the comparative evaluation of tar removal using Olivine versus Nickel-Olivine. Using the FICFB demonstration gasifier at Güssing, it has been determined that Ni-Olivine reduces tar content by about 90%. Further investigations are in progress to ascertain the effect of Ni-Olivine on the distribution and nature of tar components. Tests with a commercial monolithic Ni honeycomb catalyst installed in a slip-stream at the Güssing gasification plant, show that it is possible to achieve >99% removal of most of the major tar related contaminants under raw gas conditions.

Ultra-clean gas cleanup research in Germany

ITC in Karlsruhe has been conducting an exhaustive screening of sorbents for removing trace constituents of HCl and H₂S from hot raw gases, in support of commercializing the Sustec SVZ process for biofuels. The entrained high-temperature gas cleaning process at 800°C does not produce any tars. Furthermore, the use of sorbents essentially removes all HCl and H₂S and most of the organic sulphur.

High-temperature gas cleanup research in UK

Porvair in Norfolk is investigating using catalytically active metal foam in biomass gasification research. Metal foam is a promising substrate for gas cleanup, with

a high catalytic surface area, low pressure drop, and good depth filtration properties. Porvair's permeable media filters are made to withstand 900°C. They have a porosity in the range of $3.1 \times 10^{-11} \text{ m}^2$ to $1.8 \times 10^{-13} \text{ m}^2$ which exhibits an efficiency of 99.98% separation of particles > 0.3 micron, and 95% separation of < 0.45 micron particles.

Gas cleanup research in The Netherlands

Dahlman is commercializing OLGA, a multistage oil-based tar scrubbing system which operates above the water dew point. Pilot tests have shown that the process removes all tars and tar aerosols, as well as most of the BTX compounds. The process is currently being tested with an updraft gasifier in Moissannes, France.

The Technical University of Eindhoven is exploring the use of pulsed corona to decompose tar molecules under hot-gas conditions. Pulsed corona is an efficient source of electrons, radicals, and excited molecules. When energetic electrons collide with gas molecules they produce radicals which are chemically very active and easily attach to or modify other molecules that they come in contact with. In general, it has been observed that higher corona densities are required under reducing conditions compared to inert gas conditions.

Gas cleanup research in Finland

VTT in Espoo has conducted extensive slip-stream gas cleanup tests with nickel monolith. Reporting on the gas cleanup research at the Novel gasification plant in Kokemäki, VTT reported that the gas cleaning system works adequately to provide a clean fuel gas for the downstream Jenbacher gas engines. The treated gas contains tars < 100 mg/Nm³, ammonia < 50 ppmv after catalytic removal and scrubber, and dust < 10 mg/Nm³ after gas filtration.

Gas cleanup research in Switzerland

The Pyroforce® Gasification system demonstrated in Switzerland first cools the raw gas to approximately 160°C to prevent clogging by tar/soot. The cooled gas is passed through pre-coated filters to remove solids, acids, heavy metals and sticky tars. It is then cooled further in washing columns, to condense water along with heavy HC and partial absorption of ammonia. With this methodology the biomass gasifier and the gas engine have demonstrated satisfactory integrated operation over extended periods

For further information on the work of Task 33, contact Suresh Babu at suresh.babu@gastechnology.org

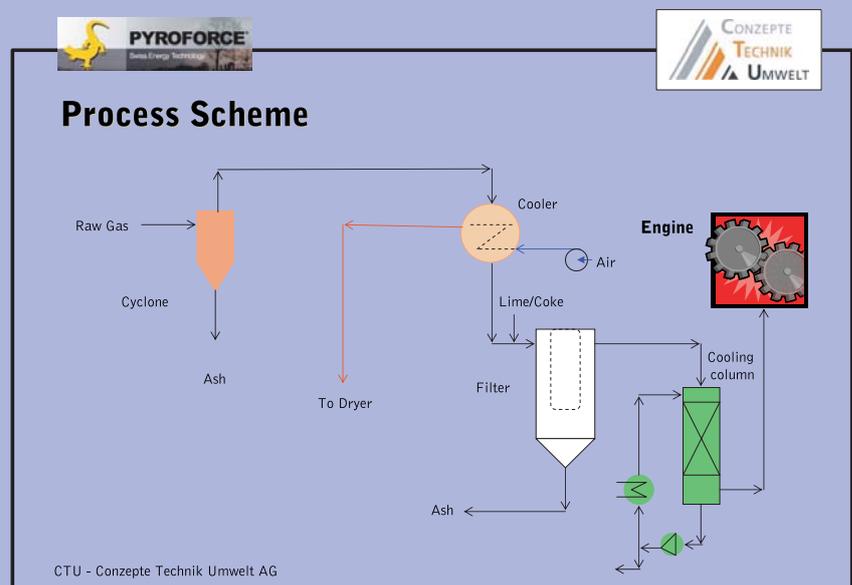


Fig 1. Gas cleanup method for Pyroforce Gasifier, Switzerland. This is an example of a successful small-scale biomass gasification system for power generation

Task 29

(Contribution from Keith Richards)

Task 29 discovered the importance of bioenergy solutions for remote towns and villages in the alpine region of Voralberg in Austria during May 2007. The group visited a series of projects illustrating the use of wood as a fuel for district heating schemes, driven and owned by local groups wishing to make the most of their own local resources. Security of supply was high on the agenda but also the sustainable management of local forestry resources. As a part of the programme, the group was shown how the forest was managed and timber extracted from steep, alpine terrain. These resources give critical protection from avalanches and are also attractive to tourists – the main economic activity. Hence, their management is afforded a high priority. The snow falling added to the ambience of the occasion when visiting Lech – the world famous ski resort. I have the enduring memory of a steaming pile of wood chip set against the snow capped peaks beyond!



climatic conditions. In the workshop the results of the research work were presented, including early experiences of full-scale application. German research on the optimal growth of different energy crops under varying conditions of climate, soil quality and crop rotation were also presented. The abstracts and presentations from the workshop can be downloaded at:
www.iea-biogas.net/publicationspublicberlin.htm

The Task also held its regular business meeting at which new team leaders joined, from France and the UK. The country reports presented at the meeting can also be downloaded from the website.

Task 39

In April 2007, Task 39 held its second business/planning session of the current triennium in Denver, USA. The meeting was hosted by Mike Himmel the US Country Representative and was observed by Adam Brown (Technical Coordinator, IEA Bioenergy) and Ed de Jong (Task 42 Leader). It included countries' updates on their progress with biofuels implementation to-date and prioritization of activities for the next triennium. Task 39's updated website was discussed (www.task39.org) and a communication strategy was outlined. Ed de Jong gave an overview of Task 42's activities, and discussion ensued on how the two Tasks could work more effectively together.

Task 39's planning session was followed by the 29th Symposium on Biotechnology for Fuels and Chemicals, sponsored by the US Department of Energy and industrial sponsors. Sessions included microbiology and genetics, bioproducts processing, feedstock supply, and special sessions on 'policy drivers and international development of biofuels' and 'compositional and structural analysis of biomass'. In excess of 800 participants from over 30 countries attended, including a number of IEA Bioenergy members, who were conspicuous in their contribution to technical discussions and their leadership in overcoming the challenges that biofuels must meet in coming years.

Task 40

Task 40 organized a joint workshop on biomass policies and trade with EUBIONET2 in February 2007 in Rotterdam. This was followed by a May workshop titled 'Ensuring increasing and sustainable biomass production: the importance for international bioenergy trade' held as a side-event during the European Biomass Conference.

For further details and copies of presentations see:
www.bioenergytrade.org/



An associated conference entitled 'Biomass Supply Issues and Solutions' held in Bregenz was well attended. The Austrian regional programme and other country-led activities were presented and contrasted in a variety of papers. A growing interest in the concept of ESCO's and their application was a discernable theme to be further examined. Task 29's business meeting focused on case studies exhibiting best practice. In addition, there was discussion concerning the timing of extending the work underway to test models and the 'socio-economic matrix' with communities and business organisations.

Task 31

The Task held a planning meeting for the new Task period 2007-09 in Umeå, Sweden in March 2007. An observer from The Netherlands was welcomed to the Task, which presently has 8 fully-participating countries. Informative country reports were presented and annual workshop plans were agreed. The Task is collaborating with FAO on a publication on certification of sustainable woodfuel production systems, which is expected to be completed in 2008. Participating countries will develop a series of case studies over the new period, using a template which will be reviewed at the Joensuu workshop in August/September 2007.

Task 37

Alongside the 15th European Biomass Conference held in Berlin in May 2007, Task 37 organized a workshop with CropGen (an EC project on biogas production from energy crops). Task 37 and Cropgen have been deeply involved in the development of biogas production under different



Publications

2006 Annual Report

The 2006 Annual Report contains a special colour feature 'Biomass Pyrolysis' which was prepared by Professor Tony Bridgwater of Task 34. This report is available on the IEA Bioenergy website, or hard copies can be obtained from the Secretariat.

IEA Energy Technology Essentials

This is a series of regularly updated factsheets that provide brief profiles of different energy technologies, including their technical status, cost, potential role, timescales, markets and barriers to deployment. The most recent technologies covered are:

- Fuel Cells
- Hydrogen Production & Distribution
- Nuclear Power
- Biomass for Power Generation and CHP
- Biofuel Production

Profiles can be downloaded at: www.iea.org/Textbase/techno/Essentials.htm

Bioenergy Project Development & Biomass Supply – IEA Good Practice Guidelines

These guidelines to bioenergy project development 'endeavour to identify the potential issues for bioenergy project developers that will need to be overcome during the complex planning and consultation process'. This in turn will help to enable a more rapid deployment of bioenergy projects worldwide. Download this discussion document at: www.iea.org/Textbase/publications/

Contribution of Renewables to Energy Security

This IEA Information Paper focuses on the contribution of renewable energy technologies to energy security. It shows how in electricity generation, heat supply, and transport, renewables can enhance energy security and suggests policies that can optimise this contribution. View this paper at: www.iea.org/Textbase/publications/

Energy Policies of IEA Countries - 2006 Review

This review contains a broad analysis of recent developments in energy policy and markets in the 26 member countries of the International Energy Agency, plus China, India and Russia. It also examines trends in energy markets, including an analysis of energy demand and supply, energy prices and energy related CO2 emissions. It highlights key policy trends across member and non-member countries on energy security, energy market reform, climate change mitigation, energy efficiency, renewables and energy R&D. This book is available from the IEA Online Bookshop at: www.iea.org/w/bookshop/add.aspx?id=272

The Use of Biomass for Power Generation in the US

This report is an overview of the renewed US market interest in biomass-fuelled power generation. It includes an analysis of the key business factors that are driving the interest; the challenges faced in implementing biomass-fuelled generation projects and the current and future state of biomass-fuelled generation. Order a copy of the report at: www.researchandmarkets.com/reportinfo.asp?report_id=342443

Renewable Energy Technology Roadmap to 2020

Only a few EU Member States are currently on track to meet their renewable energy targets for 2010. This EREC brochure shows the ambitions of the European renewable energy industry to ensure that existing targets are being achieved, while at the same time trying to set a new target framework for the future. Copies are available from: www.erec-renewables.org/publications/EREC_publications.htm

Energy and Climate Change

This World Energy Council study looks at the impact of existing climate change measures, and how effective they have been in promoting sustainable development, using the criteria of the '3A's' – accessibility (to affordable energy); acceptability (of the energy sources used, particularly in environmental terms); and availability (how secure and reliable are those sources?). Download a copy at: www.worldenergy.org/wec-geis/publications/

energy [r]evolution

EREC and Greenpeace International have produced this global energy scenario as a blueprint for how to meet CO₂ reduction targets and secure affordable energy supply at the same time. Using only proven and sustainable technologies, it develops a global sustainable energy pathway up to 2050.

Obtain a copy of the report from: www.energyblueprint.info/

Biomass to Biofuels Market Potential 2007

This report is a guide to assessing the feasibility of domestic and international production of biofuels. It looks at the role of government in the biofuel industry, the growth drivers and obstacles to be overcome; details various conversion technologies, and presents an overview of the economics of the biofuels industry. Copies of the report can be bought at: www.energybusinessreports.com/shop/item.asp?itemid=1194

The Bioenergy Assessment Handbook: Bioenergy for a Sustainable Environment

Edited by Frank Rosilo-Calle, Sarah Hemstock, Peter de Groot and Jeremy Woods

This handbook provides the skills to understand the biomass resource base, the tools to assess the resource and the pros and cons of exploitation. It looks at assessment methods for woody and herbaceous biomass, biomass supply and consumption and remote sensing techniques. International case studies help to illustrate step-by-step methods and are based on field work experience. Order the handbook from: <http://shop.earthscan.co.uk/ProductDetails/mcs/productID/716>



Networking

Green Energy TV

A new internet-based television show – Green Energy TV – aims to show successful green energy projects to its viewers around the world. The programme airs videos from companies, installers, inventors or universities, with newly completed projects or breakthroughs in technology. Videos can be uploaded directly on the website www.greenenergytv.com

Calendar of Events

IEA Bioenergy Meetings

Tasks 29, 38 and 40 will host a joint experts meeting on sustainable bioenergy in Dubrovnik, Croatia from 25-26 October 2007. Contact Ana Kojakovic, Energy Institute, Croatia
Email: akojakovic@eihp.hr

Task 30 is holding a workshop on 'Short Rotation Crops for Bioenergy Systems' from 12-17 August 2007 at the University of Guelph, Canada. Contact Andy Gordon, University of Guelph
Email: agordon@uoguelph.ca

Task 31 will hold an international workshop and field study tour on 'Sustainable Forestry Systems for Bioenergy: integration, innovation and information' in Joensuu, Finland from 29 August - 3 September 2007 (coinciding with the Bioenergy 2007 Conference and Exhibition in Jyväskylä, Finland). Contact Jim Richardson, Task Leader
E-mail: jrichardson@on.aibn.com

Task 32 is holding its next meeting on 3 September 2007 in Jyväskylä, Finland. This will be followed by a workshop on 'Aerosols from Biomass Combustion'. Contact Jaap Koppejan
Email: jaap.koppejan@procede.nl

Task 33 will meet from 24-26 October 2007 in Petten, The Netherlands. A technical workshop on 'Analytical Procedures for Characterizing Synthesis Gas from BMG' is being planned for 23 October. In Spring 2008, the Task meeting will be held in conjunction with the IEA EXCo 61 Meeting in Oslo, Norway. Contact Suresh Babu, Task Leader
Email: rsbabu8303@comcast.net

Task 40 is organizing a joint workshop with CANBIO and Bioenergy Focus Ontario to explore domestic biomass energy and potential for bioenergy trade. It will take place from 12-13 September 2007 in Ontario, Canada. Contact Douglas Bradley
Email: Douglas.bradley@rogers.com

ExCo60 will be held in Munich, Germany on 29-31 October 2007.

ExCo61 will be held near Oslo, Norway on 14-16 May 2008.

ExCo62 will be held near Dubrovnik, Croatia in October 2008.

ExCo63 will be held in The Netherlands in May 2009.

ExCo64 may be held in Belgium in October 2009 (this invitation is still to be confirmed).

ExCo65 will be held in Japan in May 2010.

Other Events

Southeast Bioenergy Conference 2007
31 July 31 - 2 August 2007, Tifton, Georgia, USA
Contact: Evelyn Folds
Tel: +1 229 386 7274
Fax: +1 229 386 7371
Email: efolds@uga.edu
Web: www.sebioenergy.org

Renewable Energy and Main Actors. A Long Term Challenge
30 August 2007, Bucharest, Romania
Contact: Mr. Gheorghe Balan
Tel: +4021 211 41 55
Fax: +4021 211 41 57
Email: ghbalan@cnr-cme.ro

International Bioenergy Exhibition & Conference
3-6 September 2007, Jyväskylä, Finland
Contact: Mia Savolainen, FINBIO
Tel: +358 207 639 602
Fax: +358 207 639 609
Email: bioenergy2007@finbio.fi
Web: seminaarit.ohoi.fi/

CISBAT 2007: Renewables in a Changing Climate - Innovation in the Built Environment
4-5 September 2007, Lausanne, Switzerland
Contact: Barbara Smith
Tel: +41 21 693 6249
Fax: +41 21 693 2722
Email: cisbat@epfl.ch
Web: cisbat.epfl.ch

Biofuels Africa 2007
10-13 September 2007, Johannesburg, South Africa
Contact: Tally Leshem
Tel: +27 11 516 4943
Fax: +27 11 463 6903
Email: tally.leshem@terrapinn.co.za
Web: www.powergenerationworld.com/2007/ebfza

Realising the Bioenergy Opportunity (CANBIO)
12-14 September 2007, Toronto, Canada
Contact: Douglas Bradley
Tel: +1 613 321 2303
Email: Douglas.bradley@rogers.com

Renewable Energy Association Bioenergy 2007
20-21 September 2007, Oxford, England
Contact: REA
Tel: +44 20 7747 1830
Fax: +44 20 7925 2715
Email: info@r-e-a.net
Web: www.r-e-a.net

Energy from Biomass and Waste
25-27 September 2007, Pittsburgh, USA
Contact: Dr Ines Freesen
Tel: +49 2802 948484 0
Fax: +49 2802 948484 3
Email: info@ebw-expo.com
Web: www.ebw-expo.com

Texas Biodiesel Conference and Expo
27-29 September 2007, Austin, Texas, USA
Contact: Kristin Kilpatrick
Tel: +1 512 358 1000
Email: kristin.kilpatrick@iemshows.com
Web: www.iemshows.com/biodiesel/

7th Annual BioCycle Conference On Renewable Energy From Organics Recycling
1-3 October 2007, Indianapolis, USA
Tel: +1 610 967 4135
Web: www.igpress.com

2nd Conference on Energy Efficiency & Renewables 2007
2-5 October 2007, Belgrade, Serbia
Contact: Dr. Miodrag Mesarovic
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Next Generation Biofuels Markets
4-5 October 2007, Amsterdam, The Netherlands
Contact: Green Power Conferences
Tel: +44 207 801 6333
Email: info@greenpowerconferences.com

BBI Biofuels Workshop and Trade Show
9-11 October 2007, Portland, Oregon, USA
Email: conferences@bbibiofuels.com
Web: www.biofuelsworkshop.com

European Meeting Point: Energy for Development 2007
10-12 October 2007, Beja, Portugal
Contact: Marcos Nogueira
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Email: mnoqueira@ist.utl.pt
Web: www.energyanddevelopment-2007.net

Ethanol & Biofuels Asia 2007
16-19 October 2007, Singapore
Contact: Grace Chng
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Web: www.terrapinn.com/2007/eba

Biodiesel Congress
18-19 October 2007, Buenos Aires, Argentina
Contact: Green Power Conferences
Tel: +44 207 801 6333
Email: info@greenpowerconferences.com

International Conference on Biorefineries 2007
20-23 October 2007, Beijing, China
Contact: Xu Zhang
Tel: +86 10 64421335
Fax: +86 10 64416428
Email: zhangxu@mail.buct.edu.cn
Web: www.biorefineries.cn/

World Renewable Energy Council International Seminar in Britain
21-27 October 2007, Brighton, UK
Contact: Prof. Ali Sayigh, WREN
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Bioenergy Asia 2007
23-25 October 2007, Beijing, China
Contact: David Sun
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Web: www.bioenergy-asia.com

World Renewable Energy Congress - Pacific Rim Region
30 October - 1 November 2007, Taipei, Taiwan
Contact: Prof. Shang-Shyng Yang
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Biofuels Markets Africa
5-6 November 2007, Cape Town, South Africa
Contact: Green Power Conferences
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20th World Energy Congress
11-15 November 2007, Rome, Italy
Contact: Chicco Testa
Tel: +39 2 2414 2405
Fax: +39 2 2414 2330
Email: info@wec-italia.org
Web: www.rome2007.it/

Innova Energy 2007
22 - 25 November 2007, Brussels, Belgium
Contact: Sam van de Kerckhof
Tel: +32 2 741 61 76
Fax: +32 2 732 05 09
Email: info@innova-energy.com
Web: www.innova-energy.com/en/

Bioenergy Australia 2007
26-27 November 2007, Surfers Paradise, Queensland, Australia
Contact: Stephen Schuck
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Bioenergy for Central Europe
16-19 January 2008, Graz, Austria
Contact: Austrian Biomass Association
Tel: +43 1 533 07970
Fax: +43 1 533 079790
Email: office@biomasseverband.at
Web: www.biomasseverband.at

ENVIETECH 2008
31 January - 1 February 2008, Vienna, Austria
Contact: Dr Roland Ernest Poms, ICC
Tel: +43 1 707 7202 0
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Web: www.icc.or.at

5th International Biofuels Conference
7-8 February 2008, New Delhi, India
Contact: B Anil Kumar
Tel: 91 124 4303868
Fax: 91 124 4303862
Email: anil@winrockindia.org
Web: www.winrockindia.org

Bioenergy World Europe 2008
7-10 February 2008, Verona, Italy
Contact: Céline Nehmé
Tel: +33 384 86 89 30
Fax: +33 384 43 24 03
Email: bioenergy-world@bees.biz
Web: www.bioenergy-world.com/europe/2008/

POWER-GEN Renewable Energy & Fuels 2008
19-21 February 2008, Las Vegas, USA
Contact: Michael T. Eckhart, ACORE
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Web: pgre08.events.pennnet.com

Washington International Renewable Energy Conference (WIREC) 2008
1-7 March 2008, Washington DC, USA
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Tel: +1 1 703 506 3270
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Web: www.acore.org/programs/wirec/

World Sustainable Energy Days
5-7 March 2008, Wels, Austria
Contact: OÖ. Energiesparverband
Tel: +43 732 7720 14380
Fax: +43 732 7720 14383
Email: office@esv.or.at
Web: www.esv.or.at/esv/index.php?id=217&contUId=0

World Biofuels Markets Congress & Exhibition
7-8 March 2007, Brussels, Belgium
Contact: Green Power Conferences
Tel: +44 207 801 6333
Email: info@greenpowerconferences.com

Bioenergy Conference & Exhibition 2008
3-5 June 2008, Prince George, BC, Canada
Contact: Cam McAlpine
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Fax: +1 250 764 0533
Web: www.bioenergyconference.org

World Renewable Energy Congress X
19-25 July 2008, Glasgow, Scotland, UK
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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 30: Short rotation crops for bioenergy
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Task 31: Biomass production for energy from
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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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Task 39: Commercialising 1st and 2nd
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Task 40: Sustainable international bioenergy
trade - securing supply and demand
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