

HOW AMBITIOUS CAN WE BE IN CONTRIBUTING TO THE WORLD'S ENERGY NEEDS WITH WIND, SOLAR AND BIOENERGY.

And what role does energy storage play?



Workshop on Sustainable Energies
At the Technical University, Lyngby, Denmark
14 - 15 January 2009



INTRODUCTION

About 13 % of the world's primary energy comes from renewable energy sources, most from traditional biomass, 2 % from hydropower and only 1 % from modern renewable energies. It is a great industrial, technical and political challenge to increase the contribution from these modern renewable technologies. EU has the ambition to raise the contribution from renewables to 20 % in 2020, Denmark the ambition to raise it to 30 % in 2025. How far can we go, what stands in the way and what should the leading actors do? That is what we will address here.

AIM

The aim of the workshop is to define a number of ambitious but realistic targets and describe roadmaps to reach these targets. The roadmaps are intended as input to the UN Climate Change Conference, COP 15, and as inspiration for action to meet climate challenges. The roadmaps will describe contributions and commitments needed from industry, research and policy.

WORKSHOP

The workshop will address the challenges for increasing the contribution from wind power, bioenergy and solar energy. The aim is to identify initiatives that can accelerate development and deployment of the technologies addressed. This includes energy storage and implementation and interaction of storage technologies with the overall energy system.

The workshop will be initiated by keynote presentations. In four parallel sessions visions, opportunities and challenges for each topic will be discussed by invited speakers. The themes for the four parallel sessions are:

- Wind energy
- Bioenergy
- Solar energy
- Energy storage

At the end of day one, working groups will be established, each with representation from research, industry and policy makers. Each group will work with a selected topic within one of the four themes. On day two the groups are charged with identifying initiatives that can accelerate the development and deployment of the addressed technology. The initiatives will be described as ambitious but realistic targets and roadmaps to reach them. The targets and roadmaps will be presented by the proponents and discussed in the respective sessions.

Selected targets and roadmaps from each session will be discussed by a panel in a final joint session, with interventions from the audience and the proponents.

Drawing on this “peer review” at the workshop the proponents are invited to submit written accounts of their targets and roadmaps which will be published as a report from the workshop and injected into the COP 15 to show what is possible and as inspiration for action.

THE WORKSHOP IS FOR

Leading actors in the fields of sustainable energy technologies coming from industry, research and policy. Specifically we encourage participation from

- Leaders in industry, both technology providers, utilities, investors and analysts
- Research leaders and leading researchers
- Representatives from governmental and international authorities



PRELIMINARY PROGRAMME

14 JANUARY 2009

08:00 – 09:00 REGISTRATION AND COFFEE

Where: Entrance F

09:00-10:45 WELCOME AND INTRODUCTION TO THE WORKSHOP

Where: Oticon Hall - see map

Henrik Bindslev, Director of Risø National Laboratory for Sustainable Energy, DTU, Denmark

Raffaele Liberali, Director, Directorate "Energy", Directorate-General for Research, European Commission

Tomas Kåberger, Director General, Professor, Swedish Energy Agency
Knud Pedersen, Vice President, DONG Energy, Denmark

10:45-11:00 WALKING TO PARALLEL SESSION FACILITIES
IN BUILDING 302 AND 306

11:00-13:00 PARALLEL SESSIONS, BUILDING 302 AND 306

Invited presentations

(See individual session programmes for wind, solar, bio and storage)

13:00-14:00 WALKING TO BUILDING 101, LUNCH IN SPORTS HALL,
WALKING BACK TO 306

14:00-16:00 PARALLEL SESSIONS, BUILDING 306

16:00-16:15 COFFEE BREAK

16:15-18:15 PARALLEL SESSIONS, BUILDING 306 AND 302

Working groups

18:30 – 19:00 REFRESHMENTS BEFORE DINNER

19:00 – 21:30 DINNER IN THE DTU CANTEEN
Dinner speech by Henrik Bindslev, Director of Risø National Laboratory for Sustainable Energy, DTU, Denmark

21:45 BUS DEPARTURE FOR HOTEL IN COPENHAGEN

15 JANUARY 2009

08:15 BUS DEPARTURE FROM HOTEL TO DTU (PLAN TO BE ANNOUNCED)

09:00 – 10:00 PARALLEL SESSIONS, BUILDING 302 AND 306
Working groups

10:00 – 10:30 COFFEE BREAK

10:30 – 12:30 PARALLEL SESSIONS, BUILDING 302 AND 306
Working groups

12:30 – 13:30 LUNCH
Where: Sports Hall

13:45 – 15:30 PARALLEL SESSIONS, BUILDING 302 AND 306
Presentations and discussions in plenum of targets and roadmaps.

15:30 – 16:00 REFRESHMENTS
Where: Entrance F

16:00 – 18:00 PRESENTATIONS AND PANEL DISCUSSION OF SELECTED TARGETS AND ROADMAPS, OTICON HALL
Chairman: Henrik Bindslev, Director of Risø National Laboratory for Sustainable Energy, DTU, Denmark
Panel: (to be announced)

INFORMATION

REPORTING FROM THE WORKSHOP

The report from the workshop will be compiled of the written accounts of targets and roadmaps prepared by the proponents taking account of the “peer review” at the workshop. These written accounts will be prefaced by an overview of the current state, challenges and opportunities for each technology. The report will be injected into the COP 15 to show what is possible and as inspiration for action.

LOCATION

The workshop takes place at DTU Campus, 2800 Lyngby, Denmark. The plenary sessions in Oticon Hall, and the four parallel sessions in building 306 and 302, at “Matematik torvet”. A map will be sent to the participants prior to the workshop.

WORKING LANGUAGE

The working language is English and no translation will be provided.

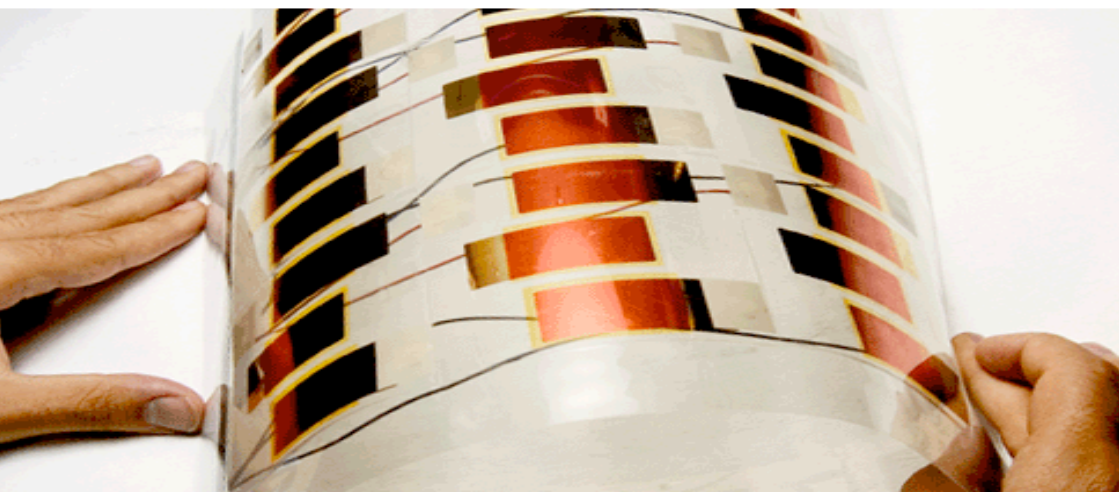
REGISTRATION

The workshop is free of charge and includes workshop lunch and dinner as well as transport to and from the recommended hotel. Please register at the following link:

http://risoe-forms.risoe.dk/Sustainable_Energies/Sustainable_Energies_registration.asp

Registration deadline: 2nd of January 2009.

At registration please indicate your preferences with regard to the four parallel sessions.



CHAIR OF ORGANISING COMMITTEE

Henrik Bindslev, Director at Risø DTU, Phone +45 4677 4601

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WORKSHOP SECRETARIAT

Henriette Hansen, Innovation Coordinator, Phone +45 4677 4605,
e-mail henriette.hansen@risoe.dk

INFORMATION ABOUT SESSIONS

1. Wind power: Peter Hjuler Jensen: e-mail: Peter.hjuler.jensen@risoe.dk and Flemming Rasmussen, e-mail: flemming.rasmussen@risoe.dk
2. Bio Energy: Kim Pilegaard, e-mail: kim.pilegaard@risoe.dk
3. Solar Energy: Peter Sommer Larsen, e-mail: peter.sommer.larsen@risoe.dk
4. Energy storage: Allan Schrøder Pedersen, e-mail: allan.schroeder.pedersen@risoe.dk

ACCOMODATION

Our suggestion for hotel accommodation is Radisson SAS, Amager Boulevard 70, Copenhagen. We have reached agreement with Radisson SAS for a special workshop price which represents 895 DKK for a single room and 995 DKK for a double room (including breakfast). Please contact "Radisson SAS Hotels and Central Reservations" on telephone + 45 3815 6500, Fax: + 45 3815 6501 or e-mail: copenhagen@radissonsas.com with reference to number: A120109DTU. The favorable price can be obtained by booking no later than December 24th 2008.

Booking and payment is your own responsibility.

In the morning of the 14th there will be bus service from SAS Radisson in Copenhagen to DTU in Lyngby. In the evening there will be bus from DTU back to SAS Radisson. On the 15th in the morning there will be bus service available from SAS Radisson to DTU. Plan will be announced.

WIND POWER

14 JANUARY 2009

11.00 – 13.00 PARALLEL SESSIONS, BUILDING 302 AND 306
PRESENT STATUS AND PERSPECTIVES
CHAIRMAN

INTRODUCTION OF THE UNFCCC-CLIMATE SUMMIT (COP15)
Ministry of Climate and Energy

STRATEGY AND PLANS FOR WIND ENERGY IN CHINA
Deputy Director General Li Jungfeng, Energy Research Institute, China

PRESENT STATUS OF THE WIND ENERGY
Birger Madsen, BTM Consult, Denmark

THE GOAL WIND ENERGY GOAL FOR 2020
Professor, President, Arthouros Zervos, European Wind Energy Association

PRECONDITIONS AND ASSUMPTIONS FOR LARGE SCALE UTILISATION OF
WIND ENERGY
**Professor Poul-Erik Morthorst, Risø National Laboratory for Sustainable Energy,
DTU, Denmark**

US WIND ENERGY STRATEGY AND TECHNOLOGY OVERVIEW
Principal Engineer, Sandy Butterfield, National Renewable Energy Laboratory, US

14.00 – 16.00 PARALLEL SESSIONS, BUILDING 302 AND 306
CHALLENGES AND OPPORTUNITIES
CHAIRMAN

GLOBAL WIND RESOURCES AND METEOROLOGICAL CHALLENGES
**Head of Division, Erik Lundtang Petersen, Risø National Laboratory for
Sustainable Energy, DTU, Denmark**

CAN THE INDUSTRY DELIVER?
CTO, Henrik Stiesdal, Siemens Wind Power

LARGE SCALE GRID INTEGRATION
Hannele Holttinen, VTT Finland

FUTURE WIND TURBINE TECHNOLOGY
Director, David Quarton, Garrad Hassan Group Ltd (GH), UK

BIOENERGY

14 JANUARY 2009

11.00 – 13.00 PARALLEL SESSIONS, BUILDING 302 AND 306
BIOMASS RESSOURCES FOR BIOFUELS
FOR TRANSPORTATION

CHAIRMAN: KIM PILEGAARD

GLOBAL SUSTAINABLE BIORESOURCES FOR BIOENERGY PRODUCTION

Dr. Edward Smeets, Utrecht University, The Netherlands

THE ROLE OF THE AGRICULTURAL SECTOR IN BIOMASS PRODUCTION

Peter Gæmelke, Landbrugsrådet, Denmark

THE ROLE OF LIGNOCELLULOSE-DERIVED BIOFUELS IN A SUSTAINABLE
ENERGY PORTFOLIO

Professor Jack Saddler, University if British Columbia, Canada

THE INTEGRATED BIOMASS UTILIZATION SYSTEM (IBUS)

Charles Nielsen, Dong Energy, Denmark

14.00 – 16.00 PARALLEL SESSIONS, BUILDING 302 AND 306
THERMAL GASIFICATION, BIOGAS AND
SUSTAINABILITY OF BIOENERGY

CHAIRMAN: ERIK STEEN JENSEN

GASIFICATION OF BIOMASS FOR FUELS AND POWER

Suresh P. Babu, Institute Fellow, Gas Technology Institute, USA

BIOGAS PRODUCTION IN PRACTICE

Frank Rosager, Xergi, Denmark

SUSTAINABILITY OF BIOENERGY

Dr. Horst Fehrenbach, IFEU Institute Heidelberg, Germany

POLICY FOR INCREASED SHARE OF BIOENERGY

Peder Jensen, European Environment Agency, Denmark

SOLAR ENERGY

14 JANUARY 2009

11.00 – 13.00 PARALLEL SESSIONS, BUILDING 302 AND 306

SOLAR THERMAL

CHAIRMAN: DR. ELSA ANDERSEN, TECHNICAL UNIVERSITY OF DENMARK

KEYNOTE SPEAKER SOLAR THERMAL

Dr. Alexander Thür, Institute for Sustainable Technologies, Austria

SOLAR THERMAL 1: SDHW SYSTEMS AND SOLAR COMBI SYSTEMS

Associate Professor, Simon Furbo, Technical University of Denmark

SOLAR THERMAL 2: SOLAR HEATING PLANTS

Ass. Professor, Jan-Olof Dalenbäck, Chalmers University, Sweden

SOLAR THERMAL 3: HEAT STORAGE

Dr. Ing., Harald Drück, ITW, Stuttgart University, Germany

SOLAR THERMAL 4: SOLAR HEATING MARKET

Jes Donneborg, Arcon Solvarme A/S, Denmark

14.00 – 16.00 PARALLEL SESSIONS, BUILDING 302 AND 306

PHOTOVOLTAICS

CHAIRMAN: DR. PETER SOMMER LARSEN, RISØ NATIONAL LABORATORY FOR SUSTAINABLE ENERGY, DTU, DENMARK

KEYNOTE SPEAKER PHOTOVOLTAICS

Director, Peter Ahm, PA Energy, Denmark

POLYMER SOLAR CELLS

Dr. Frederik C. Krebs, Risø DTU National Laboratory for Sustainable Energy, Technical University of Denmark

HIGH-EFFICIENCY MULTIJUNCTION SOLAR CELLS FOR CONCENTRATOR PV APPLICATIONS

Dr. Giovanni Flamand, IMEC, Belgium

COMPETITIVE CRYSTALLINE SILICON PHOTOVOLTAIC TECHNOLOGY

Dr. Jan H. Bultman, Energy Research Centre of the Netherlands (ECN), The Netherlands

ENERGY STORAGE

14 JANUARY 2009

11.00 – 13.00 PARALLEL SESSIONS, BUILDING 302 AND 306
STORAGE

CHAIRMAN: TO BE CONFIRMED

THE FUTURE NEED FOR ENERGY STORAGE FOR TRANSPORT

Business Development Manager, Ulf Hafsel, StatoilHydro ASA, Norway

THE FUTURE NEED FOR ENERGY STORAGE FOR BALANCING MISMATCH
BETWEEN DEMAND AND SUSTAINABLE PRODUCTION OF ELECTRICITY

Head of Section, Kim Behnke, Energinet.dk, Denmark

14.00 – 16.00 PARALLEL SESSIONS, BUILDING 302 AND 306
TECHNOLOGIES

CHAIRMAN: TO BE CONFIRMED

BATTERIES FOR TRANSPORT

Senior Research Manager, Per Jørgensen Møller, Nokia Danmark A/S

BATTERIES FOR STATIONARY APPLICATIONS

Senior Consultant, Jillis Raadschelders, KEMA Consulting, The Netherlands

COMPRESSED AIR ENERGY STORAGE

Head of Section, Associate Professor, Brian Elmegaard, DTU Mechanical Engineering, Technical University of Denmark

PUMPED HYDRO

Senior Vice President, Lars Audun Fodstad, Statkraft AS, Norway

ELECTROLYSIS

Dr. Kevin Harrison, National Renewable Energy Laboratory, Colorado, USA

HEAT STORAGE

Dr.-Ing. Stefan Zunft, German Aerospace Center, Stuttgart, Germany

The workshop is a part of DTU Climate Change Technologies programme (see: www.dtu.dk/climate). As part of the DTU Climate Change Technologies programme, DTU has arranged a series of workshops and conferences on climate change technology focusing on assessment of and adaptation to climate changes as well as on mitigation of green house gasses. Each workshop addresses a specific technology area. The workshop on Renewable Energies develops and discusses recommendations for development and application of these energy technologies. The recommendations will be input to the COP 15 Summit.

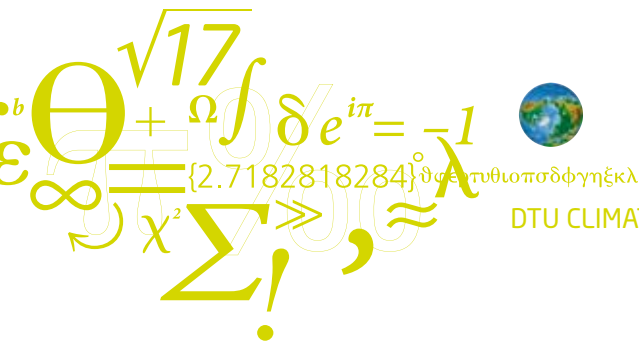
The DTU Climate Change Technologies programme is run by the Technical University of Denmark (DTU). It provides a firm platform for development and deployment of new technologies to climate change issues. DTU will focus on technologies which reduce CO2 emissions and can support growth and welfare while concurrently adapting to climate changes. DTU promotes co-operation between universities, industry and governments in order to accelerate the implementation of technologies and energy systems.

Read more on DTU Climate Change Technologies at www.dtu.dk/climate

ORGANISERS

Risø DTU
National Laboratory for Sustainable Energy

DTU Civil Engineering
Department of Civil Engineering



DTU CLIMATE CHANGE TECHNOLOGIES