

Press release

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Fossil fuel independence possible by 2050

Complete independence from energy generated from fossil fuels is possible. Professor Henrik Lund, of Aalborg University, believes that a system based 100 per cent on renewable energy is a viable option and could be achieved by 2050 in Denmark. Renewable energy systems (RES) planning can also be successfully applied to other countries worldwide.

During his extremely well attended plenary lecture at CHISA, the 21st International Congress of Chemical and Process Engineering, Lund explained Denmark's long history of energy planning has resulted in stable energy consumption and a business potential for a fossil-free society.



Currently, wind power accounts for nearly 30 per cent of the electricity supplied in Denmark and 50 per cent of its electricity production is linked to combined heat and power (CHP) plants. Plans are in place to increase wind power up to 50 per cent by 2050.

The challenge associated with this system is that as the share of wind power rises, there will be less demand on energy from CHP plants, meaning that this energy could be wasted.

Lund's solution, known as a smart energy system, therefore requires flexible energy conversion and storage technologies to be incorporated. CHP plants could be provided with heat pumps and additional storage capacity to store additional energy on windy days.

Renewables can also provide energy for transport, and there is potential to supplement electric cars with biomass. Another option is to make syngas by hydrogenating the carbon produced from the CHP plants.

Professor Rafiqul Gani, President of the European Federation of Chemical Engineering (EFCE), said: "The plenary lectures at CHISA have been one of the main highlights so far. In particular, Lund's presentation gave insight into the current and future energy landscape of Denmark, and how it is moving towards a target of 100 per cent energy production from renewables by 2050.

"What is more important is how his approach of the choice, planning and modelling of such renewable solutions can be applied within other countries so that chemical engineers can make real progress in addressing the grand challenges associated with energy and climate change.

"Spreading this message is important and the CHISA congress is a great platform to share these ideas within the profession and beyond."

Lund commented that a renewable energy system requires a palette of solutions. A more detailed analysis of his work is outlined in his book titled *Renewable energy systems – a smart energy systems approach to the choice and modelling of 100 % renewable solutions*.

CHISA is currently being held jointly with the 17th Conference on Process Integration, Modelling and Optimisation for Energy Saving and Pollution Reduction (PRES 2014) in Prague. The congress ends on 27 August 2014.

Ends

Related links

[Renewable Energy Systems, 2nd edition, by Henrik Lund](#)

[EFCE Media Centre](#)

[CHISA 2014](#)

[Plenary Lectures, CHISA](#)

Notes to media:

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About chemical engineers

Chemical, biochemical and process engineering is the application of science, maths and economics to the process of turning raw materials into everyday products. Professional chemical engineers design, construct and manage process operations all over the world. Oil and gas, pharmaceuticals, food and drink, synthetic fibres and clean drinking water are just some of the products where chemical engineering plays a central role.

About CHISA

The series of International Congresses, CHISA, has taken place in the Czech Republic since 1962. The objective of this joining event is to provide engineers, researchers, technologists, students and others a platform to present their latest results, interchange ideas and establish new collaborations. The Congress addresses the full spectrum of chemical and process engineering practice, including current trends and future needs.

About EFCE

Founded in 1953, The European Federation of Chemical Engineering (EFCE) is a non-profit-making association, whose object is to promote co-operation in Europe between non-profit-making professional scientific and technical societies in 30 countries for the general advancement of chemical engineering and as a means of furthering the development of chemical engineering. See www.efce.org