

EXCHANGING **IDEAS** **SEMINAR** SERIES 2017

 13 July 2017

 12.00 – 13.30

 Pierhead, Cardiff Bay



National Assembly for Wales
Research Service



THE LEARNED SOCIETY OF WALES
CYMDEITHAS DDYSGEDIG CYMRU

The National Assembly for Wales is the democratically elected body that represents the interests of Wales and its people, makes laws for Wales, agrees Welsh taxes and holds the Welsh Government to account.

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Introduction

Agenda

The seminar will be chaired by Jenny Rathbone AM who is a member of the Climate Change, Environment and Rural Affairs Committee.

12.00 – Light lunch

12.30 – Chair's introduction
Followed by presentations by the four speakers:

- Dr Nina Skorupska
- Professor Max Munday
- Professor Hywel Thomas
- Professor Andrew Barron

13.00 – Question and Answer session

13.30 – Close



Transitioning to a smarter more secure low carbon energy future: Examining the case for ambitious Welsh energy policy

In its Programme for Government, *Taking Wales Forward*, the Welsh Government has committed to support the development of more renewable energy projects. Current Welsh Government energy policy is focused on transitioning to a low carbon energy future through a range of generation technologies (including nuclear in the medium term) and adopting an energy mix featuring large, medium and small-scale projects.

In March 2016 the Environment and Sustainability Committee of the fourth Assembly published its report into *A Smarter Energy Future for Wales*. The report highlighted the need for a joined up, strategic vision for energy in Wales, and for a holistic approach to policy, with energy taken into consideration across all policy developments. In the context of the need to decarbonise our energy system and reduce carbon emissions by at least 80% by 2050, the seminar will examine whether,

as the Committee recommended, Wales should aim to meet all of its energy needs solely from renewable sources, what Wales' energy mix should look like moving forward.

The seminar will consider the feasibility of, and challenges around, aiming to meet Wales' energy needs from renewables. Key questions include:

- How ambitious should the Welsh Government be in defining the role of renewables in Wales' future energy mix?
- What are the main challenges facing the sector and is there a need for greater certainty around funding and policy?
- Is there is a case for alternative energy sources (e.g. small modular nuclear reactors and/or unconventional gases) to play a role in Wales' future energy mix?
- Are any changes to existing distribution and supply networks required to enable supply and demand matching?

These issues will be considered in the context of the leadership required to deliver a transformational shift towards a low carbon future.





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Event
partners
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Research Service

We are an expert, impartial and confidential research, analysis and information service designed to meet the needs of Assembly Members and their staff.

We have substantial knowledge of policy in Wales and an unrivalled expertise in understanding the information needs of Assembly Members.

The Research Service provides specialist parliamentary support to all 60 Assembly Members and the Assembly's Committees.

The Research Service consists of:

- four research teams providing specialist advice on specific areas of policy;
- a Financial Scrutiny Unit providing advice on Assembly finance, budgets, taxation and interpreting statistics;
- specialists providing advice on the Assembly, the constitution, UK and EU legislation, elections and referendums; and
- a Library providing a full range of reference and information services.

For more information, visit the website

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National Assembly for Wales
Research Service

Learned Society of Wales

The Learned Society of Wales (LSW) is an independent, all-Wales, self-governing, pan-discipline educational Royal Charter charity, providing public benefit including expert scholarly advice on a variety of public policy issues related to science, engineering, medicine, arts, humanities and social sciences.

Established in 2010, the Society draws upon the considerable strengths of over 460 distinguished Fellows based in Wales, the UK and beyond.

The Society, Wales' first national scholarly academy, aims to establish itself both as a recognised international representative of the world of Welsh learning, and as a source of authoritative, scholarly, and critical comment and advice on policy issues affecting Wales.

The Mission of the Learned Society of Wales is to:

- Celebrate and encourage excellence in all of the scholarly disciplines including the professions, industry and commerce, the arts and public service;
- Promote the advancement of learning and scholarship and the dissemination and application of the results of academic enquiry and research; and
- Act as an independent source of expert scholarly advice and commentary on matters affecting the wellbeing of Wales and its people.

For more information, visit the website

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THE LEARNED SOCIETY OF WALES
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Speaker
statements

Dr Nina Skorupska

2016 was an extraordinary year which will live long in the memory and the first half of 2017 has been working hard to match it! The pace of change in the political landscape was breath-taking, bringing truth to the saying that there are decades where nothing happens; and there are weeks where decades happen.

Across the world there were odds defying results, and here in the UK, we saw the referendum turn the status quo on its head, leading to a swift change of government, and with it new ministers, new departments and a new political direction.

Of course this tsunami of change reaches every industry, and the Renewable Energy Sector was no exception. In addition to the high level changes, we have contended with further policy changes which have had traumatic affects across the sector. They have still not had their full impact on deployment.

Away from the political and policy area, the industry itself is undergoing radical change. We are seeing a fundamental shift in the business and

technology. We are seeing new players such as corporate businesses and local government, stepping up to champion quite radical low carbon energy delivery models “energised” by the prospects of reducing costs and development of smart energy.

We have also seen traditional utilities reinvent themselves as clean energy “service” providers to their customers and ring fence their fossil commitments (of course, still hoping to make money from them ahead of even more significant market transformations).

All of this is underlined with falling technology costs and increased investment. There is no denying that renewable energy and clean tech is one of the fastest growing industries in the world. Here in the UK, there is significant work needed to upgrade our own energy infrastructure and the Government have the ambition to be world leaders in climate change and to have a viable and relevant Industrial Strategy. I believe that renewable energy and clean technology remains a significant business opportunity, and the investment simply has to proceed. The question only remains as to how fast can the UK take advantage of this before others realise this ambition first?

Professor Max Munday

Debates on a low carbon energy future in Wales have rightly focused on reducing the carbon emitted in electricity generation. However, while the shift towards renewable generation in Wales has been marked, there has been far less debate around how Wales benefits from both the construction and operation of new power generation facilities.

With few exceptions renewables generation creates relatively little employment in the Welsh economy, and where employment does occur it is usually during the construction phase of new facilities, and even here opportunities for local people can be quite limited. It has been argued that this is one of the reasons why some generation schemes in Wales have been 'generous' in terms of community benefit provisions.

A Smarter Energy Future in Wales might work to provide more opportunities for local people and firms, and with more consideration of how different renewable technologies work to support local economic activity. There are also challenges to look at how planning and policy can work to encourage different models of ownership and financing of renewable energy development in the region.

Professor Hywel Thomas

I will be discussing a new WEFO funded project, FLEXIS (Flexible Integrated Energy Systems), which is underway in Wales.

The project, led by Cardiff University, is bringing together expertise from across Welsh universities to facilitate an affordable, sustainable, and socially acceptable transition to a low carbon future.

The five-year project will look to solve a diverse, complex and inter-dependent set of challenges, ranging from energy storage, to decarbonisation and fuel poverty. The research will be based on four main pillars, as follows:

- Sustainability
- Security of Energy Supply
- Socio Economic Issues
- Welsh "Place Based" Demonstrator

These four pillars are further broken down into Work Packages with integrated research development and innovation activities spanning the two core stages of the transformation of our energy systems, namely, the Transition to the Low Carbon Future and Low Carbon Future itself.

Professor Andrew R Barron

The vision of Wales' energy needs from renewables must be world leading and inspirational to other regions.

At the same time it must be science led and open to an integrated approach involving multiple and creative solutions. It must also understand the global impact of decisions, rather than naively passing our problems to someone else, such as will occur by increasing dependence on lithium power storage.

The Welsh Government should actively promote a future energy mix incorporating renewables in the broadest and most creative sense. Wales needs to be positioned to achieve this aim through the discovery and implementation of new technology for a sustainable, affordable, and secure energy future.

In seeking a renewable future, Wales will move away from the post-industrial revolution certainty of predictable power generation and return to the variability of pre-industrial revolution power sources. In order to create sustainable, on-demand, green energy, it will be necessary to convert excess and wasted (unproduced) energy via a range of transformations (heat-to-electricity and electricity-to-hydrogen) providing enhanced flexibility of demand and supply.

Renewables are traditionally defined as electricity sources such as wind, wave, tidal and solar, or fuels including hydrogen and biofuels. However, one resource that Wales has in abundance is CO². Welsh heavy industry is responsible for up to 40% of the country's CO² emission. If Wales is to meet its 80% reduction by 2050, it has to address unavoidable generation from industry. Instead, Wales needs to consider CO² as its greatest resource. In combination with minimal cost H² production and bio-refinery approaches, the conversion of CO² into value added products for food, aquaculture, agriculture, chemical, automotive and aeronautical sectors, in addition to fuel substitutes, can fit into the current supply chain.

Unconventional natural gas represents both a transitional energy source and a method by which carbon negative energy generation is possible. Shale can adsorb 2.5-3 times as much CO² as the natural shale gas extracted. The reservoir can then be geologically sealed with the CO² in the same condition as the gas it replaced without the use of chemicals or the risk of water contamination UK shale would allow for sequestration of equal to about 500 years of CO² emissions at the UK's present level.





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Speaker
profiles
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Dr Nina Skorupska



Nina Skorupska is the Chief Executive of the Renewable Energy Association (REA), the largest trade association with over 750 company members. The REA covers all renewable technologies covering electricity, heat and transport and includes energy storage and electric vehicles in its portfolio of representation.

With over 30 years of working in the Energy Industry, her career started as a fuel specialist but moved quickly to managing power stations for RWE npower. After several senior roles within the RWE Group, her

career with them culminated with joining the Board of the RWE's Dutch business, Essent, as Chief Technical Officer, responsible for their electricity generation portfolio including new energy and sustainability developments.

She is also currently Vice President of the European Renewable Energy Federation (EREF) and proud member of the Board of WISE (Women in Science and Engineering) Campaign.

Nina was recently awarded a CBE in 2016's New Year Honour's list for her contribution to renewables and equality in Energy. In September of last year, Nina was appointed on the Board for Transport for London.

Professor Max Munday



Max Munday is Director of the Welsh Economy Research Unit at Cardiff Business School and a Deputy Director of the Cardiff University Water Research Institute. He has interests in regional economics, tourism economics, and regional policy.

He has recently undertaken a series of analyses examining the regional economic effects associated with the construction and development of different electricity generation technologies, and has also undertaken research examining the community benefit provisions offered by energy developers.

He has published in these areas in journals such as Environment and Planning, and Regional Studies. Other work has focused on the analysis of the waste and carbon footprint of Welsh industry, and on the carbon footprint associated with Welsh household and industry consumption.

He has also undertaken research examining the economic and environmental consequences of major sports and cultural events including FA Cup, Tour de France stages, and is currently undertaking an analysis of the European Cup Final 2017 Cardiff.

He is currently leading a major European-funded research project at Cardiff University in partnership Welsh Government examining SME responses to superfast broadband in Wales.

Professor Hywel Thomas



Professor Hywel Thomas is Pro Vice-Chancellor, Research, Innovation and Engagement at Cardiff University. In this role he is responsible for the University's research activities, the innovation agenda, including commercialisation and the broader economic impact of the University.

Professor Thomas is also a Professor of Civil Engineering, Director of the Geoenvironmental Research Centre (GRC) and a UNESCO Professor in the Development of a Sustainable Geoenvironment.

His research interests cover a wide range of geoenvironmental issues, from coupled Multiphysics/geochemistry flow problems in soils and rocks, through to sustainability issues in general. Current interests include the geoenergy field, with major projects on ground source heat, underground coal gasification, exploitation of unconventional gas and carbon sequestration in coal seams.

He is a Fellow of the Royal Society (FRS), a Fellow of the Royal Academy of Engineering (FREng), a Member of Academia Europaea, the Academy of Europe (MAE) and a Fellow of the Learned Society of Wales (FLSW).

He was awarded a CBE in the 2017 New Year's Honours List.

Professor Andrew R Barron



Professor Andrew R. Barron is the Sêr Cymru Chair of Low Carbon Energy and Environment, where his research involves the application of nanotechnology to fundamental problems in energy research.

He is the founder and director of the Energy Safety Research Institute (ESRI), a £38 million investment on the new Science and Innovation Campus which will concentrate elements of the University's energy research with a unique focus on safety.

Educated at Imperial College (London), Professor Barron has held posts at the University Texas at Austin and Harvard and he continues to hold the Charles W. Duncan, Jr. - Welch Chair of Chemistry and Professor of Materials Science at Rice University.

Professor Barron is the author of over 400 publications, 20 Patents, 5 books, and is the recipient of numerous awards including the Humboldt Senior Scientist Research Award, the Corday Morgan Medal, the Meldola Medal, and the first Welch Foundation Norman Hackerman Award.

He is a Fellow of the Royal Society of Chemistry, and in 2009 was appointed as the Prince of Wales Visiting Innovator. In 2011 he won both the Houston Technology Center's Lifetime Achievement Award in Nanotechnology and the World Technology Award for Materials.



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