



Newsletter
January 2016
Issue 5

Welcome!

Welcome to the first MEDOW newsletter of 2016!

The MEDOW (Multi-Terminal DC Grid for Offshore Wind) project is investigating DC (direct current) grids for transmitting offshore wind power. MEDOW researchers are working on the technology that we hope will form the basis of a future European 'supergrid'.

Please pass the newsletter to those who you think will be interested and ask them to contact me to join the mailing list.

A newsletter will be issued 3-4 times per year and will aim to communicate not only news from MEDOW but also news of interest to the wider research community and the public, so contact me if you have news from the DC grids, HVDC, offshore wind, power electronics or renewable energy communities that can be included in the next issue.

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Welcome



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MEDOW is funded by the Seventh Framework Programme of the
European Union under grant agreement no. 317221



Events



Register now: **EnergyCon 2016**

In April 2016, KU Leuven will host the IEEE International Energy Conference. The Conference Chair will be Prof. Dirk Van Hertem

Technical sessions are expected to include:

Smart Cities and ICT

Multi-energy systems / ICT for smart grids
Data processing and visualization in the power system / Electric vehicles

Transmission

Planning / Operation and Control / HVDC and HVDC grids
Connection of offshore resources / Modelling and analysis

Distribution

Integration of distributed energy sources / Modelling and analysis
Operation and control

Markets and Policy for electricity and gas

European Energy policy towards 2030 and beyond / Security of supply
Market modelling / Market design / Regulation

Energy conversion

Devices (power electronics, drives, ...) / Innovative energy technologies
Power to gas / Energy storage (electrical, thermal,...)

Partners: IEEE / KU Leuven

To register, visit the [EnergyCon website](#)



As part of the conference, MEDOW will host an 'HVDC Day' on Thursday 07 April, consisting of industry panel sessions co-hosted by Friends of the Supergrid, and a presentation of MEDOW's aims and achievements to date

Want to take part?

Email Cath Roderick RoderickCH@cardiff.ac.uk

Raison d'être



HVDC grids for offshore wind

'COP21', the 21st annual Conference of Parties of the United Nations Framework on Climate Change which took place in late 2015, achieved the first universal climate agreement. 195 countries committed to hold the increase in the global average temperature to well below 2 °C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5 °C above pre-industrial levels.

Climate change is largely caused by 'greenhouse gases' (GHGs), such as carbon dioxide and methane, trapping the Sun's energy and causing the planet to warm. The huge increase in atmospheric GHGs since pre-industrial times is caused by several factors including, most significantly, the burning of fossil fuels to generate heat and power.

To achieve COP21's and the EU's legally binding climate targets (in order to save planet earth!), rapid and significant transformations of the ways in which we generate and use power are needed.

Wind power is considered a front runner for reducing GHG emissions because of the high availability of wind resources and the maturity of the wind energy technology compared to that of other renewable energies. Each wind-produced kilowatt hour (kWh) avoids a kWh created by power stations burning coal, gas or oil - which equates to a saving of, on average, 696g/kWh of CO₂.

To permit the installation of new wind power generation and transmission, innovative technologies and cost-effective solutions for both offshore wind power plant technologies and offshore power transmission technologies are crucial. DC transmission is more efficient than AC transmission – less of the power gets lost along the way – and a grid, rather than a single point-to-point connection, is highly desirable as grids are the best way to balance supply and demand of electrical power and to ensure reliability of the system when something goes wrong.

Hence MEDOW's research into DC grids for offshore wind power !

Network Training

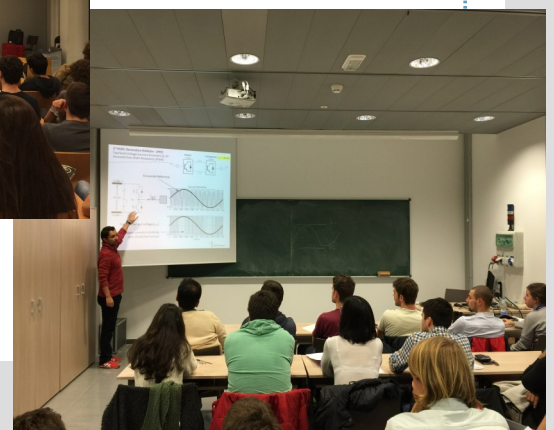
Network training week at UPC, Barcelona December 2015

As an 'Initial Training Network', we aim to give our researchers wide-ranging training in the technical and supporting skills that they need to embark upon successful and productive research careers in the private sector as well as in academia.

Our last meeting took place in December 2015 in Barcelona. You can see full reports on what we did on our [website](#).

Activities included:

- ⇒ Training session on "Entrepreneurial and Commercial Skills"
- ⇒ Visits to the premises of MEDOW partners Alstom Renovables and Cinergia
- ⇒ Teaching a class on "Grid Integration of Renewables" to Master's students (see page 4)
- ⇒ Outreach afternoon with a local school (see page 4)



Public outreach activity

December 2015



MEDOW's researchers carry out two outreach activities in Barcelona!

Renewables 'master-class'

On 01 December, the ESRs and ERs taught a class on "Grid Integration of Renewable Energy" to students of the KICInnoenergy MSc in Renewable Energy. The MSc course is offered by MEDOW partner UPC (BarcelonaTech).

Introduction to offshore wind and power systems

On 04 December, MEDOW researchers met with around 50 pupils of the local school Escola Sunion. The pupils were nearing the end of their science and technology A-level courses and are thus the future generation of engineers!

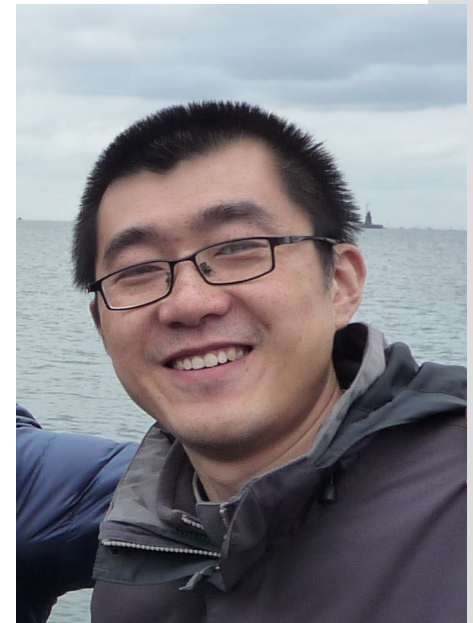
Although the session was mainly given in English, knowledge of the Spanish education system from CEPRI's Agusti Egea, Cardiff's Marc Cheah and ELIA's Alejandro Bayo was useful to connect with the audience and facilitate communication with a few Spanish or Catalan sentences. The presentations focused on how to become an engineer, the future power system, renewables and wind power. Barcelona-based Kevin Schönleber gave some insights on the difference between conventional and renewable energy. The pupils were interested and interacted actively with the researchers, who were very impressed with the pupils' technical understanding and English language skills!



Farewell!

This month we have said goodbye to Dr Qing Mu, post-doc Experienced Researcher

Qing joined MEDOW in January 2015 from China State Grid. He has been working at Cardiff University alongside Dr Jun Liang and the wider research team to improve modelling and simulation techniques to be implemented in a large-scale hybrid AC/DC network. To support his project, Qing spent 3 months with the UK's National Grid where he carried out work on damping of sub-synchronous resonance (SSR) using line commutated converter HVDC (LCC-HVDC).



The MEDOW project would like to say a big 'thank you and farewell' to Qing — and we hope to see him again soon!

Results

Research outputs

4th International Conference on Renewable Energy Research and Applications, 22-25 November 2015, Palermo

Control System of Voltage Source Converter to Interconnect Offshore AC Hub with Multiple Onshore Grids (Muhammad Raza)

European Wind Energy Association Annual Conference, EWEA 2015 17-20 November 2015, Paris

Overview of High-Power Medium-Frequency DC/DC Converter Topologies for Wind Turbines Interfaced to a MVDC Collection Grid (Domenico Ricchiuto; Kevin Schönleber)

Design Control Strategy to Enhance the Fault Ride Through Capability of VSC HVDC Transmission System Interconnecting offshore Wind Power Plant (Muhammad Raza)

14th International Workshop on Large-Scale Integration of Wind Power into Power Systems as well as on Transmission Networks for Offshore Wind Power Plants, 20-22 October 2015, Brussels

Reactive power optimization in HVDC-connected wind power plants considering wake effects (Kevin Schönleber)

Dynamic Reactive Power Control in Offshore HVDC Connected Wind Power Plants (Jayachandra Naidu)

IET Generation, Transmission & Distribution, volume 9, issue 11

Ancillary Services in Electric Power Systems with HVDC Grids (Robert Renner)

MEDOW also plans to participate actively in future large international conferences, including IEEE EnergyCon 2016 and IEEE Power & Energy Society General Meeting 2016



Take a look at the full list on our
dissemination webpages at
www.medow.engineering.cf.ac.uk

Communication

So in which other ways does MEDOW communicate its work?

As a Marie Curie project, MEDOW has communication high on its agenda. We aim to communicate with as wide a variety of people as possible so as to share our work, to increase its impact and to let European taxpayers know how their money is being spent! We are keen to find news ways of sharing our project news, so do get in touch with us if you can help!



Public outreach

We have already taken part in a number of activities with people outside the research community including participating in a 'renewable energy project day' at a school in Cardiff and hosting a group of Spanish and Swedish school students at a workshop on 'HVDC Towards the Future' in Barcelona.



MEDOW in One Minute

Take a look at our bite-size explanation of MEDOW and life as a Marie Curie researcher on Youtube.

Facebook

<https://www.facebook.com/medowproject>

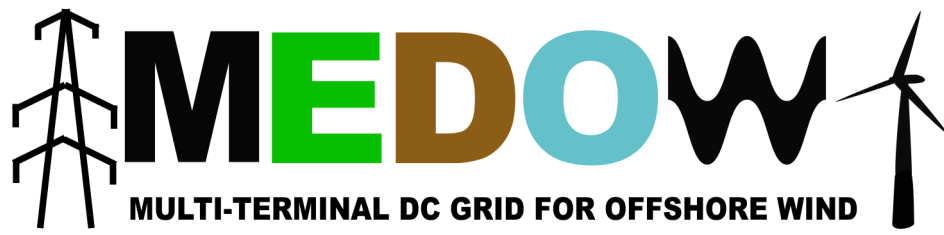


LinkedIn

Group: 'MEDOW'

In the press

Articles on MEDOW have targeted a wide range of audiences in [renewable energy news-site reNews](#), Spanish site [Smart Grids Info](#), in the [national newspaper of Wales](#) and on [OffshoreWind.biz](#)



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MEDOW Consortium

Members and roles

MEDOW is co-ordinated by Cardiff University and has four other university partners, five private sector partners and one associate partner.

Collectively, staff from the partners organisations have the wide-ranging experience and expertise to provide the appointed researchers with broad-ranging training in DC grid technologies.

All partners will host at least one researcher, and associate partner National Grid will provide training and steering to the consortium.

MEDOW partners:

-  Cardiff University (Co-ordinator)
-  Universitat Politècnica de Catalunya
-  Control Intel.ligent de l'energia
-  Alstom Renovables España
-  Universidade do Porto
-  EFACEC
-  Katholieke Universiteit Leuven
-  Elia System Operator
-  Danmarks Tekniske Universitet
-  China Electric Power Research Institute
-  National Grid (Associated Partner)





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Useful Information

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A DC grid based on multi-terminal voltage-source converter is a newly emerging technology, which is particularly suitable for the connection of offshore wind farms. Multi-terminal DC grids will be the key technology for the European offshore 'supergrid'.

The project's anticipated achievements will greatly contribute to integrating offshore wind power into the onshore AC grids of European countries and to the European 'supergrid'.

Read more about supergrid at friendsofthesupergrid.eu

MEDOW offers a development path to researchers across Europe in the area of DC grids, in addition to fostering greater ties between industry and academia in this key development area.

The MEDOW project has received funding from the Seventh Framework Programme of the European Union under grant agreement number 317221.

**Deadline for contributions to next newsletter:
15 April 2016**

www.medow.engineering.cf.ac.uk



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