



# Dŵr Uisce

Energy Recovery in Water Services  
Adennill Ynni yn y Diwydiant Dŵr

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**NEWSLETTER****3rd September 2019**

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***Welcome/Croeso/Fáilte***

Welcome to our Autumn 2019 newsletter bringing you up to date on the Dŵr Uisce project. I am Szu-Hsin Wu – a new member of the team and the editor of this issue. It has been an exciting and productive time over the summer. In this edition, we are delighted to share our achievements on the launch of our micro-hydropower energy recovery demonstration site at Blackstairs Group Water Scheme, followed by a report from behind the scenes. Also, we introduce and welcome our new team members. Finally, we highlight upcoming events at the end of this edition. So, take a look to learn more about this project. Enjoy!

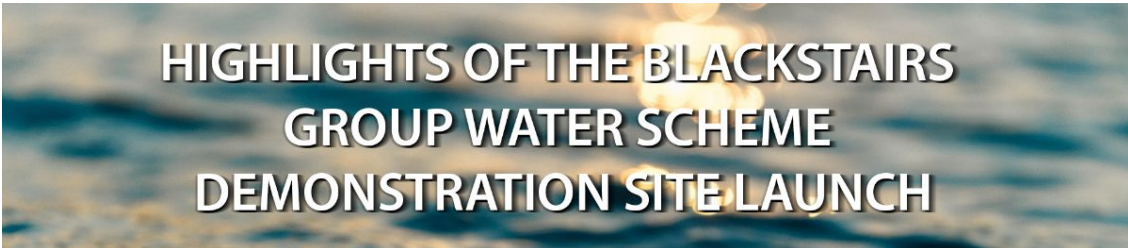
**Szu-Hsin Wu**

Editor

Croeso i gylchlythyr hydref 2019 gyda'r wybodaeth ddiweddaraf am broiect Dŵr Uisce. Szu-Hsin Wu yw fy enw i - aelod newydd o'r tîm a golygydd y rhifyn hwn. Rydym wedi cael amser cyffrous a chynhyrchiol dros yr haf. Yn y rhifyn hwn, rydym yn falch iawn o rannu ein llwyddiant wrth lansio ein safle arddangos adfer ynni micro-pŵer dŵr yn y Blackstairs Group Water Scheme. Hefyd, rydym yn cyflwyno ac yn croesawu aelodau newydd o'n tîm. Yn olaf, rydym yn tynnu sylw at ddigwyddiadau sydd ar ddod ar ddiwedd y rhifyn hwn. Felly, cymerwch gipolwg i ddysgu mwy am y project hwn. Mwynhewch!

**Szu-Hsin Wu**

Golygydd



**HIGHLIGHTS OF THE BLACKSTAIRS  
GROUP WATER SCHEME  
DEMONSTRATION SITE LAUNCH**



*Attendees at the Blackstairs GWS launch*

The Dŵr Uisce project has installed low-cost and innovative pump-as-turbine technology at Blackstairs Group Water Scheme in Co. Wexford. It was launched officially on 2nd May. This pilot plant is reducing energy consumption at the water treatment works by 20-25%. Blackstairs Group Water Scheme and EPS, the treatment works operator, are donating the cost savings to the charity, Wells for Life. The initiative demonstrates clearly to the water supply sector how multi-disciplinary research-based collaboration with operators can address environmental challenges.

Speaking at the event, Barry Deane outlined how, in recent years, water suppliers, including the Group Water Schemes, have never been more aware of the impacts of climate change on the service they provide. "Initiatives such as the Dŵr Uisce project, where energy can be recovered and recycled, helping to reduce the associated carbon footprint and operating costs, must be welcomed."

Dympna Skelton, General Manager of the Blackstairs Group Water Scheme responded, "We are delighted this demonstration is taking place on our scheme. It enables us to reduce our impact on climate change by recovering energy while simultaneously making access to clean drinking water possible for another community in Uganda through Wells of Life."



*The low-cost and innovative pump-as-turbine technology at Blackstairs Group Water Scheme in Co. Wexford*

Dr. Aonghus McNabola, Leader of the Dŵr Uisce Project, said, “The demonstration of this energy saving technology in Blackstairs is a very significant milestone for this project, and one which will make an important impact on the cost and environmental impact of water supply in this part of Wexford”. The event also attracted six new members who have joined our Smart Specialisation Cluster, including Kildare County Council, WEW Consulting, Dunne Technical Services, Ballingate GWS, Glynn St.Mullins GWS, and Mullaun GWS. Together, we hope to provide a better solution for dealing with climate change and create positive impacts on our environment and society.

If you are interested in knowing more or participating in this critical research, you may visit our [website](#).

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**BEHIND THE SCENES OF  
MICRO-HYDROPOWER ENERGY  
RECOVERY TECHNOLOGY DEVELOPMENT**



*Daniele Novara explained the Micro-hydropower energy recovery installation*

#### Daniele Novara

One of the unique features of the Dŵr Uisce Project is the translation of research into practice by building a number of demonstration sites to prove the viability of the technologies developed. However, this translation poses practical challenges, as we have experienced with the two designed hydropower energy recovery installations in Wales and Ireland. Even if the two pilot plants deployed the same Pump as Turbine (PAT) technology, their contexts are significantly different and therefore, the inherent challenges to bring them to completion were quite different. On the Welsh side, as the turbine was going to be installed on a newly built pipeline drawing water from a river in the Snowdonia Natural Park, the planning and authorization processes ended up being rather lengthy and expensive. Thankfully our project partner, National Trust Wales, took care of the process over a whole year. Secondly, an additional difficulty arose from the UK legislators. From 27th of April 2019, they changed the legislative framework governing the connection of a renewable energy generator in parallel to the grid to the new G98/G99 standards. This change made it difficult to source appropriate electrical equipment for the nearly-built site.

In developing the Irish demonstration site, a significant challenge derived from the identification of the ideal location. As a first step, a preliminary screening was performed assessing multiple rural water schemes across the south-east of the country. Blackstairs Group Water Scheme, Co. Wexford, was identified as the scheme with the highest energy recovery potential. A more detailed analysis and measuring campaign had to be carried out to come up with the final design for the water processing plant. After this, there was the need for discussion between the different institutions and companies involved (Trinity College Dublin, EPS Ireland, Blackstairs Group Water Scheme) in order to draft a satisfactory legal agreement before proceeding with the construction phase.

The Dŵr Uisce project is funded by the European Regional Development Fund, through the Ireland Wales Programme 2014-2020. The project is designing, developing and demonstrating low-cost in-pipe hydropower turbines in practice. This project features active collaboration among an international research team from the fields of engineering, environmental science, geography and management, working together with a network of water authorities, operators and suppliers. That collaboration is vital to overcoming the practical challenges. The technology is viable and the implementation of micro-



(from left) **Prof. Paul Coughlan, Daniele Novara, Dr Katrin Dreyer-Gibney, Dr Aonghus McNabola and Dr Himanshu Nagpal** at the demonstration site in Blackstairs GWS, Wexford, Ireland.



Demonstration site in Tŷ Mawr Wybrnant, Snowdonia, Wales

## RESEARCH IS ON THE GO

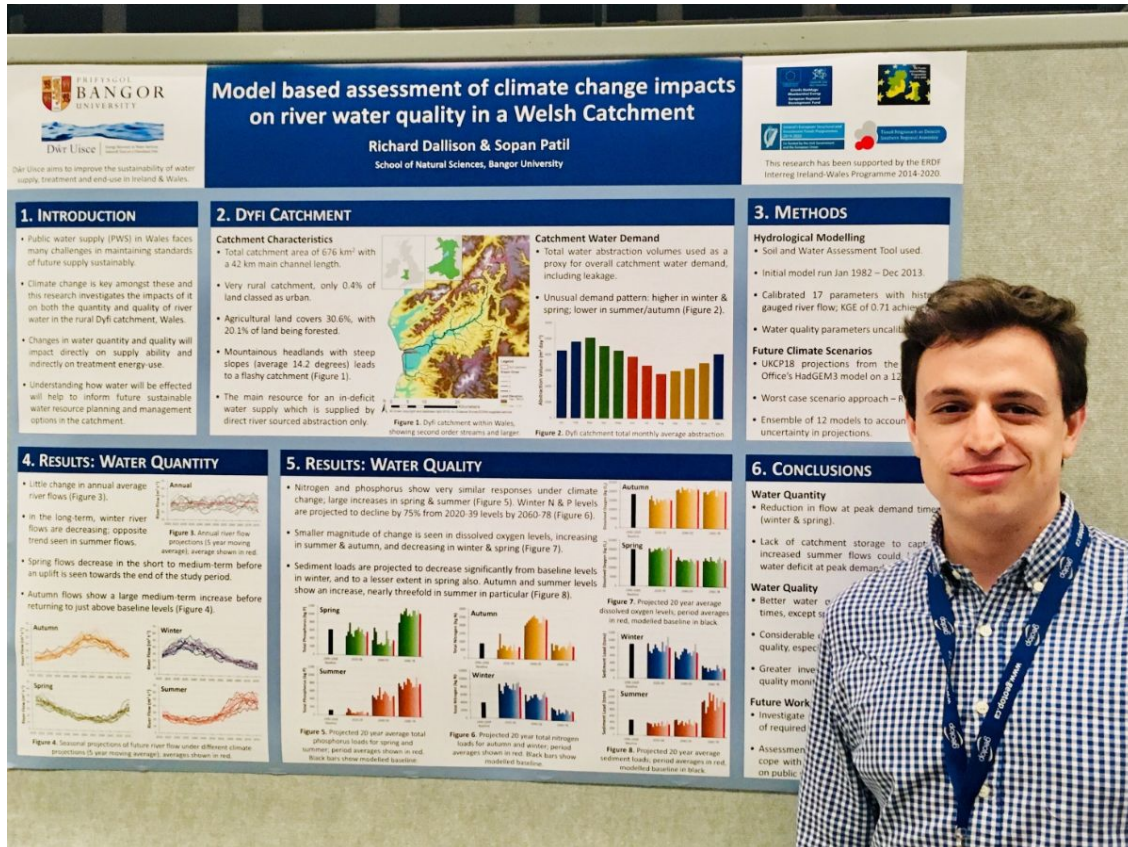


**Isabel Schestak** and other researchers at the IWA Water Reuse conference

Over the summer, a number of the Dwr Uisce research team travelled across Europe as well as to Canada to present our research findings and project outputs.

Bangor PhD researcher, [Richard Dallison](#) has attended two international conferences. In July, he attended one of the premier gatherings of earth and space researchers, [the 27<sup>th</sup> General Assembly of the International Union of Geodesy and Geophysics \(IUGG\)](#) in Montréal, Canada. Richard's research fitted well with the conference theme - '*Beyond 100: The next century in Earth and Space Science*'. He is researching how climate change will impact on water resources in Ireland and Wales over the coming decades, and the knock-on implications for future water supply security. His particular focus is on the potential changes in water quality and quantity in the Dyfi catchment in west Wales. The poster presentation of a high future emissions scenario allowed Richard to disseminate his work to a broad

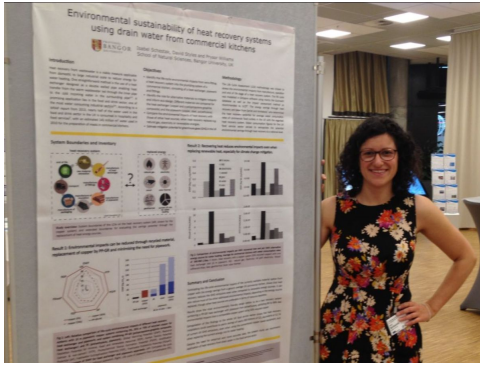
Shortly after returning from Montréal, Richard attended [the International SWAT Conference](#) at the University of Natural Resources and Life Sciences (BOKU) in Vienna, Austria. The conference covered a variety of topics relating to the development and use of the Soil and Water Assessment Tool (SWAT). SWAT is a hydrological model which Richard is implementing to assess climate change impacts on future water supply. The model is used internationally for a variety of purposes, with climate change impact assessment being a key use. The oral presentation at the conference was, therefore, a valuable learning opportunity for Richard, allowing him to speak with and to question some of the leading global users of SWAT, as well as the model developers. During the conference, he also took the opportunity to make connections in the SWAT modelling community.



*Richard Dallison presented his research outputs at the 27th General Assembly of the International Union of Geodesy and Geophysics (IUGG)*

[Isabel Schestak](#), one of our PhD researchers at Bangor University, attended [the IWA Water Reuse conference](#) in Berlin, Germany. Building upon her work on the sustainability of heat recovery from commercial kitchen wastewater, she presented the results from the study with [our demo site at Penrhyn Castle](#) and the environmental benefits for the application of heat recovery across the UK. At the end of the conference, Isabel took part in the technical tours, where participants were shown real-world examples of heat recovery in an industrial laundry and a production site for instant coffee.

Water reuse experts from all over the world had come to Berlin to present their research on water reuse and reclamation. Water reuse was discussed for different sectors and countries: potable water reuse, industrial and agricultural reuse. Case study examples were given on how to integrate water reuse in existing systems, how to monitor water quality and how to manage associated risks. State of the art technology was presented for the removal of emerging contaminants such as pharmaceuticals. Also, how can public perception be influenced and how can we make direct water reuse, especially as drinking water, acceptable by consumers? The Berliner Wasserbetriebe – the water supplier for Berlin – undertook one step to test public acceptance. They have brewed a batch of 1000 litre beer from recycled water. The



*Isabel Schestak presented the research outputs at the IWA Water Reuse conference*



*Beer is brewed from recycled water*

On the Trinity College Dublin side, [Dr Katrin Dreyer-Gibney](#), also representing the team, attended the [26<sup>th</sup> IPDM Conference](#), in the University of Leicester, UK. Katrin presented a research paper, co-authored with Ana de Almeida Kumlien, Paul Coughlan and Aonghus McNabola, titled: "Learning to innovate through action learning, collaborative prototyping and [demonstration](#)".

The presentation generated much interest amongst conference delegates. Not only did the presentation describe a project addressing [water-energy challenges](#), one of the top sustainability priorities globally, it was also one of the few research projects undertaken using action learning research. With this research methodology, practical knowledge is generated in collaboration with stakeholders over an extended time-period, finding a workable solution to a real-life problem.

Katrin's talk was well received. Some attendees invited her to collaborate in follow-up activities and provided much constructive feedback. Overall, it was a success, as delegates understood the overall message of the presentation: new technology can be adopted to address the global water crises when researchers step out of the lab and work side-by-side with industry, local communities, decision-makers and legislators.



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## RECENT PUBLICATIONS

- Novara, D., Carravetta, A., McNabola, A. and Ramos, H.M., 2019. Cost model for pumps as turbines in run-of-river and in-pipe microhydropower applications. *Journal of Water Resources Planning and Management*, 145(5), p.04019012.
- García, I.F., Novara, D. and Mc Nabola, A., 2019. A model for selecting the most cost-effective pressure control device for more sustainable water supply networks. *Water*, 11(6), pp.1297.
- Walker, N. L., Norton, A., Harris, I., Williams, A. P. and Styles, D. (2019) 'Economic and environmental efficiency of UK and Ireland water companies: Influence of exogenous factors and rurality', *Journal of Environmental Management*, 241(December 2018), pp. 363–373.
- Spriet, J. & McNabola, A., 2019. Decentralized drain water heat recovery from commercial kitchens in the hospitality sector. *Energy and Buildings*, 194, pp.247–259.
- Spriet, J. and McNabola, A., 2019. Decentralized drain water heat recovery: A probabilistic method for prediction of wastewater and heating system interaction. *Energy and Buildings*, 183, pp.684-696.
- Dallison, R. & Patil, S. 2019. Modelling the impact of climate change on the sustainability of water supply for a rural catchment (Afon Dyfi) in mid Wales, UK. European Geosciences Union General Assembly 2019. Vienna, Austria, 8th-12th April 2019.
- Dallison, R. & Patil, S. 2019. Model based assessment of climate change impacts on river water quality in Wales. International Union of Geodesy & Geophysics General Assembly 2019. Montreal, Canada, 9th – 14th July 2019.
- Dallison, R. & Patil S. 2019. Impacts of climate change on water quantity and quality in the Dyfi Catchment, UK: Implications for drinking water supply. SWAT International Conference 2019. Vienna, Austria, 17th-19th July 2019.
- de Almeida Kumlien, A., Coughlan, P., Dreyer-Gibney, K., and McNabola, A., 2019. Learning to innovate through action learning, collaborative prototyping and demonstration, 26th IPDMC: Innovation and Product Development Management Conference, Leicester, 10-11 June.
- Schestak, I., Styles, D., Williams, P., 2019. Environmental sustainability of heat recovery systems using drain water from commercial kitchens, 12th IWA International Conference on Water Reclamation and Reuse, Berlin, 16-20 June.

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## INTRODUCING OUR NEW TEAM MEMBERS

**Aisha Bello-Dambatta** is a water and environmental engineer





integrated water resources management, and international development. Prior to joining the Dŵr Uisce project at Bangor University in February 2019, she was a Teaching Fellow in Water Science at University College London (UCL) Geography where she contributed teaching to seven research-based interdisciplinary undergraduate and MSc courses. She also worked as a Postdoctoral Research Fellow at the Centre for Water Systems at Exeter University where she led and delivered contributions to several large-scale international water and wastewater research consortium projects. She is currently contributing to several work packages in Dŵr Uisce, working mainly on water-energy auditing, rating, and benchmarking of different water demands; environmental and climate change impact assessments of demand management interventions; and on developing policy and best practice guidelines to facilitate the implementation of the low-carbon and smart energy solutions developed in the project for different stakeholders.

**Dr Annum Rafique** is an agricultural and environmental economist. She has a PhD in Economics from Cardiff University focusing on economic and environmental efficiency of the UK dairy industry. Dr.Rafique joined the Dŵr Uisce project at Bangor University in February 2019 as a postdoctoral research fellow. She is using her economic background to identify cost and carbon reducing potential of various technologies being developed through Dŵr Uisce platform (heat recovery, micro-hydropower) as well as technologies generally available in the market. She is also working on auditing and benchmarking water-related energy use in the food and beverage sector to develop a framework that can facilitate low cost and low carbon environmental impact while increasing output in the sector.



**Szu-Hsin Wu** joined our Trinity team in early July 2019. She has a multi-disciplinary background specializing in marketing, design and graphic arts. She has work experience in graphic design and holds a Master's degree in Design Management from the University of Southampton, UK. Before joining the Dŵr Uisce project, her research focused on emotional customer experience and value co-creation in the context of hospitality services. This is related to her PhD study at Dublin City University. She was also a researcher in an EU Horizon 2020 project – Global Entrepreneurial Talent Management 3 (GETM3) and a Guest Lecturer at Dublin City University and Trinity College Dublin.

In the Dŵr Uisce project, her work involves coordinating events, meetings and workshops as well as research dissemination including maintaining and enhancing online presence. Combining with her previous research experience, she is also working on exploring potential opportunities for implementing action learning in organisations. This work will provide insights into how organisations can achieve sustainable strategic improvement by implementing action learning.



**Katrin Dreyer-Gibney** holds a PhD from the Trinity Business School, an MBA from the Open University, and a Business degree from the College of Commerce in Munich, Germany. Her teaching involves working with undergraduate and graduate students as

practice and advancing theory in sustainable service operations, through participatory methodologies such as collaborative action learning, action research and action oriented leadership. She worked with both private and public sector organisations including BMW, Hilton International, Hertz and the Health Service Executive.

Throughout her career, Katrin combined academic engagement with practice. In parallel to her teaching and research engagement in the Trinity Business School, Katrin holds a senior management role in the Trinity Human Resources Department.



## SAVE THE DATE!

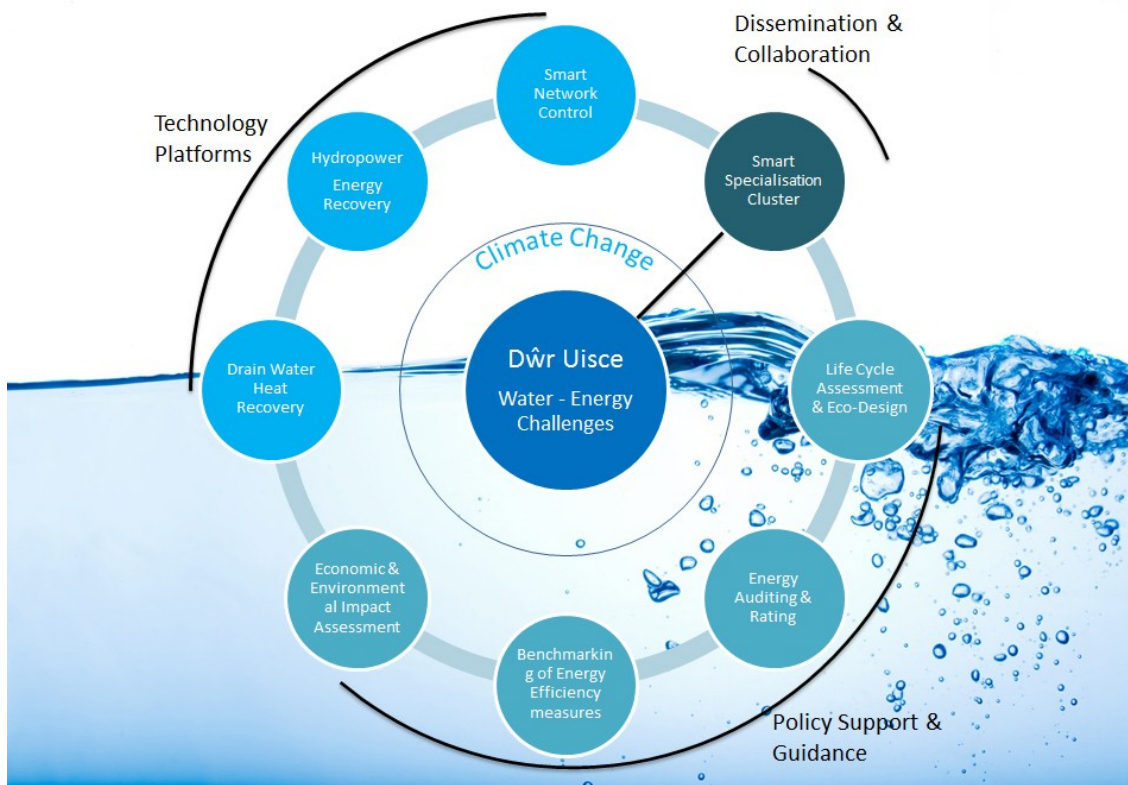
### The launch event of Tŷ Mawr Wybrnant (Northern Wales) Mirco-hydropower Site

Date: 21 November 2019

Venue: Tŷ Mawr Wybrnant

Visit our [website](#) to learn more information about the event!

## OUR VIDEOS



You can now watch our Dŵr Uisce videos at our website. Visit: [www.dwr-uisce.eu](http://www.dwr-uisce.eu).

## JOIN (OR RECOMMEND) THE DŴR UISCE WATER SPECIALISATION CLUSTER



Are you a company, a consultant, a university, a scientist interested in saving water and energy? Are you in one of the regions in Ireland or Wales covered by the [INTERREG funding initiative](#):

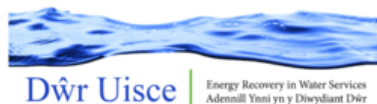
- Ireland - Carlow / Cork / Dublin City / Dun Laoghaire / Rathdown / Fingal / Kerry / Kildare / Kilkenny / Meath / South Dublin / Tipperary Waterford / Wexford / Wicklow
- Wales - Carmarthenshire / Ceredigion / Conwy / Denbighshire/ Flintshire / Gwynedd / Isle of Anglesey / Pembrokeshire / Swansea / Wrexham

You may eligible to join our [SMART SPECIALISATION CLUSTER](#) and benefit from a range of services we offer.

[Click here](#) for more information.

## BUSINESS SUPPORT

Let us help you to reduce your water and energy costs.  
**For free!**



Our aim is to support your business in saving water, energy, emissions and money, and thus making it more resilient for the future. We are a team from Trinity College Dublin and Bangor University, Wales, experienced in working with industry.

**We offer a minimum of six hours free consultation time to:**

- Measure your current water and related energy use
- Identify opportunities to reduce your water and energy consumption
- Propose cost-effective solutions
- Advise on how to improve your environmental footprint, both in your business and along your supply and demand chains

The free consultation we offer only involves a little time from your side - no financial investment is required.

Participation qualifies you to become part of the DŴR UISCE network with the opportunity to link and learn from similarly-challenged businesses. You will hear about technology choices, cost and carbon savings, avoid the mistakes others have made and connect with trusted suppliers.

**Send us an informal request and start benefitting from our expertise, our support and our network.**

**Email:** [admin@dwr-uisce.eu](mailto:admin@dwr-uisce.eu)  
**Phone:** +44 (0) 1248 38 3219 (Bangor)  
+353 (0) 1 896 1311 (Dublin)  
**Web:** [www.dwr-uisce.eu/business-support](http://www.dwr-uisce.eu/business-support)



DŴR UISCE stands for *Distributing our Water Resources: Utilising Integrated, Smart and Low-Carbon Energy*. The project is contributing to improving the long-term sustainability of water supply, treatment and end-use in Ireland and Wales. DŴR UISCE is funded by the European Regional Development Fund through the Ireland-Wales Cooperation programme.



## CONNECT WITH US

All project updates, progress, activities and events are posted regularly and shared widely on our [@Dwr\\_Uisce](#) Twitter account.

Follow also the hashtags: [#Dwruisce](#).

You can read more on our latest news @ our [News](#) section. Sign up for our newsletter [here](#).

## SHARE THIS



# Dŵr Uisce

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Adennill Ynni yn y Diwydiant Dŵr



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