



Dŵr Uisce

Energy Recovery in Water Services
Adennill Ynni yn y Diwydiant Dŵr

NEWSLETTER

20 December 2021



Welcome/Croeso/Fáilte

Welcome to our Winter 2021 Newsletter, bringing you up to date on the Dŵr Uisce project.

On November the 26th [UN Climate Change Conference of Parties \(COP26\)](#) took place in Glasgow (UK) and offered an opportunity for reflection on our contribution to the global efforts in reducing carbon emissions.

With our Newsletter, we highlight the Dwr Uisce team's continued commitment to provide solutions to improve the sustainability of the water sector and to spread the message.

In this issue, you can read about the progress made in our technological solutions for water networks and drain water heat recovery opportunities. Looking ahead, read Nathan's insightful piece on the implications of the hydrogen-water nexus for the water sector.

Individually and collectively, we have engaged in numerous activities together: from education and outreach events to our Citizen Science project, from a new webinar to presenting our findings at research conferences to online meetings. Thank you for your contributions.

We take this opportunity to wish you, our followers and cluster members, a Peaceful Christmas and a Happy 2022!

Roberta Bellini

Editor

Croeso i gylchlythyr y Gaeaf 2021 a'r wybodaeth ddiweddaraf am broiect Dŵr Uisce.

Fis Tachwedd cynhaliwyd 26ain Cynhadledd Partïon Newid Hinsawdd y Cenhedloedd Unedig (COP26) yn Glasgow (Y Deyrnas Unedig) a fu'n gyfle i adfyfrio am ein cyfraniad ninnau

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gynnig atebion i wella cynaliadwyedd y sector dŵr ac i ledaenu'r neges.

Yn y rhifyn hwn, cewch ddarllen am y cynnydd a wnaed yn ein datrysiadau technolegol ninnau mewn rhwydweithiau dŵr a systemau adfer gwres dŵr draenio. Yn unigol ac ar y cyd, rydym wedi cymryd rhan mewn gweithgareddau lu: gan gynnwys digwyddiadau allgymorth a phroject Gwyddoniaeth y Dinasyddion, gweminar newydd a chyflwyno ein canfyddiadau mewn cynadleddau ymchwil a chyfarfodydd ar-lein. Yn olaf, edrychwn ymlaen. Darllenwch ddarn craff Nathan ar oblygiadau'r nexus hydrogen-dŵr i'r sector dŵr.

Hoffem fanteisio ar y cyfle i ddymuno Nadolig Heddychlon a 2022 Hapus i'n holl ddilynwyr ac aelodau'r clwstwr!

Roberta Bellini

Golygydd

COUNT US IN!



The 26th [UN Climate Change Conference of Parties \(COP26\)](#) in Glasgow last month prompted us to look even further forward. An initiative organized as part of the Conference was [“TAKE A STEP”](#). The challenge was to “build the world’s largest community of people and organizations taking practical action on climate change”. In Dŵr Uisce, that is what we are doing. Read [more](#).

UPDATES ON OUR TECHNOLOGICAL SOLUTIONS

HEAT RECOVERY FROM KITCHEN WASTEWATER

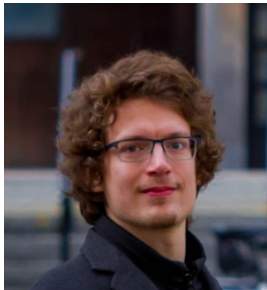
Ajeet Singh

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energy embodied in hot wastewater associated with kitchen drains in the hospitality and food services sector in the UK was estimated 1.24 TWh/yr. The capture of this energy has the potential to reduce greenhouse gas emission by 344 k tons Ce/yr. If this energy could be recovered, it would directly attenuate the heating load requirement of each kitchen, and hence the energy bill. The EU has officially recognized wastewater as a renewable source of energy. Continue reading [here](#).



A FURTHER NOVEL APPROACH TO HYDRAULIC ENERGY RECOVERY: SUBMERSIBLE PUMPS AS TURBINES



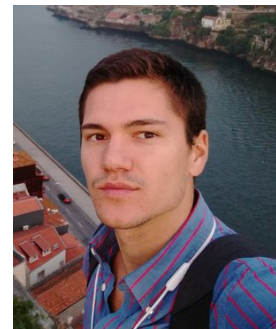
Daniele Novara

Instead of a conventional “dry” Pump As Turbine (PAT) device for energy recovery, the Dŵr Uisce team is investigating the use of a “submersible” PAT in order to simplify the construction of the turbine house. Therefore, a prototype submersible PAT has been tested in the lab to determine its performances. Read more [here](#).

WHEN IS THE REPLACEMENT OF CONVENTIONAL PRESSURE REDUCTION VALVES IN OUR WATER DISTRIBUTION NETWORKS WITH PATs ECONOMICALLY VIABLE? WHAT ARE THE UNCERTAINTIES?

Djordje Mitrovic

Some level of water loss occurs in water distribution networks (WDNs) during its operational lifetime no matter how well these are managed. For perspective, on the level of EU the values of water losses range from single digit values in Germany, Denmark and Netherlands to around 45% in Ireland, with an average of 23% (The European Federation of National Water Services, 2017). As the relationship between the leakage and pressure is well established, in the last 30 years, many pressure reduction valves (PRVs) have been deployed within WDNs around the world to manage pressure. In the United Kingdom some of the main water utilities operate in the range of 2,000 district metered areas, where 50%–60% are pressure managed using PRVs (Vicente et al., 2016). Read [more...](#)



AN UPDATE ON OUR CITIZEN SCIENCE PROJECT



We launched a cross-sectional survey on public perception of household water and water-related energy use was launched in September as part of a Dwr Uisce project citizen science project on household water use efficiency in Ireland. The survey was open for 7 weeks in September and October and was open to all households in the Republic of Ireland. We also partnered with Wexford County Council to promote the survey in County Wexford. Read [more](#).

NOTES FROM DWR UISCE PUBLIC ENGAGEMENT EVENTS

Sustainability Webinar Series: CLIMATE CHANGE AND FUTURE WATER RESOURCES

The most recent webinar in the series took place on 6 October 2021. Richard Dallison, Bangor University, presented the Dwr Uisce project's latest work in quantifying the impact of climate change on hydrology and water quality in Wales, and its implications for run-of-river hydropower operations and other water uses. There were 19 attendees from various research groups, as well as Welsh Water, Natural Resources Wales and members of the general public. To view the recording, access the Members Only Area [here](#).

Primary School Webinars

Our primary school webinar 'Think Water = Think Energy', developed by Roberta Bellini, Daniele Novara and Dympna Skelton - manager of Blackstairs Group Water Scheme, was delivered to pupils of St Joseph National School in Donard on October 14, 2021 and to 6th class pupils of Caim National School on December 14, 2021. The children and teachers engaged enthusiastically and really enjoyed the workshop, activities and interactions with researchers and Dympna. We look forward to working with more schools. Please [get in touch](#) if you are interested in hosting our workshop in your school.

EPANET workshop

On November 29 2021, Dwr Uisce Trinity team members, Aonghus McNabola and Nilki Aluthge Dona delivered an in-person workshop on 'How to use EPANET' to Group Water Scheme staff and managers of the National Federation of Group Water Schemes. The workshop took participants on a step-by-step exercise to build a water network. The event was designed and delivered in collaboration with NFGWS.

DWR UISCE PARTICIPATION TO EXTERNAL OUTREACH EVENTS

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Aisha at COP Cymru – Shaping Wales' Response to the Climate Emergency

On 4 November 2021, Aisha Bello-Dambatta spoke about her engagement on the Dŵr Uisce project at a [COP26 live regional roadshow across Wales](#). The set of roadshows mirrored the Glasgow Green Zone showcasing activity in Wales under the four key themes: energy transition in North Wales, nature-based solutions in Mid-Wales, adaptation and resilience in Southwest Wales, and clean transport in Southeast Wales. The roadshows highlighted examples of best practice and allowed participants to engage in conversations around the key COP26 Presidency Programme themes. Continue [reading](#).

Roberta's participation to the first EC Education for Climate Day on Nov 25th

On November 25 2021, Roberta Bellini participated in the first Education for Climate Day event which took place online. It included both plenary and concurrent sessions to discuss different topics around Climate Education at European Level. On the Day, the collaborative platform [Education for Climate \(E4C\) Platform](#) was launched. Read [more](#).



LOOKING AHEAD

HYDROGEN AND THE WATER SECTOR: LOW CARBON AT WHAT COST?



Nathan Walker

The UK Government has committed to Net Zero carbon emissions by 2050 and has targets to cut emissions by 78% by 2035 relative to levels in 1990. Over the last year, the 10 Point Plan and Energy White Paper have outlined the path to Net Zero, and have identified Hydrogen as a key feature of both. Hydrogen offers new ways to decarbonise by replacing fossil fuels in many sectors, replacing natural gas in some industrial processes, and use in heating for commercial and residential buildings. Hydrogen requires large amounts of water to produce. Continue reading [here](#).

SPREADING THE MESSAGE

DO WE KNOW WHEN WE HAVE ENOUGH?

Isabel Schestak

This year's International Conference on Life Cycle Management (LCM, 5-8 September 2021), delivered virtually from Stuttgart (Germany), brought together over 600 sustainability scientists and practitioners under the motto "Building a Sustainable Future Based on Innovation and Digitalization". Research was presented which applied Life Cycle Thinking to such areas as bio-based materials, recycling technology, energy technologies, e-mobility, buildings and construction or urban lifestyle choices. Read [more](#).



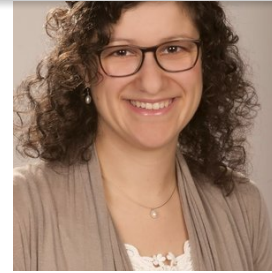
AGU PRESENTATION BY RICHARD DALLISON



Last week Richard Dallison and Sopan Patil, responsible for the Climate Change work package and from our Bangor University team, attended the American Geophysical Union's (AGU) Fall Meeting, AGU21. The meeting, one of the largest gatherings of researchers and scientists in the field of earth and space sciences, was held as a hybrid online/in-person event this year due to the ongoing global pandemic. This year's meeting attracted over 10,000 attendees in person in New Orleans, with more than 12,000 joining the week-long conference online. Read [more](#).

CONGRATULATIONS TO...

Isabel Schestak, from our Bangor University team, successfully defended her PhD thesis at her Viva on the 16th November 2021, passing with minor corrections. Dr. Schestak's thesis is entitled "Environmental impacts in the water-energy nexus: quantification and mitigation in the food and drink sector". Read [more](#)



TEAM MEMBERS LEAVING



We say goodbye to our colleague Nilki Aluthge Dona. Nilki has been a valued member of the Trinity Team working on Smart Network Control in Water Distribution Systems. Nilki is taking up a position as Water Engineer at Ryan Hanley Engineering Consultancy in Dublin. Thank you from all the team and Good Luck for your new endeavours!

RECENT PUBLICATIONS IN PEER-REVIEWED JOURNALS

- Schestak, I., Styles, D., Black, K. & Williams, A.P. 2022. Circular use of feed by-products from alcohol production mitigates water scarcity. *Sustainable Production and Consumption*, Volume 30, March 2022, Pages 158-170. <https://doi.org/10.1016/j.spc.2021.11.034>
- Schestak, I., Spriet, J., Styles, D. & Williams, A.P. 2021. Introducing a Calculator for the Environmental and Financial Potential of Drain Water Heat Recovery in Commercial Kitchens. *Water* **2021**, 13(24), 3486; <https://doi.org/10.3390/w13243486>
- Novara, D. & McNabola, A. 2021. [Design and Year-Long Performance Evaluation of a Pump as Turbine \(PAT\) Pico-Hydropower Energy Recovery Device in a Water Network](https://doi.org/10.3390/w13213014). *Water* **2021**, **13**, 3014. <https://doi.org/10.3390/w13213014>
- Walker, N.L., Williams, A. P. & Styles, D.2021. [Pitfalls in international benchmarking of energy intensity across wastewater treatment utilities](https://doi.org/10.1016/j.jenvman.2021.113613). *Journal of Environmental Management*, **300**, 113613.<https://doi.org/10.1016/j.jenvman.2021.113613>

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[wastewater - A review of available resource. Water, 15\(9\), 1274.](#)

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

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water and energy costs.
For free!

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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
Phone: +44 (0) 1248 38 3219 (Bangor)
+353 (0) 1 896 1311 (Dublin)
Web: 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](#).

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