



NEWSLETTER

14th December 2020



Welcome/Croeso/Fáilte

Welcome to our Winter 2020 newsletter bringing you up to date on the Dŵr Uisce project. I am Roberta Bellini – a new member of the team and the editor of the newsletter.

In this issue, we bring to you a good news story to conclude 2020: the occasion of the cheque presentation to charity Wells of Life Ireland by EPS Water and Blackstairs Group Water Scheme as a result of the savings thanks to the energy recovery system. And for something to look forward to in 2021, read about the upcoming Sustainability Webinar Series.

Progress and achievements in different areas of the project are also featured in this edition. In addition, we introduce our new team members and say goodbye to Dr Jan Spriet.

Finally, we want to wish all our cluster members and supporters a peaceful Christmas and a fruitful 2021!

Roberta Bellini

Editor

Croeso i'n cylchlythyr Gaeaf 2020 i roi'r wybodaeth ddiweddaraf i chi am brosiect Dŵr Uisce. Roberta Bellini ydw i - aelod newydd o'r tîm a golygydd y cylchlythyr.

I ddiweddu 2020, rydym yn dod â stori newyddion da atoch: achlysur cyflwyno sic i'r elusen Wells of Life Ireland gan EPS Water a Chynllun Dŵr Grŵp Blackstairs o ganlyniad i'r arbedion wnaed trwy'r system adfer ynni. Ac am rywbeth i edrych ymlaen ato yn 2021, darllenwch am y Gyfres Gweminar Cynaliadwyedd sydd ar y gweill.

Ceir hefyd hanes cynnydd a chyflawniadau gwahanol feysydd o'r prosiect yn y rhifyn hwn. Yn ogystal, rydym yn cyflwyno aelodau newydd ein tîm ac yn ffarwelio â Dr Jan Spriet.

Yn olaf, rydym am ddymuno Nadolig heddychlon a 2021 ffrwythlon i holl aelodau ein clwstwr a'n cefnogwyr!

Roberta Bellini

Golygydd

MONETARY SAVINGS AT BLACKSTAIRS GWS ENERGY RECOVERY SYSTEM HAVE BEEN DONATED TO CHARITY



Official handover of the cheque. (Left to right, front row: Mr Jerome O' Sullivan EPS, Mr Aidan Jordan, Wells of Life Ireland, and Ms Dympna Skelton Blackstairs GWS; back row: Prof Paul Coughlan, TCD, Mr. Padraic Dunne, EPS, Mr David Logue, EPS, Prof Aonghus McNabola TCD, Ms Roisin Dowd Smith, NFGWS, Mr Oliver Neville, Blackstairs GWS, Mr. Mike Reddy, Blackstairs GWS Committee, and Mr Benny McDonagh, LIT)

Tuesday December 8th 2020 was a cold but sunny day in Rathnure, Co. Wexford. It was also the day members of the Dwr Uisce Team, Blackstairs Group Water Scheme, National Federation of Group Water Schemes, and staff of EPS Water were waiting to mark a number of great achievements.

The micro-hydropower energy recovery system at Blackstairs Group Water Scheme (GWS) Water Treatment Plant has been in operation for over a year. Installed to recover energy by means of a 'pump as turbine' (PAT), it was to produce electricity at significantly lower cost than conventional turbines. It was also to reduce the carbon footprint of the water supply scheme and generate monetary savings. That is what has happened! Over the past 12 months, the PAT has produced almost 15,600 kWh of electricity, corresponding to 3.6 tonnes CO₂ equivalent and €2037 saved! Read the full story [here](#).

SUSTAINABILITY WEBINAR SERIES COMING SOON IN 2021!!!



The Dŵr Uisce Sustainability Webinar Series is now planned for the first half of 2021.

Everybody has been busy designing and developing an interesting mix of talks, videos, tool demonstrations and group discussion sessions to share knowledge, disseminate results, promote discussion, collaboration and gather feedback from participants.

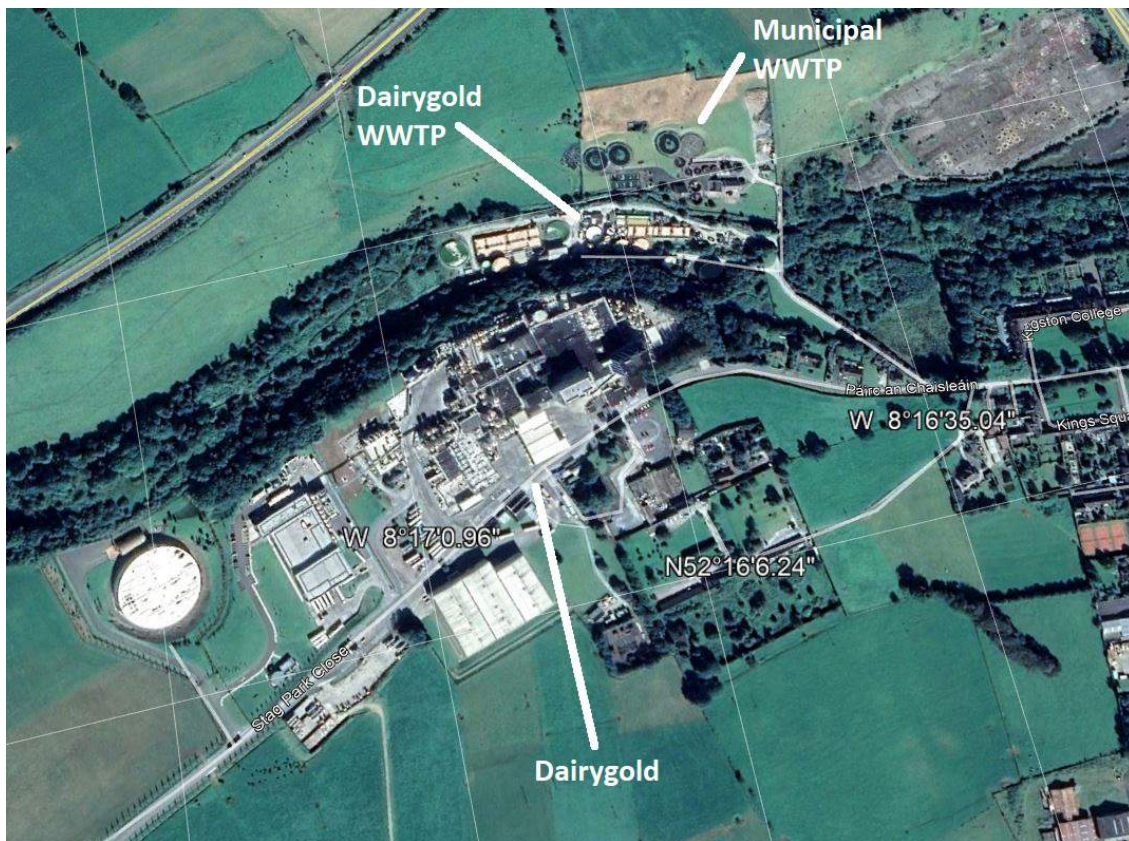
Last summer we launched a poll about what webinar theme was the preferred. The results showed a high level of interest in micro-hydropower and applications of pump-as-turbines (PATs). Thanks to everyone who voted!

The programme will be finalised shortly and will include themes such as Micro-hydropower and PATs, Drain Water Heat Recovery Systems, Auditing and Benchmarking, Climate Change impacts on the water sector.

More details will be available on our [News](#) section of the website and on our [Twitter](#) channel in early 2021

Sustainability Webinar Series Trailer **COMING SOON!** Don't miss out, subscribe on our [YouTube](#) channel.

EVALUATING THE POTENTIAL FOR ENERGY RECOVERY IN AN INDUSTRIAL WASTE WATER TREATMENT PLANT



Aerial view of Dairygold Industrial site in Michelstown, Co. Cork, Ireland

Daniele Novara

The Dwr Uisce team has recently investigated the technical and economic feasibility of installing a Pump As Turbine (PAT) energy recovery device at the Wastewater Treatment Plant of the Dairygold factory in Mitchelstown, Co. Cork. The results of the analysis showed a potential for a small 2 kW unit exploiting the low hydraulic head existing between two different stages of effluent treatment. [Read more..](#)

RECOVERING HEAT, SAVING SPACE: GREASE TRAP INTEGRATED HEAT RECOVERY

Jan Spriet

Wastewater from (commercial) kitchen drains can reach temperatures up to 55°C. Consequently, they have a significant amount of embedded energy (that you paid for), that is currently being flushed down the drain. In commercial kitchens the installation of a pre-treatment system, to remove Fat, Oil & Grease (FOG) from the wastewater is mandatory, to avoid fatberg formation.

In commercial kitchens, this pre-treatment is performed by a grease interceptor or grease trap. In the proposed prototype, this grease interceptor is used as a wastewater holding reservoir, avoiding temporal mismatches, and a heat exchanger is integrated in this grease interceptor. The heat recovered from the grease trap reduces the energy and fuel consumption of the kitchen's traditional heating system. Integrating heat recovery in the grease trap would not only reduce the space requirements of heat recovery systems, and reduce their installation costs. It would also aid in the removal of FOG from the kitchen wastewater. In this article, we describe the operation of our prototype. [Read more...](#)

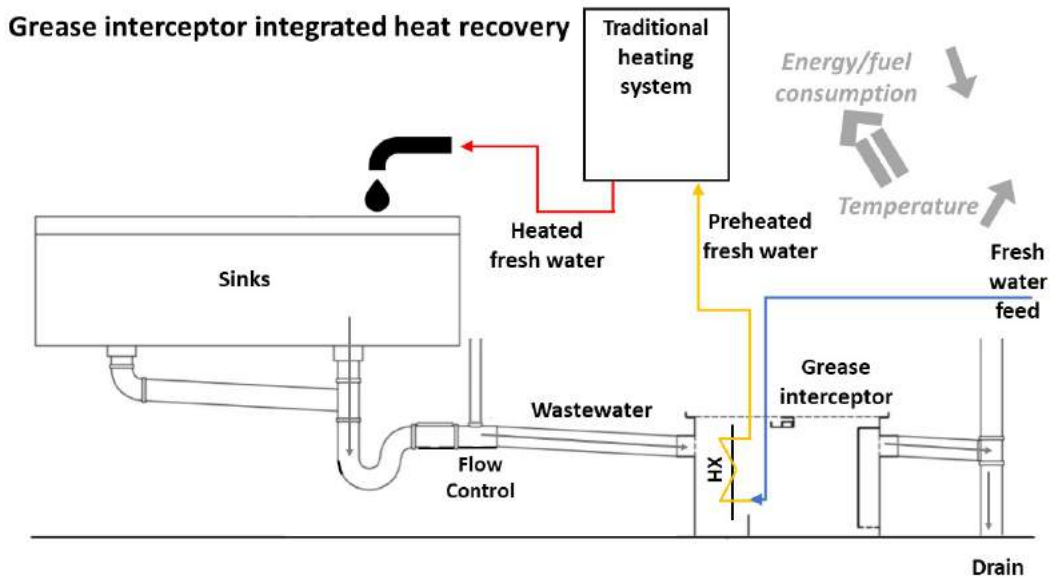


Figure 1. The working principle, in a nutshell.

LEARNING IN ACTION: GENERATING ACTIONABLE KNOWLEDGE

Szu-Hsin Wu

In the Dŵr Uisce project, it is part of our innovative culture to work with stakeholders on co-design, co-develop and co-implement green innovation which mitigate impacts on the environment.

In our collaboration with National Trust Wales (UK) and National Federation of Group Water Scheme, Dŵr Uisce researcher and stakeholders have installed micro-hydropower energy recovery system at two demonstration sites: Ty Mawr and Blackstairs Group Water Scheme. The process of achieving green innovation has never been easy and straightforward. Together, we encountered and overcame problems and challenges. To discover more, click [here](#).



EXPLORING THE RELATIONSHIP BETWEEN ECONOMIC GROWTH AND THE ENVIRONMENT

Annum Rafique

The goal of all nations is to achieve sustainable economic development. With economic development comes increase in production which has an impact on energy use of the country. Higher economic output has resulted in higher energy consumption thus increasing emissions. Richer countries, however, have more resources available to invest in energy efficient technologies to reduce their environmental imprint. We investigated the relationship between economic growth and the environment for 26 EU countries, using the hypothesis postulated for the Environmental Kuznets Curve (EKC), which assumes an inverted-U shape relationship between economic growth and environment. To continue reading, click [here](#).



COLLABORATION IN ACTION

Isabel Schestak

Research collaboration with DTU, Denmark, in the field of eco-efficiency

Dwr Uisce team member Isabel is currently at Denmark Technical University (DTU) as a guest PhD researcher. She is being hosted by the Urban Water Section, in the group of Martin Rygaard, at the Department of Environment. Here, the group has extensive research experience with water supply and treatment, in both the municipal and industrial sector with connections to food and drink companies. The collaboration with DTU is fostering Isabel's research on the integration of environmental and economic indicators in decision-making, facilitated by a methodology called eco-efficiency. Despite university life being restricted due to COVID-19, it is possible to have regular in-person meetings and discussions with other PhD students and lecturers in the field of eco-efficiency and environmental impact assessment. Isabel presented her research and involvement in the Dwr Uisce project at a Section meeting at the beginning of her stay in October.

The idea for collaboration was born at the Water Reuse Conference last year in Berlin, when Isabel connected with researchers from DTU, having identified overlapping research topics. Due to the pandemic, her stay was delayed by a couple of months and she is glad that it worked out in the end: "It makes a big difference if you have the possibility to work together in person on a daily basis compared to being connected through video calls. I am confident that this stay will not only benefit my PhD research, but especially our project partners such as the businesses we support in our project area to help them make environmentally and economically sound decisions."

Isabel also had the opportunity to visit the utility Fors, a water, wastewater and district heating utility in Roskilde, not far from Copenhagen. She was invited by Berit Godskesen, formerly working at DTU, to present her previous study on heat recovery from kitchen wastewater and it was discussed how water heat recovery could be applied by Fors. From Berit, who is responsible for water planning at the utility, Isabel learned about challenges and plans of her utility to keep water supply fit for the future with climate change and a growing population in mind.



Berit Godskesen (left) and Isabel (right) during Isabel's visit to Fors last November

SPREADING THE MESSAGE

[Isabel Schestak](#), one of our PhD researchers at Bangor University, presented the results of the water footprint of single malt whisky at the LCA Food 2020 conference in mid-October.

How much water is used for producing whisky in a craft distillery in Scotland? How can this water footprint be reduced? And what is the smartest way to use the valuable by-products, from a water perspective? These and other questions were answered in her [poster presentation](#).



You can read more about the conference [here](#).

Isabel also participated in the online training on the Product Environmental Footprint (PEF). The PEF has been initiated by the European Commission to establish more detailed and harmonised guidelines for conducting a Life Cycle Assessment (LCA). The objective is to make environmental footprints undertaken by different practitioners more comparable across products. The guidelines reduce the number of decisions that need to be taken by the LCA practitioner, reducing the scope for error and value judgement: which processes and steps of the life cycle of the product do I take into account? Where shall I source production data such as input material or energy from? How do I analyse the results in order to find all relevant environmental hotspots? The PEF gives answers.. [Read more...](#)

On the Trinity College Dublin side, [Dr Katrin Dreyer-Gibney](#) and past but still actively involved Dr Ana de Almeida Kumlien, presented at the EURAM Conference on 4-6 December 20. Katrin presented a research paper, co-authored with Paul Coughlan et al., titled: "[Responding to the UN Sustainability Goals through network action learning](#)".

Ana presented her paper on Sunday Dec 6th on "Accelerating innovation in the water sector through smart specialisation cluster", co-authored with with Paul Coughlan, Aonghus McNabola, Irene Garcia, Jan Spriet, & Nilki Dona.

Both papers were well received and generated good discussion.

RECENT PUBLICATIONS

- Schestak, I., Spriet, J., Styles, D. & Williams, A.P. 2020. [Emissions down the drain: Balancing life cycle energy and greenhouse gas savings with resource use for heat recovery from kitchen drains](#). *Journal of Environmental Management*, **271**, 110988
 - Dallison, R.J.H., Patil, S.D. & Williams, A.P. 2020. [Influence of historical climate patterns on streamflow and water demand in Wales, UK](#). *Water*, **12**(6), 1684.
 - Schestak, I., Styles, D., Black, K. & Williams, A.P. Don't water down the whisky: making efficient use of water and by-products in a Scottish distillery. 12th International Conference on Life Cycle Assessment of Food 2020 (LCA Food 2020), online from Berlin, Germany, 13th-16th October.
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TEAM MEMBERS JOINING...



Ajeet Singh completed his Ph.D. from Indian Institute of Technology, Varanasi, India. His doctoral research was based on the 'Design Innovations of Solar-Thermal Devices for Enhanced Thermo-Hydraulic performance' via computational fluid dynamics. Ajeet's research portfolio comprises 12 international peer reviewed journals, 5 functional patents and 7 international conferences.

In team Dŵr Uisce, his research work focuses on development of effective grease trap system (GTS) retrofitted with optimum heat exchanger unit for wastewater heat recovery. The idea is novel and possesses huge potential to look over the avenues to recover maximum possible heat from the wastewater to stop flushing money into drains. In addition to this, more the heat transfer from wastewater volume inside the GTS increases the FOG removal efficiency. The study comprises a series of experiments followed by computational fluid dynamics (CFD) analysis to find the optimum design and functional parameters. A CFD analysis plays a very vital role in testing the performance of the GTS which saves the various costs (material procurement, fabrication, operation, and maintenance) incurred in experimental run. In the future, the optimum GTS integrated with a best heat recovery unit will be manufactured physically and undergo testing under realistic conditions.

Dr Madhu Krishna Murali joined the Trinity Team in September 2020. He completed his PhD from the University of Western Australia on the topic of the interactions of centralized and decentralized wastewater systems. His research interests are in the areas of wastewater resource recovery, hydrodynamic modelling of wastewater systems, wastewater treatment, and water recycling. Dr Murali has previously worked for some years at a water utility, focusing on addressing technical issues with regional wastewater treatment plants and recycling schemes in Western Australia.

Within the Dŵr Uisce, he will be working on Work Package 2 which focuses on drain and waste water heat recovery. In the specific, Madhu is attempting to quantify the scale of heat available for recovery in different parts of the sewer network in Ireland-Wales and identifying the ideal places for heat extraction. I will also be analyzing the long-term operation of our pilot heat recovery rig at an industrial site, using this operational data along with modelling to develop an

appropriate heat recovery solution for industrial treatment plants. In his free time, Madhu enjoys playing tennis, hiking, and making bread.



Dr Roberta Bellini joined our Trinity team in November 2020. Educated to PhD level in Environmental Science, Roberta has a wealth of research and technical experience accumulated in academia and in the private water management consultancy sector, as well as in science communication and engagement gained during her involvement in non-formal education. Roberta has worked in Italy, the UK and Ireland. In her last role, she was the education officer at the Rediscovery Centre - The National Centre for the Circular Economy, in 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 consultancy and science communication 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.

...TEAM MEMBERS LEAVING

We say goodbye to our colleague **Jan Spriet** who completed his PhD on '*Wastewater as a thermal resource: Exploitation strategies, design methodologies & prototype development.*' and was conferred his doctoral degree on November 26th 2020. Jan has now started working for a non-profit organisation called CityMine(d) in Brussels. Congratulations Dr Spriet on your new role! Thank you from all the team and Good Luck for your new endeavours!



**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
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](#).

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Dŵr Uisce

Energy Recovery in Water Services
Adennill Ynni yn y Diwydiant Dŵr



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Ireland's European Structural and
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Twmorol Regionaeth yn Ddeusol
South Wales Regional Assembly



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