

A white helicopter is shown in flight, lifting a yellow boat from a river. The boat is suspended by a yellow crane. The background consists of a dense forest of green trees. The water is calm and greyish. The overall scene suggests a rescue or transport operation in a natural setting.

# preparing for tomorrow



Innovation at  
Welsh Water

Innovation is the only way that we can become a truly world-class, resilient and sustainable water service by 2050, for the benefit of future generations.

At Welsh Water, our vision is simple – to earn the trust of our customers every day.

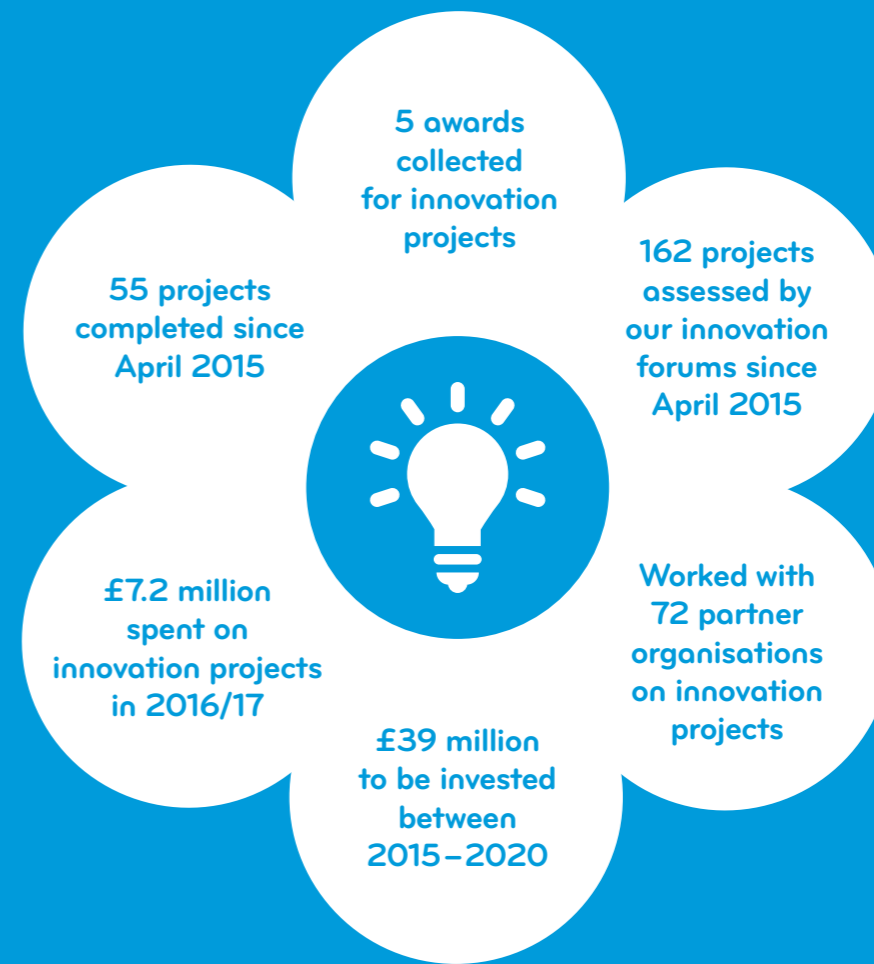
To help us achieve this, we need to deliver the best possible service at an affordable price to over three million people. We cannot do this alone and so collaboration and innovation are key to the way we need to work. These are the behaviours our colleagues and our partners need to exhibit, helping us to become an ever better business, driving improved performance and value for money so that we can meet our customers' increasing expectations at a price they all can afford.

The industry now faces a number of challenges including resilience issues due to climate change, extreme weather events, population growth and changing demographics. These challenges cannot be tackled with traditional solutions and so we must become better at adopting and embedding innovation. This is the only way that we can become a truly world-class, resilient and sustainable water service by 2050, for the benefit of future generations.



Chris Jones,  
Chief Executive, Welsh Water

# a year of innovation





# leading

### **Placing ourselves at the leading edge**

We're looking ahead and planning for the future to ensure that by 2020 we are the leading UK water company for innovation. To do this we need to push the boundaries, and work in partnership to help shape the environmental, regulatory and policy making agenda of Government. We are investing over £15m between 2015 and 2020 to investigate and model our environment, data which we are providing to Welsh Government to assist with its decision and policy making.

### **A network for the future**

As well as creating a more resilient network, to cope with future demands, we are increasing the amount of renewable energy we generate so that we can reduce our carbon footprint and the cost of importing energy. We have significantly increased the amount of energy we generate on our sites in recent years, up from just 6GWh in 2007-8 to nearly 100GWh now — enough to power nearly 20,000 new homes.



### **PestSmart**

Our routine raw water monitoring programme has detected increasing traces of pesticides and other chemicals in areas we have never seen them before. PestSmart, our latest WaterSource public awareness campaign, sees us working in partnership with Natural Resources Wales and the agricultural community to encourage landowners to consider smarter and more environmentally friendly ways of weed, pest and disease control that do not impact on people, water or wildlife.

The campaign signposts land managers to advice and practical solutions for weed, pest and disease control and includes a free pesticide disposal scheme for farmers and land managers. By safeguarding and improving raw water quality before it enters our water treatment works, we can avoid the need for using additional chemicals and energy in the treatment process, and so improve the quality and taste of the water we provide customers.

A man wearing a blue beanie and an orange and blue jacket is focused on a yellow device on a boat. The background shows a body of water and a distant shoreline under a grey sky. The word "research" is overlaid in large white letters.

# research

## Helping to inform decisions

We work with research partners to gather data and apply evidence to make sure we are making the correct investment decisions on behalf of our customers. Some of our partners include UK Water Industry Research, faculties at universities such as Cardiff, where we are members of the Water Research Institute and other bodies such as the National Environment Research Council (NERC) with whom we have a strategic Memorandum of Understanding.

## Sharing ideas internationally

We work with other water companies from across the world to share knowledge and best practice. For our award-winning RainScope work we looked around the world, from Malmo, Sweden to Portland, USA, to help us develop a sustainable new system for catching and redirecting rainwater, to reduce sewer flooding and pollution. Similarly we have exchanged information in the last 12 months with all the European Union Water Companies via EurEau, and reviewed technologies on the ground in the USA for stormwater treatment, which we are currently trialling here in Wales.



## Coastal Investigations

Our £8 million coastal investigations programme has focused on safeguarding and improving water quality at 49 bathing and shellfish waters in Wales. The study will establish our impact on Wales' marine waters and what improvements are required from both ourselves, and in the control of pollution from other sources such as agriculture.

Our modelling work will help us to establish which of our assets require upgrading to secure the highest bathing water quality standards or to meet guideline shellfish quality standards. We are also actively working with Natural Resources Wales (NRW) to establish if any other controls need to be developed to reduce diffuse pollution at these sites. Our marine models will be made available to colleagues in Welsh Government, NRW and academia to help them to better understand the marine environment and determine future policy in this area.

# technology



## Using new technologies

Our innovation forums bring the latest technologies, innovations and products into the business from across the globe.

We've worked with over 72 companies this year to trial, modify and adapt their products to help us to improve our services. This includes the use of drones to inspect the condition of assets that are usually expensive and hazardous to reach and a new water management system in reservoirs which uses large stirrers to circulate water to improve the overall quality at source.

## Creating resilience

We know that strengthening the resilience of our networks, systems and people is key.

That's why we're making lasting improvements to our service by targeting problems such as discoloured water in affected communities through our £80 million Zonal Studies programme.

Continuing to build improved capacity and resilience in our people is equally as important, so we support and sponsor qualifications such as MSc's and other courses through local universities.



## Dam Repair

When a defect at Caban Coch dam in the Elan Valley was picked up in a routine inspection last year, a complex operation was needed to make the repair.

The defective pipe was deemed too difficult to repair, meaning we needed to isolate it underwater, inside the reservoir. A specialist dive team was brought in to perform the complicated and challenging procedure to make sure the repair of the scour pipe was safe, removing parts of the pipe weighing more than two tonnes, in conditions of near-zero visibility. The repair was made under pressure in a tunnel inside the dam using specialist techniques we normally use on large mains repairs.

The works have not been attempted in the water industry before and we had to use techniques adopted in the offshore oil and gas industry to provide a safe working area for those working underwater.


 A man in an orange high-visibility shirt and safety glasses is working on a blue water filter. The word "ideas" is overlaid in large white text on the image.
 

# ideas

## Encouraging innovation internally

A key part of innovation is the fostering of ideas and the development of an environment in which colleagues are encouraged to take risks and test their ideas.

### — Innovation Forums

Our innovation forums involve colleagues from across Welsh Water, coming together to discuss new ideas, technologies and products. Managed by our Heads of Service, they act as a catalyst to bring innovation into the business. Each project considered by the forum must contribute towards us meeting the challenges set out in our 2050 vision.

### — Web Portal

Our colleagues can not only share ideas through our forums but online too, through our innovation web portal [dwcymru.com/innovation](http://dwcymru.com/innovation). It's a really simple and fast way for employees at all levels to share their thoughts and ideas.

We love it when our colleagues bring their own ideas to reality. We've had some business-changing, money-saving ideas tried and tested in garden sheds and brought to life through collaboration with the wider business and local companies.



## Arfon's Eureka Moment

From time to time we use filters in customer supply pipes to investigate discolouration. To change the filter our colleagues would remove it, take it to a local depot where they would change the filter and then travel back to site.

Arfon Jones-Hughes, a member of our Water Distribution team, in north Wales, came up with a new idea which improved safety, cost and time. "I'd often thought about how we could sort this problem out, then I had a Eureka moment where I was welding and I had to stand on the plate to get the clamp to work. I realised we could use the body of the person as the counter lever to open and close the filter and that's where the foot stand came from."

After making a prototype Arfon found that using the foot stand halved the time it takes to replace a filter. His design has won an award at our annual Health and Safety Conference and has been rolled out across the company.



# partnerships

## Partnership Working

Sharing best practice and raising awareness through collaboration with our contract partners and stakeholders is key to making sure we work as effectively as possible.

## Improving the environment together

Our partnerships with the Natural Environment Research Council (NERC) and other environmental bodies, help us to tackle environmental challenges, as well as gain the data to make decisions for the future.

The WISDOM project has seen us working with international partners to research how new technologies can help us to improve the services we deliver to our customers. Part of the pilot project involved the installation of digital smart metres which measure water usage wirelessly in selected properties in Cardiff. WISDOM is funded from the European Union Seventh Framework Programme for research, technological development and demonstration.



## Nash, Newport

At our Wastewater Treatment Works in Nash, Newport, one of the screens which filter out debris from waste was failing, leading to a risk of upstream sewer flooding and pollution to the River Usk. The project called for an emergency screen bypass facility.

A design was developed by Welsh Water and our Capital Alliance partners MMB, to construct and install a concrete channel of sufficient size to pass all flows to the works. The capital investment required to implement this solution however, exceeded available funding.

The team challenged the traditional solution and came up with an innovative option that modified the existing screens, so that they could be removed from the channel in the event of an emergency, achieving the same outcome within the available budget. The total saving of this solution is estimated at £1 million, with significant reduction in health and safety and construction risks too.





Can you help us to improve  
our services and prepare  
for the future?



[www.dwrcymru.com/innovation](http://www.dwrcymru.com/innovation)