Introduction to REDAWN

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REDAWN

Reducing Energy Dependency in Atlantic-area Water Networks

15 partners
5 countries
3 pilot demonstrations

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Opportunities for energy recovery

Water Supply Networks (Ireland & Wales)

238 sites identified, 80 feasible sites with 20 GWh of potential energy recovery
€2.5 million savings
Reduction of >10,000 tonnes CO₂ per annum

Irrigation Networks (S. Spain & Portugal)

15 irrigation networks in Spain & Portugal
20,000 ha of land
Potential for 43 installations & >1,000 kW per year

(We aim to replicate this feasibility assessment across the Interreg Atlantic Area region and beyond)

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Micro-hydropower in Water Networks

Recovering energy from flowing water in network infrastructure at points of excess pressure.

## Barriers

- Need for low-cost turbines
- Need for an assessment of the market potential
- Need for supportive policy & regulations
- Need for an assessment of the environmental & societal impact potential
- Need for pilot projects
Project Overview

Aim to foster the adoption of hydropower energy recovery technology in built water networks in the Atlantic Area (AA).

REDAWN will develop an adequate institutional, social and technological environment to foster greater resource efficiency in water networks, including:

- Energy Recovery Resource Assessment
- Design Guidance & Support Tools
- Economic & Environmental Impact
- Scale Demonstration Pilots
- Policy, Institutional & Social Impact
- Communication
- Capitalisation
Resource, Economic & Environmental Assessments

The potential of low-cost hydro plants for the reduction of energy use

Resource assessment:
- Existing infrastructure
- Flow and Pressure data
- Optimum recovery
- Long term growth

Challenges:
- 4 network sectors
- Missing data
- Access to data

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Design guidance and support tools

Energy from PRVs & pressure control

Pump-as-turbine (PAT)

- Low cost, lower efficiency, unknown performance, no flow regulation
- Predict behaviour, design guidelines, reduce risk for investment

Optimisation for energy recovery

- Pressure control
- Leakage reduction
- Maximum energy production

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Policy & Institutional Support Tools

Development of supporting organisational structures to accelerate the implementation of MHP energy recovery in practice

Diverse and changing water industry structures across the EU

Capturing the value (economic, environmental & social)

Need for robust business models & lean thinking, to support implementation

Reducing the water sectors contribution to climate change

Reducing the cost of water production and the price paid by the community

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Pilot demonstration

Three scaled demonstrations shall cover the different sectors:

- Irrigation (University of Cordoba, Spain)
- Process industry (RENOVA, Portugal)
- Waste/storm water sectors (SMPGA, France)

Construction of sites, monitor site performance, feedback on design guidance, optimise performance and analysis of non-specific technical challenges.

Supports communication and capitalisation of PAT technology.

Validation of design guidelines and support tools.

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Conclusions

PATs in water networks has been deeply investigated in the recent past.

We now know how to make the control of a micro-hydropower plant using a PAT for energy recovery.

We know how to maximize the energy production without losing in system reliability.

The design of the hydropower plant and the PAT selection will be available in short time from REDAWN for all technicians as in the design of a traditional pumping system.

Guidelines will be produced within the project to facilitate the choice of the plant layout and of the PAT.
Thank you for your attention