



LT2.3

Position Paper: Greener Pumping on Europe's Inland Waterways

GREEN WIN PARTNERSHIP

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1 Executive Summary

The **Green WIN** project sought to improve North West Europe's inland waterway pumping activities which account for around 25-33% of waterway management organisations' (WMO's) annual electricity use and 20% of their carbon emissions.

So, this was an important challenge. Recent energy cost increases mean there is now an even greater need for water managers to adopt more efficient regimes and practices.

Partners trialled pumps and controllers and learnt how fine tuning their settings can improve performance and bring significant cost savings and environmental benefits. Our results show significant emission and power reductions at the project's 11 trial sites and should encourage a wider roll out in similar size organisations. They can also use other Green WIN outputs to inform their future pumping operations.

This paper summarises our work. We also hope it supports the case for increased EU funding on this topic and to support the vital role that our inland waterways play.

2 Emerging Solutions - Smarter Management

2.1 Smart Controllers & Smart Pumps

The most recent industry developments are **Smart controllers** which use IT software, to control when pumps start up or stop, work with water level sensors or devices, and can control any manufacturers pumps, directly or via variable speed drives.

Smart pumps have this type of intelligence built into the pumps themselves and reduce the need for extra space to accommodate control panel hardware and software.

WMO's can benefit from this smarter management and realise big savings on energy costs by implementing these measures – effectively 'automising their pumping'. The purpose built 'Test Bench' in Liège enabled us to check current pumps and control panels performance and to see if we can adjust their settings to optimise performance.

2.2 Web based 'subscription services'

Intelligent and smarter asset management has grown swiftly in the water industry. With more data from sensors now available, companies can automate and manage their resources far more efficiently. They can apply technology - based on an asset's historic performance to help predict the risk of failure and when it should be replaced.

2.3 Internet of Things (IoT)

IoT devices being developed support telemetry systems that monitor water levels and provide optimal pump start-ups and efficiencies. This could reduce the size and costs of civil engineering works when installing monitoring equipment. Currently the size of a small cupboard - they could be replaced by a 'plug in' device the size of a Coffee cup.

3 Tackling Climate change

Inland waterways can help mitigate climate change in Europe's overheating towns and cities by providing traffic-free commutes along towpaths and moving road transport freight on to larger commercial waterways. Canal water can heat and cool homes, businesses, and waterside buildings. They can ease flooding by providing extra urban drainage, support hydro schemes, and facilitate water transfers to areas of drought.

Pumping is fundamental whatever the activity so rolling out the solutions outlined by Green WIN will be important if we are to tackle this major issue head on.

4 Continued European collaboration

4.1 Interreg Funding

Waterway managers face a similar challenge – the first is often to 'be brave enough' to tackle the technological complexities involved. Many of the relatively smaller inland waterway organisations won't have sufficient expertise or financial resources to tackle this issue. Joining forces as we did in Green WIN was a good start.

The Interreg funding meant we could bring together a mixture of disciplines, operational knowledge and expertise, pool costs, take a few risks, do things a bit differently, and test new solutions and clarify complex technical issues. *We hope future EU funding enables new projects to continue our work in this area.*

4.2 The Network of Inland Waterways Europe NIWE

NIWE promotes Europe's waterways' economic, social and environmental value and potential to EU institutions and new waterway partners. It will continue to host the NIWE website as a continued platform and resource for sharing and promoting Green WIN, wider Interreg, and other waterways related projects, outcomes, and learning.

This will ensure that the ideas, lessons, cross project potential and sectoral contacts are not lost as a project closes but remains as a live resource for future project development and for mainstreaming of transferable lessons and approaches.

5 Key outputs from Green WIN

5.1.1 Initial and final assessment reports from trial sites.

Tell the story of improvements made to each site and are useful case studies.

5.1.2 Test Bench report(s)

Explain how the tests were conducted, how they check a pumps characteristics and the optimum control settings to use to achieve maximum efficiency. Case studies set out the 'story' of each site; what the pumping needs are and what can be implemented at each site to improve performance - and show other organisations what they could also achieve.

I1.1.1 - Initial assessment Report

I1.2.1 - Reports from Laboratory trials - JH 56 page report V1 + V2 "overview of lab tests" part delivers this. Will update post further trials & make specific to partner. Will contain full details of the lab tests including cross references.

LT.2.3 - 'Position Paper' "Greener Pumping on Europe's Inland Waterways".

T1.1.1 - Partners review/reports of technologies, reporting on Trials of re-configurations of pumping equipment and from NL research in 2018 and 2019.

T1.2.1 - Report setting out the results of Lab tests.

T1.4.1 - A methodology and report. JH draft report "Estimates of CO2 emission reduction induced by improved pumping operations"

T1.5.1 - Summary report highlighting the opportunities for WMO's to procure joint savings when purchasing pumping equipment.

T1.6.1 - Emerging Solutions Report

T1.7.1 - Report - Highlighting (how we can) incorporate an affordable measuring device adapted to the application being tested.

T1.8.1 - Report - How we can support organisations to achieve ISO9906 certification through improved communication of the results of the testing.

T2.1.1 - Study / Report - Regulations, Funding & Procurement.

5.1.3 Greener Pumping Toolkit (GPT)

The GPT hosts the above case studies and an online calculation tool - developed with and ratified by industry experts, Arcadis – to help organisations make wise/greener choices when purchasing or improving existing pumps and control systems.

5.1.4 Automated services & processes.

Organisations can improve efficiency by building smarter pumping into their general water management. For example, automated switching on and off of pumps may allow staff to be deployed elsewhere.

5.1.5 Innovation through Green WIN

The Liège test facility, built from scratch with the aid of Green WIN funding is known as the Test Bench. This enabled us to evaluate the performance of large submersible and dry-action centrifugal pumps typically used in waterways.

Manufacturers or organisations are assured of the accuracy and reliability of the tanks pump testing procedures as testing procedures follow industry accepted ISO9906 standards. On the flip side it also validates (or challenges) manufacturers claims.

Information gathered from testing carried out - (indirectly) on behalf of industry. In addition to students, it will be available to other organisations post project.

