VESIALAN KONSORTIOIDEN BENCHMARK-SELVITYS

PROJEKTI: VESIVIISAAMMAN RUOKAJÄRJESTELMÄN RATKAISUMALLI
DNRO: ESAELY/355/2023

RAPORTIN SISÄLTÖ

INVENIRE

FINNISH WATER FORUM

Euroopan unionin rahoittama NextGenerationEU

PROJEKTIN PERUSTIEDOT

Projektissa on tarkoitus luoda ja pilotoida siirrettävä ja monistettava toimintamalli, jonka avulla ruokajärjestelmän toimijoiden veden kiertotaloutta voidaan tehostaa alueellisesti sekä Suomessa että vientimarkkinoilla. Toimintamalli yhdistää suomalaisen vesialan osaamista ruokajärjestelmien ja regeneratiivisen maatalouden tuntemukseen. Toimintamallia testataan projektin aikana Ahvenanmaalla.

Ahvenanmaalaisille elintarvikeyrityksille ja alkutuotannolle projekti tarjoaa apua vesiasioiden kiertotaloudellisuuden kehittämiseen. Suomalaisille vesialan yrityksille projekti tarjoaa kehittyvän alustan vientimahdollisuuksien aukaisemiseen ruokajärjestelmien vesiasioiden kiertotaloudellisuuden parissa.

- Projektin toteuttajat: Invenire Market Intelligence Oy ja Suomen vesifoorumi ry
- Projektin toteutusaika: 1.8.2023 – 31.3.2025
- Projektin rahoitus: Vesiosaamisen kasvu- ja kansainvälistymisohjelma (MMM/NextGenerationEU)

YHTEENVETO

Tässä dokumentissa on pyritty kuvaamaan esimerkkejä vesialan (pääosin eurooppalaisia) konsortioita. Esimerkeiksi on valittu 11 erityyppistä vesialan konsortiota, jotka on lyhyesti kuvattu. Johtuen materiaalin alkuperäiskielestä hankekuvaukset on kirjoitettu englanniksi. Tarkasteltujen konsortioiden havaintoja on kuvattu alla.

Konsortiotyyppisissä hankkeissa korostuu ennen kaikkea:

- **Projektiluontoisuus**; konsortiotyyppinen yhteistoiminta on luontevaa hankkeissa, joissa tarvitaan erityyppistä osaamista ja erilaisten osa-alueiden hyödyntämistä yhteisen tavoitteen eteen.
- **Hankerahoitus**, esimerkiksi EU:n eri tutkimusrahoitusinstrumenttien hyödyntäminen. Näissä yleistä on EU:n tukisäännöistä johtuva maantieteellinen hajaannus eurooppalaisten kumppanien kesken, ja horisontti-instrumentilla rahoitetuissa hankkeissa projektien suuri kokoluokka
- **Yritysten, tutkimuslaitosten, korkeakoulujen ja yhdistysten välinen yhteistyö** on vesialan konsortioita tarkasteltaessa yleistä. Näihin linkittyy useimmiten innovointi ja uusien teknologioiden hyödyntäminen: kuten vesialan tutkimuksen ja yritysten välinen yhteistyö uusista teknologioista ja niiden toimivuudesta. Osittain tämän voi olettaa selittyvän innovoinnin ja pilotoinnin epävarmuudella ja korkeilla kustannuksilla (vrt. valmiin tuotteen myyntikatteet), mutta myös hankerahoituksen kriteereillä
- **Vesilaitosten tai teollisten toimijoiden mukanaolo** on tyypillistä em. hankkeissa mahdollistaen teknologioiden ja ideoiden pilotoinnin käytännössä.
- **Esimerkkitapauksissa ei ole kuvattu pelkästään vesilaitosten tai korkeakoulujen välisiä konsortioita**. Tämän tyyppiset konsortiot ovat yleisiä Pohjois-Amerikassa.
- TKI-toiminnan, pilotoinnin ja infrahankkeiden ohella myös yritysten välinen analyysityö tai konsultointi voi olla konsortiomuotoista (esimerkki: hollantilaisten konsulttiyhtiöiden analyysi YK:n Valuing Water -aloitteesta).
- Johtuen hanketyyppisestä toiminnasta **on konsortiotyyppinen toiminta myös luonteenomaista kehitysyhteistyötoimijoiden väliselle yhteistyölle** (esimerkki: Swiss Water and Sanitation Consortium).
- **Puhtaasti kaupalliset konsortiot liittyvät usein suuren kokoluokan infrainvestointeihin**, joissa esimerkiksi eri laitetoimittajat, suunnittelijat, konsultit ja rakennuttajat toimivat yhteistyössä (Esimerkki: Aqualia-johtoinen projekti Saudi-Arabiassa).
    - **Konsortioita voidaan toki muodostaa kaupallisten toimijoiden kesken jatkuvaan yhteistyöhön** (Esimerkki: unkarilainen Hunwater) kaupallisiin vesialan tuotteisiin ja rakennuttamiseen mahdollistaen kokonaisratkaisut.
- **Puhtaasti yritysten muodostamien konsortioiden välisestä toiminnasta löytyy huomattavasti vähemmän tietoa tki-hankkeisiin verrattuna**. Yritysten välinen yhteistyö

ei välttämättä täysin täytä konsortion määritelmää eikä hankkeesta viestiminen ole rahoittajan näkökulmasta vaadittua. Tämän tyyppisessä toiminnassa viestintä voi esimerkiksi rajoittua vain tiedotteeseen.

ESIMERKKEJÄ

AQUALIA LED CONSORTIUM IN SAUDI ARABIA

Large scale commercial project in Saudi-Arabia to improve asset management and operations of water production and wastewater treatment.

Consortium lead: Aqualia, the fourth largest water company in Europe by population served.

A consortium led by the Spanish company Aqualia (45%) and also comprising the Spanish company Acciona (25%) and the Saudi service companies Tawzea (23%) and HAACO (7%) will oversee the management, operation and maintenance (MOM) of the end-to-end water cycle in the Saudi regions of Assir, Jazan, Baha and Najran in the south of the kingdom, near the border with Yemen. The contract for the consortium was awarded following a public tender in 2022.

Saudi Arabia is divided into 6 regional administrative units in water services, of which The South Cluster, home to over 5 million people, will be managed by the consortium for a period of 7 years.

The contract includes the management of, among other assets, 59 water treatment plants, 380 reservoirs, 330 pumping stations, 127 tanker filling stations, 20,000 kilometres of water mains, 43 wastewater treatment plants and 7,000 kilometres of sewerage networks.

Aqualia is the fourth largest water company in Europe by population served.

https://smartwatermagazine.com/news/aqualia/aqualia-led-consortium-manage-water-over-5-million-inhabitants-southern-saudi-arabia

https://www.aqualia.com/en/web/aqualia-global/-/a-consortium-led-by-aqualia-will-manage-water-for-more-than-5-million-inhabitants-in-southern-arabia

AQUASPICE

A large-scale horizon funded consortium with 27 partners built to investigate circular water practices in European process industries.

AquaSPICE aims at materializing circular water use in European Process Industries, fostering awareness in resource-efficiency and delivering compact solutions for industrial applications in the field of industrial water technologies including recovery and treatment. The consortium's overall goal is the development and validation of water efficiency management and optimization methodologies, technologies and tools that will carry process industries forward to a near-zero water footprint target with minimum freshwater consumption and water-borne emissions. To execute this, a set of scientific and technical objectives, motivated by real industrial needs will be analysed in a set of six case studies and a set of impact-related objectives.

The methods include smart water solutions such as building a digital twin of water use, recovery and reuse processes and a monitoring platform for centralizing data from water utilization.

With funding from Horizoneurope, the total budget for the project is 10 522 185€.

The consortium involves 27 partners from 12 European countries which include research centers, universities and companies.

More information: https://aquaspice.eu

HUNWATERTECH

The Hungarian Water Technology Corporation (HWTC) is a private sector consortium founded in 2015 and it compromises of three internationally operating Hungary-based companies.

Hunwatertech is an example of continuously operating consortium and not a project-oriented one. It involves three private enterprises that participates in joint projects. The consortium operates globally and employs 300 people.

The Consortium specialises in the design and complete implementation of drinking water treatment plants, construction of wastewater treatment plants, production of containerized mobile water and wastewater treatment compact units, membrane desalination plants and recycling technologies for industrial wastewater. It's areas of expertise include design, manufacturing, installation, commissioning, maintenance, servicing, remote monitoring, operation, spare parts and chemical supply of water treatment systems.

Hunwatertech's companies:

- Szabadics Civil Engineering and Construction Plc. (construction)
- Hidrofilt Water Treatment Ltd. (drinking, industrial process water and ww treatment)
- Controlsoft Automatika Ltd. (process control, automation and surveillance)

THE NETHERLANDS ENABLING WATER TECHNOLOGY (NEW)

A consortium compromising of two water sector research institutes, a University and a regional investment and development company. Strong local profile in the northern part of the Netherlands, with research-oriented consortium members and a financer. Aims to support SME's and Start-ups.

The Netherlands Enabling Water Technology (NEW) is a Dutch consortium made up of Wetsus (water sector research institute), the University of Groningen, Deltares (independent knowledge institute in water and subsurface) and Investment and Development Company North Netherlands (a regional investment and development company representing northern provinces in Netherlands). There is very limited information about the consortium, but it's aim is knowledge transfer and funding for startups and SME's operating in the field of water related technologies. It has received 8 MEUR from the Dutch government in 2021 for the dissemination of knowledge on water technology. The aim of NEW is to help start-ups in water technology who need to protect or validate their ideas and provide entrepreneurial support and training together with funding. Examples of focus areas include water and resource recycling and in the field of generation and storage of energy harnessed from water. The NEW plan comprises two components: Knowledge transfer, and a fund.

A press release concerning the funding of the project: https://www.wetsus.nl/news/e-8-million-for-consortium-enabling-water-technology/

OZONE4WATER PROJECT

A consortium led ozone technology project that is funded by the Portuguese government. Consortium consists of a university and three companies: a water utility, consultancy/design and water treatment.

The objective of the OZONE4WATER project is to develop a new ozone technology for water/wastewater treatment, offering means to the wider implementation of ozone-based solutions globally. The project has resulted in various academic publications in the field of science and environmental engineering.

In short terms it has three different aims:

- To make the process of producing ozone gas (O_3) more energy-efficient and cost-effective by using specially designed filters, called functionalized membranes.
- To create a highly efficient, compact system to produce a bubble-free, ozone-rich water solution.
- To assess the efficiency of the disruptive ozone technology for water and urban wastewater treatment.

Partners:

- The Faculty of Engineering of the University of Porto
- The AdP VALOR – Serviços Ambientais, S.A. (water utility)
- Enkrott, Gestão e Tratamento de Águas, S.A. (Water treatment)
- Simbiente – Engenharia e Gestão Ambiental, Lda (Enrivironmental and engineering management)

More information: https://ozone4water.com/ozone4water-project/

REGAIN CONSORTIUM

A Dutch research project involving a water board, an industrial water company and two research institutes piloting the removement and degradation of pharmaceutical residues from wastewater with three different technologies.

REGAIN will test the three different treatment technologies throughout an 18-month research project at Noorderzijlvest's Garmerwolde municipal wastewater plant. The project's aim is to discover by 2025, if the REGAIN research project can serve as the basis of the implementation of a comprehensive full-scale installation waste water treatment plant with an expected capacity of 10 million cubic meters per year in Groeningen. The project aims to ensure that no pharmaceutical residues in the wastewater stream enter the vulnerable Unesco nature reserve Waddenzee improving water quality. Besides this, the project also aims to evaluate the potential of reusing treated sewage water as industrial water to cater for the industrial water needs in the region to create a sustainable freshwater system that operates in a circular model.

Partners:

- Dutch Water Board Noorderzijlvest,
- WLN (water technology company WLN)
- Centre of Expertise Water Technology (CET) knowledge institute

- North Water (an industrial water subsidiary of drinking water utility Groningen and Evides Industriewater)

More information:

https://www.wateronline.com/doc/regain-consortium-partners-with-nx-filtration-to-demonstrate-municipal-wastewater-reuse-0001

https://www.aquatechtrade.com/news/wastewater/regain-consortium-to-test-three-water-treatment-technologies

https://nxfiltration.com/knowledge-base/publications/regain-consortium-partners-with-nx-filtration-to-demonstrate-municipal-wastewater-reuse/

REVIVED WATER

A large-scale company-led consortium of technology providers and universities to analyze and implement low energy solutions for drinking water production by a Revival of ElectroDialysis systems.

A European Union funded innovation project which aims to establish electrodialysis as the new standard for desalination of seawater with a significantly reduced energy consumption compared to Reverse Osmosis. A consortium that compromises of six companies, two universities, a research organization and a non-profit organization.

Total budget €9,834,255 of which EU funding: €7,639,529.

The REvivED water consortium consists of 10 partners from six different European countries, coordinated by FUJIFILM Manufacturing Europe BV. This consortium is industry driven and covers the whole knowledge spectrum required for the success of the REvivED water project with experts on electrodialysis (ED)/Reverse electrodialysis (RED) technology, desalination and purification technology, contaminant removal, off-grid applications in developing countries, knowledge transfer and dissemination.

After the project's implementation, a 25 m3/day pilot (R)ED unit is currently being successfully run with seawater at Afsluitdijk in the Netherlands demonstrating the core concepta of the method.

The project also resulted in over 20 academic publications in the field of science and engineering.

Besides large-scale desalination, the project also developed small scale stand-alone systems for rural areas powered by solar energy. The main target is off-grid applications in developing countries, where brackish water can be converted into safe drinking water. After piloting, seven of these units are still operating in rural communities in East Africa and India.

The consortium members:

- FUJIFILM Manufacturing Europe (the Netherlands)
- Trunz Water Systems (Switzerland)
- REDstack (Netherland)
- Deukum GmbH (Germany)
- Phaesun GmbH (Germany)
- European Desalination Society (Italy)
- University of Parlermo (Italy)
- Ghent University (Belgium)
- European Centre of Excellence for Sustainable Water Technology (the Netherlands)
- AquaTT UETP CLG (Ireland)

More information:

https://www.revivedwater.eu

https://www.revivedwater.eu/news/revived-water-projects-legacy-future-desalination

REWAISE: RESILIENT WATER INNOVATION FOR SMART ECONOMY

A Horizon Europe funded consortium led by Aqualia with 25 members that centers around building a sustainable and efficient and circular smart hydrological model.

The projects aim is to improve water management, water governance and utilize technological innovations for efficiency, circular practices and innovations.

The consortium utilizes a network of nine living labs across Europe in demonstrating operational environments, water governance and technical innovations.

The ecosystem of smart water production is centered around building an intelligent decentralized water services system to achieve a sustainable hydrological cycle reducing freshwater use, and recovering energy, nutrients and materials from water. The aim of the decentralized system is to also enhance collaboration with a wide network of stakeholders to better utilize information and the value of water and wastewater by nutrient recovery and circular practices. It is a major initiative of four European Water Utilities to implement technological innovations and new water governance methods

The Consortium:

24 European entities from Belgium, Croatia, Czech Republic, Denmark, France, Ireland, Italy, Poland, Spain, Sweden and United Kingdom.

These represent a wide sector of actors in the water sector representing companies, universities, cities and organisations in the following fields: water, energy, local governance, venture capital, research and ancillary services.

More information: https://rewaise.eu/the-consortium/

SWISS WATER AND SANITATION CONSORTIUM

A consortium of Swiss non-profit organizations that helps vulnerable individuals in the WASH (Water, Sanitation and Hygiene) sector in developing countries.

The Swiss Water and Sanitation Consortium (SWSC) is a consortium of eight non-profit organizations who target their know-how and resources for communities in Africa and Asia to improve water and sanitation services. The consortium has implemented three phases and is currently in phase IV which includes 16 projects in 12 countries to increases access to safe drinking water, adequate sanitation and improved hygiene. Besides concrete actions, the SWSC shares knowledge and expertise and strengthens the advocacy and policy dialogue on national, regional and global level.

Consortium members: (all non-profit organizations)

- Caritas Switzerland
- Fastenopfer
- HEKS EPER
- HELVETAS Swiss Intercooperation
- Solidar Suisse
- Swissaid
- Swiss Red Cross
- Terre de Hommes

The consortium is releasing more information about upcoming projects (Phase IV) in the near future in which it aims to implement 16 projects in 12 countries improving access to drinking water, adequate sanitation and improved hygiene.

During Phase I (2011 – 2013), Phase II (2014 - 2017) and Phase III (2020 - 2023) the Consortium projects have together provided access to water, sanitation and hygiene for 1 113 000 people in communities, 233 000 pupils, 1 700 000 health care patients including staff and 37 000 small-scale farmers.

More information:

https://waterconsortium.ch

Project beneficiaries: https://waterconsortium.ch/results-quantitative/

UN VALUING WATER INITIATIVE -ANALYSIS BY A DUTCH CONSORTIUM

A case study by a consortium of consultancy companies to analyze the principles of UN Valuing Water initiative.

The consortium consists of three Dutch consultancy firms: Witteveen+Bos, Ecorys and TwynstraGudde.

The consortium's main task is to find and analyze the implementation of the Valuing Water principles by finding and analysing showcases where the United Nations principles of Valuing Water have been applied in policy, practice, financing or behaviour. The aim of the analysis is to capture the lessons learned from these cases. The analysis will also look into the approaches and tools that have been developed to better understand, value, and manage water. The aim of this coalition is to apply the United Nations Valuing Water Principles and share knowledge. To support this goal, several pilot projects and their contributions to system change for valuing water will be analysed.

More information: https://www.dutchwatersector.com/news/consortium-to-analyse-implementation-of-valuing-water-principles

WATER4ALL PROJECTS - EXAMPLE CASE WATER-BIOFIL

The Water4All Partnership -Water Security for the planet- is a funding programme for scientific research in freshwater cofounded by Horizon Europe.

Water4All brings together a broad group of 90 partners from 33 countries in the European Union and beyond. With a duration of 2022-2029, this gathers partners from the whole water Research, Development and Innovation (RDI) chain, involving 90 partners, 33 countries and an 86 MEUR budget.

An example of a consortium, that has received funding from Water4all 2022 joint transnational call:

WATER-BIOFIL -Next-generation biodegradable filters for water purification and desalination

The aim of the WATER-BIOFIL project is to design & assemble & test next generation compostable filters, prepared from biodegradable polymers and/or bio-sourced polymers, which can be thereafter integrated in regular Point-Of-Use systems for water purification and desalination systems.

The consortium is a combination of three research partners and three SME's as technology integrators.

Consortium members:

- National Institute for Research & Development in Chemistry And Petrochemistry-Icechim (Consortia lead, Romania)
- Adam Mickiewicz University (Poland)
- University of Toulon (France)
- EDAS-EXIM S.R.L.(Engineering and construction, Romania)
- Marine Tech SAS (Marine pollutions response, oceanography and submarine fresh springs, France)
- PRESSEKO Spółka z o. o. (waste treatment, Poland)