



NORDREGIO POLICY BRIEF 2024:2

WANO POLICY BRIEF



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Policy Brief

WANO (Waste Management in the High North) is a research project funded by the Norwegian Research Council (NFR) and includes the partners NORCE Norwegian Research Centre (the lead partner), Nordregio, Remiks Miljøpark AS, and Hålogaland Ressursselskap (HRS) IKS. The project generates new research-based knowledge on the conditions for innovation-driven, cross-border cooperation in the northernmost regions of Norway, Sweden and Finland.

Map: The geographical focus of WANO is largely in North Norway and in northern parts of Finland and Sweden.





Photo: Jukka Teräs

The WANO Project

WANO (Waste Management in High North - new cross-border opportunities) is a research project funded by the Norwegian Research Council (NFR), which runs from 2021 to 2024. WANO focuses on cross-border business and innovation cooperation in the field of waste management, including municipal and industrial waste, in the regions of Troms, Finnmark and Nordland (Norway), Lapland and North Ostrobothnia (Finland) and Norrbotten (Sweden). WANO identifies key actors, technologies, innovation trends, and cross-border collaboration possibilities in the Arctic waste sector.

WANO examines conditions for creating cross-border business opportunities in the High North through the study of northern Nordic waste management systems.

The Arctic region, characterized by harsh climate conditions, vast distances as well as smaller markets and volumes of waste, emphasizes the need for innovative solutions in the Northern waste management sector. WANO supports waste management companies in addressing technological challenges of sustainable waste processing including incineration, reuse/recycling, use of energy as well as transport. The WANO project also recognizes the importance of cooperation with local communities to ensure social acceptance and understanding when it comes to new, innovative waste management processes. Moreover, the project establishes sustainable business-to-business and business-to-research contacts and networks.

Project partners:

NORCE Norwegian Research Centre AS is the coordinator of the WANO project. NORCE is one of Norway's largest independent research institutes with long-term experience in Arctic research. Within its Regional Development Group in Tromsø in north Norway, NORCE contributes to the sustainable development of societies and key business sectors in the Nordic Arctic regions. From NORCE, Jukka Teräs, Helge Flick and Anders Lind participate in the WANO project. Professor Trond Nilsen from the Inland Norway University of Applied Sciences acts as scientific advisor for the group.

Nordregio is an applied research institution under the Nordic Council of Ministers with experience in Nordic and Arctic regional development issues. Nordregio is located in Stockholm, Sweden and contributes to the WANO project with knowledge and experience on the Arctic as well as Nordic benchmarking experience. Timothy Heleniak is the Nordregio contact person of WANO.

Remiks Miljøpark AS, owned by the municipalities of Tromsø and Karlsøy, is the main waste management operator in the Tromsø area in north Norway. Remiks handles approximately 69 000 tons of waste per year, including waste from Svalbard, Troms, and northern Nordland, serving about 77 000 inhabitants. The company is organized under two main areas of operation: household and enterprise waste. From Remiks, Øivind Østbø is the contact person of WANO.

Hålogaland Ressursselskap IKS (HRS) is a waste management and recycling company owned by 8 municipalities in the northern part of Nordland and southern Troms in northern Norway. The company, with headquarter in Narvik, provides daily waste management services to 60 000 inhabitants and it is a significant regional actor in the corporate waste market, too. The company handles more than 100 000 tons of annual waste. From HRS, Line Dalhaug is the contact person of WANO.



Photos: NORCE-WANO group



Photo: Robert Bye / Unsplash.com

Opportunities and challenges of cross-border cooperation

Waste management in the Arctic area is confronted with challenges such as harsh climate, peripheral location and long distances for transport. Increasing the Nordic cross-border cooperation in the waste management sector could, however, open up new possibilities for an effective and sustainable waste management system in the Nordic Arctic region. The following table summarizes issues analyzed by the WANO project team regarding opportunities and challenges of the waste management in the Nordic north.



Photo: Helge Flick, NORCE

The table below summarizes the WANO analysis of key points in terms of opportunities and challenges of the waste management system in the Nordic North

| Challenges | Opportunities |
|---|---|
| <ul style="list-style-type: none"> • Arctic waste management faces the challenge of achieving critical mass in individual locations. • Long distances between population centers and new solutions for effective and sustainable waste management facilities complicate cooperation and reduce the need to transport waste across long distances outside regional centers / the region. • Arctic operating environment creates specific technical challenges related to cold climate. • Changes in the geopolitical situation brought on by the Russian invasion of Ukraine have stopped the efforts to open cross-border cooperation between northern Norway and Northwest Russia. | <ul style="list-style-type: none"> • Sharing of experiences and good practices among the waste management actors and stakeholders in the Nordic Arctic adds to innovative capacity and efficiency of actors, as well as increased competence of staff. • Cross-border activities enable new solutions to effective and sustainable waste management in the Arctic and reduce the need to transport waste long distances outside the area. • WANO includes analysis of promising waste management collaboration initiatives such as Rå Biopark to increase the potential for cross-border cooperation, too. • WANO promotes cooperation between waste operators, technology providers, research institutes and municipalities to create innovation potential for new cross-border collaboration and development. |



Photo: Helge Flick, NORCE

Industry interviews

Øivind Østbø



Photo: Remiks

Innovation and Development Director, Remiks AS

Please tell us something about yourself and your role at Remiks?

I work as the Innovation & Development Director at the Remiks office in Tromsø. My background in Law, Economics and IT gave me a broad starting point for working with R&D. At our department we work with both internal and external projects, always eager to improve processes, efficiency and sustainability in what we do. Remiks has, as long as I know, been a forerunner and innovator in its field and to be able to be a part of that is and has been very rewarding.

How would you describe cooperation between the waste management actors in North Norway?

Regional cooperation has been intensified in the recent years by the north Norway Waste management cluster which gathers the local actors to discuss and develop new cooperation solutions. This is very important in our sparsely populated region with long distances.

What have you learned at the WANO project?

We have extended our regional and national cooperation network to the Nordic level, with several highly interesting cooperation partners ranging from waste sorting technology providers to digitalization experts.

Line Dalhaug



Photo: HRS

Environment and Development Director, HRS IKS

Please tell us something about yourself and your role at HRS?

I live in Narvik and work as Environment and Development director at the HRS Narvik office. I took my university education at the University of Tromsø, campus Narvik, with focus on construction and environmental issues. I have worked at HRS for many years and held several positions such as operations manager, general manager in one of the HRS subsidiaries, and now I work with both internal and external projects.

What has changed in waste management?

Waste sorting, we have seen significant changes there. In fact, the waste management sector is constantly changing with new challenges, but also with new possibilities. In the North Norway region, we have achieved an increased cooperation between the waste management companies and together formed the company Rå Biopark.

Where do we find good practice in waste management?

The Netherlands have taken big steps in getting citizens to improve their waste sorting habits. The Nordic countries have been at the forefront regarding reducing of waste going to landfill. I have also learned through the WANO project that Oulu is an essential Nordic competence center for waste management.

What have you learned so far at the WANO project?

I have already been able to broaden my contact network, the know-who part, especially in the North Calotte region. We have had relations to Kiruna in Sweden, but additional east-west connections including north Finland would be highly welcomed in waste management. Perhaps we could do more waste sorting here in the North Calotte, too.



Photo: Helge Flick, NORCE

Cross-border collaboration: Case Oulu

The Oulu region in north Finland is internationally known as an ICT and technology development powerhouse. The region is also rapidly developing as a know-how centre of waste management, too, with companies and research institutes investing in waste management solutions. In March 2023, WANO organized a cross-border workshop between the waste management actors in north Norway and north Finland. The objective was to share experiences in waste management and to explore the possibilities to increase cross-border waste management cooperation, with focus on sorting of municipal waste, as well as data collection and data handling issues. The WANO workshop was attended by the WANO partners Remiks, HRS, and NORCE, and the Oulu-based waste management actors Hauru, Wastebook, Macon, and the PrintoCent cluster.

Haurun Jäteauto Oy is a private-owned waste management operator in Oulu. The company works actively with new technology and logistics solutions. *"55% of Oulu's housing companies already use smart waste management. Thanks to data, we have optimized not just the routes but the number, type and size of waste bins. Now we make 20% less collections and can serve more clients with the same resources."* Mikko Hauru, CEO Haurun Jäteauto Oy.

Wastebook Oy in Oulu provides smart waste management services and data. The services include fill level sensors, a collect-on-demand mobile app and cloud system which all enable waste management companies to streamline their services.

Macon Oy is an Oulu-based expert company focused on bio and circular economy. The Macon services include carbon footprint calculations, environmental permits, investor materials, business plans, environmental impact assessments, feasibility studies and raw material studies.

PrintoCent cluster in Oulu co-operates with international partners in materials, electronics, manufacturing and machinery testing. PrintoCent is led by VTT Technical Research Centre of Finland. The PrintoCent team includes experts from the Oulu University and the Oulu University of Applied Sciences.

The WANO cross-border cooperation initiative with Oulu resulted in the participation of Remiks at the Innofest innovation and matchmaking event in Oulu in June 2023. Innofest paved the way for a joint pilot case on advanced technological solutions related to optical sorting in waste management by Remiks and VTT. The cross-border pilot initiative by Remiks and VTT, was awarded a grant by the RFF Arktis programme in Norway in 2023, with an aim to develop specific optical technology for Arctic waste management.



Photo: Helge Flick, NORCE



Photo: Helge Flick, NORCE



Photo: Helge Flick, NORCE

International experiences: Industrial and rural symbiosis

Murat Mirata, Linköping University, Sweden, is a researcher on Industrial Symbiosis (IS), with extensive experience in improving resource use of inter-organizational industrial processes. Mirata shares with us key lessons from his experience.

Industrial Symbiosis was initially concentrated around urban areas industrial symbiosis is commonly found in areas with concentration of relatively large industries and/or urban settings.. Murat Mirata has recently expanded the work on into what he calls Rural Symbiosis (RS) - industrial symbiosis in rural settings, too.



According to him, creating integrated value chains is the key in Industrial and Rural Symbiosis. Using one actor's waste as another actor's input and jointly developing utilities, products and service with superior economic and environmental performance are key characteristics of industrial and rural symbiosis.

"Waste management (WM) plays a crucial role in realizing this symbiosis, connecting waste producers and those who can utilize the resources embedded in the waste. The WM sector has extensive knowledge in the safe collection and treatment of waste and is extremely well positioned to be a key player in realizing more productive use of resources. In short, through industrial symbiosis, WM companies can be the driving force in transforming waste streams to value streams."

Murat Mirata emphasizes that the need to move to more sustainable solutions underlines the role for academics and researchers as catalyzing actors in waste management symbiosis.

Murat Mirata points to two Swedish examples of good practice in Industrial Symbiosis. In and around Norrköping, Sweden, partnerships between a wheat-based bio-refinery, a heat and power plant, a biogas plant, farmers, forestry, other industries and the local community provide gains to all actors and stakeholders. The outcomes include the world's greenest bioethanol and animal feed that has substantially reduced protein imports. Another example, in a more rural setting, is near Habo, Sweden. The two farms, one cultivating ecological vegetables and flowers and the other raising cows and crops realize synergies through a biogas plant that utilizes manure and organic waste to produce electricity and heating. Part of the electricity is used to power the greenhouses and the rest is sold to the grid while residual heat from the electricity production is used for heating the greenhouses. The plant also produces organic fertilizer for the farms.

Through the WANO project, he has experienced the waste management sector in northern Norway as knowledgeable and competent, stating that they have been successful in finding effective solutions. However, creating more value from waste will require joining not only various waste streams but also different competencies and capabilities. The actors are increasingly recognizing the value of working across organizational and national boundaries. This requires a re-orientation of mindsets and approaches, as well as forging new partnerships with actors in other fields.



Photo: Helge Flick, NORCE

WANO - Lessons so far

The WANO project continues until the end of the year 2024. The lessons of WANO learned so far could be summarized as follows.

Firstly, waste management in Norway has already taken important steps to promote innovation and cooperation. Initiatives such as the North Norway Waste Management Cluster gather actors to join their forces and invest in joint learning. Moreover, the Rå Biopark initiative in Skibotn is a recent initiative in developing joint concepts in the field of circular economy and waste management in north Norway.

Secondly, there is a demand for additional knowledge-based expertise among the waste management actors in north Norway. As Murat Mirata puts in our interview: while the actual transformation of reforming industrial systems and value chains must be done by industry actors, academic and research institutions often play a key part in guiding decision makers to knowledge-based action.

Thirdly, cross-border initiatives are welcomed in north Norway by the actors. The big hindrance seems to be "know-who": the Norwegian actors need more information about the actors across the border in north Finland and north Sweden.

Finally, cross-border innovation needs success stories and concrete examples to move forward. The cross-border cooperation between Remiks and the Finnish research institute VTT is a good example of this.

The WANO project builds on these lessons to further promote waste management collaboration across the high north.

Learn more:

This Policy Brief is part of the project work for the WANO Waste Management in High North 2021-2024, financed by the Research Council of Norway.

Jukka Teräs, D.Sc. (Tech.), senior researcher at NORCE, is the Project Director of WANO.

For more information about the WANO project, see our website:
www.wanoresearch.no

WANO Scientific Partners:



NORCE is an independent Norwegian research institute that conducts research to facilitate informed and sustainable choices for the future.

Website: Norceresearch.no



Nordregio

Nordregio is a leading Nordic research institute within the fields of regional development, policy and planning. The institute was established by the Nordic Council of Ministers.

Website: Nordregio.org

WANO Business Partners:



HRS

Hålogaland Ressursselskap (HRS) IKS is a waste management company located in Harstad and Narvik, Norway and servicing a total of eight municipalities in the surrounding region. HRS also processes business waste from the region.

Website: HRS.no



Remiks

Remiks AS is a waste management company located in Tromsø, Norway. The company processes municipal waste from Tromsø and Karlsøy municipalities as well as business waste from the region.

Website: Remiks.no

About this publication

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