



RECOWAMA

RFF ARKTIS PROJECT

2023-2025

POLICY BRIEF NOVEMBER 2025

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ReCoWaMa (Research and Innovation with the Waste Management sector in Troms and Finnmark for Value Creation) is a research project that is part of the Norwegian regional research fund programme RFF Arktis. The ReCoWaMa project partners include NORCE Norwegian Research Centre AS (lead partner), University of Inland Norway, and Remiks Miljøpark AS in Tromsø.

MAJOR RESULTS

- **Generation of new research-based and industry relevant knowledge:**

ReCoWaMa described and analyzed the drivers, barriers, cooperation activities, and specific characteristics of the municipal waste management sector in the context of the North Norway innovation system.

- **Cooperation:**

ReCoWaMa acted as research and matchmaking partner in the cooperation dialogue within and between the waste management actors and stakeholders. Waste management in Northern Norway is a surprisingly innovative sector with considerable degree of cooperation, with a well-functioning cluster activity (North Norway Waste Cluster) as well as joint flagship initiatives of waste management in North Norway.

- **International cooperation and benchmarking:**

The ReCoWaMa international cooperation resulted in fruitful cooperation with partners such as the NOWA Interreg Aurora project, the STRAWCO Arctic networking project, and with R&D partners in Italy. ReCoWaMa contributed to networking also in the EU and internationally.

- **Analysis on needs, competences, and cooperation**

ReCoWaMa implemented an analysis of needs, resources, and cooperation among the waste management actors and stakeholders. The analysis and the related discussions provide the North Norway waste management sector with valuable data and insights as well as recommendations for future development.

- **Communication and outreach:**

ReCoWaMa prepared academic publications and provided presentations in academic conferences. The non-scientific communication reached actors and stakeholders in North Norway as well as Nordic and EU stakeholders. ReCoWaMa organized two major seminars and prepared two policy briefs with recommendations for future activities.

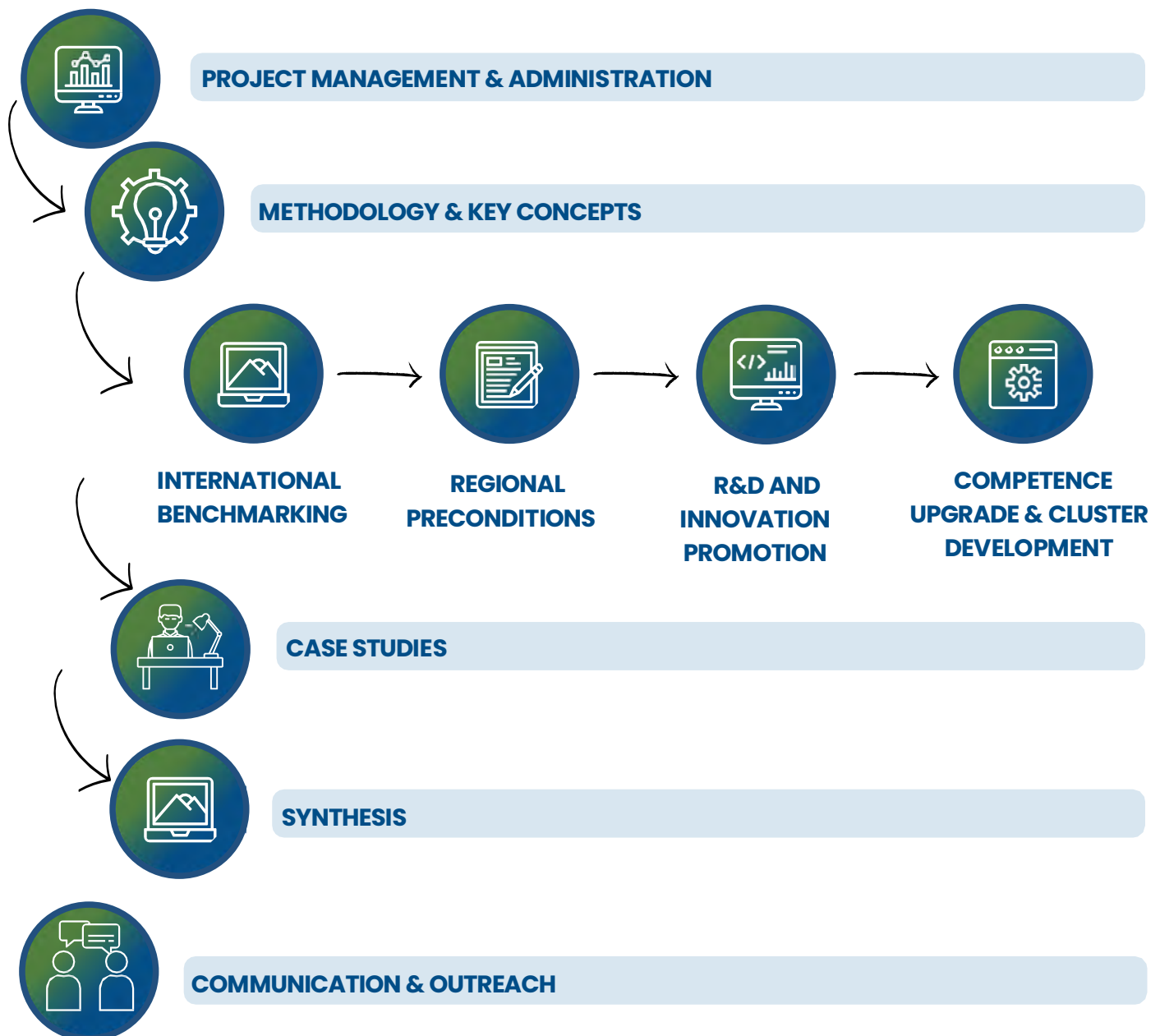
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About RECOWAMA

ReCoWaMa contributes to value creation and positive development in the waste management sector in Troms and Finnmark by enhancing research collaboration between waste management firms and research institutions.

ReCoWaMa generates new research-based and industry-relevant knowledge on Arctic waste management.



Smart waste management in North

The waste management sector in North Norway attempts to reach a scale that enables a critical mass of waste to be processed in a smart way, tackling both technology and sustainability challenges. The waste management actors in North Norway invest in mutual cooperation, too.

The ReCoWaMa project team, in cooperation with the University of Vaasa in Finland, prepared a study in 2024 about how European innovation policies and smart specialisation (S3) can be put to practice in the field of municipal waste management. The study focused on identifying activities and practices related and connected to smart specialisation. The study included interviews with waste management companies and stakeholders and included a learning case of Remiks waste management company in Tromsø.

Our study results indicate that the municipal waste management sector in North Norway has taken considerable steps towards increased innovation and co-operation, largely matching with the smart specialisation concept. The problem-solving processes identified at Remiks include internal problem identification, cooperation in solving the issues and planning for future actions, resembling recently suggested smart specialisation processes in European innovation policy. The Remiks case also provides learning and benchmarking practises, as a good example of joint Nordic learning and cooperation..

Our results indicate that smart specialisation may take place also in municipal waste management, under certain conditions.



Antti Mäenpää,
University of Vaasa,
Finland



Photo: Helge Flick

Read more: Teras J & Maenpaa A (2024) Arctic smart specialisation and municipal waste management, Case: North Norway NORCE Report 2024.



Research meets waste management in North Norway

Interview: Trond Nilsen, Professor, University of Inland Norway, Lillehammer

Professor Trond Nilsen from the University in Inland Norway contributed to the ReCoWaMa research on regional development in the context of waste management in the north.

What did you study under the ReCoWaMa project?

We studied the evolvement of the municipal waste management sector in Northern Norway with focus on regional development and innovation. We followed innovation and development processes in North Norway in close dialogue with waste management actors. We interviewed actors of the regional innovation system in Northern Norway, too, to better understand how firms and non-firms do innovation in waste management.

How would you summarize the key findings?

Our main findings can be summarized in three points.

Innovation and regional development efforts can sometimes turn out to be difficult to perform, especially outside large cities. We learned that it is essential to have intermediaries that connect firms, researchers, and public organizations within the regional innovation system. NORCE played an important role in ReCoWaMa as a knowledge broker between research and business in the region.

Although the innovation system in Northern Norway isn't heavily focused on waste management, the major waste management firms in the region are leaders and pioneers in how they do business. Remiks in Tromsø is an example of a company that identifies, and seizes opportunities with a willingness to take risks where appropriate. Remiks acts as regional leader in developing waste management in the North.

We sometimes get the impression out of public policy documents and research on innovation that only high-tech firms are innovative. In our study, we demonstrated that innovation also exists and emerges in firms outside so-called high-tech sectors. This is an important expansion to the innovation literature and should be given more consideration when public funding is allocated.

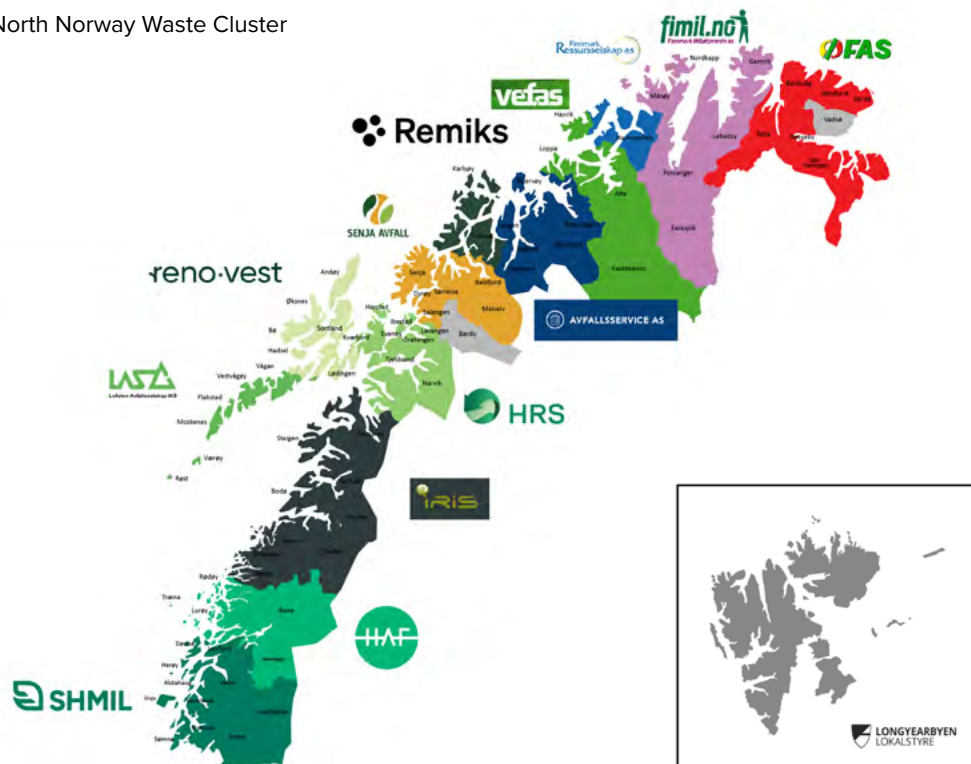
Where do you see the biggest obstacles in the promotion of cooperation between research and waste management practitioners?

The biggest obstacles are threefold. First, people need to know each other and connect to create value. Second, daily operations in firms often exhaust all the available resources and do not leave space for development work and innovation. Third, research can take the initiative and start the first steps. We encourage research actors to cooperation with waste management practitioners.

Flagship cooperation initiatives

Waste Cluster North (www.afkn.no) is a regional collaboration between 14 waste management companies in Northern Norway, collectively covering over 60 municipalities and more than 450,000 residents. The cluster was officially established in 2023 as a partnership for the waste industry, aiming to strengthen the sector through knowledge sharing, collaboration, and sustainable solutions. ReCoWaMa has cooperated with the North Norway Waste Cluster throughout the project.

Figure: North Norway Waste Cluster



Rå Biopark AS (www.raa.no) is one of Northern Norway's biggest environmental collaboration initiatives. Waste from 41 municipalities will be converted into climate-neutral biogas in a new facility in the Senja municipality, 50 km north of Tromsø.

The goal of the Rå Biopark is to establish partnerships by the end of 2025, with construction starting in 2026 and production beginning in 2027.

Rå Biopark has served as innovative joint initiative and study case for the ReCoWaMa project.



Analysis on needs, competences, and cooperation

Introduction to the study

Waste management in the High North faces distinctive operational challenges arising from harsh climatic conditions, dispersed populations, limited infrastructure, and significant transport constraints. These factors require specialized competencies, continuous coordination, and effective strategies for attracting and retaining qualified personnel.

The RECOWAMA team conducted an in-depth interview study in 2025 with waste management operators, branch organizations, and R&D representatives to: (1) identify the sector's most critical competencies; (2) assess factors influencing workforce retention; (3) highlight opportunities for targeted recruitment; (4) evaluate the role of research

and educational institutions in developing relevant expertise; and (5) explore how partnerships between operators and R&D actors can be strengthened to support recruitment and long-term staff development.

While the smaller words show more in-depth information, the colours show the competence category of each term. The figures below present our findings through word clouds. These visualizations emphasize the most frequently mentioned concepts in the interviews—the larger the word, the more often the concept appeared in the underlying data—to provide a first qualitative impression of dominant themes rather than precise quantitative measures.



Skills and competence needs

Core sector competencies span **operational functions** (e.g., driving, logistics, technical services, machine operation), **administrative roles** (e.g., customer service, finance, quality assurance, project management), and **cross-institutional collaboration** (e.g., municipal coordination, R&D partnerships).

Educational requirements: Operational functions predominantly rely on vocational training, whereas administrative functions often involve higher education.

Larger firms increasingly prioritize **digital capabilities**: IT, software, AI and sensor-based systems.

Recruitment sources

Recruitment follows four major avenues:

Educational institutes: Candidates are sourced through educational institutions, including schools, universities, and technical colleges.

Media platforms: Vacancies are advertised across media platforms such as FINN, Facebook, company websites, digital newsletters, and local newspapers.

Recruitment services: Staff are engaged through recruitment services, including private agencies, NAV mediation, platforms like Jobzone, and related advisory services.

Professional networks: Recruitment occurs through sector-based professional networks, including cooperation with transport firms, informal contacts, and industry organizations such as Sirk Norge and Avfallsklyngne Nord.





On-job training VS formal education

Two major pathways for competence upgrade:

On-job training emphasizes practical, workplace-based learning such as introductions, internal schooling platforms, specialization courses, public-sector briefings, and teaching niche responsibilities.

Formal education includes university degrees and high-school and industry courses. While there is no higher education degree on waste management, programs focusing on e.g., the “green transition” or “municipal engineering” are relevant.

Keeping qualified workforce

Our study outlines primary drivers behind employee turnover and retention, offering a comparative view of why individuals leave their positions versus what motivates them to remain. This provides a foundation for developing strategies to strengthen workforce stability. The table below provides a list of responses regarding reasons for quitting/ keeping the job in the municipal waste management sector (Note: not necessarily in the order of priority).



WHY EMPLOYEES QUIT	WHY EMPLOYEES STAY
Financial reasons	Local community connection / service
Physically demanding work	“Waste management is part of something bigger!” (sense of purpose)
Unpredictable work (especially in larger companies)	Multidisciplinary work field
Moving to other places	Modern equipment
Younger employees tend to switch professions faster	Public ownership (stability / public-sector advantages)
Different expectations	Opportunities for continuing education
Working hours	Broad professional network
Working in other processing industries	Predictability (especially in smaller companies)



Photos: Helge Flick

How to foster collaboration between R+D institutions and waste management?

- **Make use of existing networks** and create more venues for information transfer. Industry networks such as Sirk Norge play a key role in such developments.
- **Establish strategic cooperation** with educational institutions: Express needs and foster communication ties
- **Implement employer branding** to attract skilled talent, strengthening organizational reputation, and ensuring a resilient workforce capable of supporting long-term environmental and operational goals.
- **Respond to interdisciplinarity:** study programmes versus fragmented courses from several relevant studies
- **Develop a common understanding** of concepts such as “circular economy”, the “green transition” or “sustainability” to effectively communicate needs and strategies
- **Keep track of emerging trends and youth interests** to ensure the industry remains innovative, resilient, and capable of meeting future environmental challenges.

International cooperation: examples

Place branding cooperation North Norway - Tuscany, Italy: The ReCoWaMa project has continued the previously established research cooperation between North Norway and Tuscany on local acceptance and stakeholder engagement in municipal waste management. The ReCoWama project activities included e.g. presentation of the comparative study Tromsø / Peccioli, Italy North Norway at the annual IPBA conference on Place Branding in Manchester in 2025 (C.Pasquinelli & J Teräs).



Photos: IPBA/David Oates Photography

ReCoWaMa cooperates with the Interreg Aurora project NOWA (2023-2025) which develops sustainable waste management practices through collaboration among waste management stakeholders in the north of Norway, Sweden, and Finland. The project established the Arctic Waste Forum (AWF) to promote international cooperation and address current obstacles hindering the development of the joint waste market in the north.

STRAWCO, an Arctic network of municipal waste management: The ReCoWaMa project has actively cooperated with the Arctic Centre, Rovaniemi, Finland, to establish an Arctic network of municipal waste management. The STRAWCO network initiative aims to generate new research-based, policy-oriented, and industry-focused knowledge and practices to create innovative solutions and to transfer good practices and expertise in Arctic municipal solid waste management. The STRAWCO network initiative extends already to North Finland, North Norway, Greenland, Iceland, and the Faroe Islands.

MAJOR RESULTS

The ReCoWaMa project contributed to value creation and positive regional development of the waste management sector in North Norway in many ways.

- **GENERATION OF NEW RESEARCH-BASED AND INDUSTRY RELEVANT KNOWLEDGE:**

ReCoWaMa contributed to the R&D and innovation of the municipal waste management sector through studies, events, networking, and dissemination activities. ReCoWaMa described and analyzed the drivers, barriers, cooperation activities, and specific characteristics of the sector in the context of the North Norway innovation system. Moreover, ReCoWaMa applied the smart specialisation concept, widely used in innovation policy in the EU and internationally, to waste management analysis.

- **COOPERATION:**

Waste management in Northern Norway is a surprisingly innovative sector with considerable degree of cooperation. The intensive cooperation between the waste management actors has resulted in well-functioning cluster activity as well as joint flagship initiatives of waste management in North Norway. ReCoWaMa acted as research and matchmaking partner in the cooperation dialogue.

ReCoWaMa succeeded in strengthening the international cooperation and benchmarking of good practices, too. The ReCoWaMa international cooperation partners include e.g., the NOWA Interreg Aurora project, the STRAWCO Arctic networking project, as well as R&D partners in Italy on place attractiveness and branding issues related to waste management. ReCoWaMa contributed to the awareness raising and networking also in the EU and international level.



Photo: Jukka Teräs

- **ANALYSIS ON COMPETENCES, SKILLS:**

ReCoWaMa contributed to the development of the municipal waste management sector in North Norway by implementing an analysis of needs, resources, and cooperation among the waste management actors and stakeholders. The analysis and the related discussions provide the North Norway waste management sector with valuable data and insights as well as recommendations for future development.

- **COMMUNICATION AND OUTREACH:**

ReCoWaMa prepared academic peer-reviewed article and several Working Papers on themes such as smart specialisation and waste management in the north, and gave presentations of waste management in the north in academic conferences. The non-scientific communication reached local, national, and international actors and stakeholders, including waste management actors and communities in North Norway, research institutes, regional and national authorities, and Nordic and EU stakeholders. ReCoWaMa organized two major seminars: Research meets waste management in 2024 (in cooperation with the WANO project) and the ReCoWaMa final seminar in 2025. Two policy briefs of ReCoWaMa have been prepared with recommendations for future development of the waste management sector in North Norway. More information about ReCoWaMa: www.recowama.no

POLICY RECOMMENDATIONS

ReCoWaMa highly supports the proactive attitude and innovative actions of the leading actors in North Norway waste management to be further promoted and shared. Although the waste management sector is usually considered a traditional sector outside the sectors categorized as most innovative, the municipal waste management sector in North Norway is surprisingly innovative and provides opportunities for further development. The leading waste management companies, such as the ReCoWaMa project partner Remiks in Tromsø, have shown preparedness and willingness towards the renewal of waste management strategies and activities.

ReCoWaMa highlights the practical, hands-on collaboration by the North Norway Waste Cluster as inclusive, good practice concept, to be further strengthened. The North Norway Waste Cluster, formally established in 2023, encourages waste management actors to joint initiatives and practical collaboration. The North Norway Waste Cluster provides a concrete example of functional collaboration initiative also more broadly in the northern peripheral area with challenges such as long distances and limited number of actors.

ReCoWaMa supports international cooperation in waste management in the North Calotte area, across the Arctic, and with European partners. International cooperation by ReCoWaMa with the NOWA and STRAWCO projects as well as co-operation with Italy provides North Norway with additional insights and good practice examples in the planning and implementation of municipal waste management. The international cooperation should not be limited to technology or operations only but should include also issues such as local attractiveness and tackling the NIMBY (not-in-my-backyard) challenge.

The outcome of the ReCoWaMa needs, competences and skills analysis deserves to be discussed and further utilized by the waste management sector together with the North Norway R&D and educational institutions. The ReCoWaMa analysis on competences, skills and cooperation of the municipal waste management sector in North Norway described the challenges and hinders e.g. in the research - practitioners cooperation and revealed a number of important ways of improving and upgrading the competences.

Finally, ReCoWaMa demonstrates the positive impact of joint development initiatives to increasing the innovativeness of a traditional sector such as municipal waste management. Together with several other regional, national, and international initiatives and projects, ReCoWaMa provides insights, contacts, and good practice to be applied by the important sector of municipal waste management in North Norway.



Photo: Jukka Teräs

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