



European Construction Sector Observatory

Policy fact sheet

Finland

RANTA Project:
Circular Economy Aspects
of Construction in Municipalities

Thematic objectives 3 & 4

November 2020



In a nutshell

Implementing body	Green Net Finland ry, HAMK Häme University of Applied Sciences, Metropolia University of Applied Sciences and SYKLI Environmental School of Finland
Key features & objectives	The RANTA project aimed to enhance municipalities’ ability and know-how on implementing methodologies and ways to operate, supporting circular economy activities in building demolition and controlling land masses in construction.
Implementation date	Nov 2016 – Jan 2019
Targeted beneficiaries	Finnish municipalities (mainly Hämeenlinna, Helsinki and Vantaa)
Targeted sub-sectors	Demolition, recycling
Budget (EUR)	380,000
Good practice	★ ★ ★ ★ ★
Transferability	★ ★ ★ ★ ★

The circular economy promotes the reuse of materials and waste prevention. The EU’s Circular Economy Action Plans (2015, 2018 and 2020¹) and the European Green Deal², the European agenda for sustainable growth, provide a roadmap and enabling framework for the transition of industry to a circular economy.

Circular economy policy initiatives target the entire product lifecycle, from design, to manufacture, to sustainable consumption, to ensuring that resources are used, reused and recycled for as long as possible. As part of this plan, the EU has established **new goals for recycling and for the**

amount of waste that ends up in landfills. Member States are tasked with recycling at least 70% of construction and demolition waste by 2020³ and 55% of all municipal waste by 2025⁴. The Finnish government has also established its own goals and objectives to transform Finland into a socially, economically and ecologically sustainable society. Creating a circular economy as an important part of the government programme.

To achieve both Finnish and EU goals, the National Waste Plan of Finland for 2023⁵ aims to slow down the growth in the volume of municipal waste and increase the recycling of packaging waste. It also establishes **specific objectives for construction and demolition waste.** It aims to raise the material recovery rate of construction and demolition waste to 70%, reduce the volume of construction and demolition waste, and improve the accuracy and reliability of statistics on construction and demolition waste⁶.

With the exception of mining, construction generates more waste than any other industry in Finland⁷. Construction/demolition waste and soil management is a significant challenge for municipalities and other stakeholders. A lack of understanding about the impact of materials on the whole cycle is part of the problem.

The RANTA project was launched to address the municipal waste and circular economy challenges. It aimed to identify and test innovative ways of reusing construction material from public buildings after their demolition. The project conducted detailed case study analyses of onsite demolition projects commissioned by different municipalities in varied locations.

RANTA was a successful and good practice project which has provided municipal authorities with valuable findings, recommendations and examples of how to make demolition procedures more resource efficient.

1.

General description

The RANTA project was launched in November 2016 and was completed by the end of January 2019. It was implemented by a consortium of four partners – Green Net Finland (coordinator), Metropolia University of Applied Sciences, the Finnish Environmental College Sykli and Häme University of Applied Sciences (HAMK)⁸. The project also forged an active partnership with the cities and municipalities of Helsinki, Vantaa and Hämeenlinna, as well as selected commercial demolition operators and the Finnish Ministry of the Environment⁹.

The overall objective of the RANTA project was to promote circular economy opportunities in municipalities, in relation to the built urban environment and land management.

Cities and municipalities own a substantial number of buildings from which parts and materials could be reused¹⁰. The use of circular economy approaches therefore have the potential to achieve a significant impact on material reuse and waste prevention.

RANTA's four operational objectives¹¹ were to:

- Develop procurement criteria to increase the recovery rate of building waste and highlight process bottlenecks;
- Develop an understanding of the material flows resulting from the demolition of a building, their value and the possibilities to reuse them;
- Map relevant stakeholders, activating new operating models and identifying new business opportunities;
- Investigate land management in relation to soil cleaning and infrastructure construction, in accordance with circular economy principles.

RANTA aimed to explore the barriers to and opportunities for reuse and it sought to identify promising approaches and organisations capable of supporting the process. In order to do that, circular economy approaches were planned, developed and analysed through case studies on buildings and construction areas owned by the municipalities:

1. City of **Helsinki** – demolition of Hernematala Industrial Hall;
2. City of **Vantaa** – demolition of a block [this was eventually cancelled];
3. City of **Hämeenlinna** – land management in relation to soil cleaning and infrastructure demolition (Engelinranta contaminated soil remediation project and Kauriala school demolition contract).

To increase understanding of the procurement process, the project aimed to develop **examples of circular economy public procurement criteria for building demolition projects**¹². The project focused on the municipalities in which the project's sites were located (Helsinki, Vantaa and Hämeenlinna).

RANTA aimed to **identify links between stakeholders, needs and good practices, and provide recommendations** for stakeholders (e.g. municipalities and private companies) and make them available so they could be used by other municipalities in the area¹³. It sought to analyse demolition operations using onsite monitoring and interviews with municipal contracting authorities and contractors. An assessment of demolition training needs was also part of the operator field analysis objectives.

The project also sought to examine the **role of municipalities as commissioners** of demolition work and the extent to which customers can influence the implementation of circular economy approaches in their own demolition sites¹⁴.

RANTA was funded by the European Regional Development Fund (ERDF) and the cities of Helsinki and Vantaa. **The total investment in the project amounted to EUR 380,000.** 70% (EUR 266,000) of the total project budget was sourced from the ERDF through the “Sustainable growth and jobs”

Operational Programme for the 2014-2020 programming period¹⁵.

2.

Achieved or expected results

The RANTA project aimed to build an overall understanding of municipal demolition projects, the characteristics of buildings subject to demolition, and the key barriers to increasing the recycling and reuse of building parts and materials¹⁶.

Demolition of Hernematala Industrial Hall (Helsinki)

The RANTA project conducted a circular construction analysis of the Hernematala demolition project, covering onsite demolition activities and project documentation. Students at the Metropolia University of Applied Sciences analysed the site's tendering documents and proposed a circular economy development plan. The demolition contract was then analysed and its data was compared to the actual data of the demolition project. Other aspects analysed included the recycling rate, the type of waste recovered, where the waste was taken (including transport/logistics analysis) and how it was used.

Engelinranta contaminated soil remediation project (Hämeenlinna)

The polluted soil of the Engelinrata area had a remediation plan that had to be executed as a precondition for developing a residential area on it. The RANTA project cooperated with the city authorities in the implementation of the renovation contract. RANTA assisted with the tender preparation work, conducted onsite monitoring, and discussed onsite matters with the building inspector and the contractor. The RANTA project also collected information on soil remediation projects carried out elsewhere.

Demolition of Kauriala School (Hämeenlinna)

As part of the RANTA project, Häme University of Applied Sciences organised an auction of the building materials prior to the demolition contract

tender and also helped to prepare the contract. For the auction, they produced an inventory, negotiated with an operator and participated in customer service on the day of collection.

The demolition project that was meant to take place in the city of Vantaa was eventually cancelled due to scheduling delays. Several contractors stated that the timeframe for submitting a tender and completing a contract is often so tight that there is not enough time to identify recycling opportunities¹⁷.

In parallel with its main objectives, the RANTA project conducted **other research activities**:

- A noise measurement study for recycling concrete onsite;
- A study of waste material recovery possibilities;
- Research on circular construction business opportunities, which included a workshop with construction, demolition and circular economy companies and experts.

The RANTA project co-produced a new Demolition Procurement Guide under the leadership of the Ministry of Environment. The guide drew on the findings of the RANTA project.

The RANTA project provided municipalities with concrete proposals on how the circular economy could be better promoted. The **findings of the RANTA project** concluded that¹⁸:

- The circular economy approach is generally not considered when purchasing a demolition contract;
- The customer has a significant influence on a demolition project by setting the requirements for procurement;
- The lowest price tends to be the main criterion for selecting tenders;
- Buying new materials is easier and safer than recycled ones;

- Municipalities do not have the capacity to (re)sell materials for demolition sites. This fact could generate opportunities for third parties;
 - The importance of greenhouse gas emissions from demolition waste has been forgotten in urban roadmaps and other similar studies;
 - Concrete numerical values for demolition materials should be a city's own targets;
 - Reuse requirements for biomaterials are needed in municipal procurement criteria and more ambitious targets should be established for the use of materials;
 - The involvement of the EU pre-demolition audit thinking should be increased in municipal demolition procurement;
 - Cooperation with recycling centres needs to be improved so that suitable materials for recovery and reuse can be identified;
 - New and recycled materials must have a uniform classification, as is already the case in the Netherlands;
 - A uniform classification of demolition waste would allow for joint coordination but requires better documentation (electronic documentation and material flows and statistics documentation);
 - The lack of Circular Economy (CE) marking is an obstacle to reuse;
 - CE marking should also be assigned to demolition materials to improve comparability and increase recovery;
- It is advisable to focus the reuse efforts on large volumes of demolition materials. Concrete is the largest material in terms of quantity, which may account for 80-90% of the total site material flow, so it should be used in the best possible way and as close as possible to the demolition site. As an example, during the demolition of the Kauriala School in Hämeenlinna, the concrete was crushed at the demolition site to grain size and was directly taken from the demolition site to a nearby new construction site for reuse¹⁹;
 - In new constructions, bidders should not be overly constrained by pre-defined materials so that they can better reuse demolition materials;
 - Demolition should be seen as a circular economic measure that allows a municipality to:
 - Improve its resource efficiency;
 - Promote low carbon activities;
 - Increase reuse in the municipality, which could improve employment, reduce transport and save time and money;
 - As an additional result of the project, the work started in RANTA enabled the same consortium to launch a new project (HYPPY) to delve deeper into potential business models and procedures for reusing building parts and materials from municipal demolition projects²⁰.

3.

Perspectives and lessons learned

Circular economy solutions require broad stakeholder engagement and input.

The transition to a circular economy in demolition or any other activity can only be done collectively. The scale of the challenge is significant because it requires fundamental and systemic change to business operations, practices and culture. It is therefore imperative to engage with stakeholders throughout the value chain to understand how they operate and what their challenges are. The findings of the RANTA project reveal that there are a wide range of interconnected issues that demolition project stakeholders face. To be successful, a circular solution for the demolition value chain will need to address those issues and ensure stakeholder buy-in.

Stakeholder capacity constraints provide opportunities for other/new stakeholders to provide circular construction solutions.

The limited capacity of some stakeholders – measured in terms of time, working capacity, knowledge of procedures, knowledge of materials and material flows and other technical knowledge – can affect their ability to implement effective circular economy measures. For example, the RANTA project demonstrated that municipalities do not have the capacity or skills to (re)sell parts and materials for reuse. Constraints such as this are a business opportunity for other/new stakeholders to fill the gap and offer circular economy-related services to value chain customers, such as municipalities.

Customers and procurement procedures have the potential to be key circular economy enablers.

Municipal authorities and their procurement activities are central to the design and implementation of demolition activities. As a client, municipalities have the ability to define minimum requirements in tendering processes and to tailor

contracts related to municipal land. An example could be to specify pre-conditions for transforming a polluted area into a residential area.

It is therefore in the power of the client to demand greater reuse and recycling of parts and materials and to encourage contractors to meet those demands. Demolition work is often driven by concerns about cost and speed, rather than resource efficiency. That suggests that clients such as municipalities should engage more if reuse and recycling goals are to be met.

Practical and local knowledge leads to better circular solutions.

The RANTA project has demonstrated that practical assessments of a range of different real-life demolition projects in (at specific sites in Helsinki and Hämeenlinna) can make a significant contribution to the circular economy transition. The successful implementation of circular economy related activities requires deep knowledge of all the stakeholders involved in specific workflows and systems. The RANTA project was able to closely follow and analyse the work of contractors and municipalities. The project findings then provided valuable input into the production of national building demolition procurement guidelines.

Onsite work helps to build a more holistic depiction of demolition project environments.

Working onsite makes it easier to capture information directly from stakeholders, identify the blind spots and gain a more realistic understanding of an environment. As an example, RANTA's onsite work identified differences between planned and actual waste quantities, problems related to noise levels, information about material transport logistics, and more information about the potential recovery of specific materials.

4.

Conclusion and recommendations

The RANTA project successfully conducted an in-depth study of demolition projects commissioned by municipalities, at a number of different sites in various locations. It found that the reuse and recycling of materials is not a guiding factor in demolition procurement. Circular economy principles and targets are not yet considered as part of the minimum requirements and quality criteria in procurement processes. If a customer does not require a plan to sort demolition waste and reuse/recycle materials, it is unlikely that contractors will provide one.

Scheduling and capacity issues can limit the ability of demolition project stakeholders to incorporate recycling activities. The option to involve third party service providers (e.g. to sell/resell recycled materials) may help to improve recycling rates. High-volume materials are also high value and high impact materials in recycling terms. Better planning is also needed to support their reproduction/reuse.

Looking forward, five recommendations are suggested to help increase the impact of future circular economy initiatives such as RANTA:

- Customers (e.g. municipalities) should be encouraged to take a lead in setting more ambitious reuse and recycling goals for the demolition projects they commission. They are in a position to set the rules and requirements during the project definition and procurement phase. Better engagement and increased demand for circular solutions would help to incentivise the sector to provide those solutions;
- Future circular initiatives targeting the demolition or other sectors should place strong emphasis on the reuse of high-volume materials. This is a key finding of the RANTA

project, which found that concrete represents about 80-90% of the total site material flow. This focus would help to maximise the impact and value of circular strategies;

- Consideration should be given to developing a standard classification system for reused and recycled materials and for demolition waste. It would make it easier to assess, compare, control, coordinate and improve circular material flows;
- As highlighted by the RANTA project, incentive measures should also be considered to encourage contractors to be resource efficient. A performance-related reward system is one possible example;
- Third parties should be encouraged to join the demolition process to provide circular economy services to fill gaps that may exist.

Overall, the RANTA project is rated a “5-star good practice measure” on a scale of 1 (low) to 5 (high).

The project has produced a detailed analysis of the demolition process applied in onsite projects in different locations. It has identified the challenges to and opportunities for circular resource solutions. It has also reported a significant number of findings and recommendations, based on the analysis conclusions across varied sites and projects. In addition, the RANTA project received a REGIOSTARS 2019 finalist award by the European Commission for its exceptionally innovative and influential nature. It is therefore a valuable example of a good practice.

The RANTA project is rated a “5-star transferable measure” on a scale of 1 (low) to 5 (high).

Municipalities across Europe own and manage large real estate portfolios. The case study analysis approach taken by the RANTA project therefore has the potential to be readily transferable to other localities. Interested parties could use the RANTA

approach and its findings as a guide for the development of their own localised assessment projects.

It would be interesting to see other localities conduct similar types of projects in their own area

to build a broader European overview of demolition projects, the issues they face, the circular economy opportunities in each case, and eventually, the strategies they put in place. This would provide a learning platform for all involved.

Endnotes

- 1 European Commission, Circular Economy Action Plan, 2015-18:
https://ec.europa.eu/environment/circular-economy/first_circular_economy_action_plan.html
https://eur-lex.europa.eu/resource.html?uri=cellar:8a8ef5e8-99a0-11e5-b3b7-01aa75ed71a1.0012.02/DOC_1&format=PDF
European Commission, Circular Economy Action Plan, 2020:
<https://ec.europa.eu/environment/circular-economy/>
<https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1583933814386&uri=COM:2020:98:FIN>
- 2 European Commission, A European Green Deal, 2019:
https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en
- 3 European Commission, Environment, Construction and Demolition Waste (CDW):
https://ec.europa.eu/environment/waste/construction_demolition.htm
European Environment Agency, Briefing, Construction and demolition waste: Challenges and opportunities in a circular economy:
<https://www.eea.europa.eu/themes/waste/waste-management/construction-and-demolition-waste-challenges>
- 4 CIRCWASTE Project, Goals and measures:
https://www.circwaste.fi/en-US/Goals_and_measures
- 5 Ministry of the Environment of Finland, From Recycling to a Circular Economy: National Waste Plan to 2023, 2018:
https://julkaisut.valtioneuvosto.fi/bitstream/handle/10024/160889/SY_01en_18_WEB.pdf?sequence=1&isAllowed=y
- 6 CIRCWASTE Project, National Waste Plan:
https://www.circwaste.fi/en-US/Goals_and_measures/National_waste_plan
- 7 Rakennerahastot.fi, Project presentation (ERDF): Circular economy in construction in municipalities (RANTA):
https://www.rakennerahastot.fi/web/etela-suomen-suuralue/uutiskirjesisallot/-/asset_publisher/2JzdCX63qmqd/content/hanke-esittely-eakr-rakentamisen-kiertotalous-kunnissa-ranta-/maximized
- 8 Green Net Finland, RANTA - Construction circular economy in municipalities:
<https://gnf.fi/fi/gnf/ranta-rakentamisen-kiertotalous-kunnissa/>
- 9 Green Net Finland, RANTA project was awarded in a competition by European:
<https://gnf.fi/en/yleinen-en/ranta-project-was-awarded-in-a-competition-by-european-commission/>
- 10 Green Net Finland, RANTA project results:
<https://gnf.fi/en/ranta-project-results/>
- 11 Hämeenoja, Eeva, RANTA-hanke Rakentamisen kiertotalouskunnissa presentation, 2017:
<https://docplayer.fi/65943317-Rakentamisen-kiertotalous-kunnissa.htm>
- 12 Ibid
- 13 Finnish Ministry of Employment and Economy, Description of the RANTA project:
<https://www.eura2014.fi/rrtiepa/projekti.php?projekтикoodi=A72361>
- 14 Ibid
- 15 European Commission, RANTA: Finnish project improves demolition waste reuse:
https://ec.europa.eu/regional_policy/en/projects/finland/ranta-finnish-project-improves-demolition-waste-reuse
- 16 Finnish Ministry of Employment and Economy, Description of the RANTA project:
<https://www.eura2014.fi/rrtiepa/projekti.php?projekтикoodi=A72361>
- 17 Ibid
- 18 Häkämies, S., Vehkalahti, K., Lutfi, E., Uotila, T., Kivistö, P., Rautalin, K., Raimovaara, M., Raimovaara, E., Viluksela, P., Tohka, A., Koivumaa, V., Yli-Pentti, A. & Järvenpää, T. Rakennusten purku-urakoiden ja maamassojen hallinnan kiertotalous – nykytila, mahdollisuudet ja haasteet kunnissa. Rakentamisen kiertotalous kunnissa (RANTA) -hanke. Green Net Finland, Metropolia ammattikorkeakoulu, Suomen ympäristöopisto Sykli & Hämeen ammattikorkeakoulu. 59 s. Saatavissa (accessed 27.10.2020), 2018:
http://gnf.fi/wp-content/uploads/2016/04/GNF_RANTA-Loppuraportti_WEB.pdf
- 19 Ibid
- 20 Ibid