

Department of Sustainable Waste and Water, City of Gothenburg

Research and Development Agenda



The purpose of this R&D agenda is to:

- Identify and prioritize; areas of research and innovation where there is a knowledge gap between current and desired situation
- Identify and prioritize; areas of research and innovation that should be financed by the Department of Sustainable Waste and Water

The Department of Sustainable Waste and Water must meet the needs of our customers and users today, as well as in a future where the prerequisites have changed.

Therefore, we must identify the long-term challenges within research and innovation. The R&D agenda lays out the priority areas within water supply, wastewater collection systems and waste management. The need for research, innovation and external collaboration is highlighted and prioritized within each of these three areas.

Water

Maintaining a chemical barrier – detect and remove chemical hazards

There are known risks with several chemicals today, such as oil, PFOS and pharmaceutical residues. However, in the future we will also need to handle unknown chemical hazards, including cocktail effects. The challenge lays in handling these risks in a safe way as well as in the right time, through for example, chemical risk analysis including minimizing the risks.

Leakage detection

We need to minimize the leakage through strategic leakage detection. That could for example be to optimize the pressure within the pipe network and relieve the pressure on it thru the collection of data, measure and control the pressure.

Optimize renewal methods for the water supply

We will identify and test methods to optimize rejuvenation of the water supply network. Moreover, we also need to improve a hydraulic model across the distribution system.

Raw water supply

We must investigate future needs of reserves for raw water from alternatives that can complement Göta Älv. We need to investigate future outlets for the drinking water sludge from the water treatment plants.

Example of research challenges: Water

- Leakage detection; Methods to detect leakage on plastic pipes and larger pipes. Renewal planning.
- Future outlet for sludge from water treatment plants.
- Materials in contact with drinking water; water quality impact (concrete, pipe material)
- Reservoir Risks: investigate the need for action for problematic reservoirs
- Chemical hazards: preparation and new directives.
- Quality risks linked to contaminated soil and pipe material
- Alternative raw water compliment (Lygnen/Mjörn)
- Microbial safety in drinking water, distribution and treatment

Waste water

Improved surface water quality when it comes to environmental impact (microplastics, PFOS, new substances)

We need to improve recipient statuses according to environmental quality standards (control program, upstream work). We also need to bring forward an action plan for recipients and an evaluation model to support decision making.

Improved storm water quality in urban development

There is a demand for a model on how to improve storm water quality, for example thru an emissions trading cap or compensatory measures. We need to clarify the sustainable level of inflow and infiltration water. In this area it is important to include risk management and decision support tools to be able to make well-balanced sustainable decisions.

Pluvial Rainfall (Cloudburst) management

The goal is to create a resilient society that can manage cloudburst. Access to land and how measures will be financed are challenges, but also how well-preparedness and organisation will be achieved to meet this challenge.

Maintenance prioritisation

A tool is needed to be able to prioritize the right maintenance measures when it comes to storm water and the sewage systems. We must develop methods for supporting decision making when prioritizing between measures and to integrate new innovations into the administrative organisation (for example VR-control).

Example of research challenges: Waste water

- Modelling and measurement: Dynamic modelling and measurement of storm water quality
- To determine a sustainable level of inflow and infiltration
- Develop blue-green values and innovative solutions in city planning (ecosystem services, bio coal, etc)
- Smart surveillance systems: Through continuous measures of storm water, sensor development, etc.
- Cloudburst management: Climate adaptation measurements for cloudburst events.
- Improved reclamation of nutrients in sludge
- Renewal planning: Platform for collaborative data and prioritization of maintenance

WASTE

Enable sustainable behaviour

The citizens of Gothenburg should have knowledge on how to prevent waste. It should also be easy for the users to sort their waste for collection and recycling.

Waste management solutions in a dense city

We must find solutions for waste collection, reuse systems and prevention of waste which works in the new and dense cityscape of Gothenburg. The dense city might call for more and different types of transport systems as well as for a more costly waste management system and areas for reuse.

Food waste treatment

The technique must be developed further as to increase the yield of biogas and biofertilizer in the process of treating food waste.

Resource management

We need to develop treatment methods to move up the waste hierarchy. Can smart technology help us move forward?

Example of research challenges: Waste

- The future of waste management: Holistic view of sustainable waste management
- Innovative treatment measures and management to move up the waste hierarchy, for example longer life-span of electronics
- Increased knowledge about what is required for the citizens of Gothenburg to move up the waste hierarchy
- Increased knowledge about hazardous waste for citizens to enable correct handling
- Find solutions for sustainable and efficient waste management within the dense city, for example resource efficient transportation
- Behavioural change and optimisation of waste management through digitalisation

If you have any questions regarding the Research and Development Agenda or the work of The Department of Sustainable Waste and Water, City of Gothenburg, please contact:

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