Tampere - from linear to circular bioeconomy

Competence centre develops industrial scale waste-based innovations

The Tampere region has created a circular innovation ecosystem to develop, pilot and demonstrate solutions to rise to current and future resource challenges. Its ECO3 business park supports multi-disciplinary cooperation to find new ways to turn waste into raw materials and ideas into products and exports - and reduce waste management costs.

The Tampere region had responded to Finland's determination to move away from the linear model of resource consumption by setting an ambitious goal for municipal waste management. It aimed to develop the management of the whole value chain, focusing on the recovery state and costs to consumers. With the separation of waste already enshrined in national law and a far-sighted public company, Tampere Regional Solid Waste Management, taking the lead alongside the city of Nokia, Tampere and the surrounding cities were in a good place to get to work. Then a decision was made which opened the door to an even bigger, bolder plan that would fast track progress.

When Tampere Regional Solid Waste Management decided to invest in a new digestion plant to replace composting, and its counterpart Nokia Water was planning a new waste water treatment plant, they recognised their shared interest in building at the same site. This presented an opportunity to designate the site a biomaterials centre and to foster a circular innovation ecosystem of municipal organisations and private enterprises, plus research institutions, where one organisation's waste could be turned into another's commodity.

> "Private companies have in-depth expertise in their own fields, while public operators have mastered large systems – we truly want to use that as a basis for finding new models that are useful to everyone at ECO3."
>
> ***Harri Kallio - CEO, Tampere Regional Solid Waste Management Ltd***

cities in action
November 2017

where: Tampere region
what: Cooperation
when: 2013 - ongoing

Making connections

This concept was turned into reality on a 600 hectare site within Finland's leading bio- and circular economy business park. Its name, ECO3, reflects the goal of developing innovations in the bio-, water- and circular economies. Despite the scale of the project, no municipal taxation has been needed, with the new treatment plants funded by their customers, the waste producers.

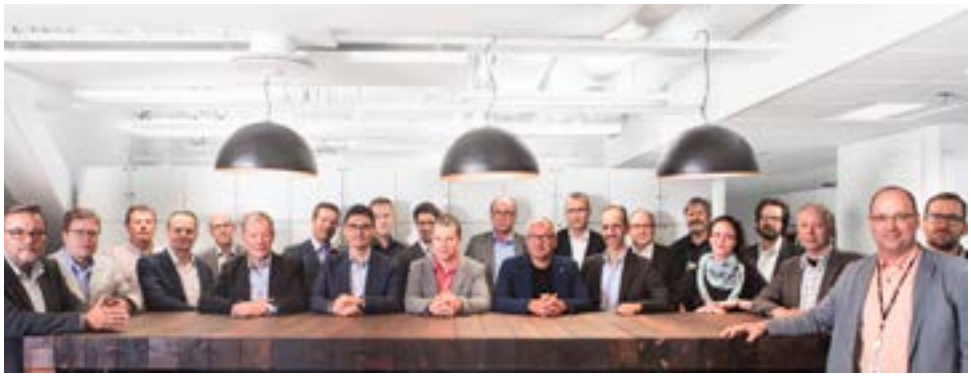
The development of the ECO3 area is the responsibility of Verte, an ECO3 platform company owned by the city of Nokia. Verte develops bio- and circular economy businesses and innovations on an industrial scale. It also markets the area, matchmakes private enterprises, looks for funding and R&D projects for stakeholders and helps scale cooperative models. The Tampere region economic development agency, BusinessTampere, is tasked with getting companies to move to the area and link their operations into its regional corporate network.

> In the ECO3 area, bio- and circular investments will be translated into practical activities in the coming years, making ECO3 business area the best bioeconomy and circular economy hub in Finland.
>
> ***Sakari Ermala - CEO, Verte***

Reusing waste

The main ideas driving the work at ECO3 relate to nutrients, wood and energy. It is particularly concerned with the development of the nutrient cycle and the recovery of nutrients. This will be aided by the anaerobic digestion plant, which has two separate material lines, one for waste water sludge and one for biowaste and food industry, agriculture and forestry residuals. Potential end products include biological nutrients for food production, biogas for vehicles and raw materials for earthworks.

Finland produces such a wide range of wood products that there is much to be gained from understanding how to make circular use of all parts of the material flow. To capitalise on this potential there are plans for a 32 hectare biomass terminal at ECO3. This will act as a centralised area for the distribution and processing of wood-based materials for the energy industry and a draw for companies involved in the timber cycle and bio economy based activities.



ECO3 is also focused on making the versatile production of renewable energy and biofuels possible. It already has biogas production plants and runs pilots and demonstrations related to the industrial processing of biologically based fuels derived from by-products and waste products.

Accelerating progress

The experience of pyrolysis specialist Ecomation exemplifies the ECO3 advantage. When it decided to build a new plant at ECO3 not only were land and permit issues sorted smoothly, but Verte found them suitable partners. In just over a year, Ecomation had set up a plant for processing decommissioned car tyres and plastic waste which its latest pyrolysis technique can use to create oil, carbon and gas - without generating any emissions.

ECO3 is not only helping to restructure a vital industry, it has also already been instrumental in achieving the lowest waste management prices in the country. Enterprises and their partners have so far agreed to make investments worth around €60m between 2016-2019. This success owes much to ECO3's location, platform services and cooperative spirit, as well as to the support of citizens who start the process by sorting their waste, and farmers who are open to trying new green and circular ideas.

The long-term objective of ECO3 is to develop service models for the management of municipal waste in cooperation with national and international partners using smart technology. In the meantime, the concept is to be replicated in another area of Tampere, where good use will be made of the lessons learned at ECO3.

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