



Valio and Gasum intend to make energy from farm manure

Carbon footprints for food and traffic are a hot topic that touches everyone in Finland. Traffic is the source of a fifth of Finland's greenhouse emissions, and milk's share of the emissions hovers around four percent. We are in need of new ways to control climate change. Valio, the food company, and Gasum, the energy company, intend to find solutions to the climate challenge together: cow manure can be used to generate biogas, which can replace fossil fuels used in transportation. This new statement of intent serves to initiate an investigation into an appropriate cooperation model.

Valio, owned by Finnish dairy farms, wants to reduce its milk chain's carbon footprint to zero by 2035. This ambitious goal can be reached, especially, in two ways: binding more atmospheric carbon dioxide in grass fields and generating biogas from manure to replace fossil fuels.

- It's great that a larger group of Finns want to make environmentally sustainable choices. Our mission is to find new ways to reduce milk's environmental effect. Valio is owned by 5,000 Finnish dairy farms with cooperatives in between. Our calculations show that if we used the manure from all our farms to make biogas, the volume would be enough to fuel the farm machinery and Valio's milk collection trucks. Recycling manure into biogas could, therefore, reduce milk's carbon footprint by up to 50 percent. This would reduce the use of fossil fuels as well as methane emissions, generated during manure storage and use, says **Juha Nousiainen**, Valio's director for the carbon neutral milk chain.

Biogas to reduce traffic emissions

Finland produces roughly 15 million tonnes of manure every year, making it an interesting raw material for larger-scale biogas production. Currently, the market has not taken off, as using manure in biogas production is not profitable in Finland. In other Nordic countries, government subsidies make it possible to use manure as both an ingredient for biogas and as recycled fertiliser, enabling a better nutrient cycle.

- As the largest biogas producer in the Nordics, working together with Valio is a natural solution for us to create solutions for a circular economy. Gasum invests strongly in growing its gas refuelling station network in Finland and the other Nordics. Biogas production must increase to meet traffic emissions reduction targets. We have worked with Valio before. Valio has recently rolled out its first biogas-fuelled distribution and milk collection trucks. Both trucks run on Gasum's biogas, which uses, among other things, waste from Valio's dairies as raw material," says **Matti Oksanen**, Gasum's director for business development.

Finland's Ministry of Transport and Communications published an action plan in December 2018, outlining the changes in Finland's transportation towards 100% renewable fuel by 2045. One solution is to increase the share of renewable fuels, such as biogas. At the same time, Finland's government has set a goal to have 50% of our farms' manure to be recycled by 2025.

Biogas, clean water, and fertiliser

The manner of Valio and Gasum's cooperation will be detailed over the course of this year. One option is to build a shared biogas plant, or a network of several plants. All the while, Valio and Gasum are continuing to design their shared plant at Nivala, in Finland's Ostrobothnia region. An investment decision on the Nivala plant has not yet been made, and the project is in the planning stages.

In 2017, Valio was the first in the world to patent a method to turn liquid manure into both clean water and easily transportable, organic-approved phosphorus and nitrogen fertiliser fractions that are easy to spread. The same process allows for producing biogas from dry manure fractions and other milk chain side flows. There are many benefits: using slurry as a fertiliser gets easier, nutrient cycling becomes more efficient, and the runoff of nutrients decreases. The method differs from current separation processes in that it's possible to remove most of the water from the fertiliser fractions and turning the energy in manure to biogas. Valio has made use of its milk component processing know-how in the manure nutrient separation process.

Like black gold – 3 facts of manure and recycling

1. Manure energy can replace fossil fuels

Finland produces roughly 15 million tonnes of manure every year, the energy in which could be used to make biogas. (Source: Luke Natural Resources Institute Finland, The Finnish Normative Manure System)

2. Dwindling world phosphorus reserves

Manure, in addition to energy, contains valuable nutrients that plants need: nitrogen and phosphorus. Phosphorus is a mineral that plants need to grow. The world's reserves of phosphorus are dwindling quickly, which means we need new solutions for mineral recycling, soon. Recycling the phosphorus and nitrogen in manure makes it possible to use fewer chemical fertilisers.

3. Manure needs a lot of storage space and field area

From a farmer's perspective, liquid manure needs large slurry tanks and wide fields to spread the manure on. If a milk producer wants to expand their farm, i.e. to have more cows, they also need larger fields. Buying new fields, however, makes little business sense, if existing fields can produce a sufficient harvest. Cutting down forests for fields just to spread manure is not environmentally sustainable.

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VALIO FROM FINLAND – THE WORLD'S MOST INNOVATIVE DAIRY AND FOOD COMPANY

Valio, offering the taste of Nordic nature since 1905, is a brand leader and the biggest dairy business in Finland and a major player in the international dairy ingredients market. The company is owned by dairy cooperatives comprising some 5,100 dairy farmers.

Wellbeing is at the heart of Valio's world leading technology innovations, expertise and products that are made from clean Finnish milk and other ingredients. Our product development follows in the footsteps of Nobel Prize winner A. I. Virtanen, and the company holds 350 patents in 50 countries. Our efforts to improve animal wellbeing are resolute, and we know that only healthy cows can produce premium milk products. Valio's milk ranks among the cleanest in the world, and we have zero tolerance for antibiotic residue in milk.

Valio has net sales of EUR 1.7 billion and is Finland's biggest food exporter. Valio products are found in some 60 countries and account for 30% of Finland's total food exports. Valio seeks strong growth in international markets and has subsidiaries in Russia, Sweden, the Baltics, USA and China.

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