



How two shippers enabled more climate efficient bread delivery
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1. Background

In this case study, two examples show how organizational and technical measures can reduce greenhouse gas emissions as well as costs in fresh bread distribution. The compilation is based on interviews with Hannu Nylander, Logistics & Service level Director at Vaasan in Finland and Niels Kristian Holm, Supply Chain Manager at Schulstad in Denmark. Both companies are part of Lantmännen's Unibake.

Lantmännen is an agricultural cooperative owned by 25,000 Swedish farmers with operations throughout the value chain. Operations are run in the divisions:

- Agriculture offering products and services for agricultural activities
- Machinery that imports, markets and sells agricultural and construction machinery
- Energy, which is one of Sweden's largest producers of bioenergy products
- Food that develops, refines and markets food products and meal concepts

The Food Division has the business areas; Lantmännen Cerealia and Lantmännen Unibake. Production takes place at 46 plants and within the division there are brands such as AXA, Kungsörnen, Amo, Regal, FINN CRISP, Bonjour, GoGreen, Gooh, Hatting and Korvbrödsbagarn.

In this case study, we focus on the Unibake business area and their distribution of fresh bread in Denmark and Finland. Overall, Unibake's energy and climate work is based on energy efficient bakeries 'furnaces, switching to LED lighting and constantly measuring and monitoring the savings from such measures via a digitized monitoring tool. By improving energy efficiency and other initiatives Lantmännen's overall climate goal is to reduce carbon dioxide emissions by 40% by 2020 compared to base year 2009.

Lantmännen's overall climate target for the Group's purchased transport is to reduce greenhouse gas emissions (CO₂e wtw) by 70% by 2030 from the base year 2009. The target is set relative to sales and also applies to Unibake. In both Denmark and Finland, active work is underway to make the distribution of fresh bread with trucks being more efficient with regard to emissions of GHG.

2. Distribution of fresh bread in Denmark

In Denmark, Unibake delivers fresh bread under the Schulstad brand. The business covers the entire country. Previously, each bread supplier in Denmark had its own distribution, which was expensive and increased congestion in the vicinity of the store reception. In order to streamline the flow of goods, Coop decided that they only wanted one delivery of bread per day to their stores. The assignment to distribute the other bread producers' bread to the Coop stores went to Schulstad with a logistics agreement that included all producers in the bread distribution. The solution was later expanded to several other retail chains in Denmark. In order not to conflict with competition law, a common distribution solution was made open to all bread suppliers who wanted co-distribution in Denmark. The ideas were successful and



today Schulstad distributes fresh bread from Kohberg, Pågen and 15 other smaller bakeries. This resulted in considerable cost savings and reduced the total greenhouse gas emissions. There are still food chains that supply bread outside this coordinated distribution system. Schulstad distributes fresh bread 7 days a week to 2,400 stores around the country. The fresh bread is mainly delivered before 7:00 and at 9:00 at the larger supermarkets. A challenge in this distribution is congestion problems which significantly lower the productivity of the distribution trucks. The problem is greatest between 07:00 and 9:00 and this is also when delivery should take place. Schulstad analysed the situation which showed great potential.

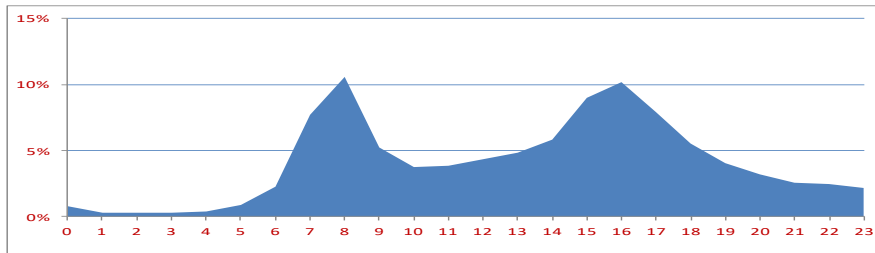


Figure 1. 24 hour cycling behaviour in Copenhagen

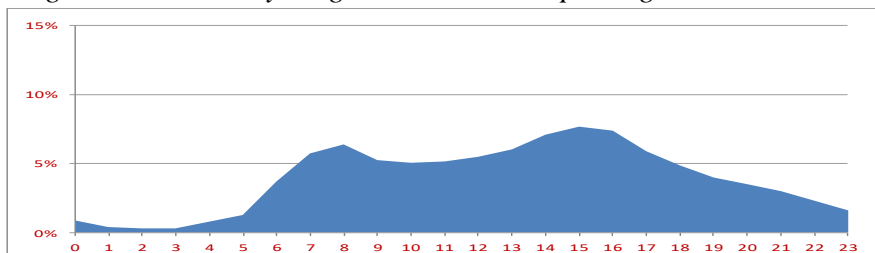


Figure 2. 24-hour car traffic in Copenhagen

In larger cities, mainly Copenhagen, a discussion was held about the challenges of the low productivity of bread distribution. Contact was made with the City of Copenhagen about the possibility of distributing the bread at night as other traffic is almost non-existent. The arguments for night distribution were:

- Bread must be delivered no later than 8 a.m. to the larger department stores
- There is severe congestion between 6.30 a.m. and 9.00 a.m.
- Distribution trucks' productivity drops by 17% between 7 a.m. and 9 a.m.
- More efficient distribution reduces carbon dioxide emissions
- Reduced idle driving reduces emissions and noise
- Less stress for drivers because rush hour traffic can be avoided
- Shorter transport time, which provides greater delivery flexibility
- Improved operating economy

The city understood the arguments and was open to these ideas but felt that the noise problem must first be solved for local residents before night distribution could be allowed. The solution was the purchase of three electric / diesel hybrid trucks from Scania. With these, Schulstad could deliver to the store almost silently. The City of Copenhagen approved the solution and it was quickly clear that the solution significantly improved the bread distribution productivity. Previously, a truck could deliver to 2 stores an hour in the morning. With the



new solution, the truck could deliver to 6 stores per hour when delivered at night. Two more hybrid trucks are now ordered from Scania to expand night distribution.

Today, the driver has keys to 75% of the receiving stores (1700 stores) and access to code to turn off alarms. In these cases, delivery takes place entirely without receiving staff who are instead met by bread to put up on the store shelves when they come to work. In 400 of the stores, delivery must not take place before 7:00 a.m. because of specific local requirements. Furthermore, 200 stores are not interested in handing out their keys. Interestingly, drivers prefer to drive at night than during the day when it involves less stress. In addition, they receive extra compensation. The trucks run all night until 10:00 in the morning.

Hybrid trucks with silent electric drive were a prerequisite for this solution. Schulstad has also invested in equipment that reduces other noise sources when loading and unloading bread and so far no one has made any complaint that the business is noisy. The distribution takes place with 68 trucks, all of which have a Euro 6 engines and are Piek approved as "low noise". 54 trucks have noise-cancelling equipment approved according to Piek. The drivers are also trained in driving technique for quiet departure.

Add to these general activities the three hybrid trucks from Scania, all of which are Piek certified. The trucks are powered by conventional diesel but below 30 km / h they go into electric power. Night-time distribution has been going on for three years in fixed routes with silent vehicles where there are specific noise restrictions.



Figure 3. Scania' diesel-electric hybrid truck

Scania's hybrid trucks have no reverse alarm but instead a reverse camera. The cargo compartment floor is designed to reduce noise. Lift trucks have insulated motors and noise cancelling wheels. Schulstad has also invested in separate cabinets for delivery to certain stores with access via own keys. With this technology, delivery windows can be completely



changed to increase productivity and reduce emissions. The technology helps the company reach targets on both noise and carbon dioxide.

The company makes no systematic measurement to show reduced carbon dioxide emissions. “The measurability is that we can deliver larger quantities of bread with less fuel consumption” according to Niels Kristian Holm and continues: “We want to be a company that takes environmental and climate responsibility. That’s why we do this. However, we do not communicate these benefits with this distribution to consumers. At the start of the project, however, we had with us Ramböll’s noise experts who could verify the solution’s potential and utility, which gave weight to the dialogue with the City of Copenhagen and thereby convinced them to give their consent to the change. The measurements showed that the difference between a conventional truck and the electric hybrid at bypass and idle was 15-17 dB.

By starting a renewal process, it has become more natural to continue to try other new solutions. Schulstad sees no limit to what can be achieved. The next step for further reducing noise and emissions is probably pure electric power according to Niels Kristian Holm.

3. Distribution of fresh bread in Finland

In Finland, Unibake delivers fresh bread under the Vaasan brand. The customers consist of three large food chains with a total of about 3000 stores around the country. Bread is delivered daily from Monday to Saturday. Distribution on Sundays is extremely rare. In total, this means more than 300 delivery days per year.

In total, Vaasan has 5 bakeries in Finland and 4 in the Baltic countries that supply bread in Finland. Distribution takes place through 6 distribution centres covering defined geographical areas. Some types of bread are only produced in one or a few bakeries, i.e. these bakeries deliver via all distribution centres.

Transportation logistics includes 20 large trucks for the inbound logistics (bakery to distribution centre) and approximately 250 distribution trucks (distribution centre for retail). All trucks are owned and operated by private hauliers. There are a few Euro 4 engines in the fleet of vehicles, but the fleet are dominated by Euro 5 and Euro 6 engines. Vaasan’s privately owned customers do not require a specific level of Euro class, but customers in public operations require Euro 6 engines.

For in-house logistics, large trucks of 25.25 meters and some with 34.5 meters in length are used in test operations. As of January 2019, Finnish legislation permits 34.5 meters of trucks on the main routes in Finland. These long vehicles enable transition from transport with two 25.25 meter vehicles to one 34.5 meters vehicle when practicable. The reason for this significant savings is that delivery volumes vary between days of the week. Monday and Friday have the most goods, which require two 25.25-meter trucks. The truck, which is 34.5 meters, can handle these peaks and also the lower volume of other days. From a fuel consumption perspective, long trucks are no challenge. Bread is light with large volume which mainly creates volume challenges in the cargo space. Fuel consumption is not a problem since only the weight affects the vehicle’s consumption. Thus achieving significant climate benefits



Figure 4. The 34.5-meter truck

The major practical challenge with long vehicles is not the national main roads, but the local road network in municipalities, narrow areas around the bakeries and tight roundabouts. For example, in some roundabouts it is only possible to get through in one direction. To get back, the vehicle must take another slightly longer route back.

However, the Finnish government and the Ministry of Transport are very positive about developing the national road network in order to be able to include long and heavy trucks. The challenge lies more on the local road network owned by municipalities with less resource and therefore less willing to adapt roads for longer vehicles. All in all, Hannu Nylander at Vaasan foresees many opportunities to increasingly introduce and use longer trucks

For those plants where long trucks are already in use, the number of vehicles can be reduced by 30%.

During the period 2009 to 2012, Vaasan initiated a general review of its distribution system to save costs. At this time, bread was delivered twice a day. The service level was too high and the new distribution system meant a switch to only one delivery per day during from 2009 to 2012. The result was considerable cost savings and halved greenhouse gas emissions.

The next step in the streamlining process became an initiative to coordinate bread distribution with several players. Collaboration via subcontractors (to handle antitrust law) with nationwide Fazer was established. With the coordination between Fazer and Vaasan of bread distribution, costs and emissions of carbon dioxide could be further reduced.



In addition to more efficient logistics, an ongoing program for energy-efficient traffic operation is ongoing. Among the haulage companies, great focus is placed on energy efficiency through economical driving programs. The savings vary, but this measure is essential to limit carbon dioxide emissions. Vaasan receives regular reports from hauliers and their vehicles regarding:

- Total km for the period
- Km for Vaasan
- Average fuel consumption per km

Up to now, previously implemented measures to reduce greenhouse gas emissions have coincided with cost savings. Consequently, there have been no major internal target conflicts regarding emission reductions and costs.

In addition to improved efficiency, the development towards more climate neutral transport is driven by the use of more renewable fuels. At present, there are a few trucks in the vehicle fleet running on LNG (fossil fuel), but the expectation is that access to more gas stations with LNG will increase in the country, which should enable the introduction of more LNG-driven trucks. The next step must then be the transition to liquid biogas in the pumps.

The next step to reduce greenhouse gas emissions is the introduction of biodiesel. The fuel is called “My diesel” and is supplied by Neste. The cost is slightly higher for this fuel compared to conventional fuel.

The introduction of new powertrains and renewable fuels will be a test of what climate work can cost. Through past and planned activities, Hannu Nylander is not concerned about the possibility and costs of achieving the Group's overall target of a 70% reduction of greenhouse gases by 2030 for all purchased transports.