



Interreg Europe



European Union
European Regional
Development Fund



Staff Exchange
Report
Kronoberg June 2018

Staff Exchange 4: ASTER to Kronoberg (2018, June 25-27)

1. Participants

- Pierre Ståhl (Energikontor Sydost)
 - Project manager for TRIS. Work with projects within renewable energy and circular economy
- Sarah Nilsson (Energikontor Sydost)
 - Senior project adviser for TRIS. Specialist in project applications and ERDF funding.
- Ugo Mencherini (Aster)
 - Project manager at ASTER, responsible of Mechanics and Materials unit.
- Sara Picone (Aster)
 - Project manager at ASTER, energy and environment area.

For complete attendance lists please see signature sheets.

2. Staff exchange main topics and program

Day 1: June 25

Malmö city

At Malmö city the group met:

- Ellen Corke Malmö City
- Murat Mirata, Linköping University
- Anders Persson, Sysav (South Scania Waste Company)



Pierre Ståhl, Ellen Corke and Murat Mirata

The agenda for the meeting covered:

- Industrial and Urban Symbiosis in Malmö
- How Malmö city is working with:
 - Policies and strategies
 - Tools for city planning to enable Urban Symbiosis
 - Involvement in EU and other projects
 - Network for Industrial Symbiosis

In 2016, Malmö developed a [vision on industrial symbiosis](#), especially focused on the port area, as a response to three challenges faced by the city: maintain economic competitiveness, ensure a stronger urban-rural connection and a sustainable use of environmental resources. The vision includes a roadmap and indicators to monitor the roll out of the strategy (see extract below).

The harbor area is the heart of the city's energy production and waste management, and it has a well-developed infrastructure for electricity, heat and gas, as well as for waste water treatment. The port area also handles large flows of material and products, transported by sea or land, and in the area there are companies that sort, treat and store most waste fractions.

Malmö harbor area is in a developing phase, which opens up the possibility to develop the port area in a sustainable way, while contributing to increased competitiveness and profitability.

As part of the vision, the concept industrial symbiosis shall be included in Malmö process when new plants/companies are planned to locate within the harbor area.

Roadmap for Malmö harbour area	
2016	
Milestones:	<i>There is a finalised version of a vision and roadmap for the harbour area. Method for and ongoing activities to map flows in the area.</i>
Activities:	<ul style="list-style-type: none">- Development of Malmö's production of renewable energy- Development of Malmö's energy distribution system for higher flexibility and better utilization of wasted heat flows- Platform for cooperation established and is continuously developed- Regional and national network active with purpose of sharing good examples and solve barriers that hinders the development- Development of the city's, port's and infrastructural owner's roles to meet the demands of the future
2017	
Milestones:	<i>Market and communication plan for wider dissemination of the concept industrial symbiosis and related work in Malmö. GIS-layer in the city's "City Atlas" that shows all flows for participating companies. Better knowledge and formed alternatives for different applications of today wasted resources.</i>
Activities:	<ul style="list-style-type: none">- Test of market dialogue and PPP innovation procurement for better utilization of waste resources to new products- Implementation of smart grid solutions on industry- Investigations of potential for utilization of low grade heat and district heating for new applications- Involvement of GIS-experts to get an understanding of the development and its needs, and to prepare a solution- Network meetings with different themes in order to share development ideas, share company visions and match companies that may benefit from cooperation
2020	
Milestones:	<i>The concept industrial symbiosis is included in Malmö's process when new establishments are planned. Industrial symbiosis is an important part of City of Malmö and CMP's marketing of the harbour. There is a structure for joint logistic solutions between established actors. Local symbiosis with a global perspective.</i>
Activities:	<ul style="list-style-type: none">- Develop synergies and integration between port close housing areas and the industry port- Cooperation between different departments within the city on how the concept can be a part of establishment planning – what is needed?

- Engage logistic stakeholders and plan how to develop logistic systems further in the port, focus on joint transport solutions - Study the progress on a national and global level – what can we learn?	
For 2025 to 2040 activities have not yet been formulated, it is simply too long into the future to foresee which activities that will be most beneficial to focus on. Several of the activities stated for the milestones above will most probably be active during many years to come, especially when it comes to networking activities, mapping of flows and identifying business opportunities.	
2025	Milestones: Platform that drives the concept for symbiosis, manage the network and follow-up results. X* percent of the actors in the port area cooperates with one or more other actors within the same area. Number of work opportunities created (employees at cooperating companies).
2030	Milestones: X* percent of the actors in the port area cooperates with one or more other actors within the same area. Number of work opportunities created (employees at cooperating companies).
2035	Milestones: X* percent of the actors in the port area cooperates with one or more other actors within the same area. Number of work opportunities created (employees at cooperating companies).
2040	Milestones: X* percent of the actors in the port area cooperates with one or more other actors within the same area. Number of work opportunities created (employees at cooperating companies).
X* will be set after a public workshop, and will also increase in number for each year.	

We discussed how important in the case of Malmö was the top-down approach in establishing IS links. In Malmö, however, most of the synergies (24 over 26) came up as bottom up initiatives. Biggest challenges faced by Malmö when working on IS were related to mindset, and particularly to difficulties in creating the right type of working conditions within an open and collaborative approach. In order to do this, a network has been established called the “Sustainable Business Network”, which has taken almost 5 years of work, the city acts as coordinator of the network, integrating top down with bottom up processes.

Roadmap for IS in the city of Malmö

The industrial symbiosis approach has required also an internal shift of mentality within the Municipality itself, as it requires collaboration amongst the different departments to move from an inspective/compliance based approach to an integrated approach able to capture opportunities which can bring a shared value for more actors in the city (e.g. relocation of industrial plants, authorization for excess heat discharge, etc.).

The EPIC 2020 IEE project has supported part of the work towards developing a shared vision on IS for the City of Malmo. The project aimed at building capacity and know-how to promote the most efficient use of available bioenergy resources within ports and port regions. Mantova in Italy was also partner of the EPIC 2020 project.

Also, we learned about future plans of the city of Malmö related to tools supporting IS. Specifically, they are working on developing a tool which uses the environmental data that companies are obliged to report for monitoring resources and energy flows in order to facilitate possible synergies.

Murat Mirata from the University of Linköping explained in more detail about the work they are doing on improving the understanding of existing industrial symbiosis networks as well as supporting the development of new industrial and urban symbiotic processes towards a circular economy. The group lead by the University also manages a portal on IS in Sweden where examples are presented ([Swedish IS portal](#)). The University is a member of the Sustainable Business Network of the city of Malmö. Sysav, South Scania Waste Company, as

waste management company is member of Malmö Sustainable Business network with its resource recovery activities.

Travel to Älmhult

Pierre Ugo and Sara enjoyed a ride with a biogas fueled car to Älmhult.

Day 2: June 26

IKEA Museum

The day started with a guided tour at IKEA museum in Älmhult. The Museum is in the same building as the very first IKEA store in the World was opened in 1958.

The guide told us that IKEA were founded in a context where resource efficiency was necessary. Reuse was a natural thing. Sweden 100 years ago was a poor country and furniture was expensive. By mass fabrication, flat packages and a strive to be cost effective in every detail IKEA succeeded in reaching its vision to “Create a better day life for the many people”. Mass-production can however have its drawbacks and IKEA and similar companies became symbols for the throwaway society.

IKEA has however started a transition towards a more sustainable company. With the concept of *Democratic Design* sustainability is highlighted as a core value.



Democratic Design “manifesto” at IKEA museum in Älmhult

Innovation is a key factor in the development of sustainable products: IKEA developed M-Board, a new material for furniture deriving from recycled cardboard, which can be considered an example of circular economy. Paper and cardboard are collected at IKEA malls and reused at the site to produce new boards. M-Board is also 100% recyclable, and also its production line improves the performances of the traditional production line, being 10 times shorter (about 30 meters) and consuming approximately half of the energy.



Pierre and Sara at IKEA Museum

Also open innovation is an important pillar for IKEA, that launches challenges open to startups and designers in order to find new design and products ideas.

Travel to Växjö by train

Sundet – biogas production in Växjö

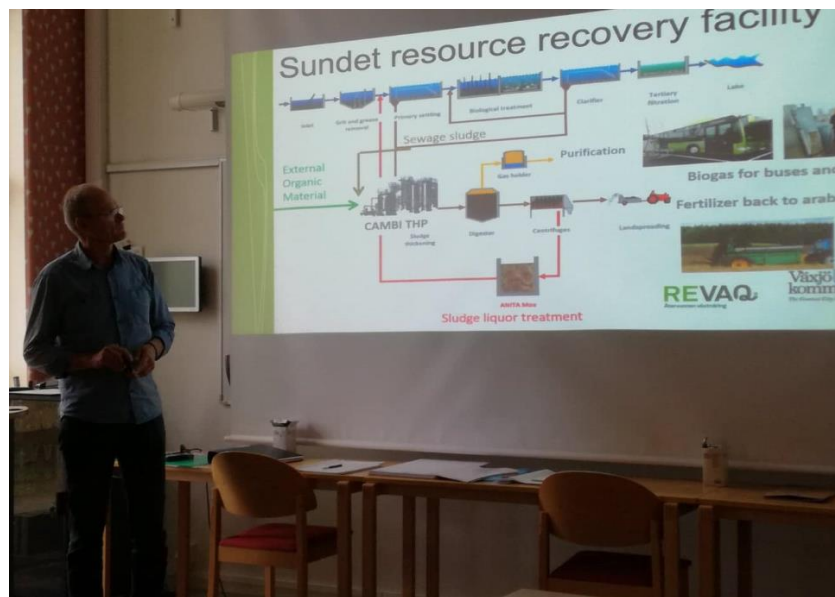
Once in Växjö Sara, Ugo and Sarah were welcomed to Sundet plant by Steve Karlsson, waste manager at Växjö municipality.

The plant aims at producing high value nutrients and biomethane from waste streams. Treated waste streams includes wastewater sludge (80%) and household waste and agroindustry fat (20%). Wastewater sludge is obtained from the wastewater treatment plant currently treating about 8 mln/m³ a year but which is planned to increase its capacity as the urbanization of Växjö proceeds.

An innovative pretreatment has been recently introduced prior to the anaerobic digestion of the three types of biomass waste: thermal hydrolysis. This step includes steam injection at 6bar. Once pressure is released, cell walls breaks and the material is cooled down by a heat exchanger up to about 40°C and sent to the anaerobic digestion plant.

The pretreatment step increases biogas production by about 20% and lowers necessary retention time to 10-15 days.

The produced biogas is then upgraded by chemical scrubbing to biomethane (about 350 m³/h) for both public transport and fuelling stations. Sludge is dewatered, sampled for quality checks and can be used by farmers, yearly about 7000 ton of sludge are produced.



Steve Karlsson, Växjö municipality

Evening activity – midsummer fest

The weekend before the staff exchange midsummer was celebrated in Sweden. This is an important event for all Swedes in parity to the National day.

In order to teach the Italian guests how this can look like, a compact version of a traditional fest was arranged at Sarah's home.

Invited to the party were also Steve Karlsson and Åsa Karlsson-Björkmarker. Åsa is vice mayor of Växjö municipality and active in ICLEI - Local Governments for Sustainability.

Day June 27

Volvo CE

30 km north from Växjö, in Braås, is Volvo CE's production plant for articulated haulers located. Pierre, Sarah, Ugo and Sara together with Urban Bäckström from Företagsfabriken (an incubator supported by the Region) were welcomed by Richard Alm, Environmental care & Security Manager at Volvo Braås.

Alm presented his work on bringing environmental aspects within company's goals and daily routines, which had direct impact on a more efficient resource use. He started an internal process of engaging line managers and employees on issues related to waste management and security. This led to a reduction of overall waste costs from 1400 SEK/ton in 2014 to less than 800 SEK/ton currently.

Volvo is also a partner of *Sustainable Småland*, a network of companies of diverse size which are actively involved in sustainability.

After the presentation we took a visit to the plant production line.



Pierre, Ugo and Sarah

Region Kronoberg

After lunch Pierre, Sara and Ugo visited Region Kronoberg in the center of Växjö. Region Kronoberg is a regional elected authority with responsibility for health care, public transport, and regional sustainable development. They are also a stakeholder of TRIS. At the Region Agata Uhlhorn hosted and introduced us to a new project “CRKKL”. The project is 50% ERDF-funded and 50% national-funded.

The project is a 3 years project aimed at supporting companies and municipalities in the transition from linear to circular economy. Overall, the goal is to reach 240 companies. The activities include a survey for local companies on how they can improve their resource management consultancy within the area of business development in line with circular economy. This will perform a screening on a number of companies – where they are and what do they need to improve. Energikontor Sydost is also partner of the project and will work with the municipalities.



Agata Uhlhorn, Ugo and Sara

Finally, the staff exchange was discussed and summarized.

Circular dinner

In the evening the place chosen for dinner was natural, Café de Luxe. The restaurant is known for only using second hand furnishings and serve local/regional food.

3. Lessons learnt

The meeting with the city of Malmo showed us how important it is to have a clear leadership in the management and establishment of IS networks in order to maintain a mechanism which grants a collaborative environment both amongst companies and between companies and local authorities.

It was also very interesting to learn about how the development of IS vision and roadmap had implications on the long term change of the internal organization and mindset of local authorities as this can be a very important enabling factor for IS uptake. The relationship between companies and local administration is in fact often mentioned as a barrier for IS in the Local IS Lab of Emilia-Romagna.

As for the Sundet plant, in Emilia-Romagna, biomethane plants are just starting because of a long regulatory “stand-still” situation, therefore it has been extremely interesting to see an example of nutrient recovery from different waste streams operational, also as we are not aware of similar types of pre-treatment plants operational in Emilia-Romagna.

Volvo visit provided insights on the perspective of a very large industrial group, whose sustainability targets in terms of energy and CO₂ production can also steer the whole ecosystem of supplying companies as these criteria may lead to the change of supplier.

The final meeting with Region Kronoberg was useful in order to evaluate other possible actions in order to support the establishment of IS initiatives: the transition from a circular

to a linear economy is a challenge also for the Emilia-Romagna industrial ecosystem, mainly composed of SMEs.

4. Follow up actions

In the wrap up of the staff exchange, the discussion with Kronoberg region has led to thinking about possible joint initiatives within the TRIS pilot actions dedicated to Incubators and in particular working with Incubators and startups about the topic of circular economy. Also, the deepening of the scientific literature on Industrial Symbiosis in Sweden –and in particular- in Malmo, following the suggestions provided by Prof. Mirata, will be very useful in order to understand better the conditions able to favor the bottom-up mechanism for industrial symbiosis interactions.

