



Uptake of industrial symbiosis in European regions

A Policy Learning Platform event

22-23 May, Helsinki

The thematic workshop has provided a forum for thematic exchange and learning between Interreg Europe project partners on **policies for promoting Industrial Symbiosis (IS)** with different levels of experience in this field. It brought together around 35 participants from all over Europe. Recommendations for future policy action have been formulated and are available in this document.

The workshop was followed by a study visit to Forssa region, one of the most advanced IS sites in Finland formed around circular economy.

Further information about the event including agenda, presentations, and attendee list is available [here](#).





Highlights

Role of regions in facilitating Industrial Symbiosis (IS)

- Regions play a strategic role in Industrial Symbiosis and act as facilitators supporting the process of establishing IS synergies. Forerunner countries in IS initiatives such as Finland and Denmark have developed the operational environment for IS and **incorporated IS in their Smart Specialisation Strategies**. For example, in the Finnish Päijät-Häme region, circular economy and IS were embedded in the Regional Development Strategy, the RIS3 Strategy, in the Regional Land Use Strategy.
- In some countries, there is experience in supporting IS facilitation directly, through the implementation of **national facilitation programmes** at regional level (e.g. FISS Finland, Danish Green IS, or the Hungarian NISP, developed with the help of EU funding). The support has been mainly related to the organisation of matchmaking events, collection of data on resource streams and identification of IS potential. The programmes in Finland and Denmark also address the lack of expertise in the companies by providing technical assistance to assess potential for IS synergies. Building trust between facilitators and companies is crucial for IS synergies and the Danish Green IS Database is a good example in this regard (more details in the next section).
- **Universities are among the key IS stakeholders**. Sometimes they have links to industrial parks and also have a role in product development. In Greece, a national programme to facilitate joint work between universities and companies was established. **Clusters and chambers of commerce** also play a role as exemplified by the Waste Exchange Scheme good practice from Spain.

Success factors and enablers for stimulating Industrial Symbiosis in European regions

- Several **economic and regulatory instruments** can drive IS indirectly, through favouring higher and penalising lower waste hierarchy options. Examples include relatively high landfill and incineration taxes (e.g. in Finland), local landfill bans of various waste streams (e.g. biowaste), and targeted economic incentives. When low prices of primary raw materials compared to secondary materials deter further use of secondary materials, incentives for the use of secondary materials can be introduced. This can be done through economic instruments (e.g. the price of the secondary raw materials could be subsidised and should become lower than the primary ones), but also through regulatory instruments such as design standards that set minimum requirements for use of secondary materials.
- There is a need for **constructive enforcement of the regulatory framework**. For example, in Slovenia companies are reluctant to engage in IS as they are concerned about the restrictive attitude of the enforcement agency. In Hungary, there are differences between the regions with regards to the interpretation of IS exchanges and work needs to be done in aligning the approach of the regional enforcement agencies.
- **Regulatory uncertainty related to the status of secondary materials** (waste versus product) has been one of the major issues discouraging companies from engaging in IS endeavours. Therefore, there is a need to harmonise interpretation of waste regulation and the application of the concepts of By-Product and 'End of Waste' across Member States. 'End of Waste' criteria specify when certain waste ceases to be considered waste and obtains the status of a product (or a secondary raw material).
- With regards to **waste exchange platforms**, the pros and cons of using proprietary software vs. an open source system was discussed. The Finnish Industrial Symbiosis System (FISS) is based on proprietary software. However, an open source system will soon be launched. Participants raised the question of intellectual property protection in the case of an open platform and the complexity of a proprietary system and hence the need for trained experts.

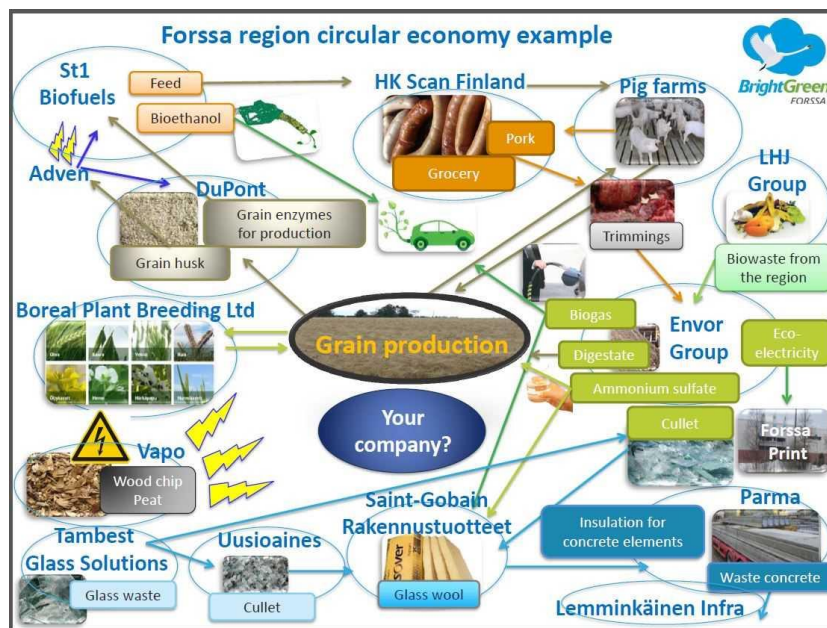


- **Green Public Procurement (GPP)** is also one possible instrument for stimulating IS and IS principles need to be added to GPP policies (particularly relevant for infrastructure projects). The Green label which companies could get is also a driver for them to engage in IS.



Study visit to the eco-industrial park of Forssa (SYMBI project)

Finnish Häme region, represented by two project partners in SYMBI project, is known for its progress in IS development. To deepen the thematic exchange and learn from practitioners on the ground a group of workshop participants visited the Eco-industrial Park in Forssa. The Park consists of industrial symbioses between companies illustrated in the figure below. Forssa IS brings together diverse businesses in material recycling and waste processing, bio-economy and renewable energy. IS synergies were presented and discussed during the meetings with the representatives of Envor Group, the regional waste management company LHJ and Saint Gobain Finland Ltd., producing glass wool. Education in circular economy and cooperation of Forssa IS with HAMK university is essential for the success of IS in Forssa, The perspective of the regional council of Häme was also brought in, together with the local municipality focusing on how land-use planning policies in the region are an enabling factor for IS development.



Source: SYMBI project



Good practices

Good practices:

[FISS – Finnish Industrial Symbiosis System, Finland, SYMBI project](#)

FISS is nationally managed network and a practical tool for promoting circular economy, IS and regional development. Based on collection of resource information, matchmaking and active facilitation FISS provides a systematic way to help companies and other organisations to create partnerships and new business opportunities through more efficient use of raw materials, technology, services and energy. After five years of operation FISS is an established national operating model with 14 regions engaged, over 700 companies involved in the operation, over 5000 resources registered in the database resulting in 2500 synergy opportunities.

[Green Industrial Symbiosis Database, Denmark, CESME project](#)

A national web database, the Green Industrial Symbiosis (GIS), was established to systemise the collected information regarding companies with leftover resources and match them with companies looking for resources. It is a collaboration between the Danish Business Authority and the Danish regions. The focus is on identifying the potential for industrial symbiosis and initiating new collaborations. The database offers a categorisation of resources (e.g. energy, water, hazardous waste, plaster, metal, construction waste, organic waste, etc.)

[FRUSH - Circular economy and IS event for start-ups and growth enterprises, Finland, SYMBI project](#)

FRUSH originates from the results of SYMBI project, as from the studies conducted within the project a general lack of knowledge among businesses about circular economy and IS was noticed. It aims to boost the development of start-ups and create and promote new business opportunities around circular economy and IS. Since its launch in 2017 the number of participants quadrupled. The pitching competition has helped start-ups and growth enterprises to get funding and promotion. The competition has also helped some businesses to launch their products.

[Waste exchange scheme, Spain, TRIS project](#)

The Spanish Chambers of Commerce have set up a regional waste exchange scheme (Bolsa de residuos) that allows companies to easily exchange waste as by-products. The Chamber of commerce of Valencia began working on the By-product Exchange in 1989 in collaboration with the regional government. In 2017, 219 offers and 59 requests have been processed by these programmes in the region. The five Valencian Chambers of Commerce were involved in the dissemination and management of the by-product exchange.

[The use of organic residues for energy production, Greece, BIOREGIO project](#)

A project led by the Aristotle University of Thessaloniki developed an innovative, bio-based solution allowing the utilisation of the residues' energy content on-site, to cover most part of the energy needs of the industries themselves. Developed in the framework of an EU LIFE+ project, the practice demonstrated positive results evolving into an award-winning start-up. The practice offers a learning potential for SMEs in agri-food sector.

[Green Deals, the Netherlands](#)

The Green Deal approach in the Netherlands is an accessible way for companies, local and regional government and interest groups to work with the Central Government on green growth and social issues.



A Green Deal is a mutual agreement or covenant under private law between a coalition of companies, civil society organizations and local and regional government to supplement existing regulation and legislation. It is a flexible method for jointly finding solutions to regulatory barriers experienced by companies trying to introduce new sustainable products, technologies or services to the market. The Green Deal approach is particularly suitable when innovations are put into practice, a phase during which projects often encounter barriers. In the period between 2011 and 2014, 176 Green Deals were closed in the Netherlands, involving a total of 1,090 participants. Green Deals cover nine themes: **energy, the bio-based economy, mobility, water, food, biodiversity, resources, construction and the climate.**

[Finnish Roadmap to Circular economy](#)

After the first national road map to a circular economy prepared in 2016, an [updated](#) version was published in March 2019. The roadmap includes descriptions of the essential circular economy measures to which Finnish stakeholders have already committed themselves. There are measures under way in state administration, towns and cities, as well as such that affect businesses and citizens.

Policy changes:

As a result of SYMBI project a policy change occurred in Kanta-Häme RIS3 strategy. Specifically, IS was introduced in the current regional development programme Häme programme 2018+ for the first time. The awareness of the importance of IS as one of the key segments of circular economy has risen due to the participation of Regional Council of Häme in SYMBI project.



Next steps

Policy recommendations:

During the discussions and working sessions of the event, the participants worked out the following policy recommendations for better IS policies, taking into account the different levels of IS development and experience across Europe:

For regions more advanced in IS:

- Raise awareness of companies on the potential benefits of engaging in IS such as increased competitiveness, productivity and resource efficiency, enhanced innovation capacity and knowledge about alternative business models. Environmental and social benefits to be emphasized as well. Initiatives like FRUSH help to address this knowledge gap. Including the concept of circular economy in the curriculum and sharing of good examples (as mentioned in the Finnish roadmap to circular economy) can also contribute to improving knowledge, raising awareness of potential benefits and mind-set change in companies.
- Further exchange on information on the experiences with closed database vs. open database will be useful.

For regions that are at an early stage with IS development:

- **Organise campaigns** that aim to raise awareness of companies about circular economy, and the benefits of IS.
- Start with small first steps such as **mapping the industrial ecosystem** and potential opportunities for IS synergies. Waste flow mapping could support in identifying areas of potential. Targeting the biggest emitters in a database is also important.
- **Map the most important stakeholders** that can support bringing companies together and facilitate IS synergies.
- **Mapping legislation:** it is important to make an inventory of legislation that could be an obstacle and communicate this to the respective authorities. The Green Deals example from the Netherlands can be helpful in this regard. Make efforts to include IS and circular economy activities in regional strategies. The Finnish Roadmap to Circular economy can serve as a good example.
- **Develop a simple waste exchange platform** (either open or closed) in the beginning and upgrade it on the way. The scope of the platform depends on the ambition of the IS system. Very often the platform is developed on a national level within a national IS system (i.e. FISS). However, when such a central platform is missing regions can develop their own solutions.
- With regards to **matchmaking**: start small and scale up gradually contacting companies one by one. The question of building trust in IS is crucial for creating IS synergies and can be addressed by adopting an inclusive approach, promoting open data as well as an open-minded communication.

Follow-up actions by the Policy Learning Platform related to IS:

- Presentation of the good practice [“From food production to glass wool production”](#), SYMBI project (June 2019)
- A policy brief on waste management (July 2019)
- News item on establishing of EU [CircLean network of Industrial Symbiosis](#) (early 2020)

Visit the [conclusions page](#) of the event which includes photos, attendee lists, presentations.



Other resources on Industrial Symbiosis:

- Policy Learning Platform, [Policy brief on circular economy business models](#)
- Policy Learning Platform's [webinar](#) on circular economy business models
- Policy Learning Platform, [Policy brief on industrial symbiosis](#)
- Policy Learning Platform, [Policy brief on food waste](#)
- Policy Learning Platform, [Policy brief on sustainable management of bio-waste](#)
- Policy Learning Platform, [Policy brief on green public procurement](#)
- Policy Learning Platform, [Policy brief on resource efficiency](#)
- [Guidelines on how to capitalise GPP as an enabler of industrial symbiosis](#), SYMBI project
- [Industrial Symbiosis in the Baltic Sea Region, Nordregio Policy Brief](#)
- [European Resource Efficiency Knowledge Centre](#)
- [FISSAC Project](#)
- EC, [Cooperation fostering industrial symbiosis: market potential, good practice and policy actions, 2018](#)

