



Industrial symbiosis

August 11th 2022 Annika Holmbom
Circular business models research group

How are you today?

What has been the most interesting part of this course so far?

Topic of this lecture

Industrial symbiosis

- What?
- Why?
- How do we at TUAS promote these in our work?

FISS- Finnish Industrial Symbiosis System

” Industrial symbiosis promotes cross-sectoral collaboration and supports local and regional growth, creates jobs, and fosters industrial clusters that share a mutual interest in resource efficiency.“

<http://www.industrialsymbiosis.fi/>

“Industrial symbiosis is an industrial ecosystem where unused or residual resources of one company are used by another. This results in mutual economic, social and environmental benefits. It is a process involving several companies – firms that complement one another provide mutual added value through efficient use of raw materials, technology, services, energy and know-how.

Industrial symbiosis promotes cross-sectoral collaboration and supports local and regional growth, creates jobs, and fosters industrial clusters that share a mutual interest in resource efficiency.”

<http://www.industrialsymbiosis.fi/>

Discussion in class

**Please discuss:
What is
industrial
symbiosis**

- Please write the key points here

Annika's points

- Collaboration between companies, which broadens the business
- Resource efficiency
- Waste management
- Monetary benefits
- New products

**Please discuss:
What are the
benefits with
industrial
symbiosis**

- Please write the key points here

Annika's points on the benefits

- Companies get rid of their excess material, instead of paying for the disposal of them
- Promoting resource efficiency, less need for new raw materials
- Waste prevention
- Minimizing the carbon footprint
- New innovations in collaboration with other companies.

**Please discuss:
What kind of
problems exists
with industrial
symbiosis**

- Please write the key points here

Annika's points on problems

- Companies do not want to share vital detailed information on their products
- The product is not in the right format, and needs to be treated somehow
- Lack of time, easier to dispose the material, than to find a user
- Logistics costs – it costs too much to move around trash. Max 50 km distance.

Circwaste project

<https://www.tuas.fi/en/research-and-development/projects/circwaste-towards-circular-economy/>

C2.1.c Industrial symbiosis as part of C2

“CIRCWASTE is a seven-year LIFE IP project that promotes efficient use of material flows, waste prevention and new waste and resource management concepts.”

Industries need help with symbiosis -> a role for municipalities!

- Coordinators, who know the industry in their region
 - Circwaste regions and forerunner municipalities
 - FISS (Finnish Industrial Symbiosis System) network - Motiva Oy

*Coordinators - partly same people, often work for cities, UAS or other public instances.

Opportunities and Weaknesses (SWOT)

Opportunities with the existing system

- The carbon neutrality road maps drive companies to examine their material processes.
- The timing is right!
 - Companies are more open and willing to talk about their byproducts
 - The culture of online workshops is accepted
- An updated workshop model could be useful

Identified weaknesses with the existing system

- No continuous funding for development of FISS
- The coordinator changes often, due to resource issues
- The existing workshop model outdated and not suitable online

C2.1.c Industrial symbiosis

Need for the development of an easily organized 2-part workshop model that needs minimal resources and has huge impact!

- Part 1 – workshop model
 - Introduction to what industrial symbioses are, how to identify your own byproducts, waste, or need for material, how to create an announcement on Materiaalitori platform.
 - The model includes clear easy-to-use instructions with ready made material on schedules, invitations, advertisements, i.e., how to organize and run the workshop.
- Part 2 – workshop model
 - The aim is to promote cooperation between companies that complement one another, keep the materials circulating and create mutual economic, social, and environmental benefits.
 - Focus on the material flow of one larger company at a time in order to help them to utilize their unused or residual resources, such as byproducts or waste.

C2.1.c Industrial symbiosis

The development of the 2-part workshop model

Part 1 –workshop model

- A written easy-to-use workshop manual is being tested internally
 - So far reported 4 events in Sept 2021 and 5 events in April 2022.
 - To come: 1 workshop in June 2022 and planning for a minimum of 1 in autumn 2022 and 1 in spring 2023. A total of 12 organized workshops.

The part 2-workshop model is under development.

- Plans for execution of 1-3 workshops within Circwaste project.
- Too early to predict coming successes or challenges.



Industrial symbiosis - Results

Deliverable C.2_11 DL 31.12.2023: Organize 12 events that promote industrial symbiosis.

The most important result of this action:

- 2-stage workshop model that can be further used by anyone who aims to promote industrial symbioses.
- We have tested the part 1-workshop model several times with different parameters, e.g.,
 - Online, hybrid, calling round, 2 areas at once, and a complementary excel file to support the participants in their preparation for the workshop.
- We will comprise our experience and lessons learned into **a handbook**, which will function as a guide both for planning and execution of the part 1-workshop model.
- So far, we have tested the workshop model internally, which means that we still facilitate and mentor the process when the coordinator organizes the workshops. In the future, other projects will solely use our handbook, without our help.

Industrial symbiosis – Part 1 workshop model

Successes

- Fruitful cooperation with Motiva Oy and the FISS network.
- Several workshops organized around Finland in cooperation with Motiva and the FISS and Circwaste regional coordinators. Aim for 12 events.
- Development of an easy-to-use workshop model with ready to use instructions that are needed throughout the organization of the workshop.
- Companies have shown interest in the subject. Several good discussions during workshops and phone calls to companies.
- More entries of materials to the Materiaalitori.fi platform
- A new project will start in September that will use the developed workshop model in their actions.

Industrial symbiosis – Part 1 Workshop model

Challenges

- Everybody are tired of virtual workshops !!!
- The coordinators do not have dedicated resources to this kind of work. The resources need to be allocated from other projects with a similar interest. This leads to the short sightedness of the industrial symbiosis work. This is the reason for developing an easy-to-use handbook.
- Activation and openness of the companies to share information on the surplus or needed materials that could lead to industrial symbiosis actions. This is the reason why we decided to develop a 2-stage workshop. Only companies directly involved with the symbiosis are invited to the part 2- workshop.

TURKU AMK 



Thank you!