

**Industrial Symbiosis for Regional Sustainable Growth and a  
Resource Efficient Circular Economy**

**SYMBI**  
Interreg Europe



**ACTION PLAN**

**HÄME**

**June 2019**



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## SYMBI Industrial Symbiosis for Regional Sustainable Growth and a Resource Efficient Circular Economy

Produced by each region, the **action plan** is a document providing details on **how** the lessons learnt from the cooperation will be exploited in order to improve the policy instrument tackled within that region. It specifies the nature of the actions to be implemented, their timeframe, the players involved, the costs (if any) and funding sources (if any). If the same policy instrument is addressed by several partners, only one action plan is required.

### Part I - General information

Project: SYMBI

Partner organisation: Regional Council of Häme

Other partner organisations involved (if relevant): Häme University of Applied Sciences (HAMK)

Country: Finland

NUTS2 region: Etelä-Suomi

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## Part II – Policy context

The Action Plan aims to impact:

- Investment for Growth and Jobs programme
- European Territorial Cooperation programme
- Other regional development policy instrument

**Name of the policy instrument addressed:** Häme 2018+ Programme

**Basic information about the policy instrument:** The Häme programme is a strategic programme shaping the future of the region. The latest Häme Programme 2018+<sup>1</sup> was approved in November 2017 by the Assembly of Regional Council of Häme. It includes a regional strategic plan 2040 for the long-term perspective and a regional development programme for the four-year period 2018-2021. Smart Specialization Strategy – Smart Tavastia 2018-21 is also part of the document.

The aim of the programme is to show the direction into which the region will be developed and to gather resources so that various themes and ideas can be implemented. Regional strategic plan provides also guidelines for the regional land use plan. Compiling regional strategic plan and regional development programme are both based on regional development law<sup>2</sup> and they are updated once in four years in each Finnish region. Each year the implementation plan for regional development programme will be made for the next two years.

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<sup>1</sup> <https://www.hameenliitto.fi/sites/default/files/dokumentit/hame-ohjelma-2018-2021.pdf> (in Finnish only)

<sup>2</sup> <http://www.finlex.fi/fi/laki/alkup/2014/20140007> (in Finnish)

### Part III – Details of the actions envisaged

## INTRODUCTION

(Please put a short introduction including the regional context of the Action Plan)

There are three main themes in Häme programme 2018+: 1) A region that renews itself and is flexible to change; 2) Vitality from growth corridors; 3) Good everyday life. Circular economy is one of the four subthemes under the first main theme: A region that renews itself and is flexible to change. It is the only industrial sector which has its own subtheme in the programme. Smart Specialization Strategy of the region – Smart Tavastia<sup>3</sup> 2018-21 consists of four focus areas: 1) Sustainable use of natural resources – Bioeconomy and circular economy 2) Manufacturing industry 3) Creative industries, tourism and well-being services 4) Built environment and services. This shows that circular economy is definitively one of the key themes of regional development strategies. This can be seen at least partly as a result of the work done in SYMBI project.

One policy change from the SYMBI activities has been that industrial symbiosis as a concept is now introduced first time in Häme programme 2018+. There was not any mention of industrial symbiosis in our previous Häme programme 2014-2017 even though we already have some good examples of industrial symbiosis of our own in our region. The awareness of the importance of industrial symbiosis as one of the key segments of circular economy has risen due to the participation of Regional Council of Häme in SYMBI project. SYMBI activities in exchange of experience (surveys, studies, good practices from the SYMBI partners and other EU regions and cases introduced during SYMBI workshops and study visit) have encouraged and convinced to highlight the importance of industrial symbiosis in Häme programme 2018+. It has been recognized as one of the possible future development actions in regional circular economy utilized especially in modernizing and developing manufacturing industry in the region.

The results of SYMBI-project show that one of the main barriers on the way towards circular economy (CE) is lack of knowledge about business possibilities in it. Circular economy and industrial symbiosis and their possibilities are not well known among the companies. This has been highlighted especially by the results of the survey made for enterprises (SYMBI project activity 1.2. Mapping the investment potential in industrial symbiosis) in Häme region in the beginning of the project. The need for education and communication about these possibilities is mentioned also as one of the actions in Häme programme 2018+. After delivering knowledge about CE and industrial symbiosis (IS) support in starting new business models is needed also. Thus, the actions proposed are a) an extensive dissemination programme about CE and IS among various stakeholders and b) an industrial park (not the traditional one but something more creative) for start-ups and small and medium sized enterprises (SMEs) to support in developing new business based on CE and IS in Häme Region. The third action c) Mapping industrial plants, and commercial buildings producing excess heat which could be channelled for usable purposes, stems from lessons

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<sup>3</sup> Häme region is also called Tavastia region in English

learned from a study visit and a good practice. During the study visit in Slovenia the participants were introduced to an industrial symbiosis between two companies (shared heating system) and the potential for these kinds of symbiosis to be transferred to Häme region as well was recognized.

## 1. OBJECTIVES OF THE ACTION PLAN

(Please describe the objectives of the Action Plan, eg. main objective vs. specific objectives)

The original objective related to policy instrument was to try to improve the Häme programme with funding new projects under the programme. Häme programme itself is a regional strategy and does not include any funding. The funding for the actions in the programme must be found from other sources like Sustainable growth and jobs 2014 - 2020 - Finland's structural funds programme. During the SYMBI project many circular economy projects have been funded from this programme in the region and some parts of the actions presented in this plan, in point 4.1. and 4.2., are included in project proposals applying funding from the next call of the above mentioned structural funds programme.

The main objective of the Action Plan is creating new business based on CE and IS. That leads to improved economy and employment rate in Häme Region. The actions planned are trying to a) increase the awareness of the business possibilities among the enterprises and to b) improve the possibilities to proceed from ideas to business. These two can be seen as specific objectives of the action plan.

## 2. REGIONAL ANALYSIS OF THE CURRENT SITUATION

### a) Key intermediate actors in the promotion of industrial symbiosis and circular economy in the region (please include actors from the Quadruple Helix<sup>4</sup> concept if possible)

**Actor 1: Entrepreneurs and SMEs** in Häme Region (the public sector alone cannot make the progress) including their representatives (associations, development organizations, chamber of commerce).

**Actor 2: Municipalities** in Häme Region (for example land use planning affecting CE and IS is done by the municipalities).

**Actor 3: Häme University of Applied Sciences (HAMK)** and other **education institutions** (the ideas about CE and IS must be delivered and new employees on various levels must be trained).

**Actor 4: Various third sector organizations** (CE and IS do not proceed if no one is promoting products and services developed. It would be beneficial to get information delivered by neutral organizations instead of advertisements only).

### b) Main barriers that hinder industrial symbiosis or circular economy development

**Barrier 1:** Lack of knowledge about the business prospects

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<sup>4</sup> The Quadruple Helix concept (industry-academia-government-citizens) is preferred due to the fact that industrial symbiosis and circular economy are involving different spheres of actors, each contributing according to its function.

**Barrier 2:** Lack of support (not only financial but also counselling, advices and expert services) to ideas, start-ups and SMEs

**Barrier 3:** Lack of facilities where new business ideas could be born and developed (we should create ‘a critical mass’ of creative persons and new innovations and ‘living labs’ to speed up and the development of CE and IS and supportive infrastructure should be developed as well)

### **3. IDENTIFICATION OF BEST PRACTICES IN THE IMPLEMENTATION OF INDUSTRIAL SYMBIOSIS AND CIRCULAR ECONOMY PROMOTING ACTIVITIES:**

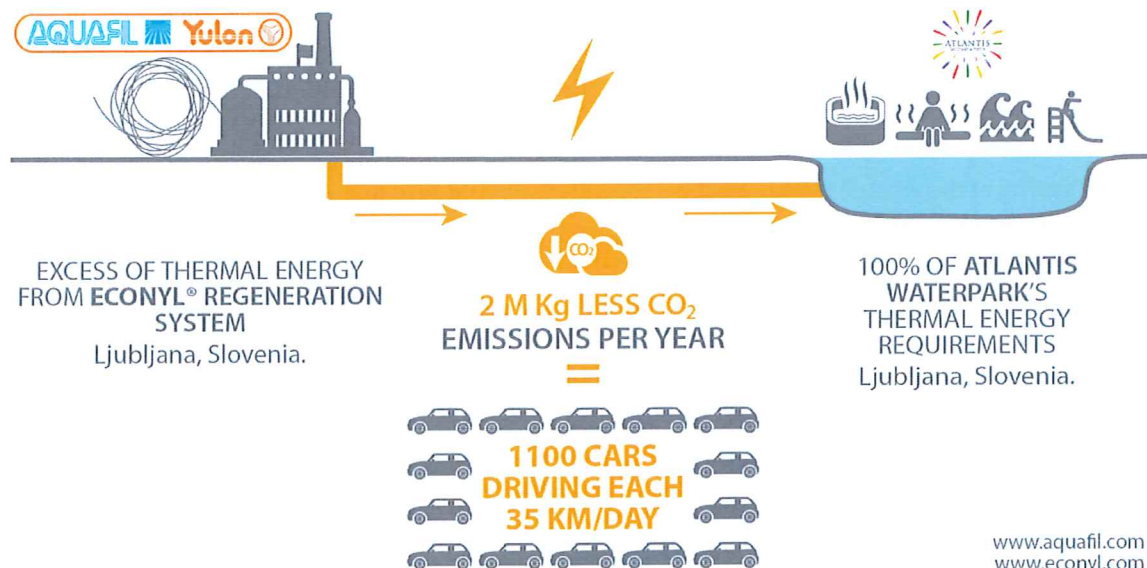
(Please list good practices from SYMBI project with the highest potential to be transferred to the project partner territory)

The shared heating system between two Slovenian companies has ignited the third action in the Finnish Action Plan:

During the project study visit to Slovenia (2017) the participants visited aqua park Atlantis, which has a remarkable industrial symbiosis with Aquafil Company (shared heating system). Aqua Park Atlantis needs heat to warm the pools and the entire complex, while Aquafil needs to cool the process water, before releasing it in the municipal sewage system. The excess heat from Aquafil's processes is transferred to Atlantis, to provide 100% of the waterpark's thermal energy requirements. The close location of the two companies allows to significantly reduce the businesses' environmental impacts on the city. The expectation is that more than 2.000.000 kilograms of CO2 emissions are avoided each year, that corresponds to 1100 cars driving each 35 km a day.

The good practise is also listed in the SYMBI project's website and the Policy Learning Platform, under Good Practices: <https://www.interregeurope.eu/policylearning/good-practices/item/2004/shared-thermal-energy/>

The industrial symbiosis can be best illustrated with this picture:



Source: [Aquafil](http://aquafil.com)

## 4. IDENTIFICATION OF ACTIONS TO BE IMPLEMENTED

### 4.1. Action 1: Awareness campaign on circular economy

#### A. The Background

When implementing data collection among various stakeholders within the SYMBI-project it was clearly noted that one of the major reasons why CE and IS are not progressing with the speed one could assume is lack of knowledge. This has been highlighted especially by:

- the results of the survey made for enterprises (SYMBI project activity 1.2. Mapping the investment potential in industrial symbiosis) in project partner regions in the beginning of the project. The results from Häme region indicated that companies still have poor knowledge of the two aspects of IS and CE. If stakeholders (entrepreneurs, authorities, financiers) only knew the benefits of CE and IS not only to the environment but to economy as well, the progress would be faster. To back up this assumption some preliminary results were received from the investment potential survey (activity 1.2.) from the Slovenian project partner SVRK, as most of the companies SVRK received feedback from, were not familiar with the concept of industrial symbiosis. The Slovenian survey entailed a paragraph where industrial symbiosis was explained to the recipients. The introduction followed by a question about now that they were informed of the concept, do they think that the

implementation of such projects would be beneficial for their company, and would they be willing to support it, and most of the companies said yes.

- discussions during the Public Consultation meeting on 14.9.2018 and Policy Awareness Event on 25.3.2019 (SYMBI project activities 2.2) and Stakeholder Group Meetings.
- third party event: participation to the CEN workshop on industrial symbiosis: one of the main findings of the whole SYMBI project among other scientific research is that the absence of common understanding of the whole concept of industrial symbiosis has made exploitation of IS more difficult. SYMBI was one of the projects to propose a workshop with the European Committee for Standardization (CEN) about industrial symbiosis and the workshop was held. In December 2018, the CEN Workshop Agreement for industrial symbiosis was drafted with the aim to advance the uptake of industrial symbiosis across Europe and globally by defining core elements and implementation approaches. The participation to this joint third party and almost like a project spinoff event, the discussions held during the event and the Workshop Agreement contributes and backs up the need to advance awareness of the whole concept.
- A1.1 Comparative analysis of regional and national policies on industrial symbiosis and circular economy: desk research on the subject shows that other publications such as the Finnish road map to a circular economy by SITRA also back up the fact that lack of knowledge hinders the diffusion of industrial symbiosis.

In order to disseminate information about industrial symbiosis, also the basic knowledge about what circular economy is all about should be delivered within this action.

## B. Action

(Please list and describe the activities to be implemented within this action. Please include\* the information if this action impacts on the programme or on a specific projects founded within the programme) \*only for ERDF instruments.

- a) The regional organization of The Federation of Finnish Enterprises has some 6000 members, mainly SMEs. Thus, co-operation with this organization is vital to reach major part of SMEs in Häme Region. The knowledge about CE and IS will be delivered through day to day actions (members' letters, organization's web-pages, various events). Especially, examples of best practices and success stories will be presented to encourage others to follow.
- b) The annual circular economy start up event FRUSH (held in Häme), is a perfect occasion for delivering the CE knowledge among various stakeholders in Häme Region and even nationally. The FRUSH event is growing every year and in the future it will be more and more international. The potential for FRUSH to become an international event was recognised through the SYMBI study visit in Finland when the project partners and stakeholders took part to the second event in 2018. The first event in 2017 was regional and the second more international due to the SYMBI study visit. SYMBI stakeholders from other regions were very interested in the event and its



concept and got us convinced that the event should be developed even more international. FRUSH 2019 will have international guests from 30 different countries.

- c) CE will be taken into account in developing curricula in all stages of education in Häme Region. Many nurseries, schools, colleges, etc. have taken sustainable development in their day-to-day actions and/or curricula and circular economy can be seen as one of the main tools in advancing economical and environmental sustainable development goals. This work will be followed up and developed further.

### C. Players involved

(Please indicate the organisations in the region who are involved in the development and implementation of the action and explain their role.)

Häme University of Applied Sciences, HAMK

-The organisation in charge of the development, promotion and implementation of the action

Regional Council of Häme

-Respond for the initiation of the action and share information about it

The regional (Häme Region) organization of The Federation of Finnish Enterprises

-Provide channels (e.g. newsletters) and opportunities (e.g events) to reach and get in touch with enterprises

Business Development Agency of Forssa, FYKKI

-Provide channels (e.g. newsletters) and opportunities (e.g events) to reach and get in touch with enterprises

Schools, colleges and other education institutions

-Receive information and intergrade lessons learned to own activities

### D. Timeframe

(Please indicate the timeframe with particular emphasis on what you will implement within the phase 2 of the SYMBI project.)

- The co-operation with the regional (Häme Region) organization of The Federation of Finnish Enterprises will start as soon as the first implementation plan is planned and agreed. The target is such that the first activities will take place in April 2019. The plan of activities will be done for one year at a time. Thus, activities will continue to the end of SYMBI project but will continue even from that onwards.

- There will still be two FRUSH-events within the ongoing SYMBI-project, in September 2019 and September 2020. Anyhow, FRUSH-event will be organized yearly even after that.
- Discussions with persons in charge of curricula development in various education institutes will start in the spring 2019. The aim is to get first (5) new curricula where CE is taken into account in use in the beginning of the school year 2019-2020. From that onwards some 10 new curricula will be updated annually. This activity is continuous as well. Thus, it will not end simultaneously with SYMBI project.

### E. Costs and funding sources

(Please list the costs for implementation with its funding sources – if relevant.)

Most of described activities are such that they will be included in projects which are planned to be implemented with the help of ERDF funds. The regional call of *Sustainable growth and jobs 2014 - 2020 - Finland's structural funds programme* has ended 4th March 2019 and the decisions for the funded projects will be made in June. It is estimated that approximately 50% of these ERDF project proposal actions are based on lessons learned in SYMBI.

### F. Monitoring of actions

(Please describe the activities to be carried out to monitor the fulfilment of action 1 described in this Plan).

HAMK will be active in promoting the implementation of this action plan. Monitoring will be done by a researcher at HAMK. The idea is to write a scientific article and/or a conference paper on the basis of the monitoring data. This way, we can assure that the results are not only monitored but reported as well.

Monitoring meetings will be organized with relevant stakeholders, such as business development organizations, municipal authorities, research institutions, etc.

## 4.2. Action 2: Promoting start-ups and SMEs working in business related to CE

### A. The Background

(Please describe the lessons learnt from the project that constitute the basis for the development of the present Action Plan.)

Within SYMBI project, in several events and discussions with entrepreneurs (study visits, project workshops and stakeholder group meetings) it was noted that start-ups with new business ideas as well as SMEs are looking for various kinds of assistance to launch their products or business ideas and/or to get support in getting new markets and/or developing the business to the next level (product development or new markets). This has been highlighted especially by:

- the results of the survey made for enterprises (SYMBI project activity 1.2. Mapping the investment potential in industrial symbiosis) in project partner regions in the beginning of the project.
- discussions in Häme Stakeholder Group Meetings (SYMBI project activity A 2.1) several times.
- discussions during the Policy Awareness Event on 25.3.2019 (SYMBI project activities 2.2).

## B. Action

(Please list and describe the activities to be implemented within this action. Please include\* the information if this action impacts on the programme or on specific projects founded within the programme) \*only for ERDF instruments

- a) There are several on-going activities around start-ups and SMEs in Häme Region. Business development organisations in all three sub-regions (Hämeenlinna, Riihimäki, Forssa) of Häme have developing and supporting SMEs as one of their main objectives. For example in Forssa region FYKKI has the objective to have 100 new start-ups during the next three years. The idea of this action is to integrate the concept of CE and/or IS into these activities. This is to speed up the development of CE in the region.
- b) The above mentioned (Action 1) FRUSH event has been created just for this purpose but even though it is an annual event, it takes place in just few days, thus, cannot complete this action by itself only. Supporting mechanisms that are active all year round are needed.
- c) HAMK will launch a 'modern business park' without a new office or a permanent organization. The idea is to offer tailor made operations for start-ups and SMEs on their way in CE. When an entrepreneur is approaching anyone at HAMK with his/her business idea the person at HAMK will collect a group of professionals from appropriate authorities and institutions to help in developing the business idea up to the level it can apply funding for product development and/or launching the business idea from Business Finland or any other organization for the purpose.

## C. Players involved

(Please indicate the organisations in the region who are involved in the development and implementation of the action and explain their role.)

Häme University of Applied Sciences (HAMK) is a key actor in this action. HAMK will follow up the action and make sure it is progressing.

There are several business development organizations in the region which will be bound to implement this action.

Municipal authorities in the region are to participate in the action as well as many other research and development institutions active in the region.

#### D. Timeframe

(Please indicate the timeframe with particular emphasis on what you will implement within the phase 2 of the SYMBI project.)

- Mapping of all ongoing actions related to projects supporting start-ups and SMEs in Häme Region – the 7<sup>th</sup> semester of SYMBI project.
- Making sure that the above mentioned actions are underlining new opportunities brought by CE and IS to business in the future – the 8<sup>th</sup> to 10<sup>th</sup> semesters of SYMBI.
- The annual FRUSH-events: the 3<sup>rd</sup> and the 4<sup>th</sup> ones within SYMBI project (Sep 2019 and Sep 2020) and from that onwards in each September.
- The idea of a 'modern business park' will be developed gradually from the beginning of 2019. Discussions are ongoing with the Business Development Organization of Forssa City and some other organizations. The target is that this type of new service for start-ups is operational before the end of SYMBI project.

#### E. Costs and funding sources

(Please list the costs for implementation with its funding sources – if relevant.)

The first task mentioned in the timeframe above do not need any extra funding. This action can be taken into study modules for students at HAMK and thus, the work will be supervised by the staff of HAMK.

What comes to the other two tasks under this action, resources for these works will be applied from ERDF funds. The regional call of *Sustainable growth and jobs 2014 - 2020 - Finland's structural funds programme* has ended 4th March 2019 and the decisions for the funded projects will be made in June.

To develop the FRUSH events gradually bigger and more international, the most ideal situation would be that there would be a person who could concentrate in developing FRUSH event for example one quarter of his/her working hours until the event could cover all the costs by itself (participation fees and cooperation contracts with companies). This would mean some 15 000 euros/per year for salaries (including all side costs) and the same for buying services from advertisement offices or similar for two-three years.

The costs for the last action in the timeframe are not known at the moment. The idea is new and detailed actions are under considerations still.

#### F. Monitoring of actions

(Please describe the activities to be carried out to monitor the fulfilment of action 2 described in this Plan).

Monitoring meetings will be organized with relevant stakeholders.

## 4.3. Action 3: Mapping industrial plants, and commercial buildings producing excess heat which could be channelled for usable purposes

### A. The Background

In the SYMBI project Study Visit in Slovenia, the project partners were shown an effective symbiosis between a textile factory and a spa (more info in section 3). The factory is producing heat (warm process waters) which it cannot utilize itself. The factory also needs to cool the warm waters before releasing them to the municipal wastewater system. Instead of wasting the heat in the air the nearby spa is taking the benefit to heat up waters. The symbiosis provides 100% of the waterpark's thermal energy requirements. And as a result of the symbiosis more than 2.000.000 kilograms of CO<sub>2</sub> emissions are estimated to be avoided each year. This seemed to be something benefitting all stakeholders (in spite of the central heating company of the area using fossil fuel in its process) and is therefore worth to be considered in Finland as well.

### B. Action

HAMK will organize mapping of industrial plants and commercial buildings 'wasting' heat in Häme Region. This will be implemented as a first stage task in this action. This means that HAMK students will organize the task on quite general level without going into very deep in the industrial processes. This is to find out the range of possibilities in taking the advantage of extra heat in the region.

Later on, if the utilization of the extra heat seems to be viable in some cases, these ones will be taken in more detailed investigations. Naturally, the target is to find ways to avoid wasting energy and resources. This kind of actions have a significant potential in rising awareness of the opportunities industrial symbiosis brings.

### C. Players involved

There are students at HAMK who under guidance could implement the first task of this action. Part of the work can be done within their studies when they are earning credit points and no extra funding is required. The action is also a potential source for bachelor and master's thesis.

Other stakeholders in this action are naturally the owners of the industrial plants and commercial buildings which allow the students and their supervisors to implement these investigations.

In the second task of the action, some specialists are needed to make detailed plans how the extra heat is captured and taken into beneficial use.

#### D. Timeframe

The first trial of this action is on-going. There is an exchange student requiring some extra credit points at HAMK and he is implementing this action as a 'pilot test'. After getting his experiences the more detailed timeframe can be designed. The target is that the first task is done within SYMBI project.

#### E. Costs and funding sources

The aim of the action is a) to reduce greenhouse gas emissions, b) to reduce burning fossil fuels and c) to improve the economy of the industry and commercial actors in Häme Region. Thus, the assumption is that the benefitting actors are covering the costs of this action.

#### F. Monitoring of actions

The number of industrial plants and commercial buildings involved in the first task of the action will be recorded and reported by HAMK.

In the second task, more detailed information will be calculated, collected and reported by the stakeholders involved in implementing the task. At this stage, it is impossible to determine responsibilities in detail. It is not known whom are involved. Anyhow, one could assume the industry itself would be interested in publishing data – that would act as advertisement of their responsibility in developing the business towards more environment friendly production.

### Signature

Date: 28.6.2019

Signature:   
Anna-Mari Ahonen, Regional Mayor

Stamp of the organisation (if available):

