Arctic Industry and Circular Economy Cluster - Smart Specialisation in Practice

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Main regional characteristics

- Surface area 100,366 km², of which 7,699 km² is water
- Population 180,200, population density 1.8 /km²
- Employment: approximately 69,000 jobs, of which approx. 50% are in private enterprises
- Number of private enterprises 9,100
- Annual revenue of Lapland €12,000 M, of which 70% comes from private enterprises
- Annual revenue of mining and metal industry approx. € 5,000 M
- Annual revenue of forest bioeconomy approx. € 1,300 M
- World’s northernmost bio, mining and metal industry hub
- Europe’s only chromium mine and the largest gold mine in Europe
- Tourism is the fastest growing sector with overall demand of approx. € 1,000 M and an average annual growth of 9%, in 2017 as much as 20%
- Agricultural production and reindeer husbandry approx. € 340 M
- Finland’s fourth largest export region, 7% of Finnish export
- Nine national parks in the area
- World’s cleanest air and Europe’s purest water
- World’s largest wild organic harvesting area
- Strong educational structure: University of Lapland, Lapland University of Applied Sciences, Vocational College Lappia, Lapland Education Centre REDU and the education centre of the Sámi region
- Research institutes: Geological Survey of Finland (GTK), Natural Resources Institute Finland (LUKE), Sodankylä Geophysical Observatory (SGO) as the most notable
- National circular and bio-economy centre in Kemi

Lapland has the fastest growing economy in Finland

Lapland is a unique Arctic region that wants to be the most innovative and entrepreneur-driven of all the sparsely populated EU regions by the year 2022. The future objectives are set high, but the measures for achieving those goals are tangible and close to the operators.
Kemi-Tornio’s circular economy innovation platform

- Arctic Spring, Investment boom in Arctic regions
- Worlds northernmost hub of bio-, mining -, metal industry and services
- Responsible for 80% of Lapland’s industrial production, with over 5 billion EUR of exports annually (7-8% of the total export value of Finland)
- Industrial symbioses estimated at 700 million EUR annually
- Industrial- and mining service companies receive orders worth of hundreds of millions.
- International-industry standards, HSEQ
- Cleantech – growing need of sustainable solutions
- Enhancing Circular Economy
- Internationalization in home market – “glocalization”
- Internationalization in the surrounding countries
- Own products and services
FURTHERING THE CIRCULAR ECONOMY AND BIOECONOMY IN LAPLAND IN 2012–2016

Where did it all begin?
11/2012
The key players of Kemi–Tomio industries and industrial services were interviewed in the side-stream evaluation of needs.

Lapland EU’s model region
7/2014
European Commission’s selection: Lapland EU’s model region in sustainable processing of natural resources.

The FISS model
10/2014
FISS workshops, Finland benchmarking, business potential.

Recognition for work
21 September 2016
Work carried out by the Kemi–Tomio region & Lapland and Digipolis and partners:
Key project of Sitra’s Finnish circular economy action plan.

Development of operations
2014
Side-stream recognition tool development together with industries across sectoral boundaries. Development of measures furthering the systematic process and taking the matter forward.

Prioritisation of development tasks
4/2013
Prioritisation of development tasks with key players of industries and industrial services.

Expansion of operations
2015-2016
Entire Lapland’s big industries involved in development. Synergies between mines and the processing industry, and entry of new service businesses. Expanding the process to northern Finland, northern Sweden and northern Norway.

2017
Implementation of Sitra’s action plan.

Industry byproducts utilised

DIGIPOLIS

Economic Union

LAPIN AMK

Leverages from

2014–2020
Sustainable exploitation of arctic natural resources
Towards a low-carbon and resource-efficient circular economy in the Arctic: Case example of industrial circular economy flows in Kemi Arctic region

Digipolis – Kemi Technology Park
The Circular And Bioeconomy Centre
Arctic Industry and Circular Economy Cluster
Finland becomes a world leader in the circular economy by 2025

Roadmap’s ambition:

- Increased exports and growth for companies from scalable and comprehensive circular economy solutions.
- Functional domestic market.
- Circular economy into the mainstream through actions and concrete pilots.

Economy, environment & society:

- Circular economy as a new cornerstone for the Finnish economy.
- Finland as a model country for the challenge of scarcity.
- From adapter to pioneer.
Circular economy can be boosted through long-term systemic changes, quick experiments, scalable solutions, and stimulation of demand.

Policy actions for creating functional domestic market:
- The creation of indicators for Finnish road map to a CE
- Financing for revolutionizing transport in regions
- Regional sustainable food system
- CE to become a part of education and future decision-making: CE in study programs of schools and universities

Large and small projects, and sharing best practices:
- WCEF 2017 – World’s first global CE forum
- A list of the most interesting companies in the CE in Finland
- A list of the most interesting CE actions in municipalities
- Finnish industrial CE Centre in Kemi

Cooperation with European Climate Foundation – CE as a means for mitigating climate change:
- CE demonstration plant for recycling valuable metals of waste electrical and electronic equipment
Finnish industrial circular economy centre - established in Kemi in 2017

- Finnish Innovation Fund Sitra, City of Kemi, Digipolis – Kemi Technology Park and Lapland University of Applied Sciences (Lapland UAS)
- First industrial circular economy centre in Finland with national level mandate
- Network of industry & university experts and intermediaries
- International network including e.g. Nordic, EU level and Chinese cooperation partners
- National level goals: competence building in industrial circular economy, spreading the operating models of the Kemi industrial circular economy in Finland
- Regional/local level goals: new investments and jobs, contribution to sustainable and resource efficient industry modernization, cooperation culture, new experts – CE education
- The main strategic focus areas of circular economy centre
  - Developing networks – Arctic Industry and Circular Economy Cluster and Finnish Network of Eco-Industrial Parks
  - Promoting entrepreneurship and systematic change
  - Circular economy RDI and Education – Lapland UAS in the collaboration with 18 UAS
- EU interregional collaboration and S3 thematic partnerships
THE DESCRIPTION OF OPERATIONAL MODEL
For Industrial Circular Economy

1. Gathering of stakeholder network
2. Identification of the needs of companies considering industrial symbiosis activities
3. Concrete start-up activities
4. Building and earning of trust
5. Communication
6. Funding
7. Benchmarking & networking
8. Ownership
9. Priority in the needs and possibilities of the participating companies
10. Toolbox of Industrial Symbiosis
THE FUTURE OF THE CIRCULAR AND BIOECONOMY IN LAPLAND

4,000
The Kemi–Tornio industries currently employ 4,000 people in the region. With future investments in the bio- and circular economy (such as Boreal Bioref, Kaidi), the employment effects in northern Finland are estimated at 2,000 persons.

Industry byproducts utilised
Annually the Kemi–Tornio industries produce 1.7 million tonnes of industrial byproducts.

Utilisation categories include neutralisation, circulation of nutrients, excavation, landscaping, soil enrichment, building products, water treatment.

From waste into profitable business
Finland has great potential to utilise industrial side streams (94 million t/a), which are currently classified as waste.

96% of waste is non-household generated.

VISON
Lapland world’s leading arctic bio- and circular economy region

Business potential
The current value of Lapland’s industrial symbiosis and the potential of the bio- and circular economy

2 billion

CE-approved recycled materials from industrial side streams:
The annual use of ferrochromium slag in road construction (400,000 tonnes) saves 600,000 tonnes of virgin gravel and rock aggregate and reduces road construction carbon dioxide emissions by 200,000 tonnes.

Source: Outokumpu plant in Tornio

Ecosystem

Kemi–Tornio circular economy

Value MEUR
Current value
Potential

700 million
How Circular we are? - Kemi-Tornio circular economy ecosystem
Thank You!
Interested in to do co-operation?
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