

# Paper Province

A forest bioeconomy hotspot



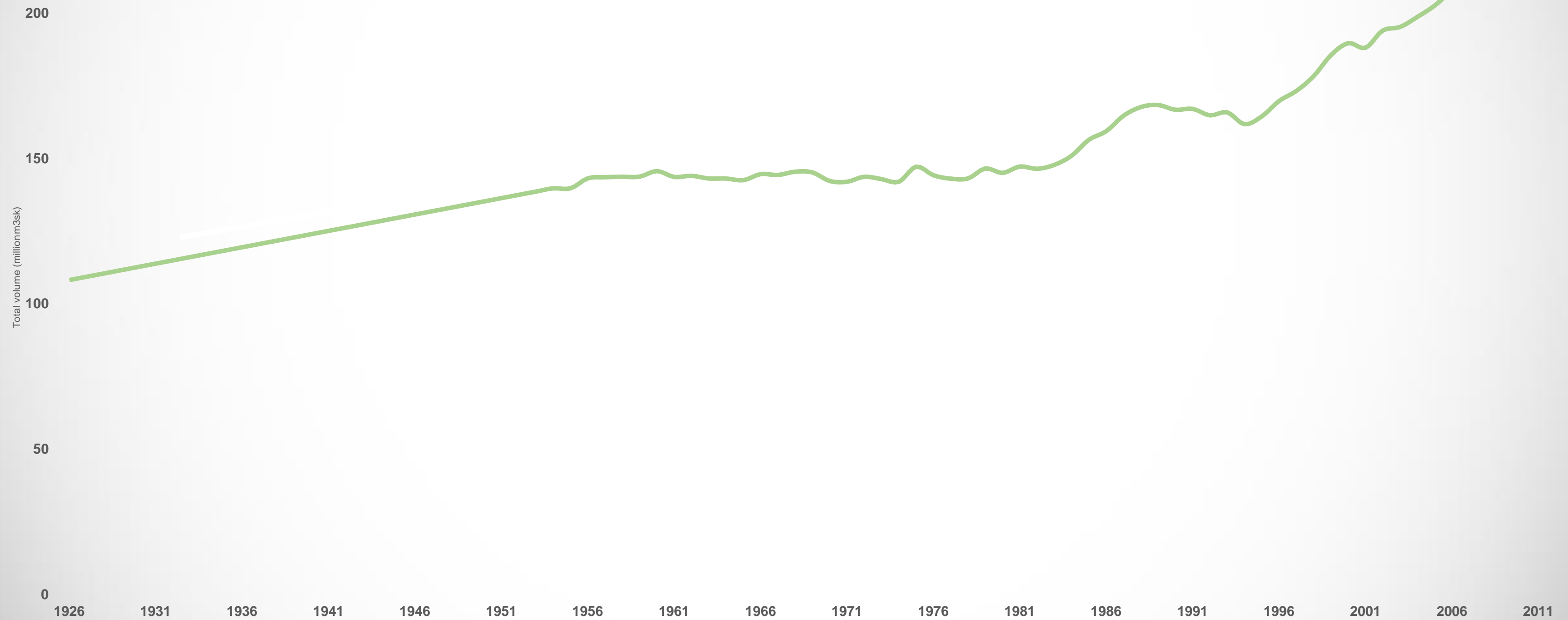


# SUSTAINABLE FORESTRY





# FOREST VOLUME EVOLUTION IN VÄRMLAND



# NET GROWTH IN PAPER PROVINCE









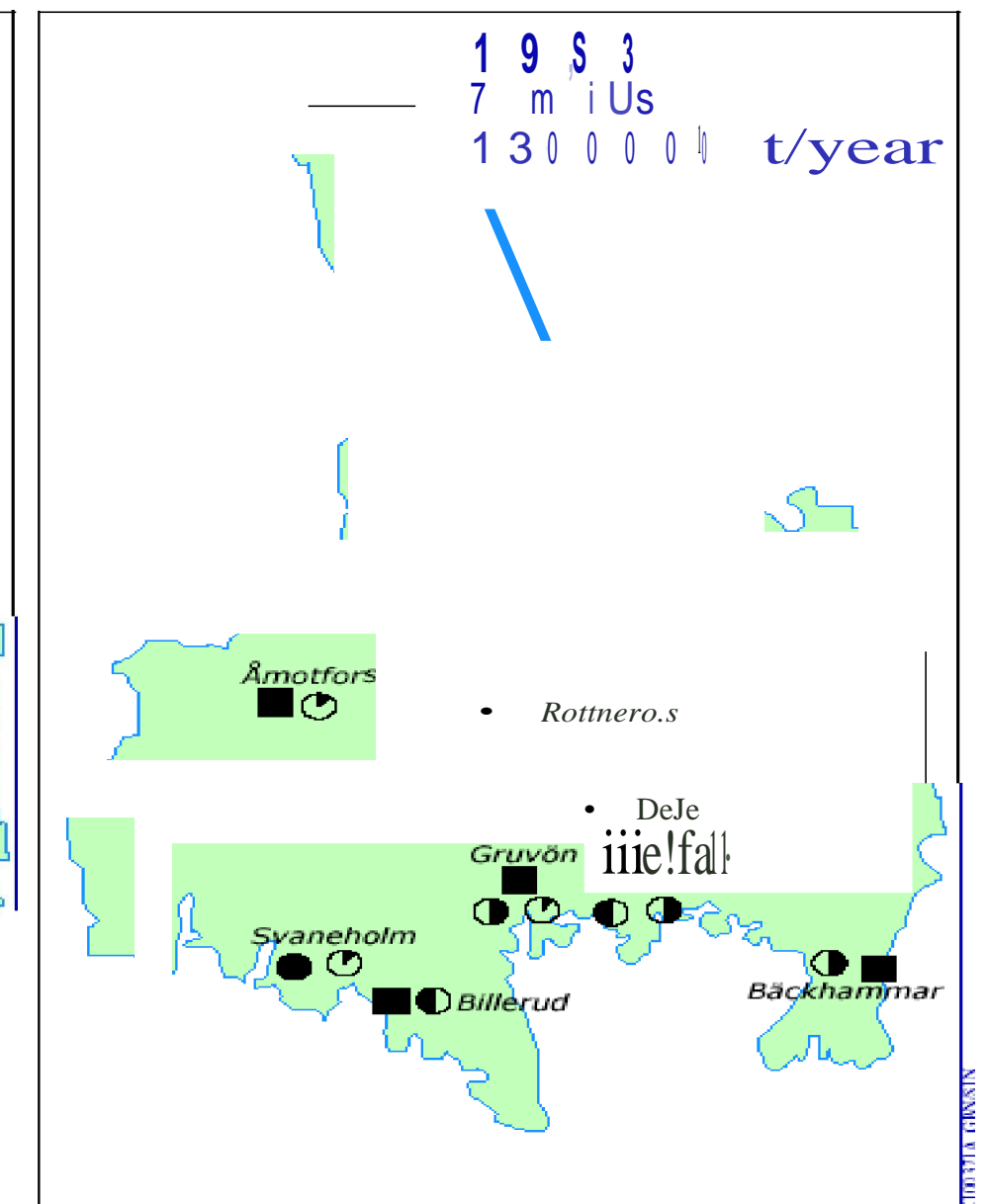
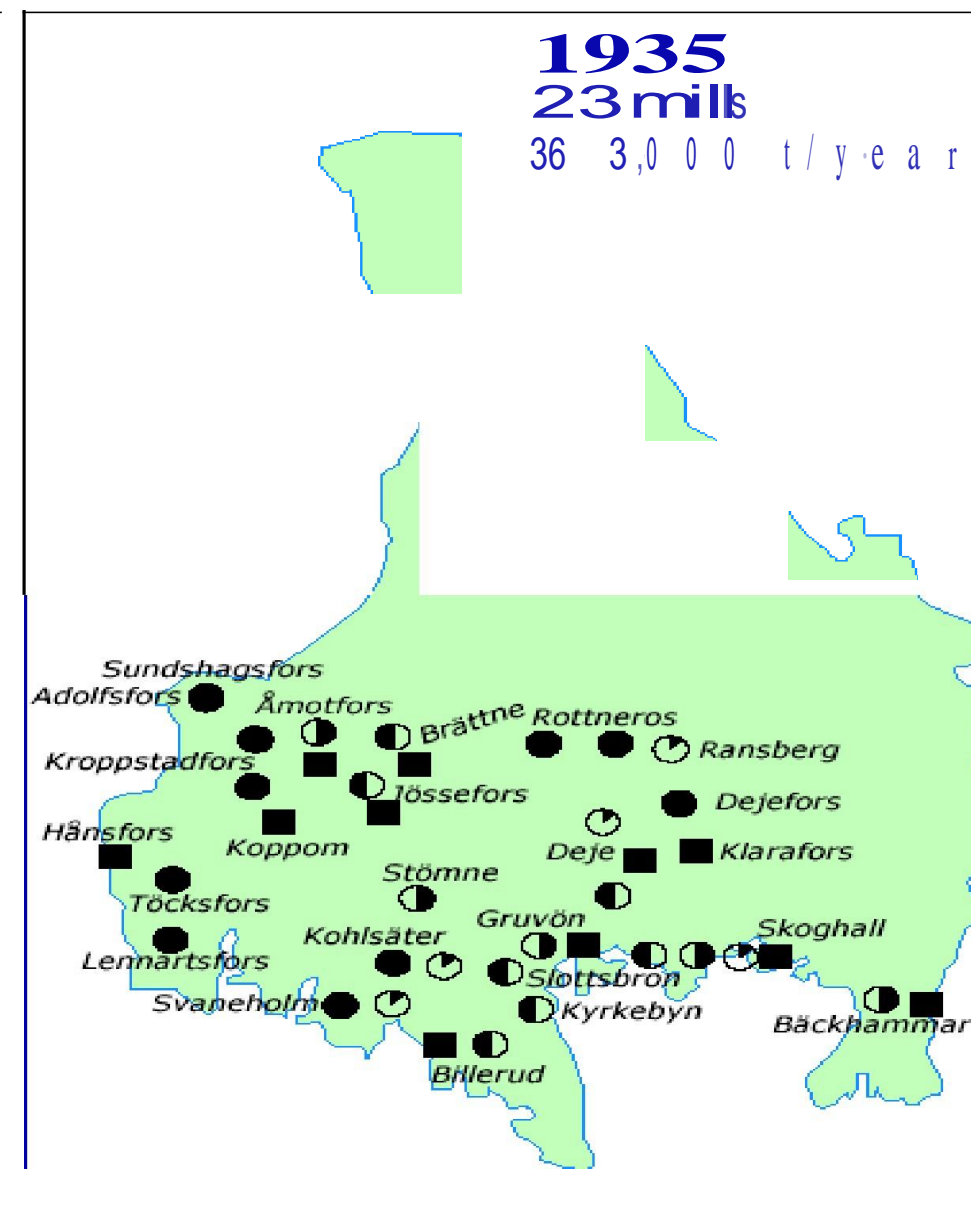
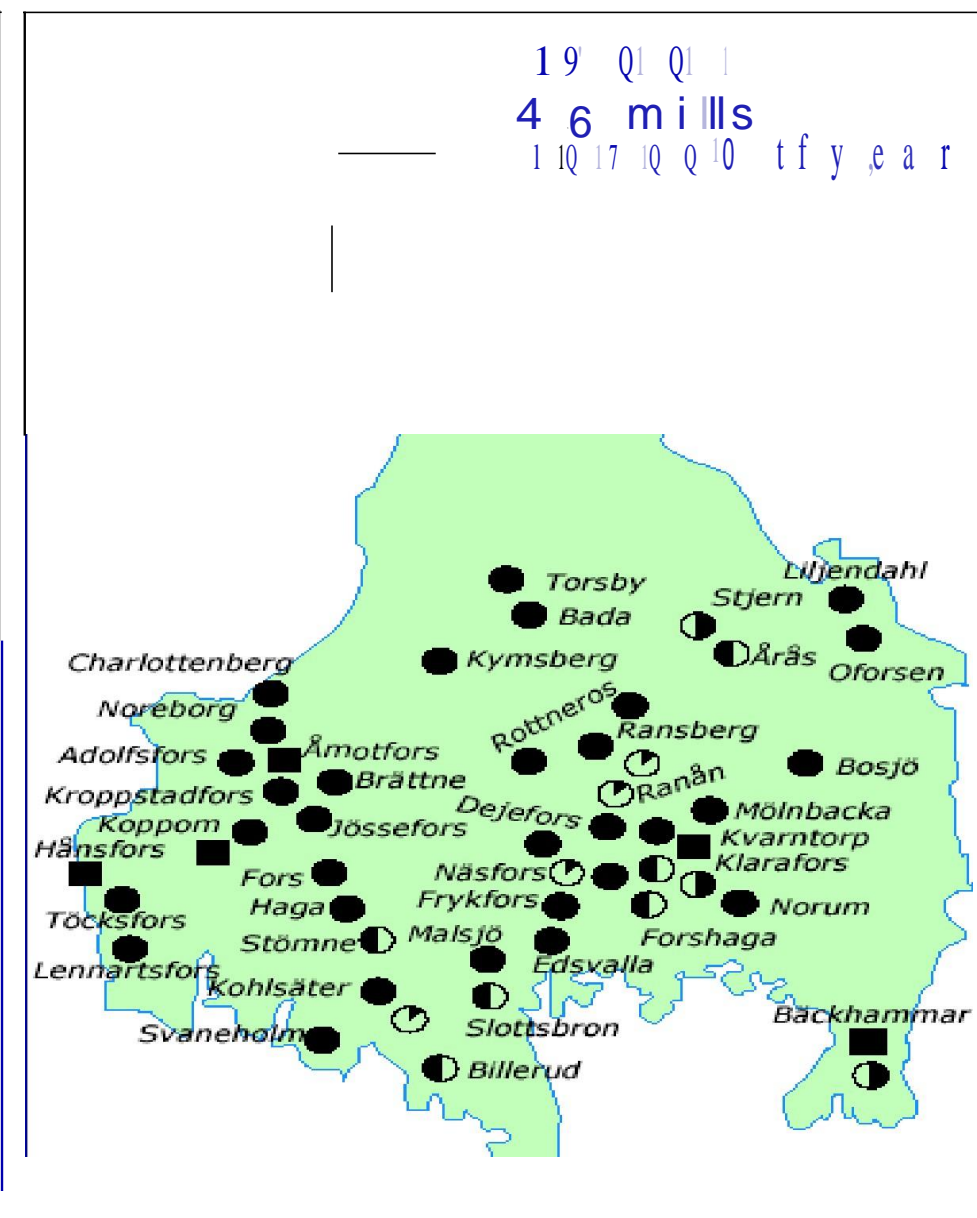
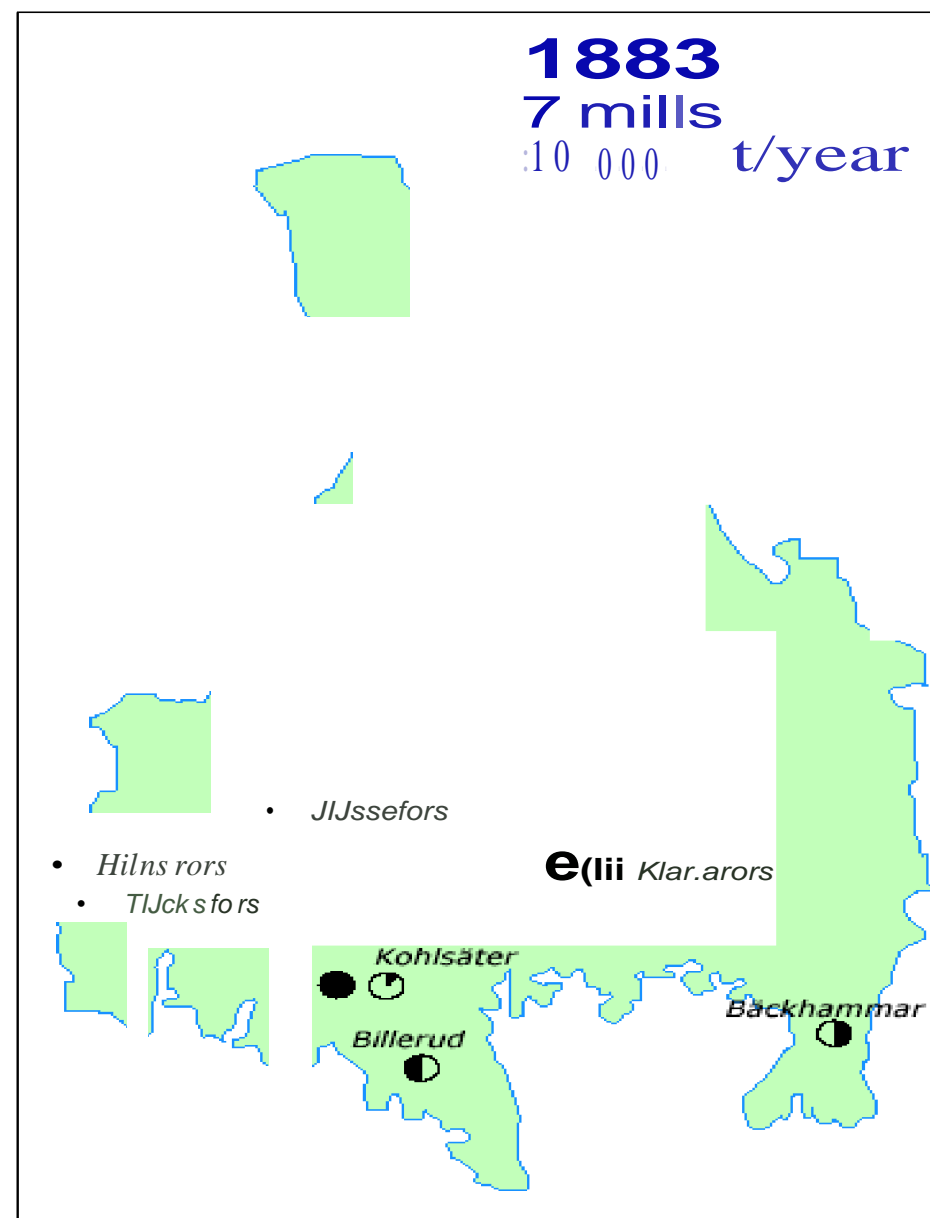
# VÄRMLAND FACTS

- 16 municipalities
- 281 482 citizens 2018
- 75% covered by forest (12 000 km<sup>2</sup> of productive forest)
- The forestry and forest industry employs approx. 24% of the total workforce in the county, around 29 000 jobs.
- 6 million m<sup>3</sup> wood harvested annually
- 1.6 million ton paper is produced
- 1.8 million ton pulp is produced
- 20 800 private forest owners, 8 200 are women





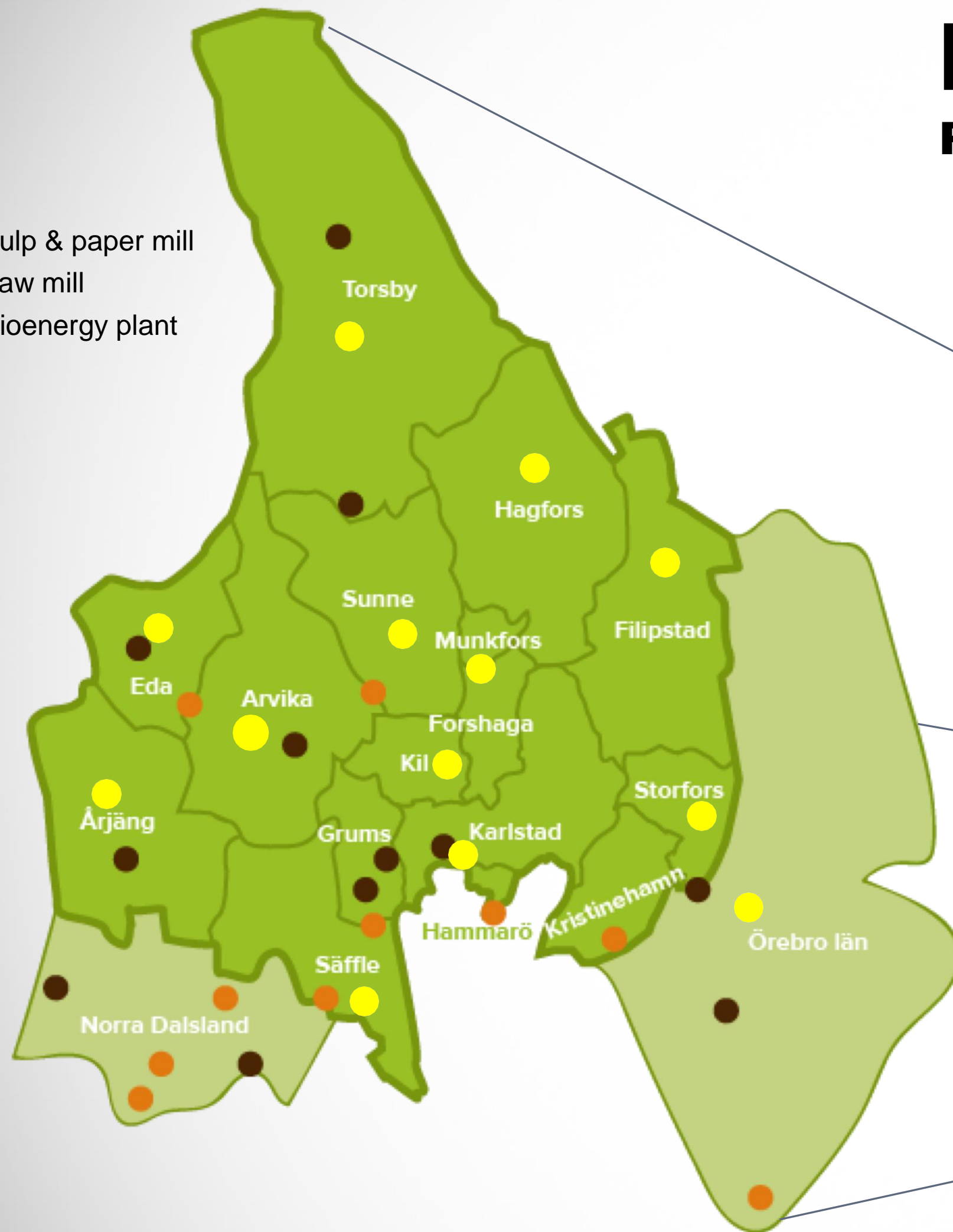
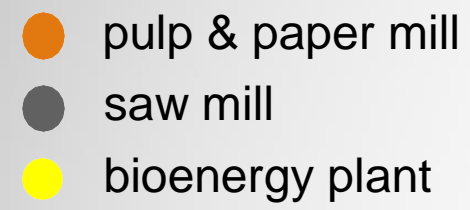
# HISTORY



- Groundwood mill
- Paper mill
- Subsite mill
- Paper and board mill
- Kraft mill



# MILLS IN PAPER PROVINCE





  
**BILLERUDKORSNÄS**  
Next generation board machine –  
**750 M€**

## REGIONAL INVESTMENTS IN FOREST PRODUCTS

  
**Rottneros**  
Wetmoulded food tray production

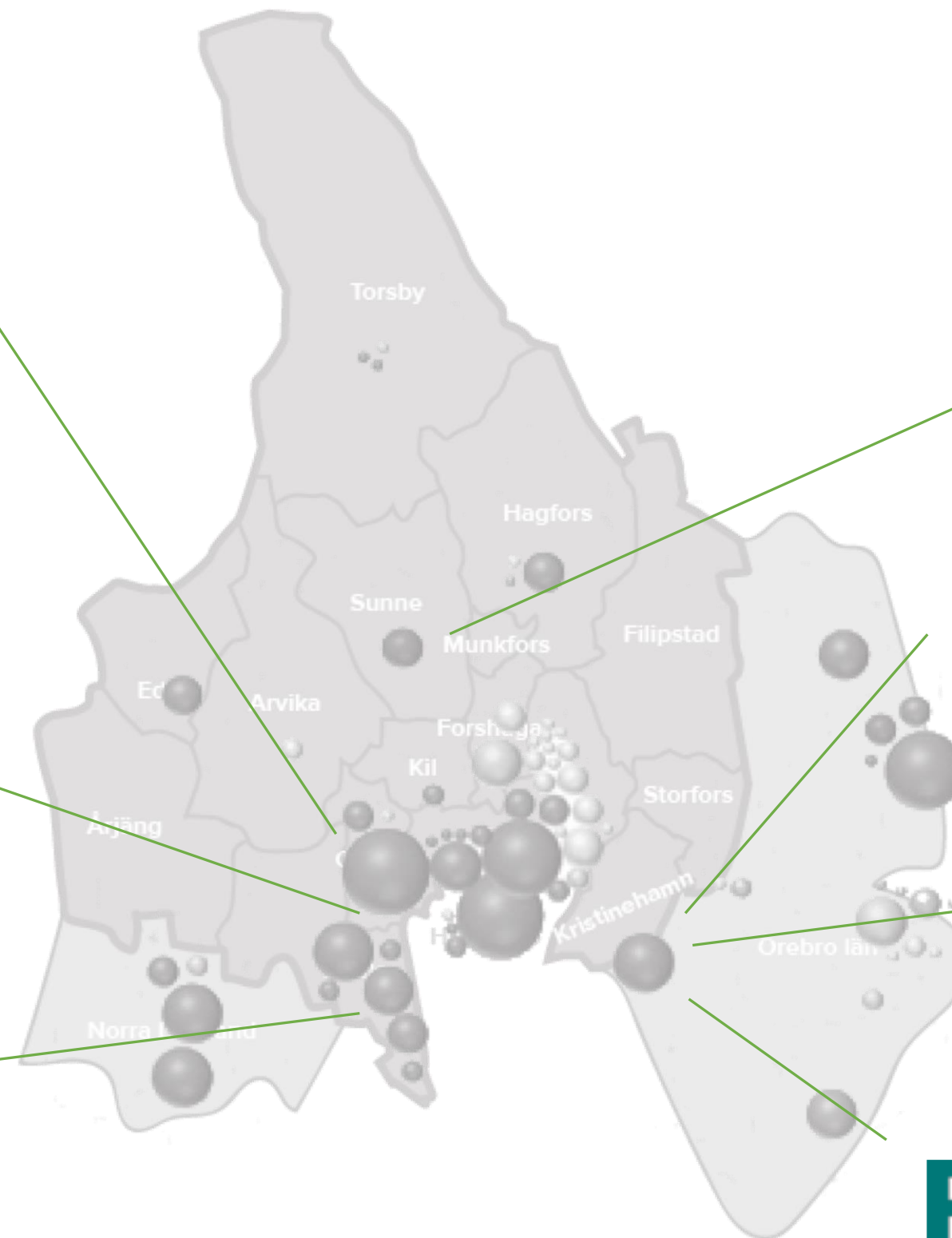
  
storaenso  
Cross Laminated Timber facility –  
**45 M€**

**re:newcell**  
Viscose production unit –  
**7 M€**

**seelution**  
Biobased barriers

  
CELLCOMB  
CREATING CLEAN COMFORT  
New laminate production line –  
**3 M€**

**RENFUEL**  
Lignin biofuel pilot –  
**13 M€**





# BILLERUDKORSNÄS

- Premium liner for corrugated board, liquid packaging and cartonboard
- 350m long and 8,6m wide; 1000 m/min
- 750 M€ 2017-2019



Annual capacity of 550,000 tonnes



# STORA ENSO GRUVÖN CLT

- Production 100 000 m<sup>3</sup> / year
- Swedish production 2018: 22 000 m<sup>3</sup> / year
- Investment 45 M€





# GRUMS MUNICIPALITY



Den nya skolbyggnaden vid Södra skolan kommer att byggas i CLT (korslimmat trä). Byggnaden är lokalt producerad. Den byggs och transporteras från Stora Ensos nya CLT-fabrik vid Grevons sagverk till Södra skolan - knappt en 1 km.



# HOW HAVE THE INVESTMENTS AFFECTED OTHER COMPANIES IN THE MUNICIPALITY?

GRUMS. 15 företag har ökat omsättningen



Billerud Korsnäs har investerat flera miljarder kronor i Gruvöns bruk. FOTO: TOMMY ANDERSSON

## Positivt för företagen

**Storinvesteringarna hos Stora Enso och Billerud Korsnäs har varit påtagliga i Grums.**

**För en del andra företag i kommunen har de också inneburit att omsättningen ökat.**

I början av året skickade Grums kommun ut en enkät till knappt 200 företag i kommunen.

Frågorna handlade bland annat om hur företagen på-

verkats av jätteprojekten hos Stora Enso och Billerud Korsnäs.

- Vi ville ha en värde-  
mätare - vad har det gett  
dem? säger kommunalrådet  
Leif Haraldsson (S).  
79 svar kom in.

### Högre omsättning

För många företag har det varit en positiv tid. 52 procent av dem som svarat säger att de inte påverkats av investeringarna, medan 39

procent har påverkats positivt. Det handlar till exempel om att de fått en större omsättning, mer jobb eller fler anställda.

15 företag säger att deras omsättning ökat tack vare storinvesteringarna. Sammanlagt handlar det om en omsättningsökning på 20,5 miljoner kronor.

**Daniel Larsson**

054-19 97 87  
daniel.larsson@nwt.se

- Poll 200 companies
- 79 answers
  - 52% not affected
  - 39% positive, revenue & employees
  - 15 companies higher revenue 2M€
- Stora Enso Gruvön + 60 employees



# TRITON VALSTEKNIK

- SME
- Started 1999, today 56 employees
- Investment 3 M€ last 5 year
- Aim to double revenue every third year
- Hired Environmental Manager and actively working with Gender





# PAPER PROVINCE

## A forest bioeconomy cluster in mid Sweden

- Started as a project in 1999
- 104 member companies
- ~ 7.000 employees in the member companies
- 24 % of work force
- Member companies turnover 25 billion EUR 2015
- Vinnväxt winner in 2013 (Long term financing)
- 13 employees
- ESCA Gold Label Dec 2017





**WE SHALL BE THE  
LEADING  
COMPETENCE NODE  
FOR FOREST BASED  
BIOEC♻️NOMY**



STRATEGY DOCUMENT

01

Värmland's Research and  
Innovation Strategy for

*Specialisation  
2015-2020*







# Academy for Smart Specialisation 2016



# A NEW STRATEGY FOCUSING ON BIO-ECONOMY



PRINTING

FOREST

FOREST BIO-ECONOMY

IES

IT-COMPANIES

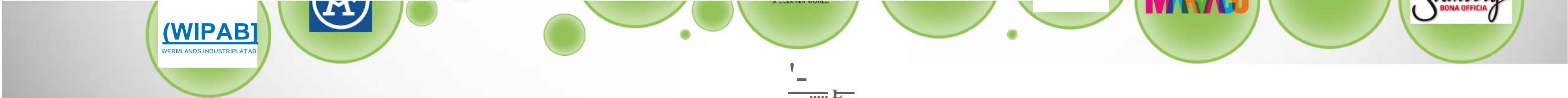
ENERGY

PAPER MILLS

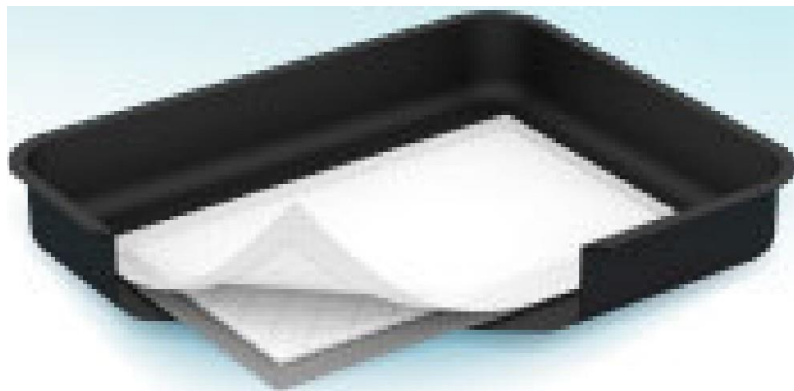
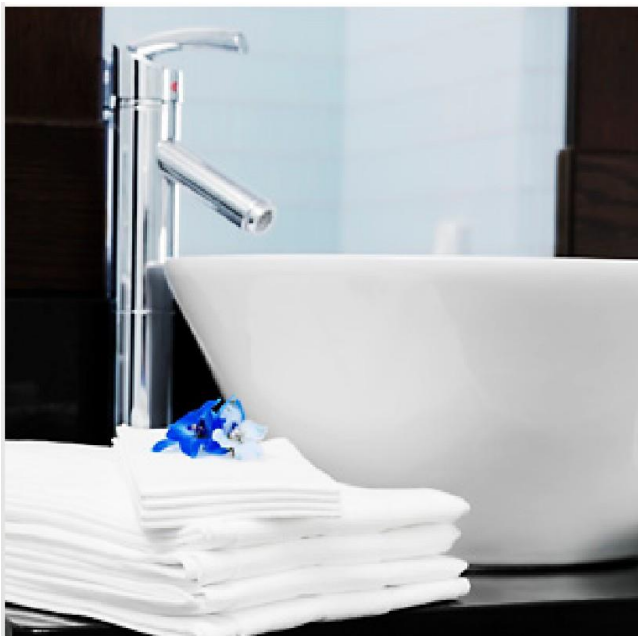
PS











# WHAT DO WE DO IN THE REGION?







— .  
BILLERUDKORSNÄS





# **STRATEGIC FOCUS AREAS**

- **Innovation & development**
- **Future competence**
- **Regional mobilisation**
- **Internationalisation**



# INDUSTRIAL SYMBIOSIS

## CURRENT PRACTICES AND GUIDELINES

Industrial symbiosis (IS) is vitaly important in facilitating the move towards a circular economy by helping industries and businesses cooperate in the exchange of natural resources and production infrastructures.



# Nordregio

#01  
POLICY BRIEF  
JAN 2019



## Industrial Symbiosis in the Baltic Sea Region

Current Practices and Guidelines for New Initiatives

Industrial symbiosis (IS) is vitally important in facilitating the move towards a circular economy by helping industries and businesses cooperate in the exchange of natural resources and production infrastructures. Strong public and private sector leadership and firm links between industry and research institutes are essential for the formulation of effective IS initiatives.



This policy brief examines three good practice examples of IS from the Baltic Sea Region (BSR) and outlines practical guidelines for public authorities and business development organisations on how to develop and implement IS

ecosystems. This research is based on the activities and experiences of a project, BSR Stars S3, which was financed by the EU Interreg Baltic Sea Region and focused on BSR cooperation within the bio- and circular economy.

NORDREGIO POLICY BRIEF 1

### THE PAPER PROVINCE (VÄRMLAND, SWEDEN)

#### WHAT IS THE PAPER PROVINCE AND HOW DID IT EMERGE?

The Paper Province is a forest-industry cluster in Värmland, northern Dalsland and Örebro counties in central Sweden, about 300 km to the west of Stockholm, with more than 100 member companies committed to turning industry collaboration into new ideas and bio-based solutions. Established in 1999 as a joint initiative for innovatively overcoming structural difficulties in the traditional forestry sector, in its first decade the Paper Province cluster organisation focused on various development activities. From 2007 onwards, energy issues became a main focus, for example through starting a regional energy network, supporting R&D and getting involved in energy recycling projects, and running an innovation-challenge initiative focusing on warm water. IS as a concept has been a specific focus of the Paper Province since 2015, and efforts and funding have gradually increased. Although the designated project to facilitate IS within the Paper Project was established recently, symbioses among companies in Värmland can be traced much further back – in fact, forestry facilities have cooperated and shared raw materials for over a century. The Paper Province has received wide recognition at national, Nordic and EU levels for its emergence as a bio-industry hub.

#### HOW DOES THE PLATFORM FUNCTION?

The Paper Province is an economic association facilitating networking and collaborative initiatives among its member organisations in several ways, closely supported by local authorities and the education sector. In the past three years, the cluster has studied the potential for and taken decisive steps towards an extensive network of IS collaboration. Public funding and research support from Karlstad University (which has been active in promoting quadruple-helix networks and has set up the Karlstad Innovation Park) and Linköping University have resulted in an overview chart of the material flows across the entire region, and a detailed side-stream survey pilot for three industrial facilities. Particularly promising potential for collaboration has been identified between pulp and paper mills and among chemical industry facilities.

#### WHICH STAKEHOLDERS ARE INVOLVED?

Approximately 15 forestry industry facilities comprise the most committed group in IS collaboration and planning projects. These efforts are coordinated by the cluster association and benefit from the cluster's strong existing foundations in bringing together industry facilities across the region. Detailed mapping



Symbioses among companies in Värmland can be traced much farther back – in fact, forestry facilities have cooperated and shared raw materials for over a century.

6 NORDREGIO POLICY BRIEF

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BRIEF 7

### BSR STARS RECOMMENDATIONS

The Interreg BSR Stars S3 project has contributed to the acceleration of the circular economy in the Baltic Sea Region by bringing stakeholders together to share information and experiences from ongoing IS initiatives at the regional, national and macro-regional level. The following IS guidelines have been drawn up based on the project activities and case study findings to help and motivate practitioners, including public authorities, industries and businesses, to develop and implement effective IS initiatives.

■ Encourage an active leadership role for public authorities in motivating and facilitating collaboration through the establishment of regional IS clusters and networks, which helps to build trust among industries, business development organisations and research institutes.

■ Increase efforts to include IS and circular economy activities in regional strategies by mapping areas of regional IS strengths and development potential in entrepreneurial discovery workshops with local experts.

■ Provide financial incentives for industry and research institutes to engage with IS initiatives, such as tax exemptions and IS-earmarked national or EU-level public procurement funding.

■ Explore private sector IS financing models, for example private for-profit platform companies (see the ECO3 case).

■ Establish stronger links between local industry and research institutes to ensure that IS research, training and business models meet the needs of the private sector (see, for example, Karlstad Innovation Park in the Paper Province case).

■ Encourage industry to take a leading role in coordinating the development of IS platforms by raising its awareness of the potential benefits of involvement (see, for example, the visionary role of experts from the Tampere University of Technology in the ECO3 case).

■ Encourage public authorities, universities and research institutes to map regional material flows and IS stakeholders (see, for example, the role of university students in the Trøndelag case and the development of online information resources such as the ecosystem monitoring tool from Tampere Region).

■ Disseminate information on IS best practices to promote learning among regional stakeholders (for example, the ECO3 platform has an updated and informative online presence).

■ Encourage the development of long-term regional IS visions and planning support tools through the development of strategic roadmaps and future scenario plans (see, for example, the development of roadmaps in the ECO3 case).

■ Advertise regional IS initiatives to international audiences to promote the region's sustainable good practices and image to maximise the potential for transnational collaborations (see, for example, the active presence of the ECO3 platform among international institutions).

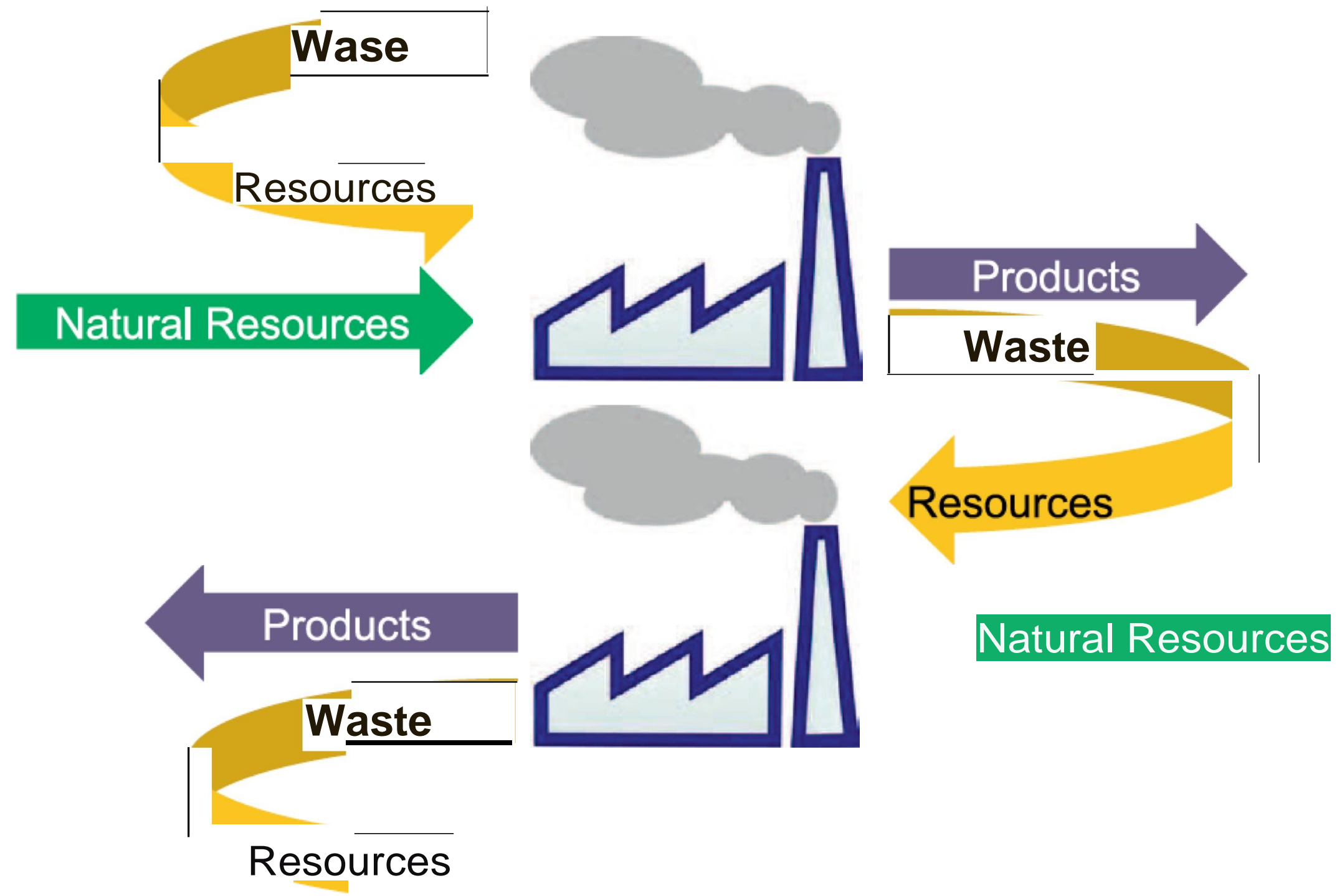
■ Local public authorities to promote conditions for industrial symbiosis in urban areas, and facilitate public and private sector interest and capabilities to form industrial symbiosis in urban districts.

10 NORDREGIO POLICY BRIEF



*Figure 2 By-product reuse IS model.*

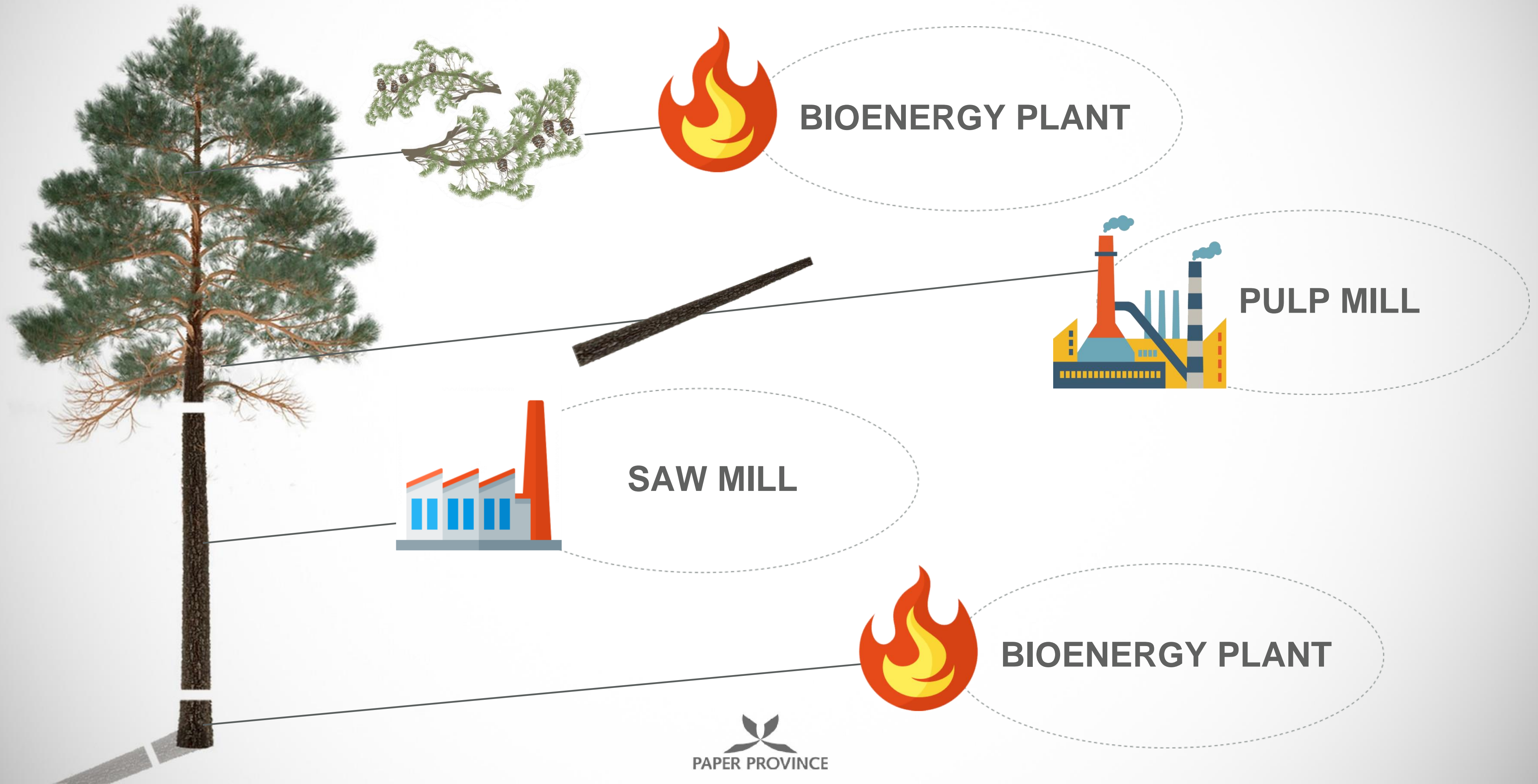
# Industrial Symbiosis



*Sou ce: Rise (2015).*



# INDUSTRIAL SYMBIOSIS STARTS IN THE FOREST





# INDUSTRIAL SYMBIOSIS

FOCUS ON SIDE- & WASTESTREAMS  
BACKGROUND



Energy meeting for cluster members

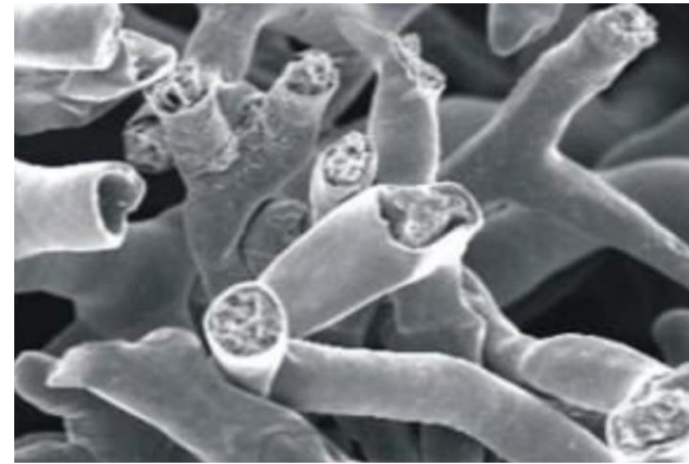


# INDUSTRIAL SYMBIOSIS

FOCUS ON SIDE- & WASTESTREAMS  
BACKGROUND



2011-15



2013-15



2014



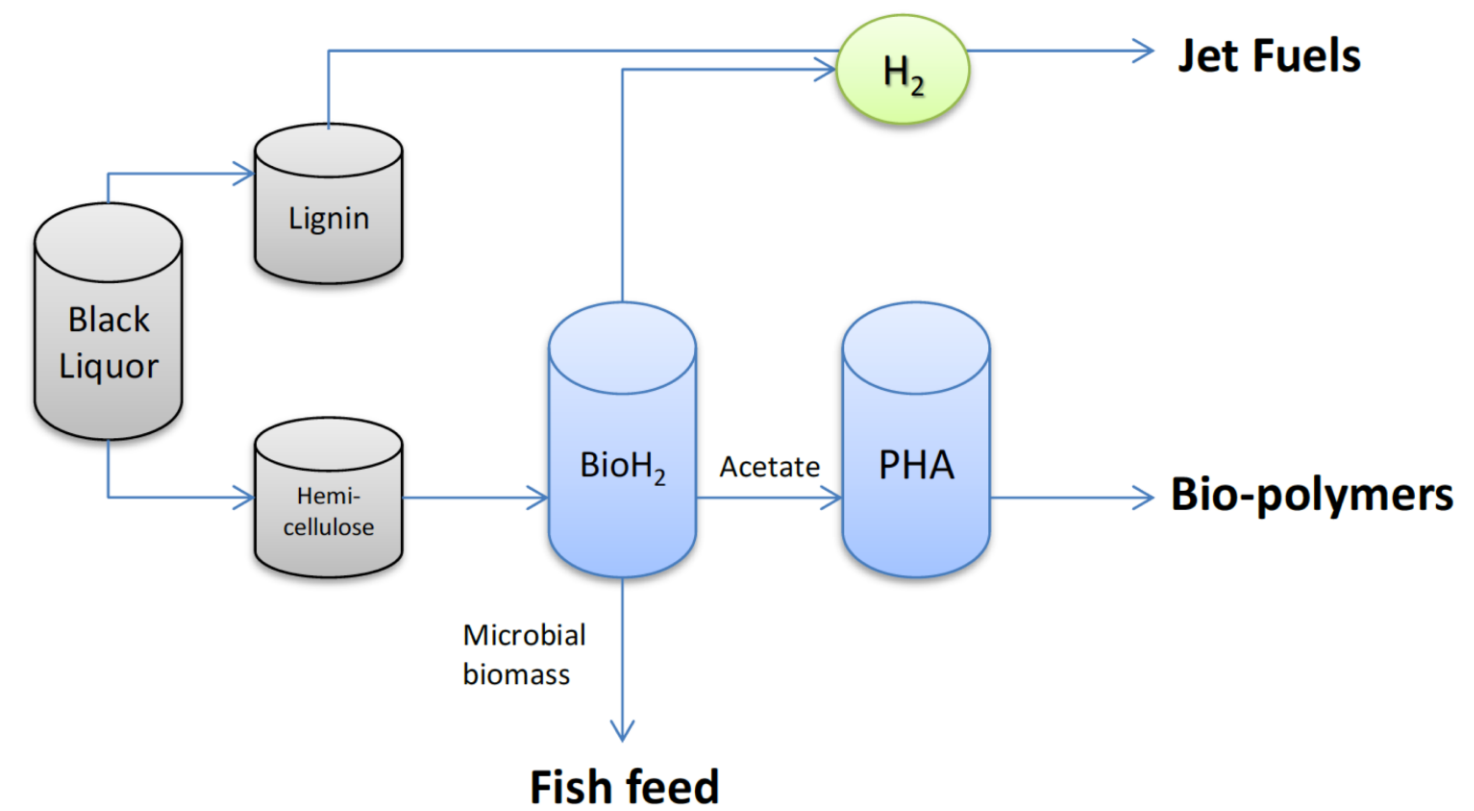
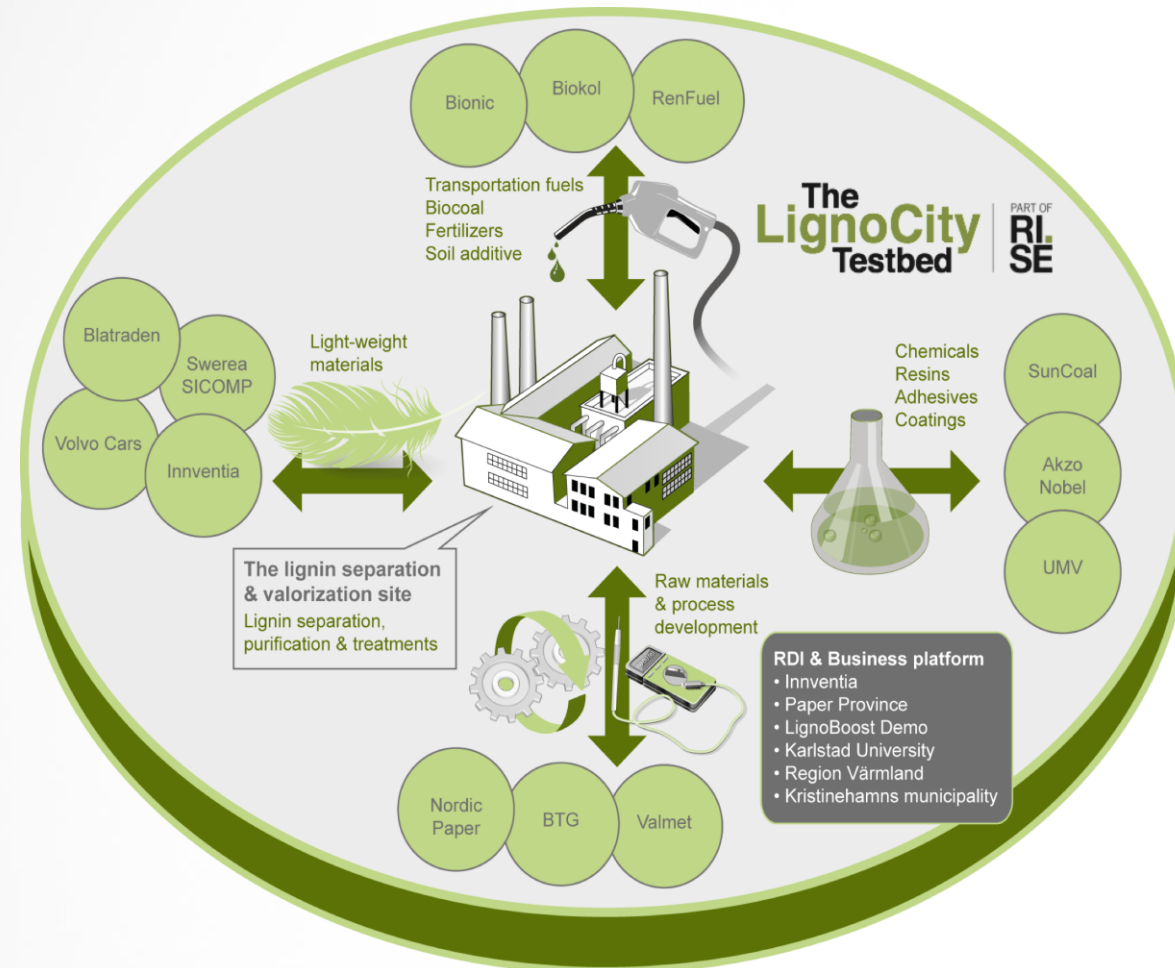
Circular Economy in Scandinavia  
Creating Value from Side and Waste Streams

Matchmaking and site visits from Oslo to Karlstad | November 24-26, 2015

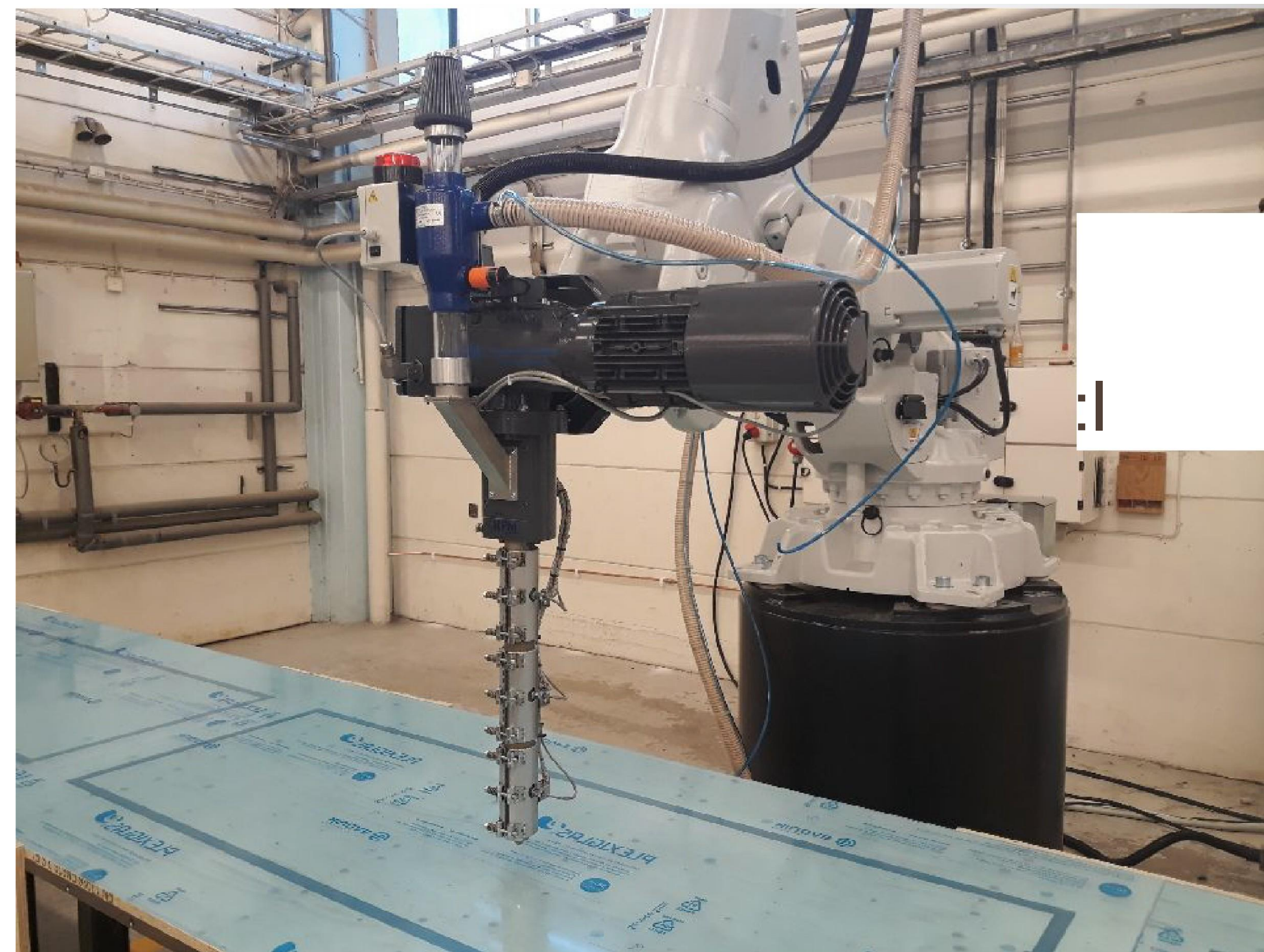


# INDUSTRIAL SYMBIOSIS

FOCUS ON SIDE- & WASTESTREAMS  
CONTINUE







6m x 2,5m x 2,5m









# CO AST ST ORI ES

TEXT / PHOTO // MATT O'LEARY / MARCEL PABST



# INDUSTRIAL SYMBIOSIS

**Interreg**  
North Sea Region  
European Regional Development Fund



EUROPEAN UNION

• 2015-16

• Netherlands, Sweden, Norway,

Den August, 2017



OCTOBER



Regional cooperation  
within  
industrial symbiosis



Nordic Industrial Symbiosis Network





# Nordic Network for IUS







## BALTIC INDUSTRIAL SYMBIOSIS

Promoting industrial symbiosis, a concept for sustainable regional development, across the Baltic Sea region

**DURATION:** Sep 2018 – Jun 2021

**TOTAL BUDGET:** EUR 2.1 million

**EUROPEAN REGIONAL DEVELOPMENT FUND:** EUR 1.3 million

**NORWEGIAN FUNDING:** EUR 0.2 million

**LEAD PARTNER:** Symbiosis Center Denmark, Kalundborg Municipality (DK)

**PROJECT PARTNERS:** Kalundborg Symbiosis (DK), Næstved Municipality (DK), The Paper Province economic association (SE), Digipolis (FI), Trøndelag County Council (NO), Swedish Agency for Economy and Regional Growth (SE), Gdansk University of Technology (PL), Linköping University (SE) and Roskilde University (DK)



EUROPEAN UNION

EUROPEAN  
REGIONAL  
DEVELOPMENT  
FUND





# WORKPACKAGES

- WP1 Project Management and Administration
- WP2 Accelerating Symbiotic Business Development
  - 2.1 Identification of new symbiotic business opportunities
  - 2.2 Symbiotic business matchmaking
  - 2.3 Peer-to-Peer learning on accelerating symbiotic business development
  - 2.4 Living Lab to demonstrate the use of a resource stream



# WORKPACKAGES

- WP3 Building Capacity to work with Industrial Symbiosis Developments
  - Investigation of the existing design and institutional capacity for Industrial Symbiosis
  - Executive Training Programs for Industrial Symbiosis Practitioners
- WP4 Policies for Industrial Symbiosis Development
  - Mapping local, regional and national policies for Industrial Symbiosis development
  - BSR Industrial Symbiosis Council
  - Encouraging Industrial Symbiosis development in Estonia, Latvia, Lithuania and Poland





# INDUSTRIAL & URBAN SYMBIOSIS

AIR WATER MATERIAL ENERGY LOGISTICS COMPETENCE



# PAPER PROVINCE DEMONSTRATE BIOECONOMY

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