

Inquiry for a national strategy for a growing bioeconomy

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The purpose of the inquiry

Promote

Promote sustainable growth, innovation and employment throughout the country

Contribute

Contribute to environmental and climate benefit

Create

Create enhanced national security of supply and reduced vulnerability in society

A national strategy for a growing bioeconomy - a tool for the green industrial transition

How?

Develop proposals for a national strategy for a sustainable, competitive and growing bioeconomy

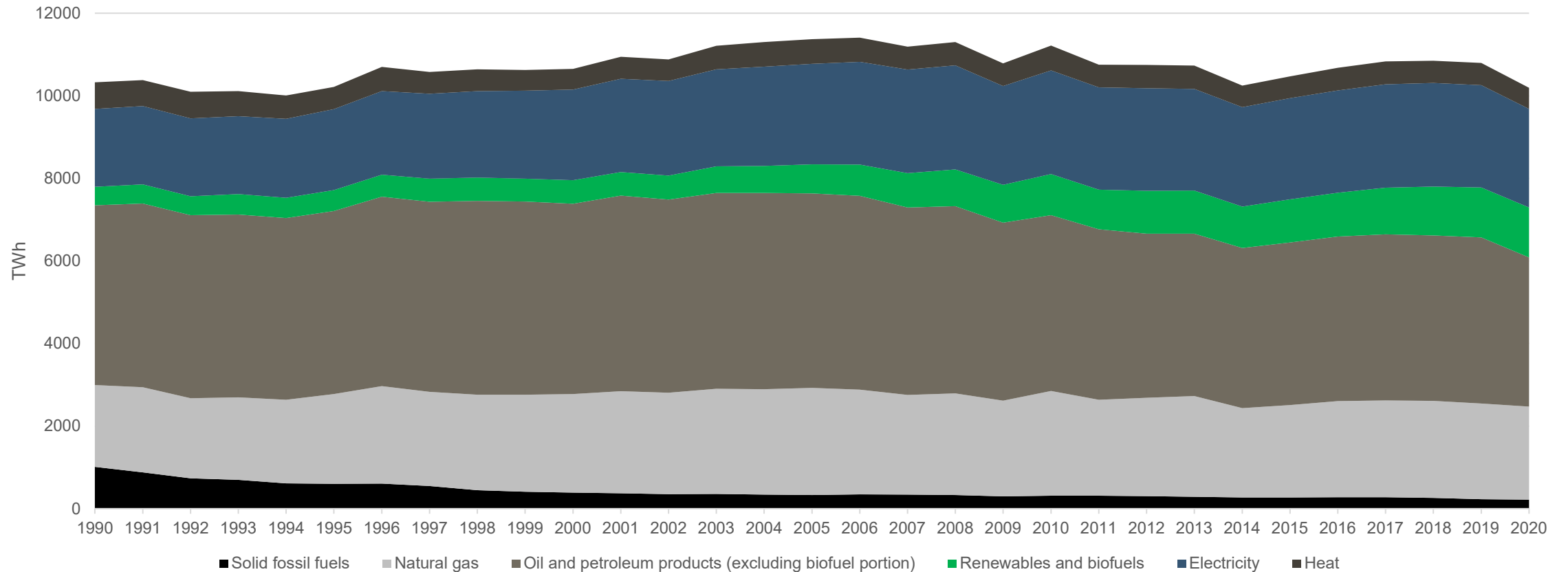
Report 31st October, 2023

Propose measures promoting effective production of liquid biofuels, based on domestic raw materials in Sweden

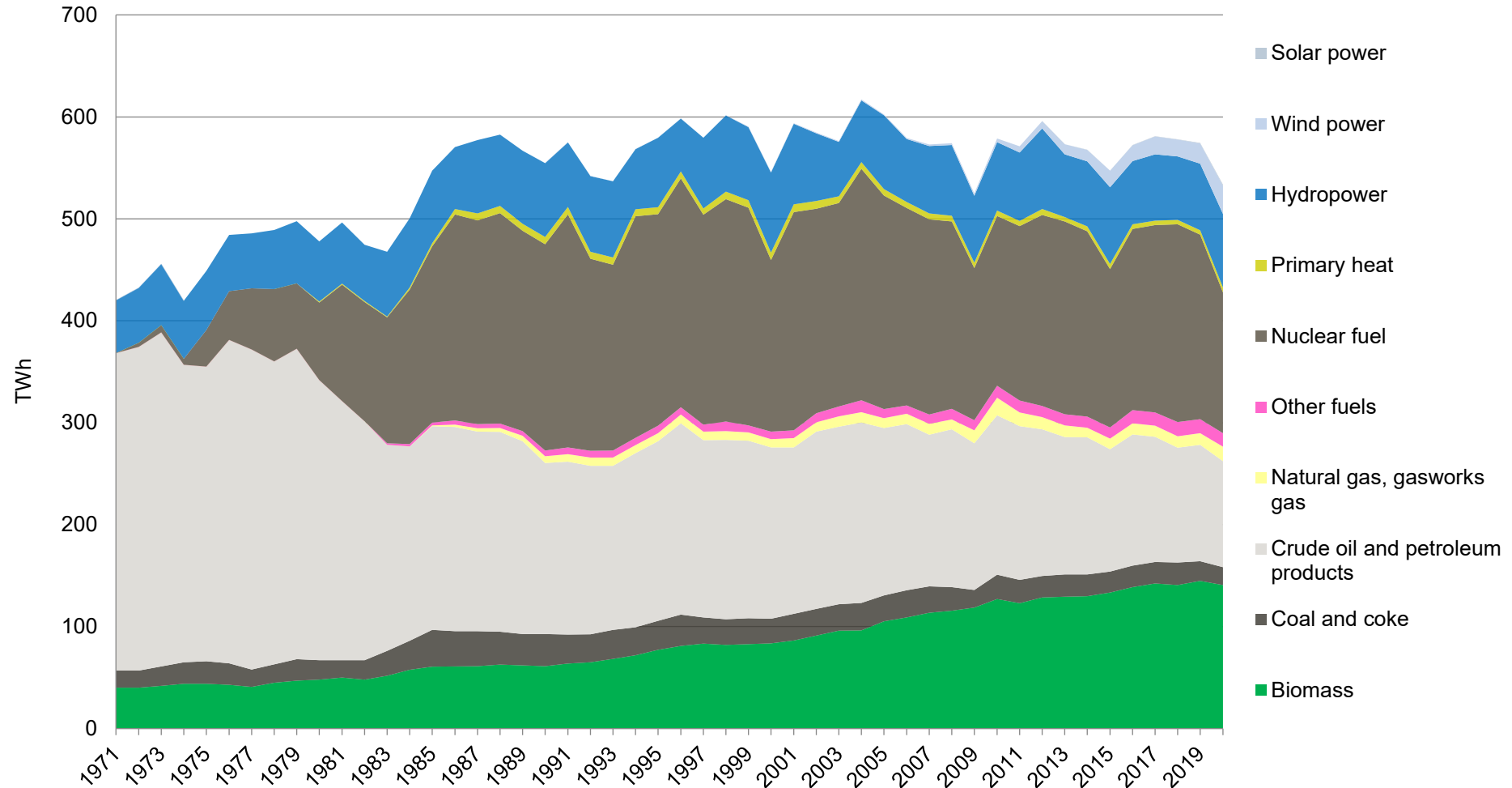
Reported 29th March, 2023



Final energy consumption in Europe



Final energy consumption in Sweden

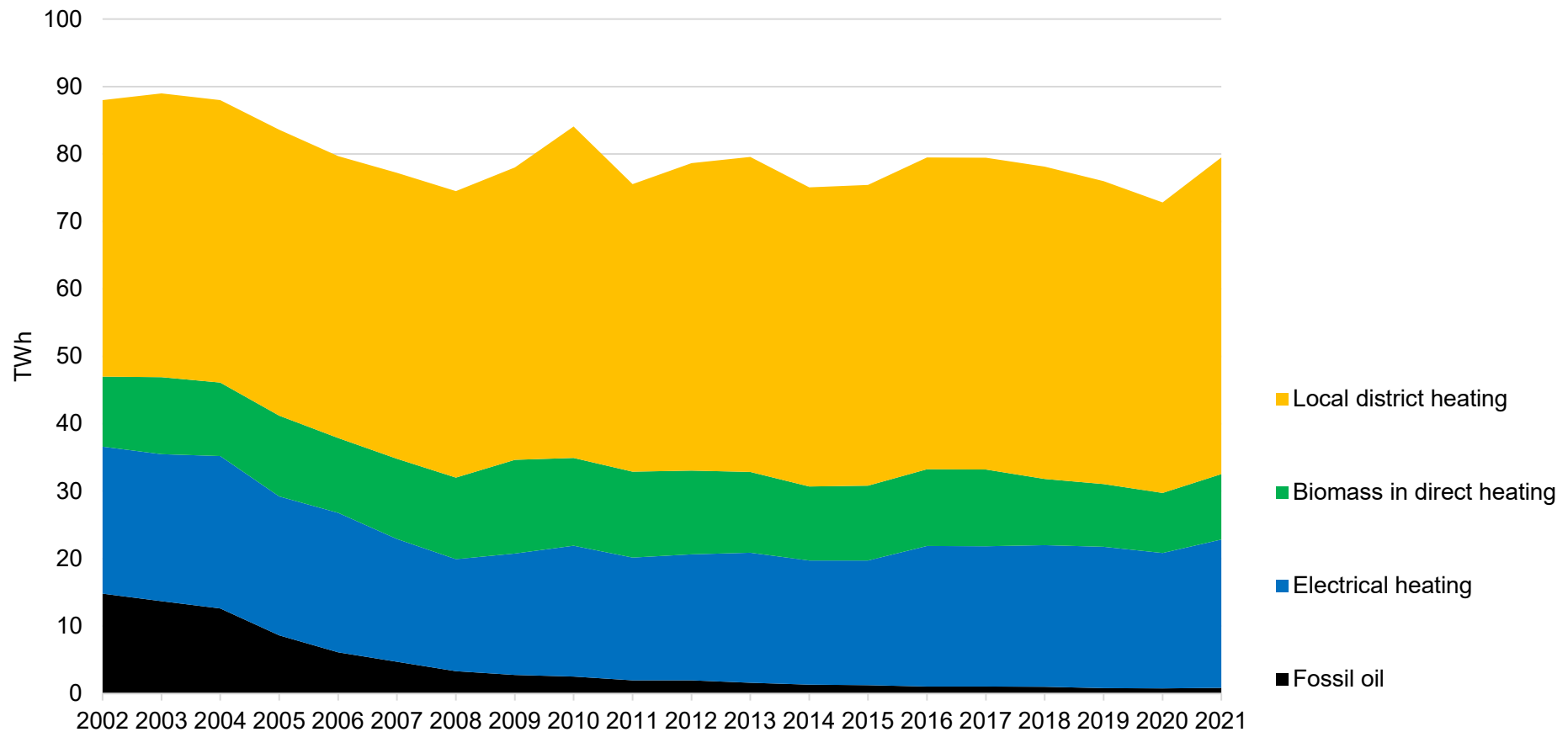


Source: Swedish Energy Agency

A national strategy for a growing bioeconomy - a tool for the green industrial transition



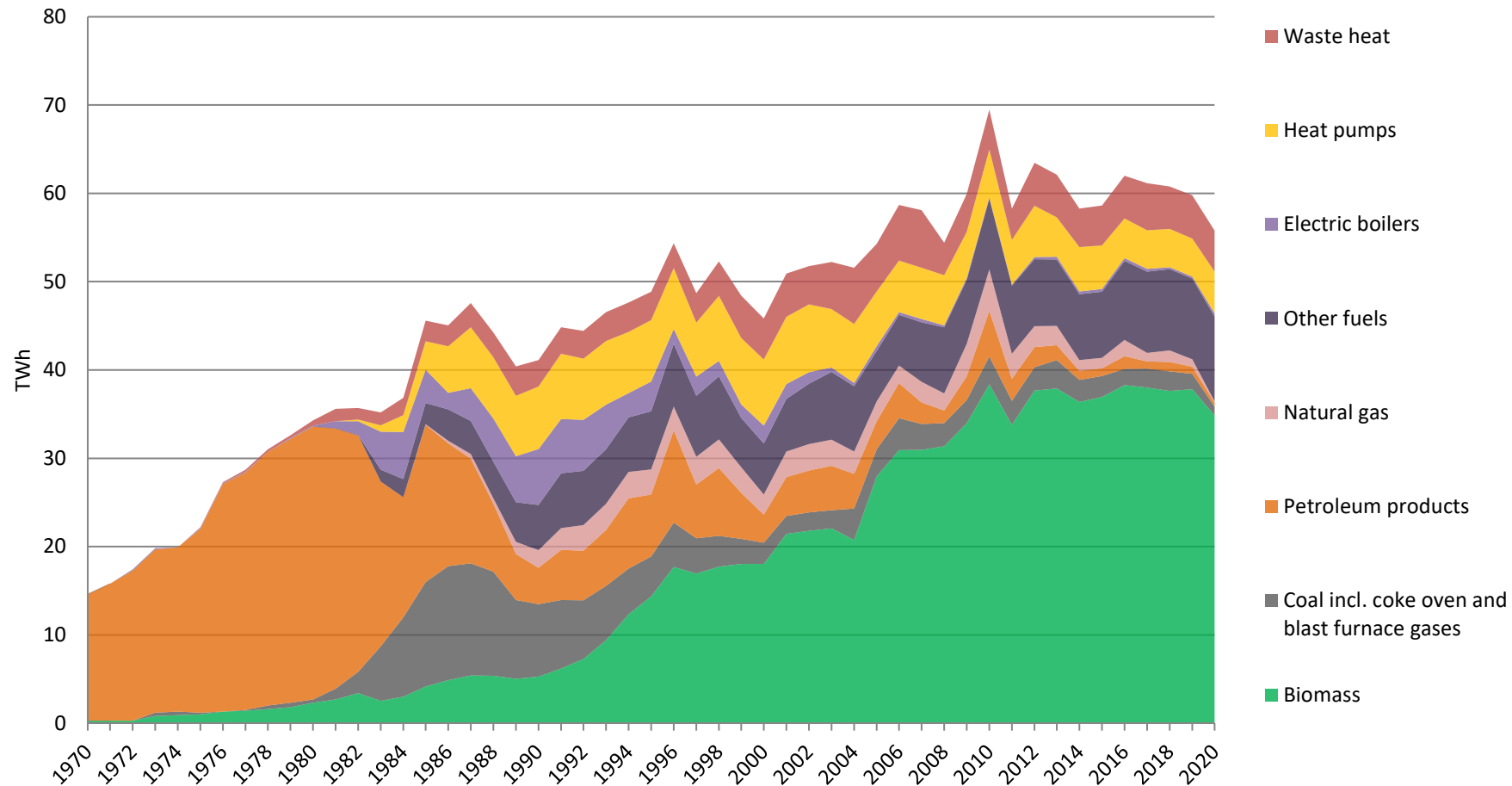
Importance of district heating for heat consumption in Sweden



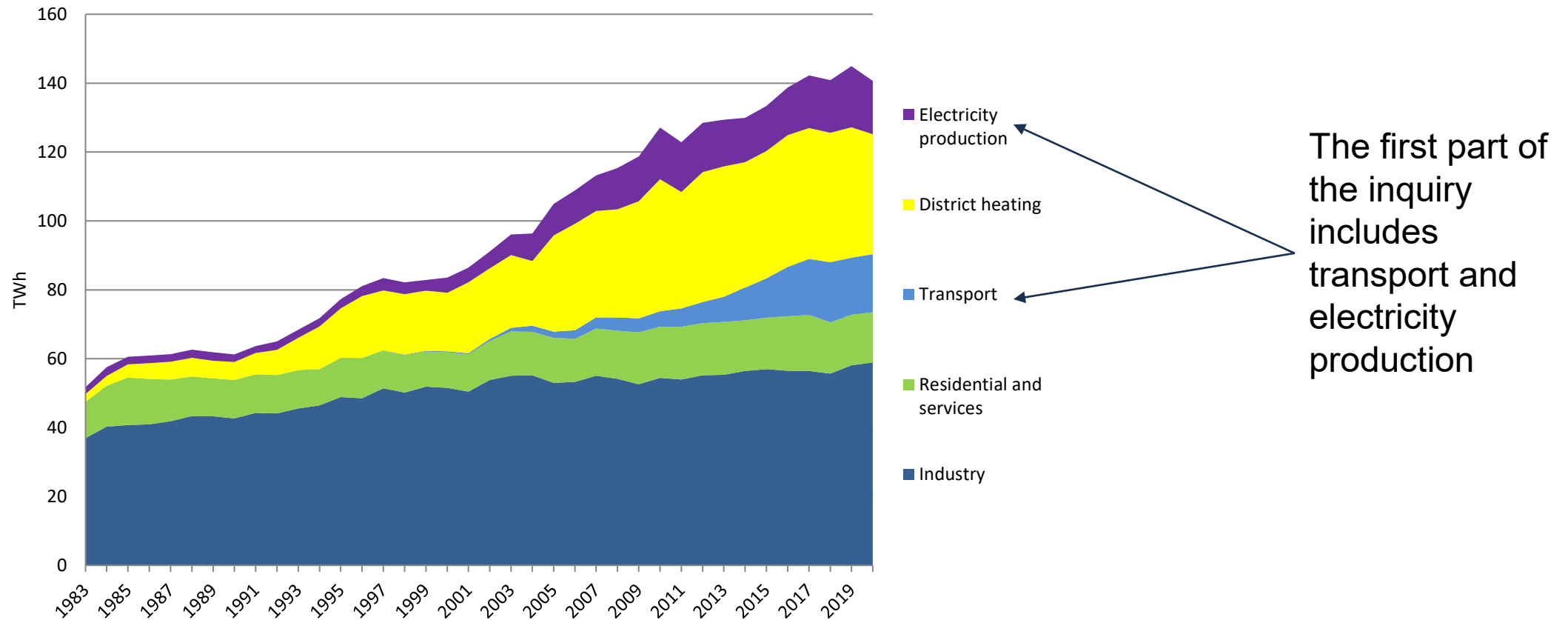
Source: Swedish Energy Agency

A national strategy for a growing bioeconomy - a tool for the green industrial transition

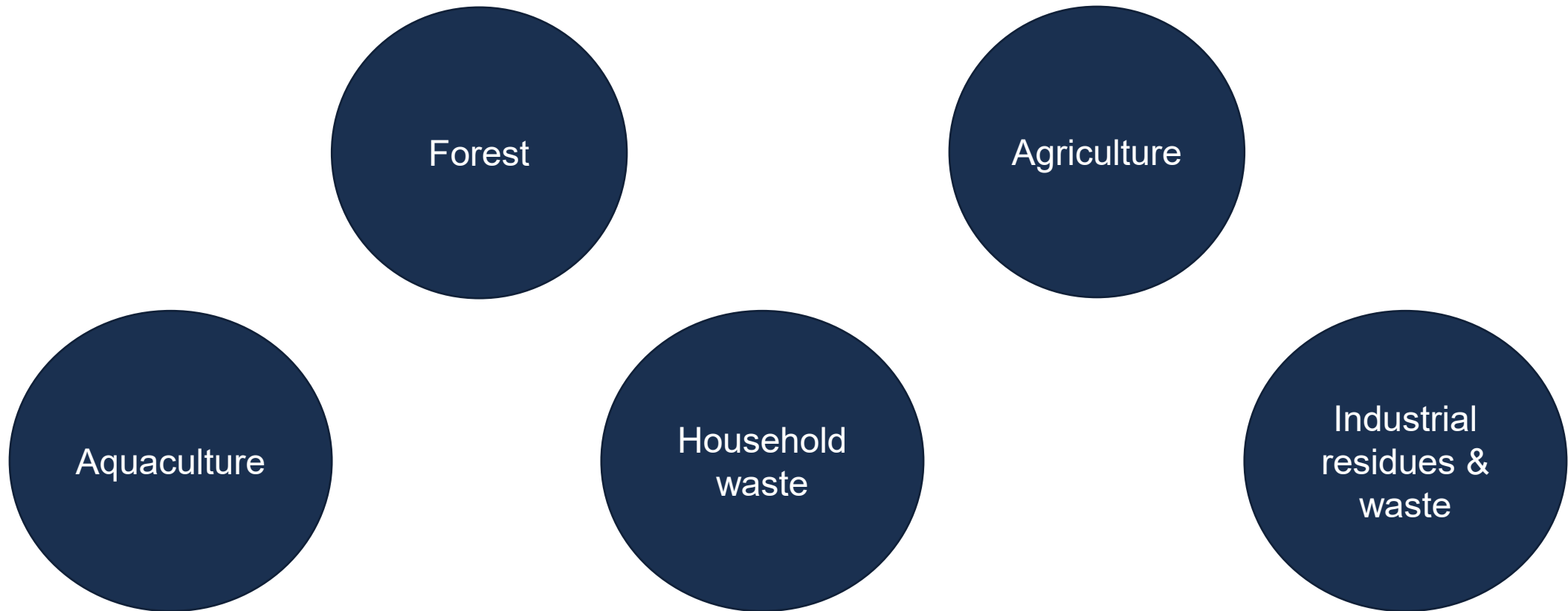
Energy used in district heating in Sweden



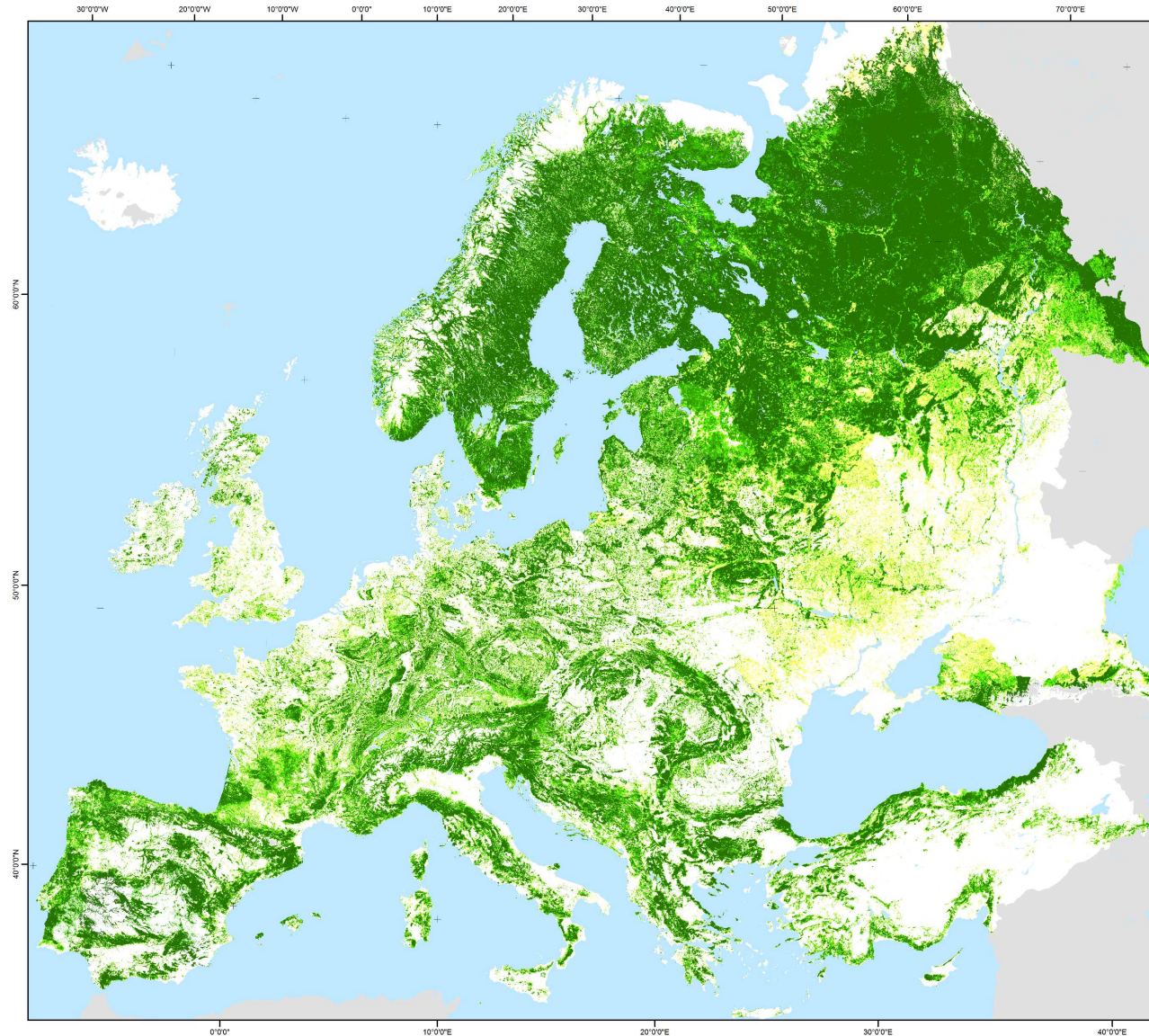
The use of biomass per sector in Sweden



Diverse availability of biomass



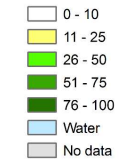
Forest in Europe



FOREST MAP OF EUROPE

(geographical Europe and Turkey)

Proportion of forest from land area
(% at 1km x 1km resolution)



ETRS89 Lambert Azimuthal Equal Area projection

Data sources

Earth observation data:

EU27_AL, BA, CH, HR, ME, MK, NO, RS, TR: Forest/non-forest map 2006 (beta version) developed by the EC Joint Research Centre, aggregated to 1km resolution. Based on IRS-P4 LISS-III, SPOT4 (HRVIR) and SPOT5 HRG satellite data of 2006.

Belarus, Moldova, Ukraine, Russian Federation: Forest share estimates based on AVHRR NOAA satellite data of 1996-1998.

Statistical data:

National forest inventory statistics
State of Europe's Forests country statistics 2011

Method

Two different earth-observation products (Kempeneers et al. 2011, Pailvinen et al. 2001/Schuck et al. 2002) have been combined with statistical data to produce a pan-European forest map that corresponds to the official forest inventory statistics at national and/or regional level. The satellite-based forest cover data was first calibrated to sum up to the forest area statistics within a given administrative region. For 19 countries (including the Russian Federation) regional statistics were utilized during the calibration, while for the other countries statistics at national level have been applied. In a second calibration run, the map was adjusted to the internationally harmonized statistics by Forest Europe 2011 at national level, to allow for comparability between the countries.

Further details:

www.efi.int/portal/virtual_library/information_services/mapping_services/forest_map_of_europe

References

Kempeneers, P., Sedano, F., Seebach, L., Strobl, P., San-Miguel-Ayanz, J. 2011. Data fusion of different spatial resolution remote sensing images applied to forest type mapping. IEEE Transactions on Geoscience and Remote Sensing, in press.

Pailvinen, R., Lehtikoinen, M., Schuck, A., Häme, T., Väätäinen, S., Kennedy, P and Folving, S. 2001. Combining Earth Observation Data and Forest Statistics. EFI Research Report 14. European Forest Institute and Joint Research Centre - European Commission.

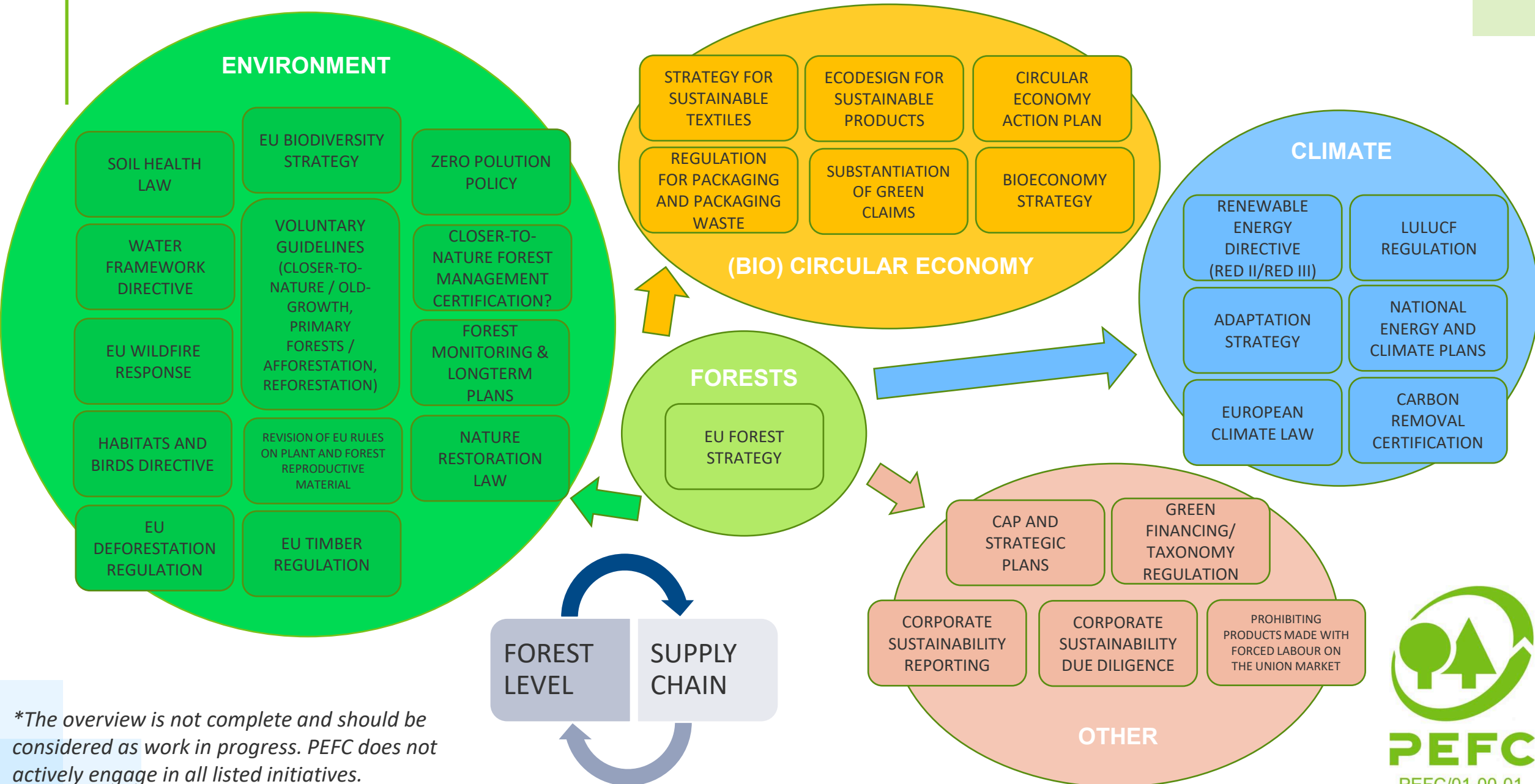
Schuck, A., Van Brusselen, J., Pailvinen, R., Häme, T., Kennedy, P and Folving, S. 2002. Compilation of a calibrated European forest map derived from NOAA-AVHRR data. EFI Technical Report 13. European Forest Institute.

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European Forest Institute / EC Joint Research Centre
September 2011



EU POLICIES IMPACTING FORESTS IN THE EU

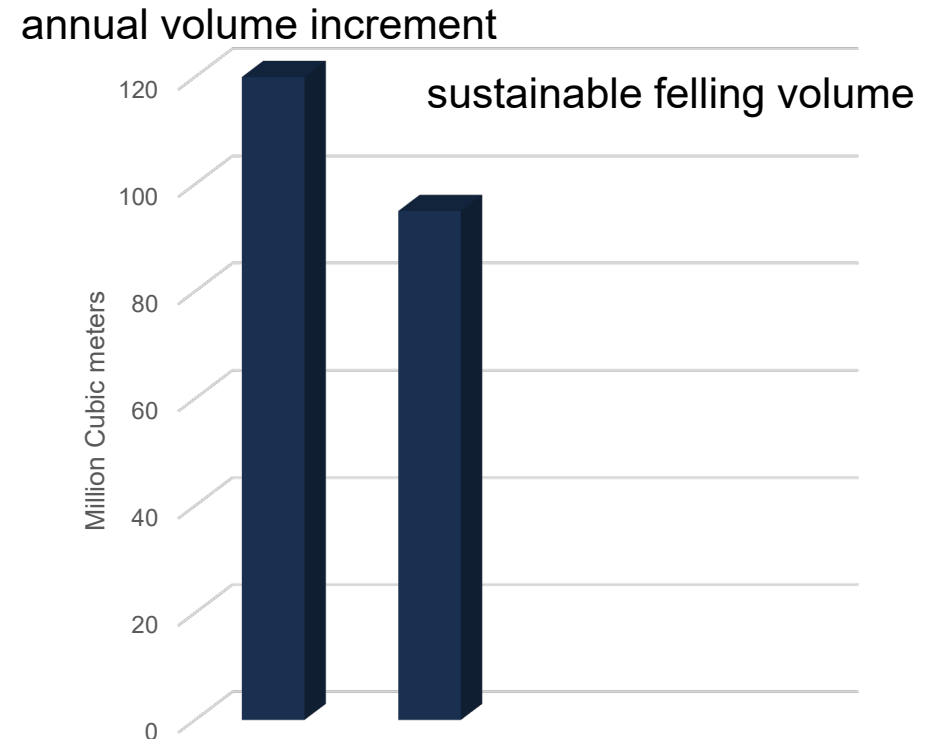


**The overview is not complete and should be considered as work in progress. PEFC does not actively engage in all listed initiatives.*

Forest growth and sustainable harvest levels

Mean annual volume increment 2016 (average) was **120 million m³**.

Highest annual sustainable felling volume until 2035 will be **95– 100 million m³**



Potential of harvest residues as bioenergy from Swedish forest

Annual use of harvest residues for the period 2016-2020 compared to potential annual use for the period 2025-2034 under four scenarios.

Potential on forest available for wood supply with deduction according to the recommendations from the Swedish Forest Agency.

Total potential without deduction within brackets.

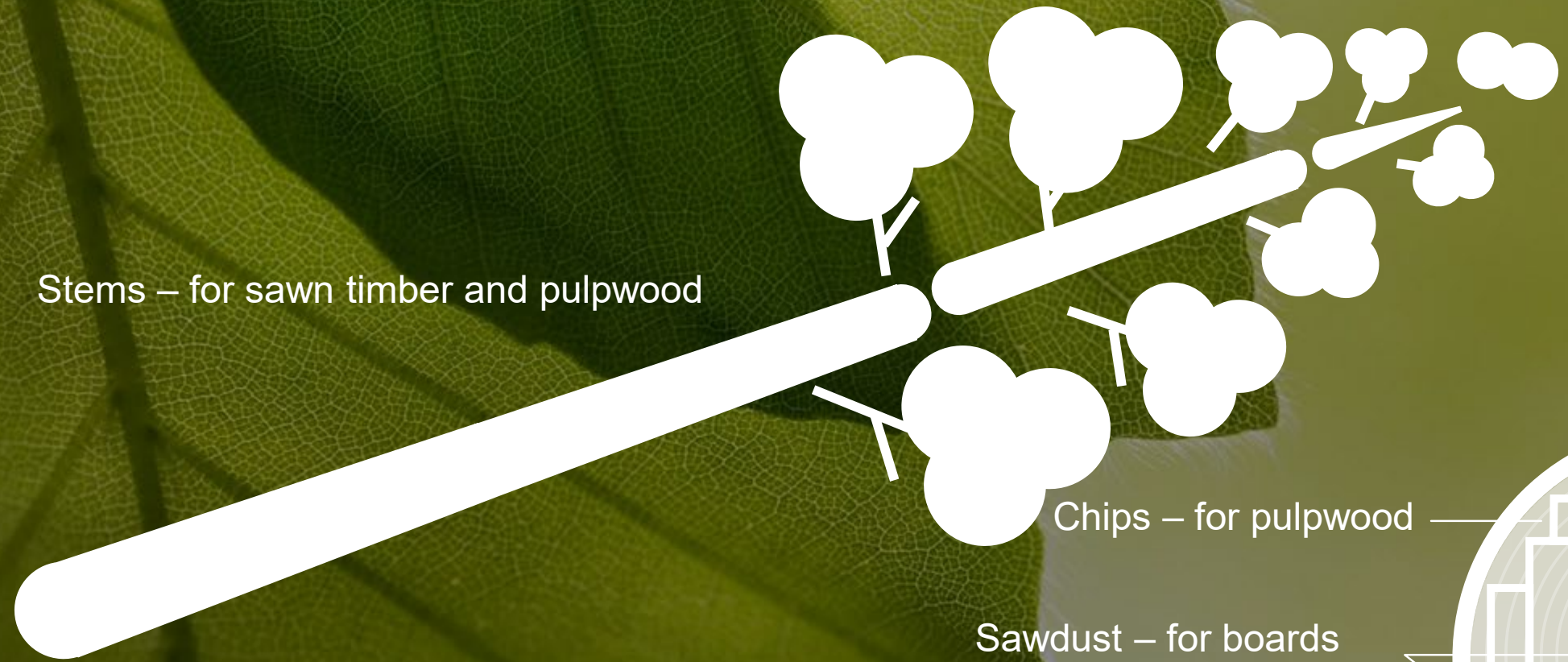
Numbers in TWh.

	Current annual use	BAU potential harvests	Focus Climate adaptation	Focus Diversity	Focus Growth
Sweden	8,7	40,2 (60,8)	37,4 (56,9)	28,5 (42,7)	39,8 (62,6)

The whole tree is used – for different purposes

Branches and tops – for bioenergy

Stems – for sawn timber and pulpwood



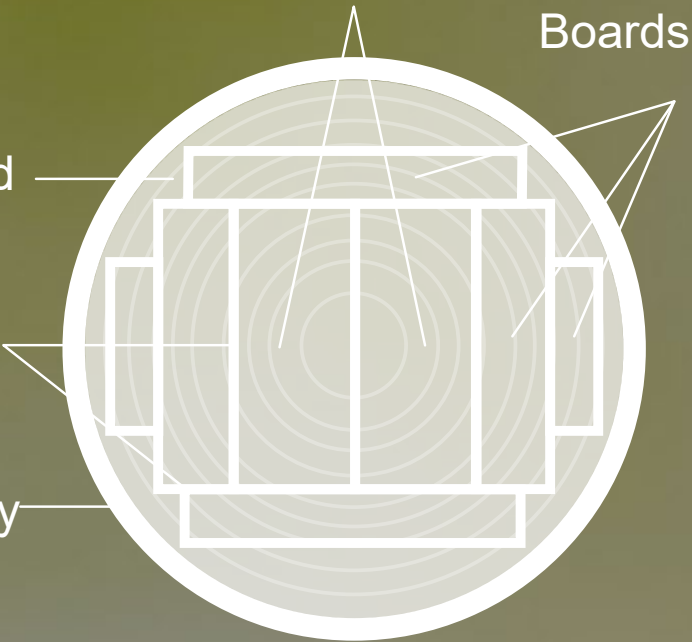
Chips – for pulpwood

Sawdust – for boards
and bioenergy

Bark - for bioenergy

Planks

Boards



The forest as a renewable resource

Lignin products

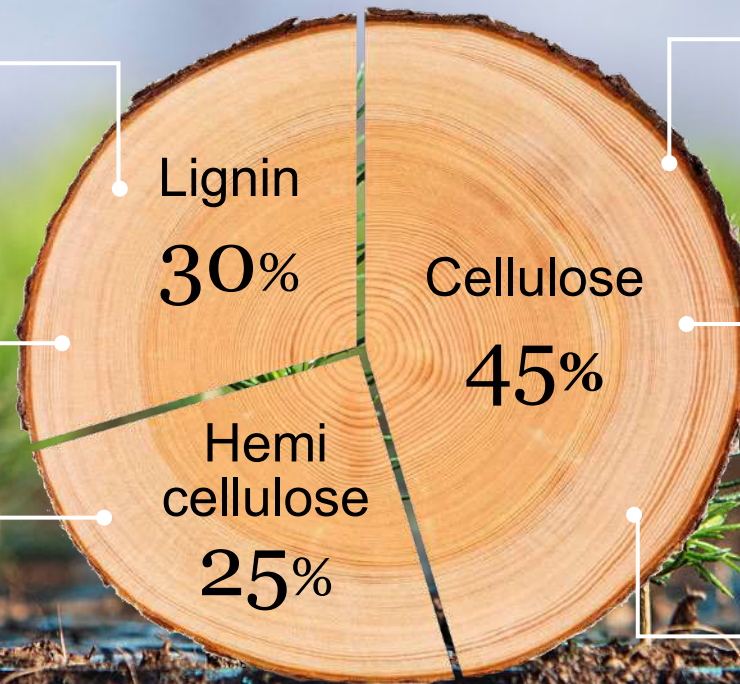
- Carbon fibre
- Vehicle fuels
- Adhesives and binders

Bark

- Specialty chemicals
- Food additives

Hemi products

- Oxygen barriers
- Birch sugar
- Plastics and chemicals



Paper

- Tissue
- Specialty paper
- Nappies and sanitary pads

Textiles

- Viscose
- Lyocell
- New processes

Composites

- Biocomposites
- Hybrid composites



The Bioeconomy in the EU

EU's understanding of the Bioeconomy:

“All sectors and associated services and investments that produce, use, process, distribute or consume **biological resources (animals, plants, micro-organisms, including organic waste)**, including ecosystem services”.

- **Ecosystem services on land and sea**
- Primary **production** systems - agriculture, forestry, aquaculture / fisheries – incl. **waste/side streams**
- Food, feed, fibre, **bio-based industry**, fuels and bio-energy





EU BIOECONOMY

European Commission's Knowledge Centre for Bioeconomy

EMPLOYMENT
(MILLION JOBS)
17.4

VALUE ADDED
(BILLION EUR)
657

	EMPLOYMENT (MILLION JOBS)	VALUE ADDED (BILLION EUR)	VALUE ADDED (SHARE TOT)
AGRICULTURE	8.8	193	29%
FORESTRY	0.5	25	4%
FISHING AND AQUACULTURE	0.2	6	0.9%
FOOD, BEVERAGES AND OTHER AGRO-MANUFACTURING	4.7	237	36%
BIO-BASED TEXTILES	0.8	25	4%
WOOD PRODUCTS AND FURNITURE	1.3	50	8%
PAPER	0.6	48	7%
BIO-BASED CHEMICALS AND PHARMA- CEUTICALS, PLASTICS AND RUBBER	0.5	65	10%
LIQUID BIOFUELS	0.03	3	0.5%
BIOELECTRICITY	0.03	5	0.8%

A key sector of the EU's economy

- **8.3%** of the EU's workforce and **4.7%** of GDP
- Agriculture and the manufacture of food, beverage and tobacco provide **65%** of the total value added
- The bioeconomy's share in GDP (10.4% for EU-28 in 2020) + labor force is much higher, when including **bioeconomy services** (e.g. nature tourism, transport + trade of biobased goods, education and research)
- **High job creation potential**, in rural, coastal and urban areas, through the growing participation of primary producers and deployment of bio-based solutions

European bioeconomy policy development

2012



Communication on Bioeconomy

2017



Review of Bioeconomy Strategy

2018



Updated Bioeconomy Strategy

2022



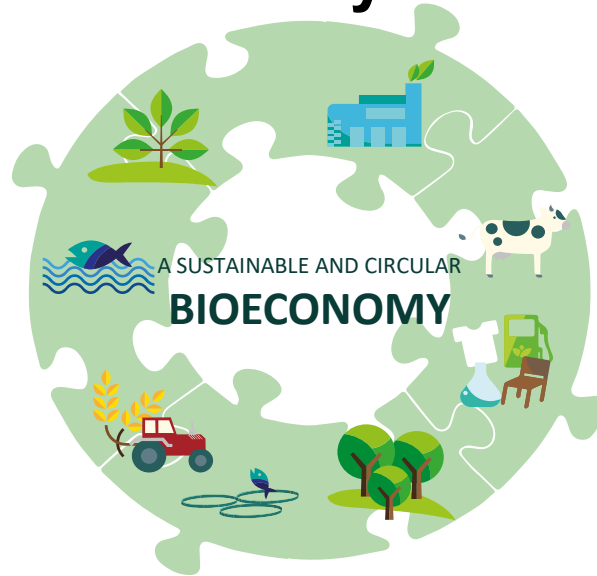
EU Bioeconomy Strategy Progress Report



OBJECTIVES

A circular and sustainable Bioeconomy

A model for green growth and a catalyst for the European Green Deal



Mitigating and adapting to climate change



Reducing dependence on non-renewable, unsustainable resources



Ensuring Food and Nutrition security



Managing natural resources sustainably



Strengthening European competitiveness and creating jobs

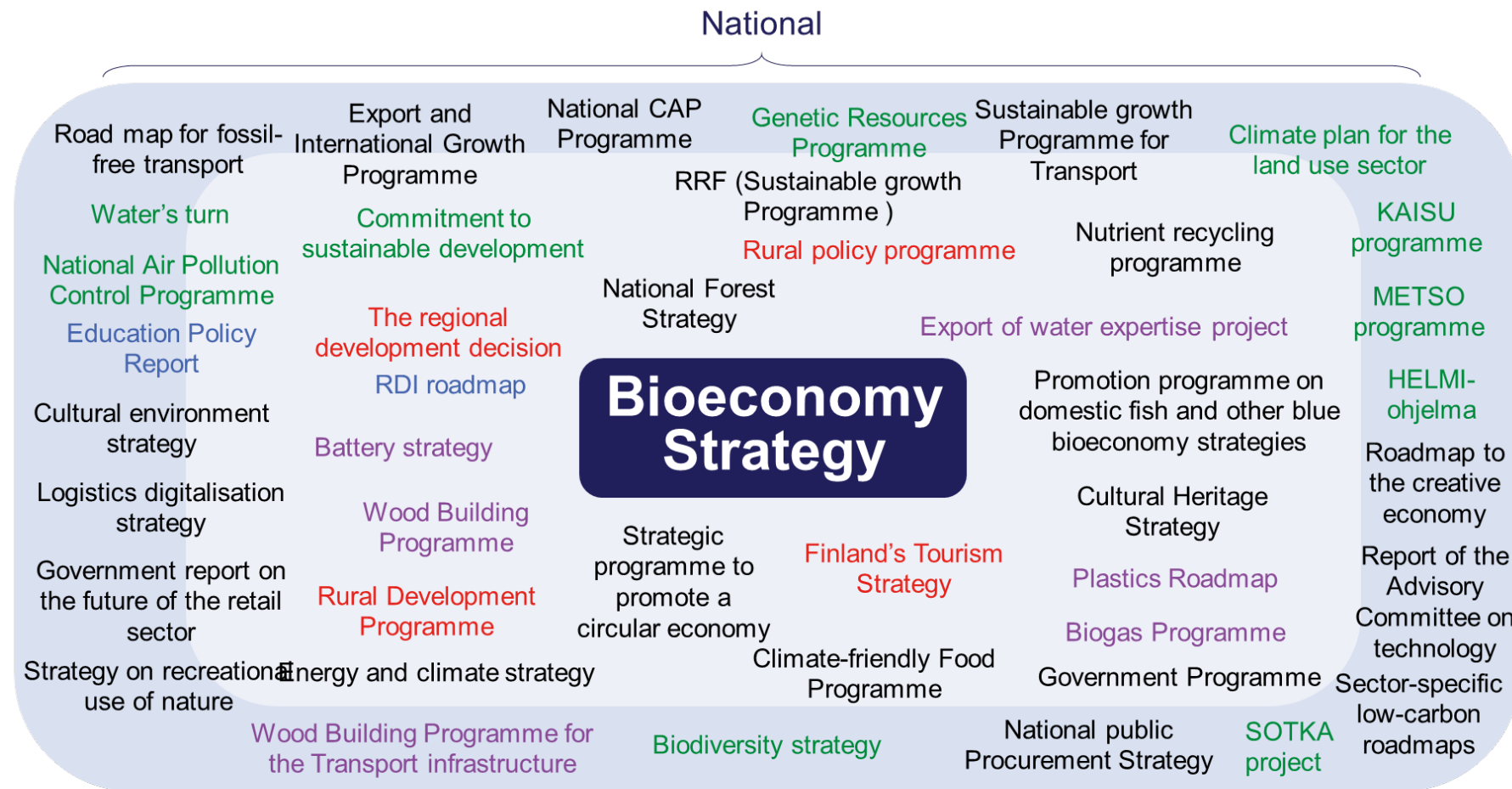


Finland's Bioeconomy Strategy

Sustainably towards
higher value added



Bioeconomy is guided by a wide range of strategies



Bioeconomy is guided by a wide range of strategies in EU

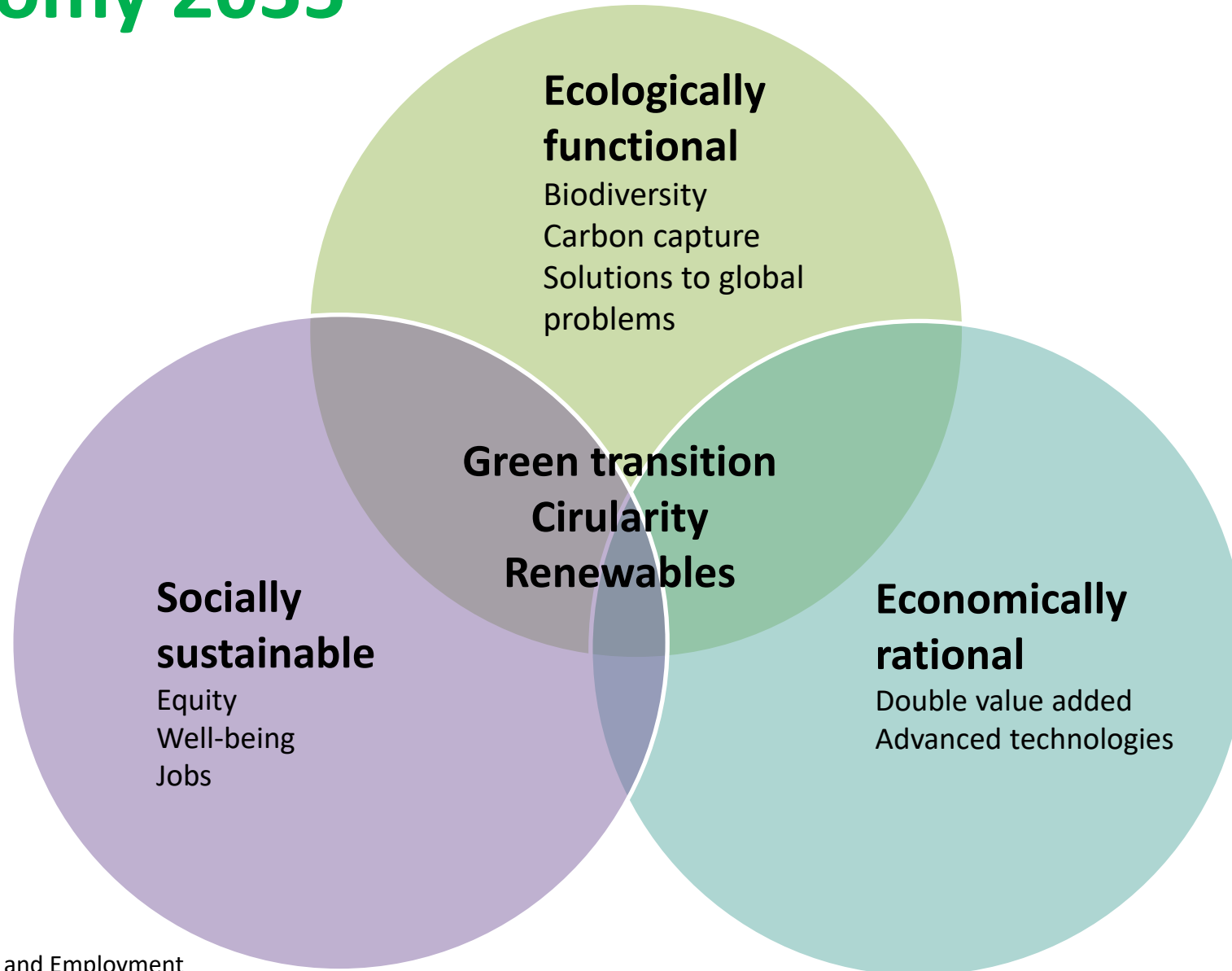


Vision 2035

Sustainably towards higher value added

- increasing **the value added** of the bioeconomy was identified as an important priority that **is not addressed in other strategies**
- **instead of taking a stand on the amount of production, the strive is to create a higher value added**
- timeline in line with Finland's carbon neutrality targets
- focus on creating a broad-based action plan
- productivity of work based on technological development in key role

Bioeconomy 2035



The Swedish bioeconomy (2019)

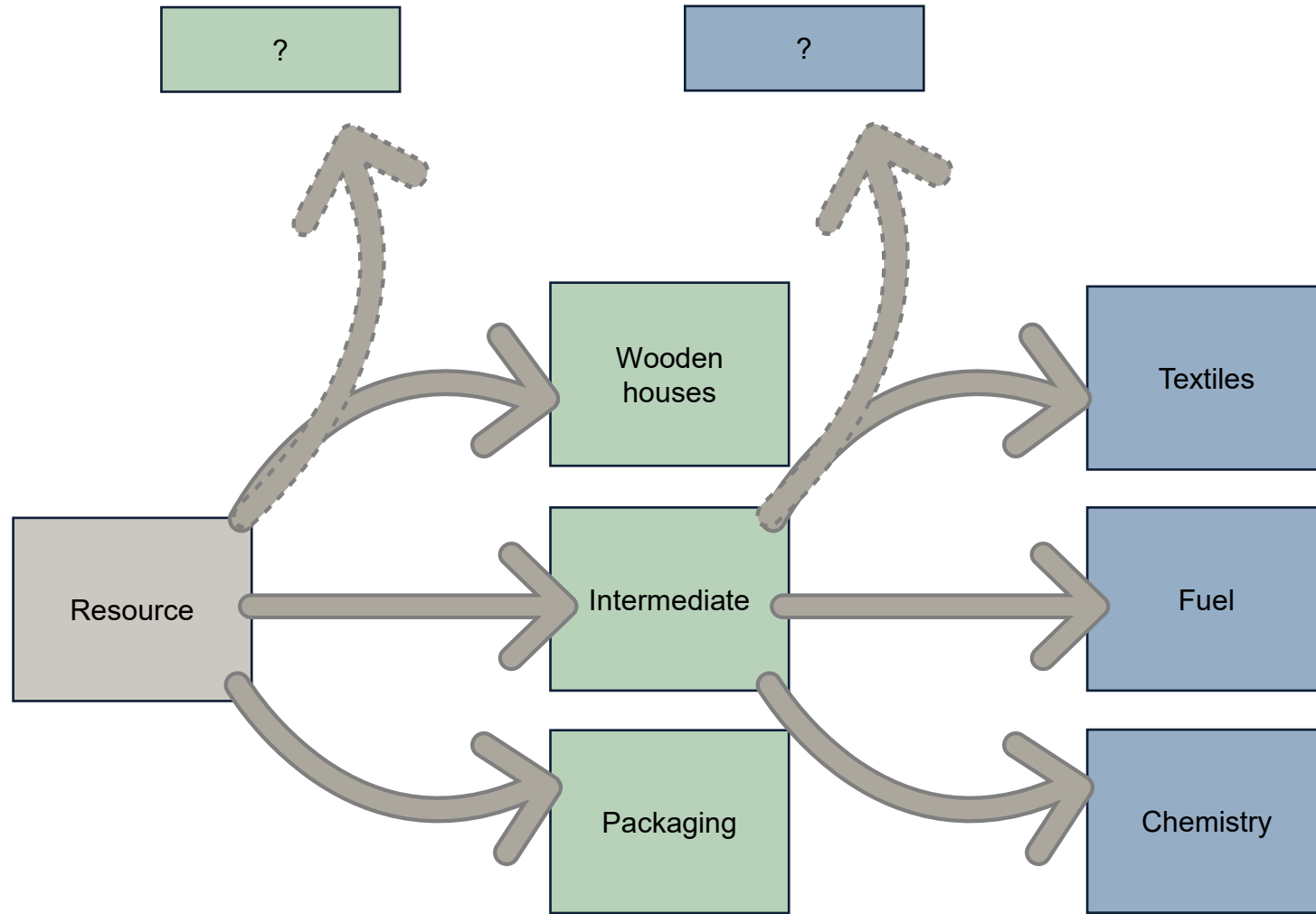
7 procent

of Sweden's total value added

21 procent

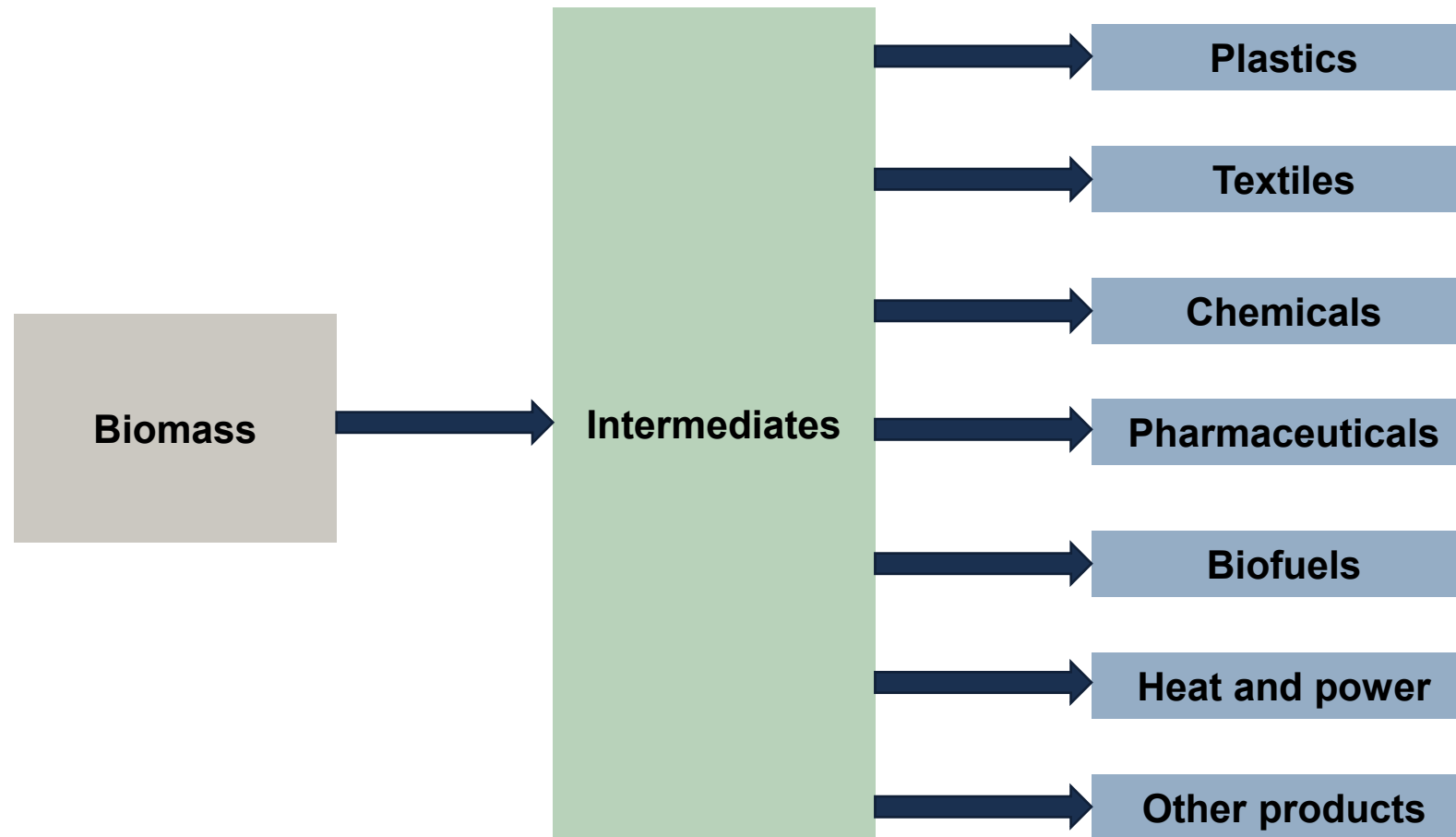
of Sweden's total export value

Source: Statistics Sweden.



Bioeconomy is the future and
the path away from fossil
dependency

Bioeconomy to reduce fossil dependency



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