

Speakers



Robert Andrén

Director General for Energy, Ministry of the Environment and Energy



Lars Guldbrand

Senior Adviser, Ministry of the Environment and Energy



Rémy Kolessar

Director of the Dept. for Research & Innovation, Swedish Energy Agency.



Andreas Stubelius

Senior Project Manager, Dept. of Market Development, Swedish Energy Agency



Sweden and Swedish Energy Policy

Robert Andrén

Director General for Energy,
Ministry of the Environment and Energy



Sweden

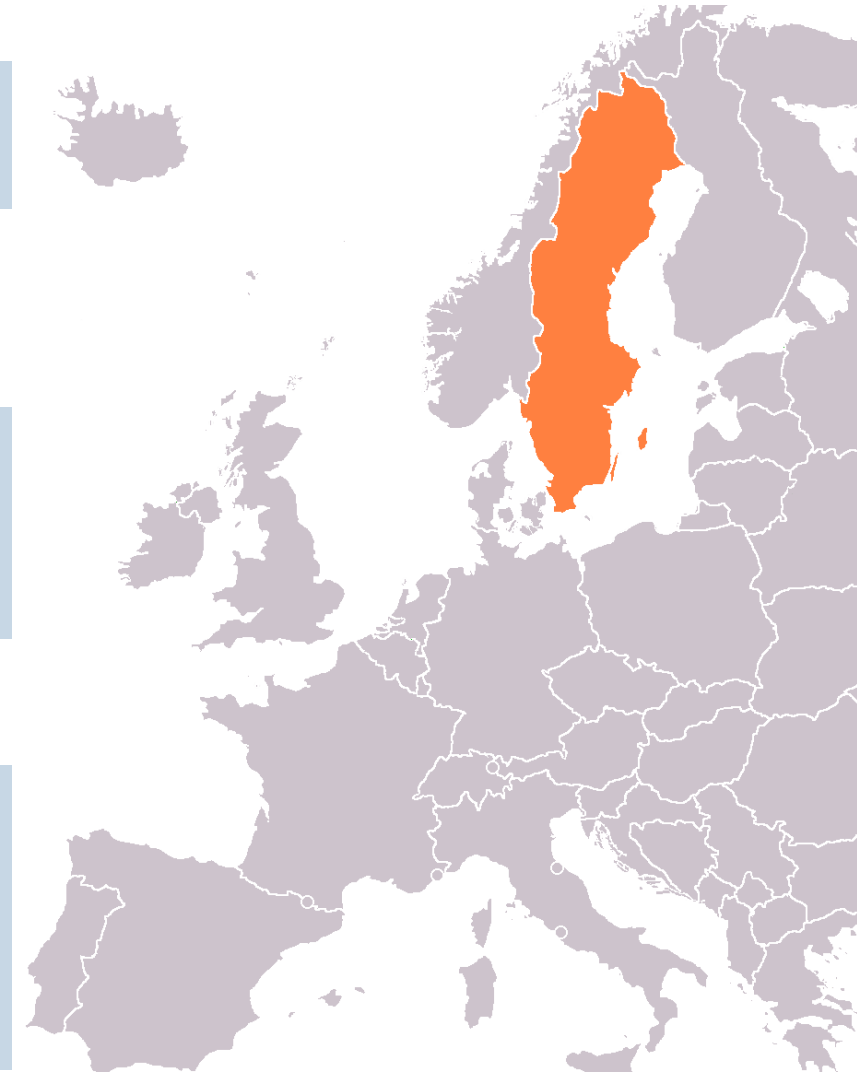
Population: 10 million *

Area: 450,295 km² 173,860 sq mi

Nominal GDP \$517.440 billion 21st (Total)
\$51,603 7th (Per Capita)

Total forest area: 55 %

Important industry sectors:
Engineering
Telecommunications
Automotive
Pharmaceutical



Overall objectives

- Sweden must have a robust electricity network with high **security of supply** and low **environmental impact** including climate change, and offer electricity at **competitive prices**.
- Sweden will be one of the world's first fossil-free welfare nations



The Goals

Goals for 2020:

50 % RES in final energy utilisation

10 % RES in transport sector

40 % less climate emissions compared to 1990 in non-trading sector

Energy Policy Agreement:

100 % RES electricity by 2040

50 % more efficient energy use by 2030

All Party Committee on Environmental Objectives

Net zero emissions to the atmosphere by 2045



The steps taken

A Carbon dioxide tax was introduced in 1991

An Electricity Certificate System was introduced in 2003 (since 2012 a joint Swedish-Norwegian system)

Investment support schemes for renewables, e.g. Solar pv

A climate investment program “The Climate leap”



Additional steps

The initiative **Fossil Free Sweden** has been launched by the Government to promote action and cooperation

A special initiative on a **Fossil Free Vehicle Fleet** has also been established

Intensified focus on reducing emissions from transportation

A national climate policy framework with new intermediate targets is in the pipeline



The Swedish Energy System

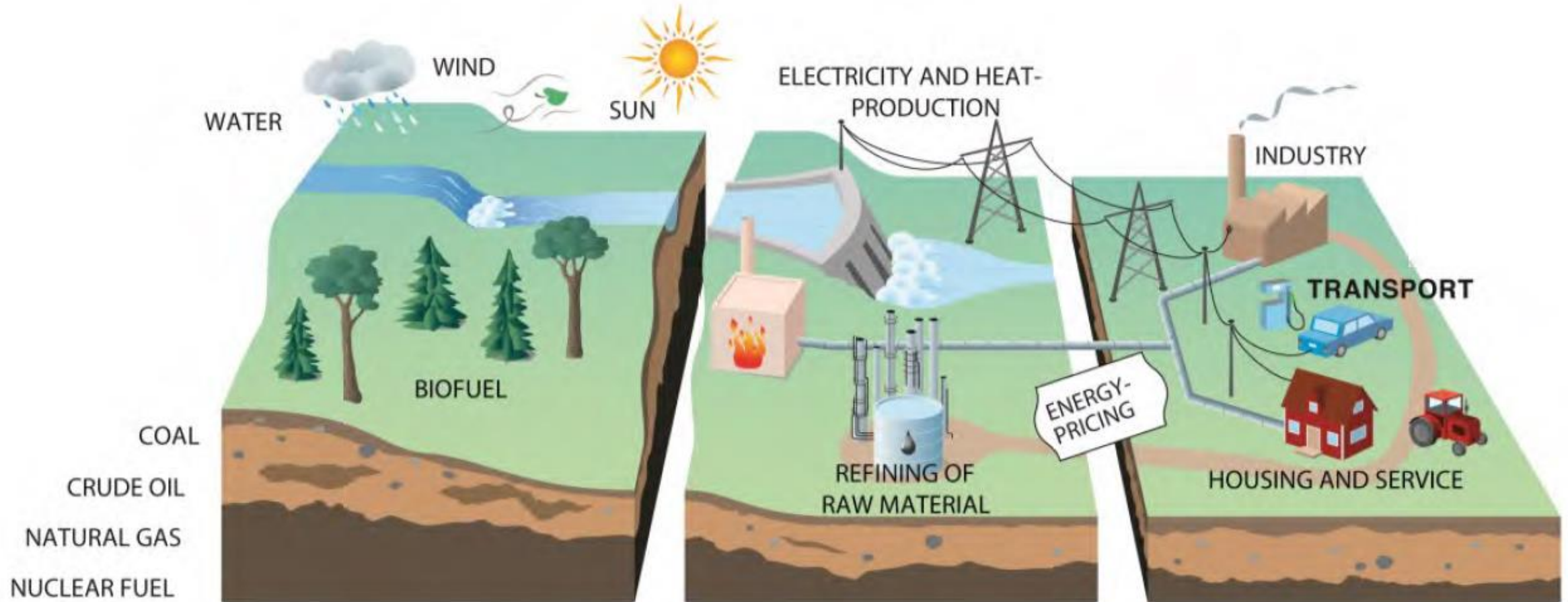
Lars Guldbrand, Ph.D.

Senior Adviser

Ministry of the Environment and Energy

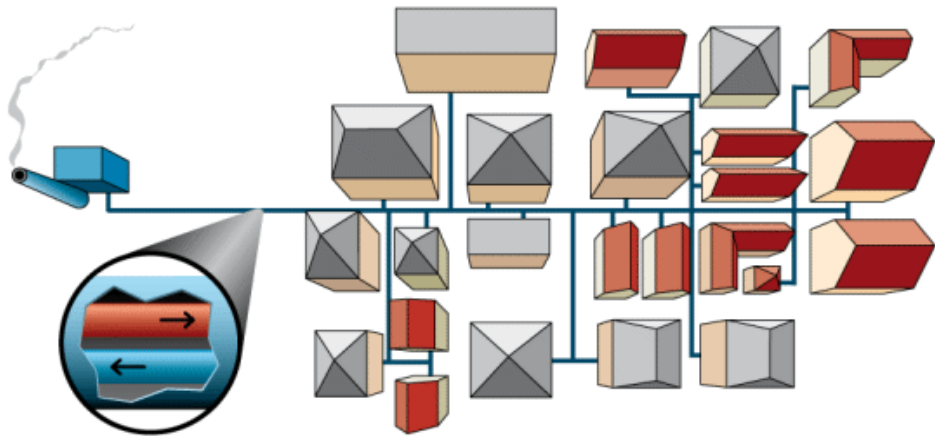


The Swedish Energy System



The Swedish Energy System

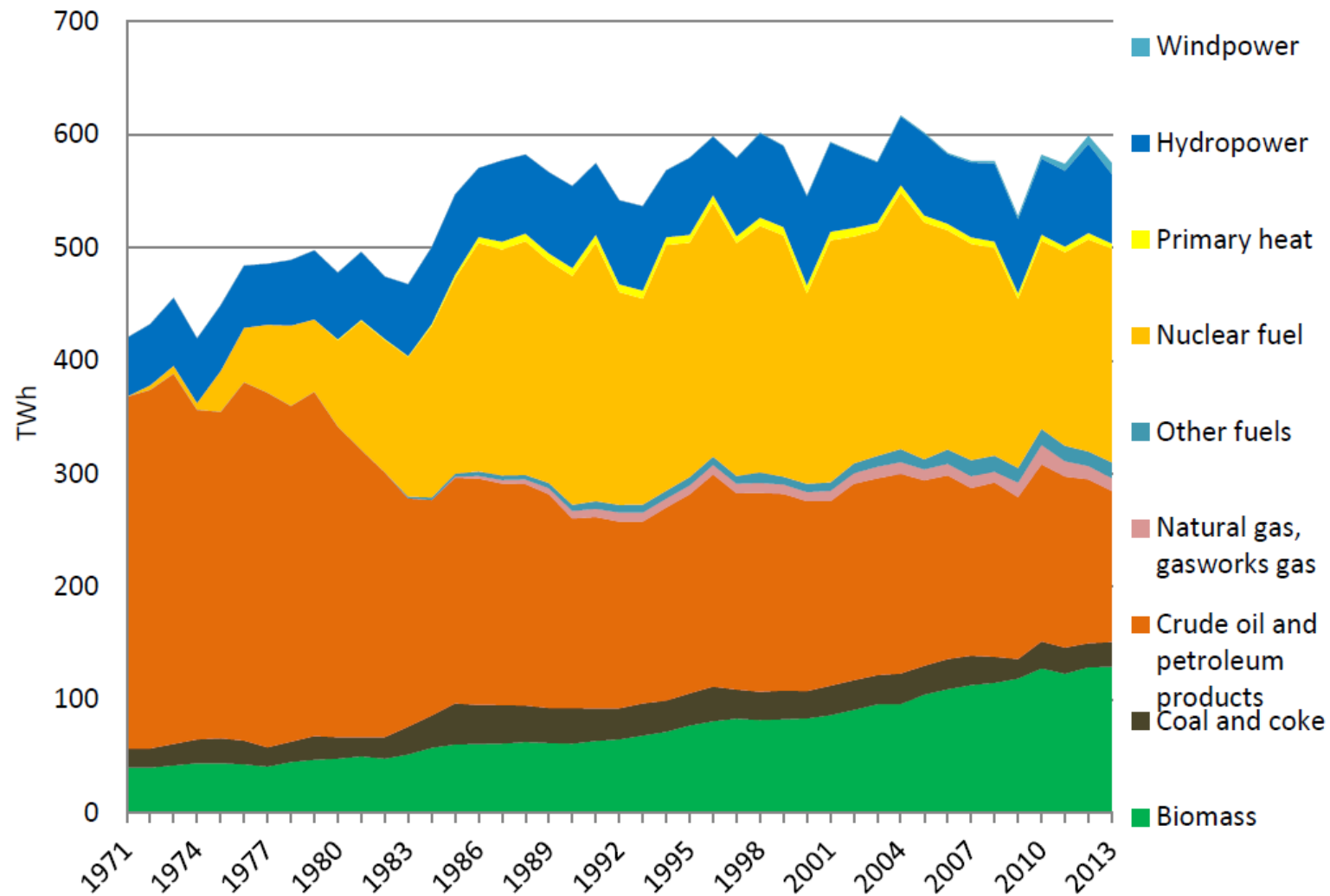
- Early deregulation of electricity market
- Well-established Nordic market
- Extensive international connections



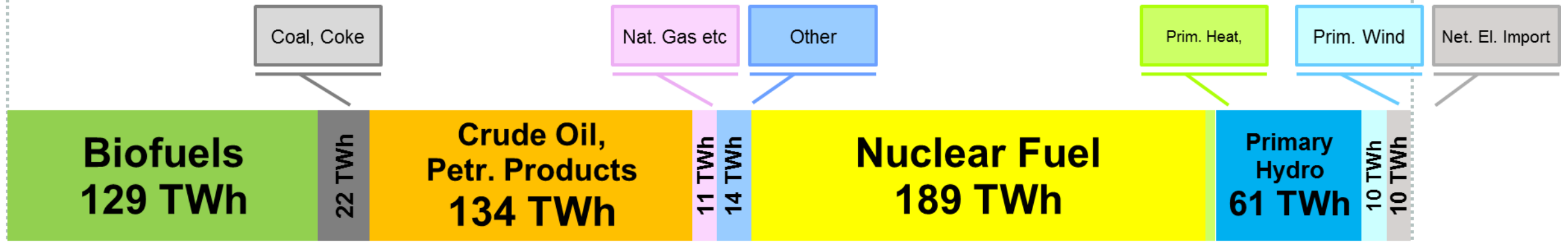
- District Heating established in the fifties.
- Now also District Cooling
- In 2013, DH delivered 58 % of the total heating energy use in housing and premises.



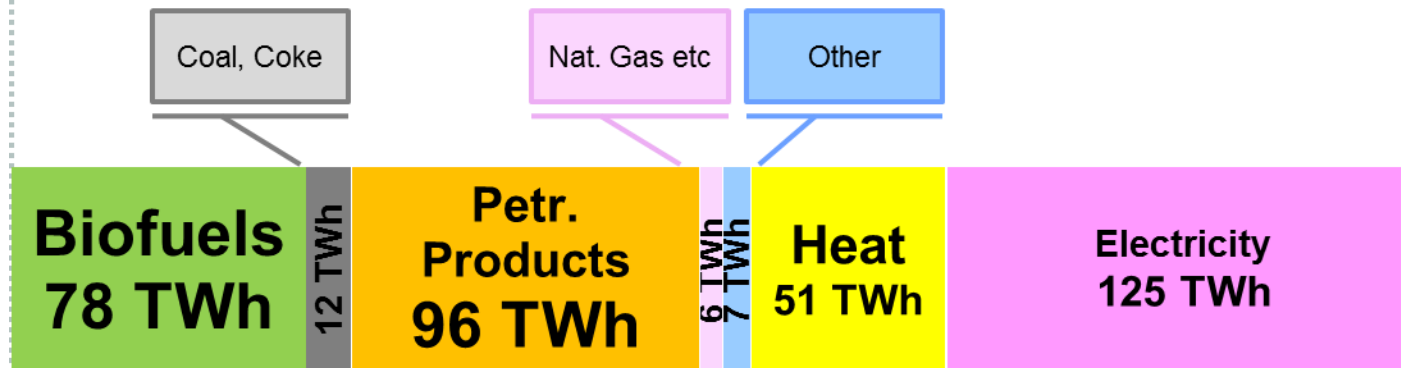
Total Energy Supply per Energy Commodity 1971 – 2013



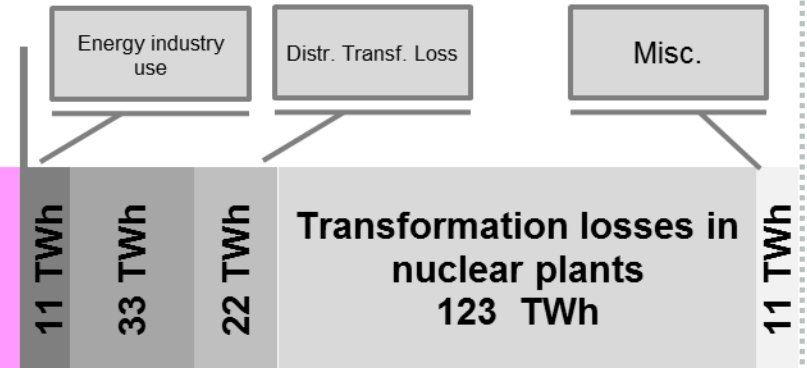
Total supply by energy commodity in 2013, 565 TWh



Total final consumption by energy commodity in 2013, 375 TWh



Losses and other consumption, 190 TWh

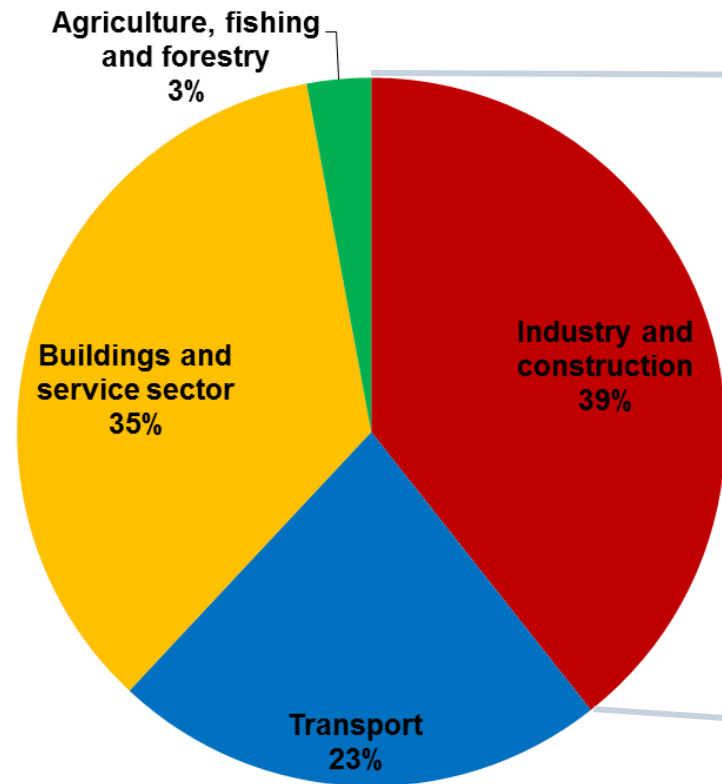


Government Offices of Sweden

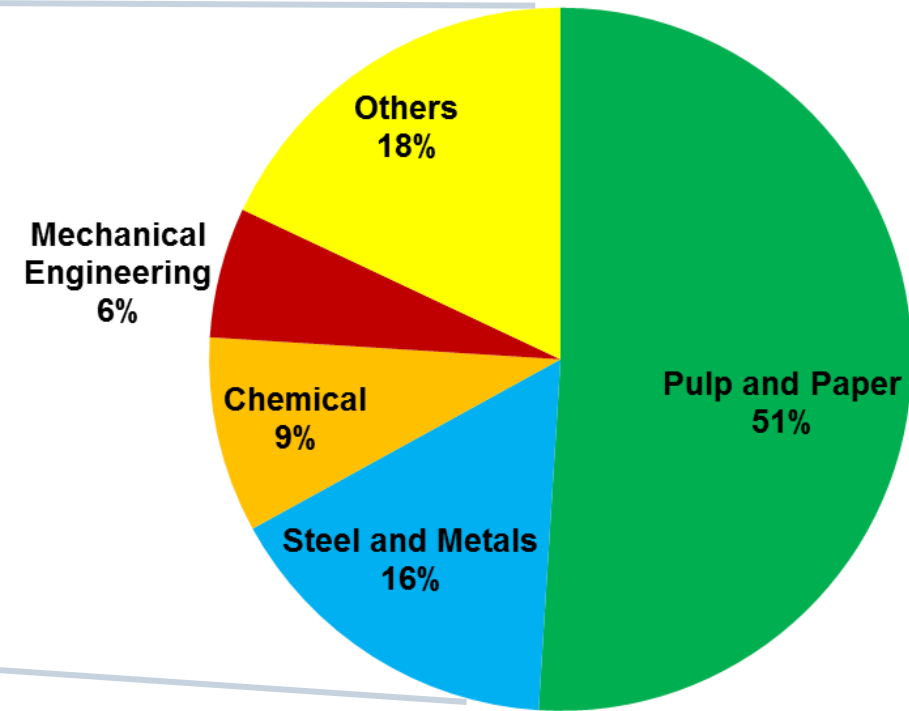
Ministry of the Environment and Energy
Sweden

Source: Swedish Energy Agency and Statistics Sweden

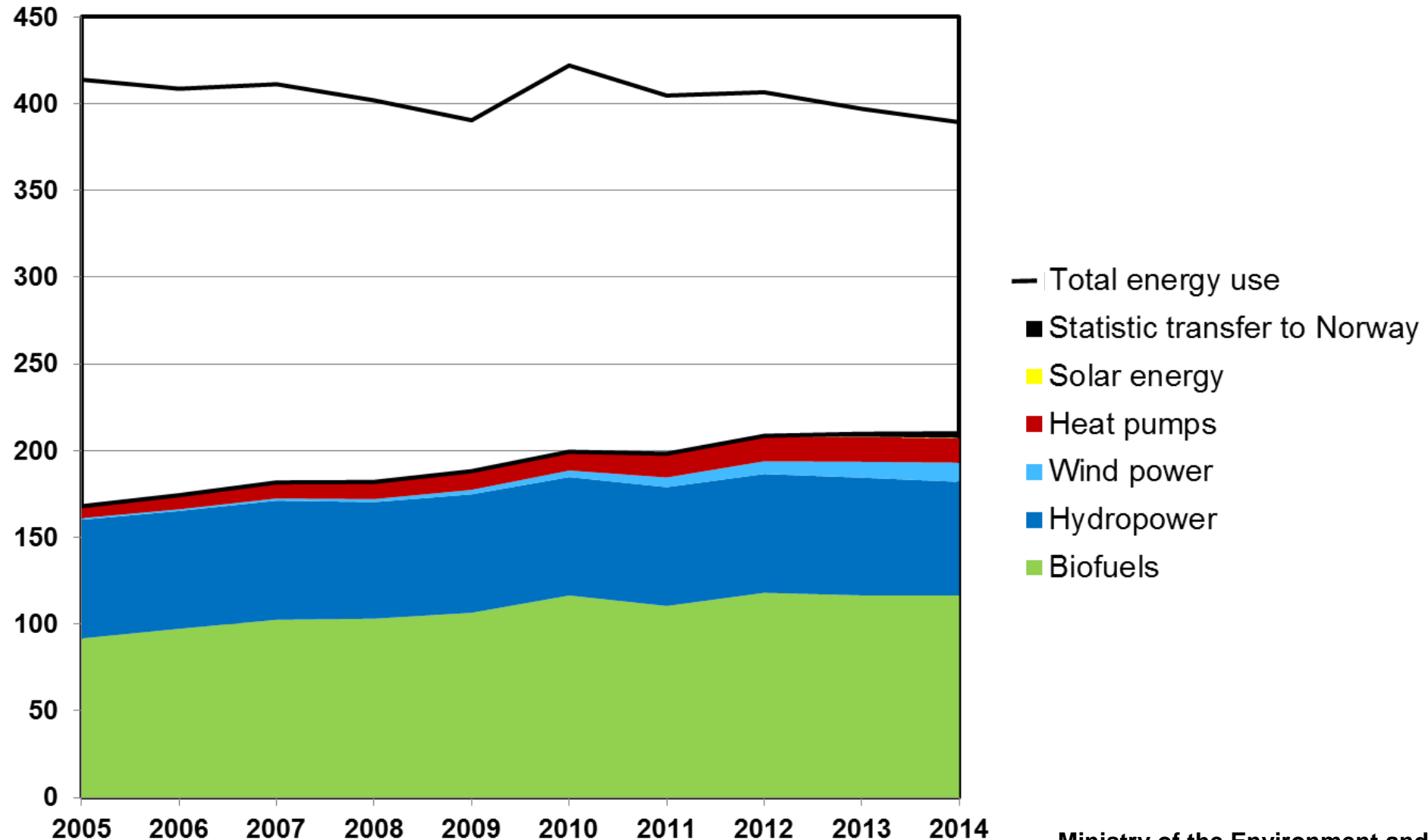
Energy Use in Swedish Industry



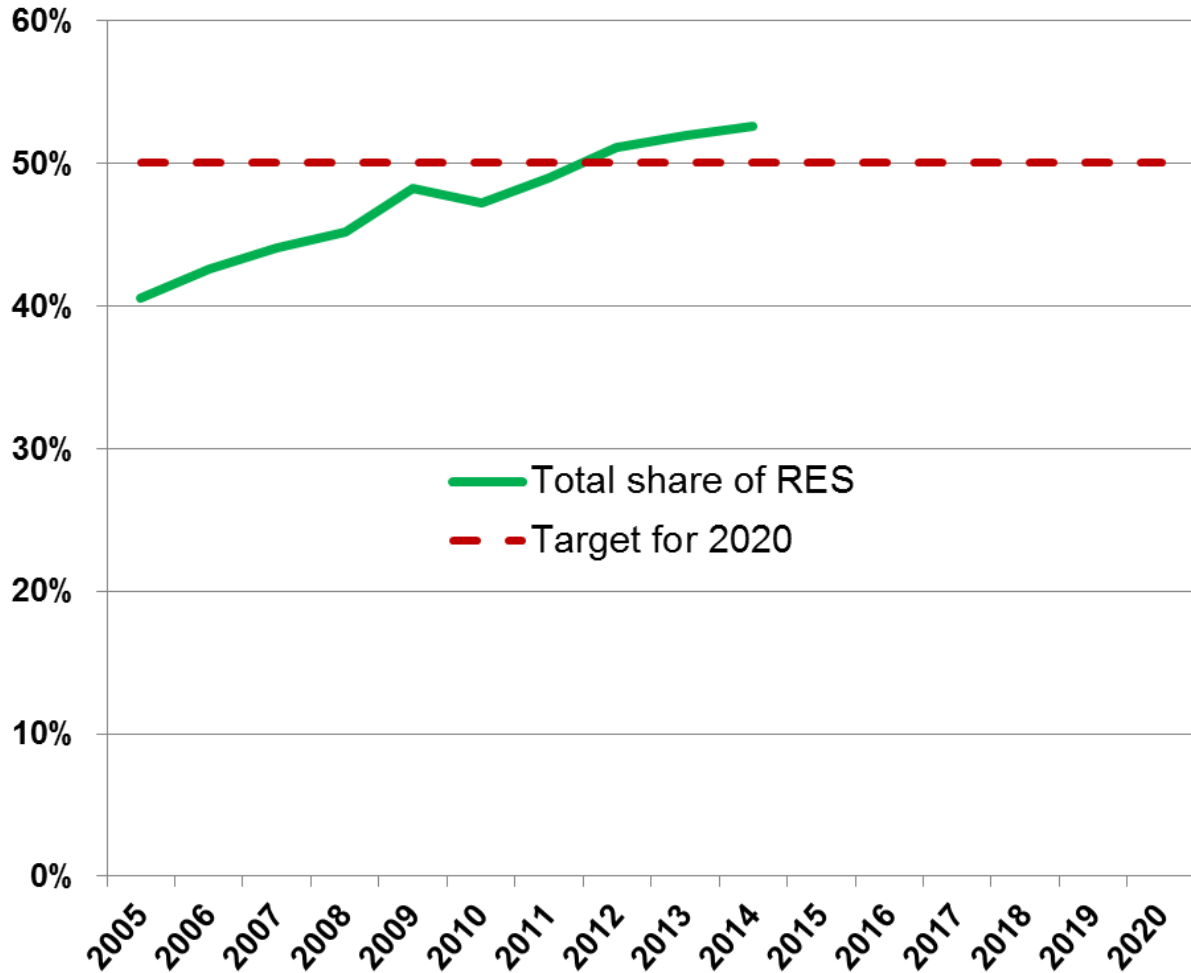
Energy Use in Swedish Industry



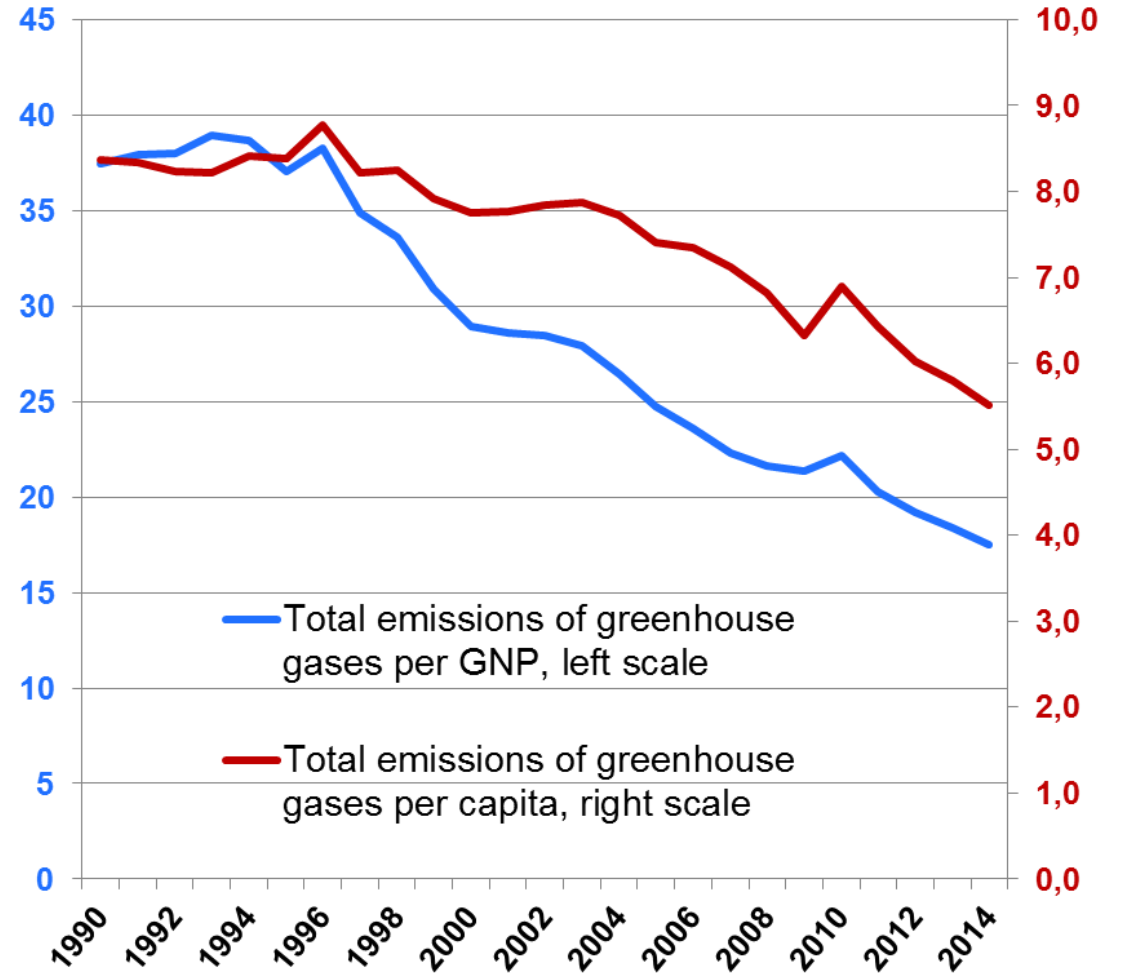
Renewable Energy Use and Total Energy Use



Share of RE in Total Final Consumption as Defined by EU



Total emissions of GHG per GNP and per capita



Funding and Promoting Energy R&I

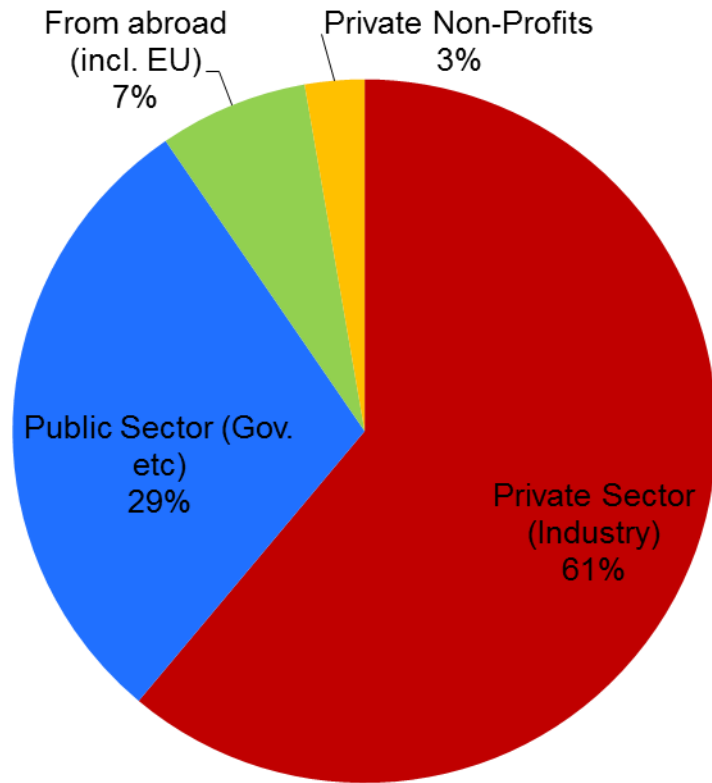
Lars Guldbrand, Ph.D.

Senior Adviser

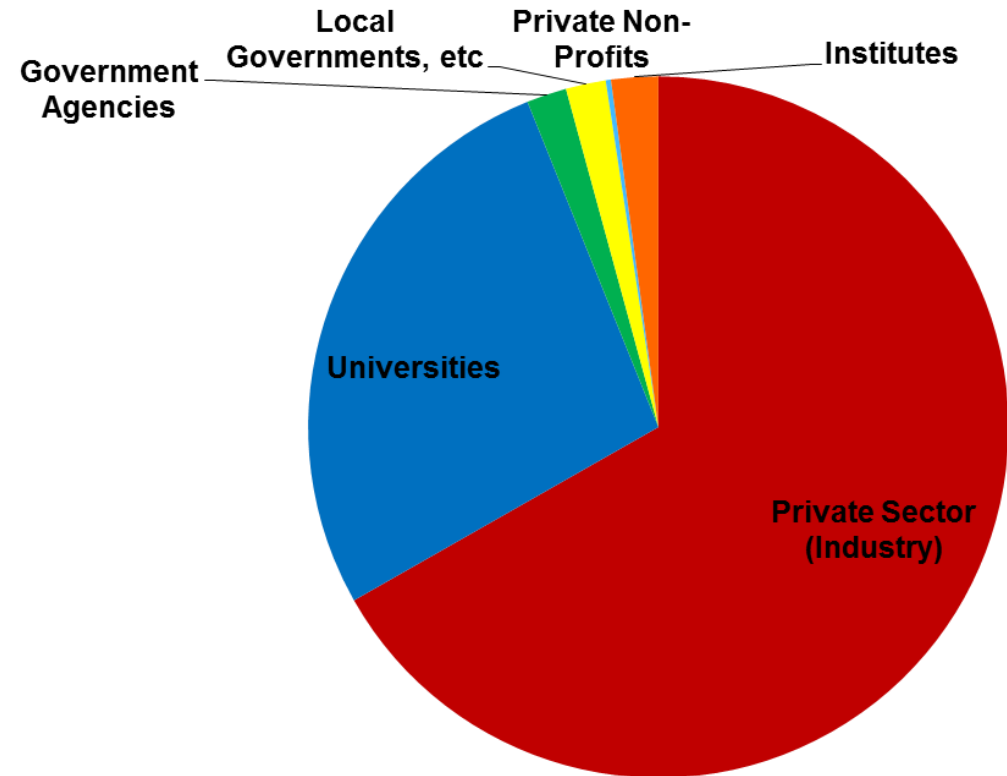
Ministry of the Environment and Energy



Funding of Swedish R&I



Performance of Swedish R&I



Ministers, Areas and Agencies



H.E. Helene Hellmark Knutsson
Minister for Higher Education and Research

H.E. Mikael Damberg
Minister for Enterprise and Innovation

H.E. Karolina Skog
Minister for the Environment

H.E. Ibrahim Baylan
Minister for Policy Coordination and Energy

Swedish Research Council

General Research, excellence

Swedish Innovation Agency (Vinnova)

General RDD&I, incl. sustainable technology

Swedish Research Council of Sustainable Development

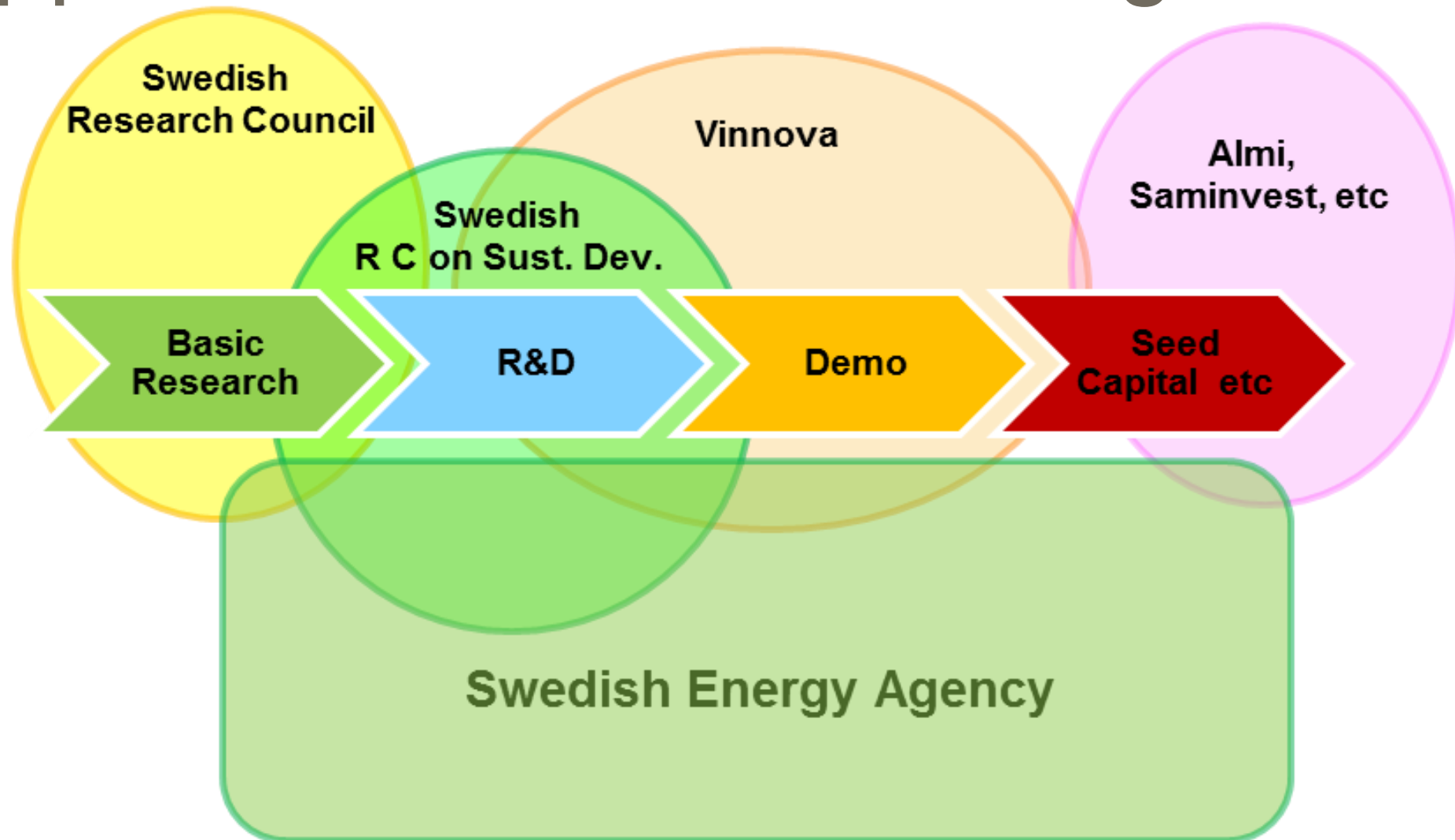
R&D on the Environment, Agricultural Sciences & Spatial Planning.

Swedish Energy Agency

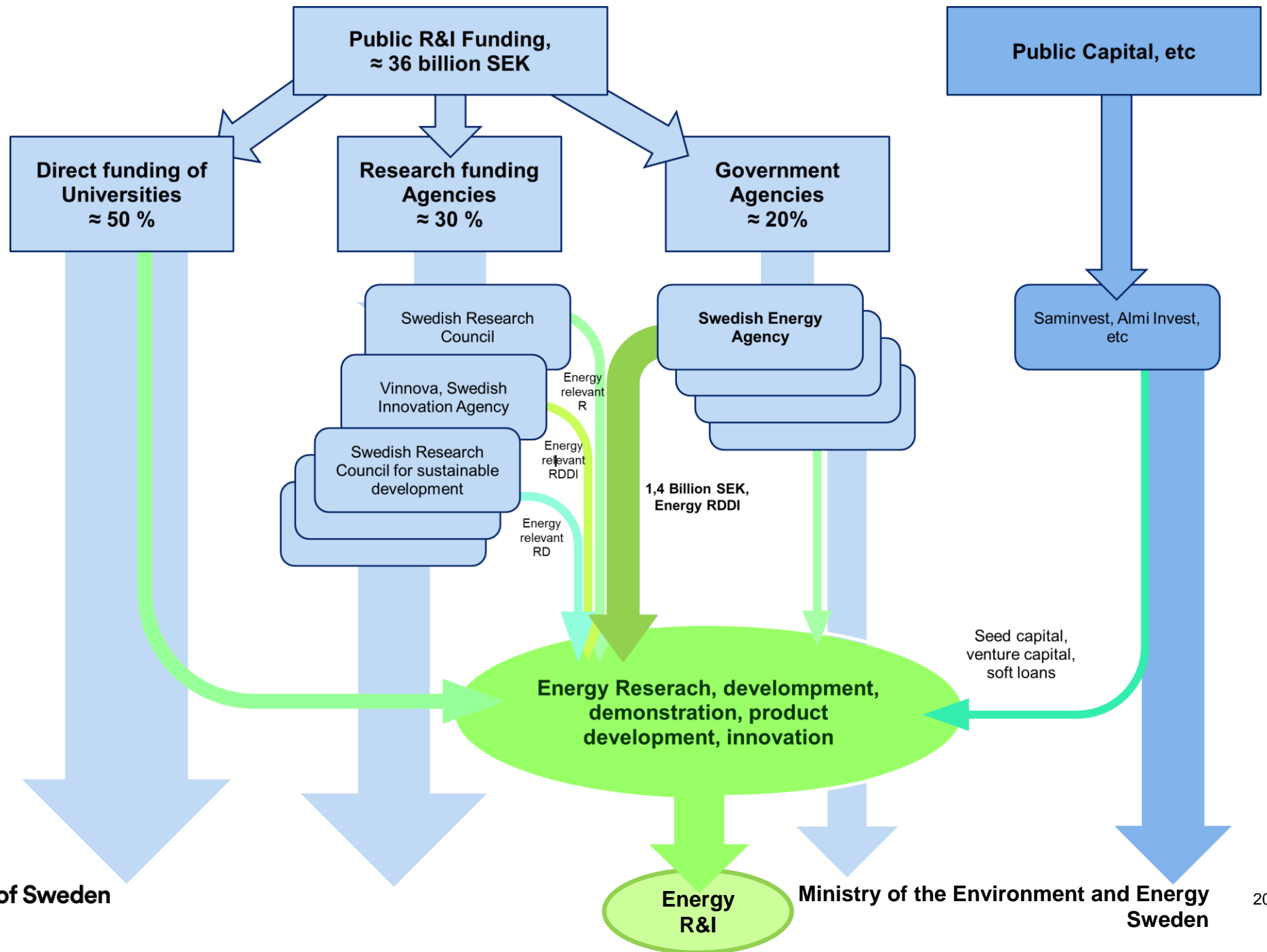
Strategic RDD&I for a Sustainable Energy System and Climate



Support for different R&I stages



Public R&I Funding System



Energy R&I Governance

Government Parliament



External Evaluations, Enquiries, etc

Annual Reports, Budget proposals, Strategy Reports, etc

Swedish Energy Agency



Knowledge, improvements, processes, products, services, innovations, ...



The Global Innovation Index



Sweden has been ranked as the second most innovative country in the world according to the 2016 Global Innovation Index (GII). Switzerland attains the top spot. Numbers 3 and 4 are the UK and the US, respectively.

Cornell University, INSEAD, and WIPO (2016): *The Global Innovation Index 2016: Winning with Global Innovation*, Ithaca, Fontainebleau, and Geneva.



2016 EUROPEAN INNOVATION SCOREBOARD

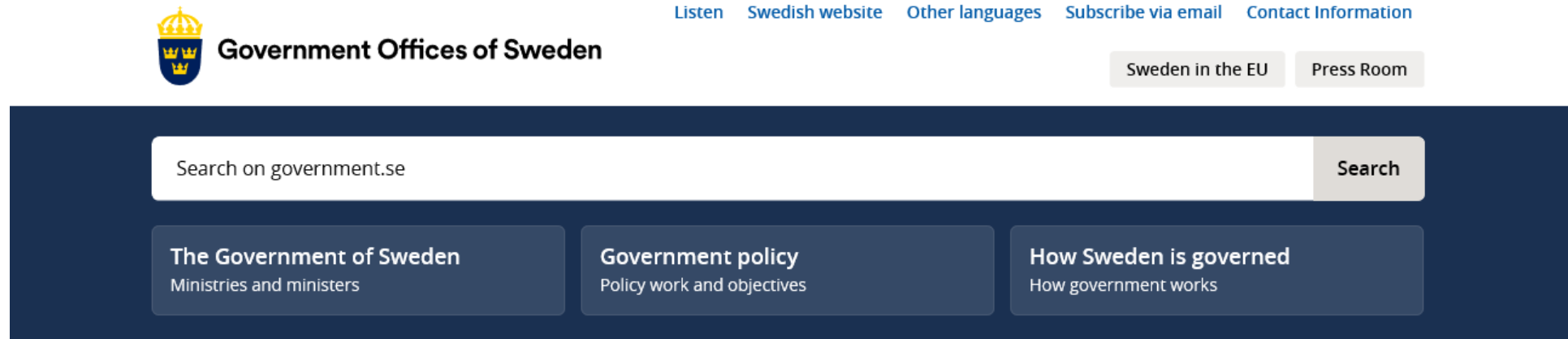
Sweden is the EU **innovation leader** in 2016, followed by Denmark, Finland, Germany and the Netherlands.

<http://ec.europa.eu/DocsRoom/documents/17822>



For more information

<http://www.government.se/>



The screenshot shows the top section of the Government Offices of Sweden website. On the left is the Swedish coat of arms logo and the text "Government Offices of Sweden". To the right are navigation links: "Listen", "Swedish website", "Other languages", "Subscribe via email", and "Contact Information". Below these are two buttons: "Sweden in the EU" and "Press Room". A dark blue search bar contains the placeholder text "Search on government.se" and a "Search" button. Below the search bar are three dark blue buttons with white text: "The Government of Sweden" (with subtext "Ministries and ministers"), "Government policy" (with subtext "Policy work and objectives"), and "How Sweden is governed" (with subtext "How government works").

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Swedish Energy Agency

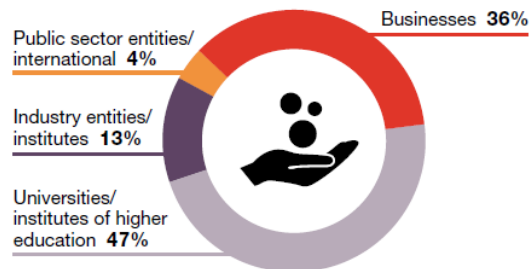
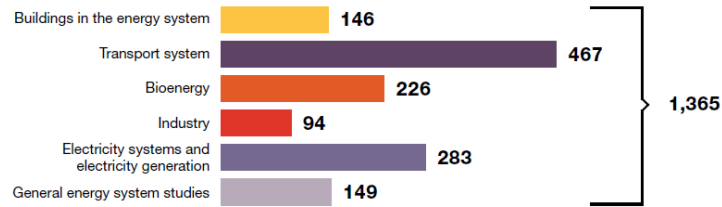
Supporting Research & Innovation for a
Sustainable Energy System

Dr. Rémy Kolessar

Director, Research & Innovation Dept.



Facts & Figures – Energy R&I Funding



Support across the whole innovation chain

- From early research to demonstration, commercialization and market uptake

Annual budget of approximately 150 million €

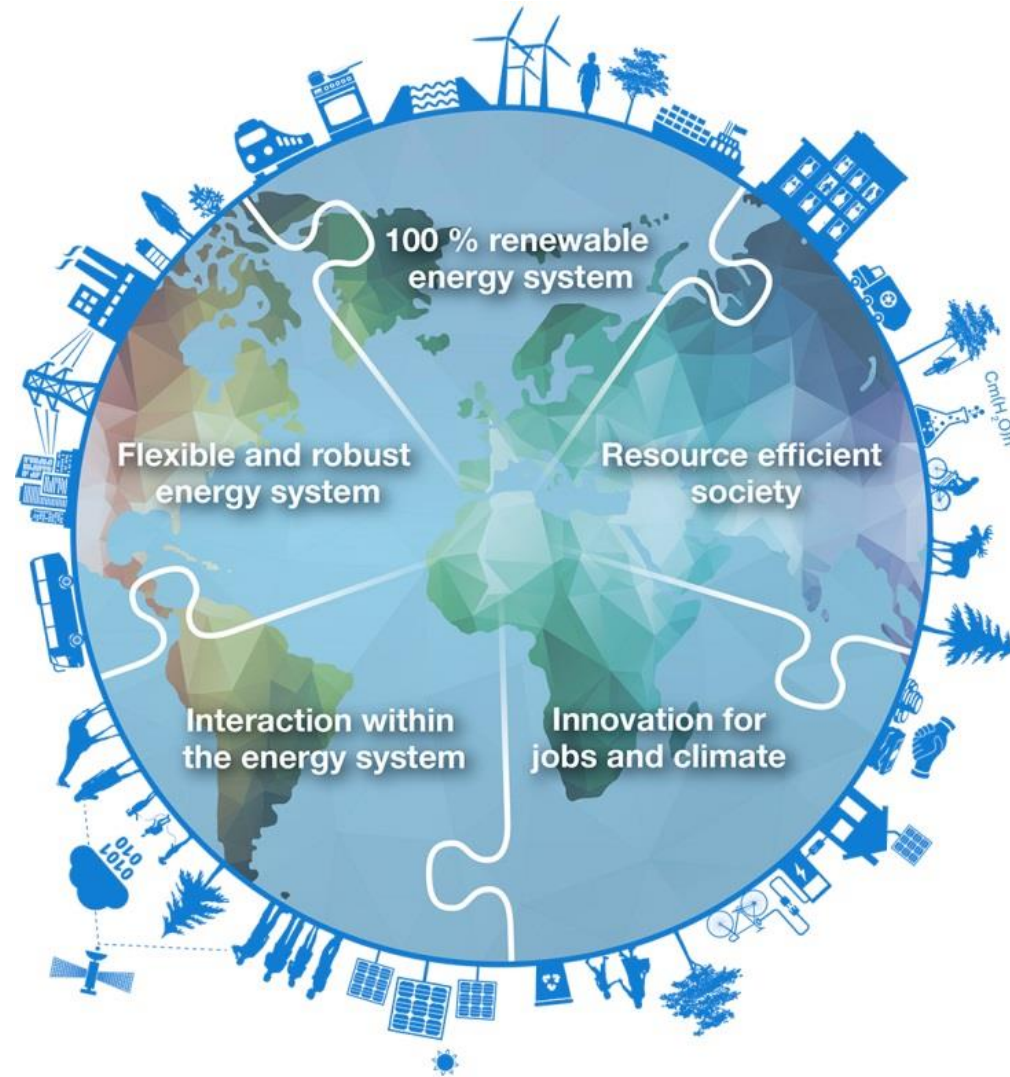
Doubled through private sector co-funding

> 50 R&I programs and > 3 000 projects running

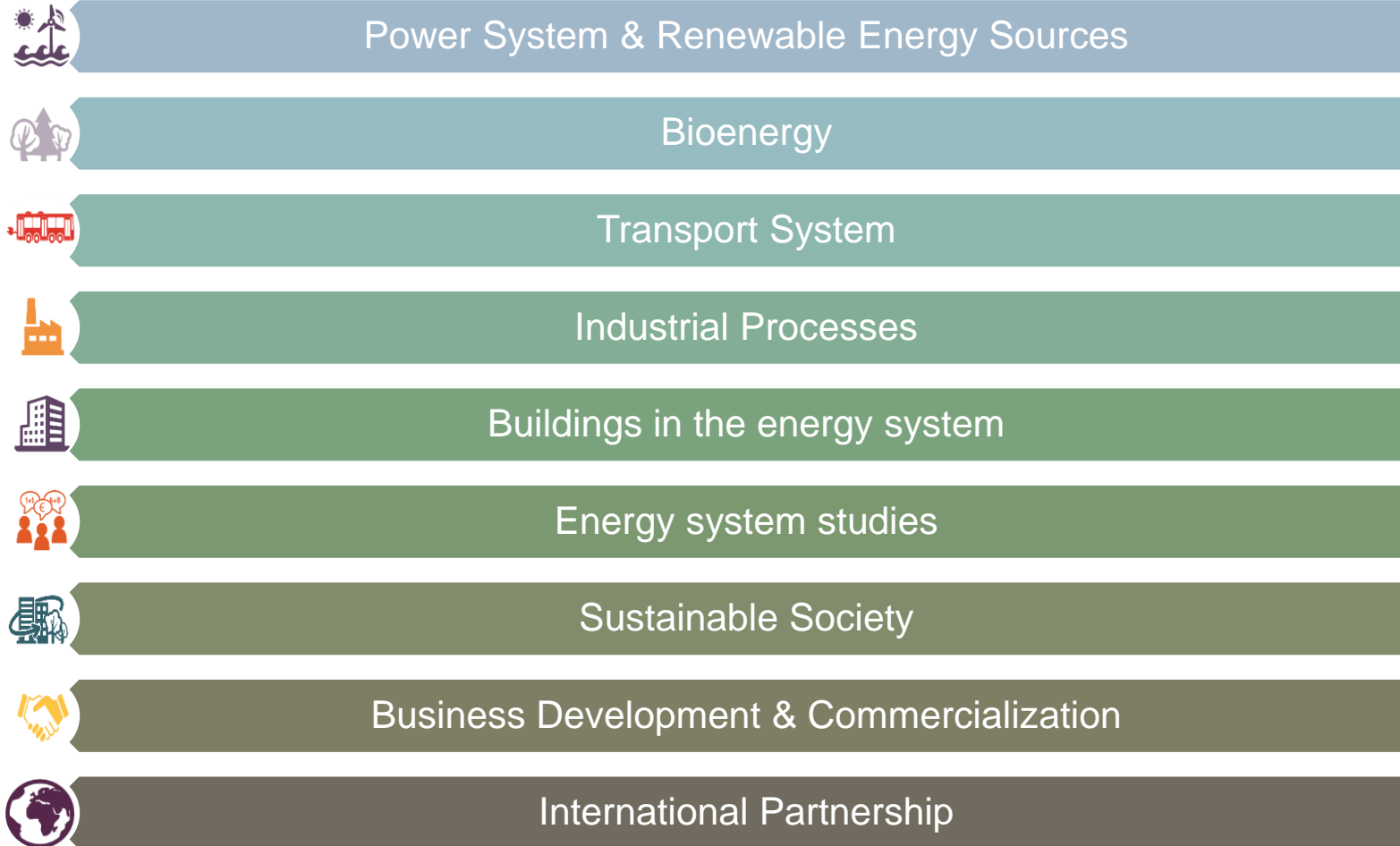
In-house priority settings and strategy for public R&DD fundings



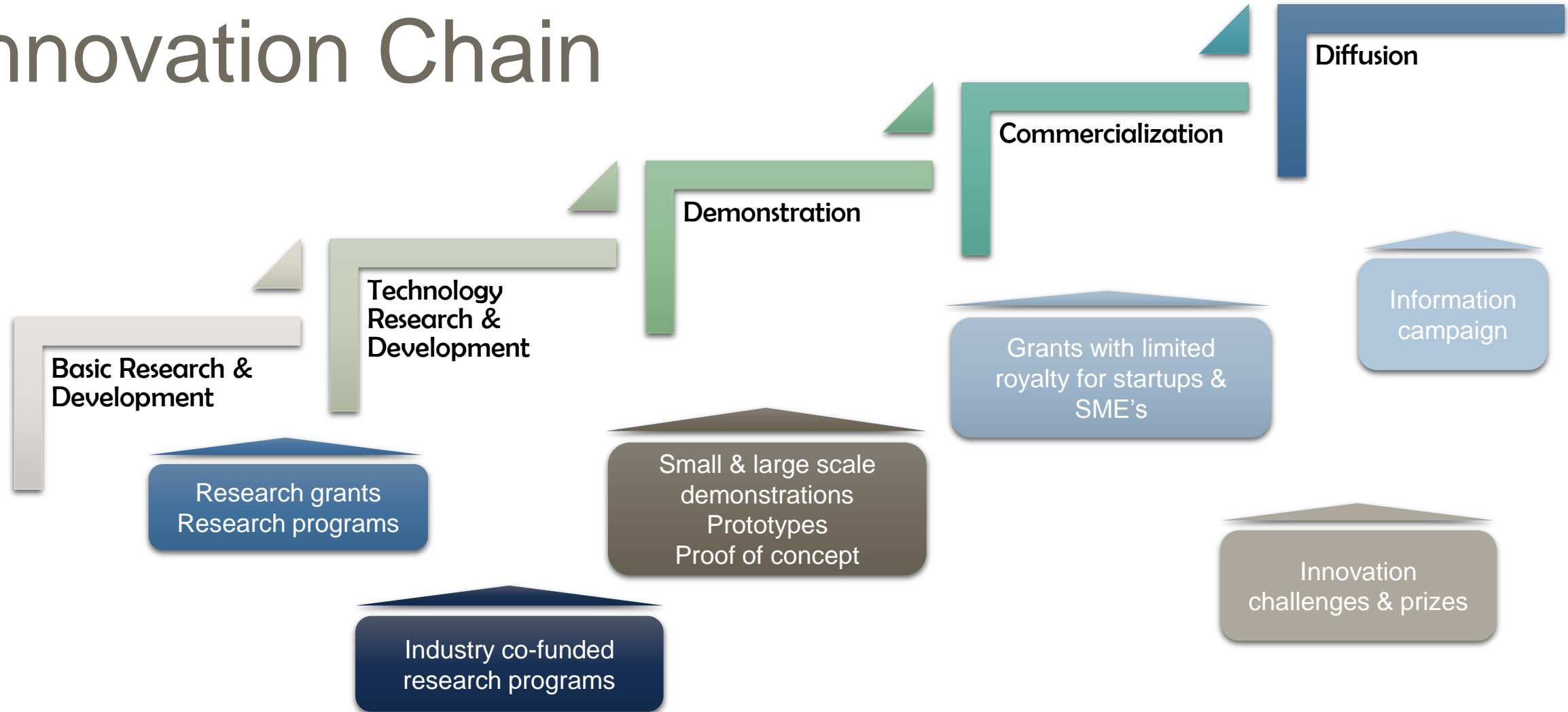
Energy Research & Innovation Grand Challenges



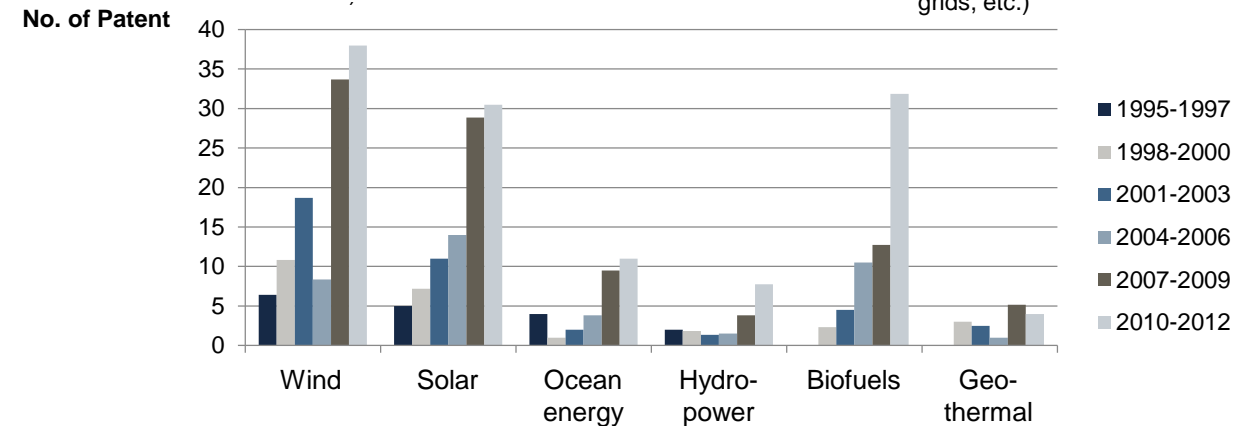
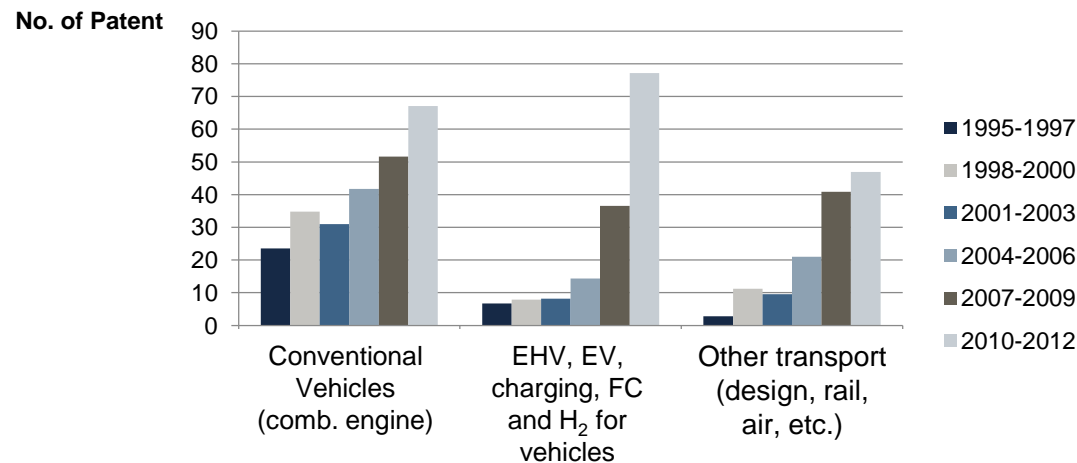
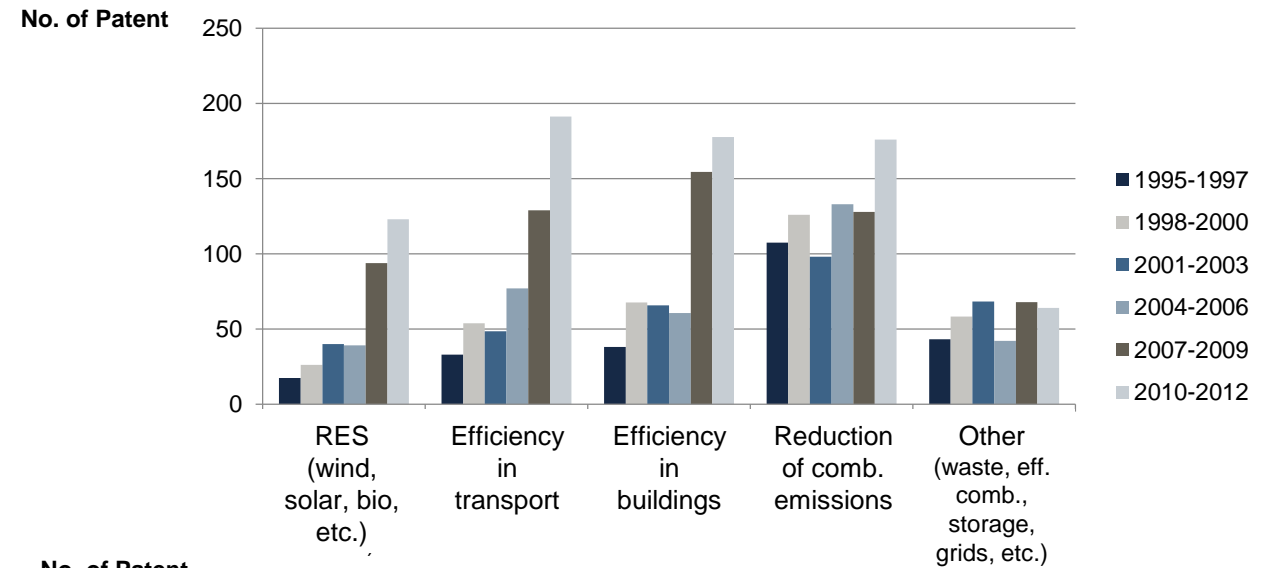
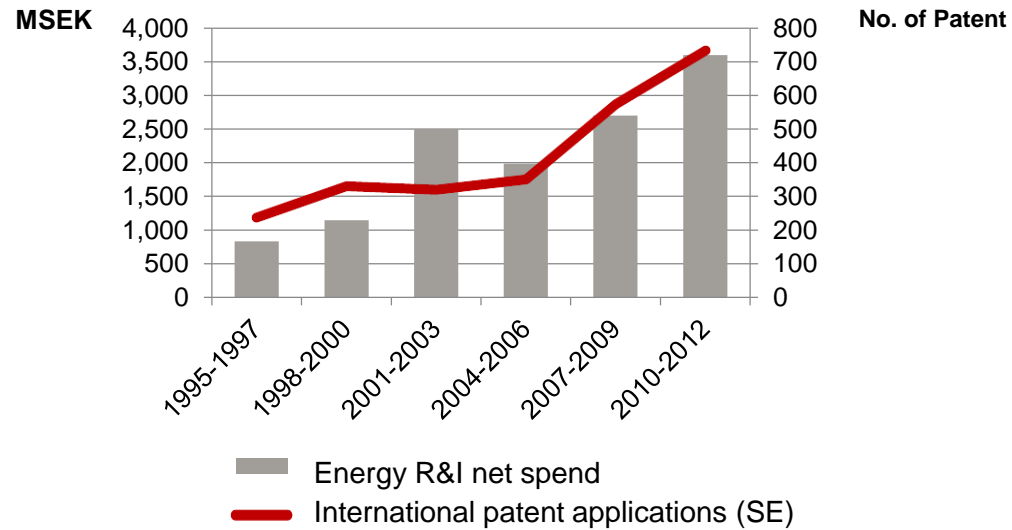
Thematic Research Areas



Various Tools Across the Whole Innovation Chain



Impact on Patent Applications



Examples – From Research to Market

Solar Energy

EXEGER



midsummer 



Government Offices of Sweden

Ocean Energy



Examples – Pilots & Demonstrations

Zero Emission Transportation



Biofuels



Government Offices of Sweden

Smart Grids



VATTENFALL



Examples – Innovation Challenges

INTELLIGENT ENERGY MANAGEMENT

A CHALLENGE FROM



 Sweden
 Sverige



CONGRATULATIONS TO THE WINNERS OF THE INTELLIGENT ENERGY MANAGEMENT CHALLENGE


 Amzur Technologies	USA	 Ferroamp Elektronik AB	Sweden	CLICK HERE to learn more
 CERTH	Greece	 KIC InnoEnergy	Sweden	



A CHALLENGE FROM


 Sweden
 Sverige


#2

SUSTAINABLE MOBILITY AS A SERVICE



 Sweden
 Sverige

 Swedish Energy Agency

 SWEDISH INCUBATORS & SCIENCE PARKS