

# Solar in the Swedish electricity system

Solar Integration workshop

October 16, 2018

# About the Swedish Energy Agency

- National authority for energy policy issues
- Sorts under Ministry of the Environment and Energy
- The Director-General is appointed by the Government
- Government funded
- Around 400 employees, Eskilstuna

***Our mission is to promote a sustainable energy system***

# Roles:

## Steering, supporting and expert

- **Steering** – enforces governmental and parliamentary decisions
- **Supporting** – disseminates information within the energy and climate area and grants financial support to research and innovation
- **Expert** – provides the public, the Government and the research domain with data (statistics, analyses, scenarios and forecasts)



# The energy balance

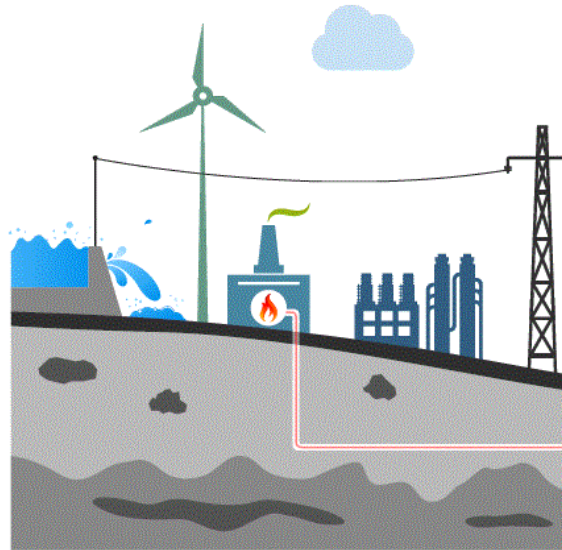
## Some characteristics of the Swedish energy system

Supplied primary energy



Biofuel, water, wind, sun,  
coal, crude oil, natural gas  
and nuclear fuel

Transformation and transmission



Electricity and heat production  
and refining of raw materials

Final energy consumption

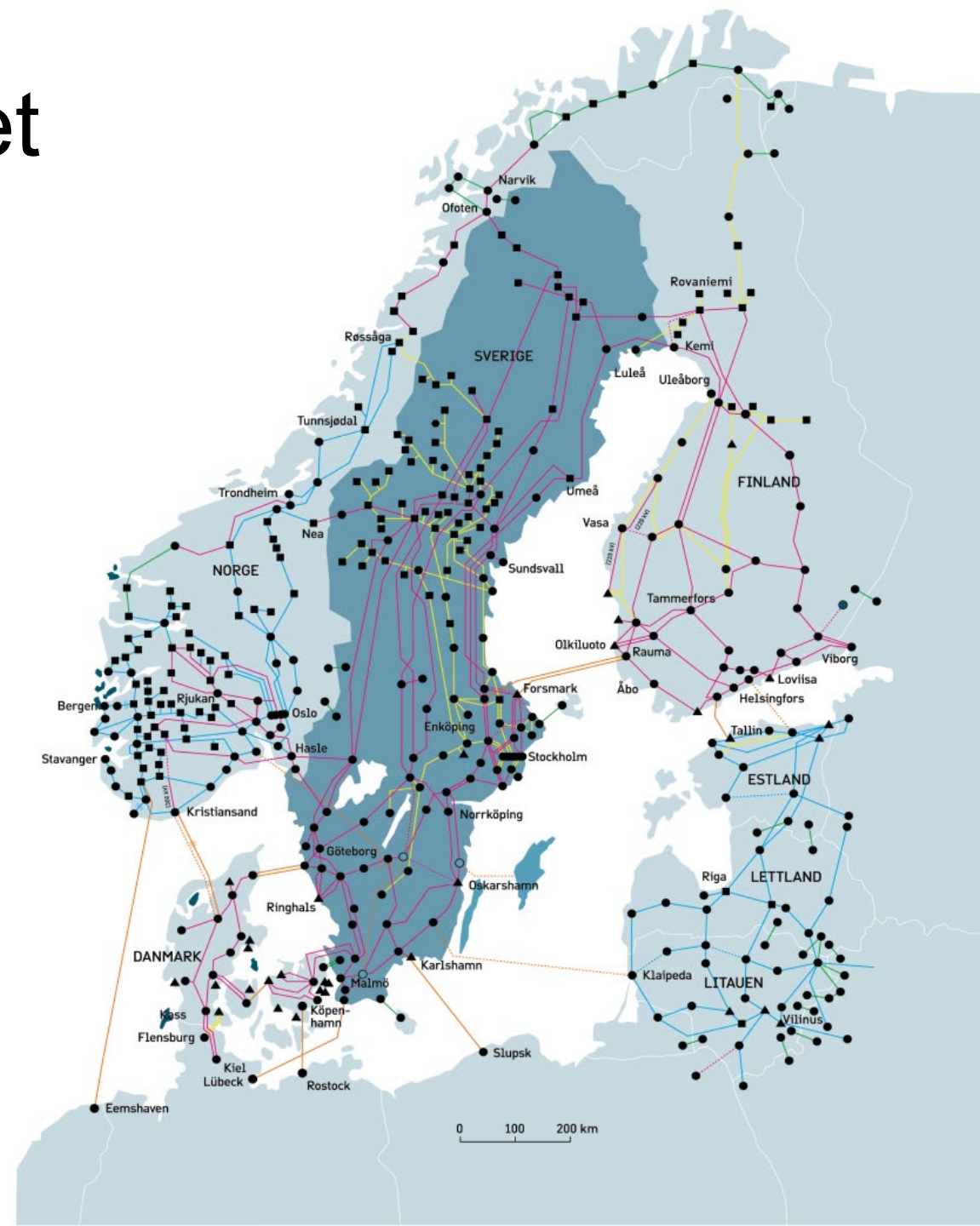


Industry, transport,  
residential and service

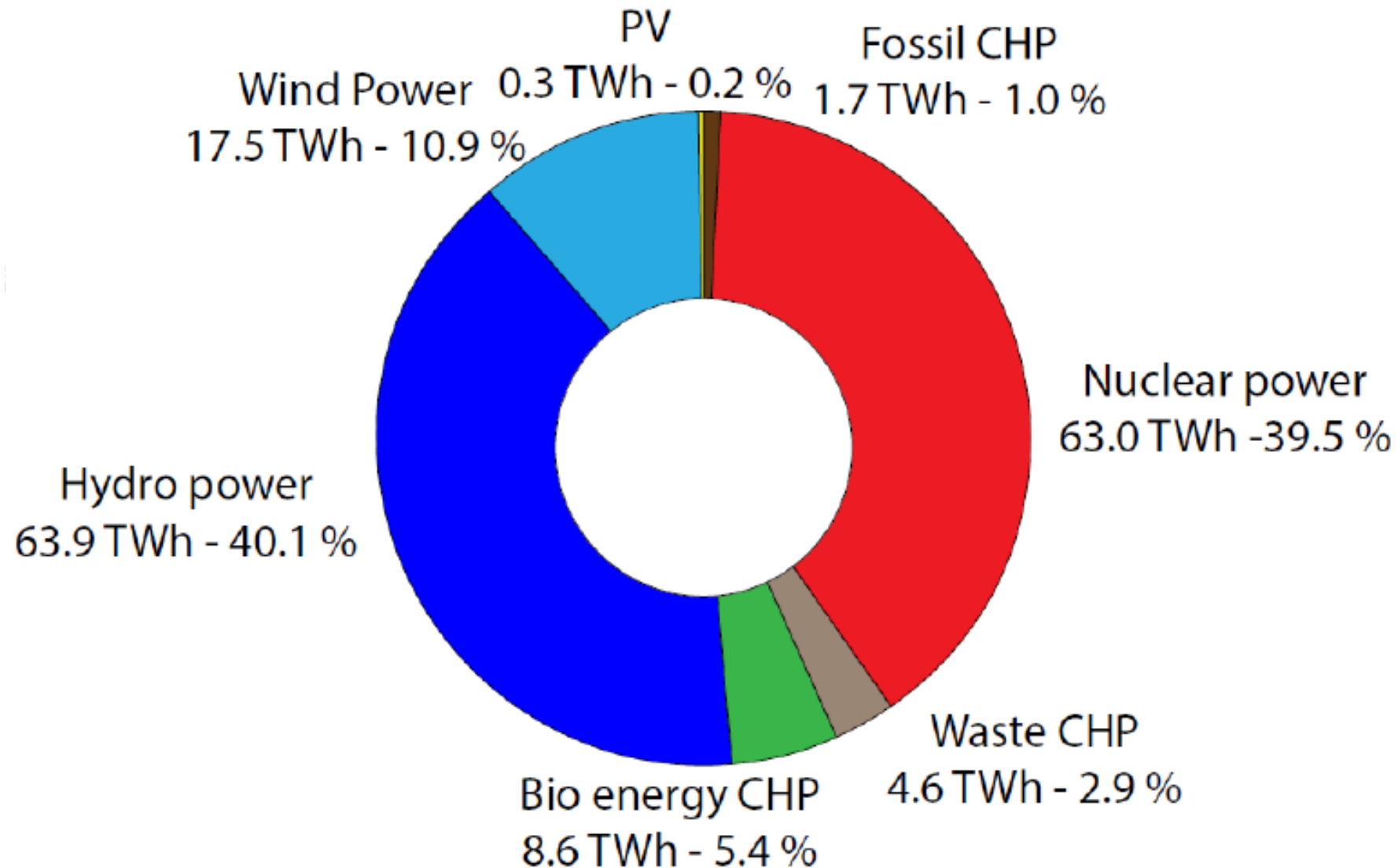
# Integrated electricity market

- Completely liberalised market
- TSO – Svenska kraftnät
- About 170 local grid owners
- The Energy Markets

Inspectorate oversees non-government distribution systems



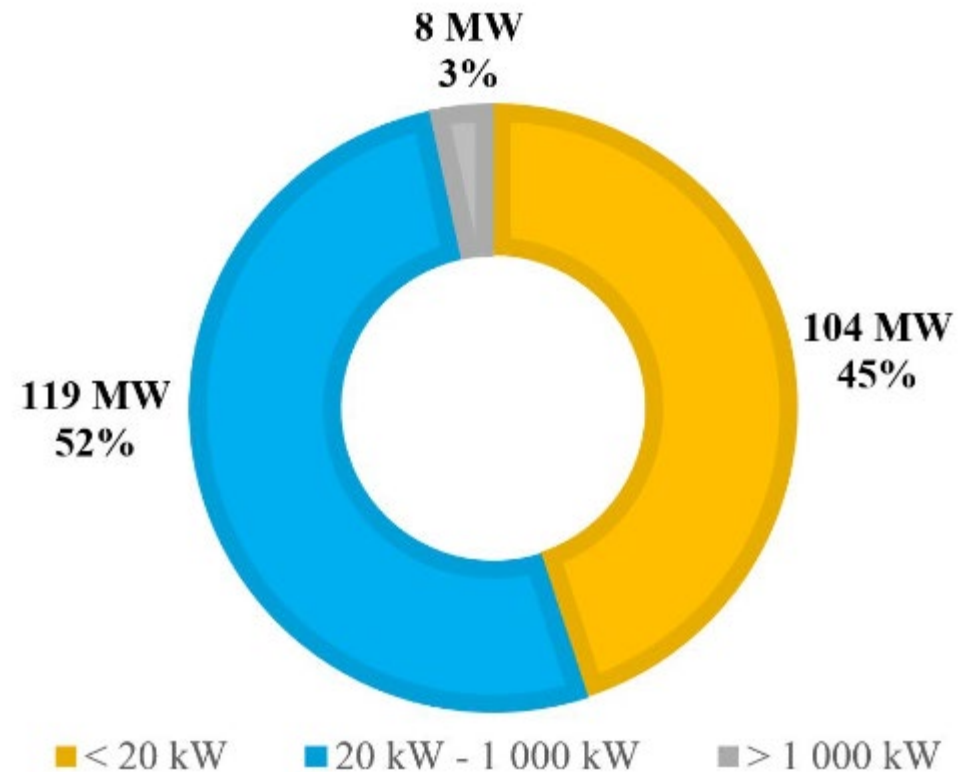
# Electricity production by type of power, 2017





# PV capacity in Sweden

- 231 MW grid connected capacity
- Marginal contribution
- Subsidies
- Fast growing market



# Grid integration of solar

- Not a big topic yet
- Increasing amounts of variable resources
  - How to ensure flexibility?
  - Lack of capacity?
  - Regulations for local solutions?
- Limitation in the solar resource
  - Positive correlation on a daily level
  - Negative correlation on an annual level

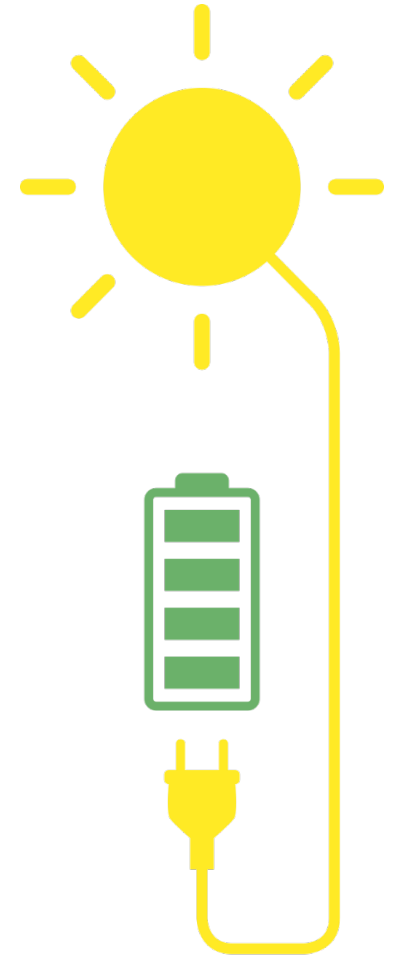


# Activities by the Swedish Energy Agency

- Research and innovation funding
- Business development and commercialisation
- Disseminates information
- Provides data (statistics, analyses, scenarios and forecasts)

# Support for storage of own production

- Private owners
- Storage system for own production and connected to the grid
- Max 60% of costs but not more than 50 000 SEK



# Swedish Smart Grid Forum

A national forum appointed by  
the Swedish Ministry of  
Environment and Energy



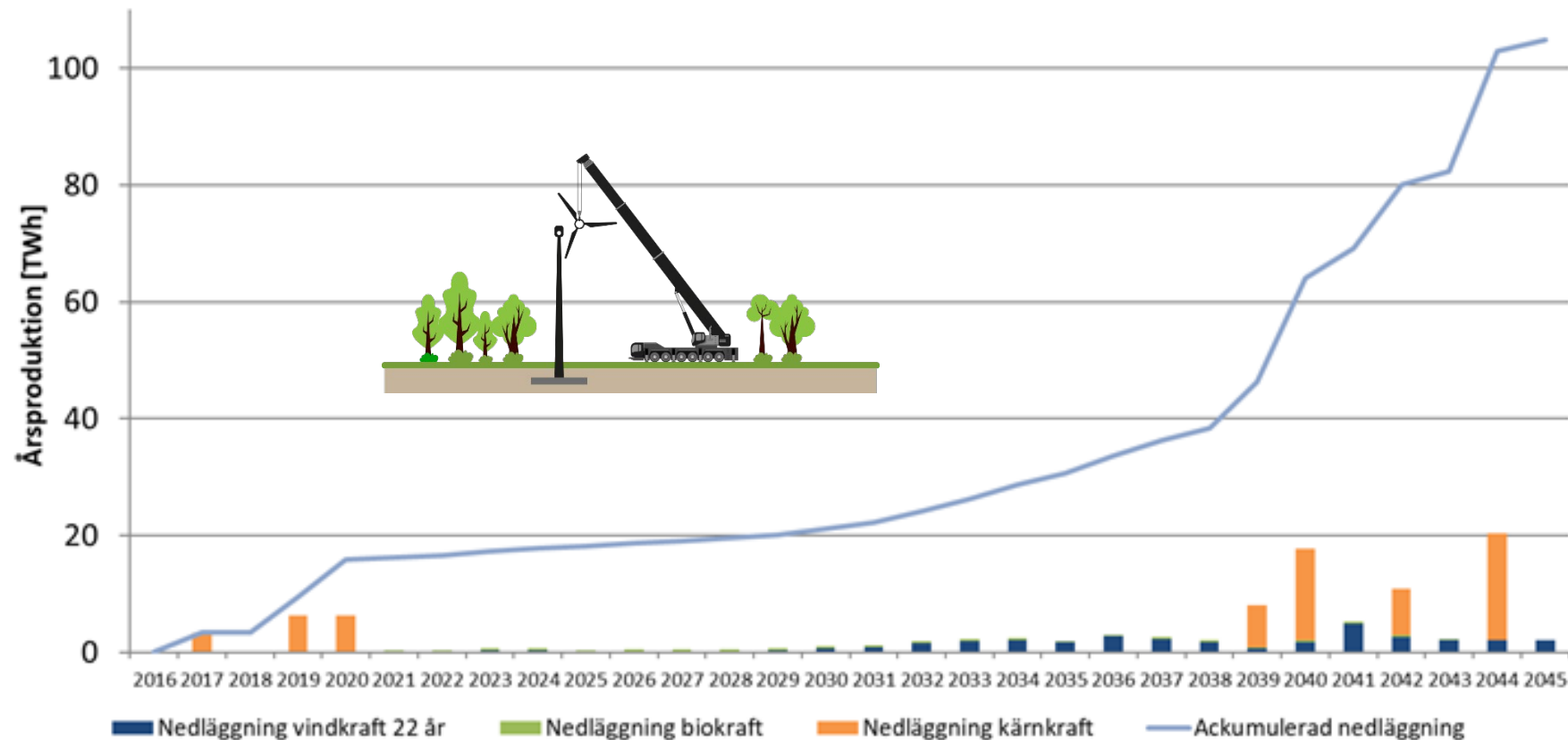
# Long-term priorities and vision beyond 2020

A sustainable and resource-efficient energy supply and no net emissions of greenhouse gases

1. Fossil independent vehicle fleet 2030  
Reduction of GHG from domestic transport is 70 % by 2030.
2. Energy efficiency 50% increase by 2030
3. 100% renewable power supply by 2040
4. No net GHG emissions by 2050



# Many power plants will reach end of technical life



# Will we reach a 100% renewable electricity system by 2040?

- Rather:  
How do we reach a 100% renewable electricity system with high stability/reliability, low impact on environment and society, sustainability and cost-effectiveness?





# Thank you for your attention!

E-mail: [sara.grettve@swedishenergyagency.se](mailto:sara.grettve@swedishenergyagency.se)

Tel: +46 (0)16-544 22 10

[www.swedishenergyagency.se](http://www.swedishenergyagency.se)

