Swedish priorities in research and innovation within energy system

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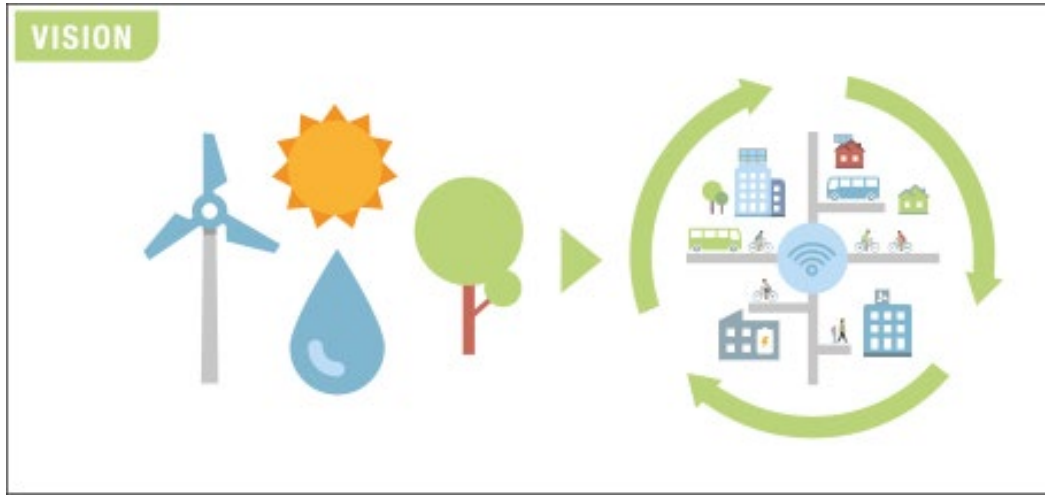
ENERGIMYNDIGHETEN

Energimyndigheten

About the Swedish Energy Agency

- National governmental agency for energy policy issues
- Role as experts for government, implementing policies, support to transition of energy system by grants for research, innovation and investments
- 440 employees, head office in city of Eskilstuna (100km west of Stockholm)
- Our mission is to accelerate energy transition for a sustainable society



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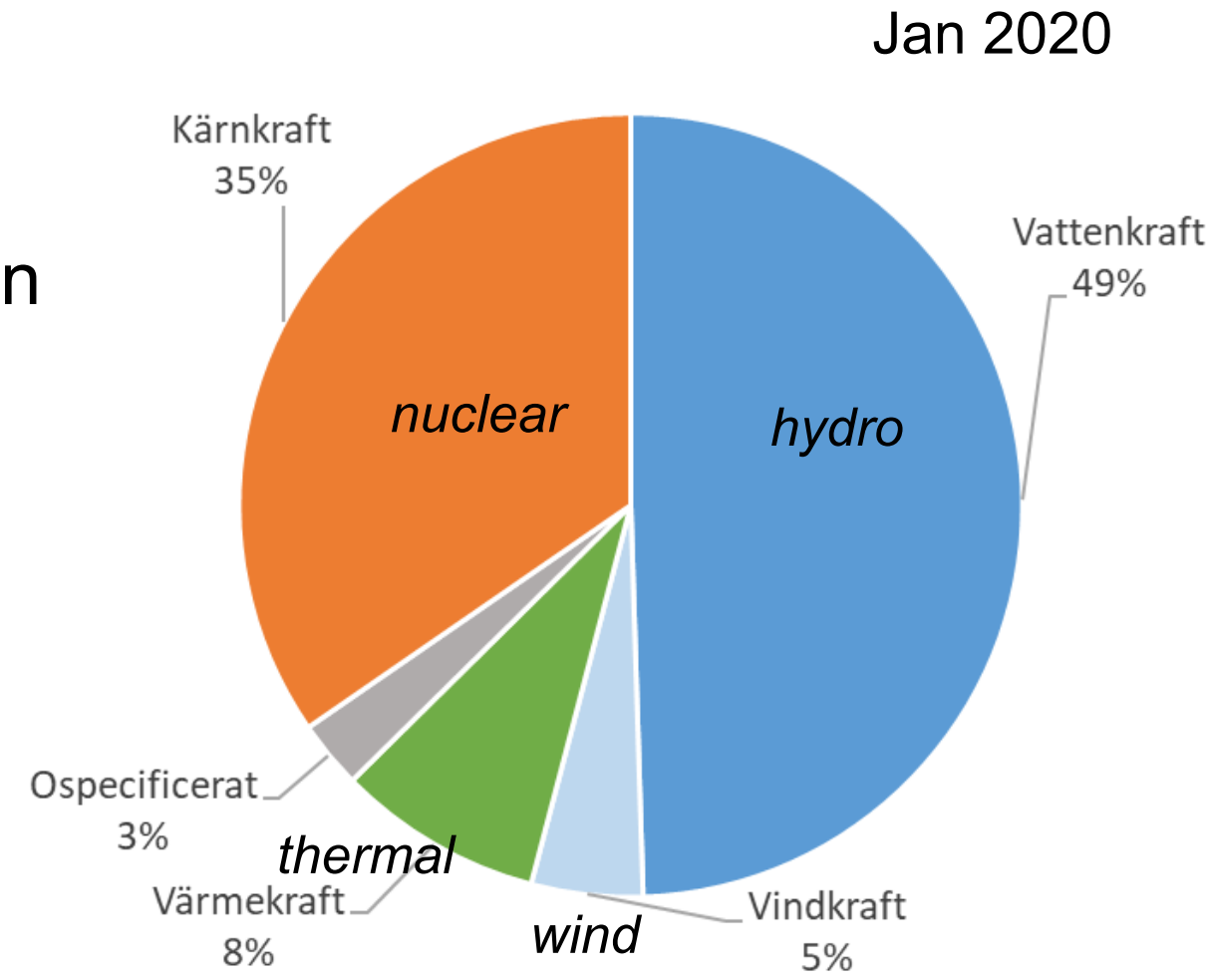
Sweden today

- Almost GHG-free electricity production
- Almost fossil-free heat production
- Low CO_2 emissions per capita
- Energy intensive industry
- High export dependency



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Energy policy targets for Sweden

50 per cent more efficient use of energy in 2030, compared with 2005

70 per cent less emissions from transports 2030 compared with 2010

100 per cent renewable electricity to 2040

No net emissions of greenhouse gases to 2045

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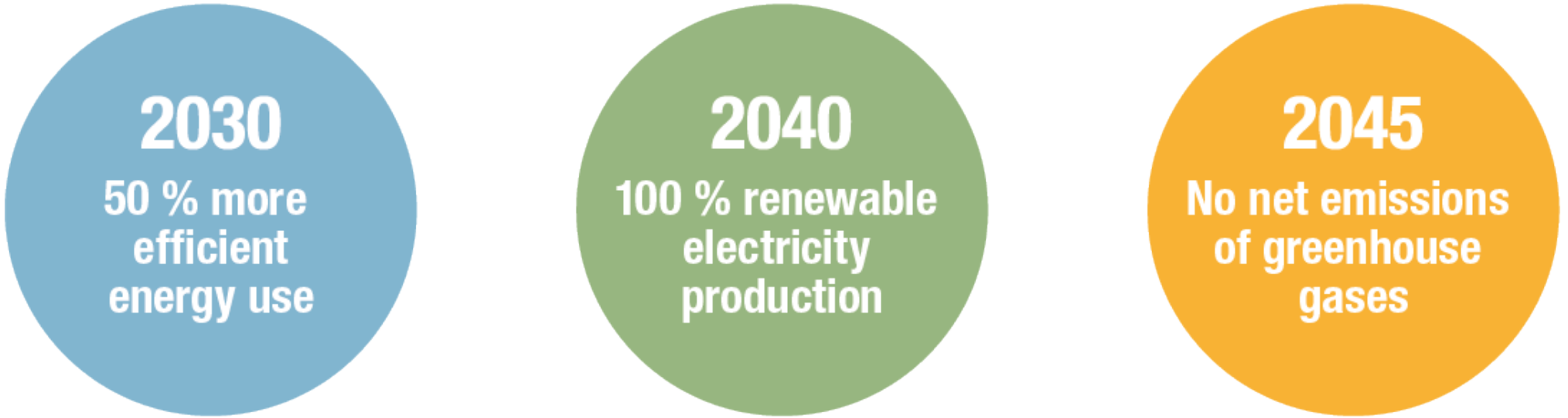
A significant leap forward is needed for the climate

Sweden shall be the world's first fossil-free welfare state



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A wide range of R&I tools

- Basic research
- Applied research
- Pilots and demonstrations
- Business development
- Dissemination and market development
- Plus continuous feedback and development

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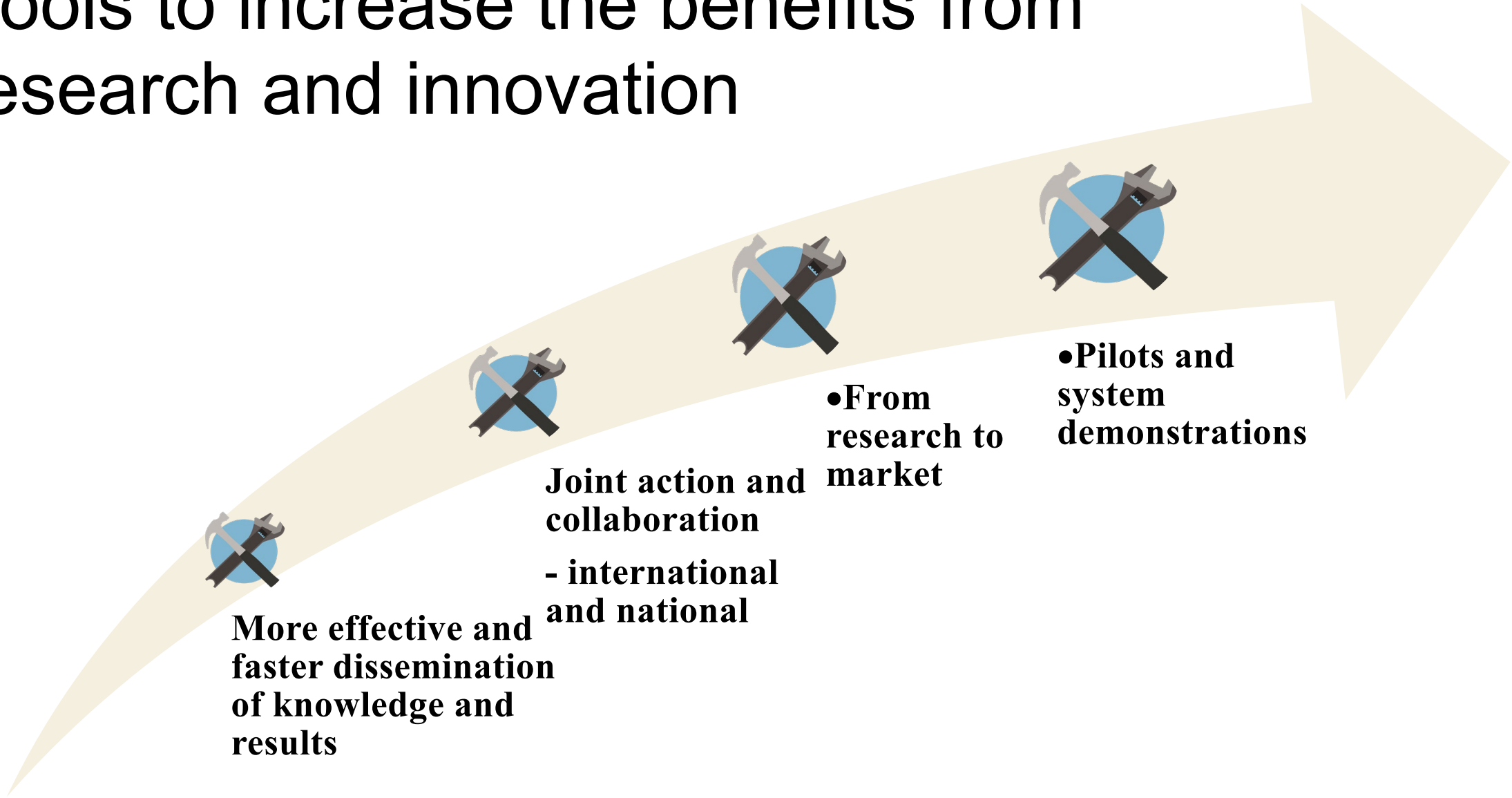
Tools to increase the benefits from research and innovation



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Electric truck success despite Arctic cold

Manager: Boliden Mineral AB
Website: www.boliden.com
Other participants: ABB, Eitech, Caterpillar, Pon Equipment, Chalmers
Support from the Swedish Energy Agency: Funding for research
Contributes to: The goal of net zero greenhouse gas emissions by 2045.

Important results

- ✓ Reduced greenhouse gas emissions: Maximum line expansion in Aitik is expected to reduce diesel consumption by 30-50 per cent for the mine.
- ✓ Increased productivity: the truck travels the 700-metre section 70 seconds faster per trip compared to a conventional mine truck.
- ✓ Better work environment: Reduced emissions in a difficult-to-ventilate environment
- ✓ Major international interest, with many enquiries about the project from other parts of the world.

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Lignin, a residual product ready for new application areas

Implementer: RISE, Chalmers, KTH, Valmet and SCA.
Support from the Swedish Energy Agency: Funding for research
Contributes to: The goal of 50 per cent more efficient energy use by 2030.

Important results

- ✓ The research has resulted in new companies, business models and led the forestry and chemical industries to initiate new collaborations.
- ✓ Sweden has become a world leader in the separation process of lignin from black liquor.
- ✓ Lignin can be used to produce a variety of bio-based plastics and lightweight materials, such as carbon fibre, for example.

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Bioenergy research puts Sweden on the map

Implementer: Universities, colleges and institutes
Support from the Swedish Energy Agency: Funding for research
Contributes to: The goal of net zero greenhouse gas emissions by 2045.

Important results

- ✓ Thanks to the investment in research, Swedish forestry is considered to be sustainable by other countries.
- ✓ The support has led to knowledge of work methods and methods for collecting branches and tops from the forest.
- ✓ The EU and other international bodies and researchers have reconsidered the impacts of bioenergy.

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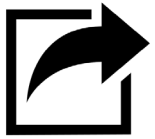
Conclusions

- Future energy system evolved by a combination of political policy decisions and innovations in technology, services and business models.
- Customer behaviour and acceptance critical
- National energy system is a part of a macroregion
- Innovations need to be implemented internationally to reach economical feasibility and contribute to global goals.



Collaborations between many stakeholders both nationally and internationally increasingly important to ensure successful implementation of new solutions.

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Tack!

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