



Energy in Sweden today and 2050

- A. Energy policies and strategies of Sweden**
- B. The Swedish Energy Agency**
- C. A vision for 2050**

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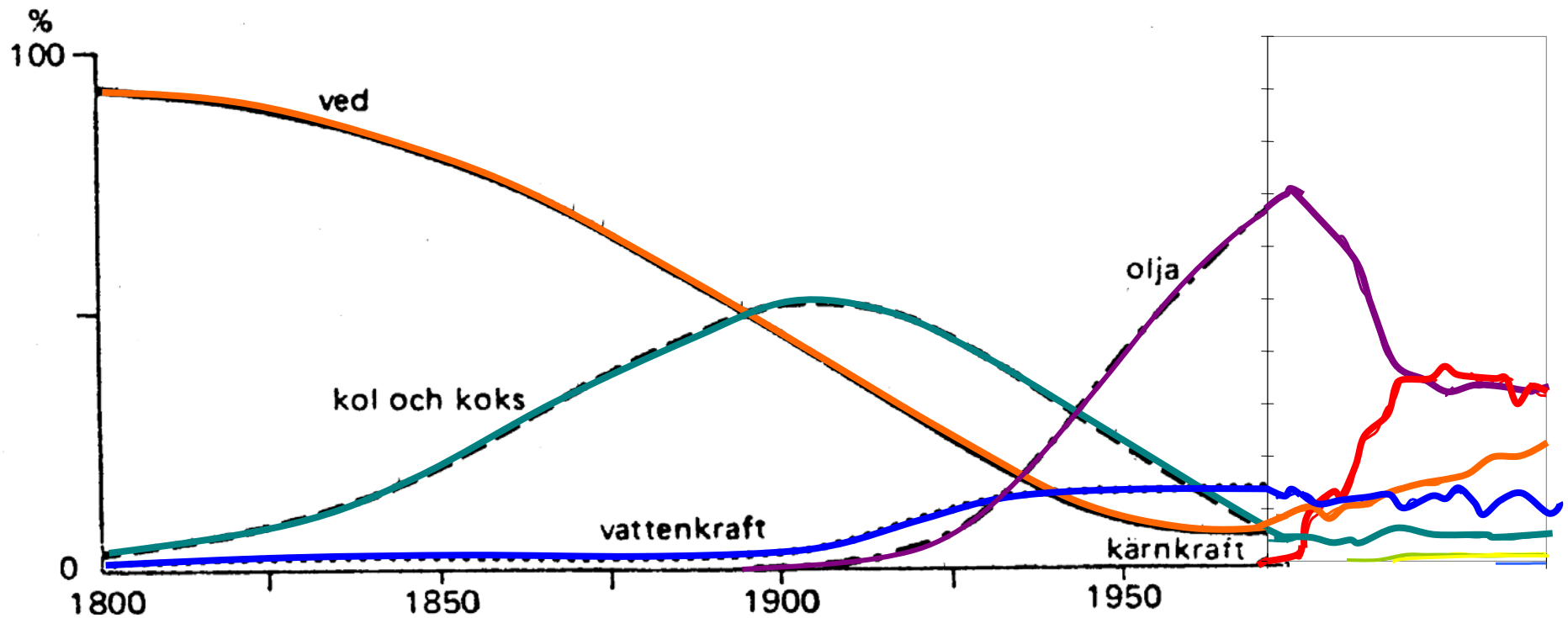
Director General



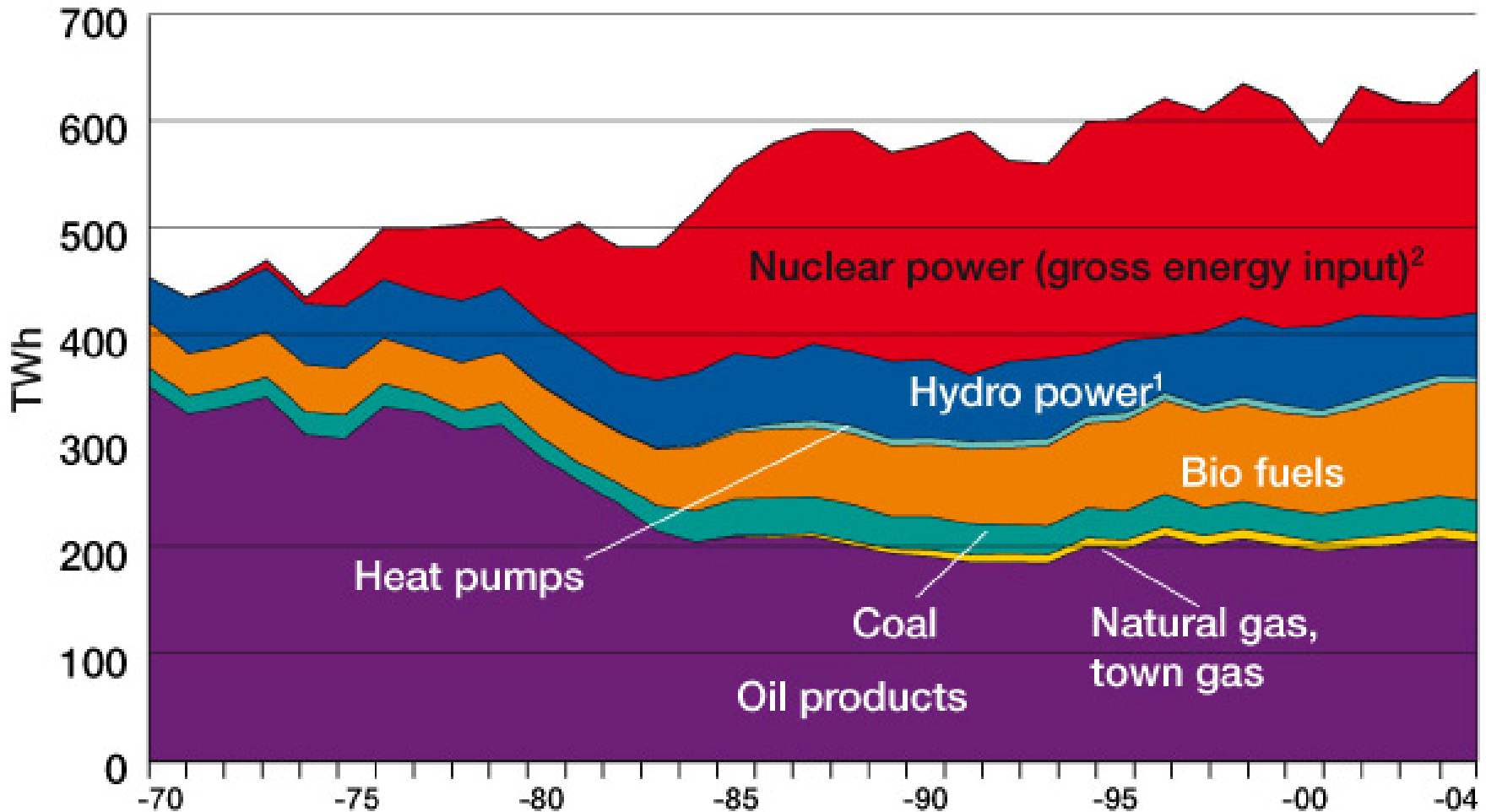
A. Energy policies and strategies of Sweden

1. Energy supply
2. Energy objectives
3. Policies and measures

Relative Energy Supply 1800-2000



Current energy supply





Target: efficient energy markets

- Electricity market is already fully competitive
- Natural gas market will open successively



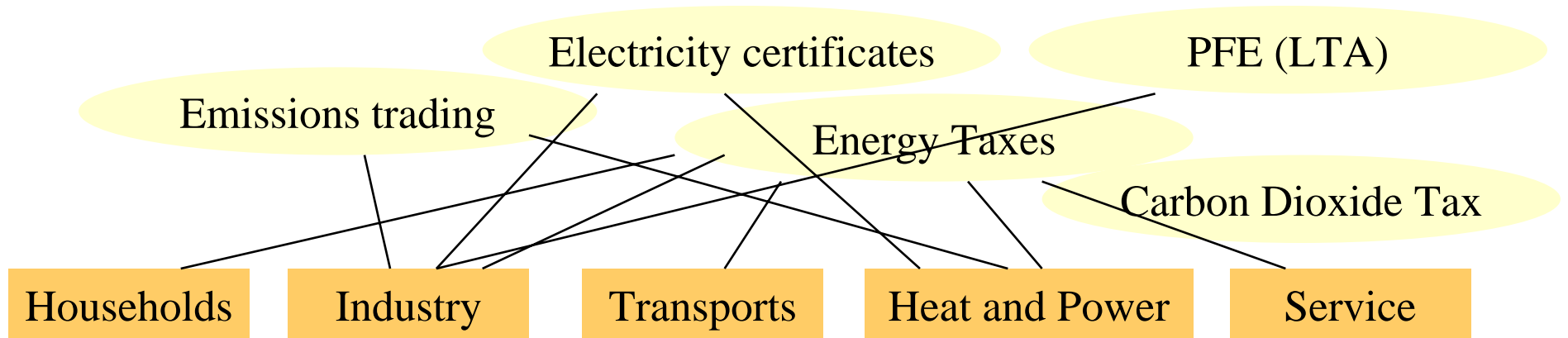
Target: a sustainable energy system

- 1980: Phase out nuclear power
- 2005: Phase out dependence on oil by 2020

Policies and measures - examples

- Economic instruments
 - Taxation, notably Carbon tax
 - Electricity Certificates
 - Emissions trading
 - Program for improving energy efficiency in energy intensive industry (PFE)
- Research, development, demonstration, dissemination
- Information
- International cooperation

The challenge of Economic instruments within Swedish energy policy





Swedish Energy Research - Focus areas

- Buildings as energy systems
- Energy intensive industry
- Transport sector
- Electricity generation and distribution
- Bioenergy including CHP
(Combined Heat & Power)
- Energy system studies



Challenges for technological development and commercialization

- **General challenge:**
 - Commercialization
- **Some strategic target areas:**
 - Renewable energy resources
 - Energy efficient vehicles
 - Motor bio-fuels

Three strategic development plants



Synthesis gas from biomass



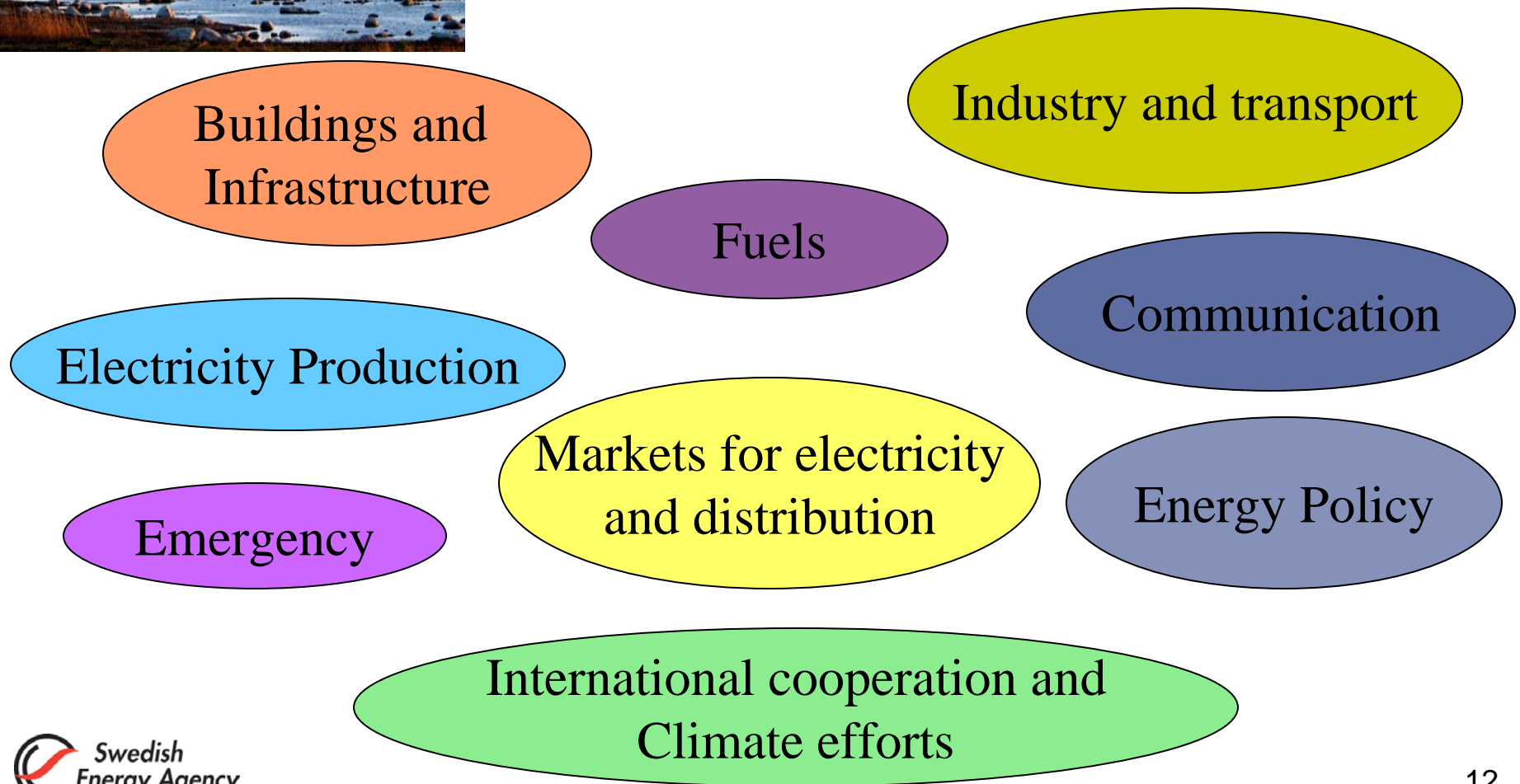
Ethanol from cellulose



Synthesis gas from black liquor



B. The Swedish Energy Agency





C. Vision for 2050

Why do we need vision?

- Energy systems have long lives
 - Technology diffuses slowly into commercial products
 - But society in general changes faster and faster
- We must study possible futures!

- **Why 2050?** – It is far enough!



The vision is an internal project

- Workshops with staff
- Interviews with heads of divisions etc.
- Draft report being discussed among heads of divisions etc.
- Final report accepted by the Director General



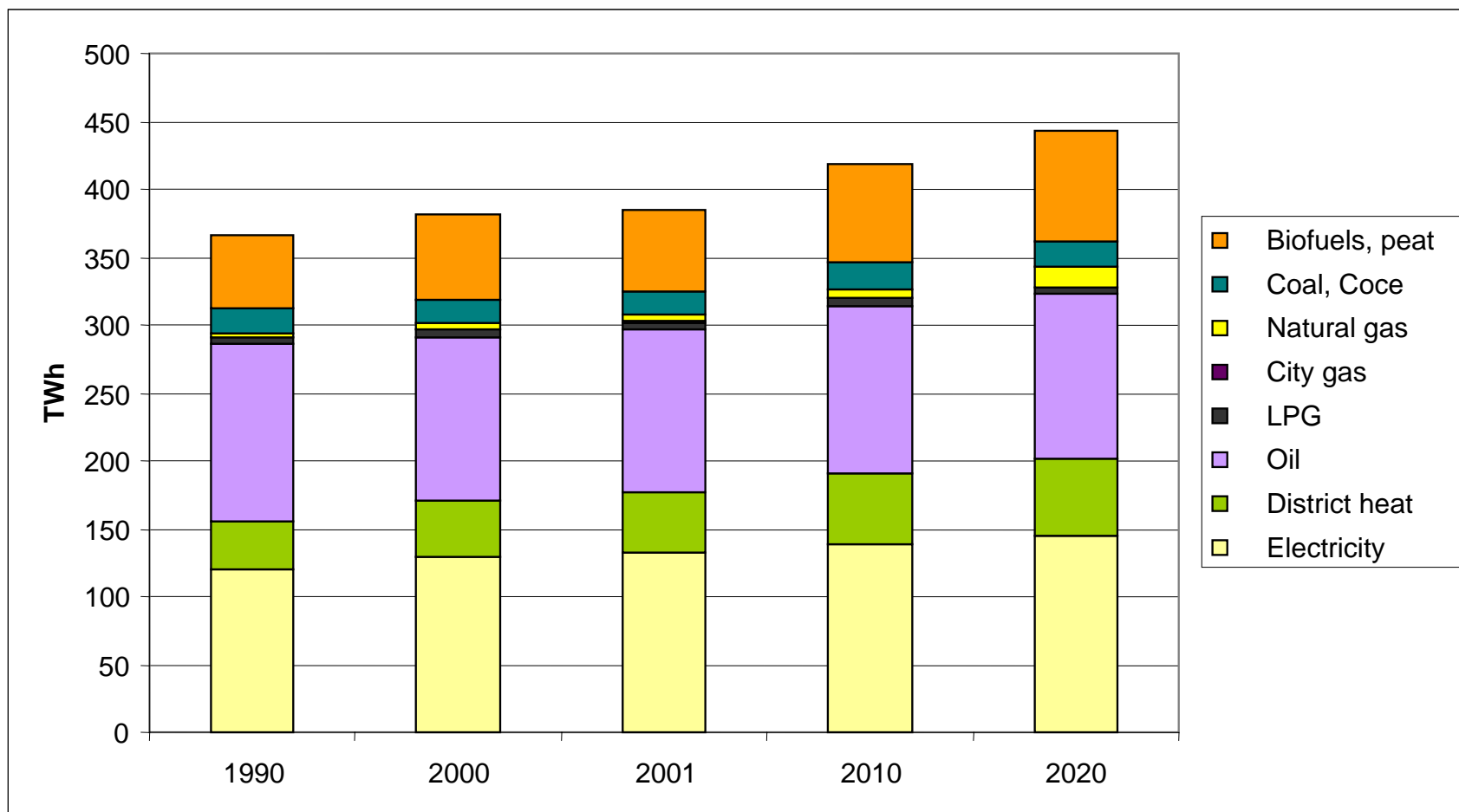
The major challenges

- Increased competition for energy resources
- Climate impact from energy sector
- Internationalisation of energy policy
- Properly functioning energy markets
- Various political targets; complex set of incentives

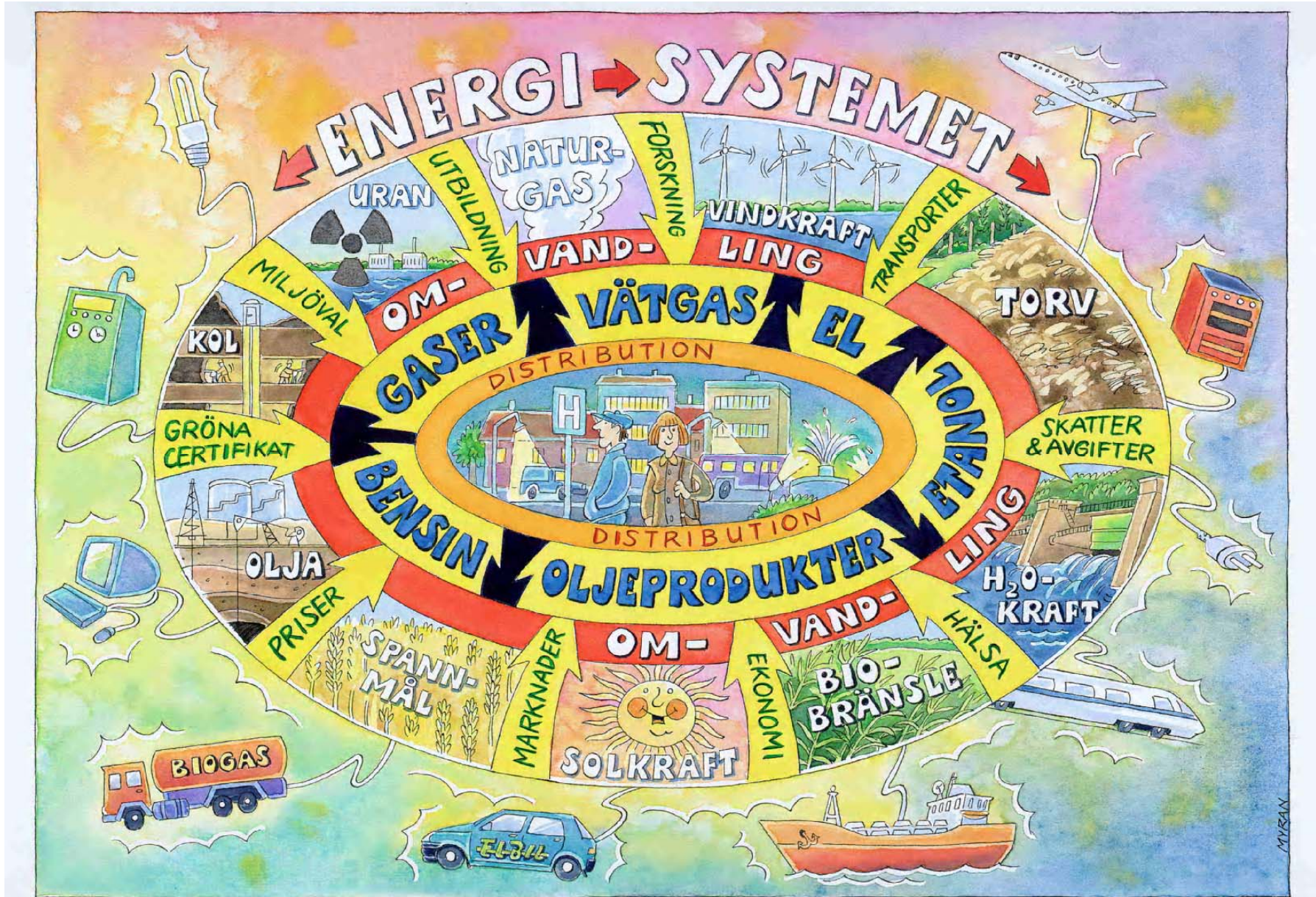
The major challenges

Energy demand, forecast 2020

(Business as usual)



The vision



The vision in brief

Industry: less energy dependent



Vision in brief

Buildings: almost self-supporting



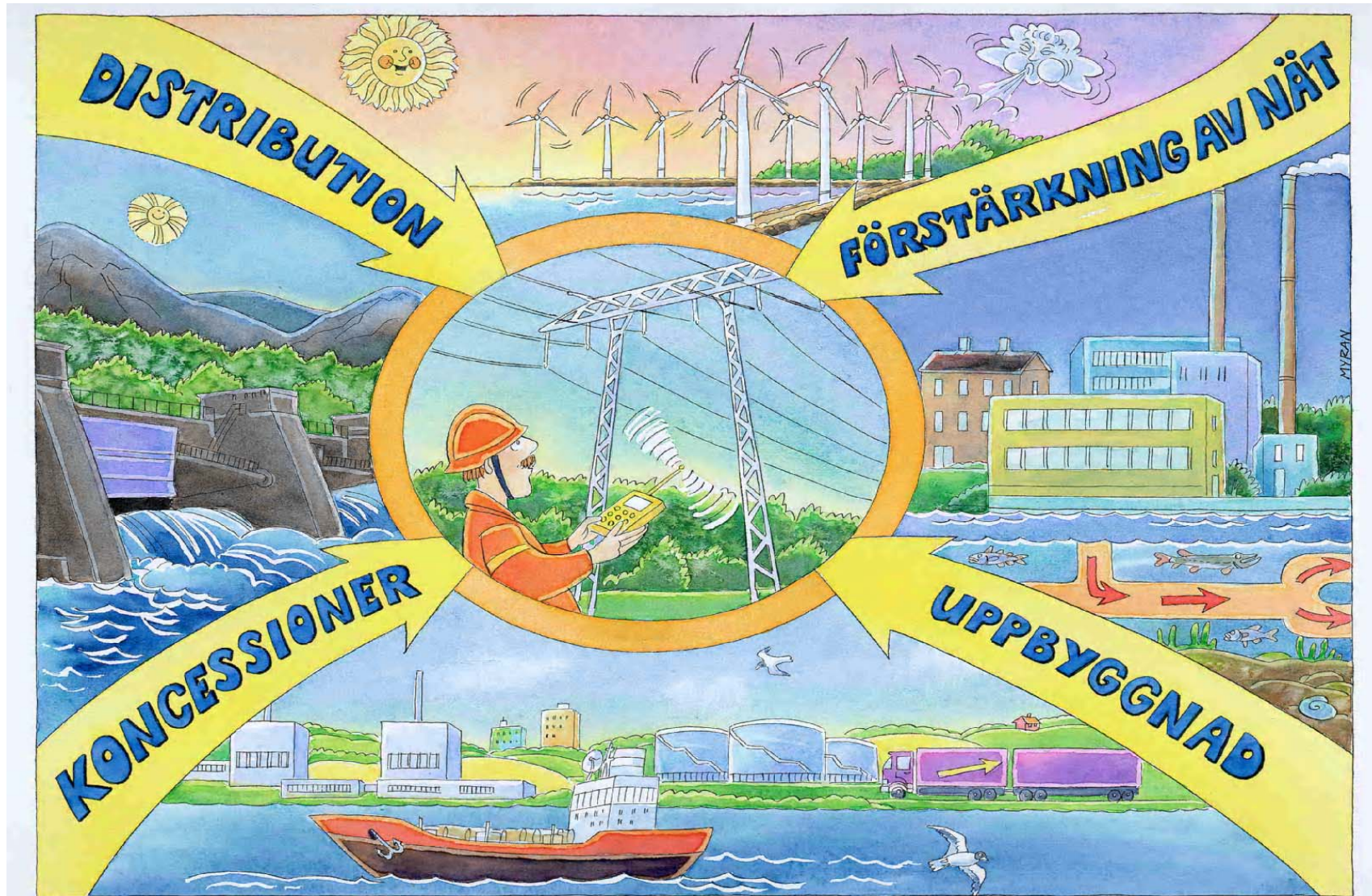
Vision in brief

Transportation: resource-efficient and flexible



Vision in brief

Heat & electricity: End use does not increase – production diversified



Critical factors

The road to the future

Challenges:

- Electricity supply for energy intensive industry
- Sustainable mobility
- Low energy municipal sector

Critical factors:

- Utilise research results
- Ambitious and realistic programmes for
 - Energy efficiency
 - Renewable energy

Long time perspective
Holistic perspective
Co-operation



**Thank You
for your attention!**