



**Regions as key actors for
achieving the national RES
targets**

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The presentation

- **The Regional Climate Strategy**
- **The challenges**
- **Energy systemic approach**
- **Bioenergy promotion in the region**
- **The role of the region**
- **The future post carbon energy system**

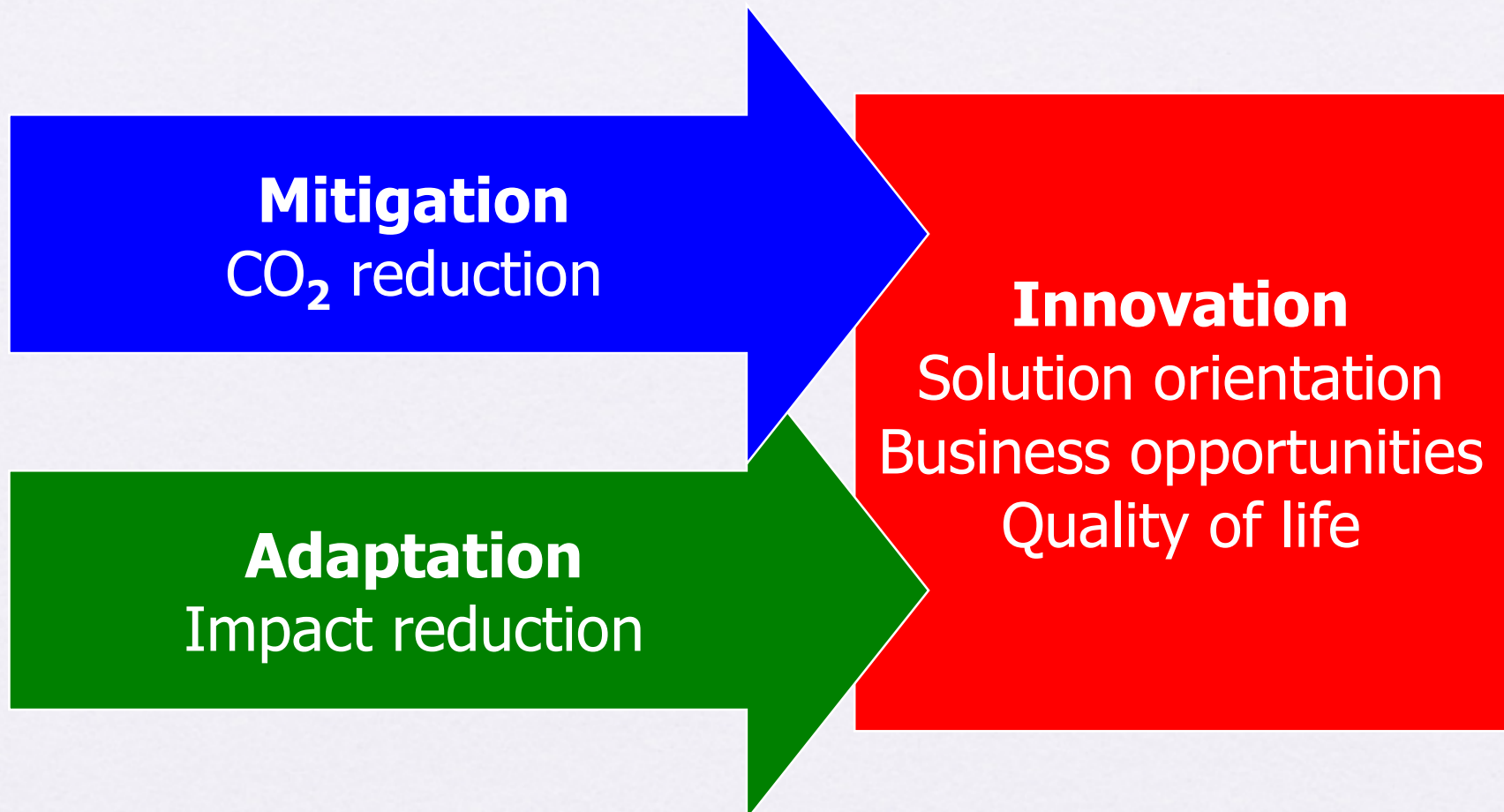
The Regional Climate Strategy

Development of the strategy

- **One region and 17 municipalities**
- **Screening of all climate actions by regional and local government**
- **Multi-stakeholder involvement**
- **9 thematic workshops with regional actors and experts - based on a triple helix approach**
- **Two local government workshops**
- **Conference with high level decision-makers**

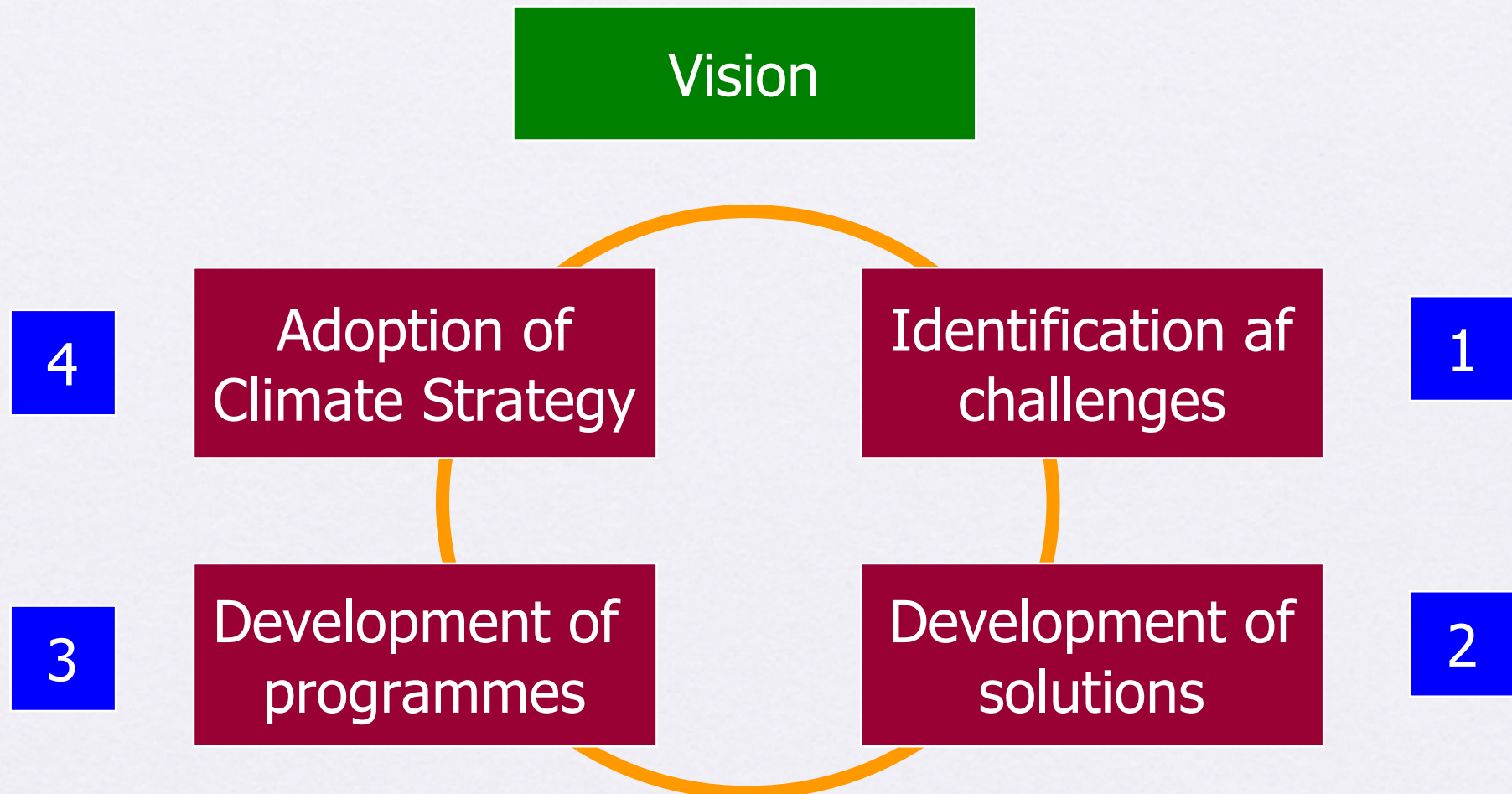


The principles in the strategy
Mitigation - Adaptation - Innovation



The regional climate strategy

The work process — June 2008 - June 2009



8 Action Programmes

Mitigation - adaptation - innovation

- Regional energy system
- Agriculture
- Industry and technology
- Transport
- Towns and buildings
- Open land
- Health care and emergency management
- Regional and municipal organizations



The Regional Energy System

Objectives

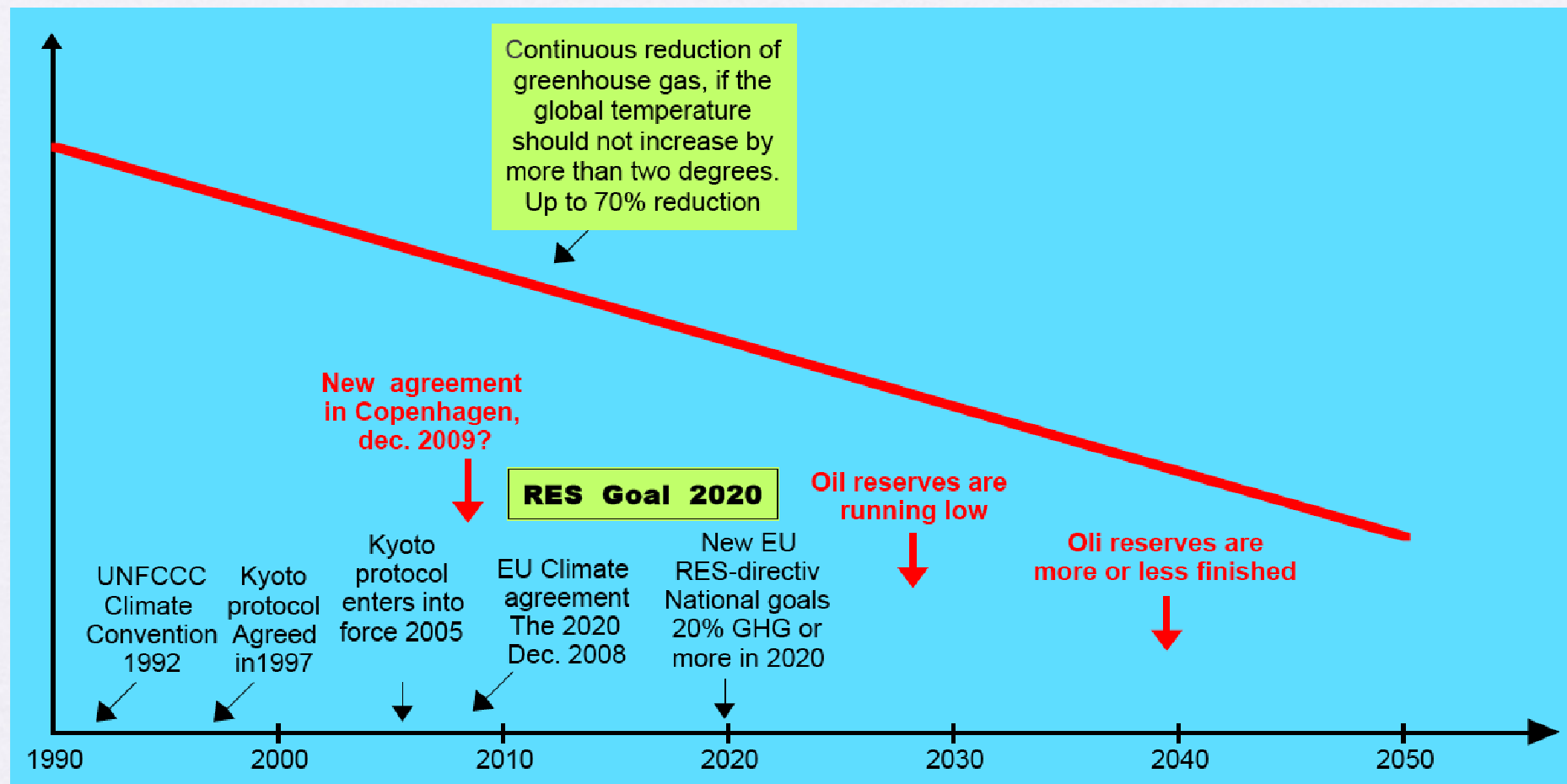
- To convert the regional energy system gradually to use of renewable energy.
- To promote more effective use of energy.

Fields of action

- Utilizing the potential for biomass in the region.
- Continued utilization of the region's wind power potential.
- Disseminating and integrating new types of renewable energy facilities.
- Saving energy in households, institutions, commercial and service organizations as well as in industry.
- Preparing heat and energy plans.

The challenges

- Regional Climate strategy - reduction of greenhouse gasses
- Regional energy supply - reduction of the use of fossil energy



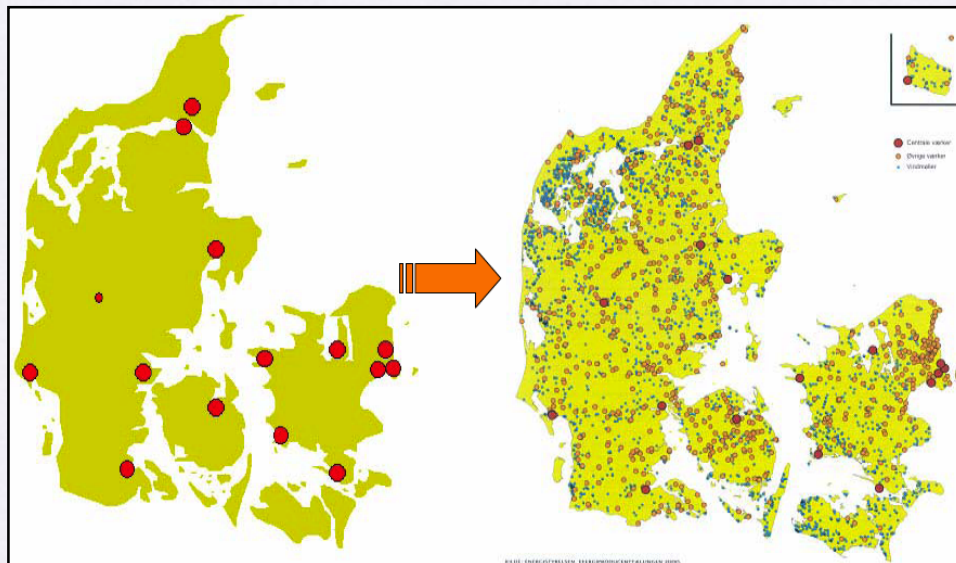
More RES as a solution

More renewable energy - EU RES-directive

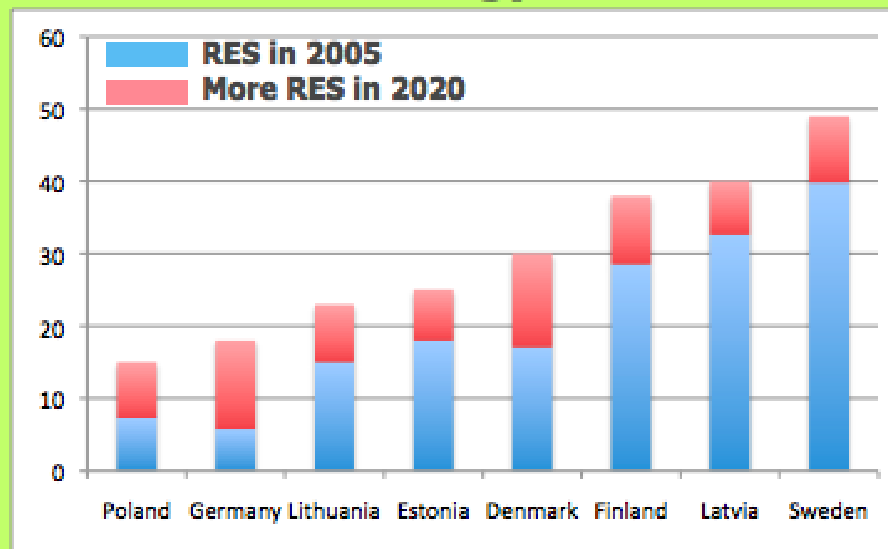
- New energy structure - localized energy system
- Better use of existing resources and technologies
- Innovation - less and less carbon

RES in 2020

Poland: 15%
Germany: 18%
Lithuania: 23%
Estonia: 25%
Denmark: 30%
Finland: 38%
Latvia: 40%
Sweden: 49%



More renewable energy from 2005-2020



Energy system approach

The whole production chain:

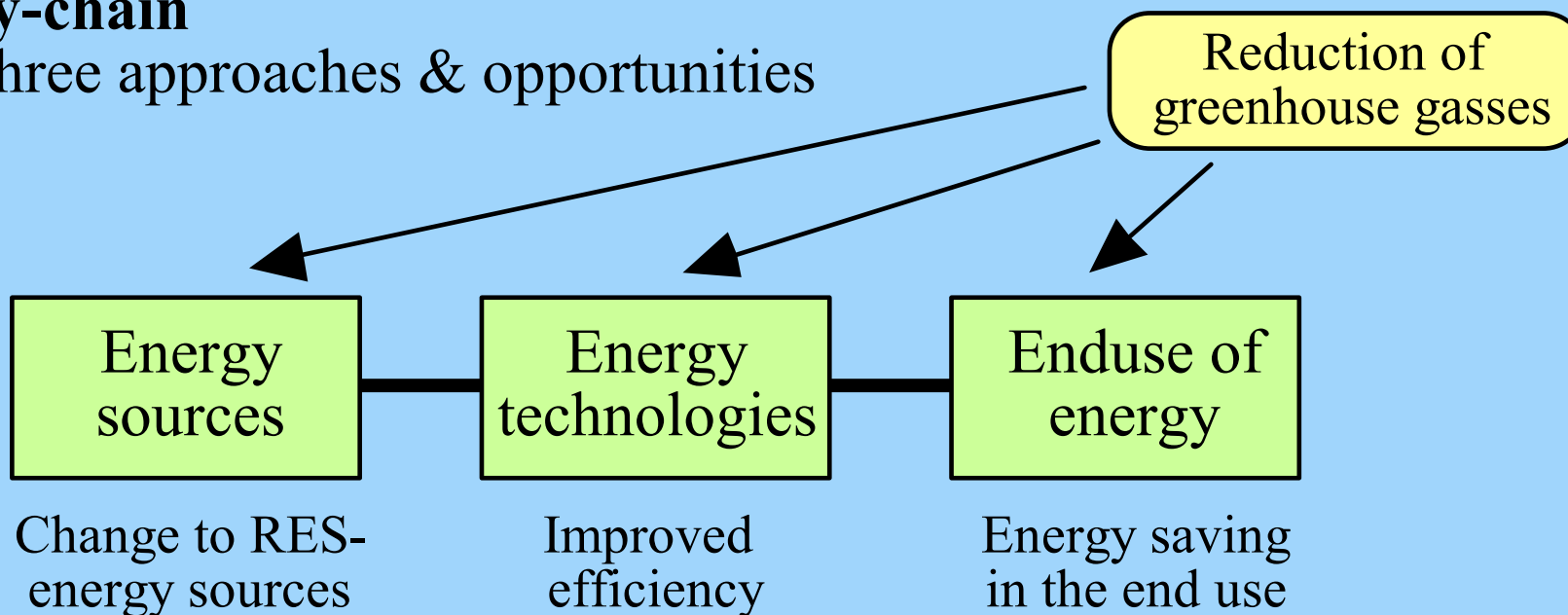


Three approaches:

- (1) change of sources: RES
- (2) more efficient and carbon efficient conversion
- (3) savings in end-use

Energy-chain

- The three approaches & opportunities



Perspective for 2020

The whole country

Three main elements:

- **30% RES in 2020 (in 12 years)**
- **10% biofuel in 2020**
- **Savings (net) on 4%**

Or:

- **Increase of RES with 82 PJ**
Equals around 120 PJ input
- **Whereof up to 9,5 PJ biofuel**

Potentials (input):

- **Wind, the last 12 years increased with 22 PJ - maybe 30 PJ more?**
- **Biomass: increase on around 90 PJ. Mainly from agriculture**

The regional part of this expansion:

- **The region: 18% of the national area - equals 16-17 PJ more**
- **Mix-production - integrated production system**

ENERGY	2007	2020
Total energy - output:	685 PJ	658 PJ
• RES share	17%	30%
• RES in all	116 PJ	198 PJ
• Increase	-	82 PJ
Biofuel		
• Consumption	0,3 PJ	9,5 PJ
RES share - input:		
- Wind power	26 PJ	? PJ
- Biomass	90 PJ	? PJ
- Biogas	4 PJ	? PJ
- Biofuel	4 PJ	? PJ
- Other	6 PJ	? PJ

The biomass potentials in the region

Actual potentials - In tons - converted to equal solid content (65%)

Potential biomass (unused):

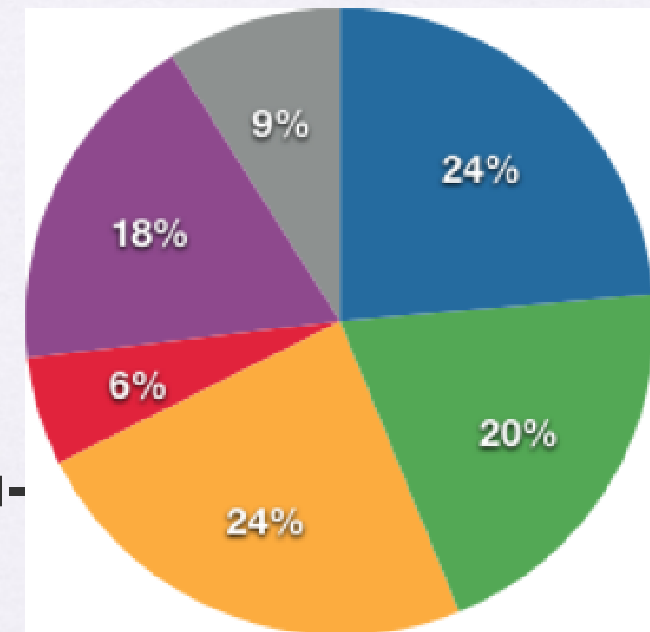
- Total around 1,8 mill. tons

Most important:

- Agriculture, straw (420.000 tons)**
- Forestry & wood industry (360.000 tons)**
- Residue sugar industry (420.000 tons)**
- Industrial waste - mainly from food industry (320.000 tons)**

Three main technologies

- combustion**
- fermentation - biogas**
- thermo-chemical (pyrolysis)**



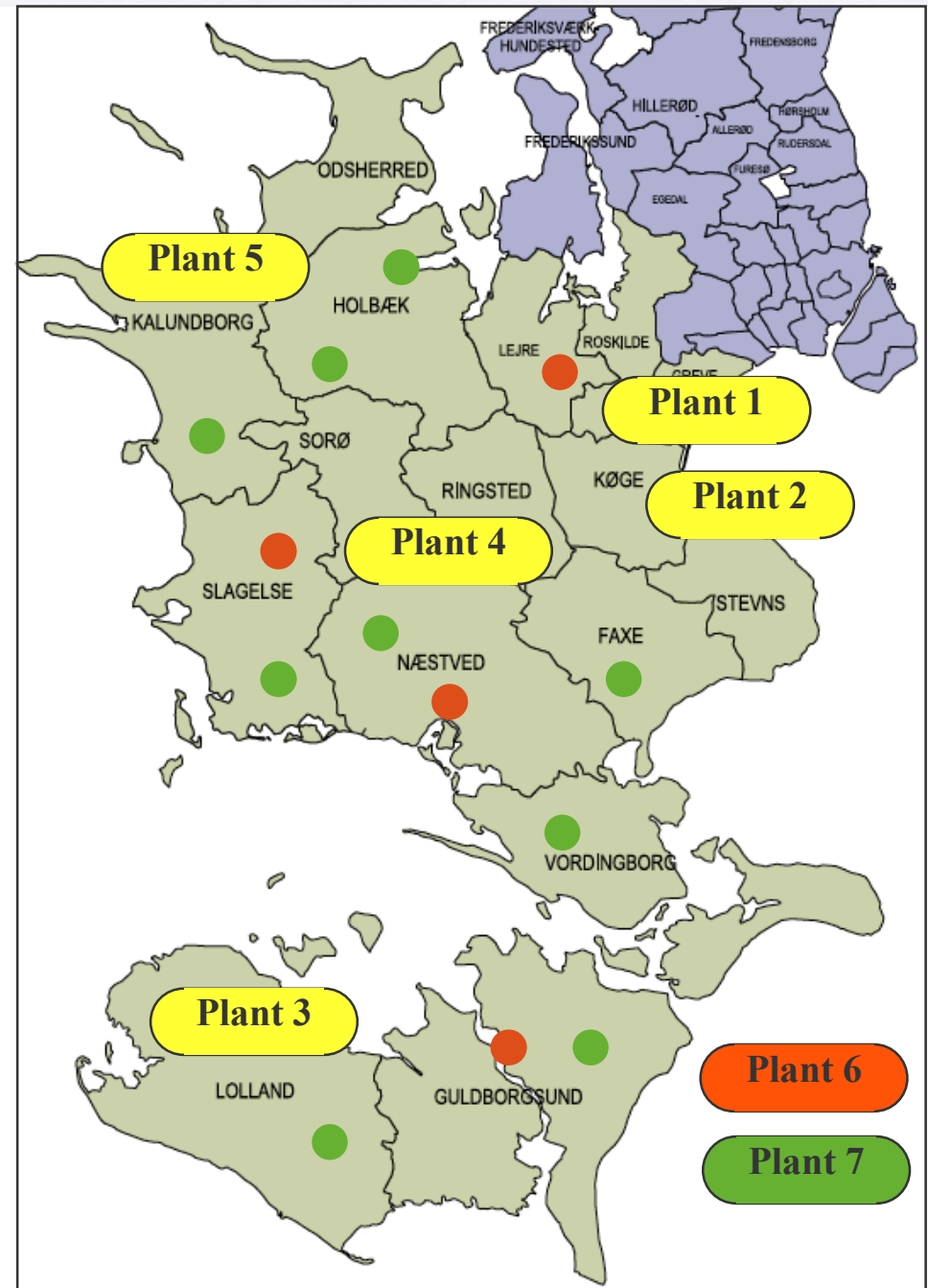
- Agriculture, straw**
- Forestry & wood industry**
- Residue Sugar industry**
- Agriculture other**
- Industrial waste**
- Waste unused potential**

Pilot & Demo projects

Location of the seven pilot- & demonstration projects in the region:

1. Biogas in Solrød area
2. Biodiesel - FT-biodiesel in Køge
3. Biodiesel - FT-biodiesel on Lolland
4. Biogas in Ringsted
5. Biogas in Kalundborg
6. Opgrading of waste incineration plants - four plants
7. Development of energy producing farms - a number of energy farms

- Exploitation of 1-2 mill. tons more than today



The role of the region

Four main elements



Strategy:

- **Development of the climate strategy, including development of the regional energy system → renewable energy → biomass**

Enabling innovation:

- **Facilitation of innovative actions → regional programmes and project funding on biomass potentials and RE-systems**

Regional business development:

- **Support for projects - feasibility study, development of pilot and demonstration plants, investment to support business development - priorities 2010 a.o:**

Climate, renewable energy, sustainable buildings

Public-private partnership:

- **Regional networking, f.x. Biofuel Cluster Denmark, Green Centre (agricultural innovation). Joint companies between municipalities, utilities and industrial companies, triple-helix / quadruple helix**

The role of the region

The Valley of Death

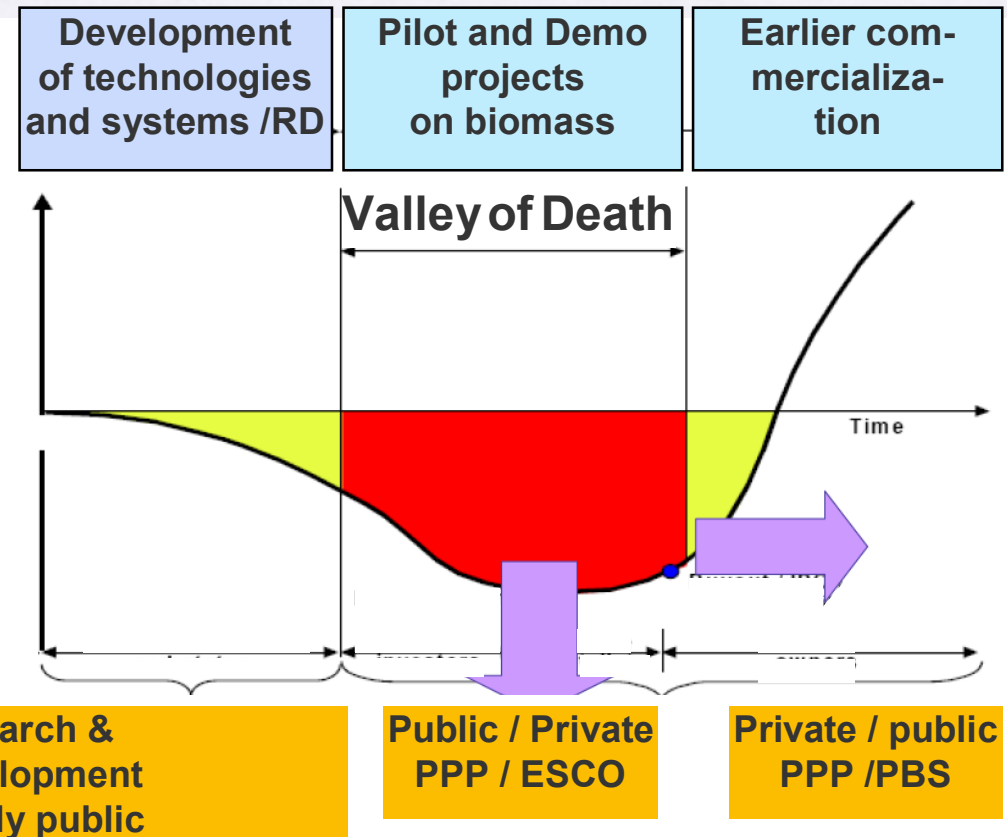
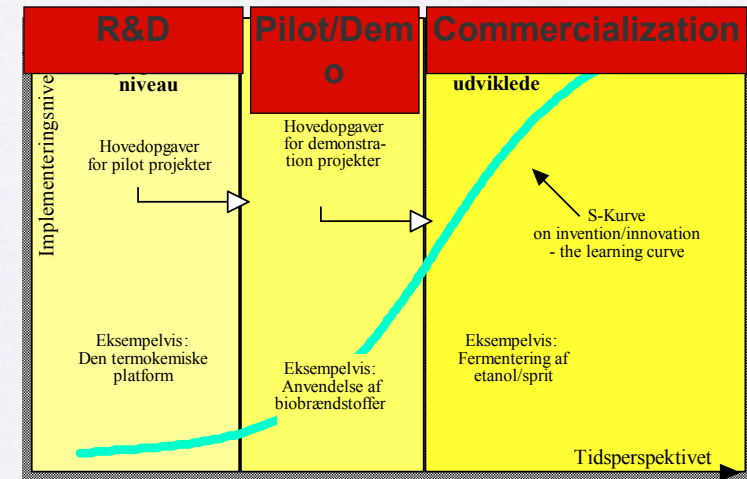
The function of the four elements:

- **Strategy**
- **Enabling innovation**
- **Financial support (as seed money -> regional business development)**
- **Public - private partnership**



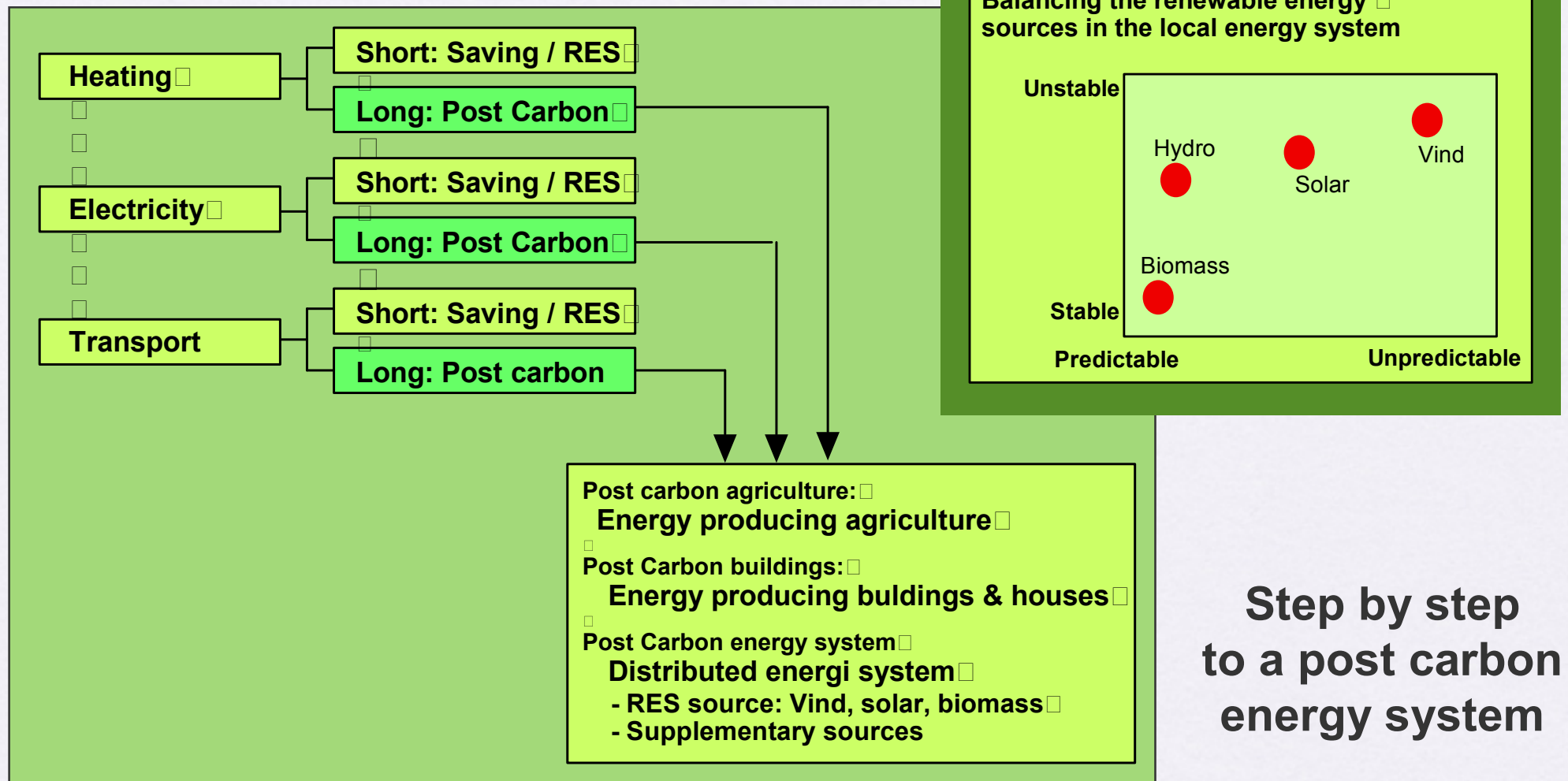
Crossing the Valley of Death:

- **through support**
- **creation of partnerships**
- **reduction of costs and risks**
- **through a systemic approach**
- **through integrated solutions**

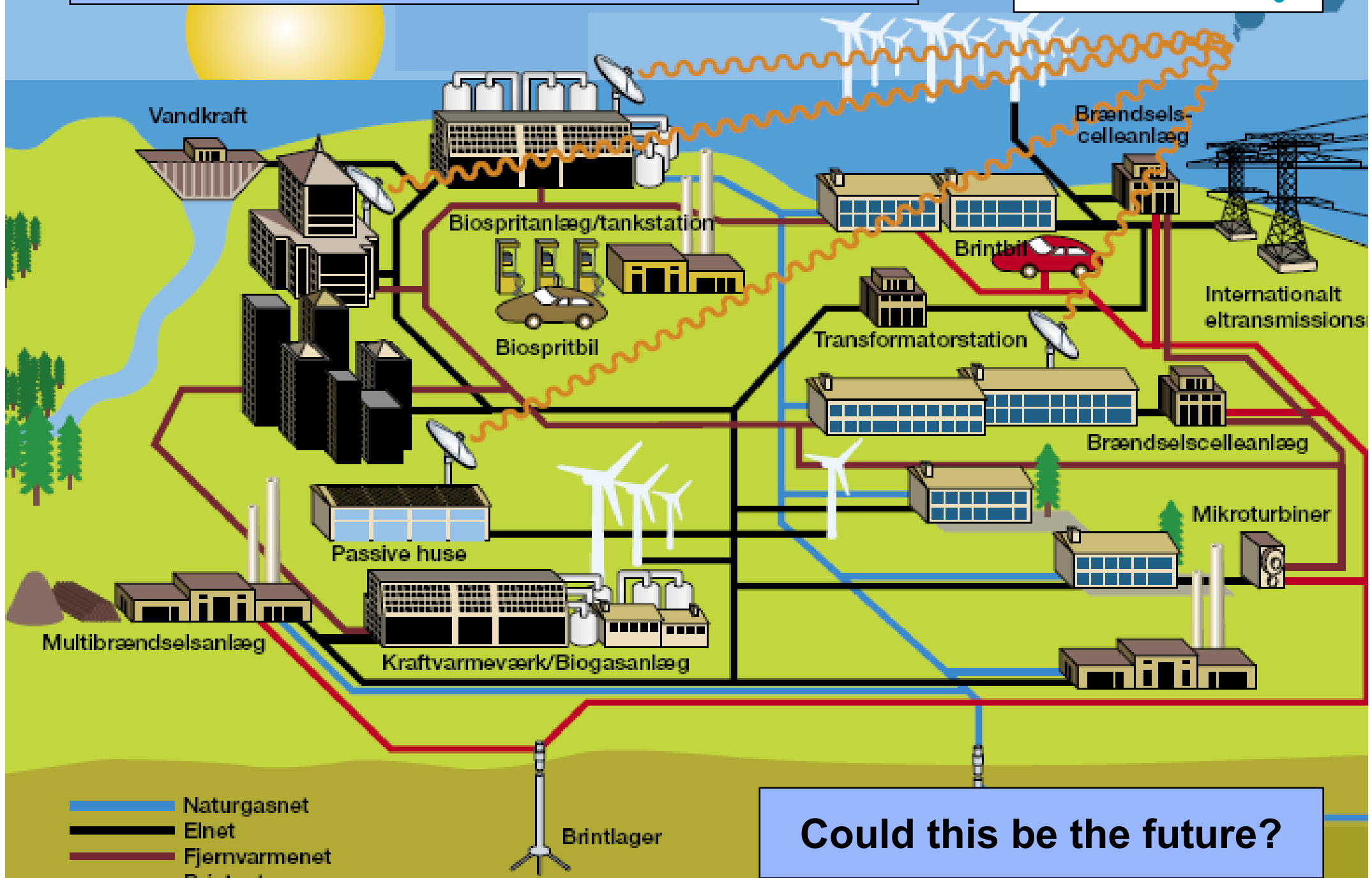


Sustainable and innovative energy systems

Short and long term efforts and solutions



The distributed energy system



Could this be the future?