Fundamental questions of Renewable Energy Self-Sufficiency (RESS):

Limits to growth, threats to sustainability and who makes the decisions?

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Overview

- **Energy Self-Sufficiency - Yes, but on which scale?**
  - Different conditions and links between local, regional, national and international level
- **Limits to growth imposed by sustainable use?**
  - Energy self-sufficiency in a broader context
  - Limiting factors of further expansion of bioenergy
  - From local to global – how are levels related to each other?
- **Who decides what?**
  - A policy framework for RESS
  - How to divide responsibilities?

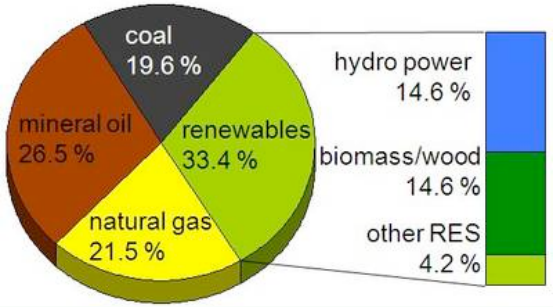
RESS on local scale - two examples

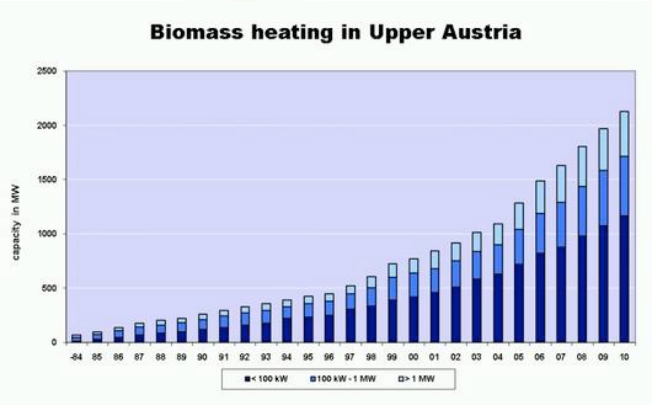
- The **village Wildpoldsried (Bavaria, Germany)** produces 321 percent more energy than it needs and is generating 4 million Euro in annual revenue
- The **island Samsö (Denmark)** produces more electricity from wind than it needs and implemented a broad energy concept funded by the Danish government

- **Important success factors:** Long-term engagement, team spirit, economic benefits for people involved, making use of local potentials, initial funding/financial incentives

RESS on regional scale – The case of Upper Austria

- Highly industrialised region in the Northern part of Austria with 1.4 mio inhabitants
- Ambitious policy targets on renewable energies and energy efficiency, e.g.:
  - by 2030, 100 % of its space heat and electricity demand from renewable energy sources
  - "Energy Efficiency Programme" achieving a 1 % annual energy saving in the region every year.
- Numerous programmes and projects are implemented to meet these targets, including information, financial and legal measures
- **Success factors**: All relevant stakeholders involved, diversity of strategies/instruments





Source: O.Ö. Energiesparverband

RESS on national scale – Germany

Political targets – Energy strategy 2050

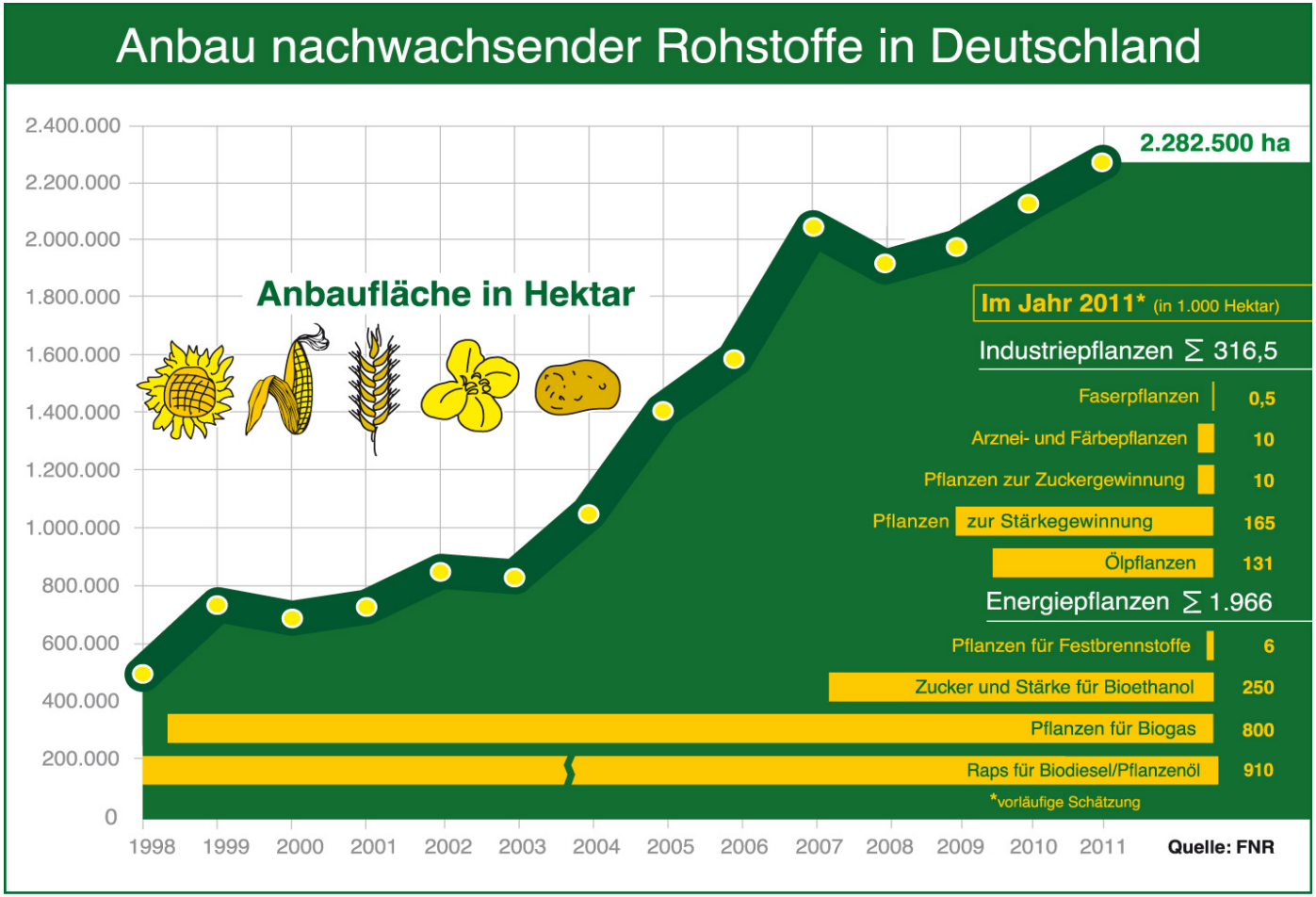
- **Goal:** Germany, most energy efficient and climate friendly economy with competitive energy prices and high prosperity level at the same time
- longterm strategy until 2050 for transformation of energy supply towards a sustainable energy economy
  - **renewable energy** as a key towards sustainability
  - **energy efficiency**, halving primary energy consumption
  - reorganization of **grid infrastructure** (power, gas)
  - energetic **building refurbishment**
  - sustainable **mobility**
  - binding policy targets, agreement on **financing concept** …

National targets for 2020 (a selection):

- CO_2-emission reduction of 40% (compared to 1990)
- share of renewable energies in different energy sectors:
  - 35% in electricity sector („at least“)
  - 14% in heat sector
  - 10% biofuels
- CHP share within electricity sector at least 25%

National targets for 2050:

- CO_2-emission reduction up to 80 – 95%
- consequences: power generation almost entirely by RES necessary



- 2010: Biomass for energy and industrial purposes on 18 % of arable land in Germany
- Estimates: 2.5 to 4 Mio ha available in 2020 (and in 2050?)

EU Biofuels Policy: On the right track?

- 10 % target will stimulate **increase in biofuel production** in EU to 24.3 Mtoe in 2020 (72 % Biodiesel, 28 % Ethanol), additional 15 Mtoe compared to 2008
- Demand will be met by **significant imports: 50 % of bioethanol and 41 % of biodiesel**
- Rough estimate: EU needs **17.5 Mio ha of land outside Europe** (more than half of Italy) to meet 10% target
- Additional demand will lead **to 4.1 to 6.9 million ha indirect land use** change (larger then Belgium)

(Source: IEEP 2010 and others)

Three provocative questions

- Are RESS villages, communities and regions also self-sufficient in food, materials and other resources?
- If not, where do they get these resources from and what are the impacts on the land used and the people living in these areas?
  - Substitution effects
  - Land competition
  - Indirect land use change
- What is RESS worth under these circumstances?

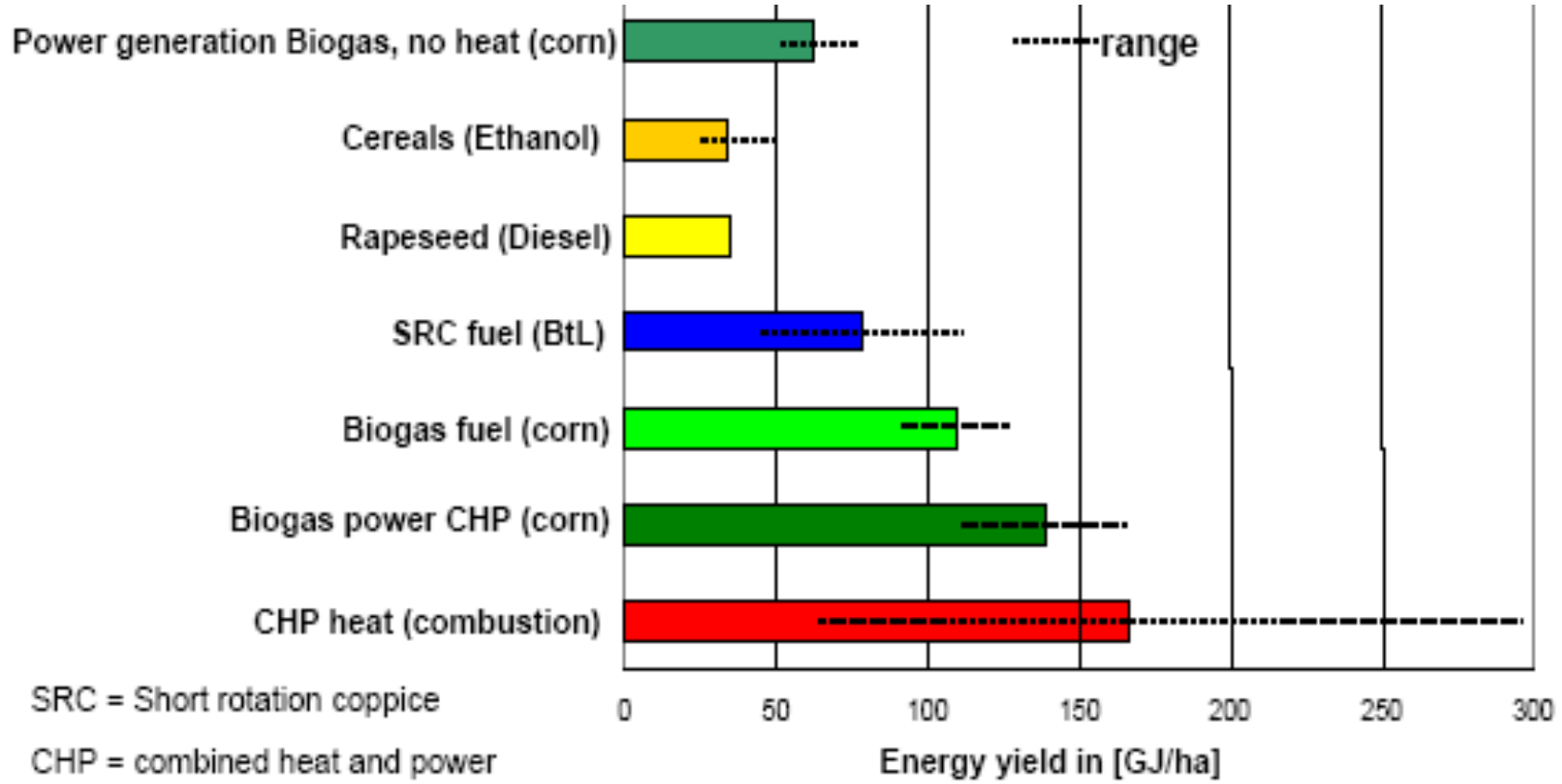
Is bioenergy sustainable?

- Deforestation
- Intensification of land use
- Doubts on GHG emission savings
- Food crisis/ Food prices
- Violation of human rights

Foto: Klemens Karkow

Foto: Marcel Silvius

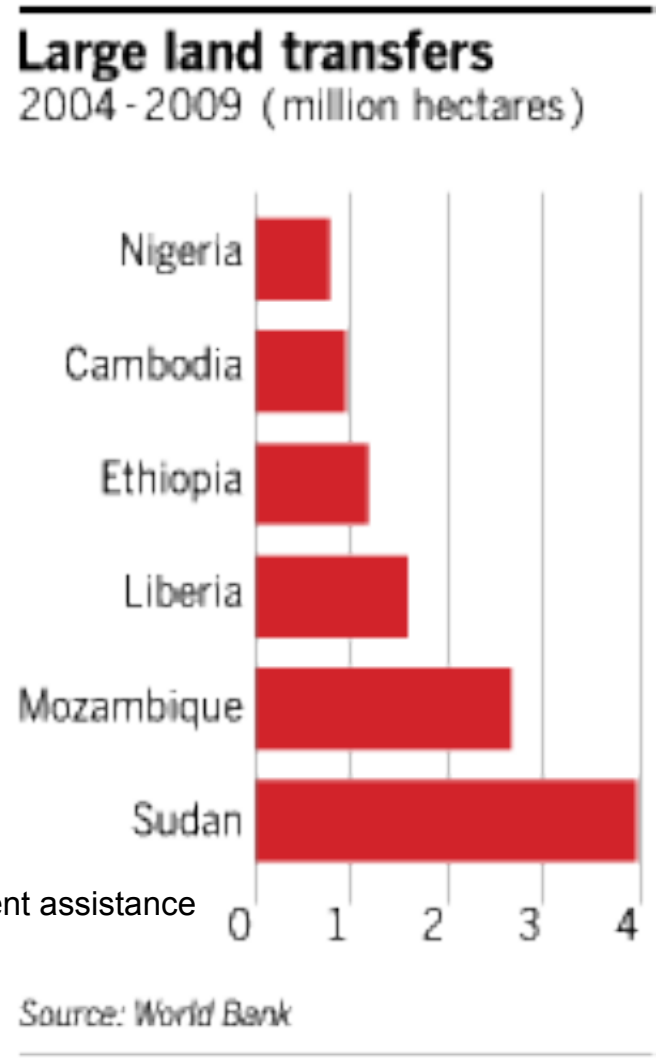
"Energy Yield" from different bioenergy technologies



Source: SRU 2007

Land Grabbing

- Land Grabbing = Large-scale land akquistion
- Foreign investors (private and governmental)
- 15 – 50 millionen ha land in Africa und Asia since 2006
- Arable land in the EU: 97 millionen ha
- Three underlying causes:
  - Expansion of energy crops
  - Food crisis
  - Land speculation
- **E.g. Ethiopia:**
  - one of the world's largest recipients of humanitarian food and development assistance
  - Government offered more than 3 Mio ha of virgin land
  - Besides food crops, palm and sugarcane will be grown
  - Forests are burned, thousands of people are relocated



Questions of a sustainable biomass use in an international perspective

- What and where are the limits of biomass use within a framework of ‘strong sustainablility’?
- How is European land use related to land use in other parts of the world?
- What are societal consequences of limiting biomass supply from other parts of the world?
- How should biomass be used under supply constraints

Some possible principles

- RESS has to focus on **availability of own (land and biomass) resources**
- **Imports** of biomass are always a second best solution
- No RESS without regulation of energy (food?) **consumption**
- Export regions need to have a ***real* surplus** of land and biomass, people (not countries) have to **benefit from exports**
- Same standards and modes of **participation** in RESS regions have to be established also in exporting regions
- Land users (farmers, foresters, land workers) are the very basis of bioenergy and always have to be represented in decision-making on land use

A policy framework for RESS

- **Energy sovereignty**: Democratisation of energy supply chains, prioritise own resources
- A framework for **energy autonomy** (H. Scheer 2005)
  - Independent availability instead of dependence from external suppliers (→ Local grids, local resources)
  - Political decentralisation instead of globalisation (→ as many decisions on local level as possible)
  - Free investments instead of investment control (→ price premium better than quota regulations)
  - Diversity instead of market harmonisation (→ promote also 'inefficient' installations to ensure wide spread application of RE)
  - Ecological responsibility instead of indifference (→ make intended preference of RE transparent and streamline RE in public investment)

Who decides in the context of RESS? Dividing responsibilities!

- **Policy level** (national, EU, global?): **Setting the framework**
  - setting the framework (legislative, financial); coordinate on international level; take care of sustainability trade-offs; respect diversity of regional conditions
- **Regional level: Adapt framework and motivate people**
  - Create (additional) incentives; raise people's interest and demonstrate benefits; create partnerships and networks; include RESS in spatial planning
- **Communal and local level: Implement RESS in participatory process**
  - Set ambitious goals, moderate exchange of ideas and knowledge
  - Ensure broad participation and leave solutions open to discussion
  - Enhance partnerships
    - Local stakeholders, investors, engineers, SMEs, land users, general public, …

Conclusions

- RESS is **not a mere local concept** within closed borders
- Energy Self-Sufficiency should be extended towards **'Resource Self-Sufficiency'** to broaden the perspective
- Decisions on RESS have to take **side-effects** on sustainability into account, also in other regions
- Implementing RESS combines **actions and responsibilities on various levels**

Thank you!

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