

Industry as prosumer in the new energy system

Renewables play an important role

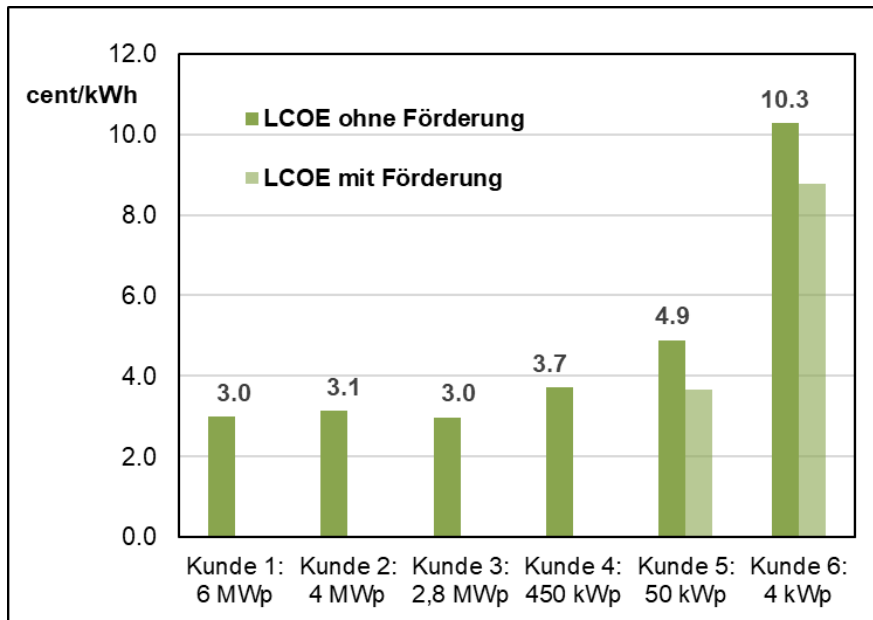
The production of renewable energy at the industrial sites will be necessary, as significant cost reductions can be achieved by using existing infrastructure.

Renewables play an important role

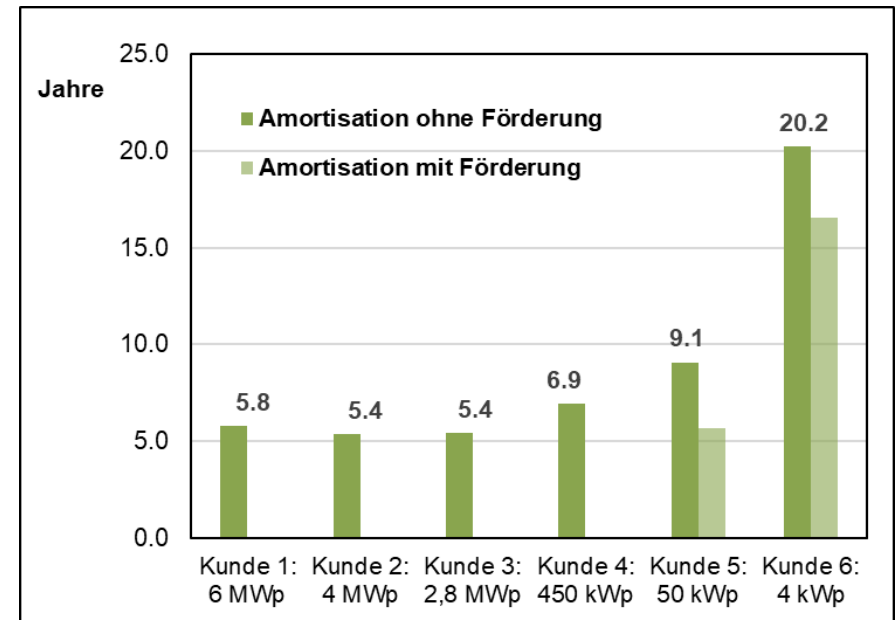
- Use of all renewable energies in combination with energy efficiency
 - avoid either or thinking!
 - use synergies of renewables and efficiency!
- Technology openness as a principle to support economic cost reduction
- But: Setting the right signals in the long term
 - ... to drive structural change forward
 - ... to avoid lock-In-effects

Renewables play an important role

Productioncost



Pay back period

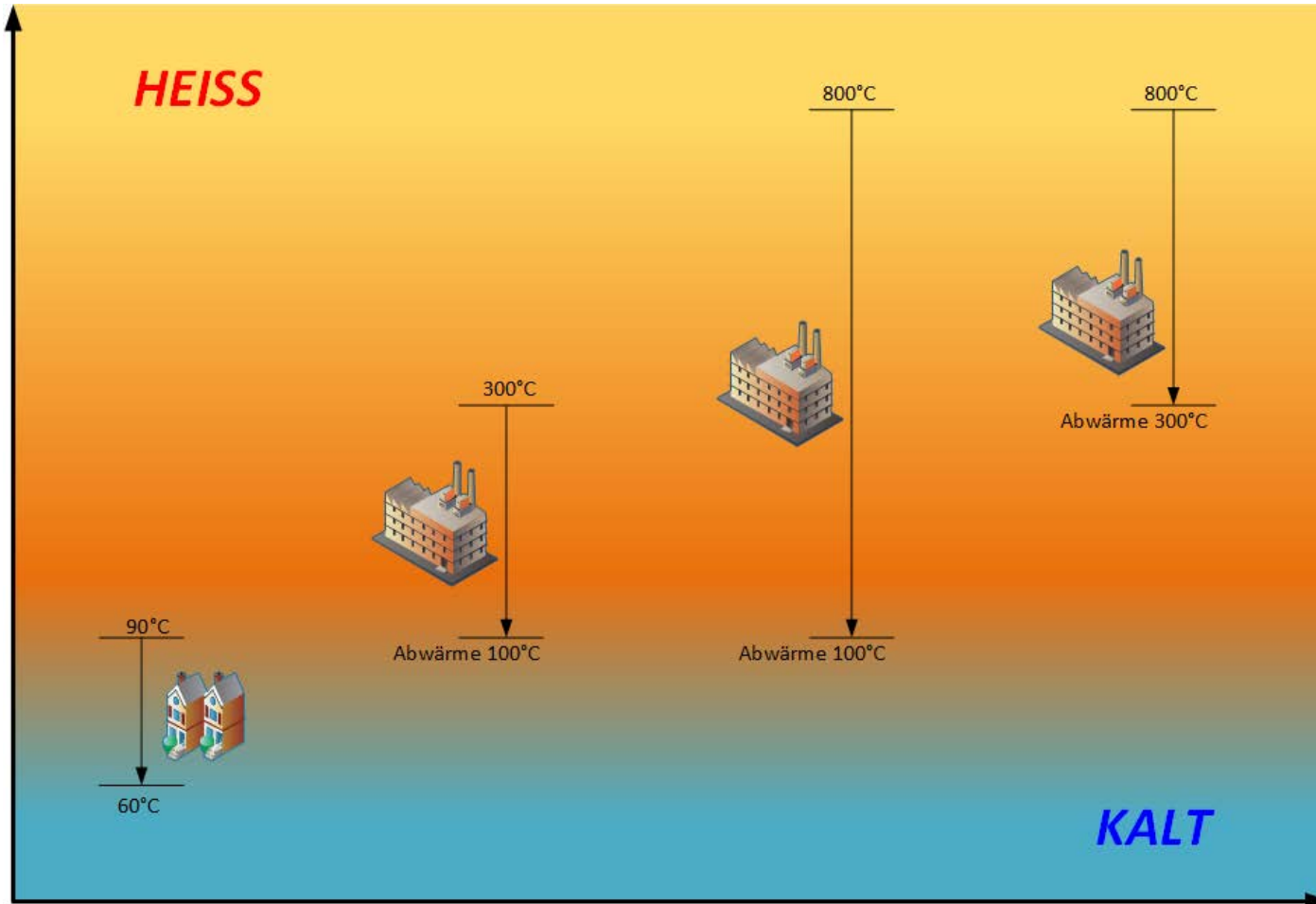


Replacement of fossil fuels is not enough

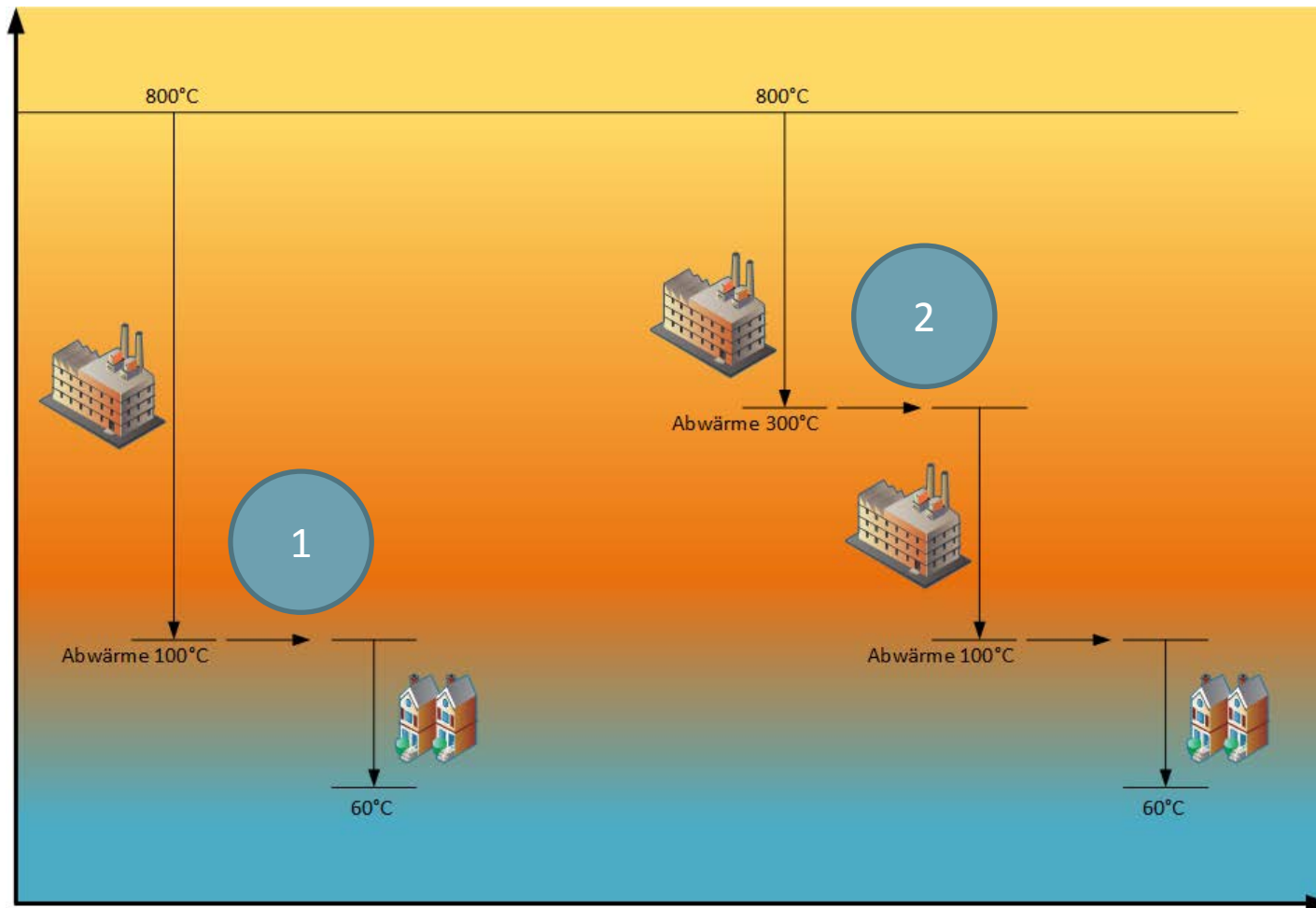
Since the replacement of fossil energy sources by renewable ones is only part of the solution for the conversion of our energy system, the reduction of primary energy use is an important task.

The use of waste heat from industrial plants must therefore be increased.

Use of heat today



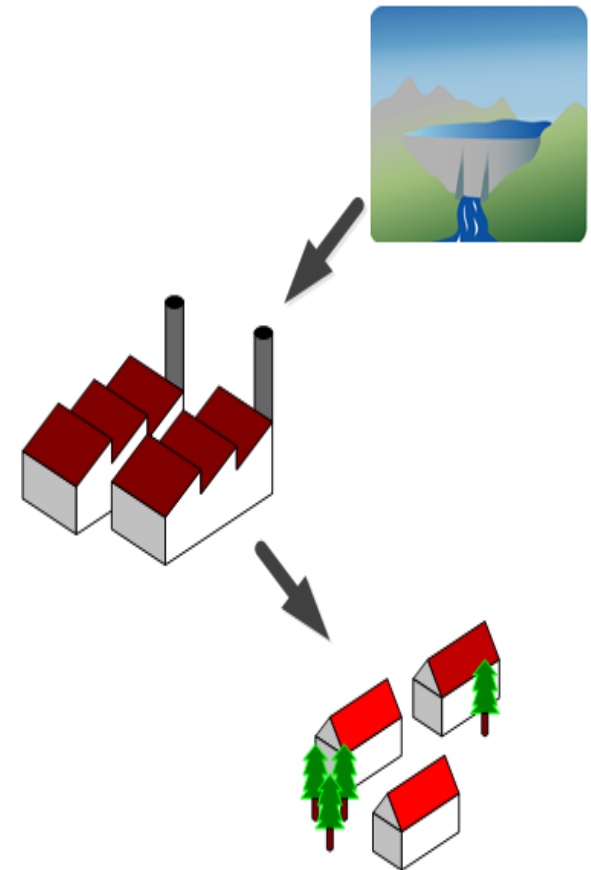
„Kaskadic“ use of heat



The use of waste heat from industrial plants must be increased.

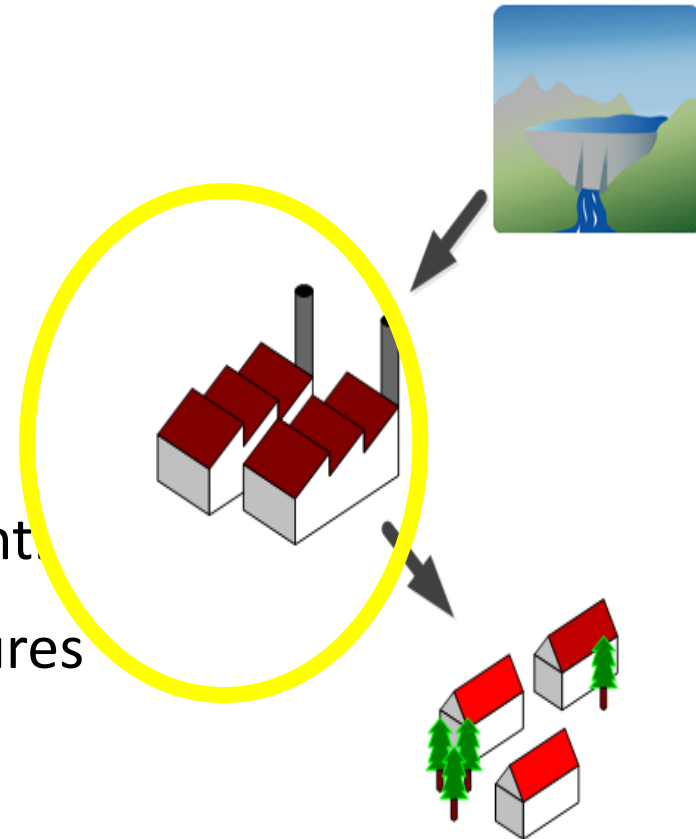
Sectorcoupling / energy cascade → waste heat-use

- **Cover exergy-needs** → potentials of RES electricity, RES gases as well as biogenic fuels are mainly used for industry and mobility!
- **Avoid exergy shortages** → Minimise competition from low temperature processes, warm-water and heating.
 - Extensive storage & use of waste heat from industry and power plants
 - Energy Spatial Planning & Heating Networks



Change of processes

- **Cover energy needs**
 - Processes must be rethought and converted to renewable energies.
- **Cover exergy needs**
 - RES electricity and renewable gases come from outside the industrial plant.
 - Supply processes with low temperatures with exergetically suitable energy.



High exergy storage

- **One challenge is to ensure the supply of exergy.**
 - Biogas and biomass will make a significant contribution to the provision of exergy requirements, but cannot cover the demand.
 - Demand response and short-term storage are used for short "dark periods".
 - For longer "dark periods" and for seasonal storage, appropriate storage technologies for renewable gas are required.
- **Gas infrastruktur**

The maintenance of the high-ranking gas infrastructure including CHP is essential for exergy storage and to guarantee the security of electricity supply.

Barriers and solutions

At present, however, there are barriers that impede these developments.

Proposals for solutions to dismantle these barriers will be the main part of the following presentation.

Waste heat is not free of charge

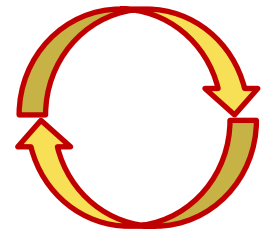
Criteria und Parameters

- The basic criteria are limited to **techno-economic availability**
- Essential parameters (extended criteria) are derived from this:
 - Distance (line costs, losses)
 - Heat transfer medium, concentration (size and type of heat exchanger)
 - Temperature (preparation, valence)
 - Profil (storage size and costs)

Removing barriers


View of involved companies

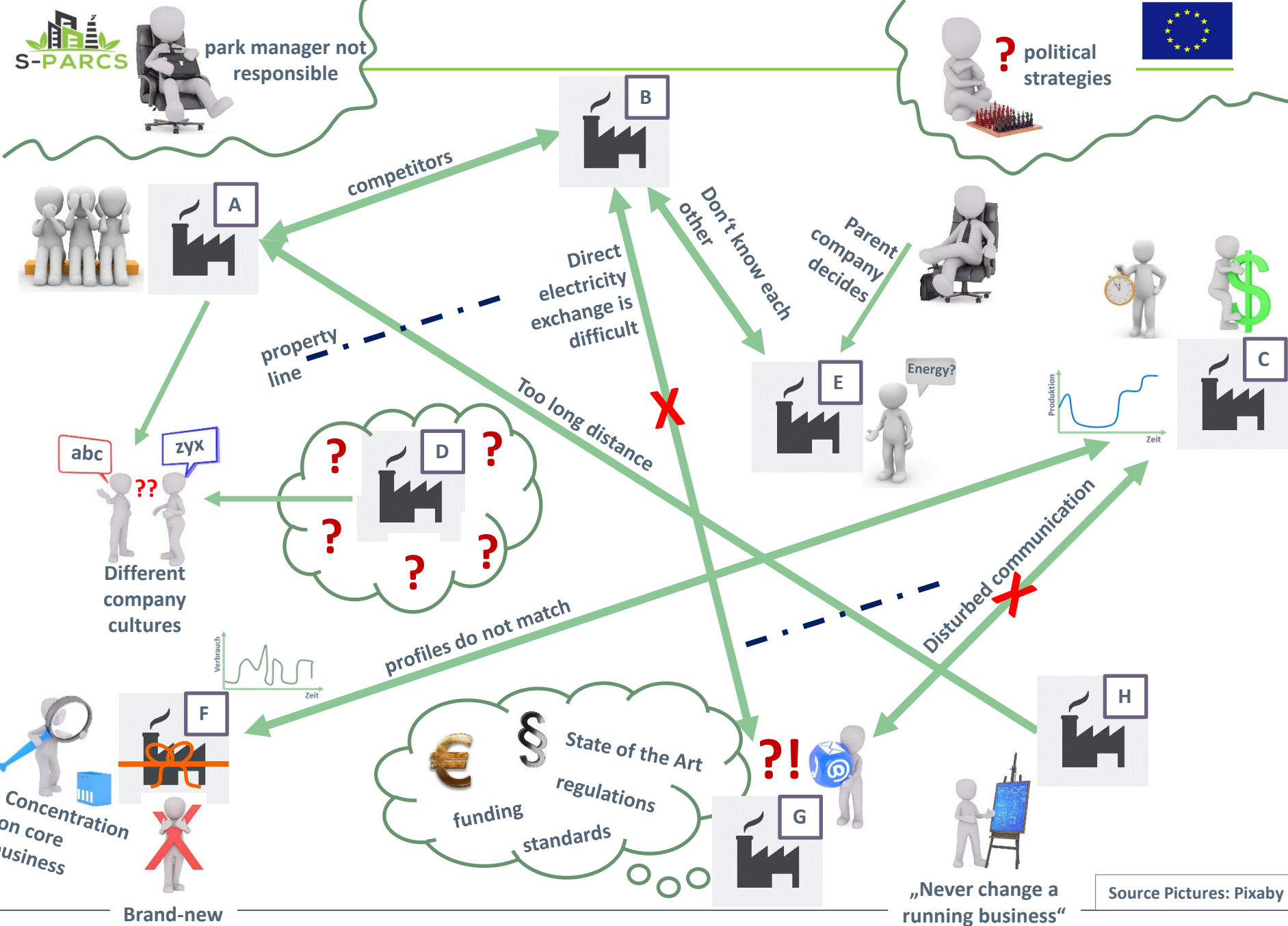
1. **Availability of information on potential**
 - Sink of own waste heat
 - Sources of external waste heat
2. **Contact & exchange of information (use the criterias)**
3. **Selection of technology and calculation of economic efficiency**
4. **Contracts**



Removing bearriirs

View of public institutions

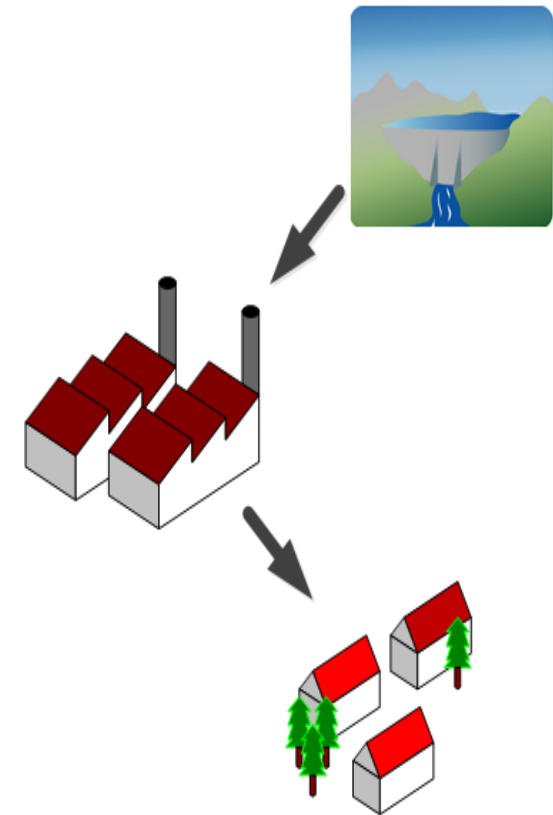
1. Sensibilize companies
 2. Provide basic informations
 3. Push contact and exchange
- 
- Questionnaire*
4. Support further exchange of information / and build trust
 5. Subsidies for attractive solutions
 6. Help drafting contracts



Conclusion:

Find & use the **SYNERGIES** of Efficiency and Renewables!

- **There is no single solution.**
- **Scarcity is less about energy, it's more about exergy.**
 - **Save power! Power will not be cheap or a flat-rate system.**
 - **Secure power supply! There is a need for**
 - efficient & seasonal storages in a new (>> TWh) dimension and CHP based on bioenergy or synthetic gas.
 - **Minimize competition for exergy.**
 - Heating and hot water demands need to be satisfied by district heating, which is fed by waste heat from industries and CHP.



Ansprechpartner:

Energieinstitut an der JKU Linz

Simon Moser

moser@energieinstitut-linz.at