

Flexible Sector Coupling by Energy Storage Implementation or “Make Sector Coupling Flexible”

New Annex Proposal



What is „Sector Coupling“?



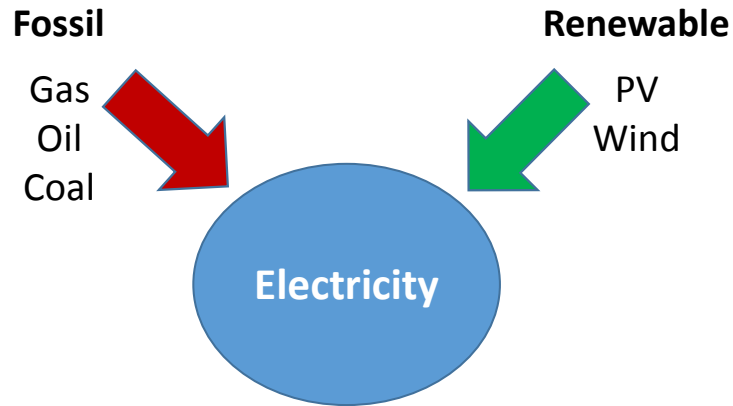
In this context electricity, heat or mobility are described as a sectors...

- Is it an energy form (like electrical, thermal, mechanical or chemical)?
- Is it an area of consumption (like transport, buildings, industry,...)?

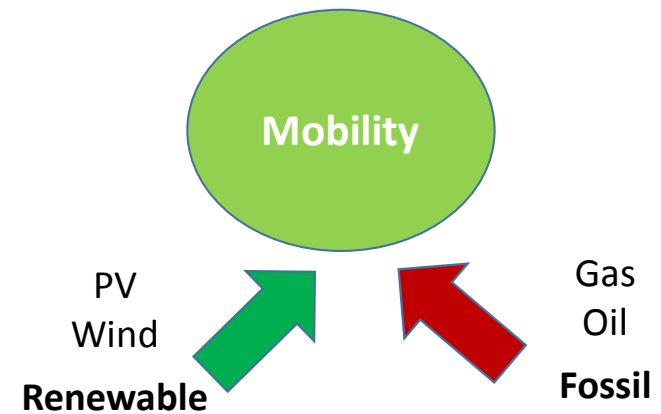
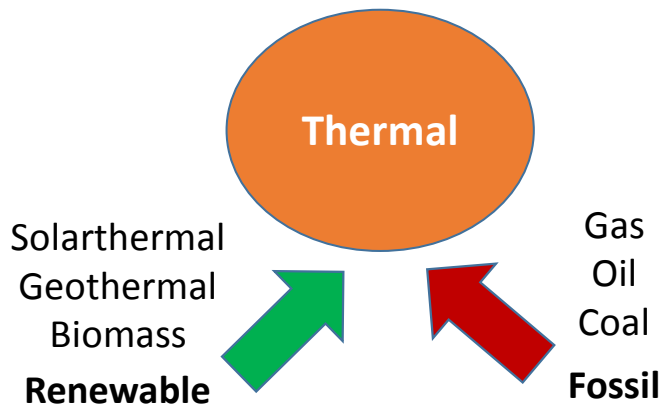
„Not only in the electricity sector, but in the heat, cold and mobility sector fossil energy carriers shall be replaced by renewable energies step by step. The so called sector coupling can support this...

Electricity from renewables can be utilized to produce heat, cold and propulsion energy. The overall goal is a replacement of fossil energy sources...“

„Sectors“



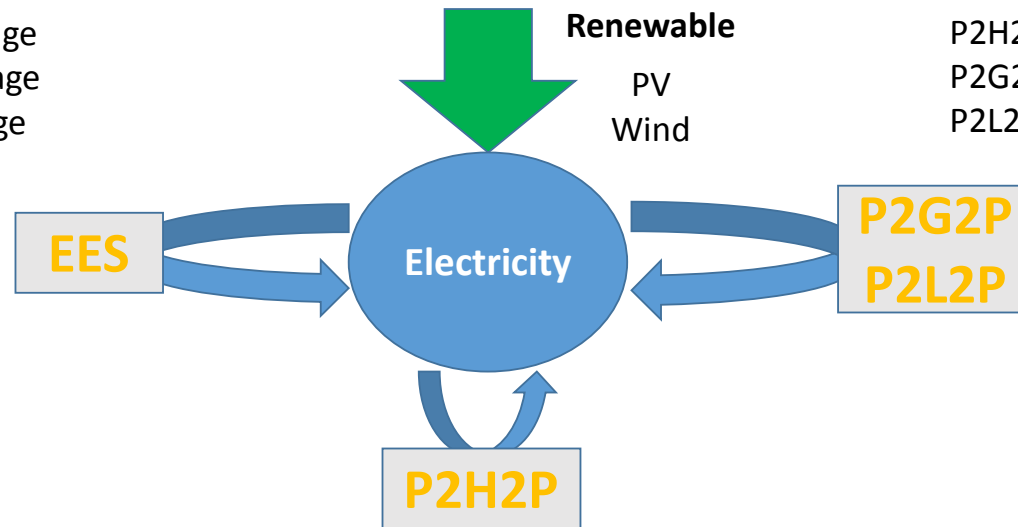
Energy Supply for different Sectors



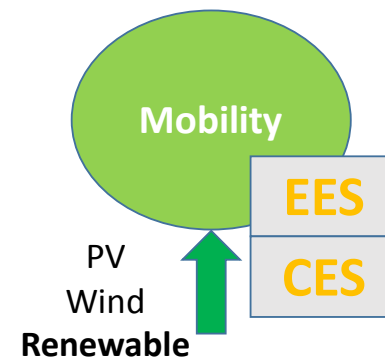
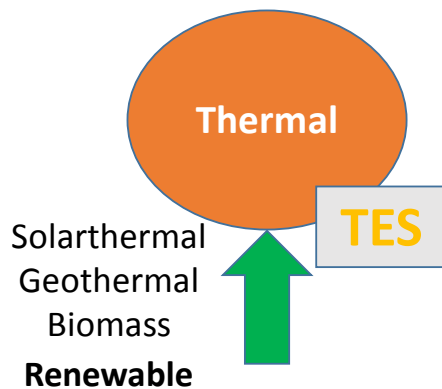
Storage within „Sectors“

EES = Electrical Energy Storage
CES = Chemical Energy Storage
TES = Thermal Energy Storage

P2H2P= Power-to-Heat-to-Power
P2G2P= Power-to-Gas-to-Power
P2L2P= Power-to-Liquid-to-Power

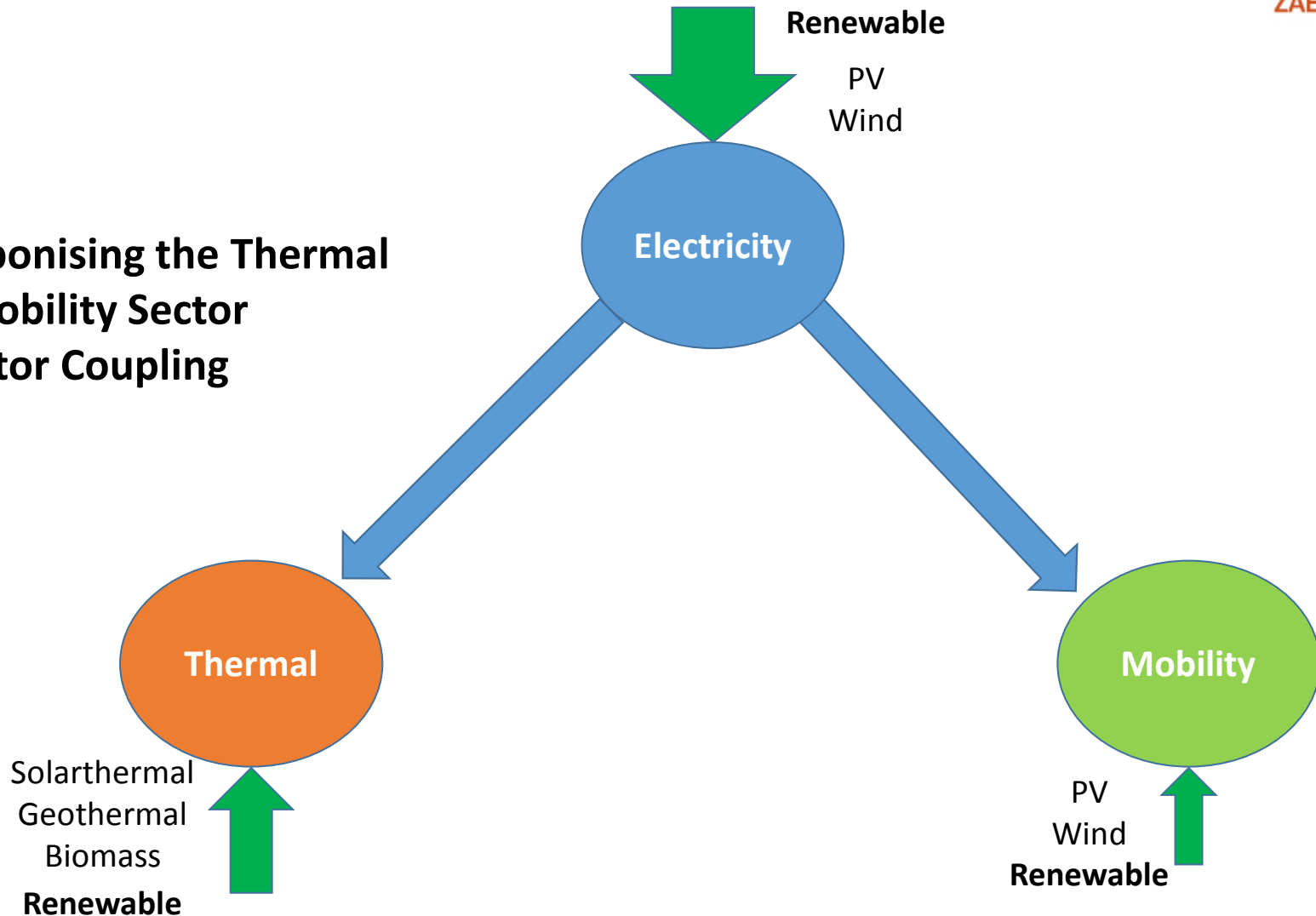


Energy Storage within the Sectors



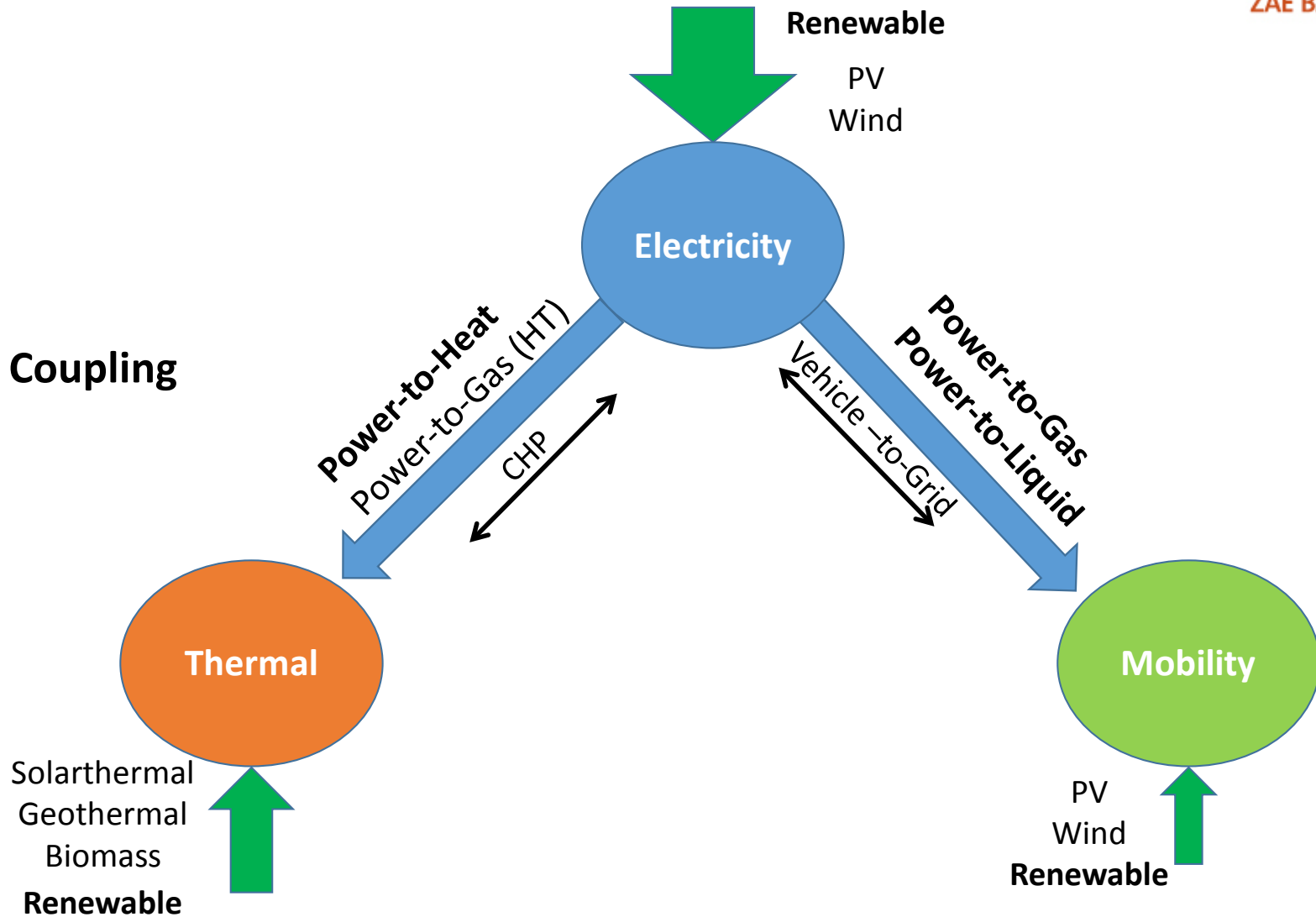
„Sector Coupling“

Decarbonising the Thermal and Mobility Sector by Sector Coupling



„Sector Coupling“

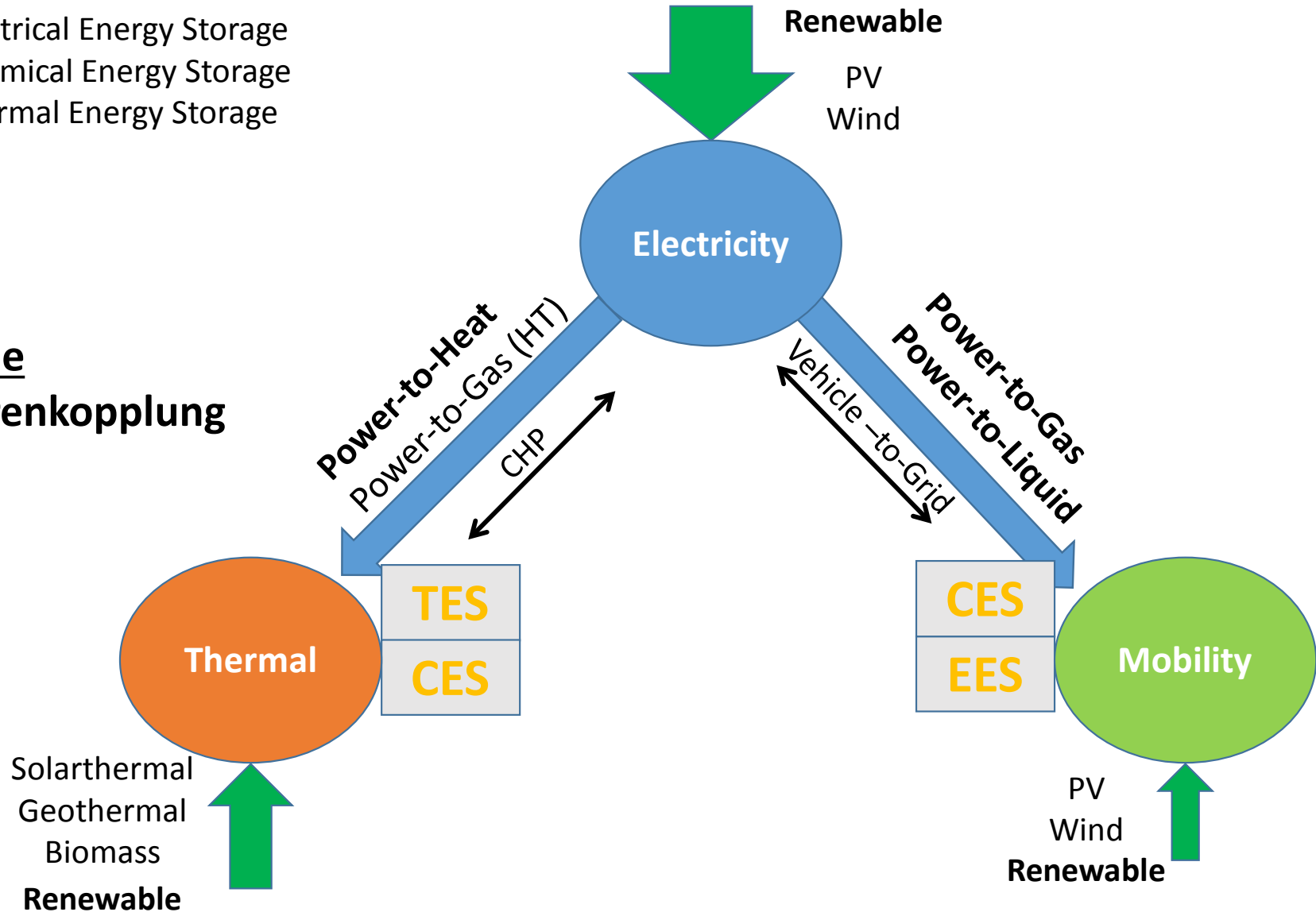
Sector Coupling



„Flexible Sector Coupling“

EES = Electrical Energy Storage
CES = Chemical Energy Storage
TES = Thermal Energy Storage

Flexible Sektorenkopplung



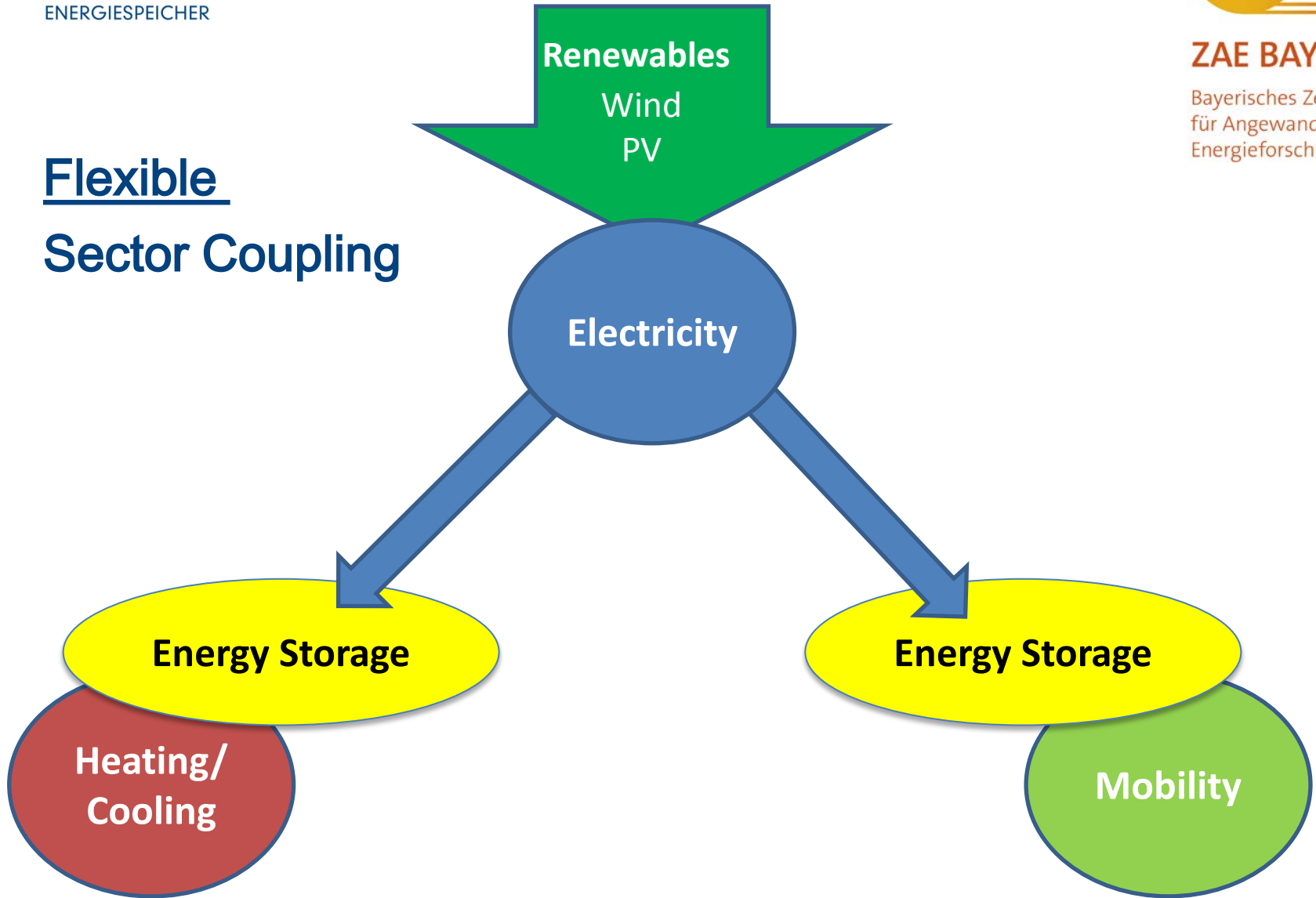


ZAE BAYERN

...for politics better make it simple!

Flexible

Sector Coupling



Main Goal



The Discussion on **Sector Coupling** shall always be on **Flexible** Sector Coupling including **Energy Storage** since this provides the Decoupling of Supply and Demand in Time.

The focus shall be on the role of **Energy Storage** in this context!

Advantages



- Energy storage is able to **increase the share of renewables** in the heat and mobility sector by matching supply and demand
- Energy storage can **provide flexibility** to all sectors („renewables on demand“)
- „Energy can be stored at both sides“
 - Heat sector: TES is **less expensive**
 - Mobility sector: Energy has to be stored anyway

Objectives



The key objectives of the proposed Annex are:

- **Definition** of “Sector”, “Sector Coupling” and “Flexible Sector Coupling”
- Identify **energy storage technologies** for actual sector coupling applications (paths in the picture) and their properties/requirements
- **Potential for storage implementation** for each path between electricity and heat and electricity and mobility
- **Technical and economic comparison** to “no-storage” sector coupling scenarios
- Prioritizing most **promising storage configurations** for sector coupling applications

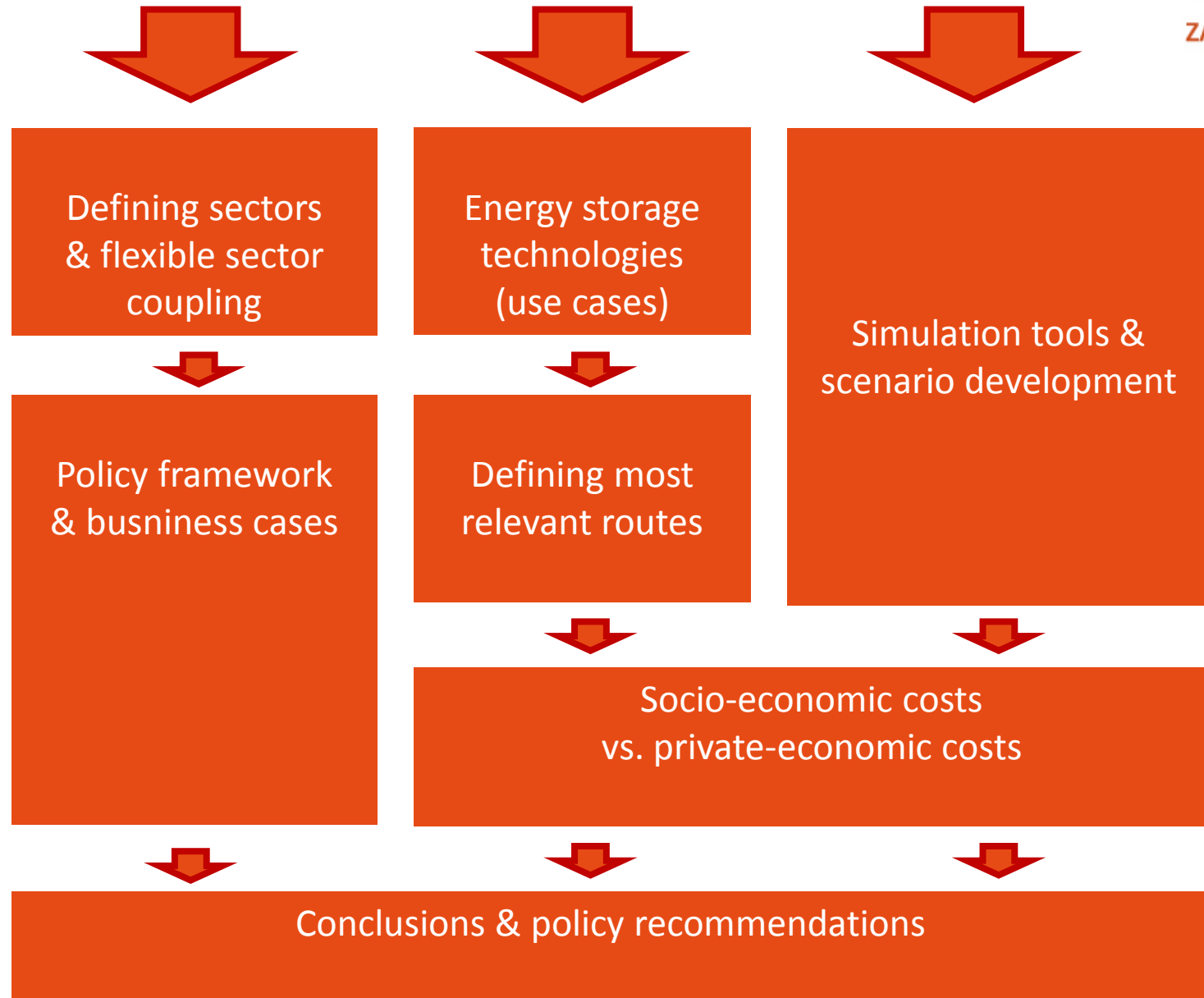
Scope



The Annex shall deal with:

- All energy storage technologies
- All applications in the heating and cooling sector (heating and cooling of all kind of buildings, DHW, process heat/cold for industry)
- All applications in the mobility sector (cars, trucks, busses...) and all propulsion technologies (EV, fuel cell, hydrogen,...)

Possible Subtask Structure



Next Steps?

- Interest from participating countries?
- Task-Definition Workshop? When?
- Include GIVAR / SIR / IEA?
- Include other TCPs from the heating/cooling or mobility sector
- 2nd Task Definition Workshop Fall 2018



Thank you very much for your attention!

