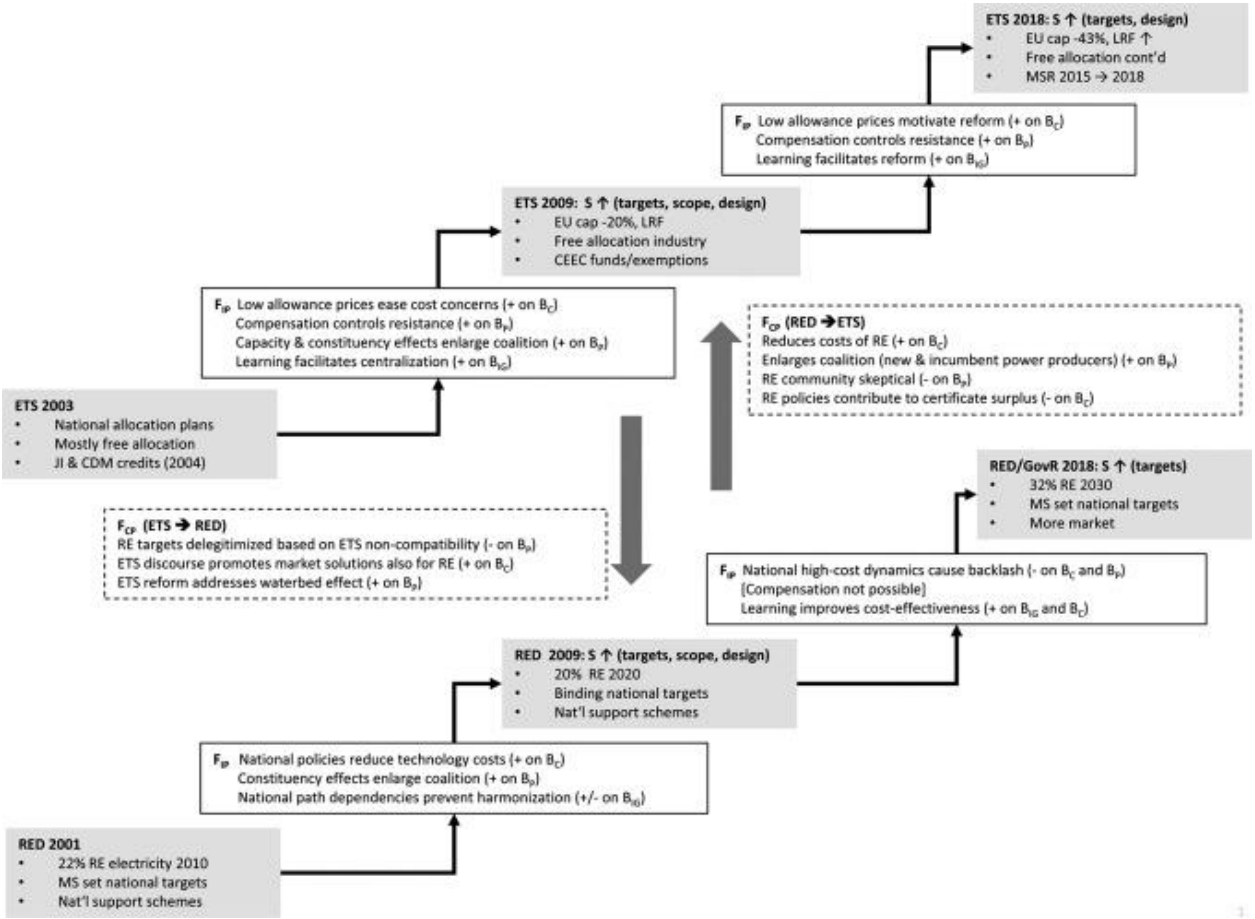
Renewable energy in systems perspective

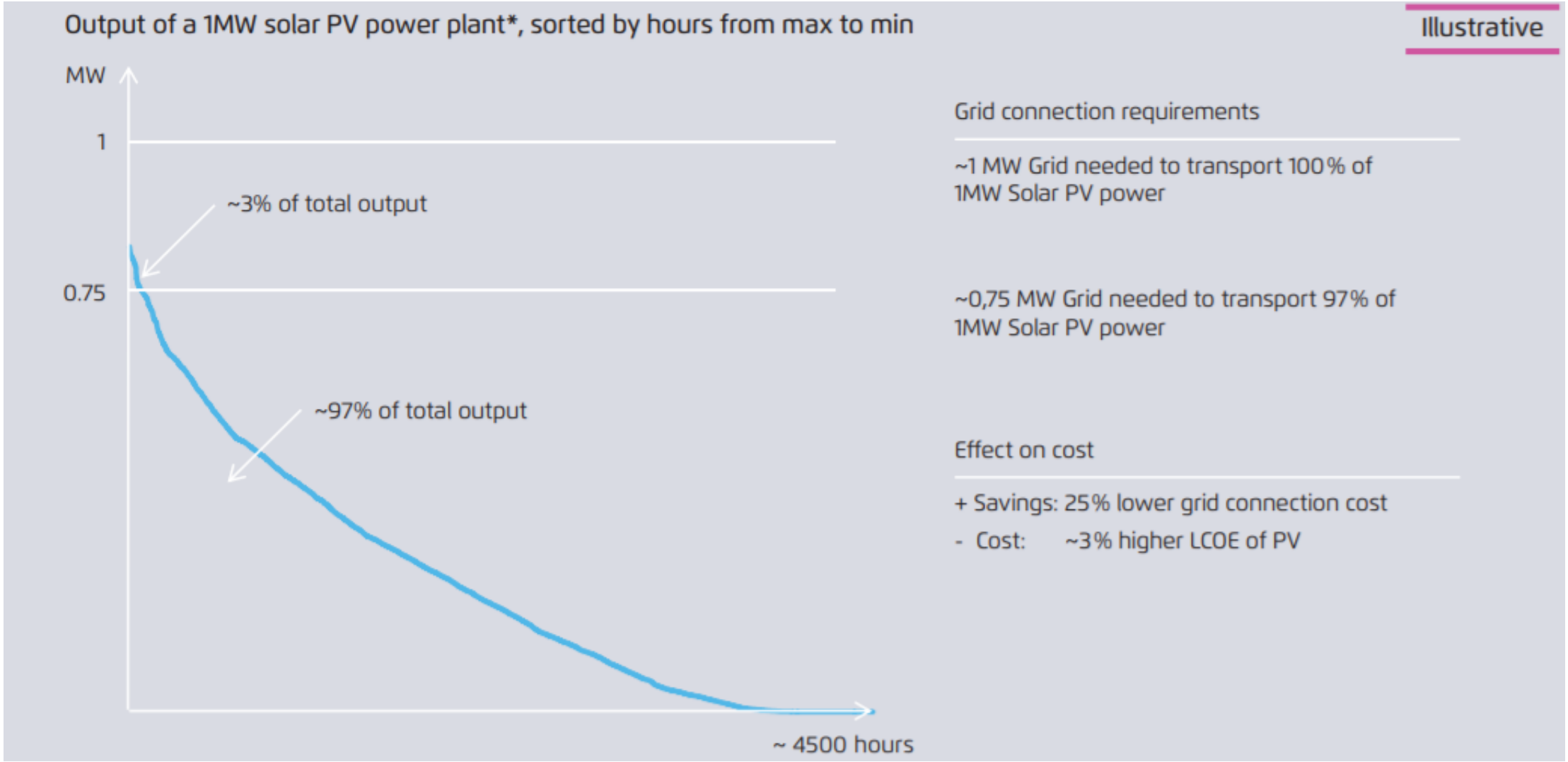
Case study: Policy sequencing



- Synergies (positive feedback)
  - RE enables actors to decrease ETS costs
  - Enlarged coalitions (eventually)
  - Learning (market solutions)
- Conflicts (negative feedback)
  - RE increases certificates surplus
  - Both communities initially skeptical

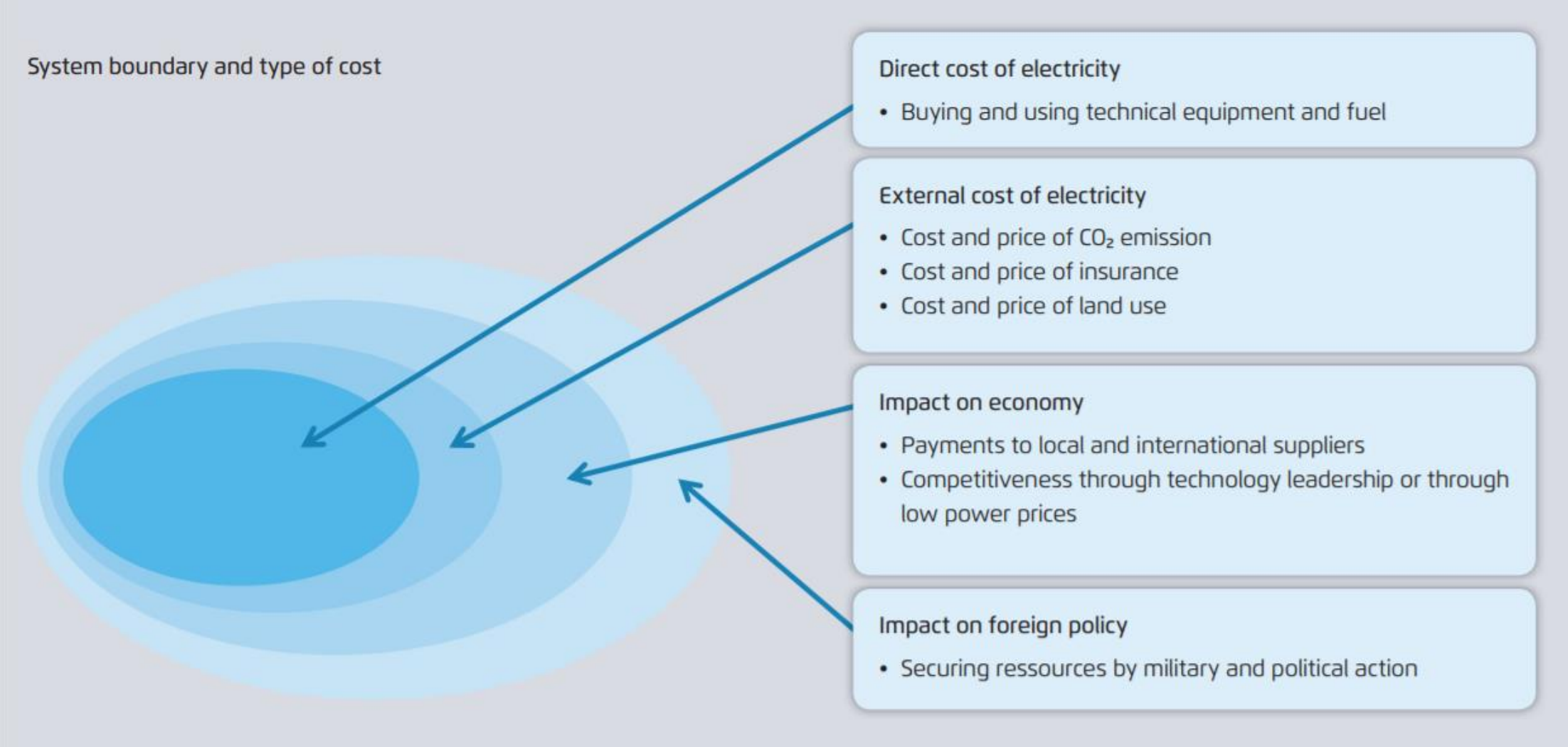
Source: Leipprand et al. 2020

Defining system boundaries (costs perspective)



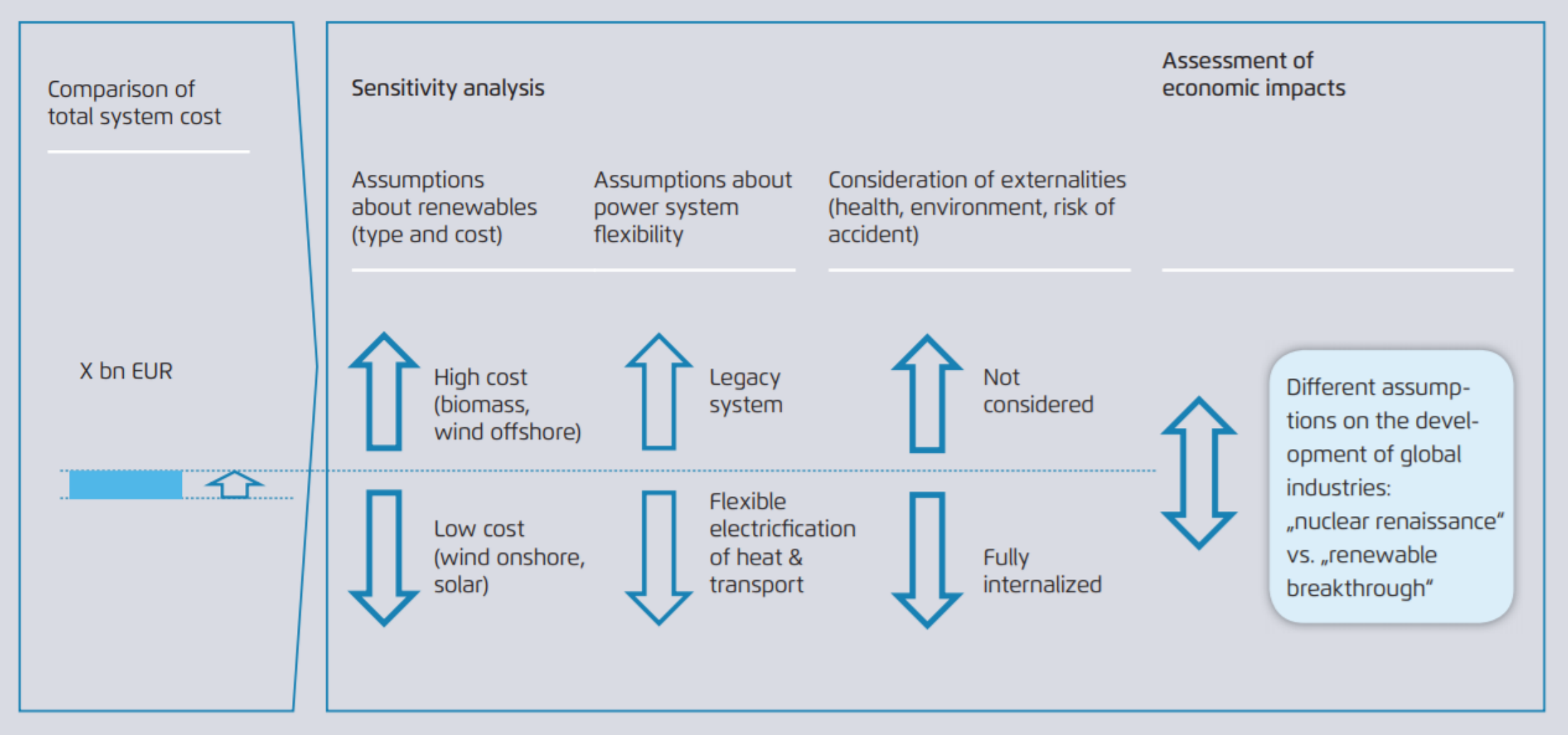
Source: Agora EW

Defining system boundaries (costs perspective)



Source: Agora EW

Defining system boundaries (costs perspective)



Source: Agora EW

Systems perspective

System components	What to watch	Acting upon a system
• Parts	• Stocks and flows	• System levers
• Interactions	• Feedback loops	• Unintended consequences
• Function or purpose	• Delays	

Feedback loops

Positive

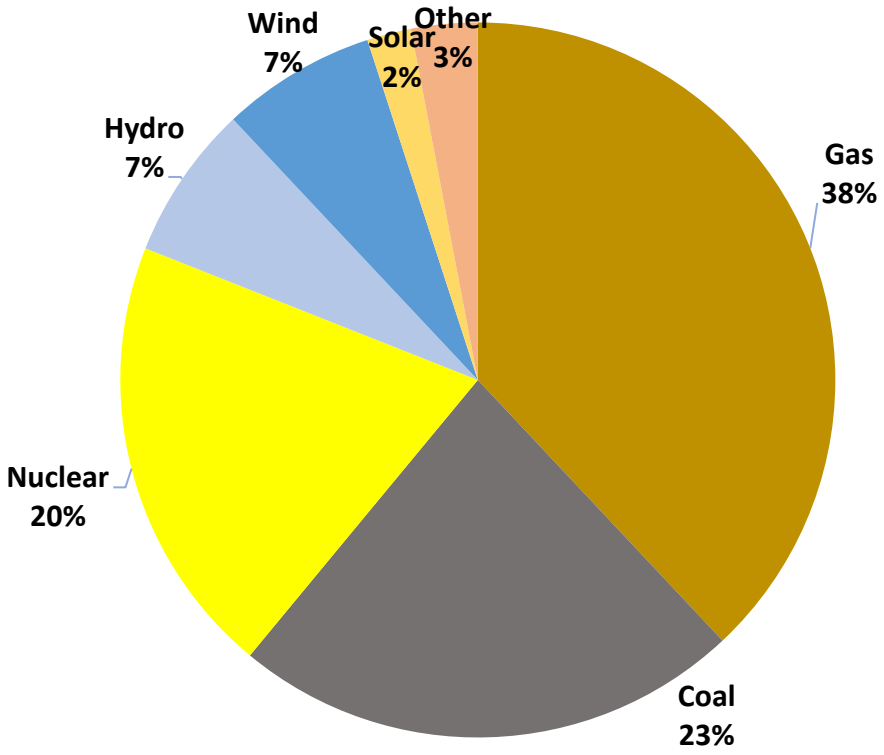
- RES deployment <> RES costs
- RES deployment <> integration tech costs
- RES deployment <> system costs
- RES deployment <> acceptance
- RES deployment <> political feasibility

Negative

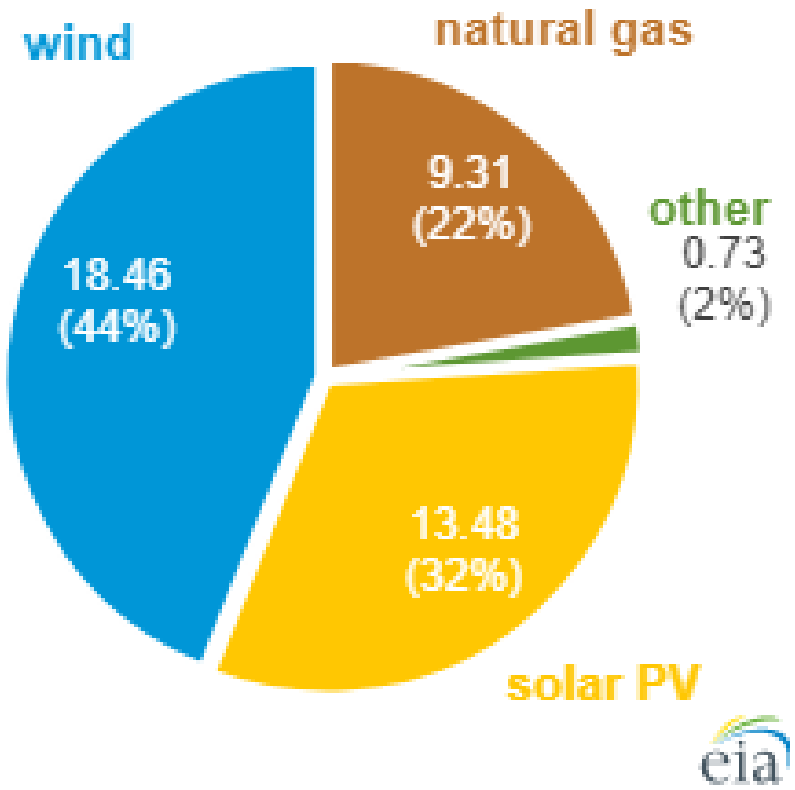
- RES deployment <> wholesale price
- RES deployment <> conventional energy costs and deployment
- RES deployment <> system costs
- RES deployment <> acceptance

Stocks and flows, delays

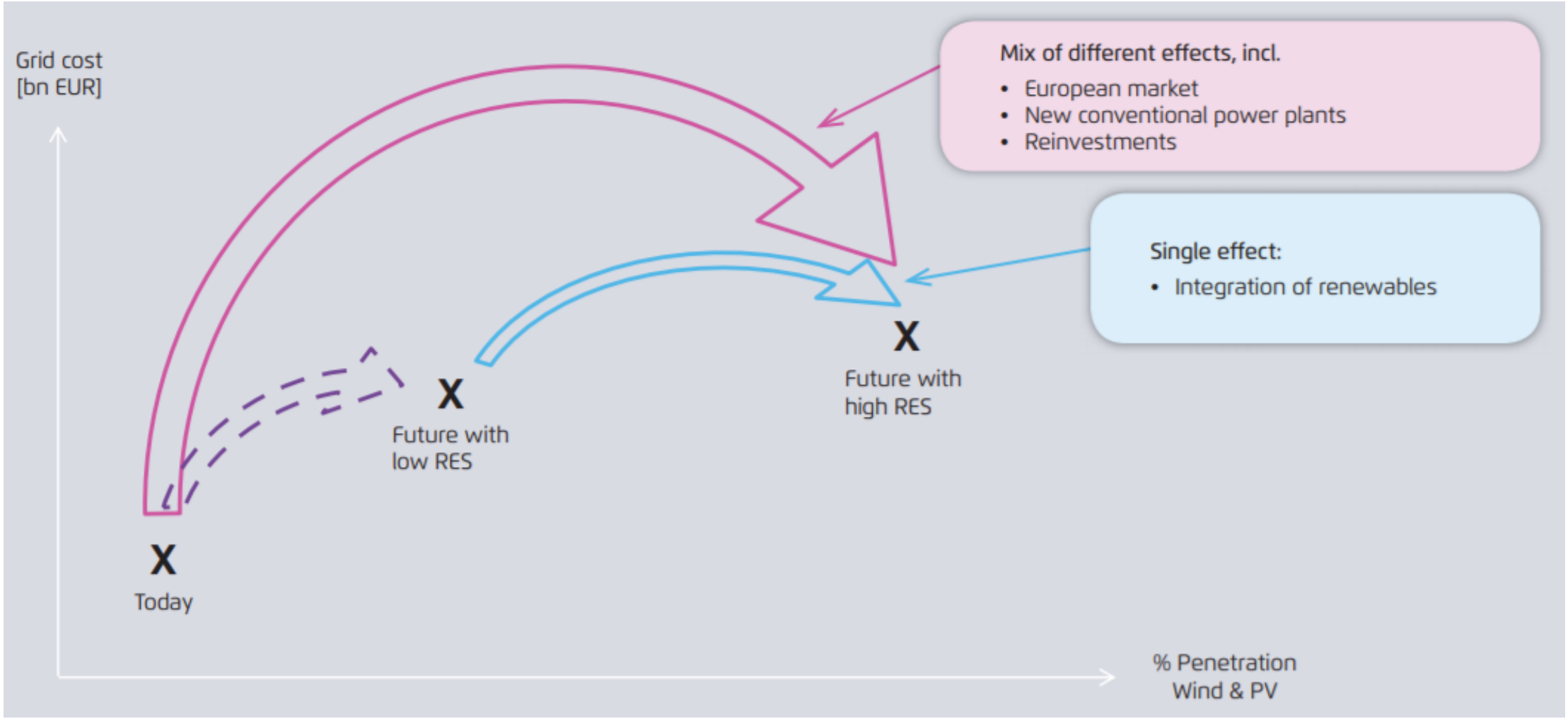
Electricity generation mix (2019)



Expected new capacity (GW, 2020)



Unintended effects



Source: [Agora EW]