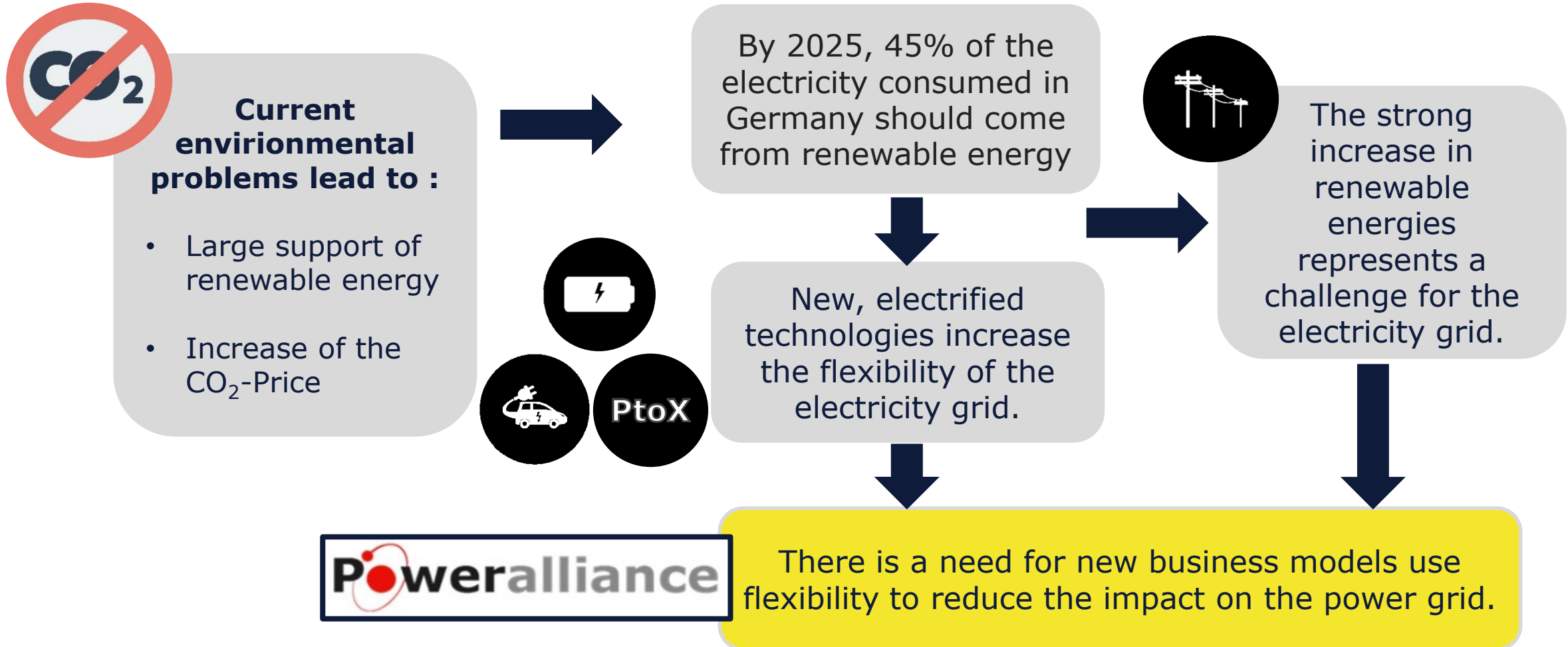
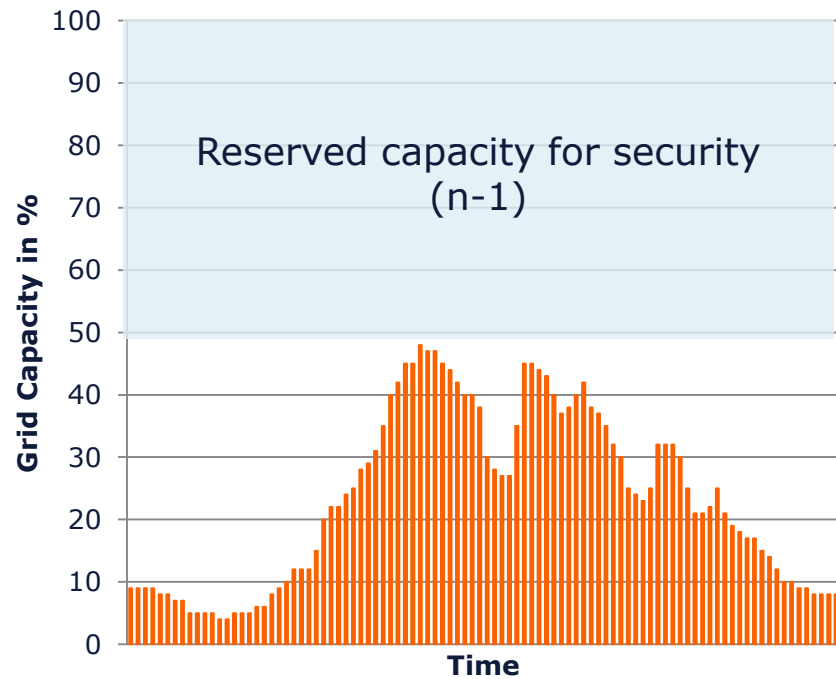

Assessing the prospects of an electrification-based business model under deep uncertainty using scenario definition and sensitivity analysis

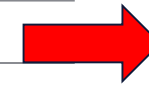
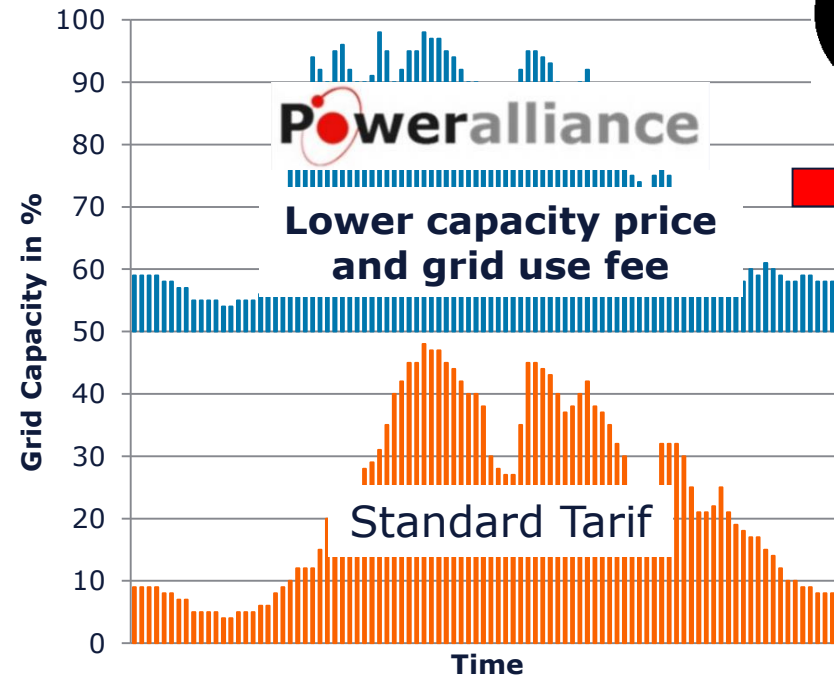
38th International System Dynamics Conference (ISDC), July 20-22, 2020, Bergen, Norway.

Juliana Zapata Riveros, Matthias Speich, Mirjam West and Silvia Ulli-Beer
Institute Institute of Sustainable Development (INE), Zurich University of Applied Sciences ZHAW





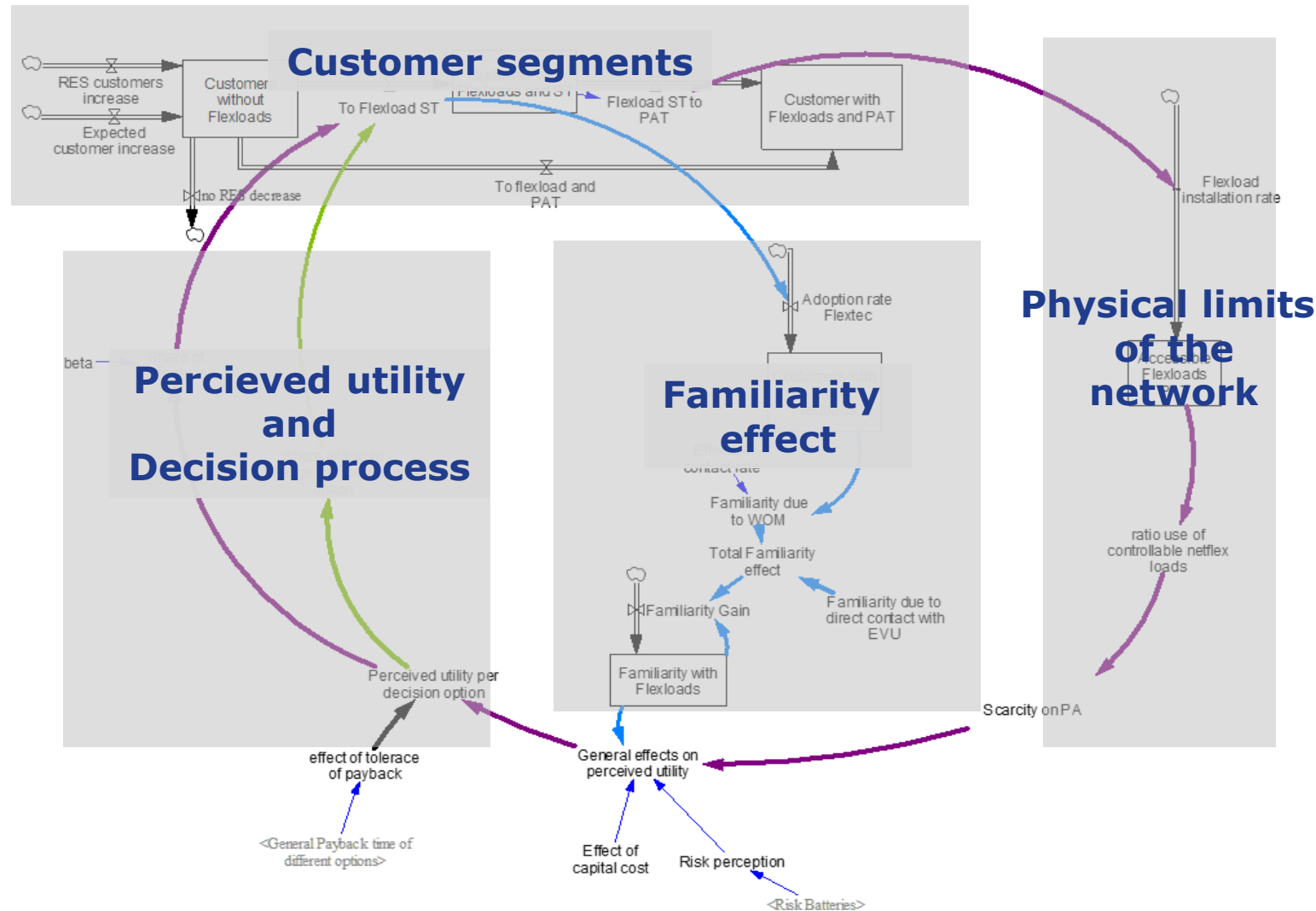
Conventional Industrial load



New Flexible Technologies



Modeling the diffusion of enabling technologies and prospects of the PA-BM



Many model parameters are uncertain or unknown

- How (un)certain are the model results?
- Which parameters have the greatest influence?
- Where is there a need for further research?

Combinations of parameter values

	P1	P2	...
Set 1	5.3	256	...
Set 2	3.2	398	...
...
Set 2000	6.7	142	...

Dynamic model

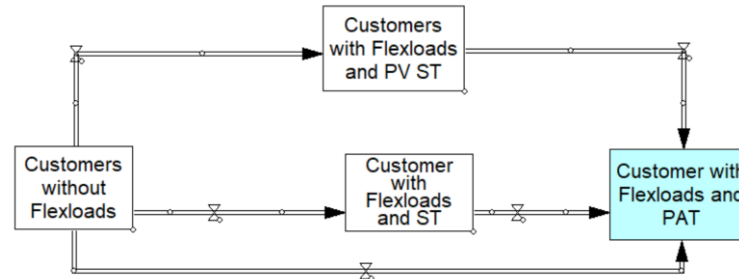


Outputs

	...	Customer s 2049	Customer s 2030
Set 1	...	12	14
Set 2	...	5	5
...
Set 2000	...	11	11

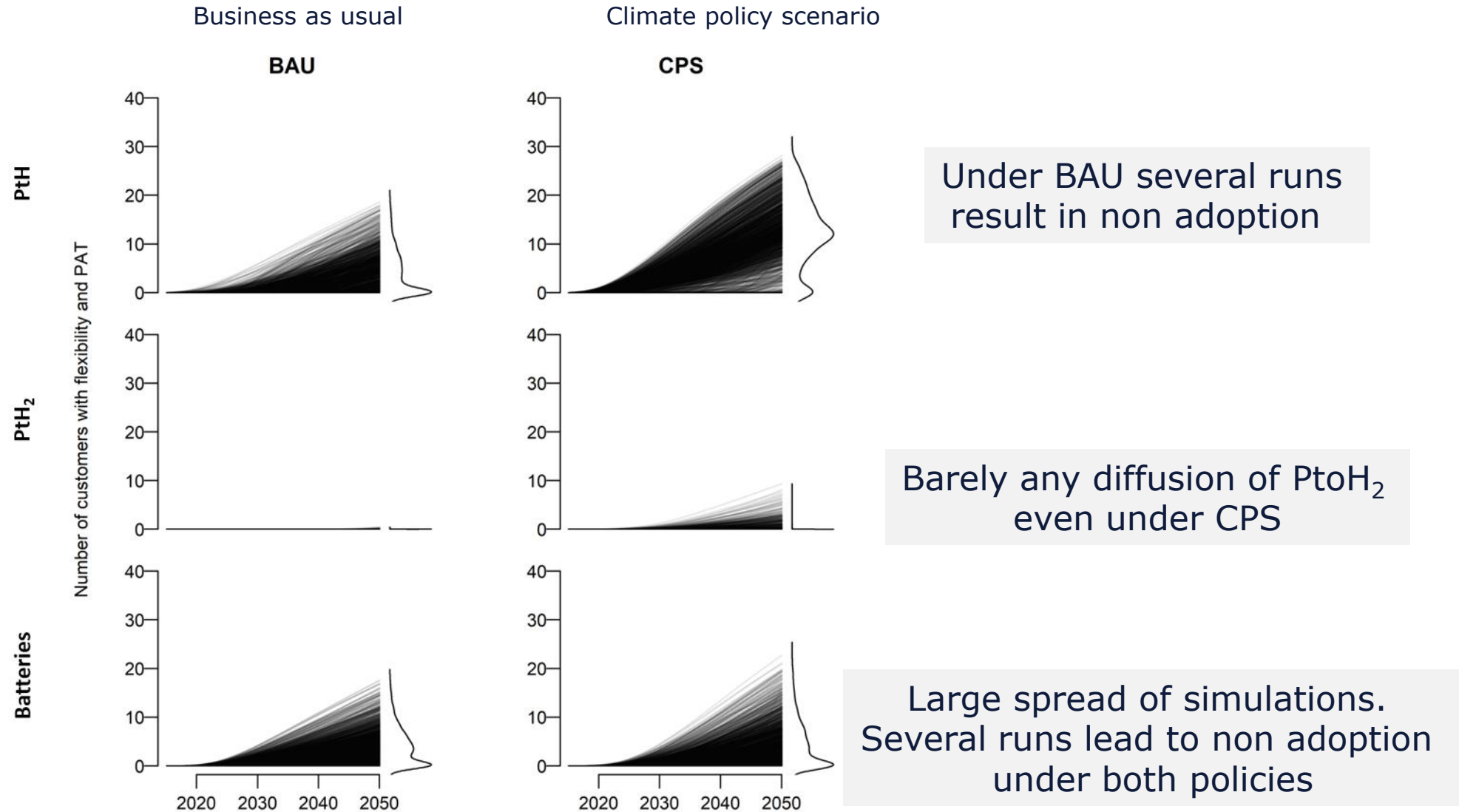
Statistical (Meta)-Model

customers in 2050 =
 $f(\text{Parameter1}, \text{Parameter2}, \dots)$

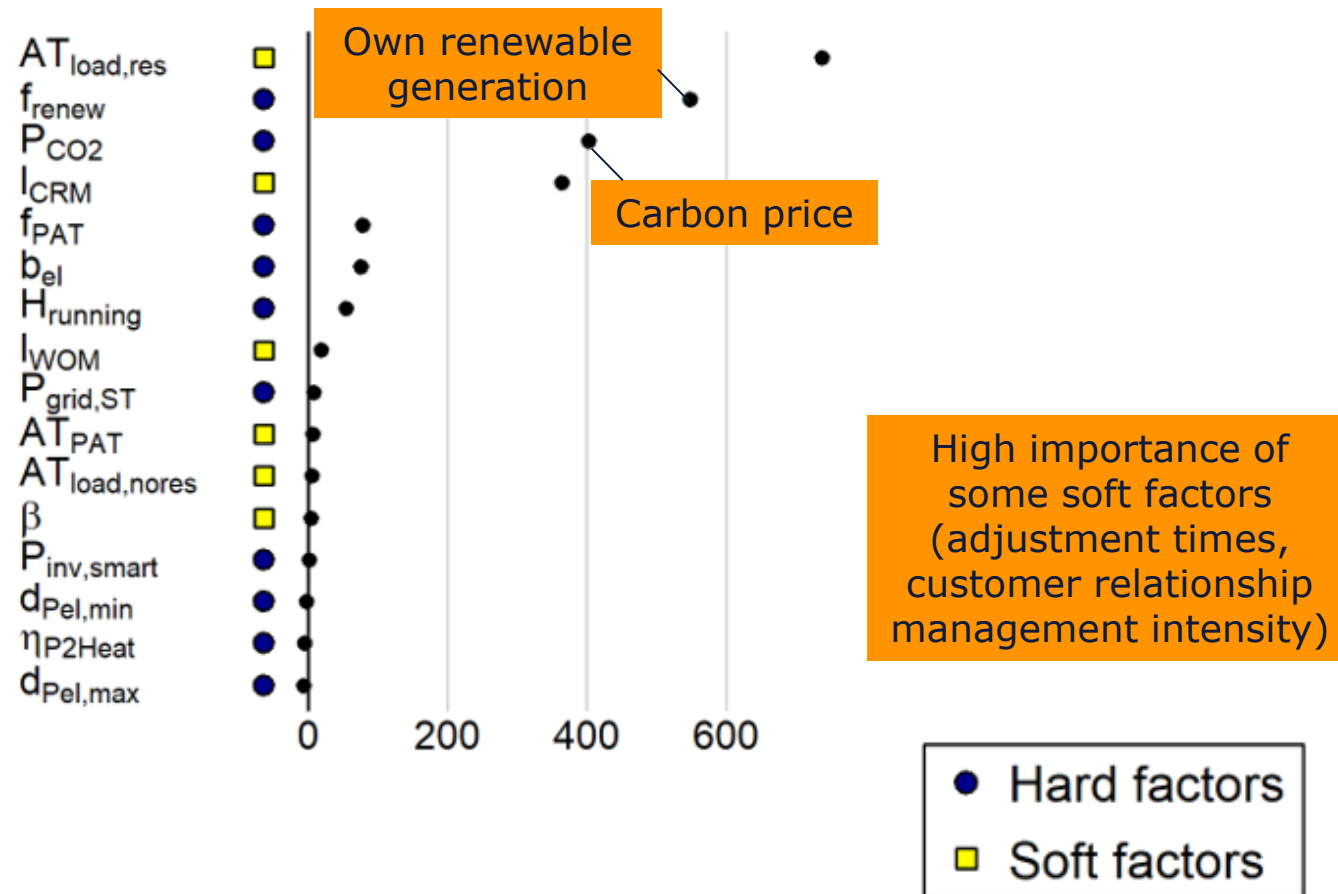


Ranking of parameters by influence

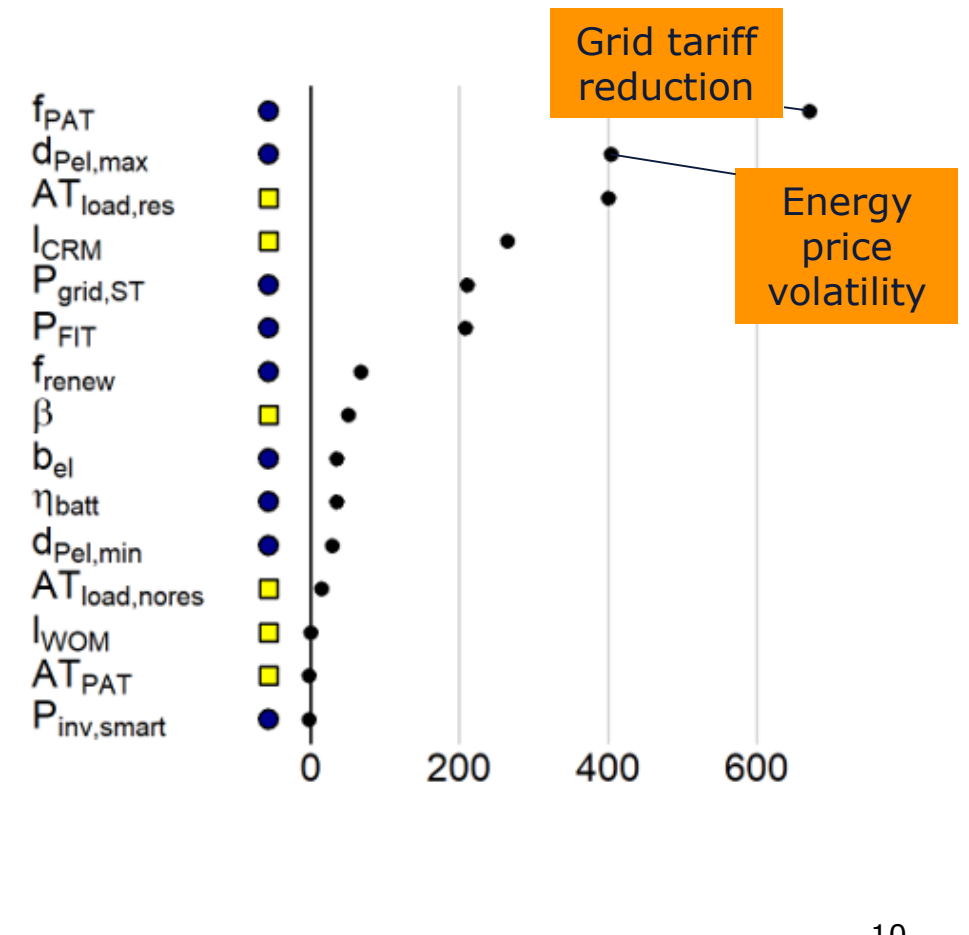
Sensitivity Analysis: Results



Example 1: Power-to-Heat (climate policy scenario)



Example 2: Batteries (BAU scenario)



Business Model Innovation

Which **opportunities** are there for (timing-based) business models aiming at relieving grid congestion?

Participatory SD Modeling

Which dynamics underlie the **diffusion of enabling technologies** (flexible electrification technologies)?

Exploratory Model Analysis

Scenario Definition

How do different **policy options** influence the prospects of the business model?

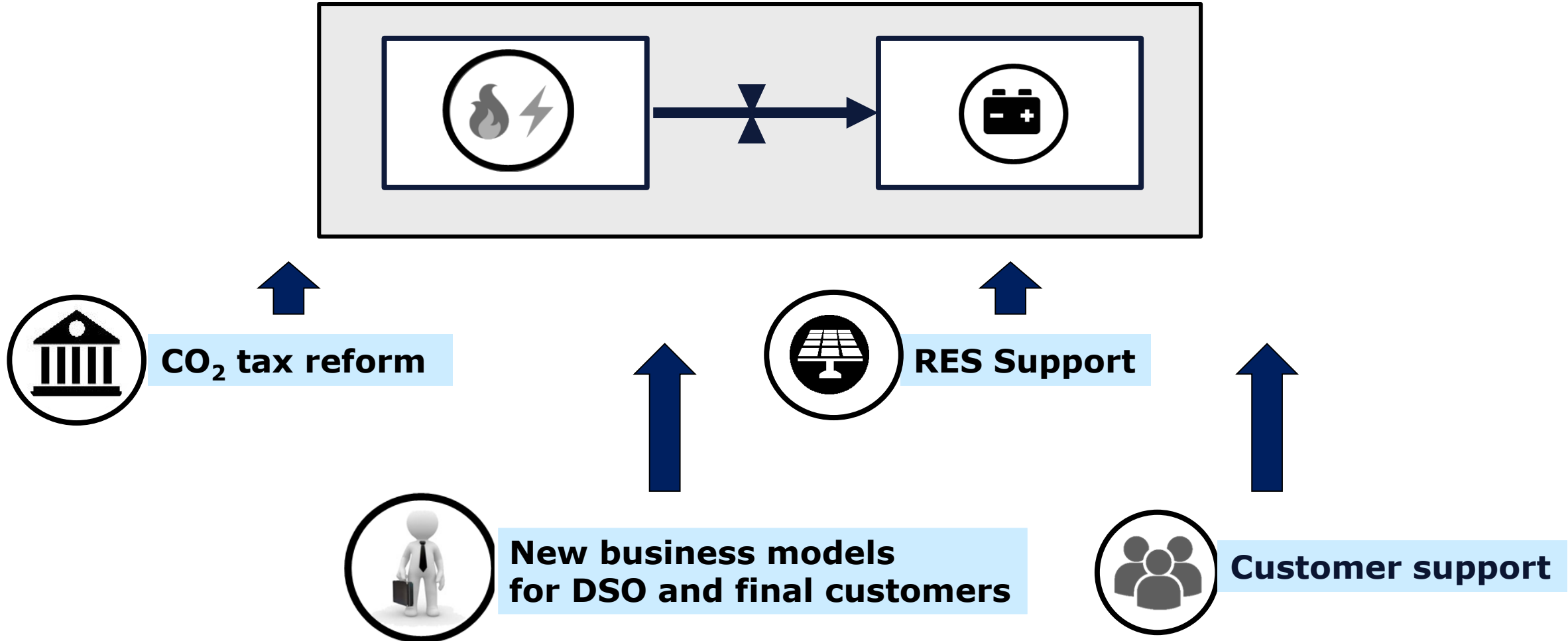
Sensitivity Analysis

How **uncertain** are modeled diffusion trajectories?

Parameter Importance

Which model parameters represent critical **leverage points** and/or critical **sources of uncertainty**?

The transition from fossils to decarbonized electrification requires....



Thanks for your interesst !



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