

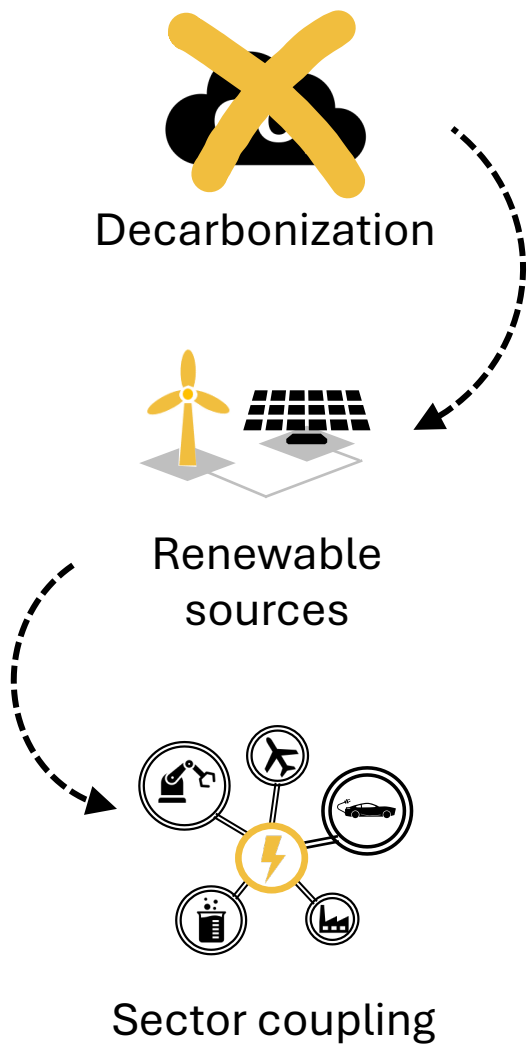
ENERGY
Week
2024
PATHFINDER CONFERENCE



Input presentation

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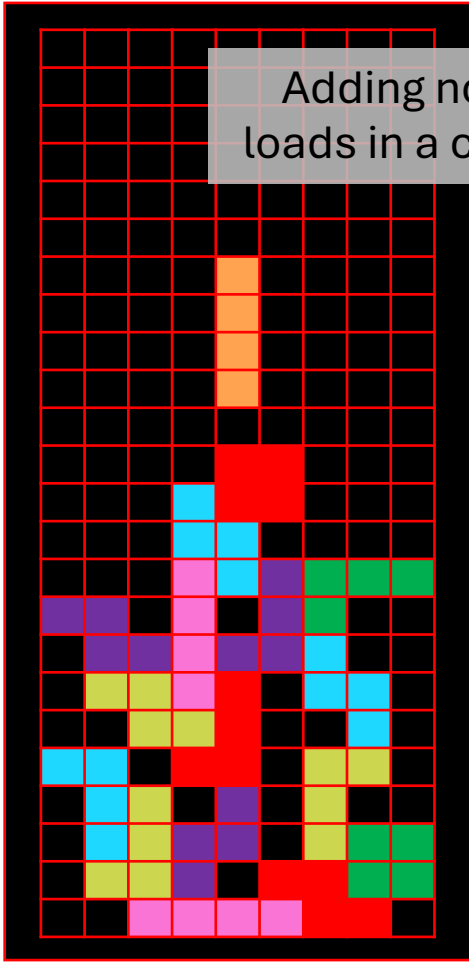
Sector coupling and flexibility: inseparable union – the Swiss case



Make EV charging as flexible as possible

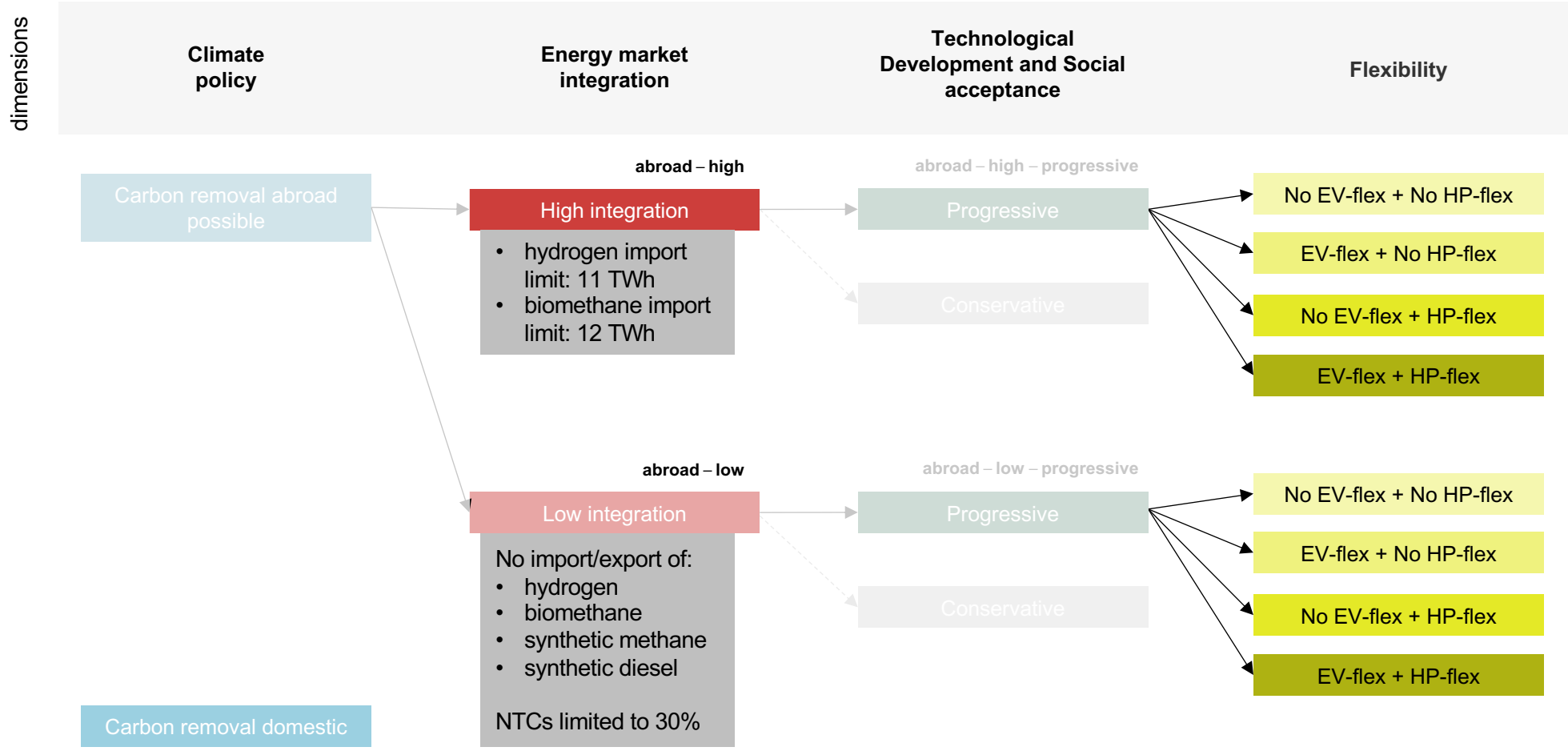


Adding non-flexible EV loads in a congested node

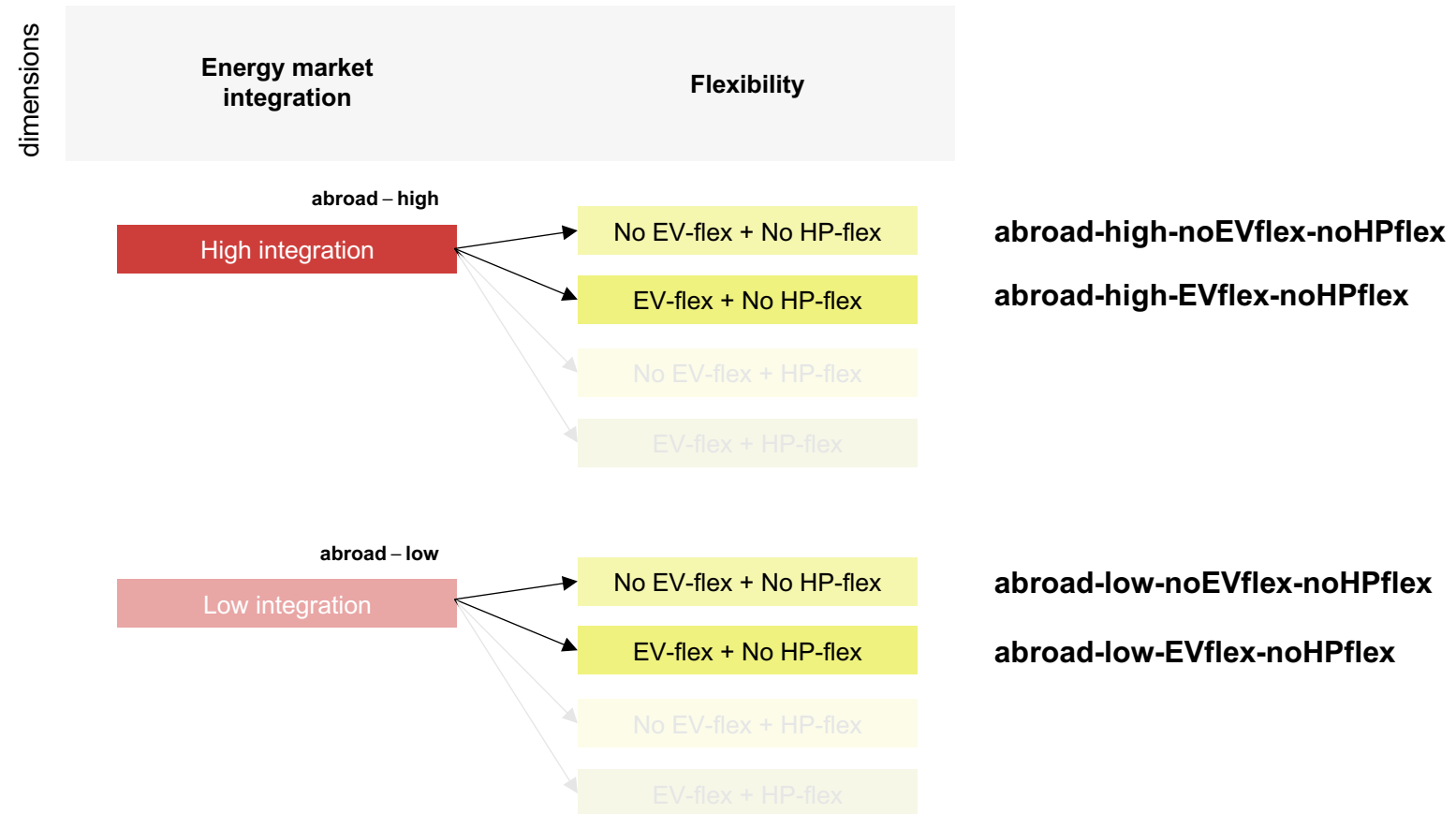


Sector coupling is like a TETRIS GAME: it can go very bad!

PATHFNDR scenarios

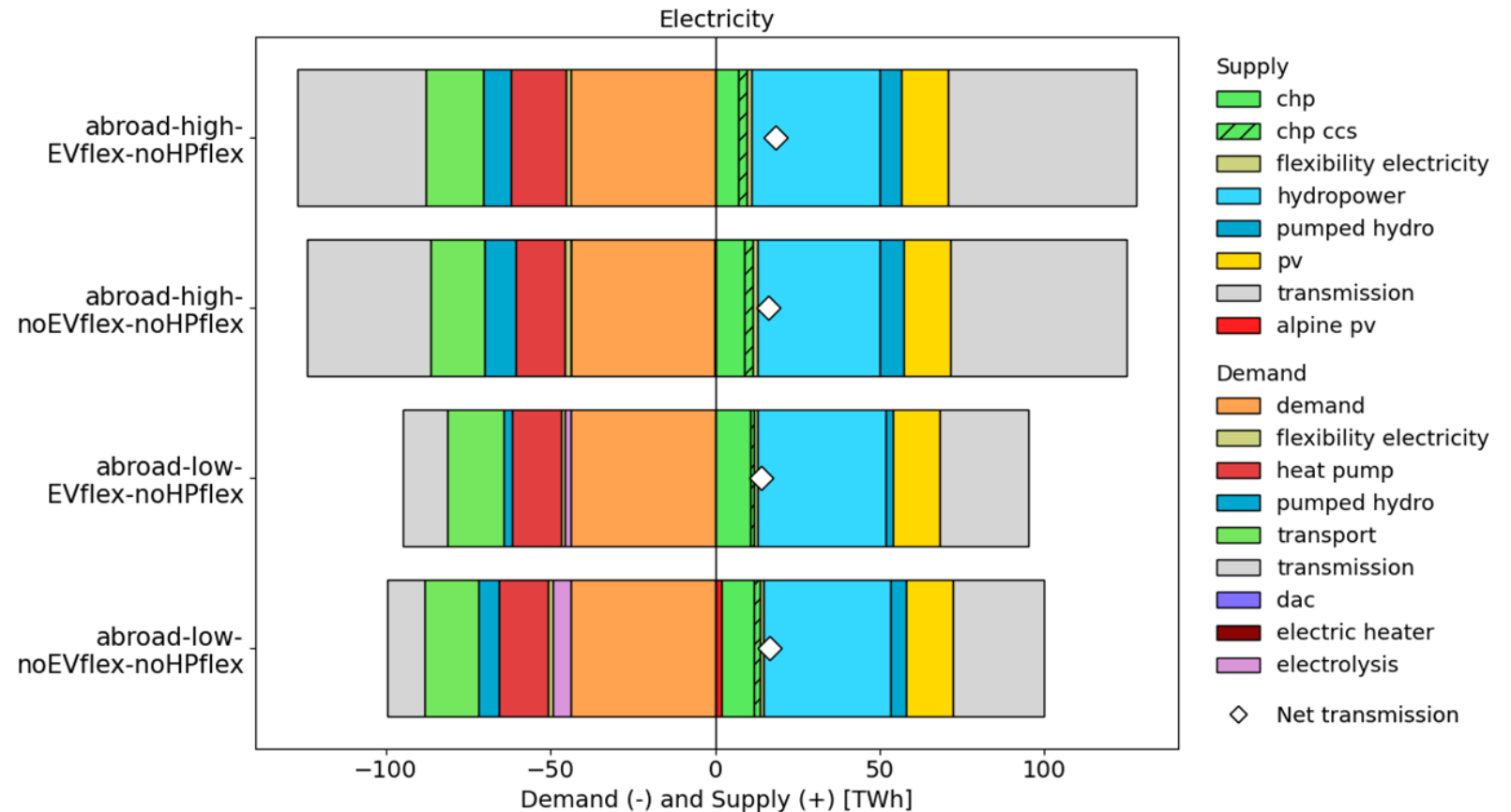


PATHFNDR scenarios



Direct electrification is the cost-optimal option

- **Direct electrification** is the cost-optimal solution for **transport** and **heat** decarbonization.
- **Electricity import/export** and **CHP** plants provide additional flexibility when EV charging is not flexible.
- **Alpine PV** kicks in when fuel import/export and NTCs are constrained.

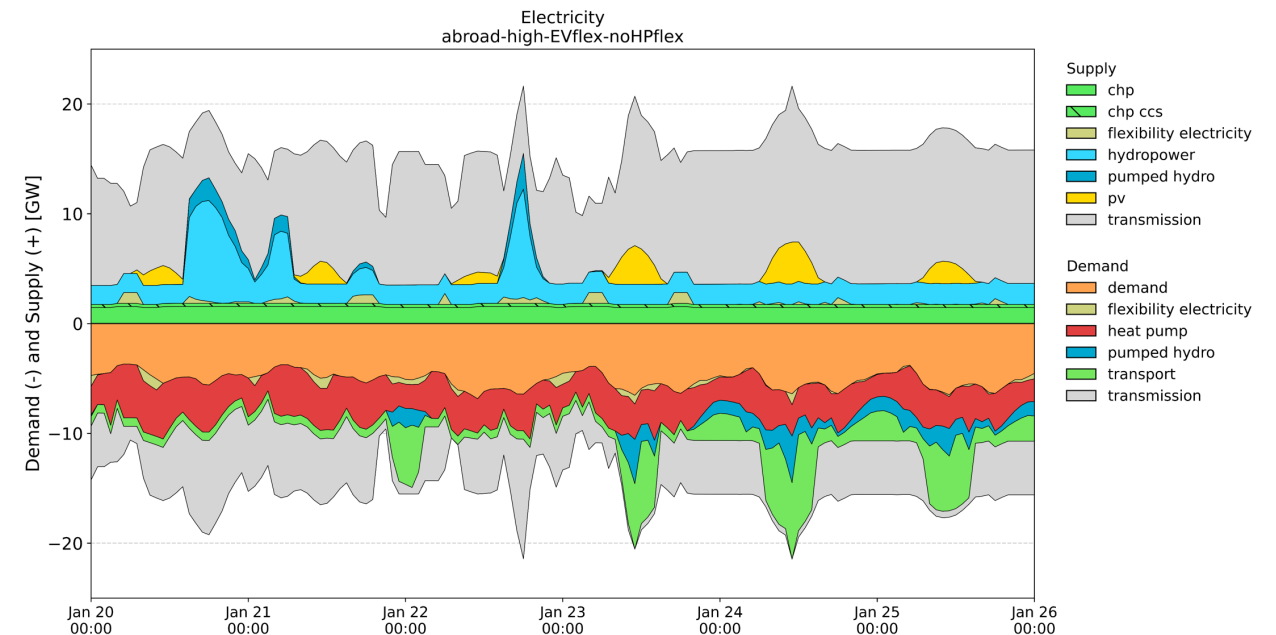
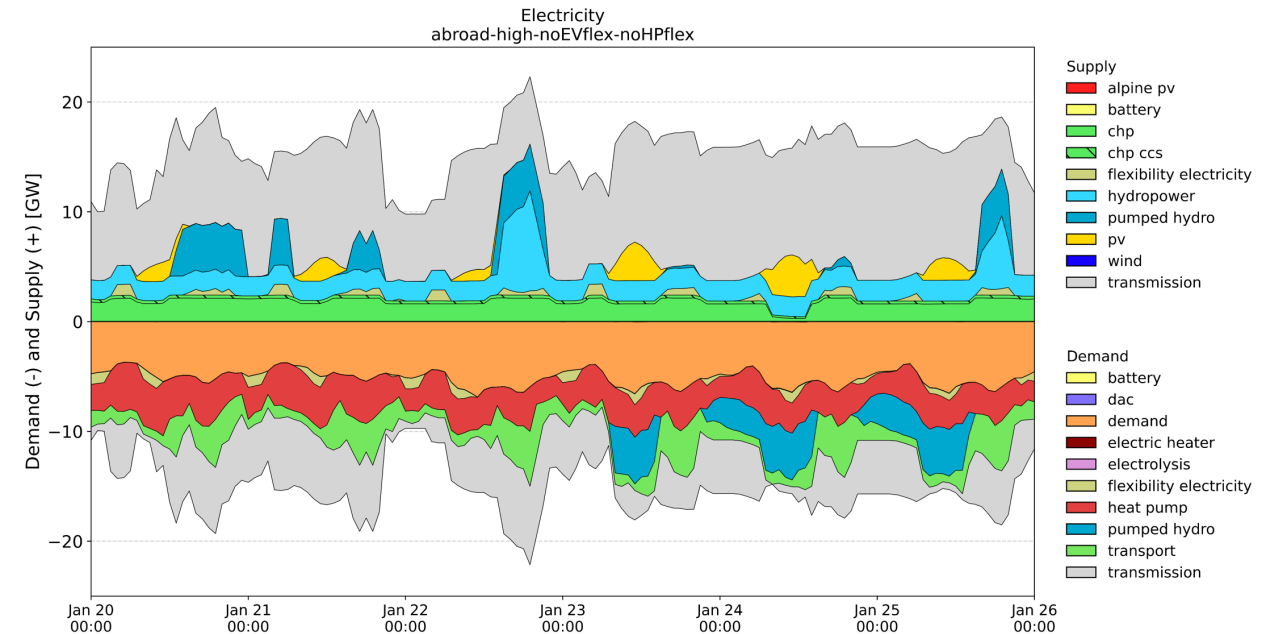


Yearly electricity balance in Switzerland in the selected scenarios.

The results are obtained from the EuroCalliope energy system model.

Flexibility demand and flexibility supply

- **Electric vehicles** are the best match for **PV generation**.
- Switzerland has flexibility options such as **transmission** and **hydro** but they are partly used for the domestic market. **EVs** can provide domestic flexibility.

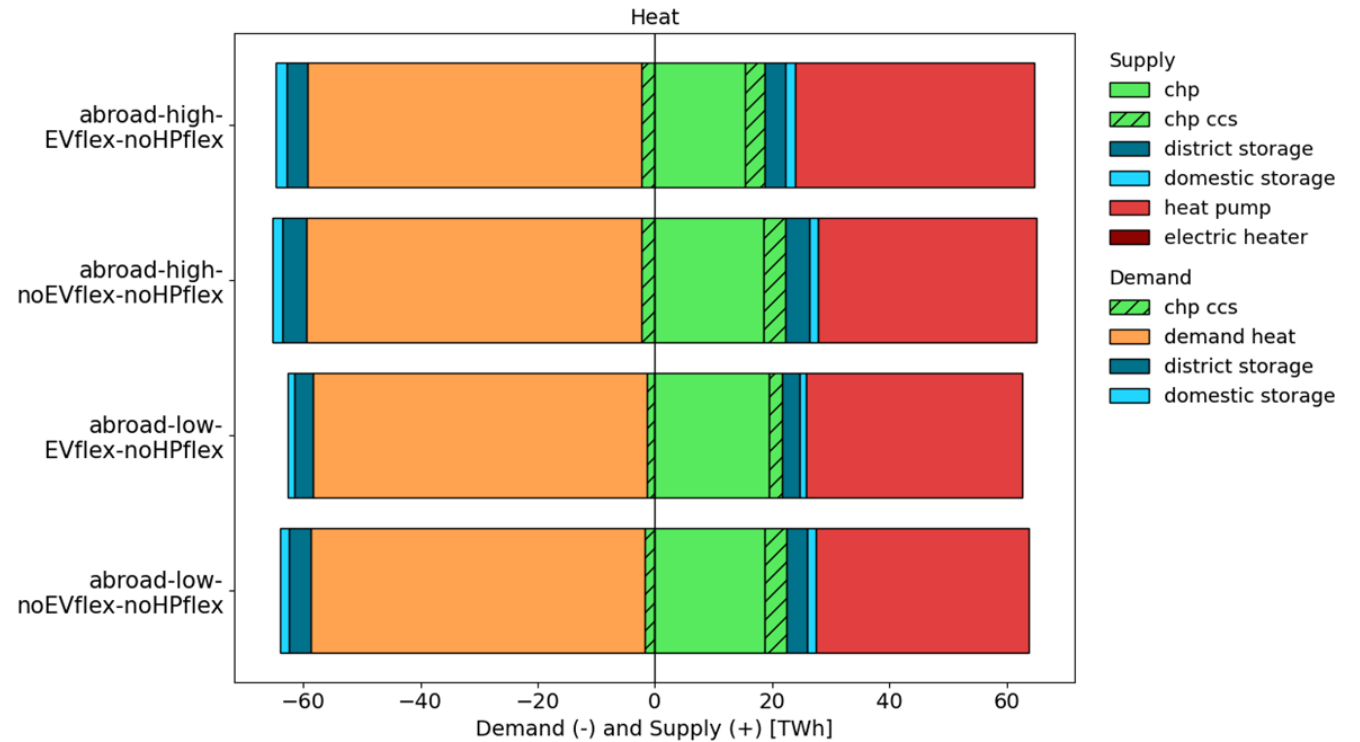


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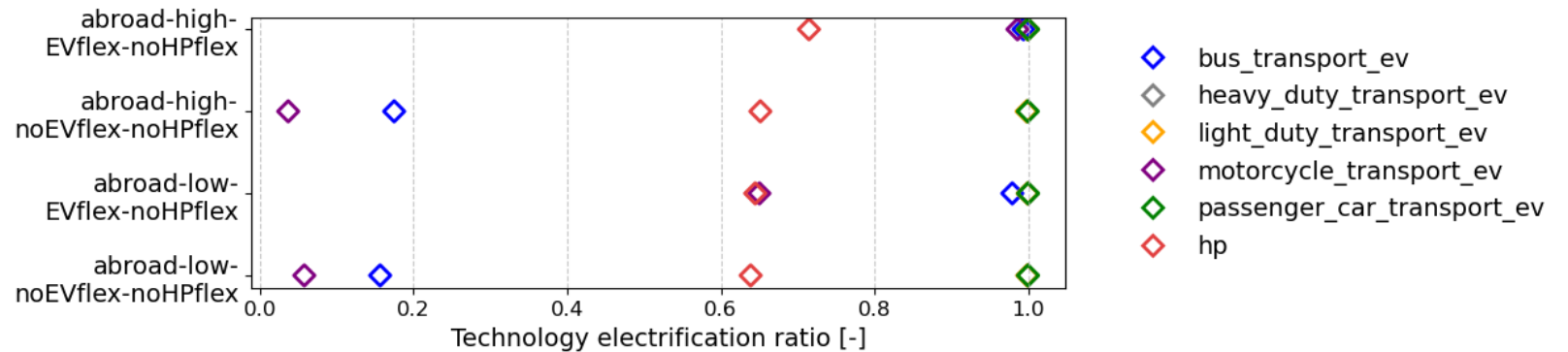
Interdependencies between sectors

- **EV flexibility** (when NTCs are not restricted) reduces the need for flexibility in the power sector that means **less CHP plants** deployment and **higher heat pump** penetration in the heat sector.

- **Low connections** and **low flexibility** reduce the electrification ratio.



Yearly heat balance in Switzerland in the selected scenarios.



Electrification rate of a selection of subsectors.

The **electrification of vehicles** adds flexibility to the power sector, reducing the need for dispatchable capacity – including combined heat and power plants – which in turn leads to greater **electrification of the heat sector** using heat pumps.