



TradeRES

New Markets Design & Models for
100% Renewable Power Systems

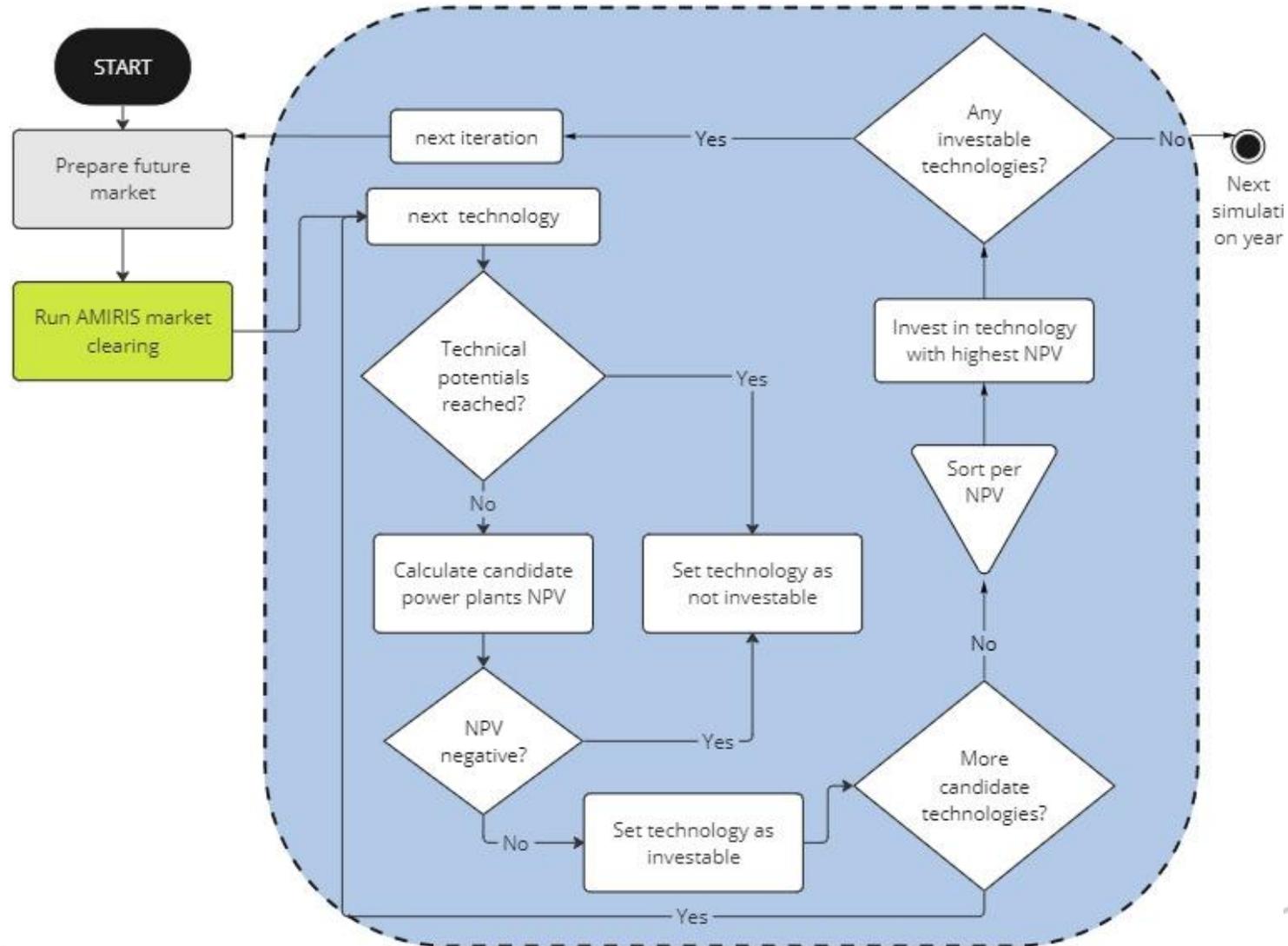
Coupling AMIRIS and EMLabpy



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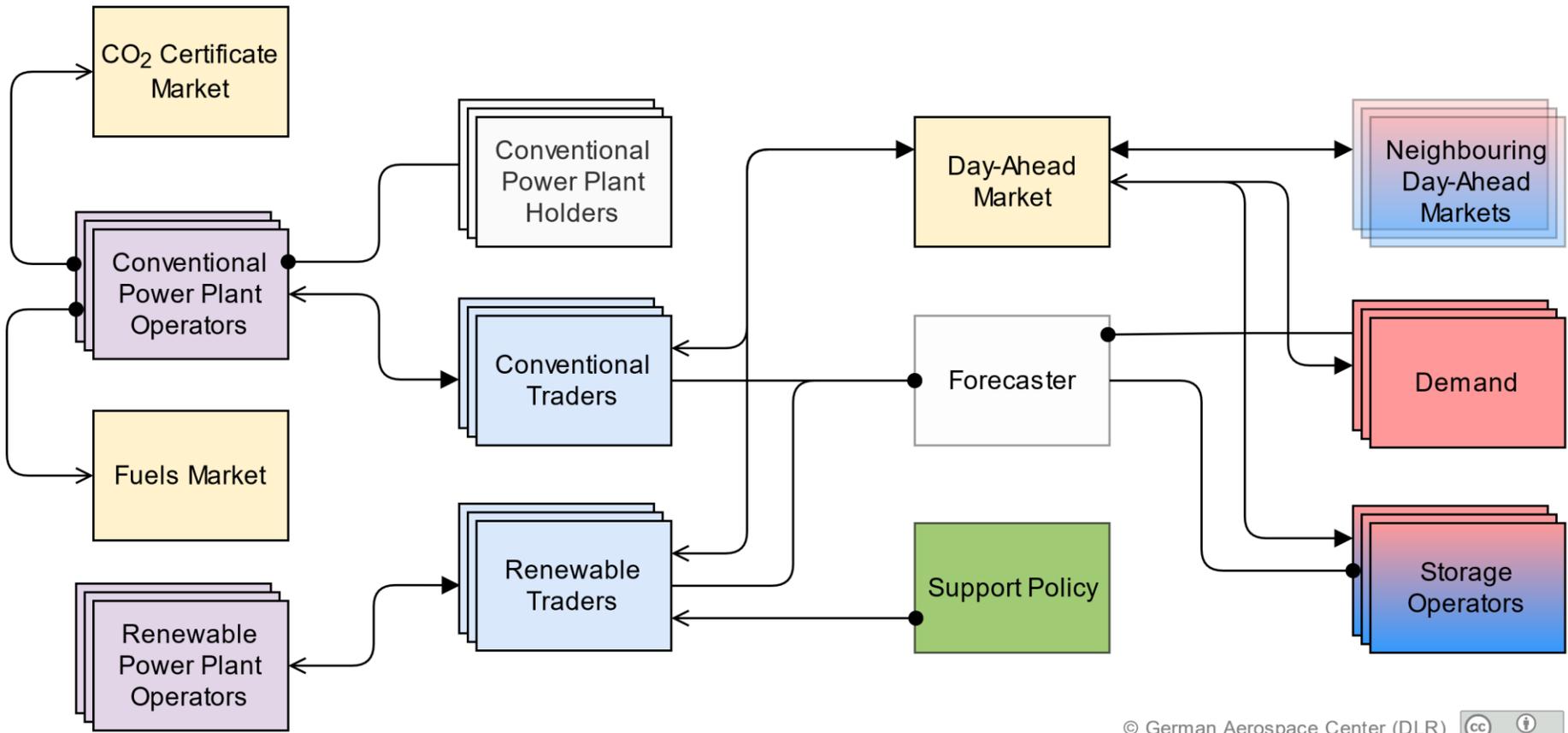
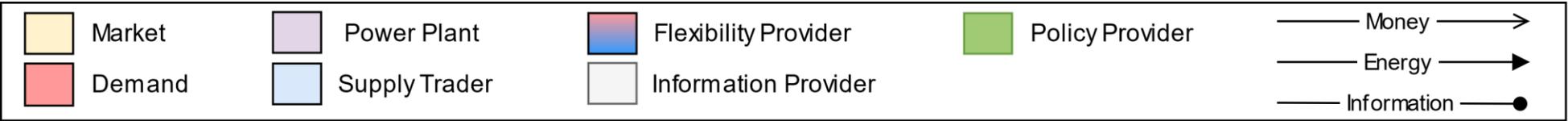
EMLabpy Investment



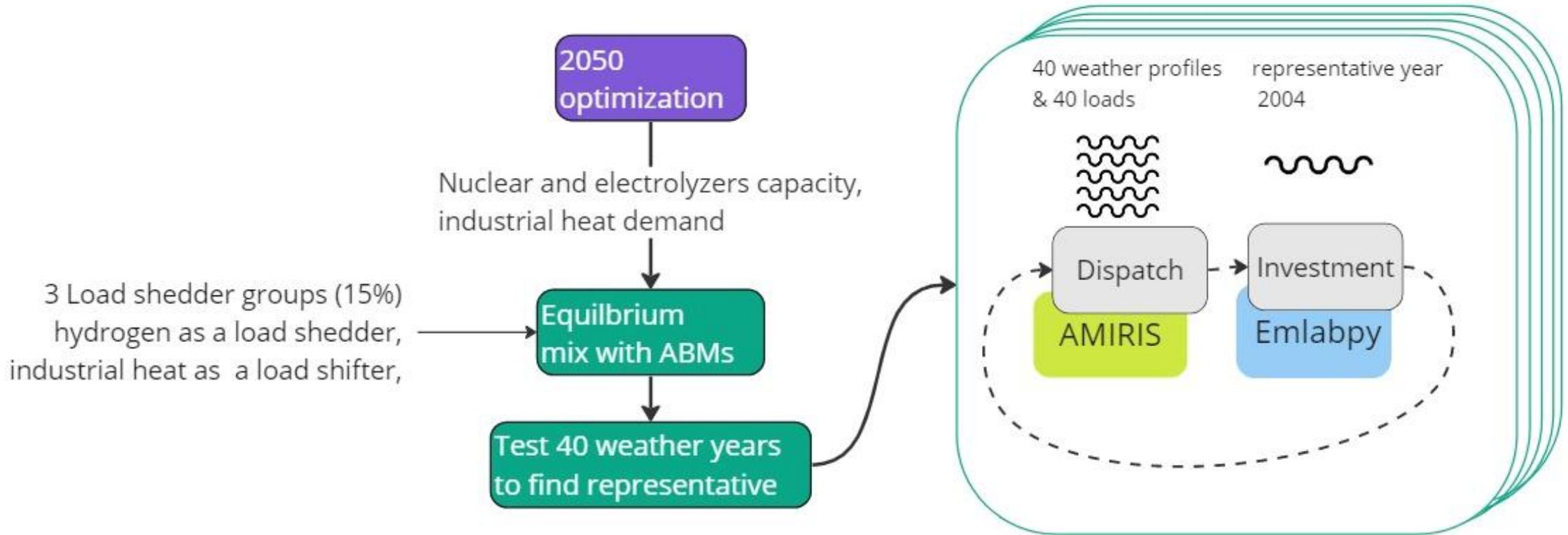


Dispatch simulation with AMIRIS

open **A**gent-based **M**arket model for the **I**nvestigation of **R**enewable and **I**ntegrated energy **S**ystems

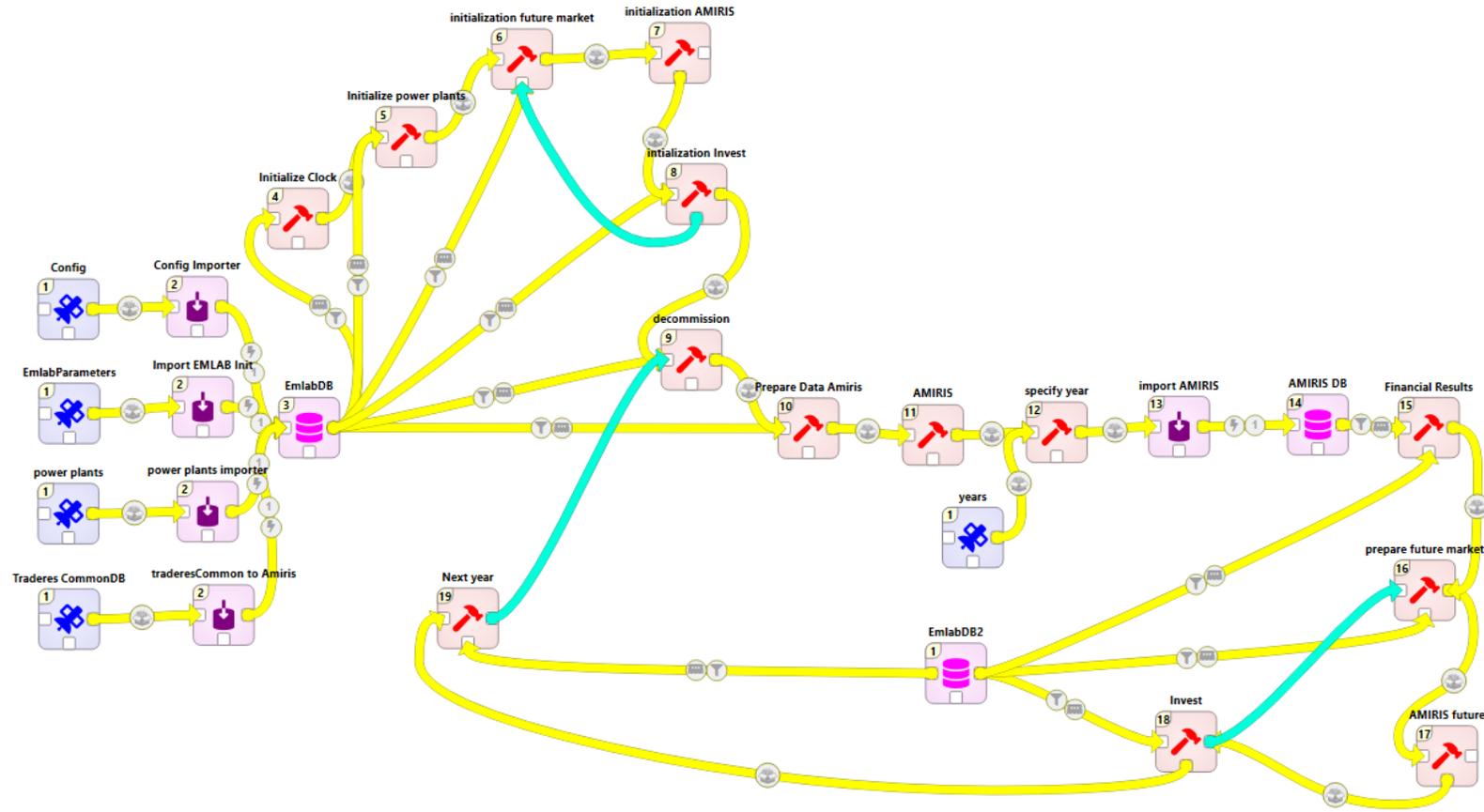


Coupling investment and dispatch ABMs



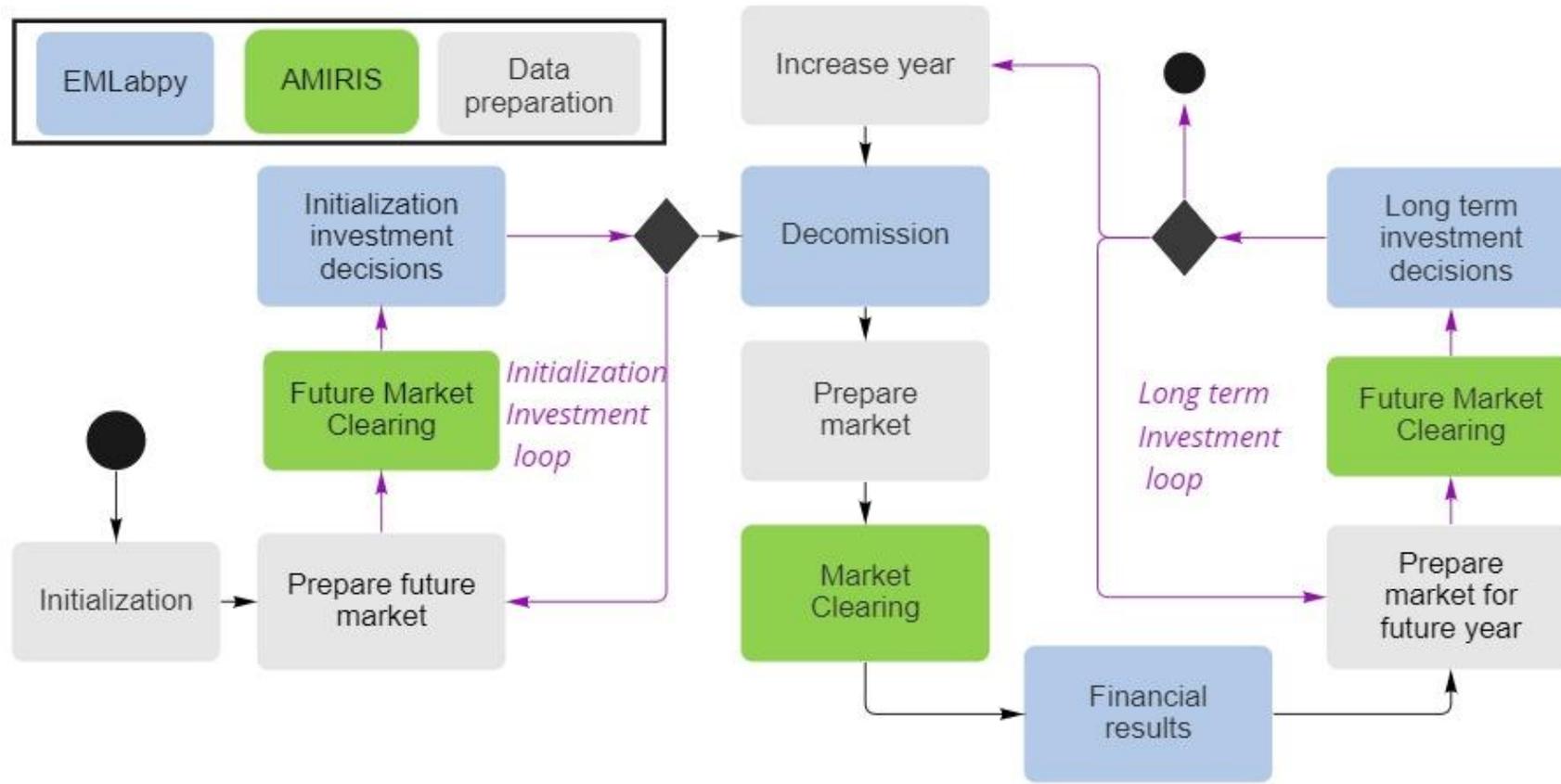


Coupling AMIRIS – EMLabpy in Spinetoolbox



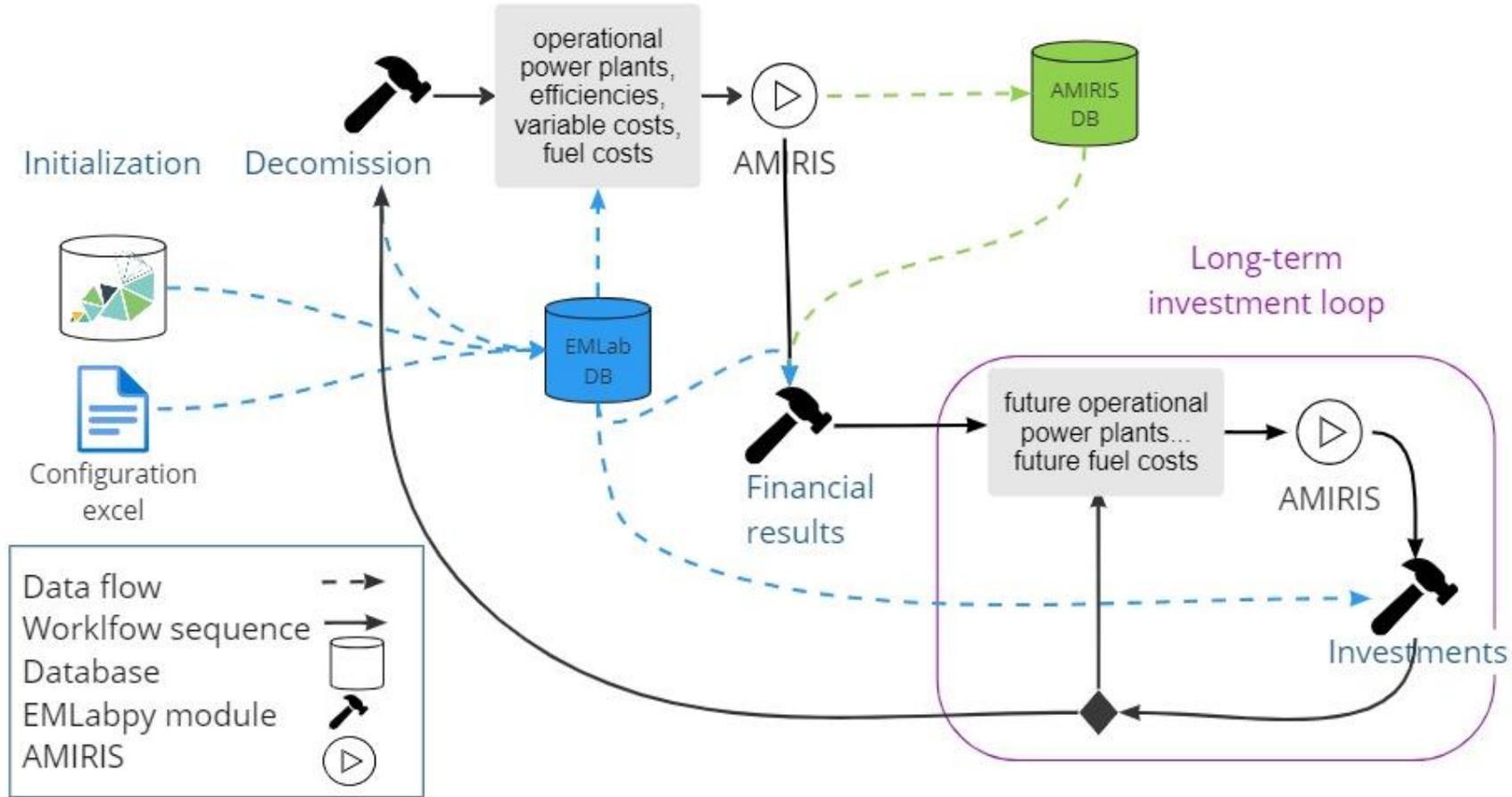


Workflow AMIRIS - EMLabpy





Data Transfer



Modelling flexibilities in AMIRIS

| Load | Load shifter | Type |
|----------------------|---|---------------|
| Flexible consumers | Percentage of load | Load shedding |
| Hydrogen | Constant demand corresponds to electrolyzer capacity | Load shedding |
| Industrial heat load | Load-shifting unit with an opportunity cost price cap | Load Shifting |
| Heat pump load | Yearly demand as a function of hourly temperature and hour of the day | Static |
| EV load | According to projected EV shares | Static |

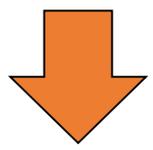


AMIRIS: Merit Order

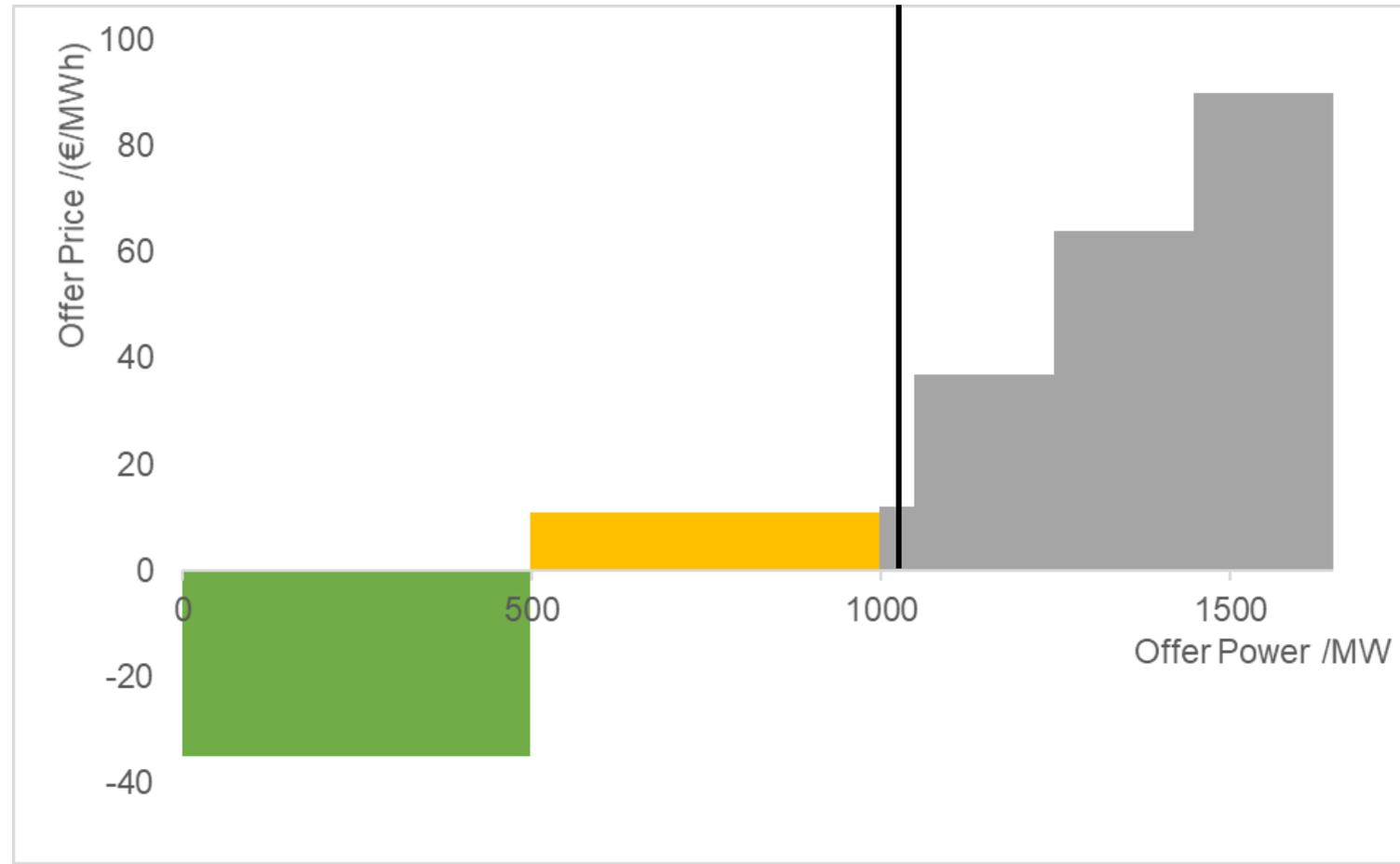
Energy Exchange Agent

- 1) Receive bids
- 2) Clear market
- 3) Send awards

| MW | €/MWh |
|-----|-------|
| 497 | 12 |
| 500 | 12 |
| 20 | 12 |



Trader



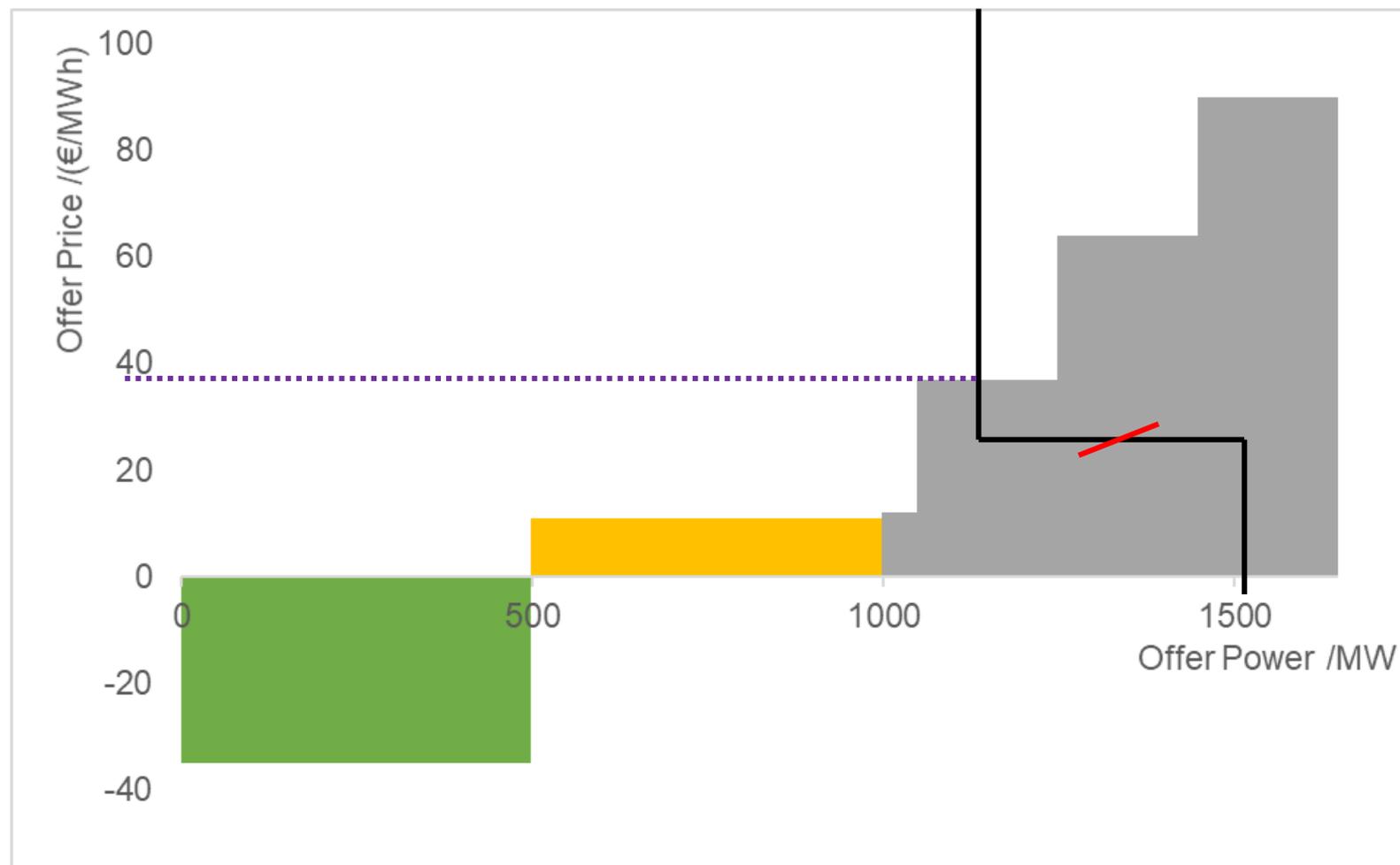


AMIRIS Flexibilities

Load shedding

- Demand bids with price < clearing price
- Offered demand price = value of lost load (VOLL)

| Group | VOLL |
|--------------|-------------------------|
| Inflexible | 4000 €/MWh |
| Industry | Tiered |
| Electrolyser | Value of H ₂ |

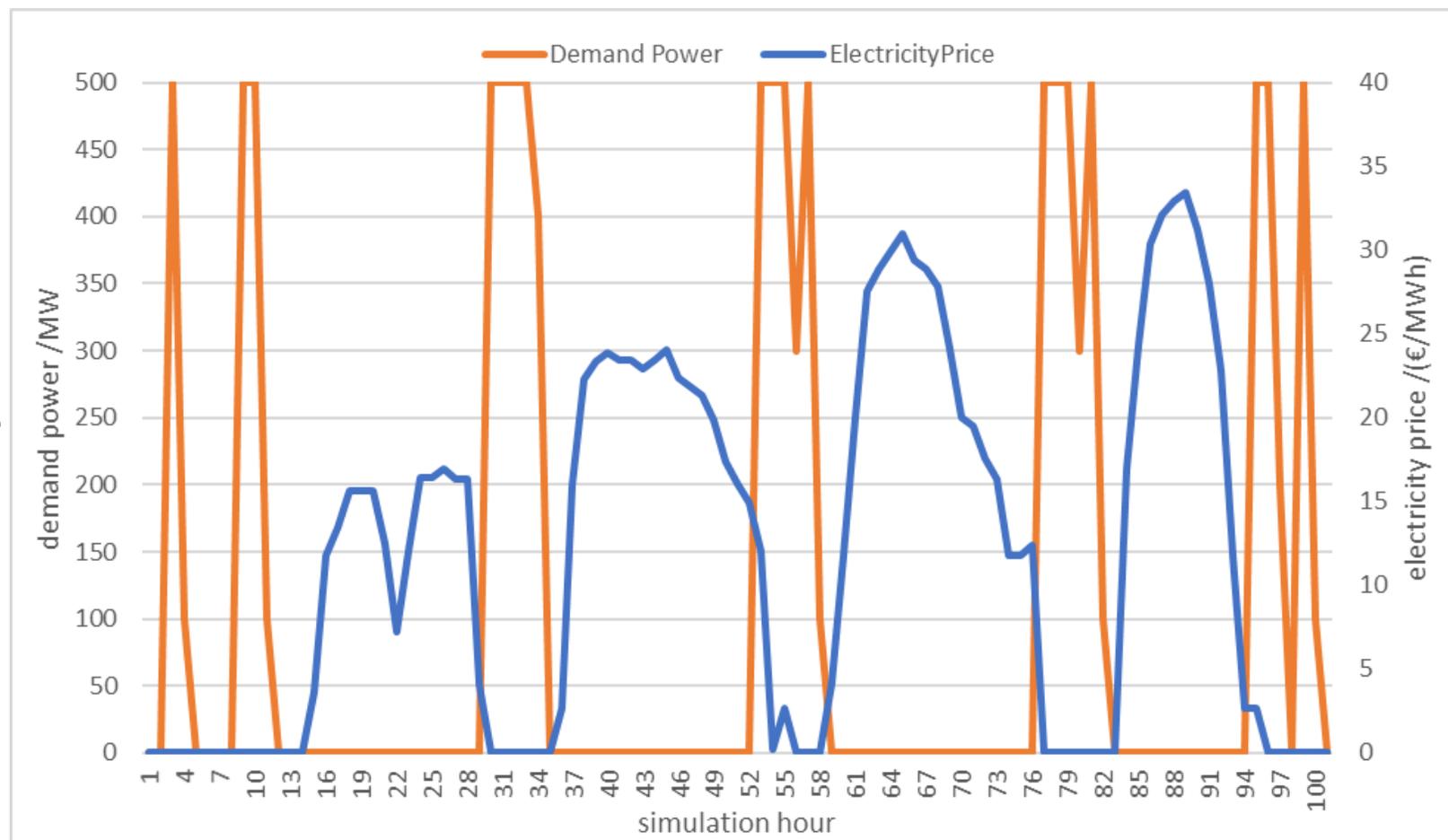




AMIRIS Flexibilities

Load Shifting: Simple solution

- Define timeframe and target demand total
- Shift demand within timeframe
- Reduce cost



Next steps:

- Transition scenario with CfD
- Capacity mechanisms

Open source (August 2023)

- <https://github.com/TradeRES>
- Public user guides





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Thank you!