

Components for grouped optimization

Link - ElectricalLine

Link

<https://oemof-solph.readthedocs.io/en/latest/reference/oemof.solph.html#oemof.solph.custom.link.Link>

- In-development component
- One link can connect two buses in both directions



- Possibility to convert the buses, different factors considering the direction
- ```
>>> link = solph.custom.Link(
... label="transshipment_link",
... inputs={bel0: solph.Flow(), bel1: solph.Flow()},
... outputs={bel0: solph.Flow(), bel1: solph.Flow()},
... conversion_factors={(bel0, bel1): 0.92, (bel1, bel0): 0.99})
```

# ElectricalLine

[https://oemof-solph.readthedocs.io/en/latest/reference/oemof.solph.html#oemof.solph.custom.electrical\\_line.ElectricalLine](https://oemof-solph.readthedocs.io/en/latest/reference/oemof.solph.html#oemof.solph.custom.electrical_line.ElectricalLine)

- In-development component
- Introduction of **ElectricalBus** object essential
- Mainly used in linear optimal power flow calculations
- **Reactance** of the line as a parameter
  - $flow(n, t) = \frac{1}{reactance(n, t)} * (voltage_{angle}(i(n), t) - voltage_{angle}(o(n), t))$

$\forall t \text{ in timesteps}, \forall n \text{ in ElectricalLines}$

# ElectricalLine

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```

b_el0 = custom.ElectricalBus(label="b_0", v_min=-1, v_max=1)

b_el1 = custom.ElectricalBus(label="b_1", v_min=-1, v_max=1)

b_el2 = custom.ElectricalBus(label="b_2", v_min=-1, v_max=1)

es.add(b_el0, b_el1, b_el2)

es.add(custom.ElectricalLine(input=b_el0, output=b_el1,
 reactance=0.0001,
 investment=Investment(ep_costs=10),
 min=-1, max=1,))

```

# Use examples

- Link:
  - [oemof-moea/liboemof.py at master · matpri/oemof-moea \(github.com\)](#)
  - [OSeEM-DE/base-NDE-SDE.py at master · znes/OSeEM-DE \(github.com\)](#)
- ElectricalLine:
  - [oemof-examples/lopf.py at master · oemof/oemof-examples \(github.com\)](#)

# More parameters ?

- If a more detailed model is required, the OEMOF.TABULAR package offers costs in relation with the link created: capacity costs and activity costs
- [oemof.tabular package — oemof.tabular 0.0.2dev documentation \(oemof-tabular.readthedocs.io\)](https://oemof-tabular.readthedocs.io)