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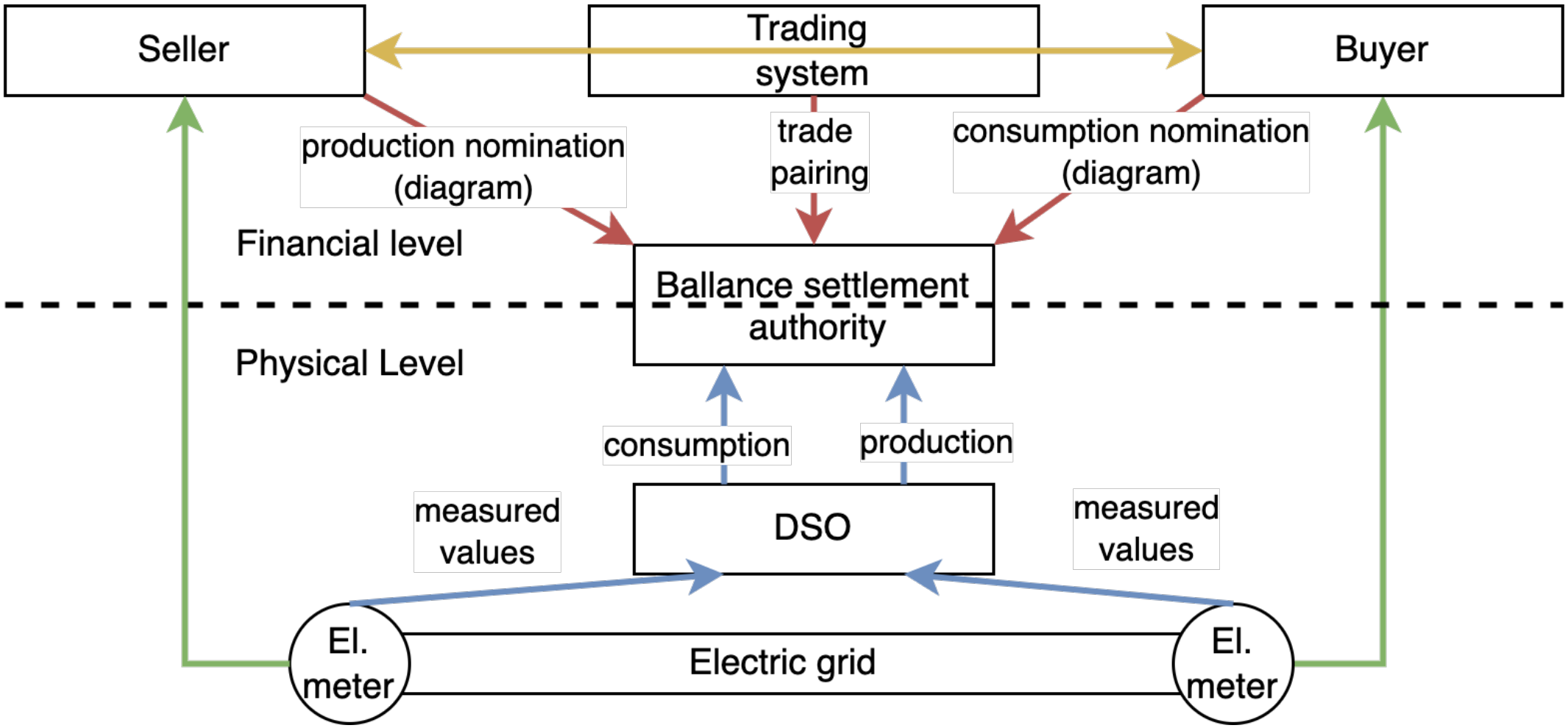
Balance in power grid



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Local and system (im)balance

- If the real consumption/production of some subject differs from the schedule, the subject exhibits **imbalance**
- Summed imbalance for all subjects connected to power grid represents **system imbalance**
- Significant system imbalance may lead to technical problems, even blackout **blackout**.
- To make the grid stabile, the system imbalance shall be neutralized. The main tool for this is the **regulation energy**. A grid operator monitors the grid and in case of system imbalances adds **positive** or **negative** regulation energy into grid, just to **neutralize** the system imbalance.

Lack of energy in the power grid	Redundance of energy in the power grid
occurs if producers produce less energy as scheduled and/or consumers consume more as scheduled.	occurs if producers produce more energy as scheduled and/or consumers consume less as scheduled.
frequency decrease (below 50 Hz)	frequency increase (above 50 Hz)
positive regulation energy needs to be added (more energy supplied to the grid)	negative regulation energy needs to be added (more energy consumed from the grid)