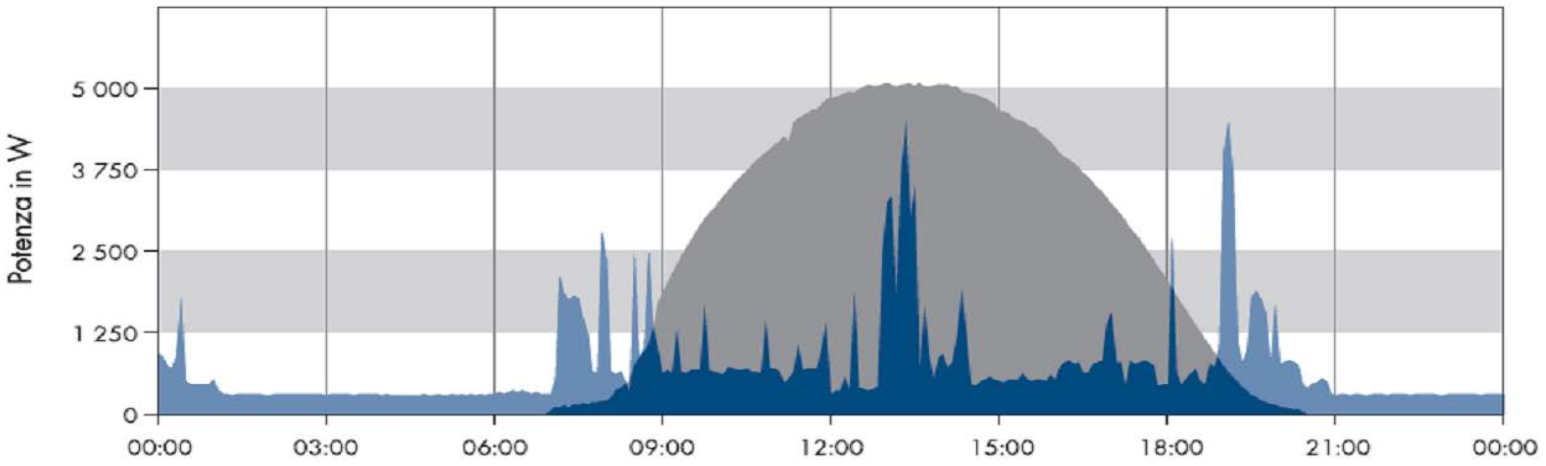
Balancing and curtailment

Matteo Leonardi

Accra, 17th October 2013

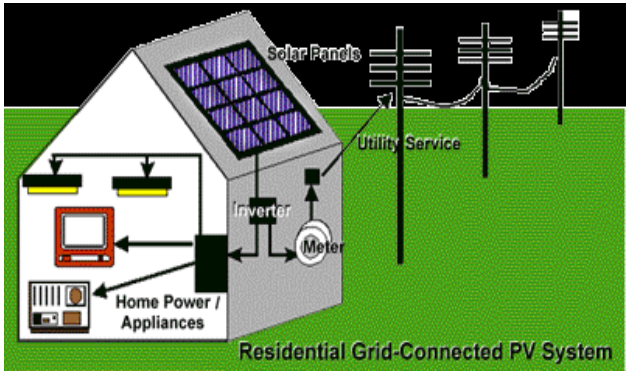
- Net metering is an exchange of electricity between a private consumer who has installed a production unit in his premises, and the local distribution company/public utility.
- The renewable electricity inputs are converted into electricity credits that the owner can use, free of cost, when its system is not operating.
- Net metering is a consumer based renewable incentive, where the owner of the system uses the national grid as a storage for the electricity produced in excess. NM was created to regulate electricity exchanges from domestic PV system. It may be extended to all renewables.



Example

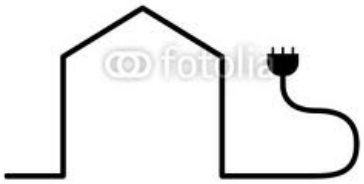
500kWh are simultaneously consumed in the house

1kW PV produces 1500kWh per year



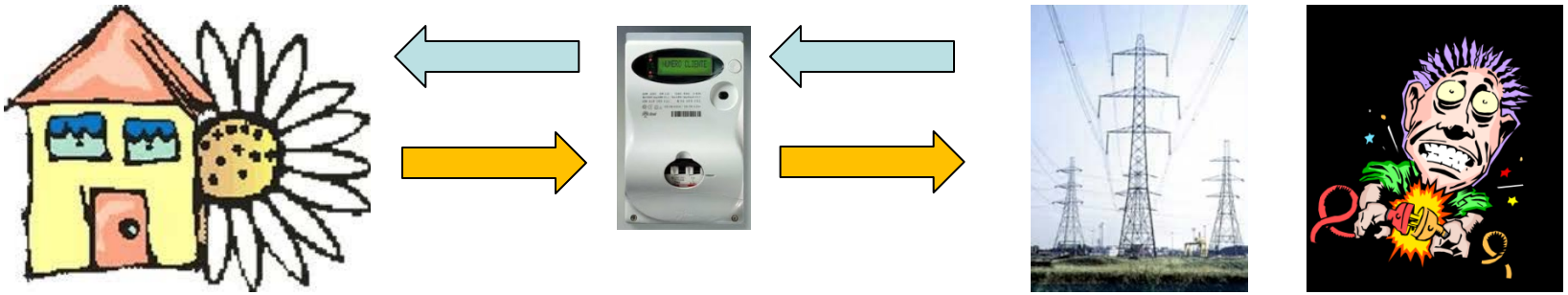
1000kWh an fed into the local grid LV

When the PV is not producing and the house is consuming energy the "grid" gives me back for free 1000kWh



Consumption exceeding 1500kWh is bought at market price

Minimum technical requirements



- A two directions meter to measure exchanges of electricity with the grid
- An inverter with adequate security standards to disconnect the system at specific voltage and frequency levels.
- The system must disconnect when there is a grid outage

Regulatory tasks usually associated with NM

- ✓ Technical aspects: net metering plants are connected at low voltage. The DSO has probably no experience in LV plant connection and two-direction metering. Technical connection rules have to be prepared and become national standards for all small RES system willing to apply to the net metering option.
- ✓ Economic aspects: The net exchange of electricity between the public utility and the power producer is regulated through the electricity bill. The regulator defines the rules for such exchange.
- ✓ Licensing: given their limited size a specific licensing procedure is normally not required for net metering installations. Technical certification of products respecting grid quality and security standards need, though, to be introduced.

Technical standards

- A simplified contract template should be produced to regulate the exchange of electricity between the system owner and the SO.
- The contract template also including the electricity quality standards to be adopted by the installation.
- The SO in charge of defying the standards if different from the International Electro-technical Commission IEC

Regulators mandates and net metering

- In fact, as net metering does not necessarily introduce an incentive for independent producers nor is normally seen as a violation to production concession rules, it may be directly introduced by regulators without a formal piece of primary legislation being approved. It is, in fact, a tariff option.

Why net metering

- Because it is a way to share with the national grid the excess production that would otherwise be wasted.
- Because it reduce transmission losses
- Because is the first step towards smart grids.
- Because there is a lot of installed PV capacity for back up reasons that can contribute to electricity demand in peak hours