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Smart metering concept

- Recommendation for Smart Metering
- Smart meters
- Examples of smart features
- Interfaces of smart meter

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Recommendation for Smart Metering

- Commission Recommendation 2012/148/EU defines **10 common** functionalities for smart metering systems
  - Provide **2-way communication** for maintenance and control
  - Allow **frequent enough data readings** for network planning
  - Provide **data readings directly to consumer** and/or any 3rd party
  - Upgrade **data readings frequently enough** to use energy saving schemes
  - Allow **remote data reading** by the operator
  - Provide **secure data communications**
  - Support **advanced tariff** systems
  - **Remote ON/OFF control** of the supply AND/**OR flow or power limitation**
  - **Fraud prevention** and detection
  - Provide import/export and **reactive metering**

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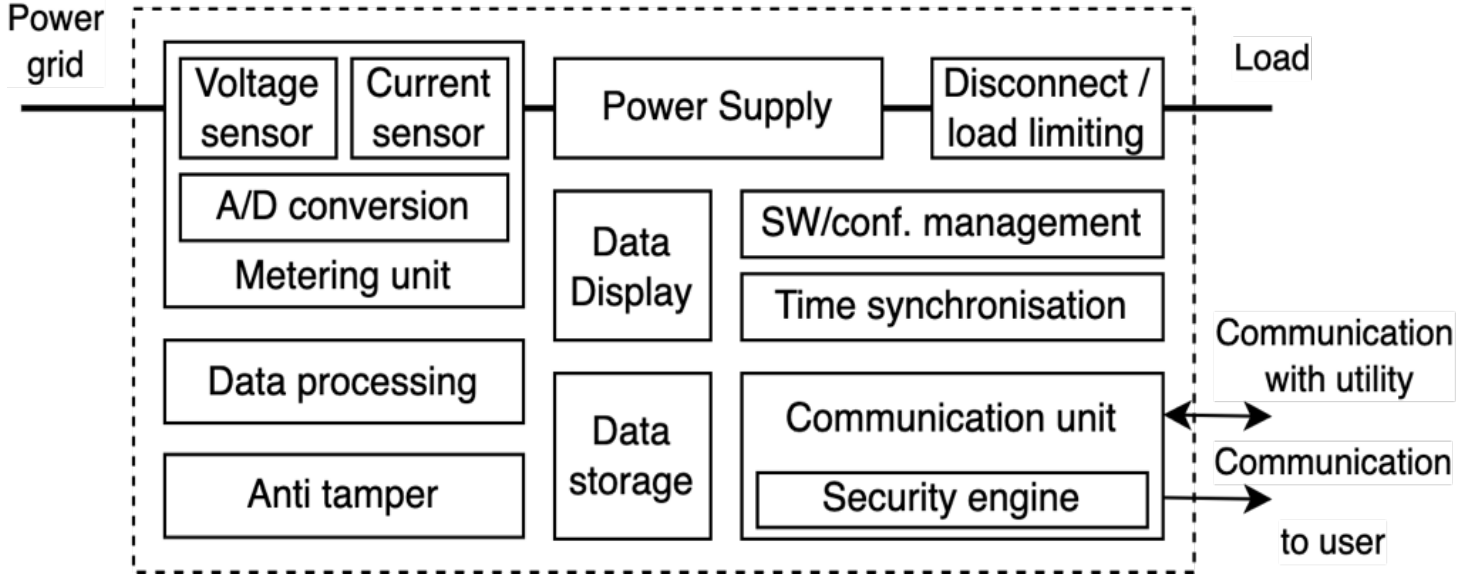
Smart meters

- Recommendations transposed to specific requirements
  - shift to autonomous operation under varying condition
  - more demanding secure
  - bidirectional communication properties
  - precise time management
  - remote management capabilities



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Smart features examples

- Good example of smart features are events
- There are four basic categories
  - Meter status events
    - “last gasp” (information about power failure)
    - “first breath” (information about power restore).
  - Power quality events
    - voltage sag / swell (shorter duration of higher/lower voltage)
    - high/low voltage alarms (longer duration of higher/lower voltage).
  - Meter tamper flags
  - Meter hardware information

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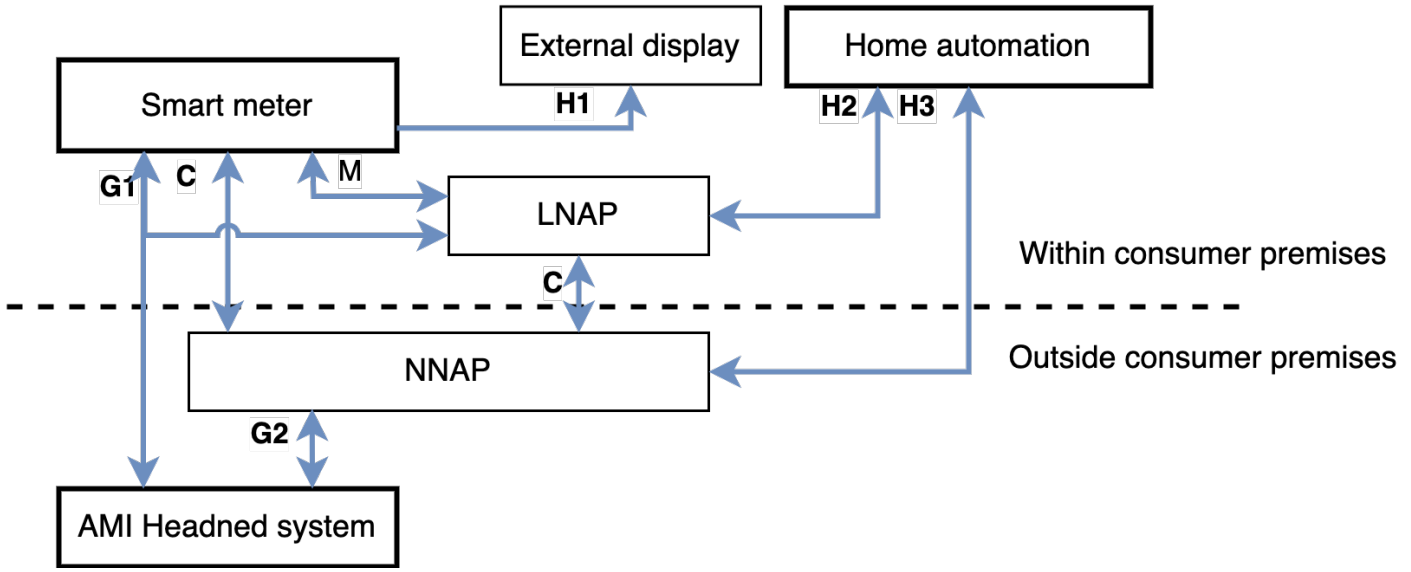
Interfaces of smart meter

- EU Directive 2019/944 defines standardized interface to automated energy efficiency programs
  - H1 interface connects the smart meter system to an external display
  - H2, H3 interfaces connects the smart meter to HEM
  - Data is shared with AMI headend or MDMS via G1 interface



- Every country prefers different communication technologies for the different interfaces H1-H3, G1-G2 and C
  - For the G1, G2 prevails GSM based technology (sometimes closer specified as GPRS, 3G, 4G, LTE, NB-IoT).
  - In the C interface prevails PLC (the NNAP device servers as data concentrator in this case).
  - The most varying are the preferences for the H interfaces.