

Motivation sustainable interoperability

The standards IEC 61850 „Communication networks and systems in substations“ and IEC 61400-25 „Communications for monitoring and control of wind power plants“ provide perfect support for **sustainable interoperability: Information Models, Information Exchange Methods, Protocol Mappings, and System Configuration Language (SCL)** for electric Power Systems (Generation, Transmission, and Distribution for HV, MV, and LV, ...).

Data Models

IEC 61850-7-4xx

Substations
150 LN
800 DO

Hydro Power
63 LN
350 DO

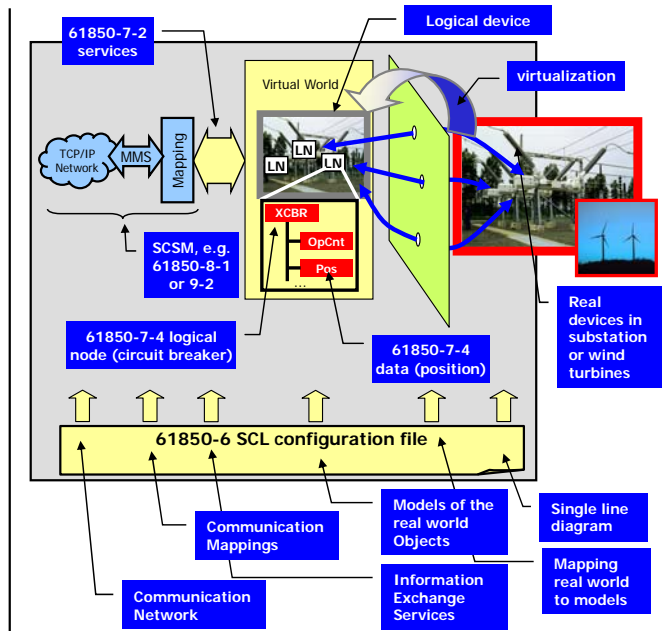
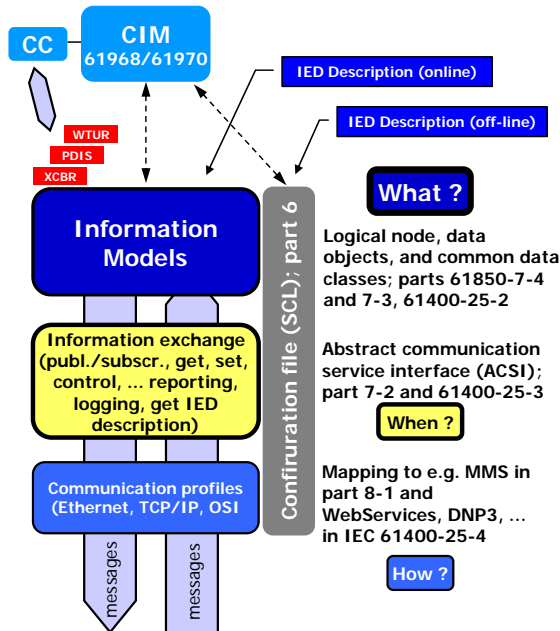
Decentralized Energy Resources
50 LN
450 DO

IEC 61400-25-2

Wind Power
16 LN
250 DO



Logical Nodes (LN) represent real-world **Inputs, Outputs, Ratings, and Settings of functions or equipment**. A LN provides a list of named data objects (DO). The LN „XCBR“ represents a real „circuit breaker“ with the data object (DO) „Pos“ (Position). IEC 61850-7-2 defines **Information Exchange Methods**, e.g., for the position (with Client/Server services, GOOSE, SV). A substation automation system is specified by a **SCL file** (IEC 61850-6).



Example: Measurement LN „MMXU“ represents power, voltages, currents, impedances, ... in a three-phase electrical system. The values can be communicated by various services. The LN „MMXU“ comprises values for measurements, monitoring, configuration, settings, description, and substitution. These values can be communicated by various services like read (polling), reporting, GOOSE, logging and log query. Recording and logging are build upon monitored value changes. The SCL configuration file .SCD (System Configuration Description) specifies the single line diagram of the substation, the information model, the parameters of the control blocks for reporting and logging, GOOSE, SV, the binding to the process and the data flow.

