

Activities of ITU-T on Smart Grid

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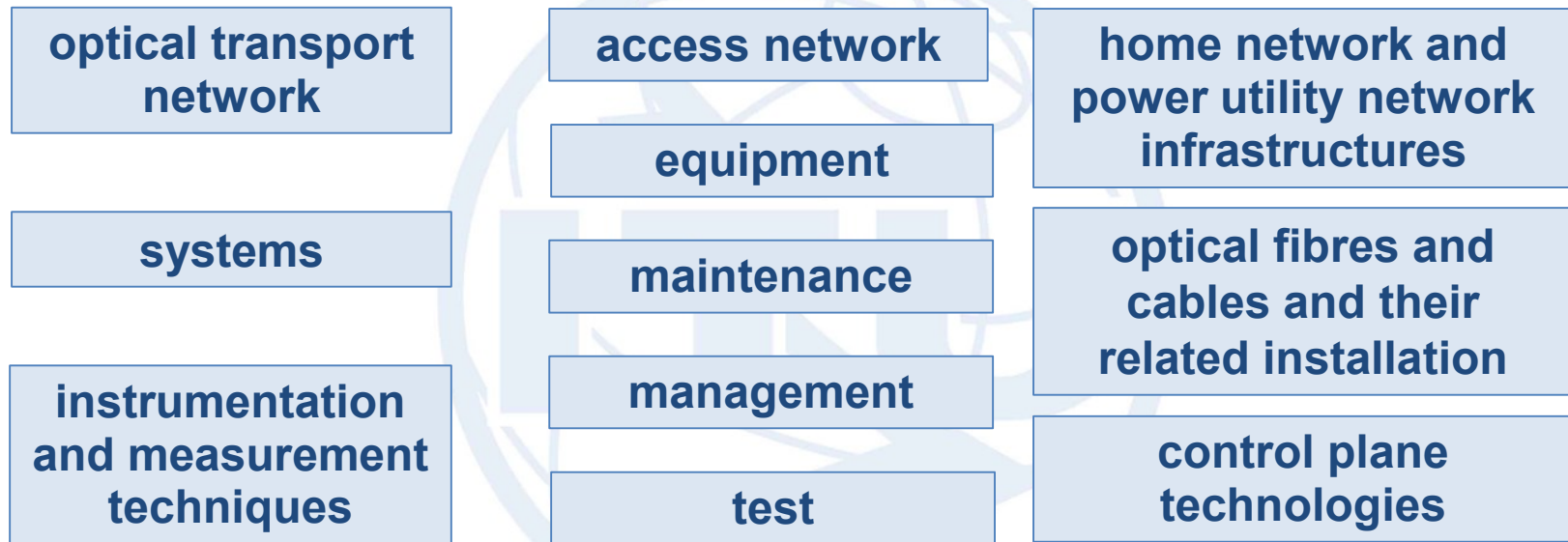


Smart Grid in ITU-T – related groups

- SG5: Environment, climate change and circular economy
- SG15: Transport, Access and Home (lead SG)
- SG20: Internet of things (IoT) and smart cities and communities (SC&C)

ITU-T SG15 - Terms of Reference

SG15 is responsible for the development of **standards** on:



to enable the evolution toward intelligent transport networks, including the support of smart-grid applications.

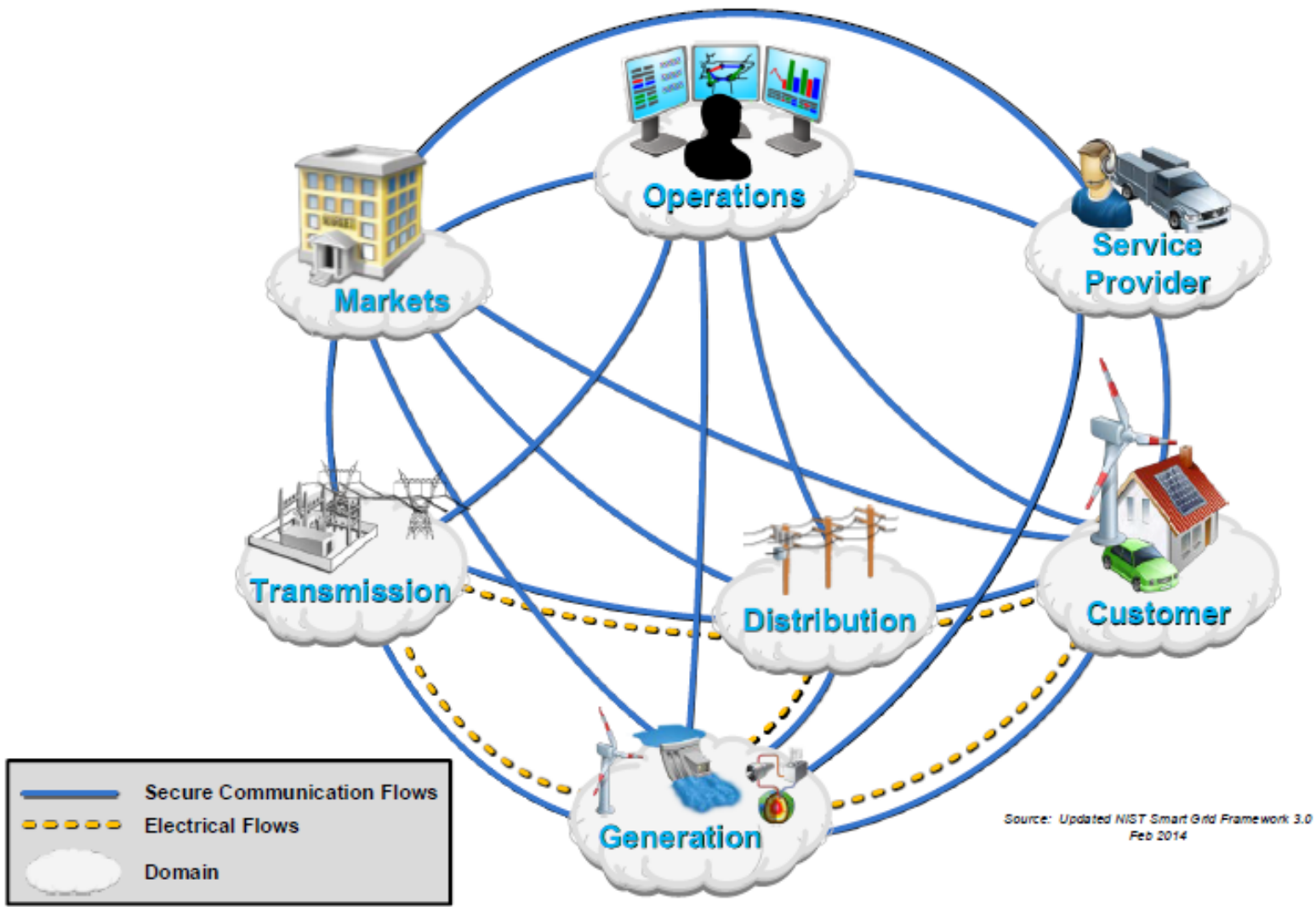
Access networks

- DSL (Digital Subscriber Line) – broadband access using existing copper infrastructure
- High speed access through fibre - PON (Passive optical networks)/FTTH
- G.fast/FTTdp - To provide the best aspects of 'fibre to the home' and 'ADSL'

Networks in a household

- Home networking (G.hn) – broadband
- Powerline communication(PLT) – narrowband for a smart grid

Smart Grid conceptual model



Source: NIST Framework and Roadmap for Smart Grid Interoperability Standards, Release 3.0



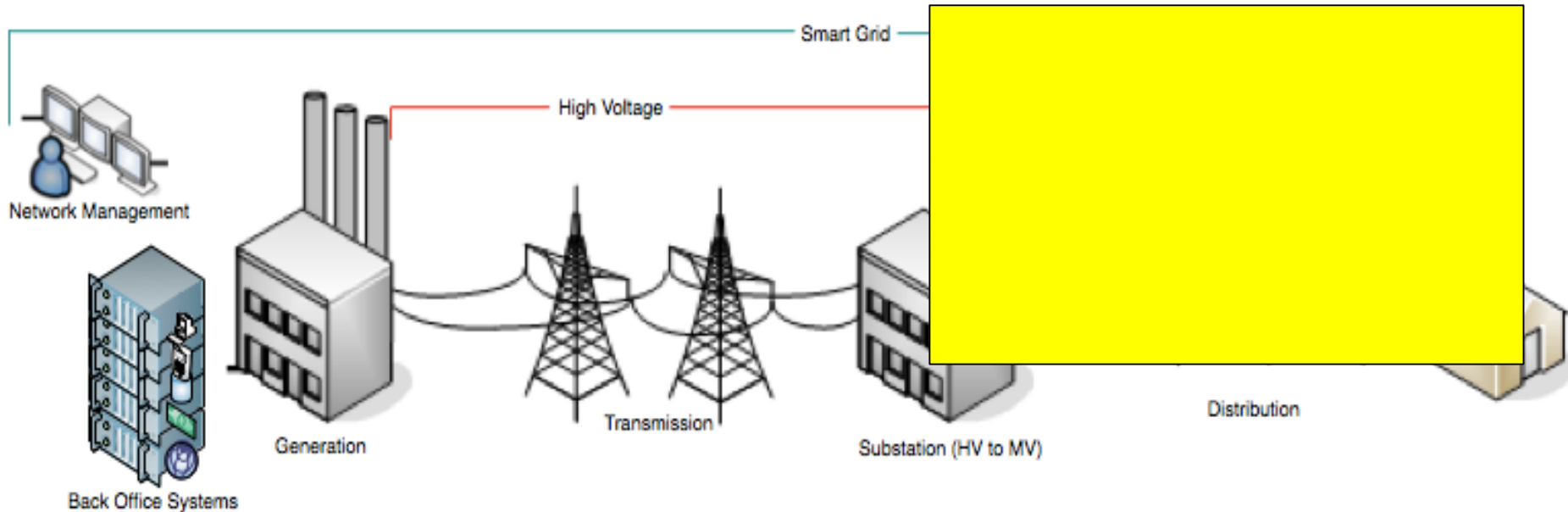
Role of ICT in Smart Grid

- The fundamental challenge in **power grids** is to ensure the balance of generation and demand/consumption
- The fundamental challenge in the **Smart Grid** is to ensure balance of generation and demand/consumption when integrating all those new technologies that are aimed at addressing in a sustainable manner energy independence and modernization of the aging power grid:
 - Utility scale Renewable Energy Sources (RES) feeding into the transmission system
 - Distributed Energy Resources (DER) feeding into the distribution system
 - Plug-in (Hybrid) Electric Vehicles (PHEV)
 - Demand Side Management (DSM)
 - Consumer participation
 - Storage to compensate for the time varying nature of some renewables

Source: S. Galli, A. Scaglione, Z. Wang, "For the Grid and Through the Grid: The Role of Power Line Communications in the Smart Grid," Proceedings of the IEEE, June 2011.



Smart Grid Communication



- ITU-T G.9901 (04/2014): Narrow-band OFDM power line communication transceivers - Power spectral density (PSD) specification.
- ITU-T G.9902 (G.hnem) (08/2013): Narrow-band OFDM power line communication transceivers – G.hnem Cenelec A, B, CD, and FCC.
- ITU-T G.9903 (G3-PLC) (08/2015): Narrow-band OFDM power line communication transceivers – G3-PLC Cenelec A, B, FCC and ARIB bandplan.
- ITU-T G.9904 (PRIME) (10/2012): Narrow-band OFDM power line communication transceivers – PRIME Cenelec A.
- ITU-T G.9905 (11/2016): Centralized metric-based source routing

ITU-T SG5 - Mitigation of climate change and improving energy efficiency

- Report: “Boosting Energy Efficiency Through Smart Grids”
- Details are at <http://www.itu.int/ITU-T/climatechange/report-smartgrids.html>
- This report discusses the role of ICT in the smart grid with a view of energy efficiency, with the ultimate goal of hindering climate changes.

