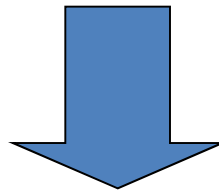# The demand and generation flexibility management of customer energy resources in the SG-CG and IEC context
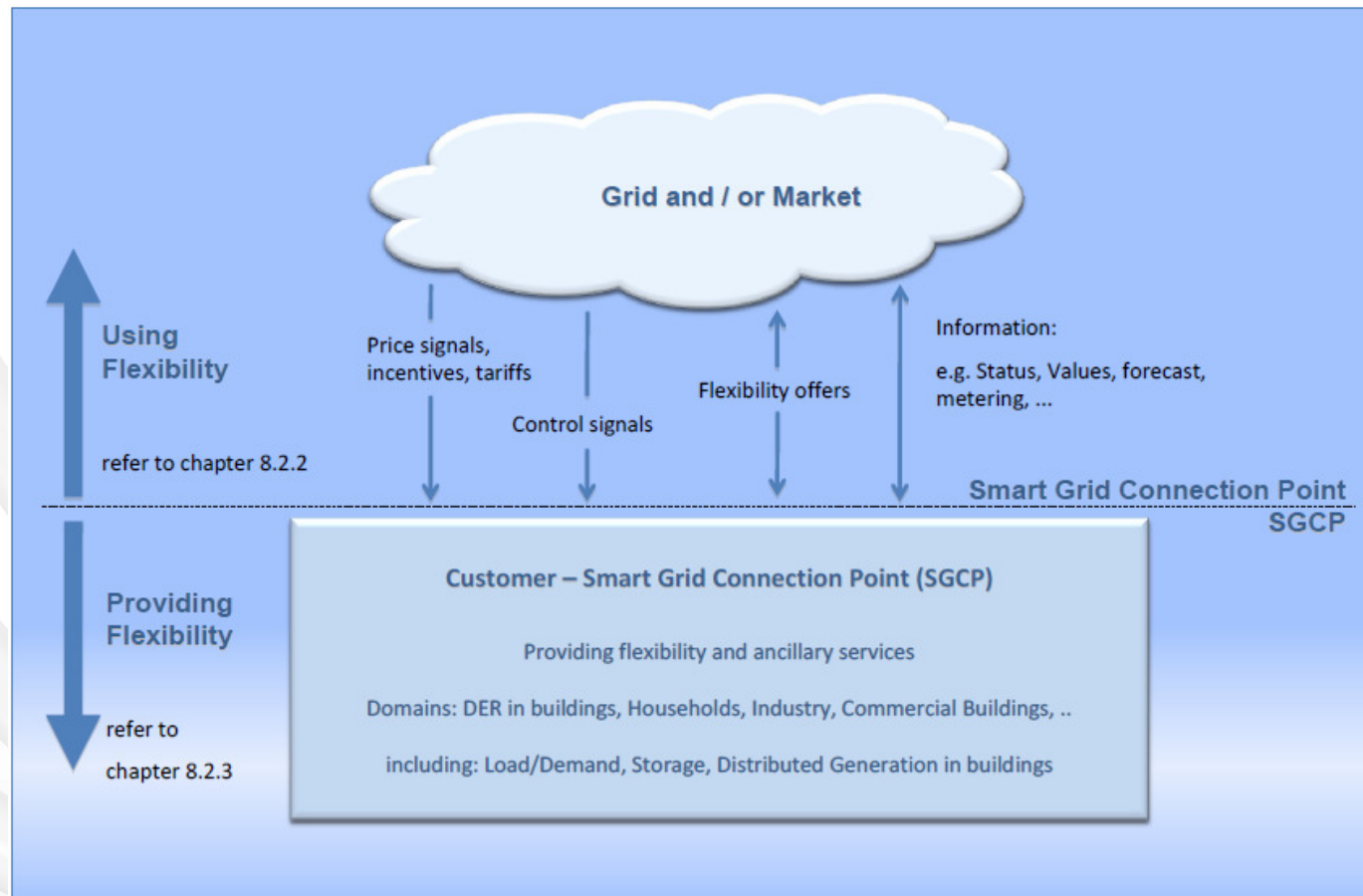
Daniele Pala

Smart Grid Standardization and Mandate in Europe

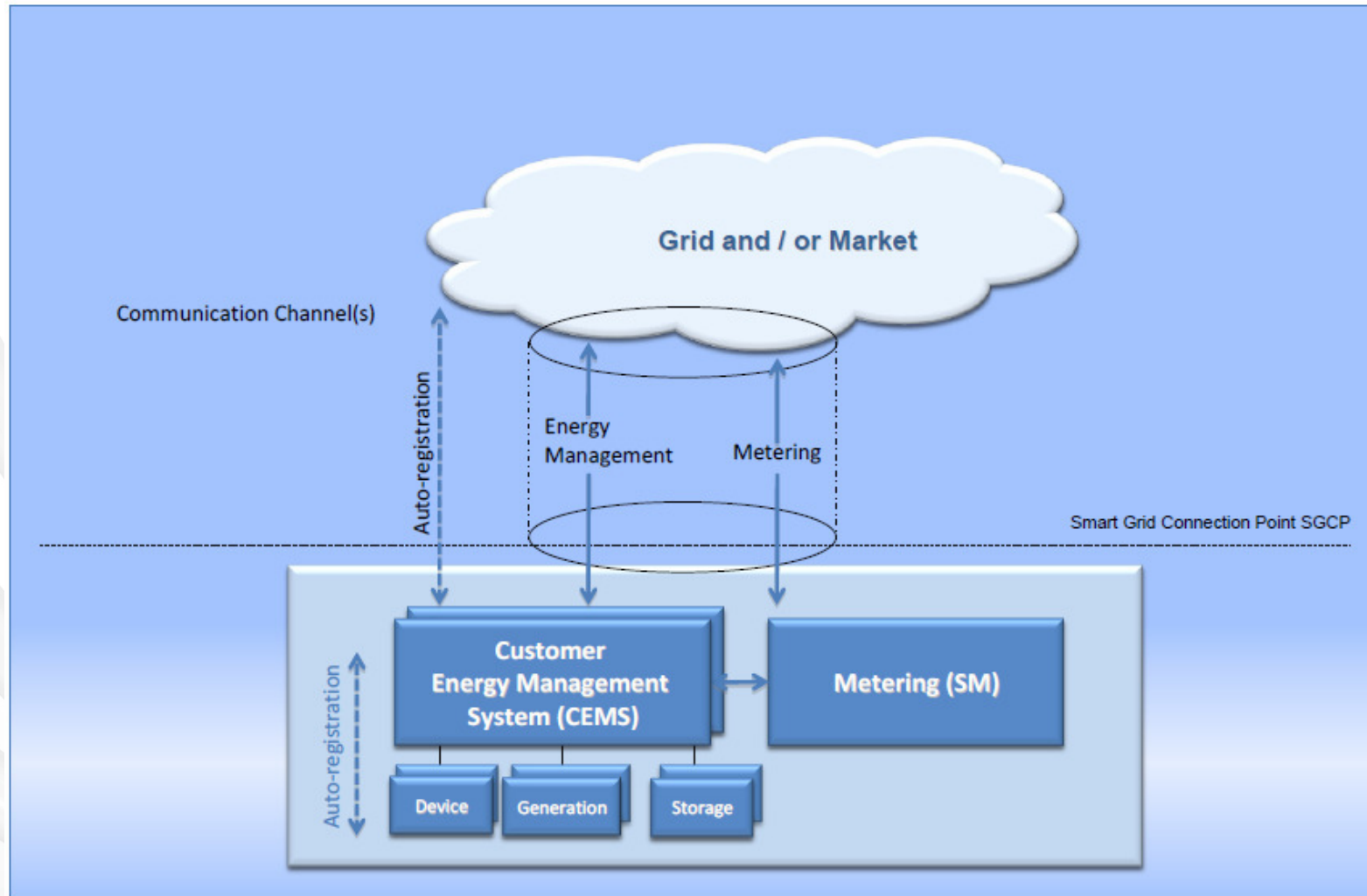- Standardization Mandate M/490 "Smart Grid" of the EU commission

- Smart Grid Coordination Group (SGCG)
  - CEN/CENELEC/ETSI
  - Kick-off (officially): *July 2011*
  - Task: *working on and coordinating the SG Mandate*
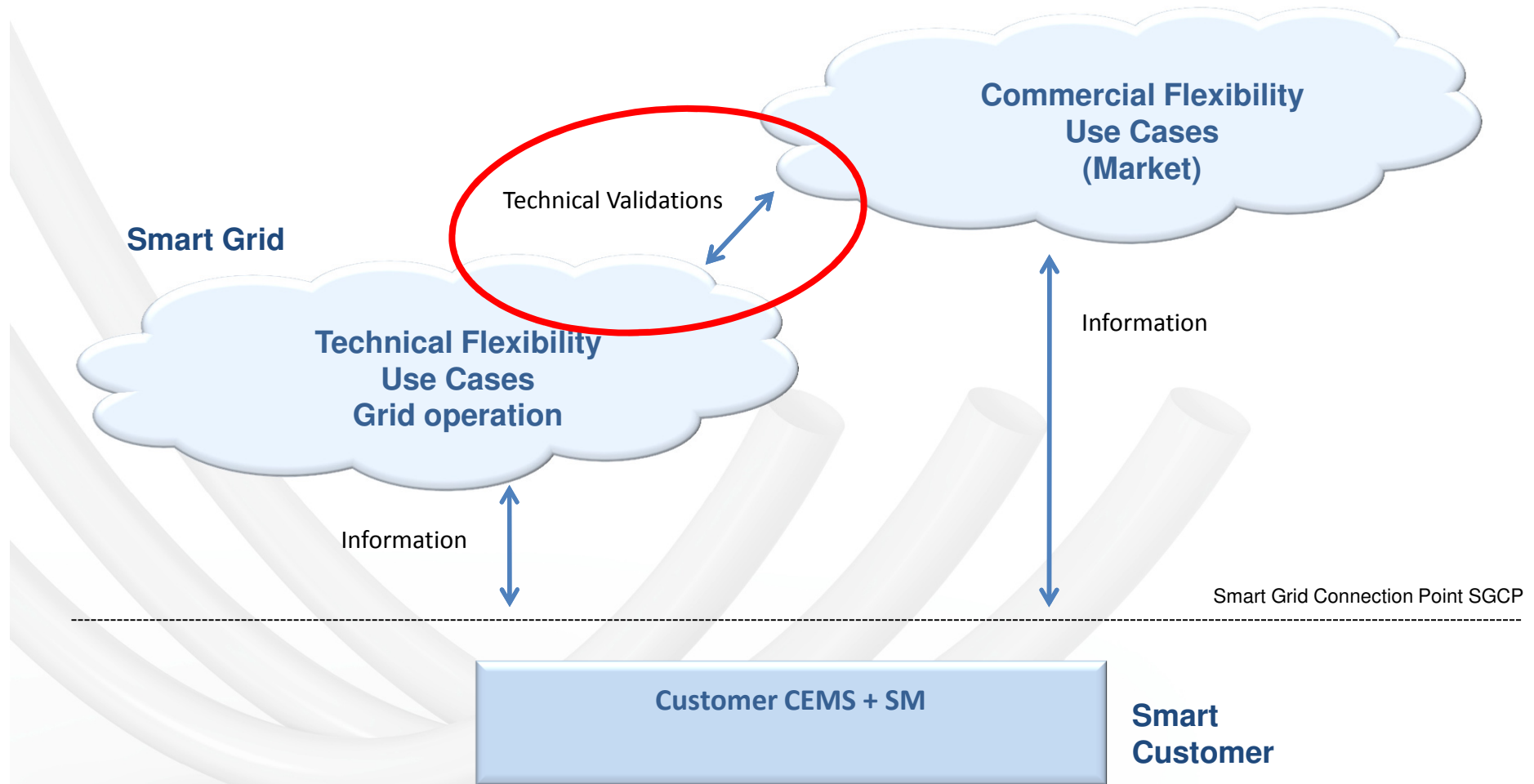 - Time frame: *until 2012 + iterations*

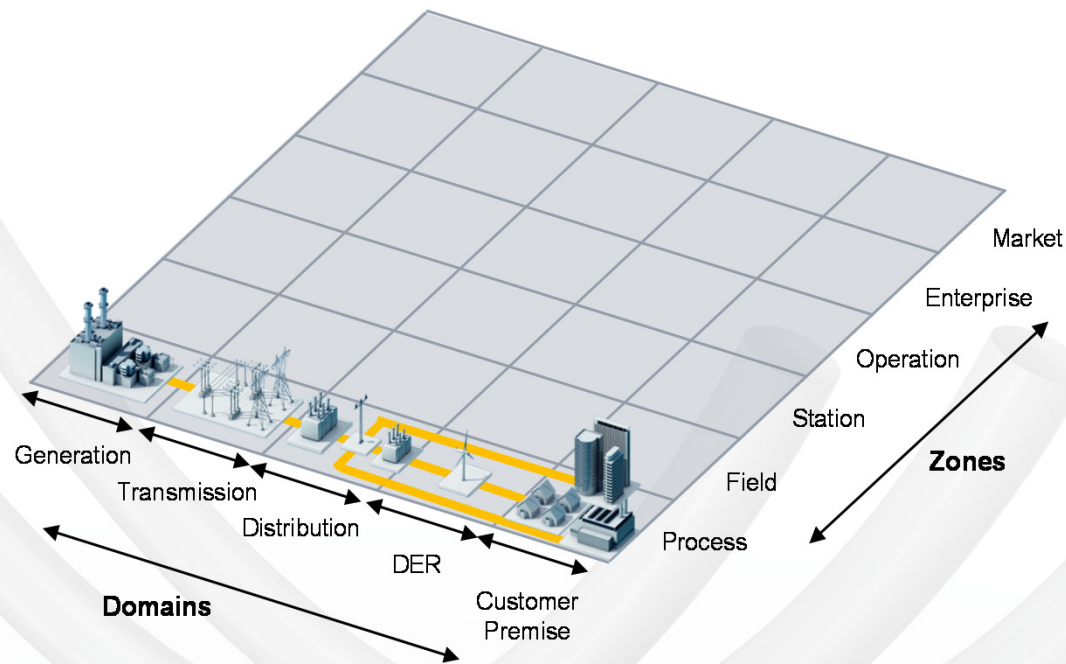# Smart Grid Connection Point: Conceptual model

Flexibility Concept

Commercial and technical flexibility use cases in the grid and market area

Commercial Flexibility Use Cases (Market)

Technical Validations

Smart Grid

Technical Flexibility Use Cases Grid operation

Information

Information

Smart Grid Connection Point SGCP

Customer CEMS + SM

Smart Customer

Smart Grid Plane

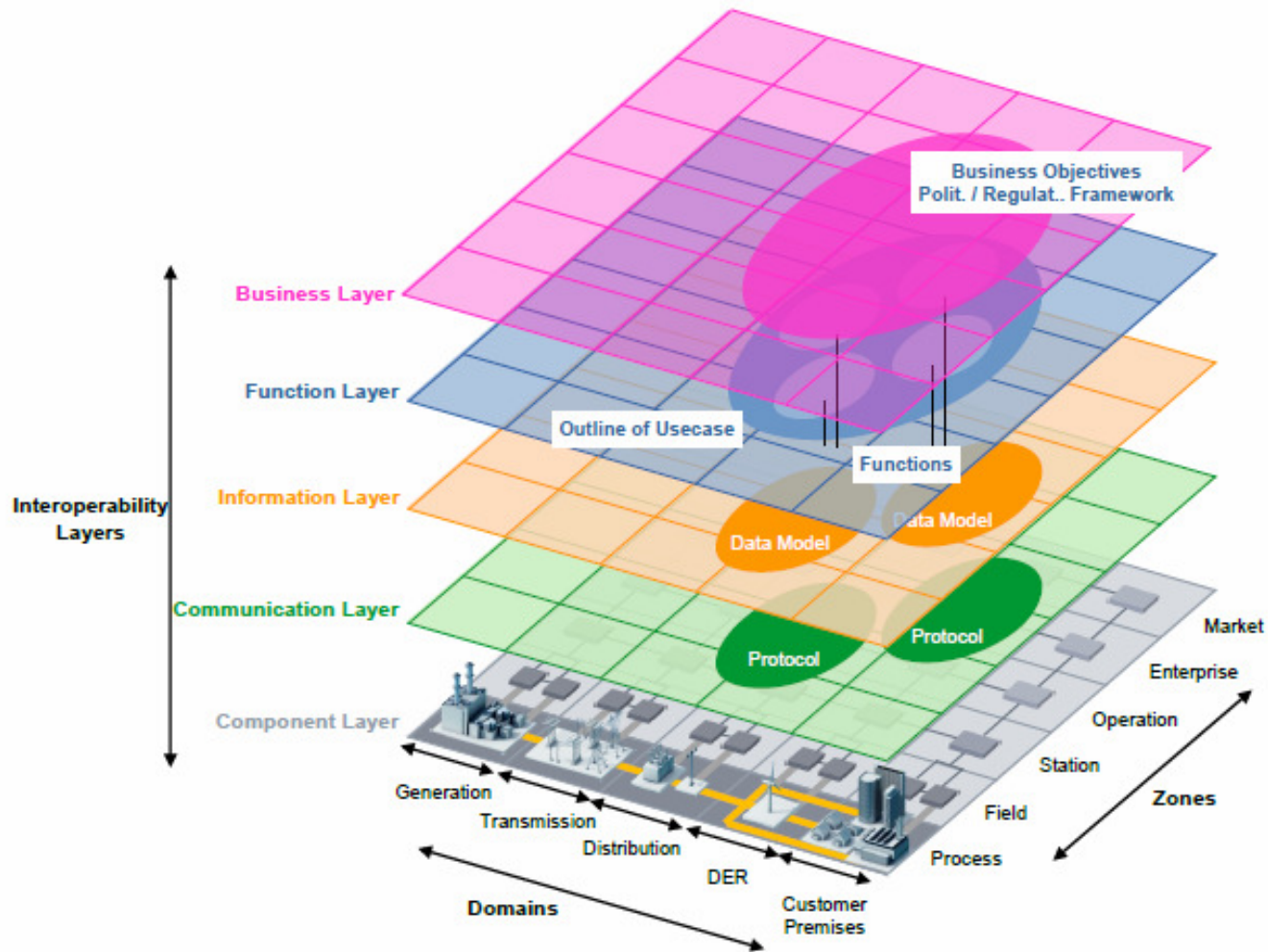
© CEN-CENELEC-ETSI 2011

- **Domains**

  covers the complete electrical energy conversion chain
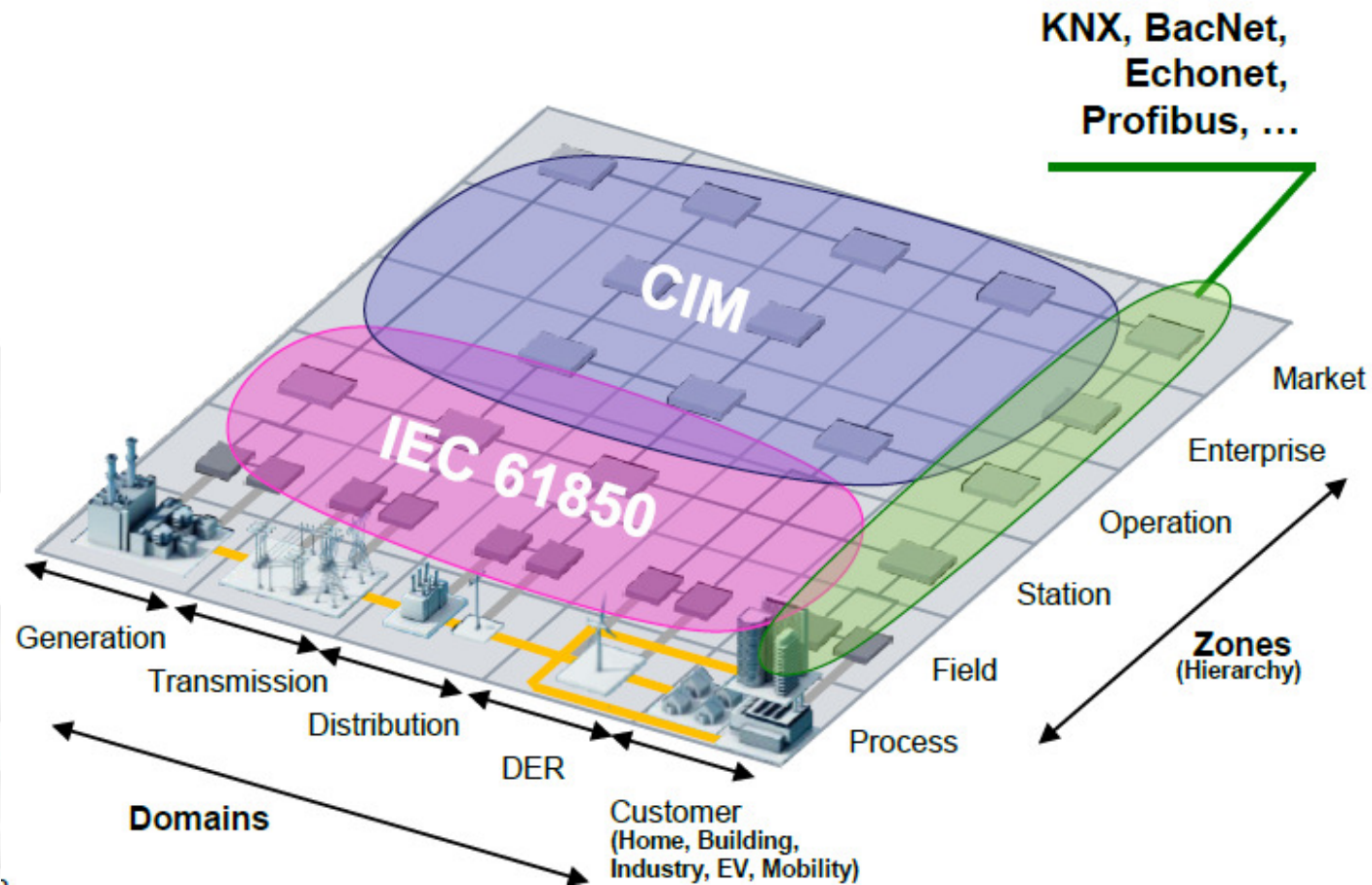
- **Zones**

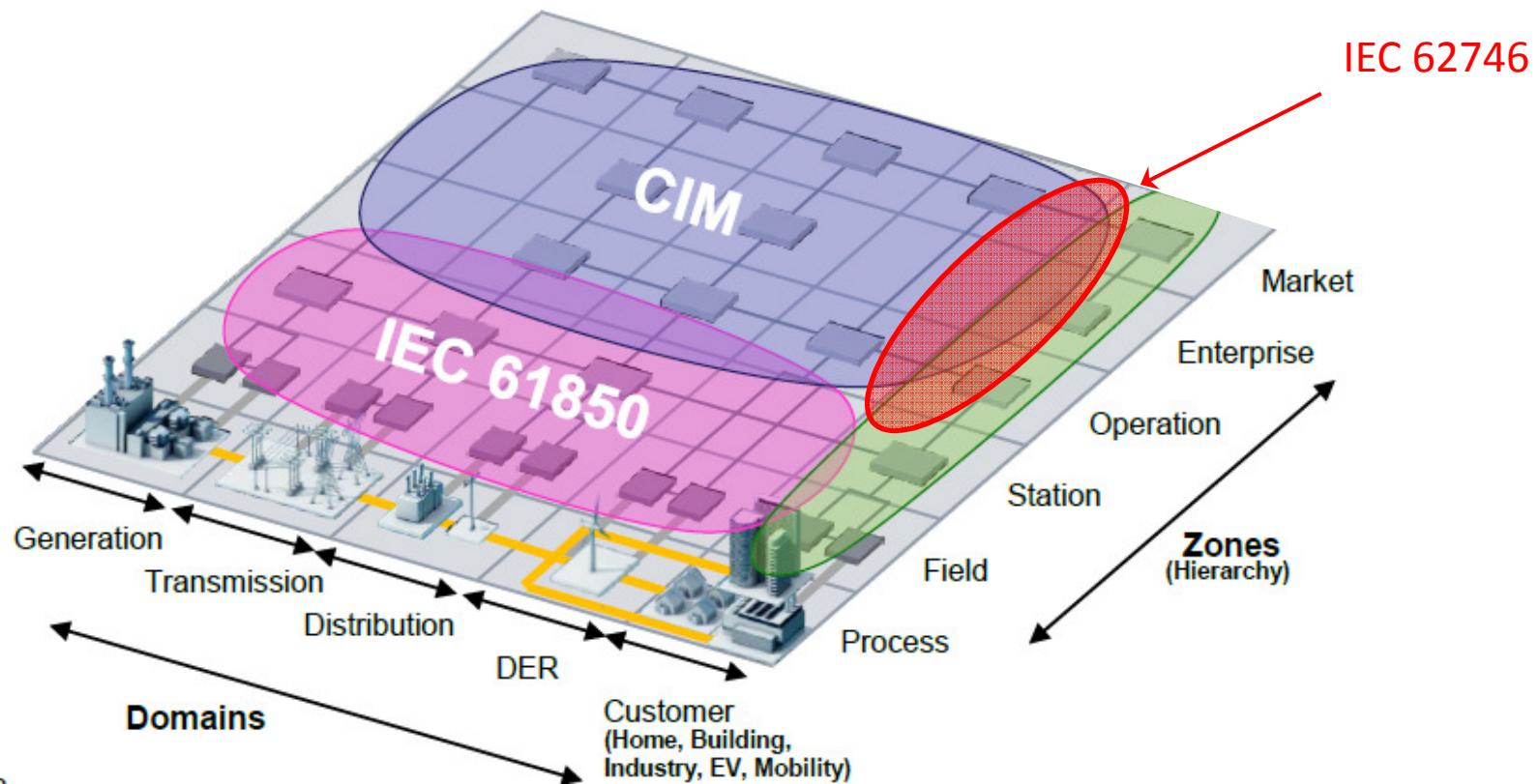 represent hierarchical levels of power system control & management infrastructure

Smart Grid Architecture Model (SGAM)

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Main smart grid standards on the Smart Grid Plane

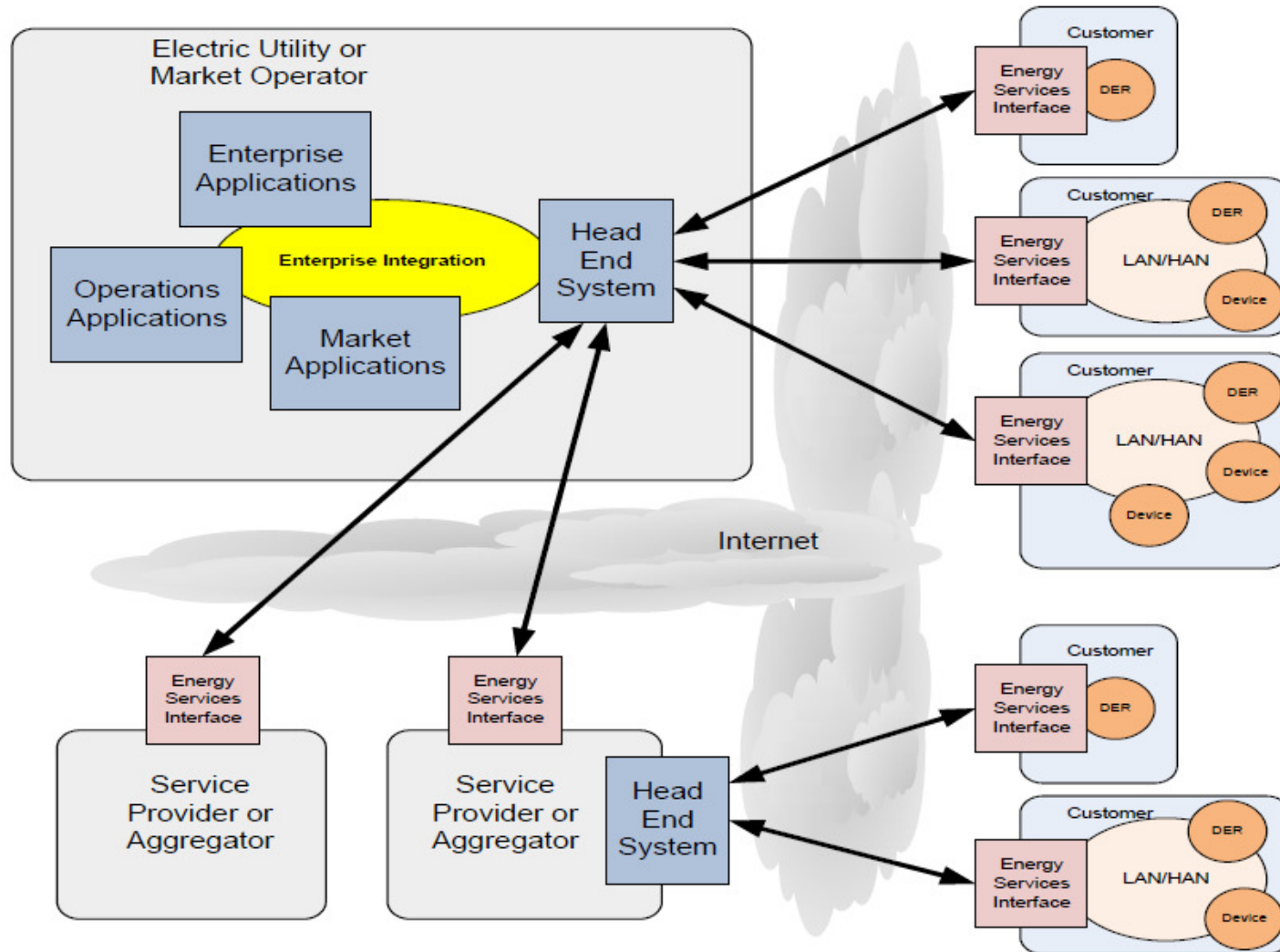# Customer flexibility management: context

IEC 62746: protocol requirements

SYSTEM INTERFACES AND COMMUNICATION PROFILE FOR SYSTEMS CONNECTED TO THE SMART GRID

- A Demand Response protocol should allow scalable, efficient and secure real-time communication over large, public wide area networks.

- Moreover: support for devices identification, group communication and publish-subscribe pattern, based on open standards and with low resource utilization.

IEC 62746 architecture hypotesis

Ricerca sul

IEC 62746 data model and transport

- Data model: based on **CIM (Common Information Model)** and **OpenADR**

- Transport protocol based on **XMPP (eXtensible Messaging and Presence Protocol)**

- XMPP will also be used by IEC 61850 for communication with DERs, becoming a **fundamental smart grid protocol**
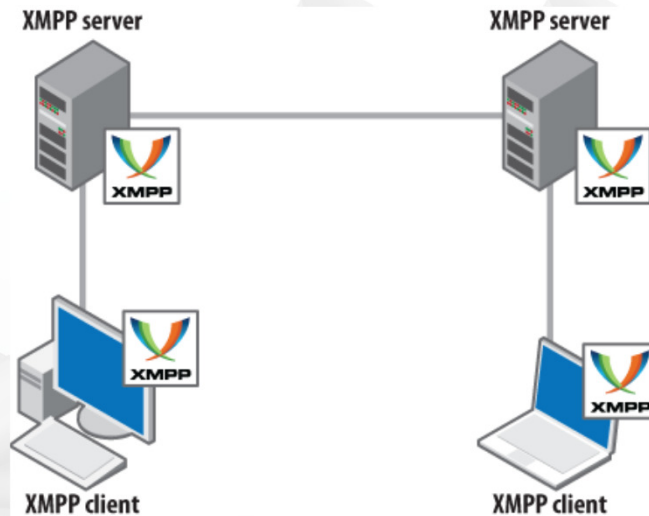
IEC 62746 and OpenADR

- **(Work Package 0)** International ballot for approval of OpenADR 2.0b as a PAS

- **(Work Package 1)** CIM extension to fully support Demand Response

- **(Work Package 2)** Adaptor definition between OpenADR 2.0b and CIM extension

- **(Work Package 3)** Fully CIM compliant OpenADR (or OpenADR-like profile)

XMPP protocol

- IETF standard originally developed for instant-messaging applications (Jabber)

- Support for real-time PUSH communication, security, publish-subscribe, domains federation

- Payloads are XML-encoded

Thank you

Daniele Pala

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