The smart metering experience in Italy in the framework of cooperation between energy and telecom NRAs

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Ethical code of AEEGSI,10(2)

Cooperation between energy and telecom NRAs in Italy (1/2)

Background

- AEEGSI (energy and water NRA in Italy) has been deeply involved in **promoting innovation** esp. in the electricity sector (smart grids, smart cities, etc). Pilot projects promoted by AEEGSI have **trialled in field** new smart solutions and some M2M services
- Important issues for AEEGSI are:
  - Ensuring **interoperability** and easy **switch capability** among operators in competition (e-SIM)
  - Encourage the development of 'smart' applications that can **minimize the cost** also thanks to competition in TLC services
  - Ensuring that widespread adoption of M2M applications does **not create any obstacle to the development of multi-service** and multi-sector solutions

Cooperation between energy and telecom NRAs in Italy (1/2)

2014

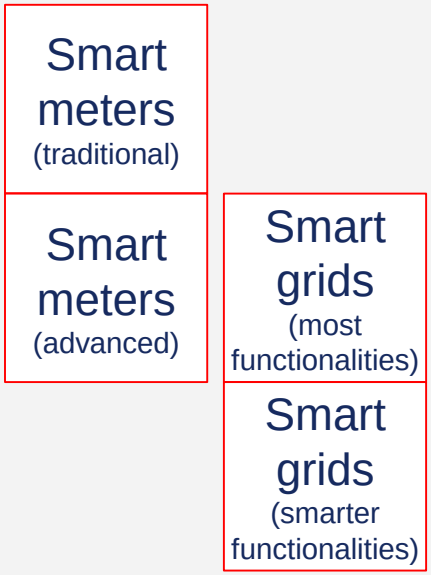
Source: www.autorita.energia.it/allegati/inglese/457-14eng.pdf

- When AGCOM launched an inquiry on **M2M services**, AEEGSI contributed with a paper based on experience collected through pilots in electricity, gas and multi-services (smart city) pilots.
- In particular, AEEGSI underlined the relevance of **latency** and proposed the following classification:

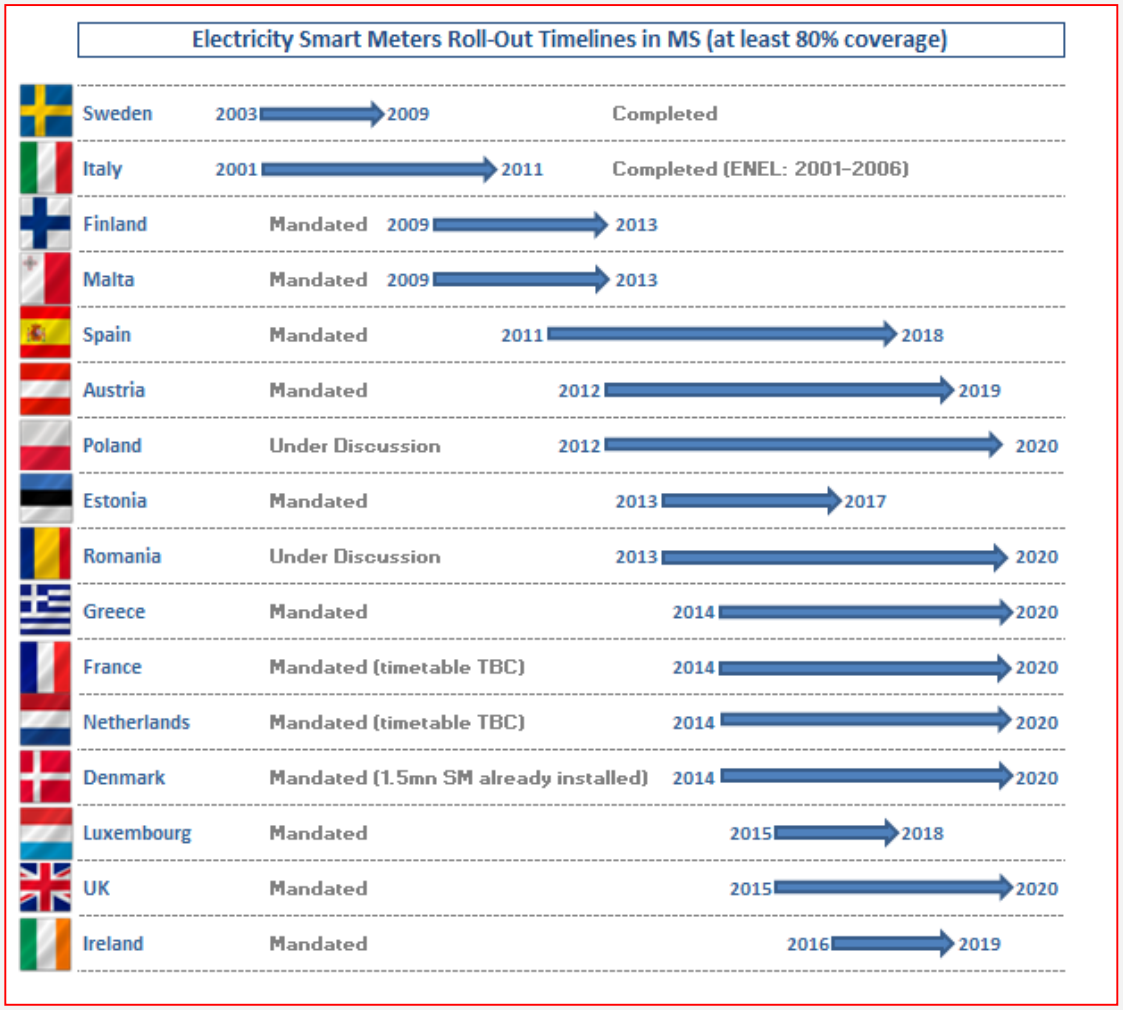
A. **monitoring**: remote data collection and configuration, without delay requirements

B. **control**: data collection and implementation commands with low delay requirements (1s)

C. **protection**: data collection and immediate reaction in difficult circumstances where speed is essential for safety or security reasons (<1s)



Electricity smart metering in Italy: first and largest



Investments for smart metering

Italy: 97 euro/point

France*: 135 euro/point

G.Britain**: 161 euro/point

Finland: 210 euro/point

Netherlands**: 220 euro/point

Sweden: 288 euro/point

Spain: not available

Source: Eur. Commission, SWD(2014) 189 final

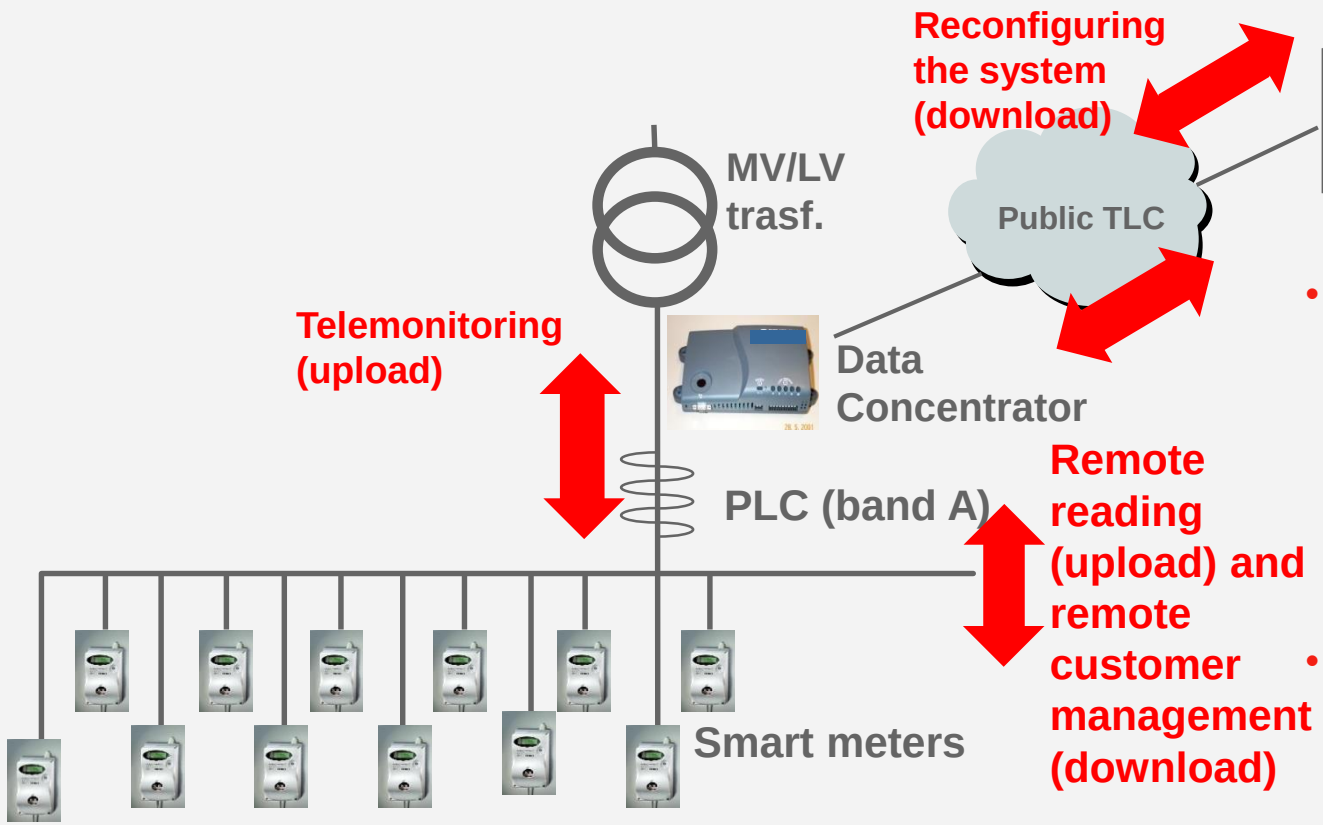
* roll-out on going

** roll-out on going, joint gas/electricity

Electricity smart metering in Italy: benefits

- Monthly/bimonthly readings
  ⇒ almost no estimated billings
- Easy switch (spot reading)
  ⇒ higher competition
- Remote temporary reduction of the allowed power for bad payers, remote reconnection after payment
  ⇒ minimum "vital" service + better service
- Theft detection and energy balance in LV networks
  ⇒ higher revenue protection for DSOs (efficiency)
- Interval metering (ToU energy prices)
  ⇒ higher cost-reflectivity, wider retail offer
- Enabler for smart IHD *(1st generation: still proprietary; pilot phase)*
  ⇒ higher level of consumer awareness

Smart metering in Italy: system architecture "1G"

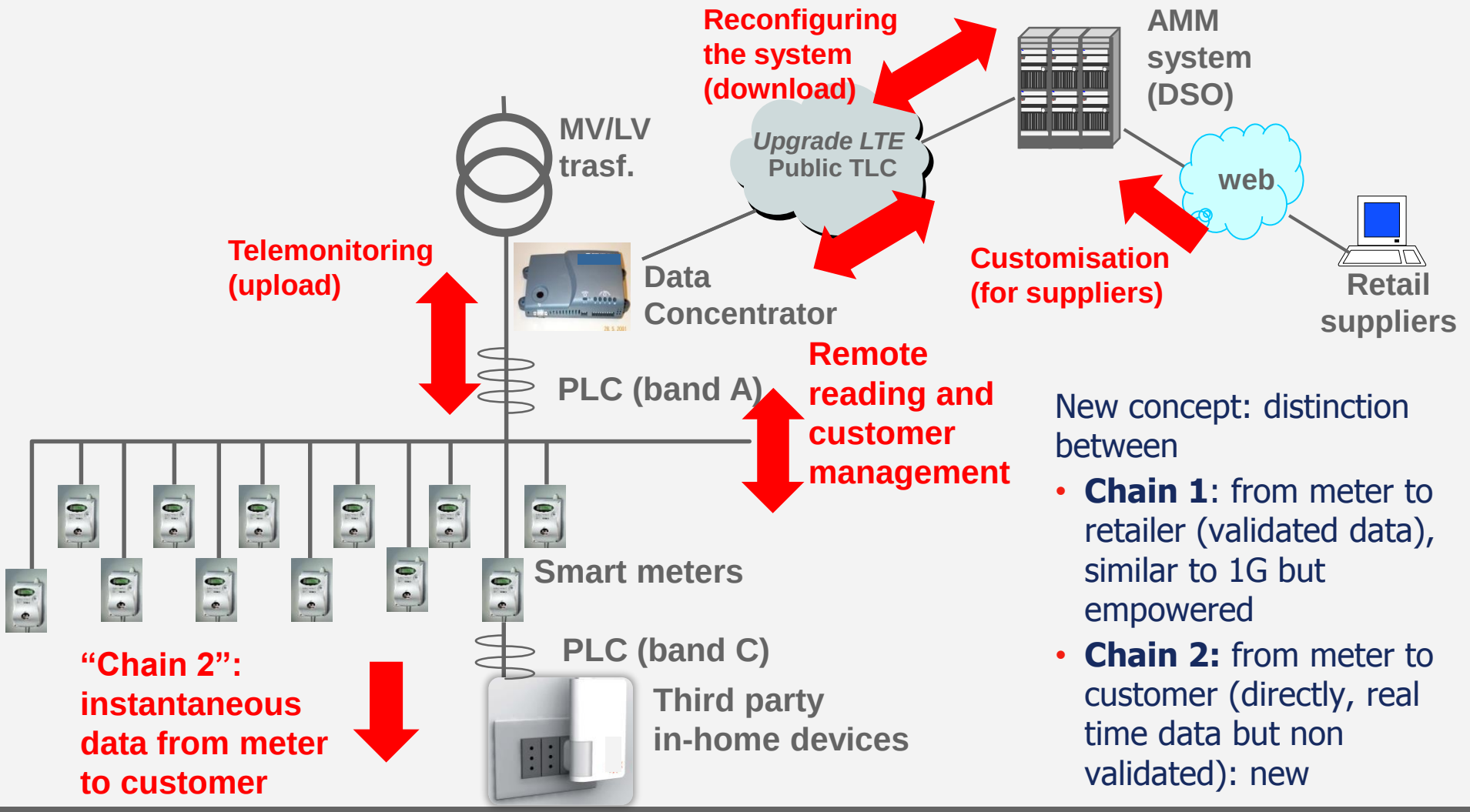


- **«Chain 1»** uses two different technologies: Power Line Carrier (between meter and data concentrator) and public TLC (GSM/GPRS so far) between concentrators and DSO central system
- **Functionalities**: Remote reading; Remote customer management (start/stop supply, switching, power capacity limit changes); Remote meter management (telemonitoring for security, reconfiguring)

Electricity smart metering: did the "1st generation" work?

	WHAT WE GOT OUT OF 1G …	…AND WHY
	**High availability**	96% of remote readings properly accomplished (end-to-end)
	**Very good reliability**	No relevant cases for meter substitution due to faults
	**Limited cases of interference between PLC and inverters**	PV inverters EM emissions reduce data acquisition (prosumers counting <2%)
	**1 channel only, only partly available for real-time data messages**	Communication channel (via PLC band A) dedicated to ***validated data***; limitated IHD
	**Very limited use for voltage data**	Buffer for interruption events too short Voltage measurement not compliant with EN 50160
	**No interoperability with 3rd party In-Home Devices**	No message encryption (launched in 2001), non disclosed protocol (cyber-sec. reasons)
	**Slow reconfiguration process**	Overall firmware download: ≈9 months

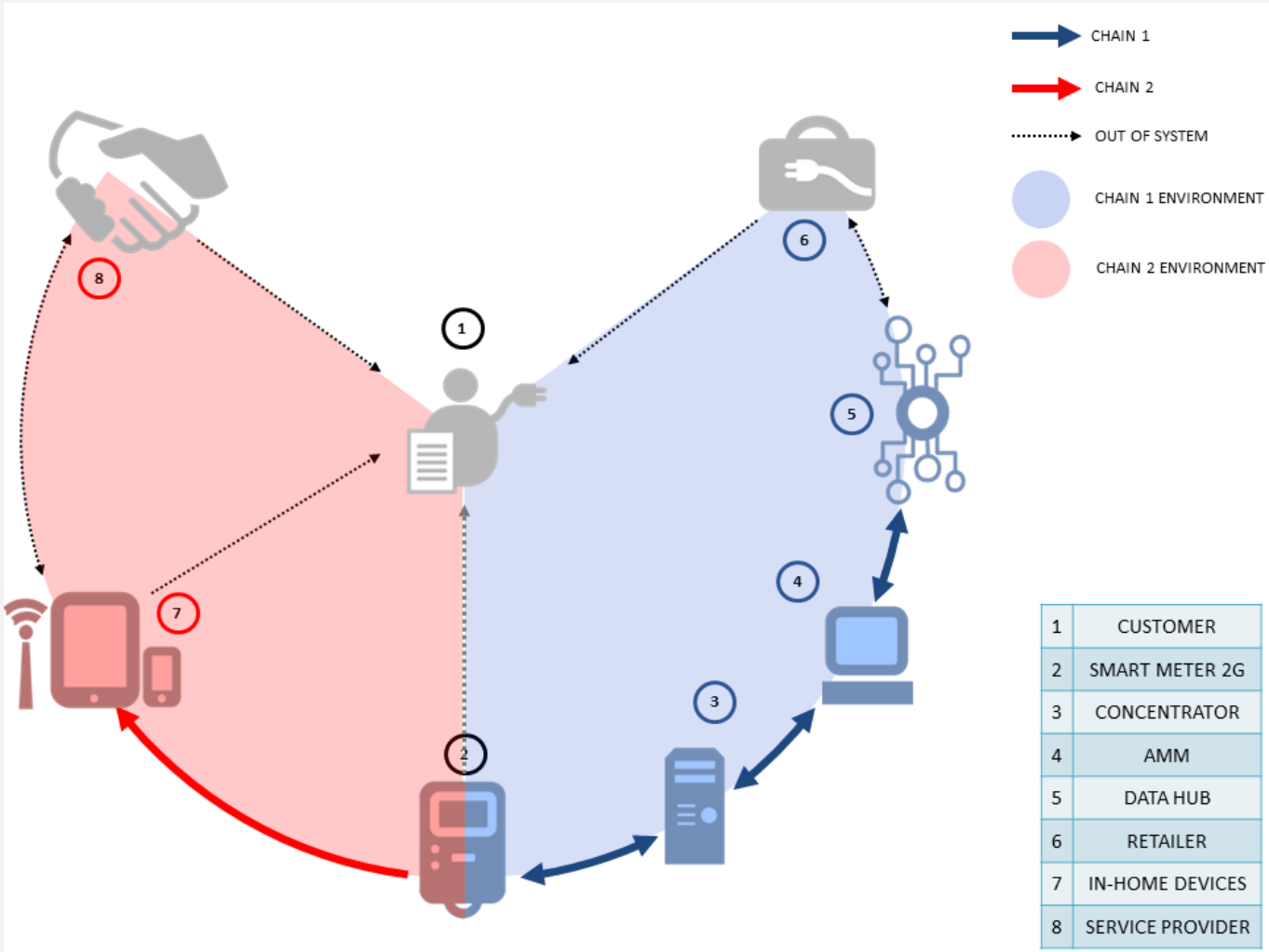
Smart metering in Italy: system architecture "2G"



New concept: distinction between

- **Chain 1**: from meter to retailer (validated data), similar to 1G but empowered
- **Chain 2:** from meter to customer (directly, real time data but non validated): new

Electricity smart metering: "2G" concept *(decision 87/2016)*



1	CUSTOMER
2	SMART METER 2G
3	CONCENTRATOR
4	AMM
5	DATA HUB
6	RETAILER
7	IN-HOME DEVICES
8	SERVICE PROVIDER

«Chain 1»

- Purpose: billing and network managem' t
- Validated data
- Daily collection, SLA
- Operated by DSO
- Back-up channel

«Chain 2»

- Purposes: customer awareness and value offering for suppliers
- Real-time, not validated data
- Continuous flow
- Interoperable with 3rd party IHDs
- No back-up channel

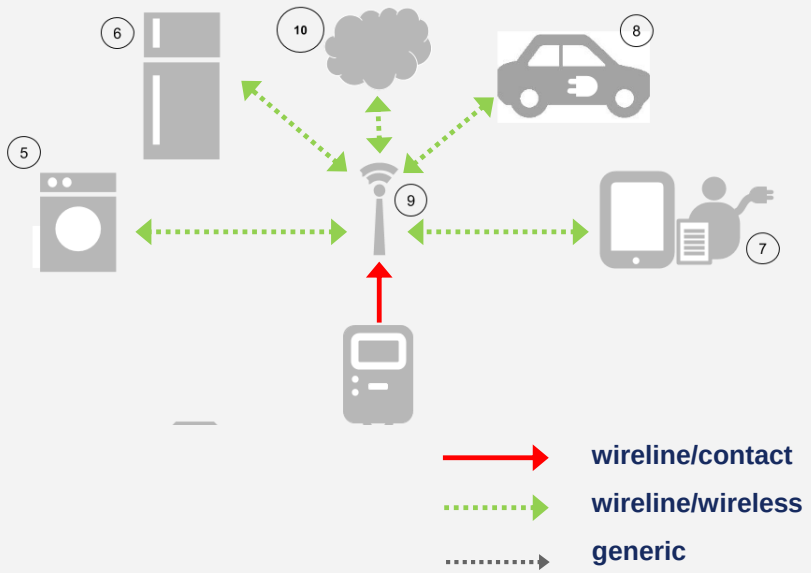
Chain 1 and Chain 2: meter reading from 1st to 2nd generation

Metering data	1G	2G
Active energy withdrawn	3 values per month [Wh]*	every 15 min [Wh]
Active energy injected	3 values per month [Wh]*	every 15 min [Wh]
Reactive energy withdrawn	3 values per month [Wh]*	every 15 min [VARh]
Reactive energy injected	not available	every 15 min [VARh]
Active power withdrawn	peak in 15 min [W] (max value in the month)	peak in 15 min [W] (max value in the day)
Active power injected	not available	peak in 15 min [W] (max value in the day)
Instantaneuos power	2 sec [W] (via display only)	1 sec [W] (both via display and chain 2)
Max/min voltage	some measure available but non EN50160-compliant	per week [V] (EN50160-compliant)
Interruption event (voltage below 5% of Un)	(in practice not used because of too short buffer)	on event occurrence: start, end, duration [min.ss]

(*) Only for 1% of LV customers (those with rated capacity >55kW): 1 value every 15 min

Chain 2: interoperable In-Home Device

- Standard communication protocol (chain 2 independent of chain 1)
- To be developed by CEI by early 2017
- Possibly bidirectional (vulnerability issues, communication QoS)
- IHDs developed by third parties (integrated with home ecosystem)
- Start with physical layer PLC in CENELEC "band C"
- "Release 2.1": AEEGSI in cooperation with AGCOM could consider further options of physical layer (e.g. optical port) with possible cost re-opening

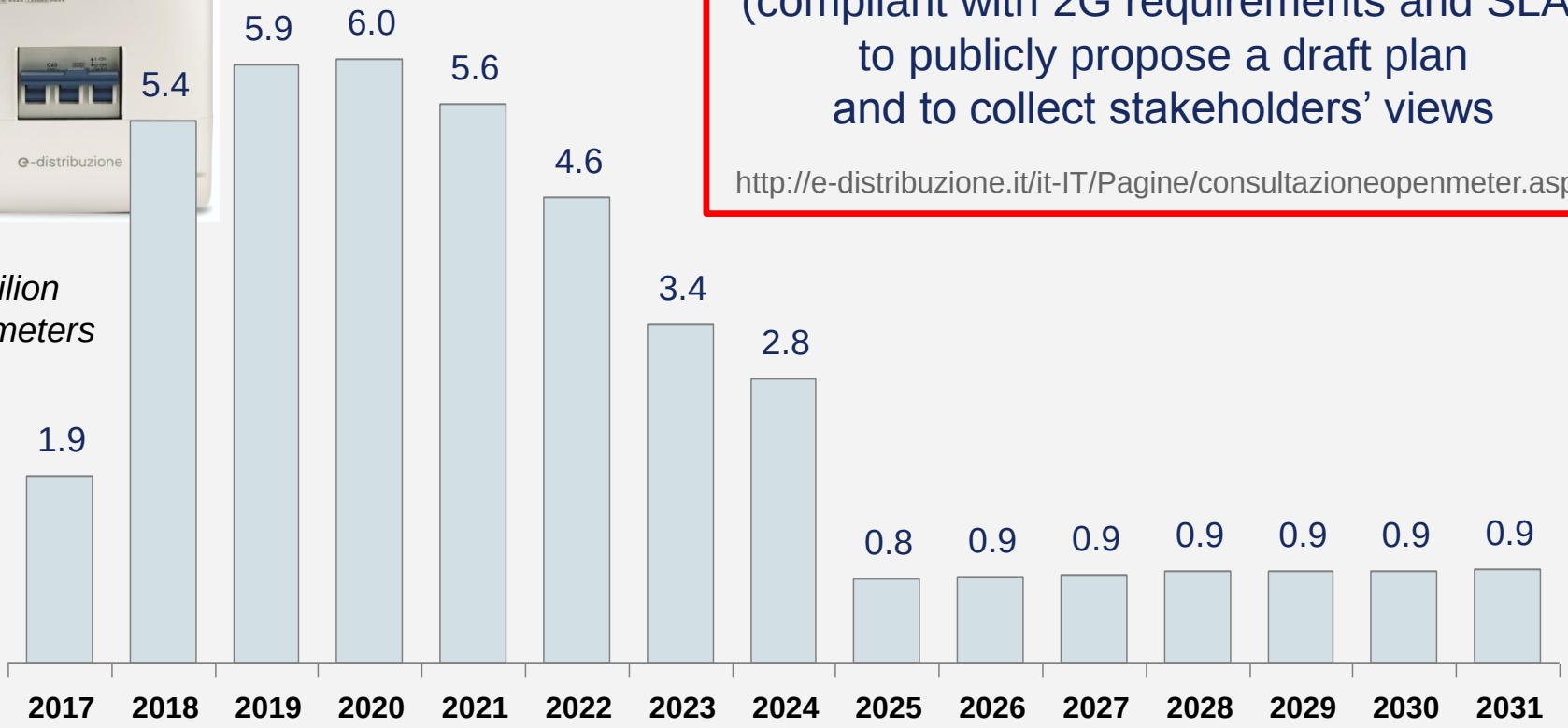


Roll out plan proposed by e-distribuzione

Regulatory decision 646/2016 compels DSOs that want to change their smart metering system with a new one (compliant with 2G requirements and SLA) to publicly propose a draft plan and to collect stakeholders' views

http://e-distribuzione.it/it-IT/Pagine/consultazioneopenmeter.aspx

Milion 2G meters

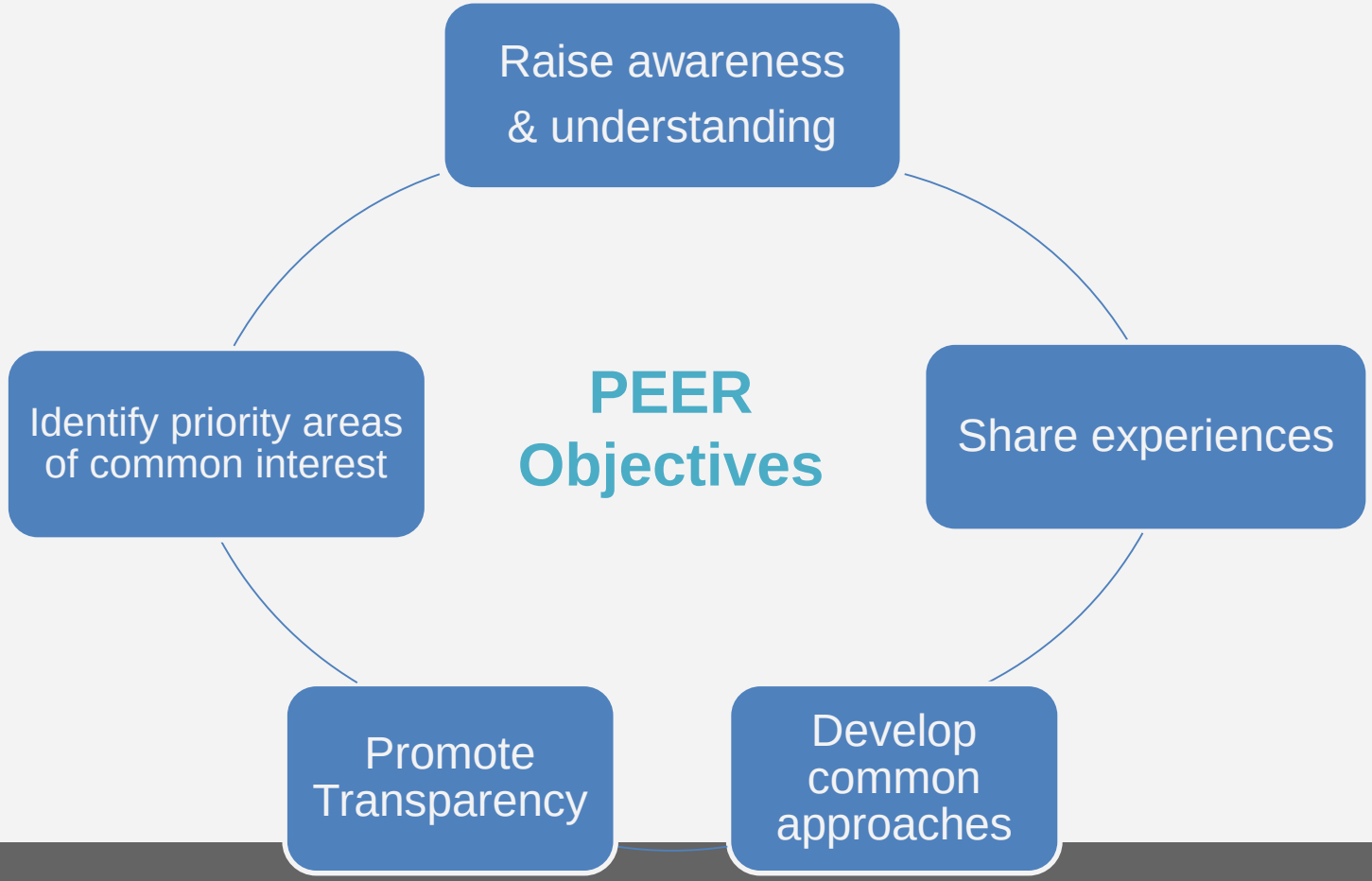


Partnership for the Enforcement of Energy Rights (PEER)

- Initiative of Europe's energy regulators (CEER) to enhance inter-authority (cross-sectoral and cross-authority) cooperation at EU level to benefit consumers
- Administratively light: CEER as Secretariat, few meetings
- No duplication: adds value to existing work e.g. European Commission's Art 29 (data protection) Working Party
- CEER recognises that better inter-authority cooperation will help meet Europe's Digital Single Market and Energy Union objectives, and invites others to join PEER.

PEER Mission

"To help protect, empower and engage European (energy) consumers through the collaboration of relevant authorities with differing consumer-related responsibilities."



PEER - a new cross-sectoral, cross-authority initiative

Invited stakeholders

- ACER, ENISA, BEREC, Art 29 (data protection) working party of EC, NEON (Energy Ombudsmen) and BEUC (European consumer organisation)

2 PEER (expert) Groups

- Smart metering, data privacy and data protection and the Internet of Things (IoT)
- Cyber security

Starts in 2017 – seeking experts to join PEER

Want to know more?

For more on Italian case:

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For more on PEER initiative:

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