

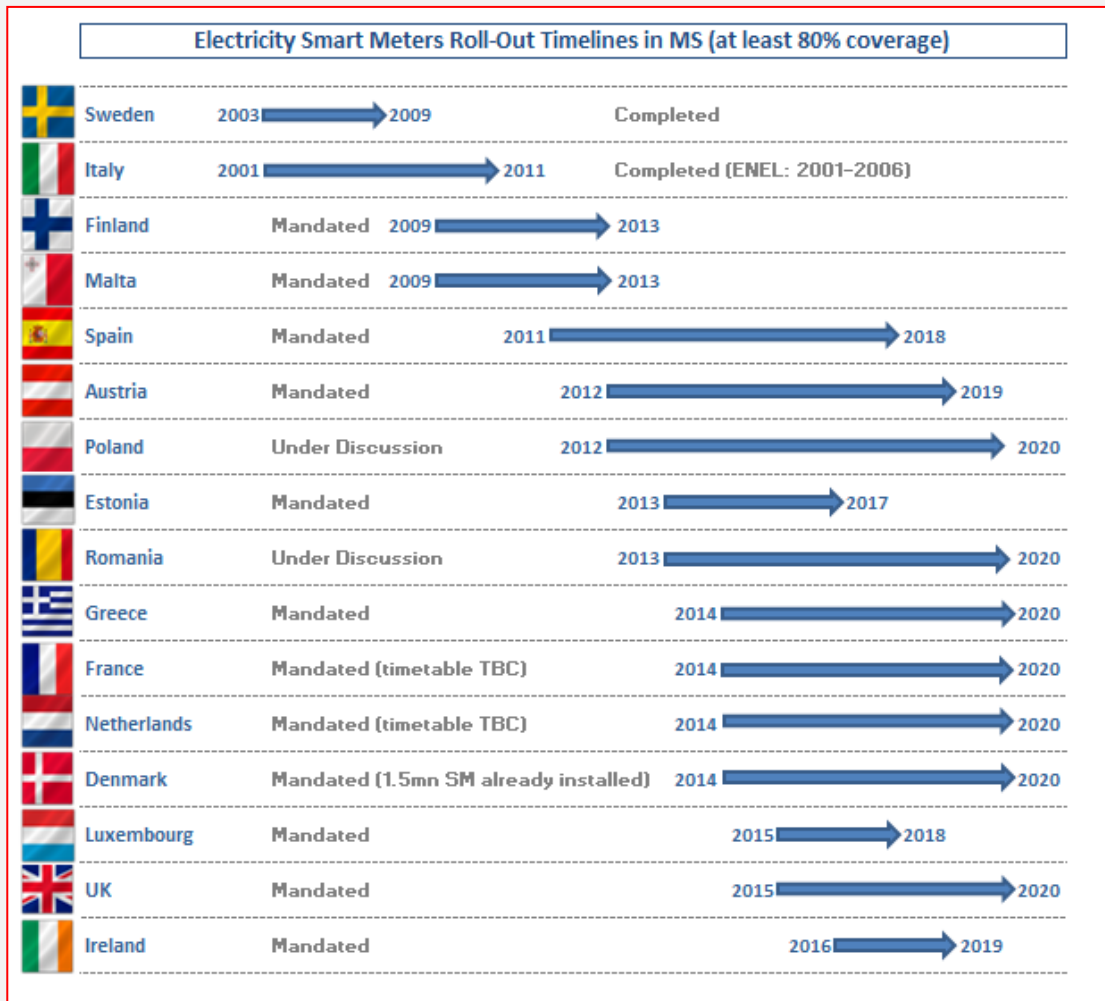
Smart metering in Italy and IHD: from 1st to 2nd generation

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Electricity smart metering in Italy: first of breed, the largest one



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: did the “1st generation” work?

	WHAT WE GOT OUT OF 1GAND 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, not available for real-time data messages	Communication channel dedicated exclusively to validated data
	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 encryption (launched in 2001), non disclosed protocol (cyber-sec. reasons)
	Slow reconfiguration process	Overall firmware download: ≈9 months

2nd generation: “future-proof” design criteria

Minimize need for system reconfiguration (e.g. update of tables for holidays)

Ensure hardware independency for any function

Keep separate communication resources for remote reading and for energy efficiency

Ensure interoperability with 3rd party in-home devices (IHDs)

Ensure interchangeability with metering systems of other DSOs

Improve electro-magnetic immunity from disturbances

Allow for multi-channel communication (PLC and radio)

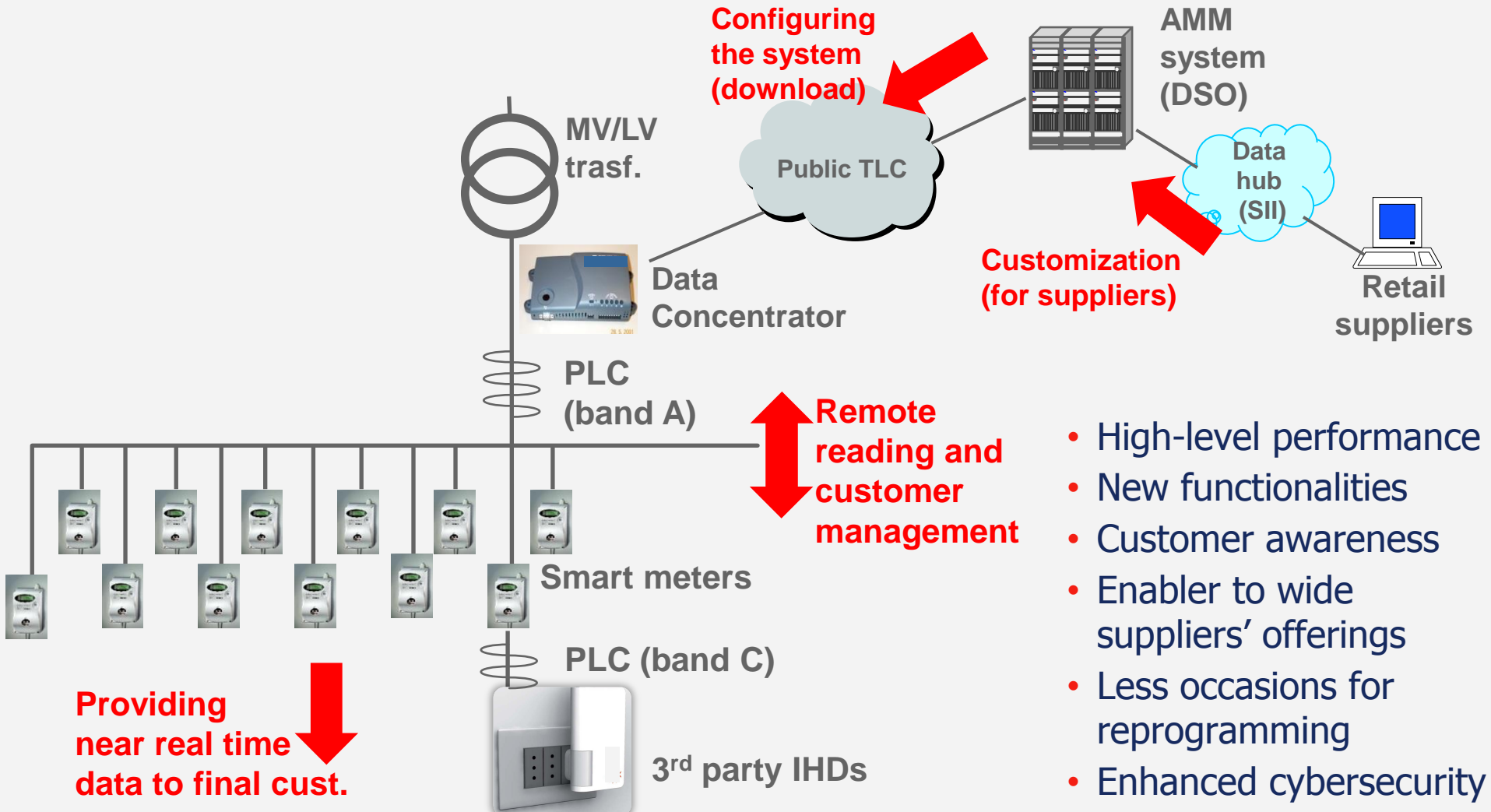
Ensure advanced cyber-security measures (e.g. data encryption)

Improve integration between smart metering and smart grid roll-out

Minimize constraints of backward compatibility for next generation

Source: AEEGSI consultation paper 416/2015, August 2015

System architecture from 1G to 2G



Meter reading for billing, from 1st to 2nd generation

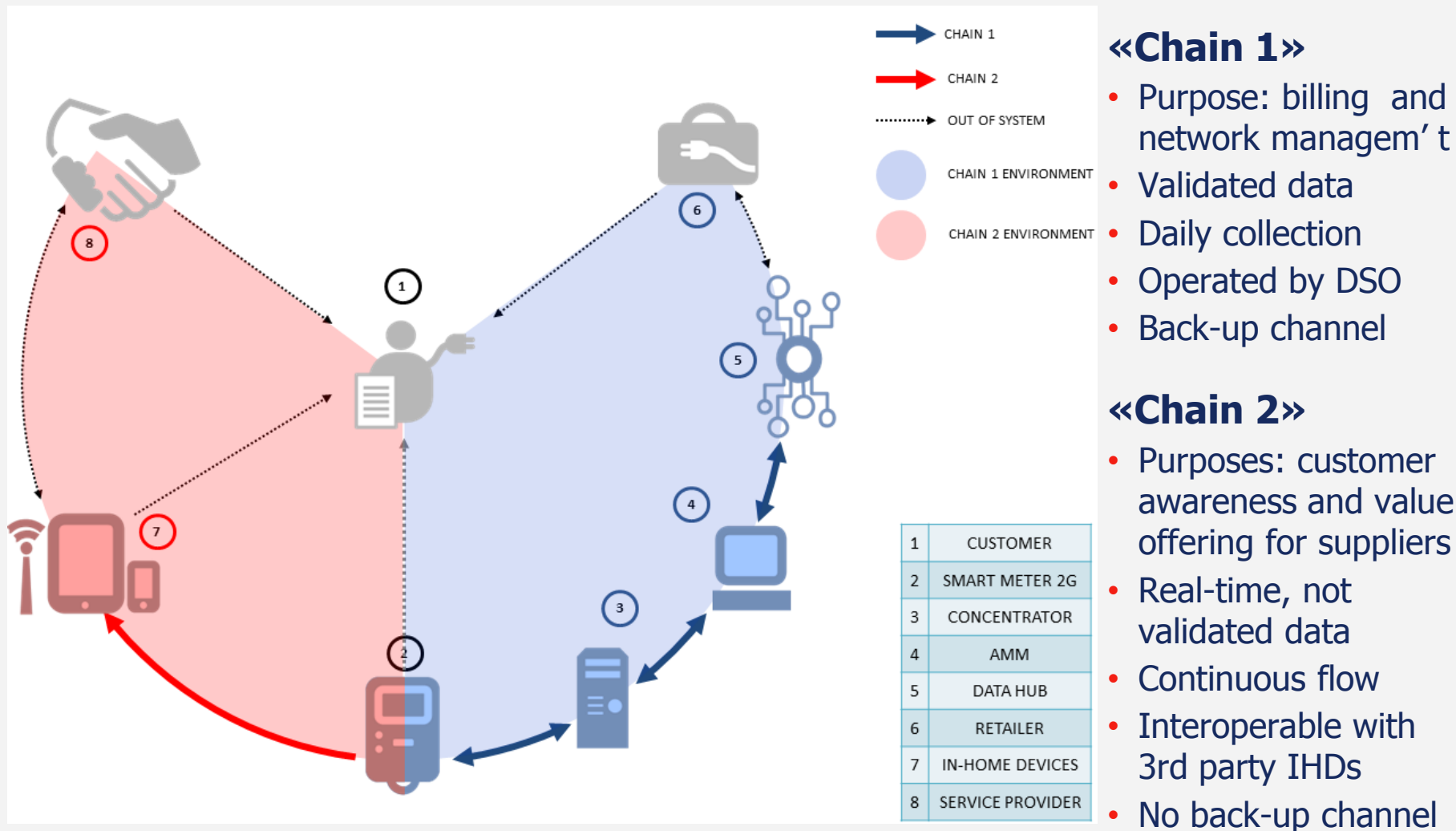
1 st GENERATION	Capacity	1G Meter reading	1G reading content	Default.suppl billing
<i>Households</i>	<i>Any (typic 3kW)</i>	<i>Monthly</i>	<i>3 timebands</i>	<i>2 prices (mandatory)</i>
<i>Small business</i>	<i>Up to 55kW</i>	<i>Monthly</i>	<i>3 timebands</i>	<i>3 prices (mandatory)</i>
<i>Medium business</i>	<i>Above 55 kW</i>	<i>Monthly</i>	<i>96 quarter-hours per day</i>	<i>N/A (only free market)</i>

1G: fixed time bands, preloaded in the meter → need for massive reconfiguration

2 nd GENERATION	Capacity	2G Meter reading	2G reading content	Default.suppl billing
<i>All customers</i>	<i>Any</i>	<i>Daily</i>	<i>96 quarter-hours per day</i>	<i>N/A (only free market)</i>

2G: time bands directly customizable by suppliers => no need for massive reconfig.

Electricity smart metering: 2nd generation (*decision 87/2016*)



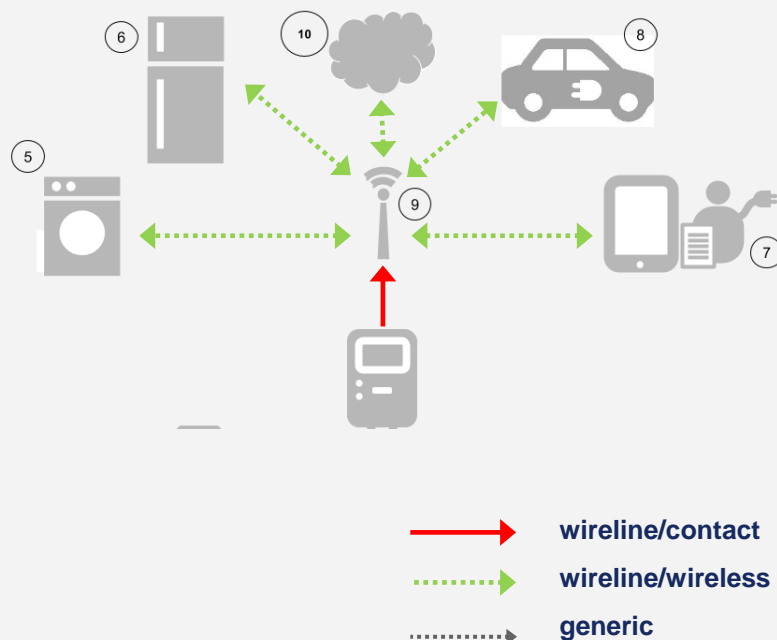
1st generation: “proprietary” In-Home Device

- **Customer awareness:** smart device to be plugged-in any electricity sockets in the house with standard USB port
- **Consumption data and peak levels** can be seen on PC, tablet, display
- **Field trial run** under regulatory supervision (smart grid pilot projects): ~4.500 consumers
- **Limitations due to chain 1 control:** communication resources not separated, single band, proprietary protocol
- **Antitrust decision** for large scale release to retailers (capped cost)



2nd generation: interoperable In-Home Device

- **Standard communication protocol** (independent of chain 1)
- To be developed by CEI **by Dec-2016**
- **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**: could consider further options physical layer (e.g. physical port) with possible cost re-opening



Next steps



AEEGSI-AGCOM
collaboration on
M2M issues
(2014>)

1G field
experience
including
trials

Consultation
Aug-15

Functional
requirements
(decision
87/16)

Cost
allowance
and roll-out
plan
(decision
464/2016)

Roll-out
approval
Regulator's
decision
after public
consultation
of distribution
company's
roll out plan

For further information, please visit:

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Thank you for your attention