

European Gas Technology Conference 2019 (EGATEC 2019)
Groningen, The Netherlands

Digital innovation in IT and TLC systems for gas sector in Italy

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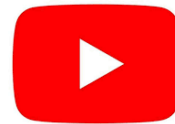
Agenda

- CIG presentation
- Background SM gas
- Updated situation
- What's going on?



Italian Gas Committee (CIG)

CIG is a non-profit organisation dealing with the safety of combustible gas



CIG, as a federated body to UNI, is part of the Italian Standardisation system



Italian Gas Committee (CIG)



- **December 1953:** It is constituted the Italian Gas Committee (CIG) with the aim to improve safety and efficiency in the use of combustible gases;
- **1960** CIG joins UNI (Italian National Standardization Body) as a federated entity, becoming the Italian official organ for the standards unification in the fuel gas sector.
- CIG participates, based on the UNI delegation, to the works within its competences, taking place at the European Standardization bodies (CEN) and international (ISO), within which the UNI represents Italy; CIG indicates to UNI the names of the experts and delegates for the various committees and working groups of these bodies; CIG reports to UNI on progress; It expresses its opinion on the draft standards and on other questions asked to the UNI by the international bodies CEN and ISO.
- CIG cooperates with the Italian Regulatory Authority for Energy Network Environment (ARERA).

CIIG in figures

- **Technical Committee** **16**
- **Standards available** **400**
- **Technical Meeting (2018)** **160**
- **Experts involved (2018)** **1160+**



EXPERTS



Gas infrastructures in Italy



TSO network: ~33,000 km
Entrance network points: 8
Gas: 72,8 billion m³

DSO network: ~ 260,000 Km
DSO number: 210
Customer: 21,1 x 10⁶

Background (1/2)

- ❑ The Italian Regulator has established in 2008 a gas smart metering rollout (ARG/Gas/155-08) with reference to provisions of:
 - ❑ 2006/32/CE (Energy efficiency)
 - ❑ 2004/22/CE (MID)

- ❑ This mandate requires the complete refurbishing of distribution gas metering point from G65+ (high C&I) to residential including smart metering functions



Background (2/2)

- ❑ The regulation specifies:
 - a) Essential technical requirements
 - b) Installation plan
 - c) Financials

- ❑ The Authority has released a mandate to CIG to provide the technical specifications to fulfill the essential requirements (a)

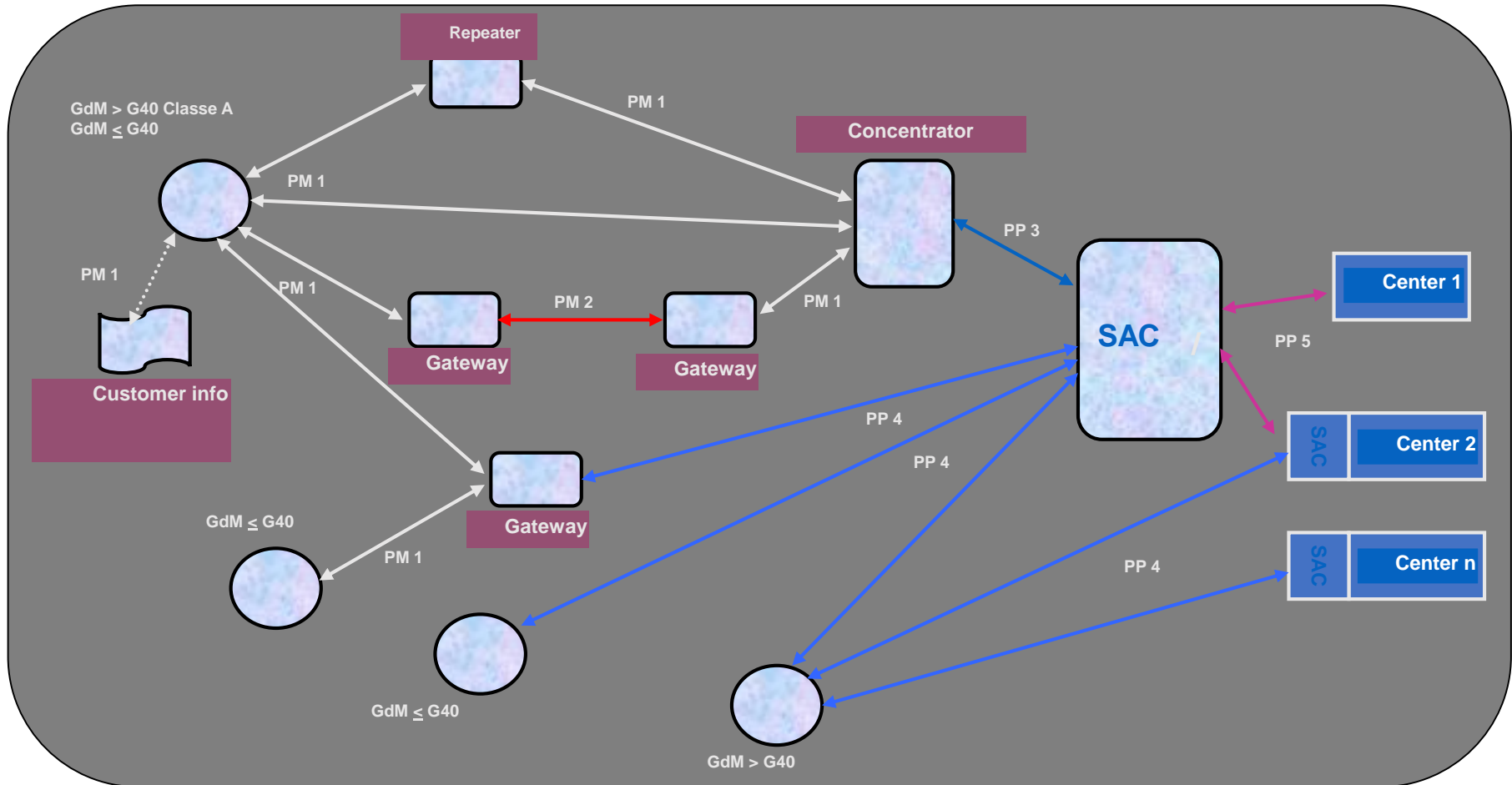


Target roll-out for residential smart meters

- ❑ With further modifications (several decisions released), the rollout will extend until 2020, with a target of 85% smart meters in service and a deadline depending on DSO dimensions:
- ❑ by end 2020 for DSO with more than 200.000 customers (50% at December 2018);
- ❑ by end 2021, for DSO with a number o customer between 100.000 and 200.000 (33% at December 2018);
- ❑ by end 2023, for DSO with a number o customer between 50.000 e 100.000 (8% at December 2018);



System architecture



PPx / PMx name a specific protocol profile

Use Cases as defined by Italian Regulator

- Measurement and load profiles
 - Daily profiles
- Multi tariff functions
 - Two seasons, three day profiles, special days, five daily switches, three rates
- Supply management
 - Disconnecting device (valve)
- Synchronization
 - Time sync
- Fraud detection and relevant information
- Device diagnostics
- Consumption information to end user
 - Currently forecasted only through commercial channels (internet, mobile, etc)
- Software update
 - I.e. Remote FW update
- Infrastructure management & diagnostic
 - Management of radio network



Updated situation (1/2)

A first set of documents for *interoperability* was published (period 2008-2013)
UNI/TS 11291-11: Gas measurement systems – Hourly based gas metering systems

- Part 1: General requirements
- *Part 2: CTE Protocol*
- Part 3: CTR Protocol
- Part 4: Requirements for meters with $Q_{\max} > 65 \text{ m}^3/\text{h}$
- Part 5: Requirements for meters with Q_{\max} from $16 \text{ m}^3/\text{h}$ up to a $65 \text{ m}^3/\text{h}$
- Part 6: Requirements for meters with $Q_{\max} < 10 \text{ m}^3/\text{h}$
- Part 7: Gas meter remote managements system
- Part 8: Remote managements system protocols
- Part 9: Interoperability Tests
- Part 10: Security

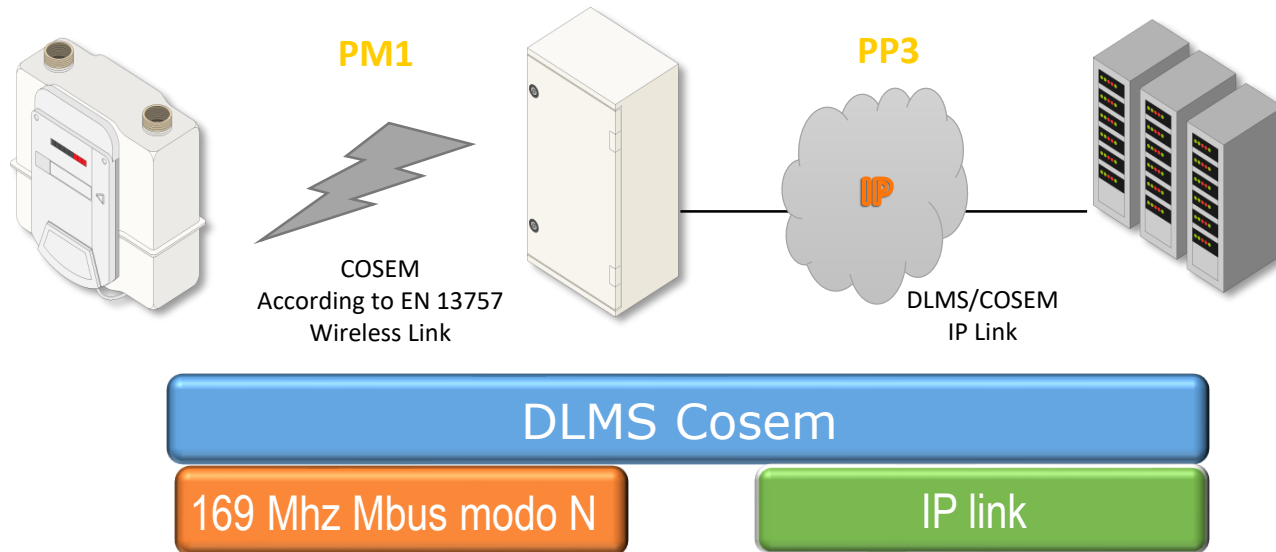
Updated situation (2/2)

SPECIFICA TECNICA	Sistemi di misurazione del gas - Dispositivi di misurazione del gas su base oraria - Parte 11-2: Intercambiabilità apparati punto-multipunto - Modello dati	UNI/TS 11291-11-2
		GENNAIO 2017
	Gas measurement systems - Hourly based gas metering systems - Part 11-2: Interchangeability point-multipoint devices - Data model	

A further set of documents for *interchangeability (PM)* was published (period 2014-2017) *UNI/TS 11291-11*: Gas measurement systems – Hourly based gas metering systems

- Part 1:2014 Architecture and use cases specified for interchangeability
 - Set up of the boundary and definition of conditions
- Part 2:2017 Data model
- Part 3:2014 Local port comms
- Part 4:2014 PM1 communication profile (radio 169 Mhz)
- Part 5:2014 PP3 communication profile (concentrator to SAC)
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- Part 6:2017 Conformity testing specification

The protocol for «interchangeability» (UNI/TS 11291-11 series)



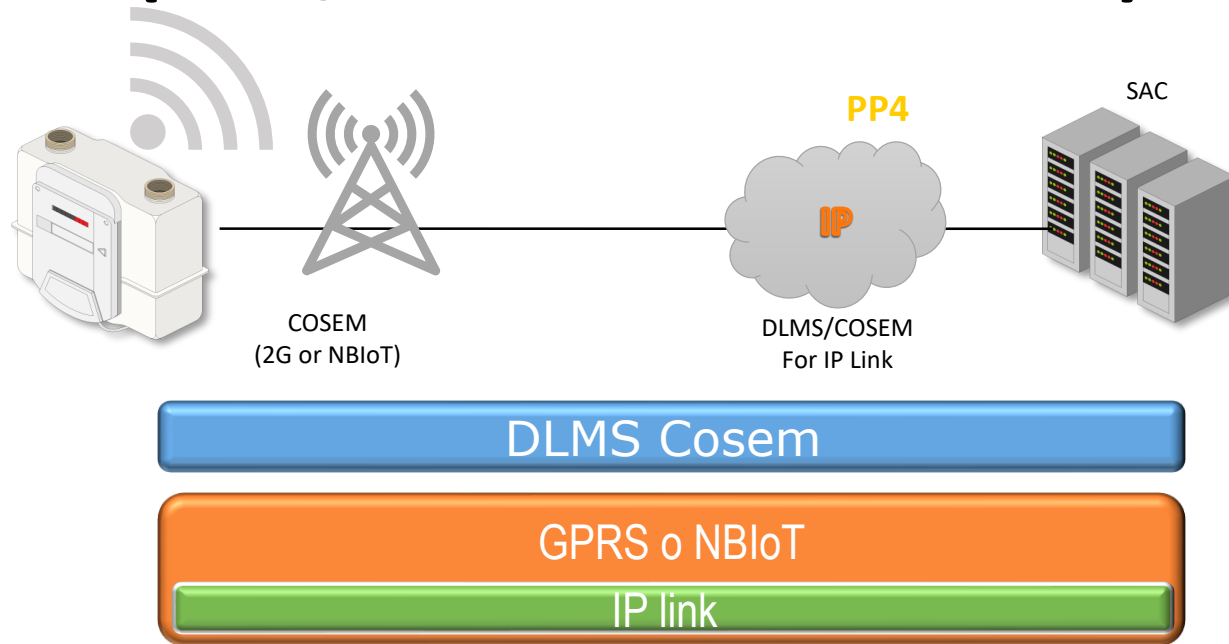
- Cosem End-to-End with optimisation of data transmitted through introduction of “compact frame”
- Security End-to-End
- Separation protocol layers
- DLMS «Italian Companion»

Target for TS 11291-12 series

- ❑ Ensure interchangeability on Smart meter (PP) having in mind the possibility of DSO Change in the network management (new tender)
- ❑ Allow utilisation of new communication technologies Future-proof, as NB-IoT, that could be supported
- ❑ Define Use Cases aimed at reducing battery energy consumption (including SLA requirement of integrated valves)



The protocol for «interchangeability» (UNI/TS 11291-12 series)



- Cosem End-to-End with optimisation of data transmitted through introduction of “compact frame”
- Security End-to-End
- Separation of protocol layers allows the same application (except for network management) as for 169 MHz
- DLMS «Italian Companion»

What's going on

- A further set of documents for *interchangeability (PP)* was developed
- *UNI/TS 11291-12*: Gas measurement systems – Hourly based gas metering systems
- Part 1:2014 Architecture and use cases specified for interchangeability (under publication)
- Part 2:2014 Data model (under publication)
- Part 3: --- (see part 11-3)
- Part 4: PP4 communication profile (under publication)
- *Part 5: --- not needed*
- Part 6: Conformity testing specification
- (ready for public enquiry by the of 2019)

Challenges of the process

- ❑ Technical (stakeholders)
- ❑ Standardisation (CIG) Vs innovation
- ❑ Financial (ARERA)
- ❑ Management (DSO)
- ❑ Production (Manufacturers)



Innovation impact

- Smart meter Vs Smart grids Vs Smart cities
- Customer awareness
- New product (smart meter) entirely designed by a DSO (1 experience ongoing)
- DSO pushed to gather and manage data (big data)
- To deploy new communication technologies in different fields of DSO activity (remote control of Meter Integrated valve, remote management of control (dynamic) pressure systems and odorisations systems, cathodic protection systems, network balancing)
- **Green gas smart measuring and metering**

Thank you for your attention

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