

The policies for the large-scale deployment of smart gas meters in some European countries and draw policy implications, in particular for Italy

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ABSTRACT

- In this study we assess existing policies, at both European and at Italian level, for the large-scale deployment of smart gas meters in Italy. In particular we focus on the cost-benefit analyses which, as required by the Third Package, have been carried out in a few countries so far, including Italy, UK and France. We find substantial differences in both the value and the type of expected benefits, which have been identified in these analyses.

- The introduction of smart metering is one of the core elements in recent European policies targeting the **environmental sustainability and the competitiveness of gas and electricity markets.**
- As part of the Third Energy Package adopted on 13 July 2009, EU Member States are obliged to "ensure the implementation of intelligent metering systems that shall assist the active participation of consumers in the gas and electricity markets".
- That is, all EU Members must roll out some form of smart metering, **subject to the results of an economic assessment.**

- The aim for implementing smart meters in the Third Energy Package is twofold: **first, to boost energy efficiency and demand side management;**
- **secondly, to ensure active participation of customers in the market.** Moreover adopting smart meters is in line with another objective in the Third Package, i.e. developing smart grids.

- **At present it does not seem clear whether the difference between the benefits and the costs of adopting smart meters on a national scale is a positive one.** There is indeed a high degree of uncertainty – more so in the gas sector than in the electricity one – concerning both the smart metering technology (including its costs) that should be adopted and the actual values of these benefits.
- The Italian smart gas metering program, having the most ambitious deployment targets, is analyzed, by comparing the latter with similar European initiatives and focusing on the corresponding cost/benefit analysis (or CBA), as required by the 2009 Directive on the internal market in natural gas.
- **It should be noted that only six/seven out of twenty-seven EU countries have so far completed the required CBA for the gas sector**

The European policy debate on smart gas metering

TABLE I – TYPE OF BENEFITS ATTACHED TO SMART GAS METERING

Macro area	Benefits
(1) Energy efficiency	<ul style="list-style-type: none">• Consumers' awareness• Consumption flexibility
(2) Industrial processes	<ul style="list-style-type: none">• Quality of service• Relationships among stakeholders in the gas supply chain• Metering costs
(3) Defaulting consumers	<ul style="list-style-type: none">• Remote disablement of supply• Accurate bills
(4) Network's operation, maintenance and development	<ul style="list-style-type: none">• Information on network flows
(5) Safety	<ul style="list-style-type: none">• Detection of network leaks

EXPECTED BENEFITS 1/3

- SGMs can contribute to making consumers' behaviour more energy efficient via two mechanisms. On the one hand, thanks to more frequent and accurate information on energy consumption and cost provided by SGMs, consumers become more aware of the economic and environmental impact caused by their energy uses and, thus, they may reduce and/or shift their gas consumption.
- On the other hand, thanks to more accurate billing, SGMs send correct price signals to consumers, which are then expected to make more efficient choices in their energy uses.

EXPECTED BENEFITS 2/3

- SGMs can contribute to improving industrial processes in the gas supply chain. More accurate and timely information on gas withdrawals of each consumer from the network allows a quick estimate of suppliers and shippers' actual balances. Also, using SGMs leads to meter reading savings for all suppliers because site visits are no longer required. Consumers benefit too as switching procedures would improve thanks to timely availability of metering data.
- The possibility of using SGM to remotely enable/disable gas supply should reduce suppliers' operating costs for non-simultaneous taking over contracts.

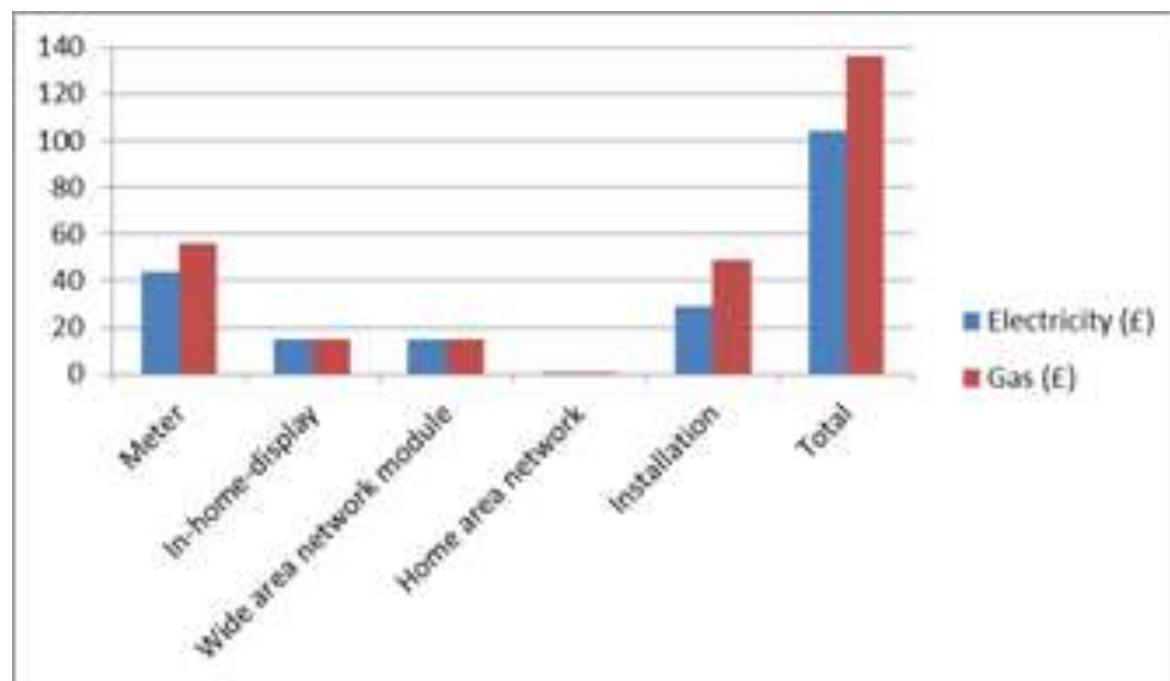
EXPECTED BENEFITS 3/3

- SGMs can make defaulting consumers' management both more effective and less significant.
- On the one hand, remote disablement (via an electric valve within the SGM) allows interrupting gas supply to defaulting consumers in a quick and economic manner.
- Also, this represents a better deterrent for consumers who are considering not paying their gas bills and, thus, reduces the number of defaulting consumers.
- On the other hand, more accurate billing lowers the risk of having consumers defaulting because of surprisingly high balances to pay.
- Not surprisingly, among all industry stakeholders, it is the suppliers who often consider this particular benefit as the most valuable one.

EXPECTED COST 1/2

- The evidence from a few European cases suggests that any smart gas metering program is characterized by higher costs and lower benefits compared to those of its equivalent in the electricity sector.
- As far as smart gas metering costs are concerned, information is very limited. However there is general consensus that SGMs are more expensive than their electricity

Fig. 1 – estimated unit cost of key components of the smart metering system for Great Britain



- In this respect it should be stressed that those deployment programs, where both gas and electricity are rolled-out simultaneously (e.g. the Netherlands and Great Britain) rather than separately (e.g. France and Italy), are assumed to be more cost effective than otherwise, due to economies of scope but also to the possibility of sharing part of the communication infrastructures.

A comparison between Italy and other European countries 1/7

- When analyzing smart gas metering policies, the Italian case appears as a particularly relevant one for at least three reasons. First, Italy was the first country to introduce and almost complete in 2008 a national roll-out of a smart meters in the electricity market.
- Secondly, Italy was the first country to set up a national smart metering program for the gas sector. Lastly the Italian smart gas metering program appears to be as one of the most ambitious ones in Europe in terms of deployment targets, i.e. tight timetable and complete replacement of gas meters for all types of consumers:

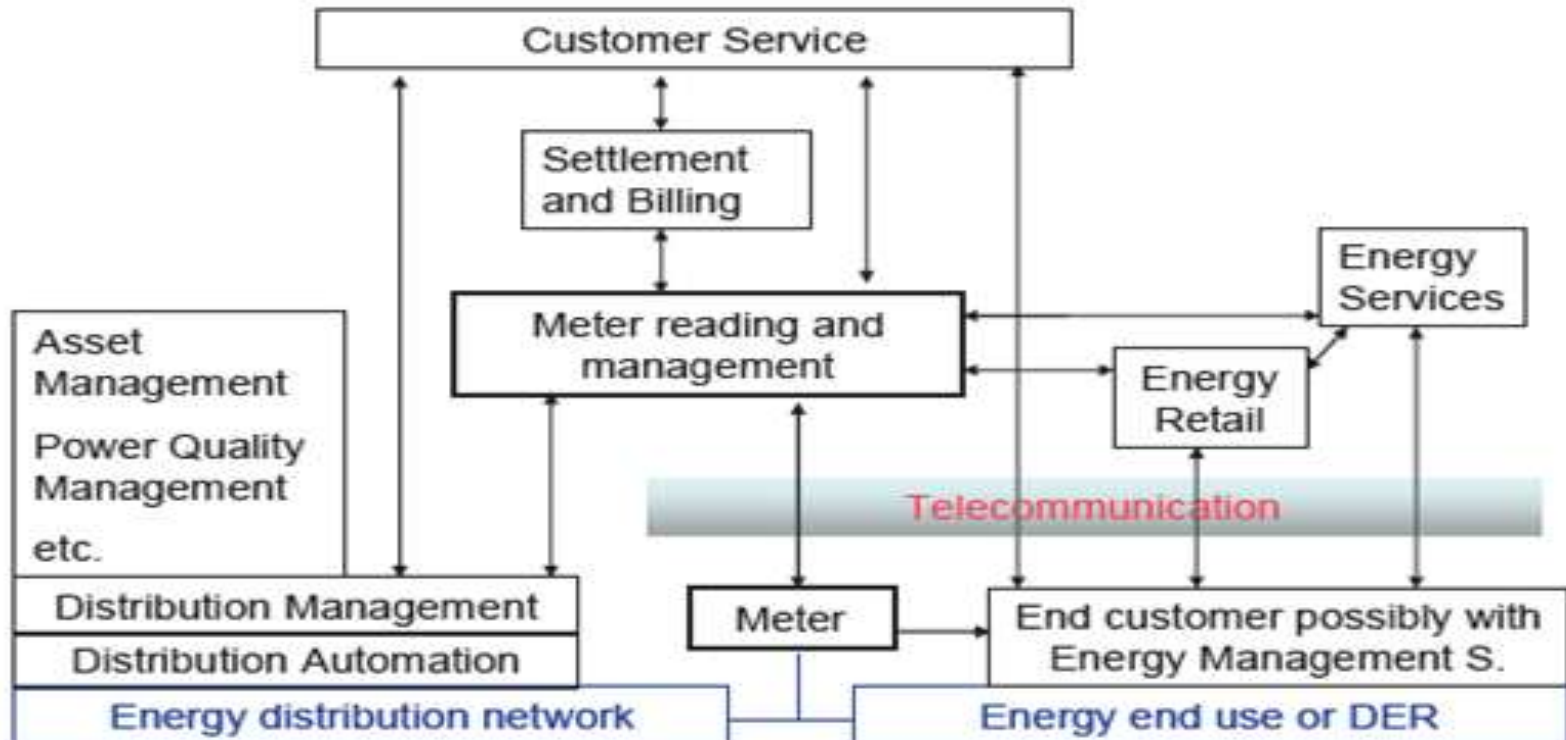
ITALIAN ROLL OUT							
Classe	2012	2013	2014	2015	2016	2017	2018
> G40	100%						
G40, G25, G16, G10			100%				
G6, G4 (17.000.000 utenti)							60%

A comparison between Italy and other European countries 2/7

- However, it should be noted that our assessment of the Italian case, in spite of its high relevance, has been largely affected by the limited available information.
- For instance, AEEG, the Italian energy regulator, has only published a synthesis of the sole CBA published so far. The latter considers costs and benefits of distributors only, which are those responsible for all metering activities in Italy, and, contrary to other European CBAs, ignores those of other stakeholders, such as suppliers and consumers
- Following a critical review of the relevant literature, our analysis suggests that the Italian policy for SGMs differs from that of other European countries (e.g. Great Britain, France and Netherlands) in at least two key elements: the objectives to be achieved through SGMs and the timing of the investment program.

A comparison between Italy and other European countries 4/7

- The Italian smart gas metering program mostly aims at improving industrial processes in the gas sector, in other European countries priority is given to improving sustainability, especially energy efficiency.



A comparison between Italy and other European countries 5/7

- Overall energy saving represents the largest benefit in CBAs carried out in other European countries.

Table II – BENEFITS OF SMART METERING IN THE BRITISH CBA (£/M)

	DOMESTIC	NON-DOMESTIC	TOTAL
ALL BENEFITS	15,825	2,823	18,648
BENEFITS ONLY FROM ENERGY EFFICIENCY (= % OF ALL BENEFITS)	5,623 (=36%)	2,140 (=76%)	7,763 (=42%)

A comparison between Italy and other European countries 6/7

Fig. 2. British CBA's key results for SGMs

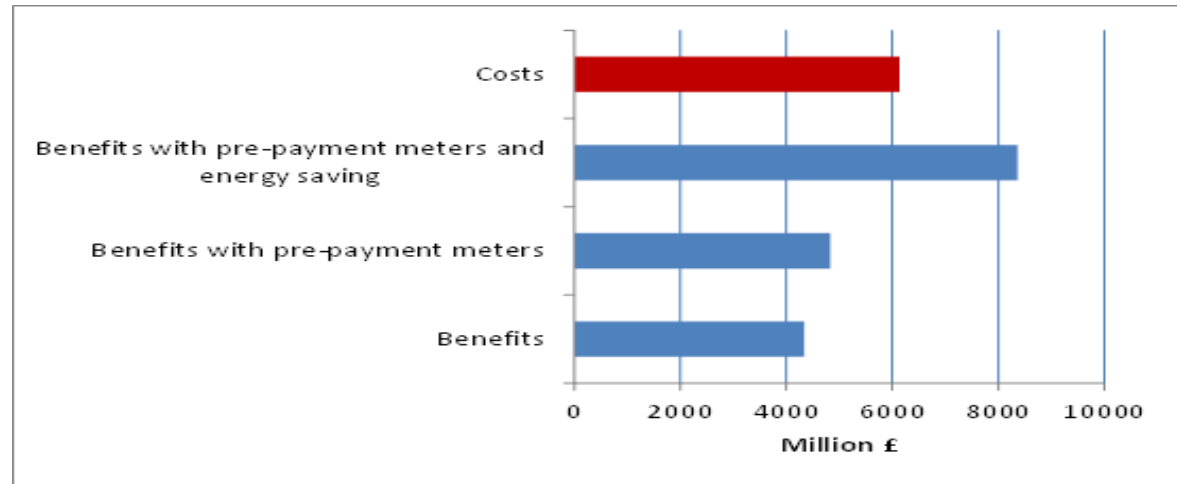
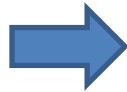
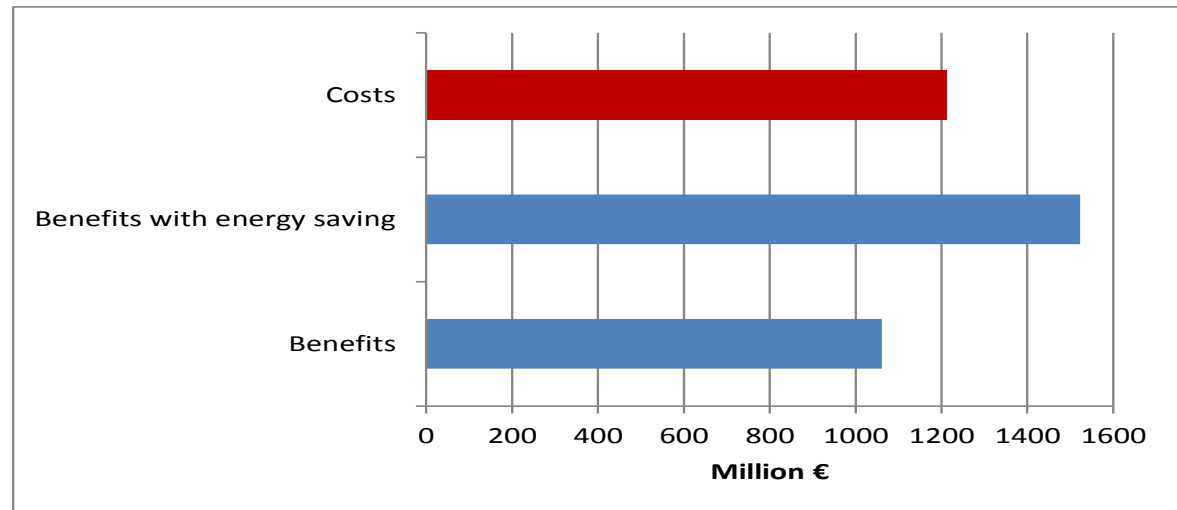
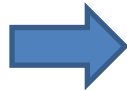


Fig. 3. French CBA's key results for SGMs



A comparison between Italy and other European countries 7/7

- Moreover, as to the net value of improving industrial processes in the gas sector, the Italian CBA does not take into consideration alternative solutions to SGMs, which may yield similar benefits but with lower costs: e.g. a more effective load profiling which makes financial settlement among suppliers, shippers and distributors more efficient.
- Overall it is believed that improvements in the organizational and regulatory framework could significantly reduce the incremental benefits which could arise from introducing a smart gas metering system.
- It should be noted that requiring that SGMS should measure consumption in standard cubic meters – i.e. adjusted for pressure and temperature – is a unique feature of the Italian program only
- With regards to the timing for the roll-out of SGMs, the Italian policy introduces deployment targets which are more ambitious than those set by other European policies

- The net benefit (=benefits minus costs brought about by SGMs) for distributors is likely to be negative if distributors themselves (e.g. France and Italy) **are in charge of the roll-out and are not allowed to pass on all investment costs to final users.**
- Suppliers, on the other hand, are likely to be **the largest beneficiaries** thanks to a series of avoided costs (e.g. fewer complaints for inaccurate billing to deal with) that SGMs are expected to yield in the area of “industrial processes” and of “defaulting consumers”.
- With regards to consumers first, consumers must be able to receive some form of feedback on their actual consumption (e.g. IHD).
- Secondly, consumers must be able to understand the opportunity to reduce their energy bills.
- Finally, consumers decide to change their energy behaviour: so far the evidence on whether they will do so has been inconclusive

- The only who will benefit are the energy companies. **Consumers will have to pay energy companies (e.g. distributors in Italy and suppliers in Great Britain) for the costs of installing and operating smart meters through their energy bills but no transparent mechanism presently exists for ensuring savings to energy companies are passed on to consumers.**
- **at present smart meters for gas are characterized by higher costs and lower benefits than their correspondents for electricity, especially where the two technologies are not deployed simultaneously.** Because of this, any policy on smart metering should carefully assess whether certain objectives could be pursued with cheaper instruments, like regulatory and organizational changes, before rolling out more expensive SGMs: e.g. requiring a more sophisticated load profiling for achieving more accurate bills; moving gas meters outside the home, for making it easier to interrupt defaulting consumers, etc.

- Significant practical difficulties may arise in procuring and installing the required data communications service (e.g. an estimated cost of £3 billion in Great Britain) before the planned roll-out
 - Such difficulties may be mitigated by conducting a relevant number of pilot projects prior to the national roll-out.
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- **We conclude that the “business case” for a large-scale deployment of smart gas meters still appears unclear, especially when it is not done in combination with smart electricity meters. Therefore, we suggest that a more thorough review of the costs and benefits yielded by smart gas meters should be conducted at both Italian and European level and that other options (e.g. new regulation), should be investigated prior to committing businesses and consumers to such a massive investment plan**