



Energy Community Regulatory Board

**A Review of Smart Meters Rollout for Electricity
in the Energy Community**



Reference Documents

Description
[1] Directive 2006/32/EC of the European Parliament and of the Council on energy end-use efficiency and energy services and repealing Council Directive 93/76/EEC
[2] ERGEG, Status Review on Regulatory Aspects of Smart Metering (Electricity and Gas), May 2009
[3] 2 nd Citizens' Energy Forum, Conclusions, London 29–30 September 2009
[4] Anthony Doherty (DG ENER), Smart Metering and the Third Energy Package, ERGEG workshop on smart metering, 14 December 2009 (Brussels)
[5] Silke Ebnet & Stefan Santer, Status Review on Smart Metering, ERGEG workshop on smart metering, 14 December 2009 (Brussels)
[6] Petter Sandoy (Chairman of EURELECTRIC WG Distribution Customers and Operation), Opportunities and Challenges of Smart Metering Roll-out in Europe, ERGEG workshop on smart metering, 14 December 2009 (Brussels)



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1 INTRODUCTION

1.1 The Energy Community

On 25 October 2005 the Treaty Establishing the Energy Community (hereinafter: “the Treaty”) has been signed by the European Community and the authorities of Albania, Bulgaria, Bosnia and Herzegovina, Croatia, the Former Yugoslav Republic of Macedonia, Romania, Serbia, Montenegro and the United Nations Interim Mission in Kosovo (UNMIK¹)². Following signature and ratification of the Treaty Moldova joined the Energy Community as of 1 May 2010.

By signing the Treaty the signatory parties agreed to implement the *acquis communautaire* on electricity, gas, environment, competition and renewables³ with a view to realizing the objectives of the Treaty and to create a regional gas and electricity market within South East Europe (SEE⁴).

The Energy Community Regulatory Board (ECRB)⁵ operates based on Article 58 of the Energy Community Treaty. As an institution of the Energy Community the ECRB advises the Energy Community Ministerial Council and Permanent High Level Group on details of statutory, technical and regulatory rules and should make recommendations in the case of cross-border disputes between regulators.

1.2 Background

The European Union’s **3rd legislative package** related to the internal energy markets and the Directive on energy end-use efficiency [1] contains provisions regarding the installation of smart meters, with the aim of better informing customers of their consumption and helping to increase energy efficiency awareness.

Against the background of the legal requirements, the European Regulators Group for Electricity and Gas (**EREG**)⁶ developed a document, entitled “Status Review on Regulatory Aspects of Smart Metering (Electricity and Gas)” [2] providing an overview of the status quo on smart meters in the EREG member and observer countries. The report more specifically examined the following topics: meter value management; roll-out policies; access to data and privacy issues; and functional and technical aspects.

¹ Pursuant to United Nations Security Council Resolution 1244.

² Following ratification, the Treaty entered into force on 1 July 2006. For details on the Treaty and the Energy Community see www.energy-community.org.

³ For details of the relevant *acquis* see: http://www.energy-community.org/portal/page/portal/ENC_HOME/ENERGY_COMMUNITY/Legal/Treaty

⁴ Title III of the Treaty. Covering territories of Contracting Parties and neighboring EU countries.

⁴ Title III of the Treaty.

⁴ Title IV of the Treaty.

⁵ For details see www.ecrb.eu.

⁶ www.energy-regulators.eu.

The importance of smart meters has been likewise recognized at the first **Citizens' Energy Forum** which took place in London in October 2008 and invited ERGEG to prepare a status review on smart meters. Similarly, the 2nd Citizens' Energy Forum in September 2009 reiterated the importance of rollout of smart meters for assisting the active participation of consumers in the retail energy market.

In 2009 the three European standardization bodies (CEN, CENELEC and ETSI) together with relevant stakeholders established a Smart Metering Co-ordination Group (SM-CG) operating as joint advisory body and focal point concerning smart metering standardization [3].

Following its work on smart metering⁷, ERGEG in 2010 continued related efforts on preparing Guidelines of Good Practice (GGP) on the Regulatory Aspects of Smart Metering⁸. It is worth to stress some highlights of the development **discussions**:

- The EC [4] reminded to the objectives of smart metering: improved retail competition; improved tariff innovation with time of use tariffs; more accurate bills; lower bills due to better consumer feedback; new services for consumers, including vulnerable consumers; facilitation of micro generation including renewable generation; less environmental pollution due to reduced carbon emissions; energy efficiency and energy savings.
- EUROELECTRIC [6] considered the rollout of smart meters as unique opportunity to make distribution grids more intelligent and more efficient stating that (a) smart meters are essential in fostering demand-side management on the long run, being one step towards Smart Grids; (b) smart meters will improve the customer's knowledge about its electricity consumption (via accurate bills) and thereby increase customer awareness of energy end-use; (c) smart meters will simplify the supplier and customer switching processes and improve quality of service.
- EUROELECTRIC [6], however, also noted that smart meter roll-out could be hampered by technical barriers such as: (a) interoperability: how can the meter openly communicate with systems and other devices across borders?; (b) standardization: minimum functionalities should be standardized. What should be left to innovation? (c) future proofing: smart metering

⁷ Presented to the 2nd Citizens' Energy Forum, http://ec.europa.eu/energy/gas_electricity/forum_citizen_energy_en.htm.

⁸ http://www.energy-regulators.eu/portal/page/portal/EER_HOME/EER_PUBLICATIONS/CEER_ERGEG_PAPERS. The GGP will serve as guidance for the industry and governments on smart meters, namely what is required so that smart metering systems actually assist the active participation of consumers in the electricity and gas retail markets and which requirements must be fulfilled to comply with EU legislation in terms of reporting frequency and interoperability. ERGEG organized workshop as an integral part of the process of developing the GGPs. Key discussions focussed on: (a) implications of the 3rd Package; (b) the findings of the ERGEG (2009) Status Review Report and of different cost-benefits analysis conducted in France, Norway and Italy; (c) the need to define minimum functionalities at least at a national (possibly EU) level; (d) the work mandated by the EC to the EU Standards bodies to enable interoperability of utility meters and the important clarification that standardisation in this context does not mean imposing identical solutions on all projects in all Member States; (e) the fact that standards are important pre-requisites for interoperability but standards on their own will not ensure interoperability; (f) the importance of "smart regulation" (e.g. demand response measures) as well as smart metering to help consumers change behaviour, reduce energy consumption and empower them to be more active in the market; (g) the work being done at EU level on smart grids (e.g. ERGEG's current public consultation and the European Commission's new task force for implementing smart grids).

systems should be designed to be flexible for possible future changes in technology or application; (d) technology: did Smart Metering technology already reach maturity?

- EURELECTRIC [6] also provided recommendations when defining the basic functionalities of smart meters such as (a) preferable open standard (inter-operable); (b) bi-directional communication of smart meters; (c) stranded investments in past systems must be taken into account by regulators; (d) EC's 441 Mandate is a step in the right direction. Next step is data requirements?

1.3 Scope and Methodology

The ECRB Customer Working Group started its consideration on smart meters already in 2008⁹. Having in mind the relevance of the topic, smart metering has been included in the ECRB Work Programme 2010.

The present report aims to assess the current status of smart meters in the Contracting Parties. The analysis is based on the **answers provided by national regulators** to a related questionnaire. The questionnaire has to some extent been based on ERGEG's „Status Review on Regulatory Aspects of Smart Metering (Electricity and Gas)“ but was limited to aspects of smart metering in **electricity** and covered¹⁰:

- Meter Value Management dealing with the collection, treatment and use of the data provided by utility meters.
- Roll-out policy contributing to several issues that influence the decision for introducing smart meters.
- The role of the regulators in the process of roll out of smart meters.
- The status of roll out in each investigated jurisdiction.
- The preferable functionalities of smart metering.
- Keeping in mind the differences between commercial and household customers, the questions for both groups were posed separately.

The present report shows the answers provided together with brief comments on the aggregated results and with a view to investigate the status quo of smart metering implementation in the Contracting Parties.

⁹ The topic of smart meters within the CWG was first raised during the 5th CWG meeting on September 18th 2008 in Vienna when CWG TF3 asked that a Tariff Study commissioned by the ECS should include separate information on metering. Further, during the approval process of the ECRB Report on the Implementation of the Best Practice Guidelines for the Protection of Vulnerable Customers metering issues were discussed in detail in the course of the 6th CWG meeting (November 2008).

¹⁰ The final questionnaire is presented in Appendix A.



The analysis **includes** the following jurisdictions:

- Albania
- Austria
- Bosnia and Herzegovina; where results for Bosnia and Herzegovina differ for its entities (the Federation of Bosnia and Herzegovina and Republika Srpska), they are displayed separately in this survey.
- Croatia
- Georgia
- Former Yugoslav Republic of Macedonia
- Montenegro
- Serbia
- Turkey
- UNMIK
- Ukraine

From the EU Member States participating in the Energy Community Process only Austria and Italy provided input to the present survey. The 12th CWG meeting on May 10th 2010 (Vienna) noted that broader involvement from EU Member States participating in the Energy Community Process in the survey would certainly have improved the analysis, particularly those close to the Energy Community region, especially having in mind that smart metering in EU countries is more developed than in Energy Communities' Contracting Parties¹¹.

¹¹ A second call for feedback to the questionnaire used as basis to the present report after the 12th CWG meeting, however, only provided additional feedback from Italy.

2 FINDINGS

2.1 Current level of penetration of smart meters

An evaluation of received answers shows that the current level of penetration of smart meters in Contracting Parties is with less **than 1%** pretty low.

Table 1 shows the actual/estimated number of metering points, whereas Table 2 provides the penetration of smart meters as a percentage of metering points equipped with smart meters in relation to the total number of metering points. In Ukraine there are smart meters installed on the different voltage level but currently NERC doesn't have detail information about their number.

Table 1 Number of metering points

Jurisdiction	Year	Households LV	Commercial LV	Com. or industry MV	Com. or industry HV
Albania	2009	922,148	131,911	5,717	1
Austria	2009	4,000,000	1,400,000	130,000	30,000
Bosnia and Herzegovina	2009	1,281,647	100,987	1,341	13
Croatia	2008	2,070,000	211,900	2,060	29
Georgia	2009	1,373,195	61,267	-	10
Italy		28,500,000	7,000,000	100,000	
FYR of Macedonia	2009	564,683	98,497	1,210	0
Montenegro	2009				
Serbia	2009	3,093,916	327,214	3,948	31
Turkey	2009	26,000,000	4,000,000	250,000	400
UNMIK	2009	342,942	60,596	238	3
Ukraine	2009	18,661,844	927,672	241,366	5,106

Table 2 Penetration of smart meters

Jurisdiction	Households LV	Commercial LV	Commercial or industry MV	Com. or industry HV	TOTAL
Albania	0.00%	0.00%	0.00%	0.00%	0.00%
Austria	1.50%		100.00%	100.00%	3.96%
Bosnia and Herzegovina	0.19%	0.16%	11.78%	38.46%	0.20%
Croatia	0.00%	7.08%	100.00%	100.00%	0.75%
Georgia				100.00%	
Italy					
FYR of Macedonia	0.00%	0.00%	0.00%	0.00%	0.00%
Montenegro				100.00%	
Serbia	0.94%	2.81%	30.62%	100.00%	1.16%
Turkey	0.00%	0.00%	2.00%		0.02%
UNMIK	0.33%	0.91%	0.42%	100.00%	0.42%
Ukraine					

2.2 Responsibilities

Installation, maintenance, reading and data management are **predominantly a responsibility of the DSO**. However there are exceptions:

- *Installation*: customers are burdened with installation in Turkey and to certain extent in Ukraine
- *Maintenance*: customers in Turkey are responsible for maintenance of meters;
- *Reading*: Ukraine relies as well on a metering company for reading;
- *Data management*: Montenegro allows data management by suppliers; in Albania data management is done solely by supplier/s.

Table 3 Responsibilities

Jurisdiction	Installation				Maintenance				Reading				Data management			
	DSO	Supplier	Metering co.	Customer	DSO	Supplier	Metering co.	Customer	DSO	Supplier	Metering co.	Customer	DSO	Supplier	Metering co.	Customer
Albania	✓				✓				✓					✓		
Austria	✓				✓				✓				✓			
Bosnia and Herzegovina	✓				✓			✓ ¹	✓			✓ ¹	✓			
Croatia	✓				✓				✓				✓			
Georgia	✓				✓				✓				✓			
Italy	✓				✓				✓				✓			
FYR of Macedonia	✓				✓				✓				✓			
Montenegro	✓								✓				✓	✓		
Serbia	✓				✓				✓				✓	✓		
Turkey				✓				✓	✓				✓			
UNMIK	✓				✓				✓				✓			
Ukraine	✓			✓	✓			✓	✓		✓	✓	✓		✓	

¹ Regulatory Commission for Energy of the Republika Srpska.

Metering is largely assigned to the DSOs. Therefore it is not surprising that the responsibilities for all aspects of metering and installation are given to DSOs. The few exceptions are compatible with chosen market models and only prove that metering is seldom given to other parties.

2.3 Frequency of meter readings

In most advanced electricity markets the **dynamics of the market** can be easily observed through switching of end users (buyers changing suppliers). However, in less developed markets the dynamics are reflected by meter reading frequency. More frequent meter readings indicate more developed markets and more knowledgeable customers. With more frequent meter readings (of conventional meters or meters with no communication capacity), switching from one supplier to another entails smaller errors in estimation of energy consumed preceding and following the actual switching date.

There is **mandatory frequency for meter reading in almost all analyzed markets**. For most of the country frequency of conventional meter reading for house holds is once a month. In all countries except Austria for commercial customers the mandatory frequency of conventional meter readings is once a month.

Figure 1 and Figure 2 may be more useful in understanding how smart meters are used. A significant fact to perceive is that smart meters in households are not fully utilized.

Table 4 Frequency of conventional meter readings per country

Jurisdiction	Mandatory frequency for meter reading		Households				Commercial			
	YES	NO	Once a month	Between more than once a month and 6 times/y	Between more than 6 times/y and once a year	Less than once a year (specify frequency)	Once a month	Between more than once a month and 6 times/y	Between more than 6 times/y and once a year	Less than once a year (specify frequency)
	Albania	✓		✓				✓		
Austria	✓				✓				✓	
Bosnia and Herzegovina	✓ ¹	✓ ²	✓ ²	✓ ¹			✓			
Croatia	✓				✓		✓			
Georgia	✓		✓				✓			
Italy	✓				✓		✓			
FYR of Macedonia	✓		✓				✓			
Montenegro	✓		✓				✓			
Serbia	✓		✓				✓			
Turkey	✓		✓				✓			
UNMIK	✓		✓				✓			
Ukraine	✓		✓		✓		✓			

¹ Regulatory Commission for Energy of the Republika Srpska

² Regulatory Commission for Electricity in Federation of BiH

Table 5 Frequency of smart meter readings for per country

Jurisdiction	Households				Commercial			
	More than once a month (specify)	Once a month	Between more than once a month and 6 times/y	Between more than 6 times/y and once a year	More than once a month (specify)	Once a month	Between more than once a month and 6 times/y	Between more than 6 times/y and once a year
Albania								
Austria								
Bosnia and Herzegovina			✓ ¹			✓ ¹		
Croatia			✓			✓		
Georgia								
Italy			✓			✓		
FYR of Macedonia								
Montenegro	✓				✓			
Serbia		✓				✓		
Turkey								
UNMIK		✓				✓		
Ukraine		✓			✓			

¹ Regulatory Commission for Energy of the Republika Srpska.

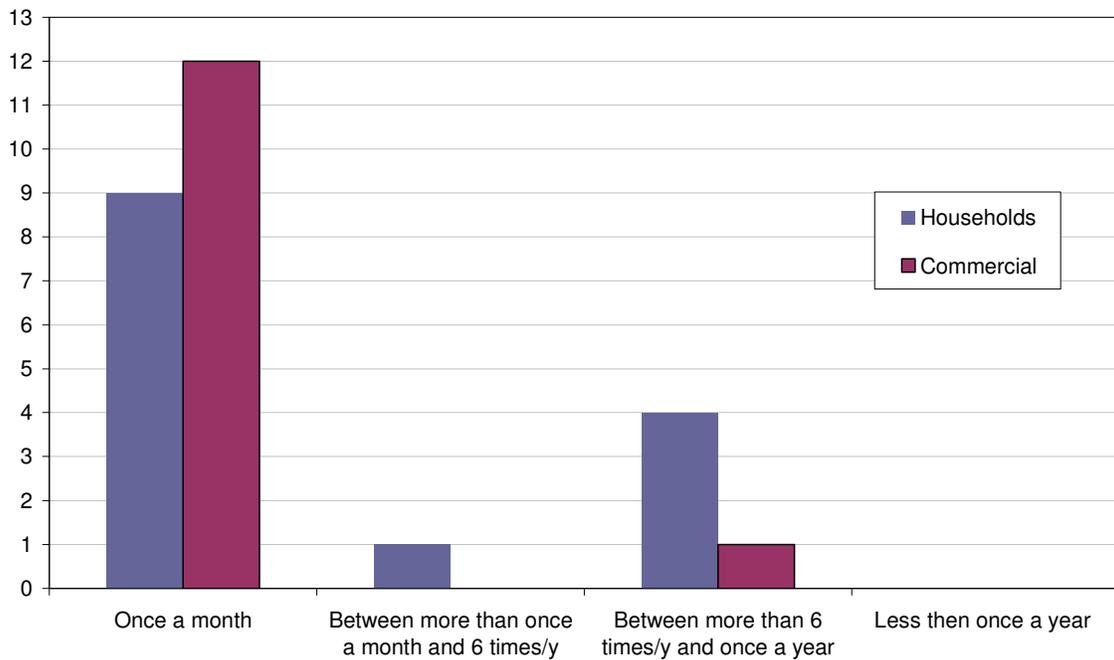


Figure 1 Frequency of conventional meter readings

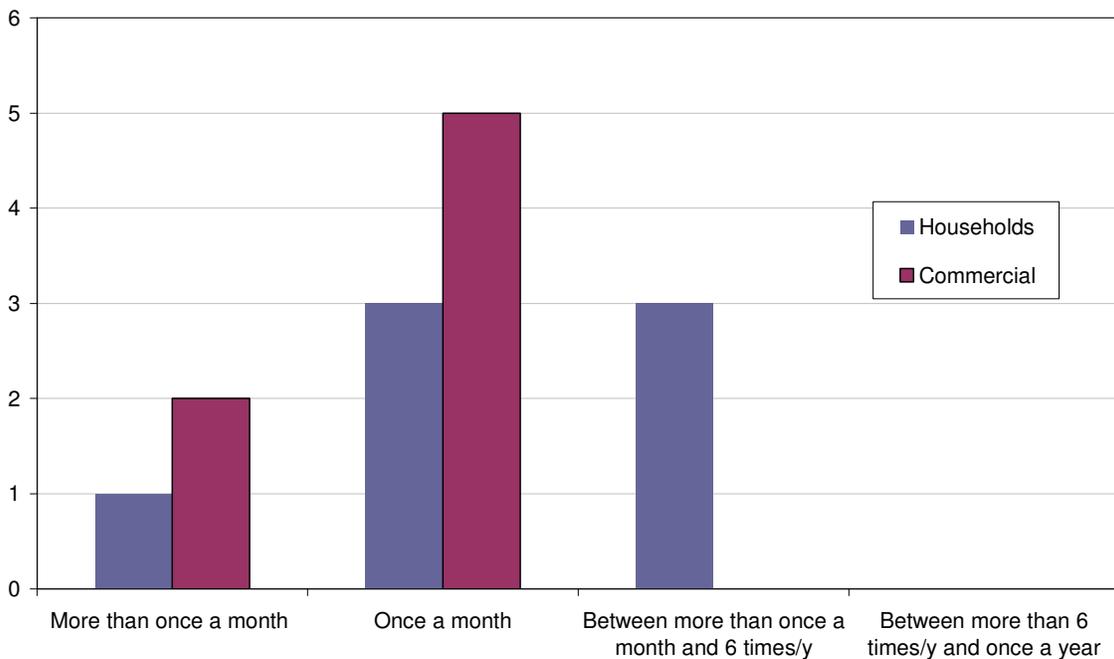


Figure 2 Frequency of smart meter readings

2.4 Policy issues and roll-out plans

Motivation for widespread smart meter roll-out covers a wide range of individual drivers (as shown in Figure 3. **Each Contracting Party has a different focus.**

However, the motivation for implementing smart meters **has not triggered appropriate decisions** (see Table 1). Apart from Serbia and Montenegro, no other CP has endeavored to implement smart meters on a large scale, neither for households and neither for commercial customers.

It must be stressed that **no analyses regarding benefits and cost** are currently conducted in CPs, except for Serbia, where a cost benefit analyses is prepared by an independent consultant.

Regardless of the current status of roll-out plans, **regulators are aware** that they have an active role. This is confirmed by the answers presented in Table 8 and Figure 4.

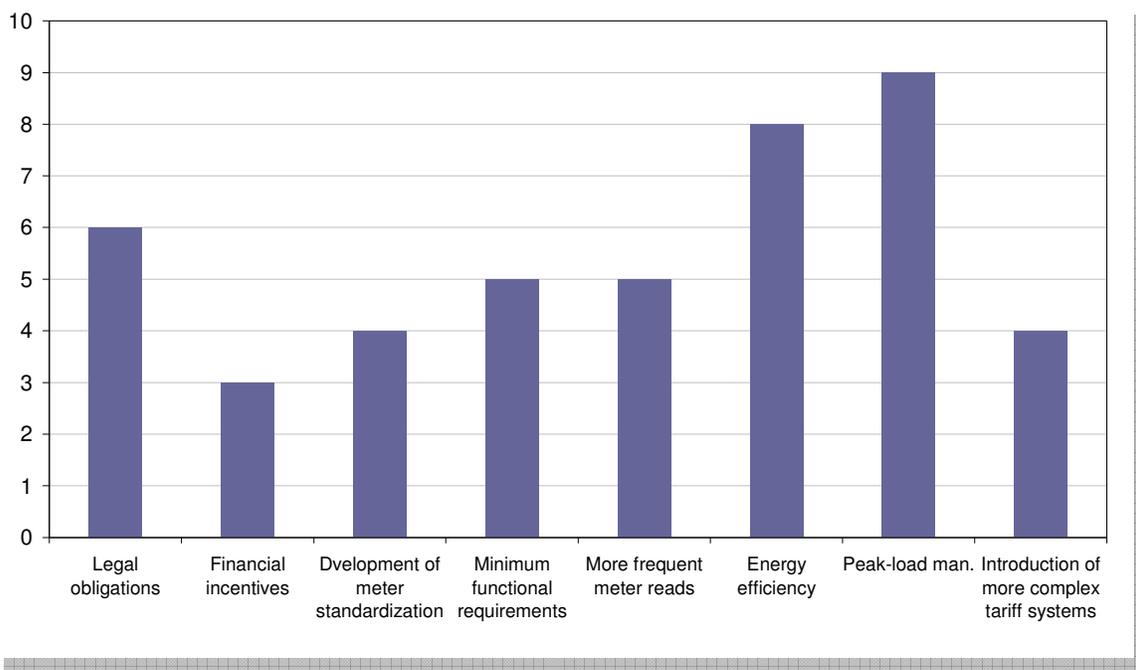


Figure 3 Policy drivers for smart meter roll-outs – aggregation of answers

Table 6 Policy drivers per country

Jurisdiction	Legal obligations	Financial incentives	Development of meter standardization	Minimum functional requirements	More frequent meter reads	Energy efficiency	Peak-load man.	Introduction of more complex tariff systems	Other - specify
Albania		✓					✓	✓	
Austria				✓	✓	✓	✓	✓	
Bosnia and Herzegovina	✓ ¹		✓	✓ ¹	✓ ²	✓ ²		✓ ¹	
Croatia	✓					✓	✓		
Georgia						✓	✓		
Italy	✓			✓			✓		Market development, Quality of service, Consumption awareness, Demand response
FYR of Macedonia	✓				✓	✓	✓	✓	
Montenegro	✓	✓	✓	✓	✓	✓	✓		
Serbia						✓	✓	✓	Reduction of losses, , Quality of service, Consumption awareness, Demand response
Turkey									
UNMIK		✓	✓		✓	✓	✓		
Ukraine	✓			✓		✓	✓		

¹ Regulatory Commission for Energy of the Republika Srpska.

² Regulatory Commission for Electricity in Federation of BiH.

Table 7 Status of roll-outs per jurisdiction

Jurisdiction	Status of smart metering roll-out for households				Status of smart metering roll-out for commercial customers				Specify the planned date of beginning and end of the smart metering roll-out for households	Specify the planned date of beginning and end of the smart metering roll-out for commercial
	No roll-out planned yet	Still under discussion	Decided	In progress	No roll-out planned yet	Still under discussion	Decided	In progress	Specify	Specify
Albania	✓				✓				No roll-out planned	No roll-out planned
Austria		✓				✓			Not specified yet	Not specified yet
Bosnia and Herzegovina	✓				✓				No roll-out planned	No roll-out planned
Croatia	✓					✓			No roll-out planned	Not specified yet
Georgia	✓				✓				No roll-out planned	No roll-out planned
Italy			✓	✓			✓	✓	Start in 2008 - End of 2011	Start in 2008 - End of 2011
FYR of Macedonia	✓				✓				No roll-out planned	No roll-out planned
Montenegro			✓				✓		middle of 2010- end of 2015	
Serbia			✓	✓			✓	✓	2010-2013	2010-2013
Turkey	✓				✓				No roll-out planned	No roll-out planned
UNMIK		✓				✓			If the financial possibility allows then it will start a roll-out plan in installing smart meters for household customers.	If the financial possibility allows then it will start a roll-out plan in installing smart meters for household customers.
Ukraine	✓						✓	✓	No roll-out planned	to the end of 2010 for large industrial customers

Table 8 Regulatory framework per jurisdiction

Jurisdiction	Regulator or the government made a cost/benefit analysis connected with roll-out			Role of the regulator				
	Yes, specify the main results, positive/negative, and main element for result	In progress	No	Definition of the roll-out timetable	Participation in the project man	Definition of minimal tech req.	Definition of the level of ROI expected	Other – specify
Albania			✓				✓	
Austria		✓		✓		✓	✓	✓
Bosnia and Herzegovina		✓ ¹	✓ ²			✓ ²	✓ ²	
Croatia			✓		✓	✓		Metering issues are decided in privatization contracts by the government
Georgia			✓	✓			✓	Financial penalties
Italy			✓	✓		✓		
FYR of Macedonia			✓	✓			✓	
Montenegro								
Serbia	Cost benefit analyses has been prepared by independent consultant and Regulator gave support to this process		✓					Real pressure on loss reduction, regulator asks DSO to prepare document with measures and activities to reach this goal.
Turkey	DSO has done the cost/benefit analyses , and the conclusions were that these kind of projects are financially justified and for 10 years it will be return on investment		✓	✓	✓	✓	✓	
UNMIK							✓	
Ukraine			✓	✓		✓		

¹ Regulatory Commission for Electricity in Federation of BiH

² Regulatory Commission for Energy of the Republika Srpska

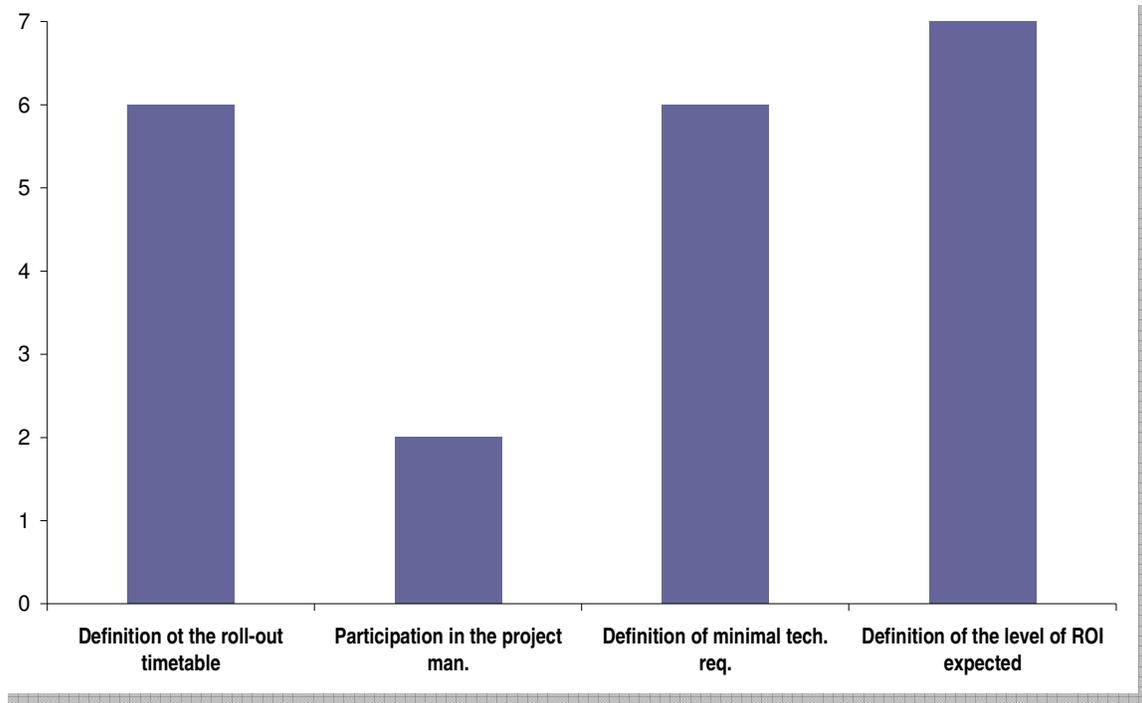


Figure 4 Aggregated answers on the role of regulators

2.5 Desired functionalities of smart meters

Figure depicts functionalities of smart meters that are required **from a regulators point of view**. Unsurprisingly, main requirements are related to remote reading, quality of service, and tariffs (remote parameterization). On the other hand, functionalities for providing information to customers are not that important to regulators.

On the other hand, the mixture of individual answers of NRAs (see Table 9) shows that requirements on functionalities should be investigated in more depth. Since, economic analyses of roll-outs are yet to be performed. It would be beneficial to gather information from market actors (suppliers and operator), customers, customer associations and customer protection associations regarding needed functionalities.

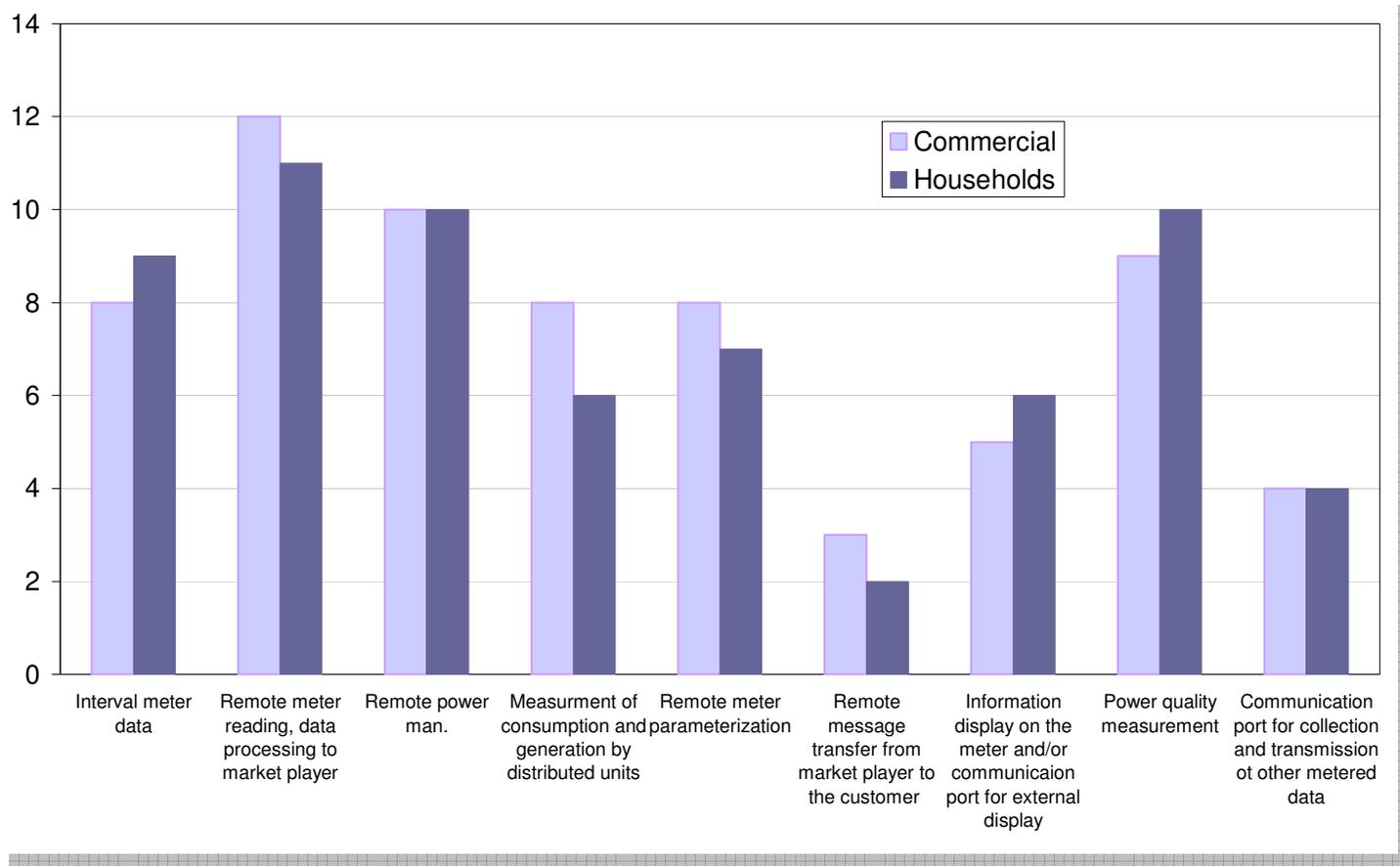


Figure 5 Aggregated answers on desired functionalities of smart meters

Table 9 Smart meter functionalities for households per jurisdiction

Jurisdiction	Interval meter data	Remote meter reading, data processing to market player	Remote power man.	Measurement of consumption and generation by distributed units	Remote meter parameterization	Remote message transfer from market player to the customer	Information display on the meter and/or communication port for external display	Power quality measurement	Communication port for collection and transmission of other metered data
Albania		✓	✓	✓		✓	✓		
Austria	✓	✓	✓		✓		✓	✓	✓
Bosnia and Herzegovina	✓ ¹	✓	✓ ¹	✓ ²				✓	
Croatia	✓	✓	✓	✓	✓			✓	
Georgia									
Italy	✓	✓	✓	✓	✓	✓	✓	✓	✓
FYR of Macedonia		✓							
Montenegro	✓	✓	✓	✓	✓		✓	✓	
Serbia	✓	✓	✓	✓	✓	✓	✓	✓	✓
Turkey	✓		✓		✓			✓	
UNMIK	✓	✓	✓		✓		✓	✓	✓
Ukraine	✓	✓	✓	✓			✓	✓	✓

¹ Regulatory Commission for Energy of the Republika Srpska

² Regulatory Commission for Electricity in Federation of BiH

Table 10 Smart meter functionalities for commercial/industry per jurisdiction

Jurisdiction	Interval meter data	Remote meter reading, data processing to market player	Remote power man.	Measurement of consumption and generation by distributed units	Remote meter parameterization	Remote message transfer from market player to the customer	Information display on the meter and/or communication port for external display	Power quality measurement	Communication port for collection and transmission for other metered data
Albania		✓	✓		✓				
Austria	✓	✓	✓		✓		✓	✓	✓
Bosnia and Herzegovina	✓ ¹	✓	✓ ¹	✓				✓	
Croatia	✓	✓	✓	✓	✓			✓	
Georgia									
Italy	✓	✓	✓	✓	✓	✓	✓	✓	✓
FYR of Macedonia		✓							
Montenegro	✓	✓	✓	✓	✓		✓	✓	
Serbia	✓	✓	✓	✓	✓	✓	✓	✓	✓
Turkey		✓	✓	✓					
UNMIK	✓	✓	✓	✓	✓	✓	✓	✓	✓
Ukraine	✓	✓	✓	✓	✓	✓	✓	✓	✓

¹ Regulatory Commission for Energy of the Republika Srpska

Table 11 Answers on preferred method of communication per jurisdiction

Jurisdiction	Preferred method of communication
Albania	GPRS
Austria	PLC, in areas where PLC is not applicable (due to technical restriction of this technology) it is also under discussion to use GPRS/GSM-communication
Bosnia and Herzegovina	GPRS, Ethernet PLC
Croatia	
Georgia	GSM
Italy	
FYR of Macedonia	It depends of the development of the standardization of the communication systems
Montenegro	GPRS, PLC
Serbia	DLMS
Turkey	
UNMIK	The method of communication that DSO is using is GPRS, GSM and PLC. Two Pilot Projects that DSO has implemented and installed smart meters to some household customers they have used PLC communication method. DSO for distribution feeders such as 110/10 KV and 35/10 KV they use GSM communication method. Other installed smart meters to different customer (household, commercial, industrial) they use GPRS communication method
Ukraine	In different regions different communication methods are used dependent on geographical and technical features, and technical policy of network companies. For households - mainly PLS, For industrial - GSM and in some cases GPRS

3 CONCLUSIONS

Introduction of smart meters on a large scale is **still to be carried out** in the Energy Community Contracting Parties. Apart from Montenegro which made a decision to implement smart meters, no other CP has endeavored to implement smart meters, neither for households nor for commercial customers.

All Contracting Parties still have to **assess the benefits** of such implementation. The next step for the Contracting Parties would be to make appropriate analyses and then prepare a suitable plan with precise technical requirements/goals and a fitting scheme for financing the roll-out.

For the time being, the **regulators** of the Contracting Parties are well aware that they have to have an active role in introducing smart-meters. However, they should be acquainted with good examples or best practice of countries in the EU that have started roll-outs already, thus enabling them to accelerate the decision process within their jurisdictions and empower them for analyzing and conducting the process.

Appendix A – Questionnaire

NO	Question	Answer	
1.	Country, Name, Phone, e-mail		
2.	Number of measuring points and number of installed smart meters by: 2009	Households LV Commercial LV Commercial/industrial MV Commercial/industrial HV	Measuring pts. Smart meters
3.	Energy consumption for the year: 2009	Households LV Commercial LV Commercial/industrial MV Commercial/industrial HV	GWh GWh GWh GWh
4.	Who is responsible for the operations related to metering?		
4.1	Installation	<input type="checkbox"/> Distribution system operator <input type="checkbox"/> Energy supplier <input type="checkbox"/> Metering company (independent from the DSO) <input type="checkbox"/> Customer	
4.2	Maintenance	<input type="checkbox"/> Distribution system operator <input type="checkbox"/> Energy supplier <input type="checkbox"/> Metering company (independent from the DSO) <input type="checkbox"/> Customer	
4.3	Meter reading	<input type="checkbox"/> Distribution system operator <input type="checkbox"/> Energy supplier <input type="checkbox"/> Metering company (independent from the DSO) <input type="checkbox"/> Customer	
4.4	Data management	<input type="checkbox"/> Distribution system operator <input type="checkbox"/> Energy supplier <input type="checkbox"/> Metering company (independent from the DSO) <input type="checkbox"/> Customer	
5.	Is there a mandatory frequency for meter reading defined in your country?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
5.1	Specify the mandatory frequency for meter reading – households	<input type="checkbox"/> Once u month (12 times per year) <input type="checkbox"/> Bimonthly (6 times per year) <input type="checkbox"/> Please specify the frequency:	
5.2	Specify the mandatory frequency for meter reading – commercial	<input type="checkbox"/> Once u month (12 times per year) <input type="checkbox"/> Bimonthly (6 times per year) <input type="checkbox"/> Please specify the frequency:	
5.3	Specify the mandatory frequency for smart meters reading – households	<input type="checkbox"/> More frequently than once a month (please specify) <input type="checkbox"/> Once u month (12 times per year) <input type="checkbox"/> Bimonthly (6 times per year) <input type="checkbox"/> Please specify the frequency:	
5.4	Specify the mandatory frequency for smart meters reading – commercial	<input type="checkbox"/> More than once a month (please specify) <input type="checkbox"/> Once u month (12 times per year) <input type="checkbox"/> Bimonthly (6 times per year) <input type="checkbox"/> Please specify the frequency:	
6.	Who is in charge for the national smart metering roll-out plan in your country?	<input type="checkbox"/> Government <input type="checkbox"/> Regulator <input type="checkbox"/> DSO <input type="checkbox"/> Other (please specify):	
7.	Has the regulator, DSO or the government made a cost/benefit analysis relating to any decision regarding a roll-out?	<input type="checkbox"/> Yes. Please specify the main results, positive/negative, and main element for result: <input type="checkbox"/> It is in progress <input type="checkbox"/> No	

NO	Question	Answer
8.	What are the main policy drivers to encourage smart metering roll-out in your country? (several answers are possible)	<input type="checkbox"/> Legal obligations (including regulatory ones) <input type="checkbox"/> Financial incentives <input type="checkbox"/> Development of meter standardization <input type="checkbox"/> Minimum functional requirements <input type="checkbox"/> More frequent meter reads <input type="checkbox"/> Energy efficiency <input type="checkbox"/> Peak-load management <input type="checkbox"/> Introduction of more complex tariff systems <input type="checkbox"/> Other (please specify):
9.	What is the role of the regulator in the processes? (several answers are possible)	<input type="checkbox"/> Definition of the roll-out timetable <input type="checkbox"/> Participation in the project management <input type="checkbox"/> Definition of minimal technical requirements <input type="checkbox"/> Definition of the level of ROI (return on investment) expected <input type="checkbox"/> Other (please specify):
10.	Roll-out plan	
10.1	What is the status of smart metering roll-out for households in your country? (several answers possible)	<input type="checkbox"/> There is no roll-out planned yet <input type="checkbox"/> Roll-out plan is still under discussion <input type="checkbox"/> Roll-out plan is decided <input type="checkbox"/> Roll-out plan is in progress
10.2	What is the status of smart metering roll-out for commercial customers in your country? (several answers are possible)	<input type="checkbox"/> There is no roll-out planned yet <input type="checkbox"/> Roll-out plan is still under discussion <input type="checkbox"/> Roll-out plan is decided <input type="checkbox"/> Roll-out plan is in progress
10.3	Please specify the planned date of beginning and end of the smart metering roll-out for households.	
10.4	Please specify the planned date of beginning and end of the smart metering roll-out for commercial customers.	
11.	Which functionalities of smart metering for households should be covered? (several answers are possible)	<input type="checkbox"/> Interval meter data (load profile measurement) <input type="checkbox"/> Remote meter reading, data processing to market players <input type="checkbox"/> Remote power management (power reduction, disconnection, demand management, etc.) <input type="checkbox"/> Measurement of consumption and generation by distributed units <input type="checkbox"/> Remote meter parameterization such as tariff structures, contractual power, meter interval, etc. <input type="checkbox"/> Remote message transfer from market players to the customer (customer/generator) as e.g. price signals <input type="checkbox"/> Information display on the meter and/or communication port for external display <input type="checkbox"/> Power quality measurement (incl. continuity of supply and voltage quality) <input type="checkbox"/> Communication port for collection and transmission of other metered data (e.g. gas, heat)
12.	Which functionalities of smart metering for commercial/industry should be covered? (several answers are possible)	<input type="checkbox"/> Interval meter data (load profile measurement); <input type="checkbox"/> Remote meter reading, data processing to market players; <input type="checkbox"/> Remote power management (power reduction, disconnection, demand management, etc.); <input type="checkbox"/> Measurement of consumption and generation by distributed units; <input type="checkbox"/> Remote meter parameterization such as tariff structures, contractual power, meter interval, etc.; <input type="checkbox"/> Remote message transfer from market players to the customer (customer/generator) as e.g. price signals; <input type="checkbox"/> Information display on the meter and/or communication port for external display; <input type="checkbox"/> Power quality measurement (incl. continuity of supply and voltage quality); <input type="checkbox"/> Communication port for collection and transmission of other metered data (e.g. gas, heat).
13.	Which is the preferred method of communication (e.g. GPRS, GSM, PLC, etc.)	

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