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Coordinator:
Svein Hallsteinsen
SINTEF
Norway

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Boukje Ehlen/BOUKJE.COM

CONTRIBUTING PARTNERS

All CoSSMic consortium partners

ABSTRACT

This document describes a first assessment of non-technical bottlenecks for the implementation of CoSSMic results.

INTERNAL REVIEWER(S)

Andreas Baur

APPROVED BY

Svein Hallsteinsen

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Stiftelsen SINTEF
(SINTEF)
NO-7465 Trondheim, Norway
www.sintef.com

Svein Hallsteinsen
svein.hallsteinsen@sintef.no
+47 93241907
Shanshan Jiang
Shanshan.jiang@sintef.no
+47 48027558



International Solar Energy Research
Center Konstanz (ISC)
Rudolf Diesel strasse
78467 Konstanz, Germany

Kristian Peter
Kristian.peter@isc-konstanz.de
+49 75313618365



Stadt Konstanz (Konstanz)
Kanzleistrasse 15
78462 Konstanz, Germany

Andreas Baur
baura@stadt.konstanz.de
+49 7531900632



Seconda Università Degli Studi di
Napoli (SUN)
Viale Beneduce 10
81100 Caserta, Italy

Prof. Beniamino Di Martino
beniamino.dimartino@unina.it
+39 3470461656



Provincia di Caserta (Caserta)
Viale Lamberti Area –
ex Saint Gobain,
81100 Caserta, Italy

Giulio Salzillo
info@giuliosalzillo.it
+39 3316686100



Norges Teknisk-Naturvitenskapelige
Universitet (NTNU)
Høgskoleringen 1
7491 Trondheim, Norway

Prof. Gabriella Tranell
gabriella.tranell@ntnu.no
+47 73592761



Sunny Solartechnik GmbH (SST)
Gustav-Schwab-Strasse 14
78467 Konstanz, Germany

Michael Simon
michael.simon@sunny-solartechnik.de
+49 7531362850



Boukje.com Consulting BV
(Boukje.com)
Zwanendreef 2
2665 EM Bleiswijk,
The Netherlands

Boukje Ehlen
boukje@boukje.com
+31 610647847



Universitetet i Oslo (UiO)
Problemveien 5-7
0316 Oslo, Norway

Geir Horn
geir.horn@mn.uio.no
+47 93059335

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1 Introduction

1.1 Role of the deliverable

D7.7 assesses whether the current legal situation, both on a local level (city, province) as well as on higher levels (e.g. national, European), will block any of the suggested business models during the trial execution or when replicating the CoSSMic in another area in Europe.

1.2 Relationship to other CoSSMic deliverables

This deliverable has a clear link with the deliverables in WP5, as legal issues blocking the trial execution would stop these deliverables from being achieved.

1.3 Relationship to other versions of this deliverable

This is the first and final version.

1.4 Structure, goal and scope of this document

The structure of this document is fairly simple: it consists of a first chapter that describes its objectives and role within the CoSSMic project, and a second chapter that describes the results achieved.

The main goal of this deliverable is to assess whether the current legal situation imposes barriers to the replication of the CoSSMic technology in Europe.

The scope of this deliverable is very much limited to the CoSSMic technology and to comment on the influence of the main market and tariff related factors that might affect the realisation of the concept. The energy sector both in Europe and in the rest of the world is facing necessary transition to more sustainable energy supply, meaning that both the technical and legal/regulatory fundament has to change. Therefore, rather than assessing in detail the current state of affairs, we choose to focus on trends and possibilities..

2 Legal and Regulatory aspects

2.1 General

The CoSSMic concept is based on automated adaptation of flexible consumption to the fluctuating production profile of the local PV production. The realisation of the concept might face the following legal and regulatory challenges:

- Allowance of local end user market features in order to secure a fair distribution of benefits for flexible customers.
- Metering infrastructure, including collective metering allowance as interface to the external ("organized physical") power markets.
- More generally: The future grid tariff structure and in particular the allocation of grid costs in the monopoly part of the unbundled power system.

This report gives an overview of the status and main trends regarding these issues.

2.2 Profitability of local production – load balancing

Innovative, customer-friendly solutions, technologies and services make it significantly easier for customers to become prosumers. The CoSSMic concept is one of several options for the future use of flexibility in consumption in the balancing of intermittent production. Services related to smart home applications and electrification, storage, buying excess electricity, installation and maintenance of generation equipment and outsourcing of generators' responsibilities (e.g. balancing) are gradually becoming more available. This has been facilitated by the decrease in technology costs and the development of smart grids and smart meters.

The European electricity system has changed significantly in the last decade. Simply put, it has shifted from a monopoly system with fewer stakeholders, large and controllable generating facilities and often publicly-owned companies to a liberalised setting in which the number of producers has grown exponentially, generating facilities are diminishing in size and the system is being unbundled.

The grid must, however, still be designed to cover peak demand when there is no local production, and to export excess production when there is low local demand. Network costs can even rise if extended network connection and network reinforcement are needed. The future regulatory framework related to local production and prosumer arrangements needs therefore to take into consideration the market efficiency related to prosumer business models and the distribution of network cost.

2.3 Market arrangements

As described in the European Communication "Clean Energy For All Europeans"¹, consumers will be active and "central players on the energy markets of the future". Prosumer and flexible consumption (Demand Response) access to the organized market Day Ahead (DA), Intra Day (ID) and Balancing Markets (BM) is regarded as the an important factor in order to secure profitable business models. According to Eurelectric² is market access essential for customers who produce electricity primarily for their own needs, but also can sell the excess electricity. National legislation in the various European countries differentiates between different sizes of prosumers, and services provided to prosumers by utilities are also specified based on the scale of activity. Other arrangements, such as being part of a microgrid, may also influence.

¹ COM/2016/0860 final "Clean Energy For All Europeans"

² Eurelectric: Prosumers - an integral part of the power system and the market, June 2015

Currently, trading and the sharing energy between neighbours (consumers) is not allowed within most member states. Trading arrangement with aggregators as mediators is however accepted in the organized markets, provided that the balance responsibility issues with the customers primary retailer is clarified.

In addition is local markets organized by the DSOs currently under development in some countries.

Of special interest is the new German legislation (effective 2017)³, called the "tenant current model" (in German: "Mieterstrommodell"), which introduces a new concept of energy supply closed to a contracting model. The neighbour supply model is defined as a decentralized/locally generated electricity from PV plants, which is used directly by tenants in multi-family houses or commercial buildings. The house owner can sell the PV energy directly to the tenants in the house. This requires billing in a way that the volume of tenant's supply and demand has to be evaluated correctly and the sub division to the tenants has to be enabled.

The Mieterstrommodell, allowing local market approaches, combined with net metering for the microgrid (PV + flexible customers) towards the external grid and market would be the optimal base for a profitable realisation of the CoSSMic concept.

2.4 "Smart" metering as facilitator

The directives of the third Energy package introduced by EU in 2009, require EU member states to equip at least 80% of consumers with intelligent metering systems by 2020. Automated metering systems (AMS) are therefore presently rolled out in several European countries. Italy was one of the first countries with metering to all with the potential of offering time differentiated tariffs. In Germany the new "Digitization of the Energy Turnaround Act" (July 2016) cleared the final legislative hurdle in the German Federal Council Bundesrat of Germany. The new law initiates the roll-out of smart meters and connected infrastructures in Germany and defines roles and tasks for market participants.

In the Nordic countries⁴ AMS to all customers with hourly or quarterly time sampling resolution will be in place within a few years (Norway in 2019). Registration of both consumed and injected energy is required. In addition is central data hubs for metering data, facilitated by the national TSOs, under development. In the CoSSMic context it should be mentioned that the alternative of common metering (net-metering) arrangements for households is no longer allowed. The argumentation is that such non-market-based net-metering schemes lead to indirect subsidies to prosumers. Consequently, this type of scheme does not provide a sound framework for developing services for prosumers.

The customers of CoSSMic are equipped with individual smart meters with hourly metering on the household level and more detailed metering at the individual appliance level. Theoretically, this should make it possible to remunerate the different customers for their contribution to the local balancing. Structure of a technological platform for the potential local market is not established in the project.

Legalization of net metering interface towards the external grid and markets seems to be a key factor in the development of the relevant business models.

³ <http://www.pv-financing.eu/wp-content/uploads/2016/10/5.-The-neighbour-solar-supply-model-Mieterstrom-in-Germany.pdf>

⁴ NordReg: Status report – update and national development, August 2015

2.5 Network tariffs

The structure and design of the network tariff is another hurdle for profitability of CoSSMic business model.

In most European countries, grid tariffs for small and medium size customers are largely based on volumetric (kWh-based) charges. Consequently, in these countries prosumers contribute less to the costs of grid development and management. Prosumers contribute little to taxes, including VAT, levies and other fixed system costs, because they are in many cases collected, based on the volume of electricity consumed, and billed by the supplier. In this way, a large share of the policy support costs and other possible fixed system costs are thereby shifted to other customers.

The prosumer does not have to pay his supplier for the corresponding volume of electricity actually consumed, and the grid operator does not receive grid fees for these volumes. At the same time, delivering these volumes of electricity has a cost for both supplier and grid operator related to sourcing, grid use, etc. This will either lead to higher retail prices for the supplier's remaining customers, or to a negative impact on the supplier's profit margins. The grid operator might not be able to recover the unpaid grid fees, and will therefore actually fund the subsidy as well.

In addition, the problem of avoided grid fees, taxes and charges, which have to be paid then by the other consumers, is even more pronounced in such net-metering schemes. Such non-market-based net-metering schemes lead to indirect subsidies and prosumers are thus not integrated in the market.

Consequently, this type of scheme also does not provide a sound framework for developing services for prosumers.

The load shaving potential of flexible consumption, combined with PV installations in microgrids, will most probably reduce the need for future distribution capacity. This aspect should be taken into consideration in the further development of network tariffs.

2.6 Data security

A special focus in many countries has been on data security and especially the risk of meter information abuse related to privacy: The possibility to analyse the daily consumption pattern in order to reveal the behaviour of the customer.

These handling of personal data are regarded as general and needs to be solved by securing that:

- Information is accessible only to those authorized to have access
- Information and treatment methods are accurate and complete - means that unauthorized persons cannot change information or system that processes information
- Authorized users access to information and associated assets when required

The decentralised architecture of CoSSMic means that data with privacy issues are kept within the household. However as with all home monitoring and automation systems, a clever hacker could possibly get access to such data.

Besides the consumer rights guaranteed in EU legislation, the EU has defined, since the opening of the energy supply market, a set of rights that all EU citizens enjoy as energy consumers. Their aim is to help getting better deals, and to track and manage energy use⁵

⁵ <https://ec.europa.eu/energy/en/topics/markets-and-consumers/consumer-rights-and-protection>

The rights of an energy consumer have to be clearly set out in the national laws and must reflect provisions in EU legislation. On that basis, the national legislation must guarantee the right to specific consumer protection measures.