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Responsible:	Organisation:	Contributing WP:
Miguel Angel Aranda	UNE	WP21

Authors (organisation):

Alberto Zambrano (ETRA], Álvaro Nofuentes (ETRA), Alexandre Lapedra (BYES), Eric Portalès (BYES), Catalin Chimirel (CRE), Giuseppa Caruso (ENG), Félix Ruiz (AMP), Jose González (AMP), Jorge Sanjuán (AMP), Xavier Benavides (AMP), Ignacio Benítez (AMP), Noemí González (ITE), Julio César Díaz(ITE), Foivos Palaiogiannis (ICCS), Maria Symponi (HEDNO), Dimitrios Stratogiannis (HEDNO), Stamatia Gkiala Fikari (HEDNO), George Thanos (AUEB), Vaiva Indilaite and Sara Tachelet (RESC), Stefan Meir (VS), Rafael Leal-Arcas (QMUL) and Miguel Ángel Aranda (UNE).

Abstract:

Standardization and interoperability issues will be considered in this document to contribute to the most efficient way to the European and International standardization bodies (V1).

Keywords:

Standards, access to markets, interoperability, data models, good practices.

Revision History

Revision	Date	Description	Author (Organisation)
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V0.9	22.04.2019	Minor final changes	Aranda Gómez, Miguel Angel (UNE)
V1.0	30.04.2019	Final version	Aranda Gómez, Miguel Angel (UNE)

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EXECUTIVE SUMMARY

The 22nd November 2018, the European Commission presented a first response to the request of the European Council in March 2018 to assess the state-of-play, as well as the remaining barriers and opportunities for a fully functioning Single Market. Standardization plays an important role in this assessment considering, in particular, its role in eliminating technical barriers to trade. Standards help to ensure that complementary products and services are interoperable, facilitate the introduction of innovative products and ultimately build trust of European consumers in the quality of products and services offered in the Union. [1]

D21.2 "Contribution to standardization" presents WiseGRID strategy for contributing to standardization and the actions performed and foreseen for this contribution. The contribution to standardization seeks to transfer selected results of WiseGRID to standards (EN/CLC/ISO/IEC). D21.2 it is being delivered at M30, being the first version of the final document to be delivered at M42, which will report on the performed contributions.

Deliverable D3.2 "WiseGRID architecture, data models, standards and data protection (V2)" served as the basis to this document as it presented the existing standards related to WiseGRID project. The number of standards, technical bodies, consortia and standards developing organizations are wide and the different standards used in WiseGRID products are identified in the deliverables covering the design of the products.

The report will present the strategy defined for selecting topics and WiseGRID results and findings that could promote contributions to standardization. WiseGRID partners involved into standardization selected different areas and topics through a questionnaire and a workshop. Some of the areas and results are still under development in other tasks of WiseGRID project. These ones would be further investigated in parallel on the contribution process.

The transfer of the results from WiseGRID to standards that are widely recognized by the industry and that are developed in a system external to the Consortium will ease the market uptake of these results and their impact beyond the duration of the project. Additionally, the standardization system is used as a targeted dissemination channel towards the stakeholders represented in the standardization committees.

The Spanish Association for Standardization (UNE), as National Standardization Body (NSB), member of CEN-CENELEC and of ISO-IEC, is member of WiseGRID to provide support regarding the standardization tasks included in the project (WP21 "Exploitation, business innovation strategy and contribution to standards").

The main areas identified are:

- Battery management (monitoring and control);
- EV monitoring (access to information through CAN bus in a standardized manner);
- EV data model (possible extension for FIWARE thanks to the project);
- OCPP standard, there is no current standard for user identification;
- WiseGRID big data platform specification;
- Common standard for defining grid modelling data;
- Remote storage management;
- FastV2G results on pilot site.

WiseGRID needs to decide which of these areas have enough maturity on selected procedures, data models and good practices that could lead to final contributions to standardization. The preferred contribution would be in the form of a CEN Workshop Agreements, due mainly to the fact that developing this document is quicker than the traditional contributions to new standards or amendments to existing ones, as it fits better in projects as WiseGRID, but all possibilities will be taken into account and duly processed.

In three months WiseGRID needs to decide the areas which finally aims to contribute before the target date of M42.

1 INTRODUCTION

1.1 PURPOSE OF THE DOCUMENT

The main objective of the task 'Contribution to standardization' is to facilitate the acceptance and utilisation by the market of the developed solutions by the WiseGRID project. The task is led by a Standardization Body who provides the relevance, knowledge and experience in the standardization system and its internal procedures. Other project partners will provide technical support to the development of this task, in particular, proposing and selecting possible topics or areas where contributions are possible. A strategy for the communication with the previously identified standardization organizations and technical committees for each relevant topic will be elaborated, considering which of them are the most relevant and to what extent the relationship should be established to effectively contribute to their works (e.g. providing technical information, participating in their ongoing developments, establishing formal liaisons, submitting proposals, organizing joint events, etc.).

The bidirectional relationship with these organizations will be created with two main objectives:

- Use the standardization system as a fast and much focused dissemination tool to the market stakeholders;
- Monitor the TC (Technical Committees) information and prepare the future elaboration of standards based on the results of the project. In order to facilitate and promote the inclusion of the outcomes of the project in future new or revised standards that can be easily used by the European or international industry. This activity will feed the selected standardization organizations and committees with specific standardization proposals, ready either for discussion and inclusion in the future development of new standards or into revised ones. The contents to be proposed will be consequent with the IPR strategy of the project.

1.2 SCOPE OF THE DOCUMENT

This first version of D21.2 "Report on the contribution to standardization" defines a strategy for the contribution to standardization from WiseGRID. It includes the steps towards a successful contribution to standardization, the actions for its implementation and a tentative schedule.

It will be updated with the progress of the different actions and their outcomes resulting in an ultimate D21.5 version at M42.

The schedule of the actions described in this document is open to changes according to the progress of the project and the standardization landscape.

1.3 STRUCTURE OF THE DOCUMENT

This report is primarily divided into four sections. After this short introduction which constitutes Section 1. Section 2 explains the strategy that WiseGRID will use for contributing to standardization. Section 3 presents the actions developed and under development to deploy this strategy, the first identified topics and the different standardization technical bodies, standard development organizations, industrial consortia and entities targeted to promote the possible contributions and the different options to execute this contribution. Section 4 explains the proposed actions and the target dates for implementation and Section 5 Conclusions.

Section 6, provides a list of references and acronyms. Section 7, presents as APPENDIX A, a non-exhaustive list of technical committees, organizations and entities with relation to Smart Grid. Section 8, presents as APPENDIX B a template for communication to technical bodies. Section 10, presents as APPENDIX C information on the process to develop a CEN Workshop Agreement. Section 11 presents as APPENDIX D the questionnaire used for the screening process of gaps and possible proposals. Section 12 presents as APPENDIX E the answers obtained from the questionnaire to WiseGRID partners. Finally, Section 9, presents as the draft proposal for standard on communication of energy storage systems.

2 STRATEGY FOR DEFINING THE CONTRIBUTION TO STANDARDIZATION

The strategy to define the possible contributions to standardization follows a process which starts with the definition of the standards related to the project and used for its development identifying then the standards development organizations (SDO) in charge of their publication. The next stage is to follow the activity of the detected bodies and organizations providing WiseGRID with the updates on the activity of these bodies. This activity should be performed during the whole project. The next stage starts after the development and testing of the WiseGRID products in particular on pilot sites. At this moment the project has implemented solutions based on standards that needed adaptations to cover the particularities of WiseGRID project. These adaptations could serve as basis for technical contributions to new standards or modifications to existing ones. In addition to that, WiseGRID have created different deliverables which could contain practices, methodologies or even technical solutions that also could mean contributions to standardization. It is then time to start considering which results or findings of WiseGRID project could lead to contributions to standardization. With this target, WiseGRID partners involved in the task, were asked to select feasible proposals through a questionnaire. The information obtained through this questionnaire has been analyzed through specific meetings. Based on these results, WiseGRID project will decide which of the selected topics could be more mature or more defined to be promoted to a real contribution. WiseGRID will also consider the more practical way to assure that the contribution is done before the end of WiseGRID project. The strategy is summarized in the figure provided below.

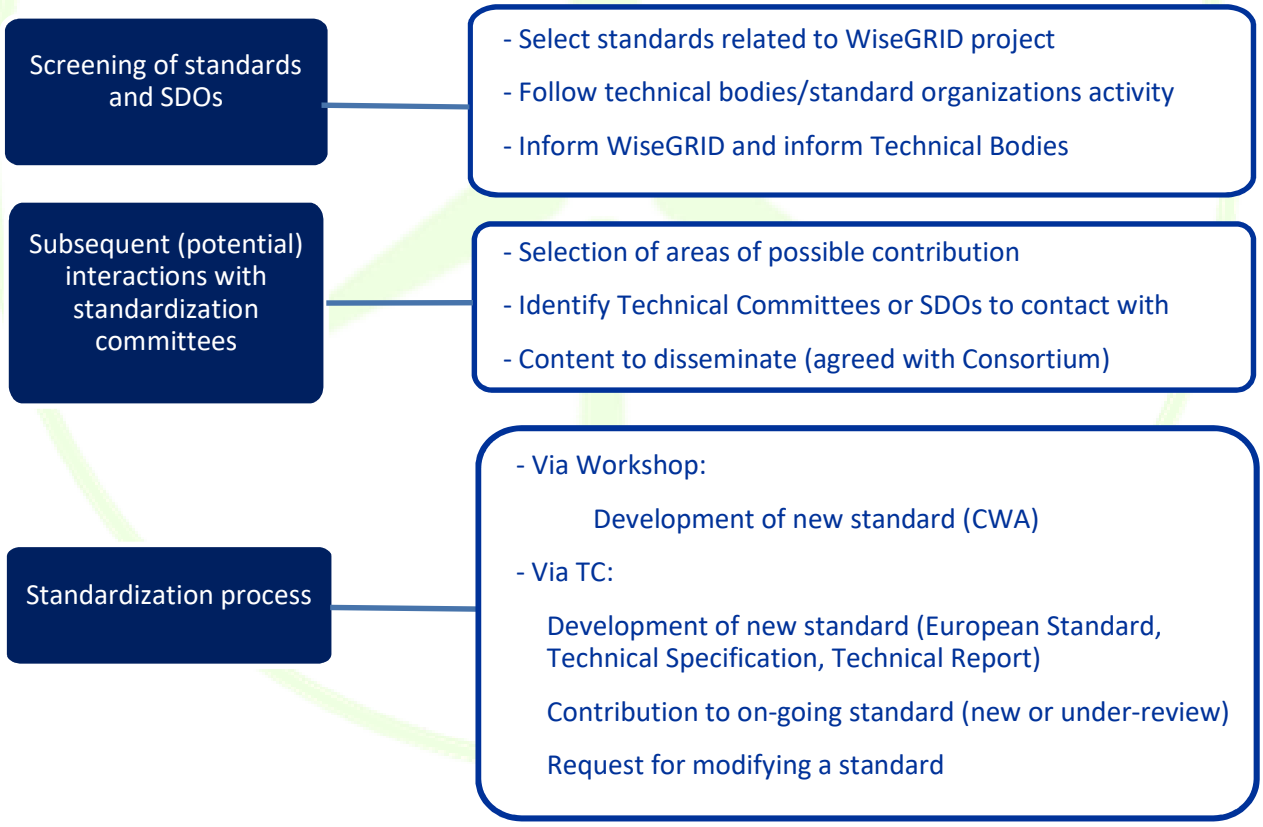

Figure 1 – Strategy for the contribution to standardization of WiseGRID

3 STATE OF THE ACTIONS TO DEVELOP THE STRATEGY

3.1 PROPOSALS UNDER EXISTING STRUCTURES.

3.1.1 Identified Technical bodies

There exists a great number of technical bodies within the fields of Smart grids and energy (Section 7 - APPENDIX A). Mainly at international level these bodies are under the International Electrotechnical Commission (IEC). The technical bodies were identified in D3.2 WiseGRID architecture, data models, standards and data protection (v2) but the possible contributions could mean contacting others not included in the deliverable or even using a new structure as a CEN Workshop.

WiseGRID project has also used standards out of the international and European standardization organizations of which UNE is member of (ISO, IEC, CEN and CENELEC). Those other standard developing organizations goes from international to European industrial consortia, such as FIWARE, OCPP, OBDii, JSON, BSON, SSL, MQTT, OpenADR, BACnet, CHAdeMO... The procedures for contributing to the standards developed by these organizations could differ to the ones used in ISO, IEC, CEN and CENELEC and could be also out of the capacity of UNE. In any case, UNE will try to find ways to address the relevant proposals to any organization.

3.1.2 First contact with standardization technical committees

Once the possible contributions are selected and the technical contributions fall within the scope of an existing technical body it is needed to do a first contact with this technical body to raise awareness about WiseGRID within this relevant standardization body and to ease subsequent contacts. Different categories of stakeholders at European/international level are present in these committees, so the standardization system is used as a targeted dissemination channel. Feedback will be asked to gather any view, opinion or advise about the project and the standardization possibilities or needs. Additionally, these first contacts will be useful to determine the best path towards the initiation of a standardization process, moreover this first step will ease future contacts if this process is launched within a standardization committee.

3.1.3 Subsequent interaction with the standardization technical committees

Different relationships can be established with the relevant CEN/CENELEC, ISO/IEC technical committees. Two factors determine the more suitable interactions: the impact/relevance of the standardization works of the standardization committees in WiseGRID and the feasibility of initiating a standardization process stemming from WiseGRID results within a standardization committee. The ways of interaction of the project with the standardization committees include:

1. Follow-up the activity of the relevant standardization committees. This allows detecting the initiation of standardization works that can be relevant for WiseGRID and the progress of significant existing under-development standards. This can be achieved through a periodical monitoring of the standardization activity resulting in updates of D21.2. This would help to check if there is any ongoing project to which WiseGRID could contribute or if there is any technical body which WiseGRID could propose new contributions.

2. When the relation of a technical body or SDO is clear further contact with these bodies are needed to update the progress of WiseGRID. In Section 8, Appendix B it is presented a draft communication to technical bodies. This can be achieved by delivering reports, by attending relevant technical committees' meetings or by joint events. On the one hand, this action contributes to further dissemination of the project and can guide the initiation of the standardization process. On the other hand, this further contact is mandatory towards the standardization committees directly covering (if it

where the case) the subject that will be promoted by WiseGRID to undergo a standardization process.

3. Once the contribution to standardization is selected it may be necessary to establish liaisons of WiseGRID in the standardization technical committees. Standardization is an open activity and all interested parties are allowed to participate in the technical committees through the designation of their National Standardization Body. This option allows for a deeper follow-up of the activity of a standardization committee and is valuable if the standardization process is going to be initiated within the standardization committee. Some of the partners are already participating in some of the identified standardization committees. For example, Athens University of Economics and Business is participating in EC's H2020 Initiative, ICCS and ETRA are participating in WG Regulations and Data Management Working Groups of BRIDGE initiative. ENG currently is not participating in specific groups about energy and smart grid, but It should be interesting participate to Bridge or ETP SNET working group. ITE, as non-profit-making association, is associated with standardization groups and alliances such as OCA or CHAdeMO, and in the case of OCA, ITE is actively participating in its working groups.

3.2 CONTRIBUTIONS OUTSIDE THE EXISTING STRUCTURES. CEN WORKSHOP AGREEMENTS.

In addition to the traditional path to contribute to standardization through existing structures (technical bodies, standard development organizations) there exist an additional way, the CEN-CENELEC WORKSHOP AGREEMENT CWA.

The CEN-CENELEC WORKSHOP AGREEMENT (CWA) is one of the different available types of European standardization documents. It represents the agreement of the participants on a temporary working group called CEN-CENELEC Workshop (WS) about a specific topic. Topics can include best practices, recommendations or guidelines, but also product requirements, testing procedures, etc. The only limitations are about: management systems, certification purposes and safety issues. CWAs are fast-procedure documents that can be produced in few months (6 to 12), can be a first step towards a future European or International Standard and thus are well suited to start the standardization of results coming from research and innovation projects. The projects can benefit from the potential dissemination of a market-oriented and consensus-based European document published by CEN and CENELEC, with a wider recognition and impact rather than a consortium-made deliverable.

The process to develop a CWA is detailed in Section 9 – Appendix C, CEN Workshop Agreement.

3.3 SELECTION OF CONTRIBUTIONS

The first step to identify which areas could produce contributions to standardization was to ask the involved partners under this action to answer a questionnaire (Section 10, Appendix C). In particular, through this questionnaire, WiseGRID partners were asked to identify which standards have been implemented in the different products, areas and practices of the WiseGRID project could lead to new contributions to standardization.

The conclusions of these answers (Section 11, Appendix D) led to some preliminary conclusions:

- The variety of standards used is wide. Not all under identified standards are developed by the traditional standards organizations ISO/IEC/CEN and CENELEC. The results could lead to contributions to existing industrial consortia at European or international level.
- In relation to the existing standards, WiseGRID project have used IEC standards to model the framework without any need to evolve the CIM model. In relation to other standards, it seems that

only small amendments or proposals could be promoted.

- Several gaps on different areas were identified what meant a first basis to build and define actions to contribute to standards. These areas were analysed by partners in two meetings, one virtual were only partners involved in this task participated and the other within the Paris Plenary meeting where the whole consortia provided feedback.

The main gaps have been identified in standardization in the following areas:

- Battery management (monitoring and control);
- EV monitoring (access to information through CAN bus in a standardized manner);
- EV data model (possible extension for FIWARE thanks to the project);
- OCPP standard, (there is no current standard for user identification);
- WiseGRID big data platform specification;
- Common standard for defining grid modelling data;
- Remote storage management;
- FastV2G results on pilot site.

WiseGRID partners will select from the above presented gaps, those areas and topics with enough maturity and content to be offered as contributions to standardization. Such contributions will be addressed by the corresponding standards organization or industrial consortia. In this sense, the greatest possible number of contributions will be proposed, but priority will be given to those with the most feasible results.

3.4 DETAILED IDENTIFIED TOPICS

WiseGRID partners involved in this task found the following relevant topics as susceptible contributions to standardization.

Battery management (monitoring and control). The WiseGRID StaaS/VPP (Storage as a Service / Virtual Power Plant) component developed in the project has as objective to offer in energy markets unused capacities of distributed energy storage systems in energy markets. These capacities, if aggregated, could help DSOs relieve distribution network congestions, for instance, as well as support TSOs in the management of the frequency regulation and power supply quality through provision of different ancillary services. The distributed energy storage systems are very often batteries installed on the prosumers' behind-the-meter premises. The main goal of these systems is usually to maximize self-consumption. By providing unused capacities, also called flexibility, to the markets, the prosumers get revenues that contribute to the economic benefits of having this kind of systems.

Therefore, the StaaS/VPP needs to communicate with a variable number of assets, sending orders and receiving an acknowledge, along with monitoring values that allow to check the status of the systems and to verify that the power and / or energy setpoints requirements were met. In this sense, a data model has been designed, with necessary messages, parameters and variables to do this. With this information, a control and monitoring protocol has been developed based on MQTT. VARTA and AMPERE have detected the need to promote the standardization of the communication model of storage systems for the purpose of aggregated management of distributed storage systems. There exist different technical bodies in IEC and CENELEC related to Energy Storage Systems, batteries and Smart Energy. UNE will contact these committees in order to know if this topic is already covered by any standard, or if, on the contrary, it might be feasible to propose a new standard or amend an existing one. In Appendix E it is presented a draft proposal for standard for remote communication of batteries.

EV monitoring (access to information through CAN bus in a standardized manner). There already exists a protocol for accessing the information of internal combustion vehicles (http://obdii.com/). Notwithstanding for accessing to the data from an EV without a monitoring tracking system (like the Crevillent fleet), it has been needed to connect to an open source android app able to retrieve the data from the OBDII and then publish this data to WiseEVP. In this sense, WiseGRID could evaluate if a standard for electrical vehicles could be promoted. Vehicle manufacturers would be the ones leading this project. It is needed to check feasibility within the scope of WiseGRID

EV data model (possible extension for FIWARE thanks to the project). It has not been identified a standard for defining a model for the information received from a vehicle. FIWARE (https://fiware-datamodels.readthedocs.io/en/latest/Transportation/Vehicle/Vehicle/doc/spec/index.html) counts with vehicle models that could be modified with WiseGRID results to specify one model for EV.

User identification. There is no current standard for user identification. OCPP 1.6 was used in the project. This version of the specification does not cover user identification only cards/payment products. Further information from the user, especially in case of fleets used by different users could provide further opportunities to new services. OCPP 1.6 neither implements messages to manage V2G, so particular extended messages have been implemented in order to overcome such a challenge. After developing these implementations, OCPP published its 2.0 version, which has already implemented all messages to manage V2G. Although authentication is included in OCPP standard, there is no current standard for user identification. However, RFID technology is the most extended one. Another aspect regarding EV charging that is not standardised is the payment systems. Although this has not been considered during FastV2G development, the fact is that some manufacturers include physical Point of Sales (POS) while others just consider telematics payment.

WiseGRID big data platform specification. Reagrding Big Data platforms, the subject is in wide development and the power of the system is that it can accept a wide variety of data, data models, being a structureless data management system with great flexibility. In case of WG Cockpit it was needed to cope with the grid topology in each area. It would be good to have a common system (standard) for defining the grid modelling data. For Big Data platform there are no such aspects.

Guidance to the community for adopting new business models for Smart Grids, as well as for evaluating them via a Cost-Benefit Analysis. It is necessary to check the feasibility to promote a deliverable (CEN Workshop Agreement) in this topic. To that end, WiseGRID deliverables addressing business modelling and CBA related ones (D1.1, D21.1, D16.1, D16.2, D17.2) could be used as a starting point.

Standards on protocols between local installation and cloud server. The communication between local installation et cloud server need some technical protocol standards, such as IEC61850, BACnet, MQTT, etc. Some common data model may be generalized. The interoperability is one of majors concerns for the communication and centralization between different technical systems.

Cooperative approach on electric vehicle. Guidance to manage efficiently. Electric vehicles, (both EVP and FV2G) and also the cooperative approach would be good to extend as guidance.

Update of CIM based on WG Cockpit and WG IOP. A DSO would be the main beneficiary of the usage of WG Cockpit and WG IOP functionalities in order to achieve the interconnection of the different legacy systems and data increasing overall efficiency. One way to achieve the interoperability between these systems is by using the CIM for data exchange, as is WiseGRID approach. DSOs are the potential users of WG integrated technology and subsequent benefit. In this case, IEC@CIM v.15 has been used for measurements, switch status changes, incidents and SCADA events. The need for a clear identification of CIM development path has occurred, as the only apparent official source of information regarding CIM software implementation is the CIMug users' group and scattered information around the web. A clear methodological approach is needed for the CIM exploitation within DSO operations based on open source tools following a stepwise method as described below: CIM latest version, tools like CIMTool to import CIM packages, identification of the relevant

part of the standard related to the use case scenario and validation of XML files.

FastV2G results on pilot site. Results of FastV2G in pilot site could be very useful to car manufacturers that are currently including V2G technology or are planning to develop it, as it can be used as a reference for plausible issues regarding this charging mode.

Contribution to SAREF4ENER. Finally, WiseGRID studied the possibility to contribute to the Smart Appliances REFerence ontology (SAREF). DG CONNECT supported different projects such as a study on the available semantics assets for the interoperability of Smart Appliances, Mapping into a common ontology as an M2M application layer semantics (SMART 2013/0077) – developed by TNO-, which resulted in the publication of the SAREF standard developed by ETSI Smartm2m/OneM2M in 2015. Since then, DG CONNECT funded several studies and ETSI developed further extensions to specific domains such as the energy one that resulted in the SAREF4ENER. The last study funded by DG CONNECT on 'Ensuring interoperability for enabling Demand Side Flexibility' shall be published in the coming weeks. Moreover, more extensions of SAREF will be published/developed in the coming year(s) (i.e. Smart Cities, Smart AgriFoods, Automotive, etc). The group examined the possible contribution to SAREF. In the aim to understand and focus the possible contribution to this ontology UNE participated into CEN-CENELEC Mapping Ontologies Workshop held on 27 November 2018. The developments of the WG Staas/VPP of data model and interoperable communication protocols may be of interest.

4 NEXT ACTIONS

The next steps are:

- Select a small group of proposals with the most possibility of success, M34;
- Contact the organization/entity/technical body which scope would include the area of the proposal, M35;
- Start the standardization process. M35-42.

5 CONCLUSIONS

WiseGRID project consist of a set of solutions and products to facilitate an efficient management and use of Smart Grids, electric vehicle fleets and energy storage system by professionals, companies, organizations and final users and citizens.

For the development of these solutions and products, the existing standards have been extensively implemented. However, in some cases, it has been necessary to adapt them and re-adjust them to achieve the target of the project and to satisfy the different realities of the pilot sites. These adaptations and/or adjustments could serve as basis for technical contributions to new standards or modifications to existing ones. Although there are still results to come specially from the application of WiseGRID products on pilot sites, the designing and implementation phase has allowed to detect several topics susceptible to promote contributions to standardization.

Although some proposal could be directly addressed, in the opinion of WiseGRID, good practices and guidelines implemented and evidenced by the use of WiseGRID products may lead to CEN Workshop Agreements in CEN. In particular, deliverables of the project may make the results of WiseGRID project closer to the citizens, mainly those addressing the efficient use of cooperative smart grids and electric vehicle fleets, as well as even provide practical tools for energy- and cost-efficient grids. Although the timeline of WiseGRID project

could recommend to focusing on feasible contributions than in theoretical ones, WiseGRID will consider both possibilities.

Finally, WiseGRID shall decide on which contributions will be more feasible before M35 starting afterwards all necessary actions and procedures to an effective contribution to standardization.

6 REFERENCES AND ACRONYMS

6.1 REFERENCES

[1] COM(2018) 764 final Harmonised standards: Enhancing transparency and legal certainty for a fully functioning Single Market.

6.2 ACRONYMS

Acronyms List	
BACnet	Building Automation and Control Networks
BSON	Binary JavaScript Object Notation
CAN	Controller Area Network
CEN	European Committee for Standardization
CENELEC	European Committee for Electrotechnical Standardization
CHAdeMO	CHArge de MOve
CIM	Common Information Model
CWA	CEN-CENELEC Workshop Agreement
DLMS/COSEM	Device Language Message Specification/ Companion Specification for Energy Metering
EN	European Standard
EM	Exploitation Manager
IEC	International Electrotechnical Commission
IPR	Intellectual Property Rights
ISO	International Organization for Standardization
JSON	JavaScript Object Notation
MQTT	Message Queuing Telemetry Transport
NSB	National Standardization Body

OBDii	On Board Diagnostics II
OCPP	Open Charge Point Protocol
OpenADR	Open Automated Demand Response
POS	Point of sales
SDO	Standards developing organization
TC	Technical committee
TRL	Technology readiness levels
SAREF	Smart Appliances REFerence ontology
SDO	Standards developing organization
SSL	Secure Sockets Layer
TR	Technical Report
TS	Technical specification
UNE	Spanish Association for Standardization
USEF	Universal Smart Energy Framework
V2G	Vehicle to Grid

Table 1 – List of Acronyms

7 APPENDIX A RELEVANT TECHNICAL BODIES TO SMART ENERGY

Technical Bodies with relation to Smart Energy	
IEC TC 3	Information structures, documentation and graphical symbols
IEC TC 8	Systems aspects for electrical energy supply
IEC TC 13	Electrical energy measurement, tariff- and load control
IEC SC 17C	High-voltage switchgear and controlgear assemblies
IEC TC 21	Secondary cells and batteries
IEC SC 22F	Power electronics for electrical transmission and distribution systems
IEC SC 23F	Electrical accessories – Connecting devices
IEC TC 32	Fuses
IEC TC 38	Instrument transformers
IEC TC 56	Dependability
IEC TC 57	Power systems management and associated information exchange
IEC TC 59	Performance of household and similar electrical appliances
IEC TC 64	Electrical installations and protection against electric shock
IEC TC 65	Industrial-process measurement, control and automation
IEC TC 69	Electric road vehicles and industrial trucks
IEC TC 72	Automatic controls for household use
IEC SC 77B	Electromagnetic compatibility – High frequency phenomena
IEC SC 86A	Fibres and cables
IEC SC 86B	Fibre optic interconnecting devices and passive components
IEC SC 86C	Fibre optic systems and active devices
IEC TC 88	Wind turbines
IEC TC 95	Measuring relays and protection equipment
IEC TC 100	Audio, video and multimedia systems and equipment
IEC TC 105	Fuel cell technologies
IEC TC 114	Marine energy – Wave, tidal and other water current converters
IEC TC 120	Electrical Energy storage systems
IEC CISPR	International special committee on radio interference
IEC SyC	Smart Energy
ISO/IEC JTC1	Information technology
CENELEC	Smart Grid Coordination Group
CENELEC	Smart metering Coordination Group.

8 APPENDIX B PROPOSAL FOR COMMUNICATION

The following draft text could serve as template for communications with standardization technical bodies or standard developing organizations.

Subject: WiseGRID(R+I Horizon 2020 project)

Dear Mr/Ms xxx

WiseGRID integrates, demonstrates and validates advanced ICT services and systems in the energy distribution grid in order to provide secure, sustainable and flexible smart grids and give more power to the European energy consumer.

WiseGRID's main objective is to provide a set of solutions and technologies to increase the smartness, stability and security of an open, consumer-centric European energy grid. The project will combine an enhanced use of storage technologies, a highly increased share of Renewable Energy Sources (RES) and the integration of charging infrastructure to favour the large-scale deployment of electric vehicles. It will place citizens at the center of the transformation of the grid.

WiseGRID goes beyond empowering prosumers. On top of having a consumer-centric approach, the project will make a difference in the market by delivering tools that facilitate the creation of a healthy, open market where not only 'traditional' utilities but also players such as electric cooperatives and SMEs can play an active role, contributing therefore effectively to the transition to energy democracy.

WiseGRID integrated solution it is being demonstrated and evaluated under real life conditions in **4 large scale demonstrators** - in Belgium, Italy, Spain and Greece - under different technical, climatological, regulatory, legislative and social conditions.

The main WiseGRID strategic goals are:

Demand-response

With different technologies such as smart metering, smart home appliances, batteries, EVs, etc., WiseGRID wants to create a win-win situation for both grid and consumers, allowing active participation, protection and empowerment of the European consumers and prosumers.

Smartening the distribution grid

Technologies and methods to gain advanced monitoring and awareness of variable generation, integration of Virtual Power Plants and microgrids as active balancing assets.

Integration of renewable energy storage systems in the network, such as batteries or heat accumulators.

Optimization of the market deployment of these storage systems, manage and balance the network optimally, responding better to changes in demand and reducing at the same time losses in distribution.

Smart integration of electric mobility services for charging, providing storage capacity or to supply electricity to the grid, including the possible use of their batteries as storage systems.

Standardization is critical for the WiseGRID project, since it will strongly influence the market uptake of the developed system. An identification of relevant technical committees and existing standards has therefore been carried out right after the start of the project. Since some of the components of the WiseGRID system are closely related to the CEN/TC xxx standardisation works, we would like to inform you and your committee about our project. If you wish we would be glad to periodically share with you the progress and findings of WiseGRID, and if possible participate in a technical committee meeting in order to present it. Should you

have any question or collaboration idea, please let us know. Within the attached presentation and on our website https://www.WiseGRID.eu/ you can find more detailed information about WiseGRID.

Thank you very much for your attention, we look forward to hearing from you soon,

Miguel Angel Aranda

Project Manager at UNE – Member of WiseGRID project.

9 APPENDIX C CEN WORKSHOP AGREEMENTS

As explained in this document one possible way to contribute to standardization is the CEN Workshop Agreement. This way fits perfectly with the need of research and innovation projects to develop the contributions in a short time. The development and duration of this Workshops use to end after 12 months. The development of international or European standards takes on average 28 months.

Below it is explained how these workshops are created and the different rules applicable 2.

This page describes the elements and actions required to develop and produce a CEN Workshop Agreement (CWA). It applies to all parties interested in developing a CWA (proposers), the CEN National Members and the CEN-CENELEC Management Centre (CCMC).

9.1 PROCESS

1.1 A party interested in developing a CWA submits a request to a CEN Member or to CCMC.

1.2 With the assistance of the CEN-CENELEC (national) Member or the CEN-CENELEC Management Centre (CCMC), the proposer of a CWA shall prepare:

- a draft Project Plan;
- a self-assessment (see CEN-CENELEC Guide 29 Annex A);
- an analysis of the degree of interest in the subject in different European countries and amongst different stakeholders.

These documents are then transmitted by the CEN-CENELEC (national) member to CCMC for further handling.

NOTE: The Project Plan must clearly identify how many CWAs the Workshop (WS) intends to develop.

1.3 The draft Project Plan and the self-assessment are submitted to the CEN Technical Board for:

1.3.1 Decision if the CWA:

- defines requirements related to safety matters;
- defines requirements related to management system aspects;
- falls within the scope of one or more CEN Technical Committee (TC) which are opposed to the WS being launched.
  Technical Committees shall be consulted prior to the submission of the draft Project Proposal to the Technical Board.

1.3.2 Information: In all other cases.

1.4 CCMC announces the proposal for a new CEN/WS on the CEN Website (or on the CEN-CENELEC Portal in case of joint CEN-CENELEC WS) for at least 30 days.
The information posted on the website will include:

- the WS draft Project Plan;
- initial information on the kick-off meeting (including agenda, venue, participation);
- the WS Secretariat (and the proposed WS Chairperson - if known);
- how to submit comments to the draft Project Plan.

If a CEN National Member expresses any opposition to the proposal at this stage of the process, CCMC deals with the situation through management by exception.
Any comments submitted during this period shall be considered with the WS Secretariat and WS Proposer and in any case during the kick-off meeting at the latest.

1.5 The kick-off meeting:

- approves the proposed Project Plan by common agreement;
- appoints the Chairperson of the CEN/WS.

1.6 The formal launch of the Workshop happens at the kick-off meeting subject to sufficient support for the Workshop Project Plan. Should no agreement be reached, the organization of a new meeting will be considered with the proposers.

Participation to the kick-off meeting does not automatically ensure registration to the WS. After the kick-off meeting the participants wishing to continue contributing to the development of the draft CWAs will be requested to officially register to the WS by mean of signing a specific registration form.

1.7 The WS participants draft the CWA(s) according to the specifications laid down in the Project Plan. The draft CWA is made available for comments to the registered CEN/WS participants.

To ensure transparency the documents of the WS should be uploaded on an electronic platform.

If the CWA is in the same domain as an existing CEN/CENELEC technical body, the draft CWA shall be sent to that technical body for comments at the same time as it is sent to the Workshop participants.

If foreseen in the Project Plan, and in any case if the draft CWA covers safety aspects, an open commenting phase (minimum 60 days) is launched.

CCMC will make the draft CWA available for external comments on the CEN (CENELEC) website.

CCMC will also notify the CEN/CENELEC (national) Members.

In case of an open commenting phase, the WS Secretariat ensures the creation of a comments resolution report that compiles all the received comments. The comments are considered by the WS participants.

1.8 The Chairperson decides when agreement is reached amongst the registered WS participants on the final text of the CWA.

1.9 The WS Secretariat submits the approved CWA to CCMC. CCMC ensures that:

- the cover page and foreword are available and in line with clause 4.8 of the CEN/CENELEC Guide 29,
- a reference number is allocated to the CWA and added before circulating the published CWA to the CEN National Members for announcement.

1.10 A CWA is valid for 3 years, after which the former Workshop Secretariat shall consult the former Workshop participants and the relevant CEN/CENELEC technical bodies to determine whether the CWA shall be:

- confirmed for another 3 years,
- revised,
- transformed into another deliverable, or
- withdrawn.

The former Workshop Secretariat shall inform CCMC of the decision.

CWAs maximum lifetime is 6 years. After 6 years from initial publication, the CWA shall be submitted to the CEN/CENELEC BT(s) for decision regarding its transformation into another deliverable or its withdrawal.

1.11 The CEN WS either:

- continues with the rest of its programme as specified in the accepted Project Plan, or
- reconsiders its Project Plan and may decide to start additional work (in this case a new/revised Project Plan and self-assessment need to be developed as described in 1.3) or
- disbands itself.

10 APPENDIX D QUESTIONNAIRE CONTRIBUTION TO STANDARDIZATION

10.1 INTRODUCTION

T21.3, Contribution to standardization.

The main objective of this task is to facilitate the acceptance and utilization by the market of the developed solutions. The participation of a Standardization Body provides the relevance, knowledge and experience in the standardization system and its internal procedures. Other project partners will provide technical support to the development of this task. A strategy for the communication with the previously identified standardization organizations and technical committees for each relevant topic will be elaborated, considering which of them are the most relevant and to what extent the relationship should be established to effectively contribute to their works (e.g. providing technical information, participating in their ongoing developments, establishing formal liaisons, submitting proposals, organizing joint events, etc.). The bidirectional relationship with these organizations will be created with two main objectives:

- Use the standardization system as a fast and much focused dissemination tool to the market stakeholders;

- Monitor the TCs information and prepare the future elaboration of standards based on the results of the project.

In order to facilitate and promote the inclusion of the outcomes of the project in future new or revised standards that can be easily used by the European or international industry, this activity will feed the selected standardization organizations and committees with specific standardization proposals, ready for discussion and inclusion in the future development of new standards or into revised ones.

The contents to be proposed will be consequent with the IPR strategy of the project.

- **Leader:** UNE (Asociación Española de normalización)

Participants: ETRA, BYES, ENG, HYP, AMP, ITE, ICCS, HEDNO, AUEB, RESC, VS, QMUL and UNE.

- **Duration:** M30 – M42(Apr 2019 – Apr 2020)

- Deliverables:
    - D21.2 : WiseGRID Contribution to standardization (V1). UNE [M30] Apr 2019
    - D21.5: WiseGRID Contribution to standardization (V2). UNE [M42] Apr 2020
- With this aim:
    - Need to **identify existing standards** used within WiseGRID projets or topics susceptible to be standardized (products, services, practices) (ALL, before December 2018);
    - **Mapping** on the technical committees organizations to contact; (UNE, before February 2019);
    - Initial **communication** to the technical committes (UNE, before February 2019);
    - **Define** possible contributions through a specific workshop (ALL, next consortia meeting).
    - **Plan** contributions and prepare possible contributions (ALL, before April 2019).
    - **Execute** during the M30-M42.(ALL)

10.2 BACKGROUND

The main conclusions of WiseGRID Deliverable 3.2 presented the core standards used by WiseGRID project. Under the framework of the IEC Smart Grid Standards Map and being IEC 60850 and CIM model the main standards for this frame, several different approaches were detected and initiatives in relation to WiseGRID activities as OpenADR, USEF and SAREF. IEC activity on Smart Energy concentrated within the following IEC System Committee .

At European level Smart Grid area is covered under the Smart Energy coordination Group which gave answer to M/490 that requested CEN, CENELEC and ETSI to develop a framework to enable ESOs to perform continuous standard enhancement and development in the field of smart grids. This mandate was duly answered through several deliverables based on the works on IEC plus extra standardization activities purely at European level.

Although Smart Grid is the core activity within WiseGRID project standards could cover additional areas, practices, parameters, management tasks, users perspective or results from the pilot sites.

Additional to the smart energy area, there exist several works in Smart cities. WiseGRID is well focused in Smart Energy but this fits in the Smart City concept too. Some of the ongoing projects are in ISO and in IEC.

Finally a very important area taken into consideration in IEC is the Electricity access by System Committee LVDC and Electricity access.

As it is well-known, in 2015, DG CONNECT funded the development of a study that aimed at bringing together semantics and data from smart appliances in buildings and households. This information was gathered in a Smart Appliances Reference Ontology known as SAREF.

SAREF is defined as a shared model of consensus that facilitates the matching of existing assets (standards, protocols, data models) initially in the smart appliances domain. Overall, SAREF's objective is to link the information coming from different smart appliances, based on different standards, to reach interoperability.

Considering the relevance of the extension to SAREF in the energy domains, and following the discussions on

this topic in the CEN-CENELEC-ETSI Coordination Group on Smart Energy Grids (CG-SEG) and CEN-CENELEC-ETSI Coordination Group on Smart Meters (CG-SM), it became clear the need to ensure a single point of reference in Europe.

In this context, a workshop **"CEN-CENELEC Mapping Ontologies workshop"** will be held on **27 November 2018 in Brussels**, aiming at mapping the existing data models and to work towards their alignment. This will be developed with sufficient coordination, inclusiveness and attention to the international and global level.

UNE is ready to participate in this workshop to provide with possible WiseGRID experiences.

The CEN-CENELEC WORKSHOP AGREEMENT (CWA) is one of the different available types of European standardization documents. It represents the agreement of the participants on a temporary working group called CEN-CENELEC Workshop (WS) about a specific topic. Topics can include best practices, recommendations or guidelines, but also product requirements, testing procedures, etc. The only limitations are about: management systems, certification purposes and safety issues. CWAs are fast-procedure documents that can be produced in few months (6 to 12), can be a first step towards a future European or International Standard and thus are well suited to start the standardization of results coming from research and innovation projects. The projects can benefit from the dissemination potential of a market-oriented and consensus-based European document published by CEN and CENELEC, with a wider recognition and impact than a consortium-made deliverable.

10.3 QUESTIONNAIRE

In order to identify possible areas/topics for contributions to standardization, WiseGRID participants on task 9.3.3, are kindly asked to answer the following questions, before 2018-11-26:

ORGANIZATION:
1. Is your WiseGRID component/task affected by any European legislation (Directives, regulations...)?
2. Is your organisation participating in any European or international standardisation technical committee, working group or similar already identified in Deliverable D3.2 related to WiseGRID project or related to the product/data model/standard used in WiseGRID project?
2.1 Based in your previous answer, please specify the technical committee, working group or similar your organisation is participating or is willing to participate or is already participating:
2.2 Please specify the reasons why you are participating or want to participate in a TC or working group or project team (several answers are possible): One could be the projects that are of your interest.
3. Within the framework of the WISEGRID project and (directly or indirectly) related to your compo-nent/tasks in the project, is your organisation using European or international standards (or other standards among those identified in Deliverable D3.2?
3.1 Please specify the reasons why you are using standards/documents related to your component/tasks (several answers are possible):
3.2 The use of these standards has promoted any modification to their existing version or adaptation to cover further functionalities/models:
3.3 Are there any new standardized data models/customized solutions developed for WiseGRID that could promote to new standards?
4. Do you think some aspect (technical, performance, efficiency, reliability, interoperability or quality requirements) of your component/task not included in a standard/document should be standardised and to facilitate design, manufacturing, trade, safety, relation among stakeholders, etc.?
5. In order to market your component/deliverable in the future, a standard/document in common with the

rest of the Smart Grid, electric vehicles, cooperatives sector, efficiency others Europe-wide or world-wide may be useful?
6. Do you think any already developed or future WiseGRID deliverable could be interesting for being applied in the Smart Grid, electric vehicles, cooperative sector or others Europe-wide or world-wide as guidance or recommendations?
7. An increasing number of standards based on patented technology are being successfully and widely developed. Nevertheless, to avoid patent rights problems that may arise when developing standards, CEN-CENELEC has developed a document to provide practical guidance on this subject. Do you know the IPR & Patents policies applied by CEN,CENELEC and ISO and IEC? (Link to CEN CENELEC IPR website: https://www.cencenelec.eu/ipr/Pages/default.aspx , Link to ISO IPR website: https://www.iso.org/iso-standards-and-patents.html) and IEC website https://www.iec.ch/members_experts/tools/patents/patent_policy.htm .
8. CEN and CENELEC Workshop agreements are usual contributions to standardization as a result of R&D projects. Do you find WiseGRID deliverables susceptible to be promoted to this kind of documents?
9. Do you consider that WiseGRID project results could be used to contribute to SAREF?
10. Please add here any other information regarding your task/deliverables and standardisation that you may deem relevant:

11 APPENDIX E ANSWERS TO QUESTIONNAIRE

11.1 AUEB

ORGANIZATION: Athens University of Economics and Business
1. Is your WiseGRID component/task affected by any European legislation (Directives, regulations...)? **No, we are not involved in any implementation activities (only in business related ones as well as on flexibility modelling for DR that is not affected by any regulation as it is a pure scientific/mathematic problem).**
2. Is your organisation participating in any European or international standardisation technical committee, working group or similar already identified in Deliverable D3.2 related to WiseGRID project or related to the product/data model/standard used in WiseGRID project? **No, we are an academic institution and our participation in such activities is limited. However, we are participating in EC's H2020 BRIDGE initiative representing WiseGRID in the business modelling working group.**
2.1 Based in your previous answer, please specify the technical committee, working group or similar your organisation is participating or is willing to participate or is already participating: **EC's H2020 BRIDGE initiative**
2.2 Please specify the reasons why you are participating or want to participate in a TC or working group or project team (several answers are possible): One could be the projects that are of your interest. **To promote our research and innovation activities.**
3. Within the framework of the WISEGRID project and (directly or indirectly) related to your component/tasks in the project, is your organisation using European or international standards (or other

standards among those identified in Deliverable D3.2? **No, we are not involved in any implementation activities.**
3.1 Please specify the reasons why you are using standards/documents related to your component/tasks (several answers are possible): **N/A**
3.2 The use of these standards has promoted any modification to their existing version or adaptation to cover further functionalities/models: **N/A**
3.3 Are there any new standardized data models/customized solutions developed for WiseGRID that could promote to new standards? **N/A**
4. Do you think some aspect (technical, performance, efficiency, reliability, interoperability or quality requirements) of your component/task not included in a standard/document should be standardised and to facilitate design, manufacturing, trade, safety, relation among stakeholders, etc.? **N/A**
5. In order to market your component/deliverable in the future, a standard/document in common with the rest of the Smart Grid, electric vehicles, cooperatives sector, efficiency others Europe-wide or world-wide may be useful? **N/A**
6. Do you think any already developed or future WiseGRID deliverable could be interesting for being applied in the Smart Grid, electric vehicles, cooperative sector or others Europe-wide or world-wide as guidance or recommendations? **Yes, for example the business modelling and CBA related ones (D1.1, D21.1, D16.1, D16.2, D17.2). These could provide guidance to the community for adopting new business models for Smart Grids as well as for evaluating them via a CBA.**
7. An increasing number of standards based on patented technology are being successfully and widely developed. Nevertheless, to avoid patent rights problems that may arise when developing standards, CEN-CENELEC has developed a document to provide practical guidance on this subject. Do you know the IPR & Patents policies applied by CEN,CENELEC and ISO and IEC? (Link to CEN CENELEC IPR website: https://www.cencenelec.eu/ipr/Pages/default.aspx , Link to ISO IPR website: https://www.iso.org/iso-standards-and-patents.html) and IEC website https://www.iec.ch/members_experts/tools/patents/patent_policy.htm .
8. CEN and CENELEC Workshop agreements are usual contributions to standardization as a result of R&D projects. Do you find WiseGRID deliverables susceptible to be promoted to this kind of documents? **Yes**
9. Do you consider that WiseGRID project results could be used to contribute to SAREF? **Possibly but WiseGRID organisations developing our products would be in a better position for answering this question.**
10. Please add here any other information regarding your task/deliverables and standardisation that you may deem relevant:

11.2 AMPERE

1. Is your WiseGRID component/task affected by any European legislation (Directives, regulations...)?
The StaaS/VPP component is directly affected by the EC energy package in the sense of allowing distributed energy storage systems to participate in flexibility markets as an aggregated resource. Moreover, specific regulations for participation in the market apply for each country or region, such as technical requirements, for instance.

2. Is your organisation participating in any European or international standardisation technical committee, working group or similar already identified in Deliverable D3.2 related to WiseGRID project or related to the product/data model/standard used in WiseGRID project?
No
2.1 Based in your previous answer, please specify the technical committee, working group or similar your organisation is participating or is willing to participate or is already participating:
2.2 Please specify the reasons why you are participating or want to participate in a TC or working group or project team (several answers are possible): One could be the projects that are of your interest.
3. Within the framework of the WISEGRID project and (directly or indirectly) related to your component/tasks in the project, is your organisation using European or international standards (or other standards among those identified in Deliverable D3.2?
No
3.1 Please specify the reasons why you are using standards/documents related to your component/tasks (several answers are possible):
3.2 The use of these standards has promoted any modification to their existing version or adaptation to cover further functionalities/models:
3.3 Are there any new standardized data models/customized solutions developed for WiseGRID that could promote to new standards?
Two: A data model for distributed energy remote storage management, and the USEF model
4. Do you think some aspect (technical, performance, efficiency, reliability, interoperability or quality requirements) of your component/task not included in a standard/document should be standardised and to facilitate design, manufacturing, trade, safety, relation among stakeholders, etc.?
The data model and commands described for the remote management of the storage systems
5. In order to market your component/deliverable in the future, a standard/document in common with the rest of the Smart Grid, electric vehicles, cooperatives sector, efficiency others Europe-wide or world-wide may be useful?
Not sure, specific legislation is yet to come.
6. Do you think any already developed or future WiseGRID deliverable could be interesting for being applied in the Smart Grid, electric vehicles, cooperative sector or others Europe-wide or world-wide as guidance or recommendations?
The developments of the Staas/VPP of data model and interoperable communication protocols may be of interest
7. An increasing number of standards based on patented technology are being successfully and widely developed. Nevertheless, to avoid patent rights problems that may arise when developing standards, CEN-CENELEC has developed a document to provide practical guidance on this subject. Do you know the IPR & Patents policies applied by CEN,CENELEC and ISO and IEC? (Link to CEN CENELEC IPR website: https://www.cencenelec.eu/ipr/Pages/default.aspx , Link to ISO IPR website: https://www.iso.org/iso-

standards-and-patents.html) and IEC website https://www.iec.ch/members_experts/tools/patents/patent_policy.htm .
We didn't know about this initiative
8. CEN and CENELEC Workshop agreements are usual contributions to standardization as a result of R&D projects. Do you find WiseGRID deliverables susceptible to be promoted to this kind of documents?
Yes, as a first step towards the harmonization of norms and standards
9. Do you consider that WiseGRID project results could be used to contribute to SAREF?
Yes, especially regarding communication protocols in Home Area Networks (HAN)
10. Please add here any other information regarding your task/deliverables and standardisation that you may deem relevant.
There should be a close synergy with the USEF model and the works done by this association

11.3 BYES

1. Is your WiseGRID component/task affected by any European legislation (Directives, regulations...)? **Yes. The battery electrical energy storage system is governed by several European Directives and regulations, namely, Battery Directive, Low voltage electrical equipment directive, EMC Directive, and WEEE directive, General Data Protection Regulation, etc.**
2. Is your organisation participating in any European or international standardisation technical committee, working group or similar already identified in Deliverable D3.2 related to WiseGRID project or related to the product/data model/standard used in WiseGRID project? **It seems not.**
2.1 Based in your previous answer, please specify the technical committee, working group or similar your organisation is participating or is willing to participate or is already participating: **Not concerned**
2.2 Please specify the reasons why you are participating or want to participate in a TC or working group or project team (several answers are possible): One could be the projects that are of your interest. **Not concerned**
3. Within the framework of the WISEGRID project and (directly or indirectly) related to your component/tasks in the project, is your organisation using European or international standards (or other standards among those identified in Deliverable D3.2? **Yes.**
3.1 Please specify the reasons why you are using standards/documents related to your component/tasks (several answers are possible): **The communication between local installation et cloud server need some technical protocol standards, such as IEC61850, BACnet, MQTT, etc.**

3.2 The use of these standards has promoted any modification to their existing version or adaptation to cover further functionalities/models: **Not concerned**
3.3 Are there any new standardized data models/customized solutions developed for WiseGRID that could promote to new standards? **Some common data model may be generalized.**
4. Do you think some aspect (technical, performance, efficiency, reliability, interoperability or quality requirements) of your component/task not included in a standard/document should be standardised and to facilitate design, manufacturing, trade, safety, relation among stakeholders, etc.? **The interoperability is one of majors concerns for the communication and centralization between different technical systems.**
5. In order to market your component/deliverable in the future, a standard/document in common with the rest of the Smart Grid, electric vehicles, cooperatives sector, efficiency others Europe-wide or world-wide may be useful? **Yes.**
6. Do you think any already developed or future WiseGRID deliverable could be interesting for being applied in the Smart Grid, electric vehicles, cooperative sector or others Europe-wide or world-wide as guidance or recommendations? **Yes, such as WiseGRID big data platform specification.**
7. An increasing number of standards based on patented technology are being successfully and widely developed. Nevertheless, to avoid patent rights problems that may arise when developing standards, CEN-CENELEC has developed a document to provide practical guidance on this subject. Do you know the IPR & Patents policies applied by CEN, CENELEC and ISO and IEC? (Link to CEN CENELEC IPR website: https://www.cencenelec.eu/ipr/Pages/default.aspx , Link to ISO IPR website: https://www.iso.org/iso-standards-and-patents.html) and IEC website https://www.iec.ch/members_experts/tools/patents/patent_policy.htm . **Yes**
8. CEN and CENELEC Workshop agreements are usual contributions to standardization as a result of R&D projects. Do you find WiseGRID deliverables susceptible to be promoted to this kind of documents? **Yes. It should be at least as one of inputs or references for new standardization.**
9. Do you consider that WiseGRID project results could be used to contribute to SAREF? **Yes. It will also be a way to promote and enhance the results of the WiseGRID project.**
10. Please add here any other information regarding your task/deliverables and standardisation that you may deem relevant: **The main obstacle to the collection of information for a project like WiseGRID is the interoperability, and the owner of these data that shall be discussed and clarified in the concerned regulations and standardizations.**

11.4 CRE

1. Is your WiseGRID component/task affected by any European legislation (Directives, regulations...)? **We develop the WG Big Data system within WiseGRID. We are also responsible for GDPR accomplishment within WiseGRID at central level. First regulation to consider is the GDPR. Otherwise, NIS regulation is also considered as important input for cybersecurity.**
2. Is your organisation participating in any European or international standardisation technical committee, working group or similar already identified in Deliverable D3.2 related to WiseGRID project or related to the product/data model/standard used in WiseGRID project? **No**

2.1 Based in your previous answer, please specify the technical committee, working group or similar your organisation is participating or is willing to participate or is already participating:
2.2 Please specify the reasons why you are participating or want to participate in a TC or working group or project team (several answers are possible): One could be the projects that are of your interest.
3. Within the framework of the WISEGRID project and (directly or indirectly) related to your component/tasks in the project, is your organisation using European or international standards (or other standards among those identified in Deliverable D3.2? **CIM, USEF, OCPP, openADR, and DLMS/COSEM, JSON, BSON, SSL, MQTT**
3.1 Please specify the reasons why you are using standards/documents related to your component/tasks (several answers are possible): **We need to find match with other tools and systems.** **Facilitate integration to third party systems or future extensions.**
3.2 The use of these standards has promoted any modification to their existing version or adaptation to cover further functionalities/models: **Not applicable for Big Data.**
3.3 Are there any new standardized data models/customized solutions developed for WiseGRID that could promote to new standards? **From respect of Big Data platforms the subject is in wide development and the power of the system is that it can accept a wide variety of data, data models, being a structureless data management system with great flexibility**
4. Do you think some aspect (technical, performance, efficiency, reliability, interoperability or quality requirements) of your component/task not included in a standard/document should be standardised and to facilitate design, manufacturing, trade, safety, relation among stakeholders, etc.? **In case of WG Cockpit we need to cope with the grid topology in each area. Would be good to have a common system (standard) for defining the grid modelling data.** **For Big Data platform there are no such aspects.**
5. In order to market your component/deliverable in the future, a standard/document in common with the rest of the Smart Grid, electric vehicles, cooperatives sector, efficiency others Europe-wide or world-wide may be useful? **N/A** 6. Do you think any already developed or future WiseGRID deliverable could be interesting for being applied in the Smart Grid, electric vehicles, cooperative sector or others Europe-wide or world-wide as guidance or recommendations? **Yes, it should be. Electric vehicles, (both EVP and FV2G) and also the cooperative approach would be good to extend as guidance.**
7. An increasing number of standards based on patented technology are being successfully and widely developed. Nevertheless, to avoid patent rights problems that may arise when developing standards, CEN-CENELEC has developed a document to provide practical guidance on this subject. Do you know the IPR & Patents policies applied by CEN, CENELEC and ISO and IEC? (Link to CEN CENELEC IPR website: https://www.cencenelec.eu/ipr/Pages/default.aspx , Link to ISO IPR website: https://www.iso.org/iso-standards-and-patents.html) and IEC website https://www.iec.ch/members_experts/tools/patents/patent_policy.htm . **Yes, some of them.**
8. CEN and CENELEC Workshop agreements are usual contributions to standardization as a result of R&D projects. Do you find WiseGRID deliverables susceptible to be promoted to this kind of documents? **Tool developers should be more precise.**

9. Do you consider that WiseGRID project results could be used to contribute to SAREF? **Not so far.**
10. Please add here any other information regarding your task/deliverables and standardisation that you may deem relevant: **WG Big Data is based for interoperability on JSON standard that is a subset of JavaScript Programming Language, Standard ECMA-262 3rd Edition - December 1999** http://www.ecma-international.org/publications/files/ecma-st/ECMA-262.pdf

11.5 ENG

1. Is your WiseGRID component/task affected by any European legislation (Directives, regulations...)? **With regards the RESCO tool for sure we need to take in account the regulation related to renewable energy. In an indirect way also the Energy Efficiency Directive should be considered.**
2. Is your organisation participating in any European or international standardisation technical committee, working group or similar already identified in Deliverable D3.2 related to WiseGRID project or related to the product/data model/standard used in WiseGRID project? **As far as know, No. But It should be useful to have a specific list of the data model/standard used in WiseGRID project in order to analyse it.**
2.1 Based in your previous answer, please specify the technical committee, working group or similar your organisation is participating or is willing to participate or is already participating: **ENG currently is not participating in specific groups about energy and smart grid, but It should be interesting participate to Bridge or ETP SNET working group.**
2.2 Please specify the reasons why you are participating or want to participate in a TC or working group or project team (several answers are possible): One could be the projects that are of your interest. **It is interesting to participate to those working groups for sharing ideas and experiences about smart grid and RES management.**
3. Within the framework of the WISEGRID project and (directly or indirectly) related to your component/tasks in the project, is your organisation using European or international standards (or other standards among those identified in Deliverable D3.2? **Yes**
3.1 Please specify the reasons why you are using standards/documents related to your component/tasks (several answers are possible): **The main motivation is to be complaint to the current standards in order to assure the interoperability and a more easy replicability in the future of the project results.**
3.2 The use of these standards has promoted any modification to their existing version or adaptation to cover further functionalities/models: **No, we are only following them**
3.3 Are there any new standardized data models/customized solutions developed for WiseGRID that could promote to new standards? **I think, no. As I said we are following the main used standards in order to be compliant.**
4. Do you think some aspect (technical, performance, efficiency, reliability, interoperability or quality requirements) of your component/task not included in a standard/document should be standardised and to facilitate design, manufacturing, trade, safety, relation among stakeholders, etc.? **I don't this it**
5. In order to market your component/deliverable in the future, a standard/document in common with the rest of the Smart Grid, electric vehicles, cooperatives sector, efficiency others Europe-wide or world-wide may be useful? **Yes for sure it should be useful**

6. Do you think any already developed or future WiseGRID deliverable could be interesting for being applied in the Smart Grid, electric vehicles, cooperative sector or others Europe-wide or world-wide as guidance or recommendations? **I think that parts of those results/deliverables should be shared in the Smart Grid and Energy communities**
7. An increasing number of standards based on patented technology are being successfully and widely developed. Nevertheless, to avoid patent rights problems that may arise when developing standards, CEN-CENELEC has developed a document to provide practical guidance on this subject. Do you know the IPR & Patents policies applied by CEN,CENELEC and ISO and IEC? (Link to CEN CENELEC IPR website: https://www.cencenelec.eu/ipr/Pages/default.aspx , Link to ISO IPR website: https://www.iso.org/iso-standards-and-patents.html) and IEC website https://www.iec.ch/members_experts/tools/patents/patent_policy.htm . **I know quite well the IPR police applied to software results, but No I don't know the IPR & Patents policies applied by CEN,CENELEC and ISO and IEC. For sure, I'm going to learn something about them.**
8. CEN and CENELEC Workshop agreements are usual contributions to standardization as a result of R&D projects. Do you find WiseGRID deliverables susceptible to be promoted to this kind of documents? **I don't know , we need to investigate on it**
9. Do you consider that WiseGRID project results could be used to contribute to SAREF? **I don't know in general for the project. I think no, from ENG side.**
10. Please add here any other information regarding your task/deliverables and standardisation that you may deem relevant:

11.6 ETRA I+D

1. Is your WiseGRID component/task affected by any European legislation (Directives, regulations...)? **In all our tools (WG Cockpit, WiseEVP, WiseCORP and WiseCOOP), the GDPR should be complied.** **Apart from that, the main legal aspects that could affect our tools can be found in the vertical's regulatory analysis done in D21.1. Summarizing:** **WG Cockpit: Page 81** **WiseCOOP: Page 89** **WiseCORP: As explained in Page 94 of D21.1, no specific legislation has been found.** **WiseEVP: Page 102.**
2. Is your organisation participating in any European or international standardisation technical committee, working group or similar already identified in Deliverable D3.2 related to WiseGRID project or related to the product/data model/standard used in WiseGRID project? **No**
2.1 Based in your previous answer, please specify the technical committee, working group or similar your organisation is participating or is willing to participate or is already participating:
2.2 Please specify the reasons why you are participating or want to participate in a TC or working group or project team (several answers are possible): One could be the projects that are of your interest.
3. Within the framework of the WISEGRID project and (directly or indirectly) related to your component/tasks in the project, is your organisation using European or international standards (or other

standards among those identified in Deliverable D3.2? **CIM, USEF, OCPP, openADR, SAREF (not yet used but future use TBD) and DLMS/COSEM.**
3.1 Please specify the reasons why you are using standards/documents related to your component/tasks (several answers are possible): **Promote interoperability.** **Increase TRL and facilitate the market penetration of the products.** **Facilitate integration to third party systems / future extensions.**
3.2 The use of these standards has promoted any modification to their existing version or adaptation to cover further functionalities/models: **OCPP: v1.6 has been extended to support V2G (which will be defined in OCPP v2.0, not yet published).**
3.4 Are there any new standardized data models/customized solutions developed for WiseGRID that could promote to new standards? **EV monitoring: no standard data model was identified so custom data model has been defined. In addition, there is no standardized way to access data from CAN bus in electric vehicles (on the other hand, such a standard – OBDII – exists for ICE vehicles).** **Battery monitoring and control: no standard data model was identified, custom data model has been defined**
4. Do you think some aspect (technical, performance, efficiency, reliability, interoperability or quality requirements) of your component/task not included in a standard/document should be standardised and to facilitate design, manufacturing, trade, safety, relation among stakeholders, etc.? **Identified gaps with regards to batteries and electric vehicles should be standardized in order to facilitate the replication of the deployments done in the project**
5. In order to market your component/deliverable in the future, a standard/document in common with the rest of the Smart Grid, electric vehicles, cooperatives sector, efficiency others Europe-wide or world-wide may be useful? **Yes. Particularly, in the case of battery monitoring/control and EV monitoring.**
6. Do you think any already developed or future WiseGRID deliverable could be interesting for being applied in the Smart Grid, electric vehicles, cooperative sector or others Europe-wide or world-wide as guidance or recommendations? **In the context of standards, the most relevant deliverable would be D21.5.**
7. An increasing number of standards based on patented technology are being successfully and widely developed. Nevertheless, to avoid patent rights problems that may arise when developing standards, CEN-

CENELEC has developed a document to provide practical guidance on this subject. Do you know the IPR & Patents policies applied by CEN,CENELEC and ISO and IEC? (Link to CEN CENELEC IPR website: https://www.cencenelec.eu/ipr/Pages/default.aspx , Link to ISO IPR website: https://www.iso.org/iso-standards-and-patents.html) and IEC website https://www.iec.ch/members_experts/tools/patents/patent_policy.htm .

No.

8. CEN and CENELEC Workshop agreements are usual contributions to standardization as a result of R&D projects. Do you find WiseGRID deliverables susceptible to be promoted to this kind of documents?

Effort can be done for D21.5.

9. Do you consider that WiseGRID project results could be used to contribute to SAREF**?**

No, WiseGRID considers current definition of SAREF, but no extension to it has been developed.

10. Please add here any other information regarding your task/deliverables and standardisation that you may deem relevant:

As commented before, main gaps identified in standardization have been:
- Battery management (monitoring and control).
- EV monitoring (access to information through CAN bus in a standardized manner).
- EV data model (possible extension for FIWARE thanks to the project).

11.7 ICCS

1. Is your WiseGRID component/task affected by any European legislation (Directives, regulations...)?
Data gathering from ICCS's infrastructure that will be used in pilot sites will comply to GDPR.

2. Is your organisation participating in any European or international standardisation technical committee, working group or similar already identified in Deliverable D3.2 related to WiseGRID project or related to the product/data model/standard used in WiseGRID project?
ICCS is participating in WG Regulation of BRIDGE initiative.

2.1 Based in your previous answer, please specify the technical committee, working group or similar your organisation is participating or is willing to participate or is already participating:
ICCS is participating in WG Regulation of BRIDGE initiative.

2.2 Please specify the reasons why you are participating or want to participate in a TC or working group or project team (several answers are possible): One could be the projects that are of your interest.
Promote our activities and our interests.

3. Within the framework of the WISEGRID project and (directly or indirectly) related to your component/tasks in the project, is your organisation using European or international standards (or other standards among those identified in Deliverable D3.2?
ICCS is using CIM. Specifically, it has developed the topology manager which will be used in WG Cockpit and which "translates" the grid topology to CIM.

3.1 Please specify the reasons why you are using standards/documents related to your component/tasks (several answers are possible): **Promote interoperability and facilitate integration to third party systems.**
3.2 The use of these standards has promoted any modification to their existing version or adaptation to cover further functionalities/models: **No.**
3.3 Are there any new standardized data models/customized solutions developed for WiseGRID that could promote to new standards? **No**
4. Do you think some aspect (technical, performance, efficiency, reliability, interoperability or quality requirements) of your component/task not included in a standard/document should be standardised and to facilitate design, manufacturing, trade, safety, relation among stakeholders, etc.? **No. CIM is a very extended standard which was sufficient for our purpose.**
5. In order to market your component/deliverable in the future, a standard/document in common with the rest of the Smart Grid, electric vehicles, cooperatives sector, efficiency others Europe-wide or world-wide may be useful? **No, CIM description is enough.**
6. Do you think any already developed or future WiseGRID deliverable could be interesting for being applied in the Smart Grid, electric vehicles, cooperative sector or others Europe-wide or world-wide as guidance or recommendations? **D21.5 is a relevant deliverable.**
7. An increasing number of standards based on patented technology are being successfully and widely developed. Nevertheless, to avoid patent rights problems that may arise when developing standards, CEN-CENELEC has developed a document to provide practical guidance on this subject. Do you know the IPR & Patents policies applied by CEN,CENELEC and ISO and IEC? (Link to CEN CENELEC IPR website: https://www.cencenelec.eu/ipr/Pages/default.aspx , Link to ISO IPR website: https://www.iso.org/iso-standards-and-patents.html) and IEC website https://www.iec.ch/members_experts/tools/patents/patent_policy.htm . **No**
8. CEN and CENELEC Workshop agreements are usual contributions to standardization as a result of R&D projects. Do you find WiseGRID deliverables susceptible to be promoted to this kind of documents? **Probably.**
9. Do you consider that WiseGRID project results could be used to contribute to SAREF?
10. Please add here any other information regarding your task/deliverables and standardisation that you may deem relevant:

11.8 ITE

1. Is your WiseGRID component/task affected by any European legislation (Directives, regulations...)? **WG FastV2G, as any other EVSE device, is affected by European legislation which concerns electric vehicle charging, such as EN 61851-1:2012, EN 61851-23, EN 61851-24, EN 62196-1 and EN 62196-3.**

2. Is your organisation participating in any European or international standardisation technical committee, working group or similar already identified in Deliverable D3.2 related to WiseGRID project or related to the product/data model/standard used in WiseGRID project? **ITE, as non for profit association, is associated with standardization groups and alliances such as OCPP or CHAdeMO, but not taking part in any of its working groups.**
2.1 Based in your previous answer, please specify the technical committee, working group or similar your organisation is participating or is willing to participate or is already participating: **As explained before, ITE is a member of OCPP and CHAdeMO association, and is considering to join CHARIN association.**
2.2 Please specify the reasons why you are participating or want to participate in a TC or working group or project team (several answers are possible): One could be the projects that are of your interest. **Participating in technical committees is a practical way of acquiring knowledge and know-how in the last trends of standardization, and at the same time grants the chance of taking part on the standards formulation.**
3. Within the framework of the WISEGRID project and (directly or indirectly) related to your component/tasks in the project, is your organisation using European or international standards (or other standards among those identified in Deliverable D3.2? **Within the WiseGRID framework, two different standards have been used: OCPP v1.6 for communications between EVSE and Control Center, and CHAdeMO versions 0.9, 1.0, 1.1 and V2H for communications between EVSE and EV.**
3.1 Please specify the reasons why you are using standards/documents related to your component/tasks (several answers are possible): **OCPP has been implemented for the EVSE communication as it is well extended in Europe, and thanks to it this protocol has become a de facto standard in EVSE communication. On the other hand, one of the main goals of FastV2G development was to adapt the original SmartV2G station to CHAdeMO standard as it is the only one that currently supports bidirectional technology (V2G).**
3.2 The use of these standards has promoted any modification to their existing version or adaptation to cover further functionalities/models: **OCPP 1.6 does not consider V2G charging, but due to this is the main extended version among EV, it has been necessary to adapt its content to enable V2G charging mode.**
3.3 Are there any new standardized data models/customized solutions developed for WiseGRID that could promote to new standards? **Not really, OCPP within its 2.0 version has implemented all necessary messages to manage V2G. However, such a version of OCPP has not been implemented because it is currently in draft version.**
4. Do you think some aspect (technical, performance, efficiency, reliability, interoperability or quality requirements) of your component/task not included in a standard/document should be standardised and to facilitate design, manufacturing, trade, safety, relation among stakeholders, etc.? **Although authentication is included in OCPP standard, there is no current standard for user identification. However, RFID technology is the most extended one. Another aspect regarding EV charging that is not standardised is the payment systems. Although this has not been considered during FastV2G development, the fact is that some manufacturers include physical Point of Sales (POS) while others just consider telematics payment.**
5. In order to market your component/deliverable in the future, a standard/document in common with the rest of the Smart Grid, electric vehicles, cooperatives sector, efficiency others Europe-wide or world-wide may be useful? **Does not apply**
6. Do you think any already developed or future WiseGRID deliverable could be interesting for being applied in the Smart Grid, electric vehicles, cooperative sector or others Europe-wide or world-wide as guidance or

recommendations? **Results of FastV2G in pilot site could be very useful to car manufacturers that actually include V2G technology or are planning to develop, as it can be used as a reference of possible issued regarding this charging mode.**
7. An increasing number of standards based on patented technology are being successfully and widely developed. Nevertheless, to avoid patent rights problems that may arise when developing standards, CEN-CENELEC has developed a document to provide practical guidance on this subject. Do you know the IPR & Patents policies applied by CEN,CENELEC and ISO and IEC? (Link to CEN CENELEC IPR website: https://www.cencenelec.eu/ipr/Pages/default.aspx , Link to ISO IPR website: https://www.iso.org/iso-standards-and-patents.html) and IEC website https://www.iec.ch/members_experts/tools/patents/patent_policy.htm . **ITE is aware of these patent policies, but do not apply for this development.**
8. CEN and CENELEC Workshop agreements are usual contributions to standardization as a result of R&D projects. Do you find WiseGRID deliverables susceptible to be promoted to this kind of documents? **Not the deliverables of FastV2G development.**
9. Do you consider that WiseGRID project results could be used to contribute to SAREF? **We consider that FastV2G results couldn't contribute to SAREF.**
10. Please add here any other information regarding your task/deliverables and standardisation that you may deem relevant:

11.9 QMUL

1. Is your WiseGRID component/task affected by any European legislation (Directives, regulations...)? 2. Is your organisation participating in any European or international standardisation technical committee, working group or similar already identified in Deliverable D3.2 related to WiseGRID project or related to the product/data model/standard used in WiseGRID project? 2.1 Based in your previous answer, please specify the technical committee, working group or similar your organisation is participating or is willing to participate or is already participating: 2.2 Please specify the reasons why you are participating or want to participate in a TC or working group or project team (several answers are possible): **One could be the projects that are of your interest.**
3. Within the framework of the WISEGRID project and (directly or indirectly) related to your component/tasks in the project, is your organisation using European or international standards (or other standards among those identified in Deliverable D3.2? **no**
3.1 Please specify the reasons why you are using standards/documents related to your component/tasks (several answers are possible):
3.2 The use of these standards has promoted any modification to their existing version or adaptation to cover further functionalities/models:
3.3 Are there any new standardized data models/customized solutions developed for WiseGRID that could promote to new standards?
4. Do you think some aspect (technical, performance, efficiency, reliability, interoperability or quality requirements) of your component/task not included in a standard/document should be standardised and to facilitate design, manufacturing, trade, safety, relation among stakeholders, etc.? **n/a**
5. In order to market your component/deliverable in the future, a standard/document in common with the

rest of the Smart Grid, electric vehicles, cooperatives sector, efficiency others Europe-wide or world-wide may be useful? **no**
6. Do you think any already developed or future WiseGRID deliverable could be interesting for being applied in the Smart Grid, electric vehicles, cooperative sector or others Europe-wide or world-wide as guidance or recommendations? **n/a**
7. An increasing number of standards based on patented technology are being successfully and widely developed. Nevertheless, to avoid patent rights problems that may arise when developing standards, CEN-CENELEC has developed a document to provide practical guidance on this subject. Do you know the IPR & Patents policies applied by CEN,CENELEC and ISO and IEC? (Link to CEN CENELEC IPR website: https://www.cencenelec.eu/ipr/Pages/default.aspx , Link to ISO IPR website: https://www.iso.org/iso-standards-and-patents.html) and IEC website https://www.iec.ch/members_experts/tools/patents/patent_policy.htm .
8. CEN and CENELEC Workshop agreements are usual contributions to standardization as a result of R&D projects. Do you find WiseGRID deliverables susceptible to be promoted to this kind of documents? **yes**
9. Do you consider that WiseGRID project results could be used to contribute to SAREF? **n/a**
10. Please add here any other information regarding your task/deliverables and standardisation that you may deem relevant:

12 APPENDIX F DRAFT PROPOSAL ON STANDARDIZATION ON COMMUNICATION OF ENERGY STORAGE SYSTEMS

AMPERE has already prepared a draft proposal for a standard on the communications of energy storage systems. This proposal could be supported by Varta.

Commands shall allow, where possible, to read (R), edit (E), delete (D) and write (W).

- Configuration (R/E):
  - Group of minimum parameters.
  - Possibility to add parameters from manufacturer.
- Monitoring (R):
  - Group of minimum parameters.
  - Possibility to add parameters from manufacturer.
- Control (R/W/E/D):
  - In case of conflict a list of priorities will be used.
  - Variables:
    - P_{inv}: Inverter power.
    - P_{bat}: Battery power.
    - P_{PV} : Photovoltaic power.
    - P_{grid}: Grid power.
    - SOC: State of charge.
    - Q: Reactive power.
    - cos φ: Power factor.
  - Parameters:
    - Three combinable parameters:

                - Exact value.
                - Maximum value.
                - Minimum value.
        - The sense of the power shall be indicated by its name (charge/discharge, consume/injection…). It will not be included signs in the power values.
        - The last received consign will be maintained for each of the power.
        - It is allowed:
            - Read.
            - Write → When confirmed an ACK is received back.
            - Delete:
                - From the consign associated to the power.
                - All consigns.
- Schedule (W/R/E/D):
    - Any command type queue.
    - Every programmed command shall have an associated ID.
    - Structure:
        - Command to program:
            - Command type.
            - Command data.
        - Initiating time: UNIX.
        - Repetition:
            - Period (in seconds). If empty, it does not exist repetition.
            - Number of repetitions: If empty, infinite repetitions.
              Note: The field “Repetition” can be formed by “Period” and “Number of repetitions”, “Period ” or both empty.
    - Clear:
        - All the queue.
        - Per ID.
    - Read:
        - Initial time + time increase.
        - All the queue.
- Modes:
    - It is allowed read and write.
    - Types:
        - Standard.
        - Manual.
        - Schedule.
        - Stand-by.
        - Regulation:
            - Type of regulation.
            - Configuration parameters needed.
            - Table.
            - Activation and deactivation.