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*Virtualized secure Communication enhanced Smart Grid Node
A proposal for FINESCE Project Open Call – Area 2*

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Onyx Technology

- Italian SME, offering a broad range of innovative ICT services and solutions, with a special emphasis on security, privacy-preserving architectures and Smart grids communication infrastructures (including AMR systems).
- Onyx Technology at the forefront of research and innovation .

On-going R&D experience/projects

- Regional (FILAS) projects tailored to develop and make available advanced solutions for real time monitoring and remote yet secure and optimized control of distributed devices (ranging from alarm systems to PVs inverter).
- INGRID FP7 EU project on hydrogen energy storage: supporting Engineering coordinating partner in designing and implementing secure communication architecture at the interface between secondary substation and INGRID storage facility.



Proposed Idea for Open Call – Area 2

Background

Main challenges for future Smart Energy Systems

Increasing penetration of fluctuating Renewable Energy Sources at MV level of the power distribution grid.

Need for real time ICT systems able to successfully integrate and effectively manage higher shares of distributed generation.

Energy marketplace, demand response, grid extension, cross-border compensation, virtual power plant and energy storage as effective solutions to make available the necessary flexibility to the power network for effectively integrating (and not curtailing) energy from RESs.



Proposed Idea for Open Call – Area 2

Proposed solution

To provide the electricity distributors with **novel, scalable, secure and reliable optimized communication architecture**, which:

- will incorporate different even proprietary communication architectures (including DLMS/COSEM and SOAP mapping of IEC61850 protocol) adapted to the specific and contextual needs (es. Power line for the last mile close to the final consumption point, DLMS/COSEM supporting metering data near real time communication with the secondary substation...).
- enriched with advanced privacy-by design security concept.
- will make available a virtualized software stack allowing energy stakeholders (DSOs, retailers, customers), participating to the energy marketplace, to effectively communicate in a full interoperable way.



Proposed Idea for Open Call – Area 2

Expected Outcome

The expected outcome will be a novel smart grid **adaptive secure scalable communication-aware real time context-aware active monitoring and control framework which will incorporate optimal performance communication network parameters selection.**

How it works

Based on the state of the grid monitoring, the addressed smart grid application, its communication requirements, the requested networks performance parameters (QoS, throughput, latency), the available (if any) communication network which better match with the planned criteria will be selected.

Such a framework will be deployed in smart grids node, either at DSO either at consumer level.

The resulting communication stack will be promptly integrated with the Generic Enablers provided by FIWARE project and will be validated and tested in the Terni's marketplace testbed.



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