

Partnering Opportunity

Profile Status: Published

Research & Development Request

LC-SC3-RES-16-2019: development of solutions based on renewable sources that provide flexibility to the energy system

Summary

For the call H2020 LC-SC3-RES-16-2019, a French university wants to coordinate a project aiming at the development of a cloud-based virtual power plant that aggregates the capacities of intermittent distributed renewable energy resources (DRER). Partners sought to complete the consortium in a research agreement: distribution system operator (DSO) or a transmission system operator (TSO), a specialist in big data analysis / stochastic predictions, or an ICT company involved in electrical grids.

Creation Date	25 June 2019
Last Update	27 June 2019
Expiration Date	27 July 2019
Reference	RDFR20190619001
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Details

Description

European countries are engaged on increasing the renewable and alternative energy use. However, the penetration of renewable energy sources can cause heavy fluctuations in the whole load system and damage the quality of the electricity network. Moving from conventional generation to variable distributed energy production impacts considerably the electric grid structure. This change leads to a new grid architecture characterized by a growing variability and uncertainty triggered by the high penetration of the renewable energy sources. Thus, balancing power supply and demand become a very challenging task.

To cope with drawback of the inherent variability of the renewable energy sources, the French university thinks that a solution should be find to provide more flexibility to the Virtual Power Plant (VPP). Their FlexVPP project aims to develop a cloud-based virtual power plant that

aggregates the capacities of intermittent Distributed Renewable Energy Resources (DRER).

FlexVPP aims to make VPP more flexible, stable and profitable by investigating and ensuring the following properties:

- Flexibility metering / index:
 - o evaluate annual, weekly and daily flexibility requirements,
 - o evaluate sensibility of those requirement towards: network interconnection and penetration level of renewable energy sources.
- Uncertainties of virtual power plant and stochastic techniques for effective costing and participation
- The multi-time scale rolling scheduling strategy which combines day-ahead scheduling, hours-ahead scheduling, and real-time dispatch.
- Smart controllability of DRER
- Cybersecurity, transparency, scalability, ...

Strategic objectives :

- Propose a multi agent-based model for the VPP that considers all parameters related to the DRER / simulate the impact of extended VPP (structure, power, geographic) on the distribution and electricity network.
- Develop a scalable cloud-based FlexVPP platform
- Design the VPP and define KPIs to characterize the Flexibility Level Integrity and the profitability of a VPP
- Predict, understand and mitigate uncertainties
- Enhance the supply-demand balance, stability and energy savings
- Provide ancillary and flexible services and propose a tailored distributed ledger technology business model
- Compare the proposed solution with VPP combined with electrochemical storage

Scenarios :

FlexVPP will study diverse case studies related to the uncertainties as follows:

1. Evaluate the flexibility of our solution face to the variability of resources (summer/winter, night/day), changeability of VPP structure and propose accurate prediction models. How the other power plant will compensate this variability?
2. Assess the performance and the reaction of FlexVPP in the case of high fluctuating productions and consumptions.
3. Evaluate the impact of trading uncertainty and price variation (spot market) on the decision making (lightning network / smart contract etc ...) and assess the users' acceptance of this technology. (national / cross-border interconnexions)

To achieve this project, the research team is looking for several partners to build a strong consortium : distribution system operator (DSO) or a transmission system operator (TSO), a specialist in big data analysis / stochastic predictions, and a company specialized in complex cloud / ICT systems for electric grids.

The deadline for EOIs : 27 July 2019

The deadline of the call : 27 August 2019

Advantages and Innovations

This virtual power plant will be more flexible, stable and profitable and provide a good balance for supply and demand of energy, while increasing the renewable and alternative energy use.

Technical Specification or Expertise Sought

The partners sought will have to bring their expertise & R&D on these tasks:

- Multiagent-based control and modeling
- Data analysis (weather, trading, demand) / flexibility analysis
- Forecasting uncertainties
- Cybersecurity
- Blockchain development / Smart contract
- Energy management
- Distributed ledger technology business modeling / ancillary services
- SmartGrid demonstrator (e.g. FlexGrid)
- Regulatory affairs knowledge

Stage of Development

Proposal under development

IPR Status

Other

Keywords

Technology

01003024	Cloud Technologies
02009026	Energy supply system
04007001	Energy management

Market

06007001	Other energy production
06008	Energy Storage
06009	Energy Distribution
08002001	Energy management
08003006	Power transmission equipment (including generators & motors)

Network Contact

Issuing Partner

ZACHODNIOPOMORSKI UNIWERSYTET TECHNOLOGICZNY W SZCZECINIE

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Open for EOI : **Yes**

Dissemination

Relevant Sector Groups

Intelligent Energy

Client

Type and Size of Organisation Behind the Profile

University

Year Established

0

Turnover

<1M

Already Engaged in Trans-National Cooperation

Yes

Languages Spoken

English

French

Client Country

France

Partner Sought

Type and Role of Partner Sought

Several partners are sought to complete the consortium :

- Distribution system operator (DSO),
- Transmission system operator (TSO),
- Specialist in big data analysis / stochastic predictions,
- Companies specialized in complex cloud / ICT systems for electric grids.

They will have to bring their expertise & R&D on these tasks:

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- Data analysis (weather, trading, demand) / flexibility analysis
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Type and Size of Partner Sought

SME 11-50, University, R&D Institution, SME <10, >500 MNE, 251-500, SME 51-250, >500

Type of Partnership Considered

Research cooperation agreement

Program - Call

Framework Program

Energy

Call title and identifier

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Anticipated Project Budget

5 millions

Coordinator Required

No

Deadline for EOI

27 Jul 2019

Deadline of the Call

27 Aug 2019

Weblink to the Call

<https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/lc-sc3-res-16-2019>

Project Title and Acronym

LC-SC3-RES-16-2019: development of solutions based on renewable sources that provide flexibility to the energy system