

ETRA INVESTIGACIÓN Y DESARROLLO, S.A. - Spain

COBRA INSTALACIONES Y SERVICIOS S.A. - Spain

INSTITUTE OF COMMUNICATIONS AND COMPUTER SYSTEMS - Greece

CRNOGORSKI ELEKTROPRENOSNI SISTEM - Montenegro

HELLENIC ELECTRICITY DISTRIBUTION NETWORK OPERATOR S.A. - Greece

UNIVERSITY OF MANCHESTER - UK

ELEKTROENERGIEN SYSTEMEN OPERATOR EAD - Bulgaria

SS CYRIL AND METHODIUS UNIVERSITY, FACULTY OF ELECTRICAL ENGINEERING AND INFORMATION TECHNOLOGIES - Republic of North Macedonia

VARTA STORAGE GMBH - Germany

KONCAR - INZENJERING ZA ENERGETIKUI TRANSPORT DD - Croatia

AD ELEKTRANI NA MAKEDONIJA SKOPJE - DIREKCIJA - Macedonia

ELEKTROMREZA SRBIJE AD - Serbia

INDEPENDENT POWER TRANSMISSION OPERATOR S.A. - Greece

NEZAVISNI OPERATOR SISTEMA U BIH - Bosnia y Herzegovina.

HEP - OPERATOR PRIJENOSNOG SUSTAVA D.O.O. - Croatia

PUBLIC POWER CORPORATION S.A. - Greece

SECURITY COORDINATION CENTRE SCC LTD. BELGRADE - Serbia

CYBERGRID GMBH - Austria

CENTRUL ROMAN AL ENERGIEI - CRE - Romania

COMPANIA NATIONALA DE TRANSPORT AL ENERGIEI ELECTRICE TRANSELECTRICA S.A. - Romania

ELPROS ELEKTRONSKI IN PROGRAMSKI SISTEMI DOO - Slovenia

UNIVERZA V LJUBLJANI - Slovenia

OPERATOR NA ELEKTROPRENOSNIOT SISTEM NA MAKEDONIJA - Republic of North Macedonia



etra I+D



This project has received funding from the European Union's Horizon 2020 research and innovation programme under the grant agreement No. 773430

Clean energy
across Europe

www.crossbowproject.eu

[@CROSSBOW_H2020](https://twitter.com/CROSSBOW_H2020)

EXPECTED RESULTS

CROSSBOW proposes the **shared use of resources** to foster **cross-border** management of variable **renewable** energies and **storage** units, enabling a higher penetration of clean energies whilst **reducing network operational costs and improving economic benefits** of RES and storage units.

CONTACT:



crossbow@grupoetra.com

 @CROSSBOW_H2020

www.grupoetra.com

1. **CROSSBOW Regional Operation Centre Balancing Cockpit (ROC-BC).** Extending the functionalities of the already established, Regional Security Coordinator initiatives (RSC), CROSSBOW will propose a set of tools for regional management and operation that will build on/enhance existing regional structures.

2. **CROSSBOW RES Regional Coordination Centre (RES-CC).** Following the examples of already existing national RES Control Centres – acting between TSO and RES producers – CROSSBOW will propose a Regional Coordination Centre platform to support TSOs in the region on the real-time supervision and control of large RES production units, achieving higher availability rates for installations.

9. CROSSBOW Cooperative Ownership Of Flexibility Assets Platform (CFP). An innovative business model for Cooperative Ownership of the Flexibility Assets will be specified, developed, demonstrated and validated in CROSSBOW. The cooperative ownership concept will be aligned with existing regulation and general enough to support existing flexibility assets, like VPPs and DR systems. Furthermore, it will by design enable multinational ownership of flexibility assets2-3.

8. CROSSBOW Wholesale and Ancillary Market toolset (AM). CROSSBOW will propose a novel market design for ancillary services and wholesale electricity market aligned with the latest grid code and market development to enhance the integration of RES and DR.

3. **CROSSBOW Hybrid RES Dispatchable Unit (RES-DU).** CROSSBOW will integrate non-dispatchable and dispatchable RES along with energy storage units under an advanced control system based on firm hybrid power plants connected to transmission and distribution grids in a single Point of Common Coupling (PCC). The combination of non-dispatchable RES, such as Wind and PV, with dispatchable RES, such as Biogas Turbine, Biomass or Hydro, and along with energy storage capability, leads to more secure, stable and cleaner electricity supply.

4. **CROSSBOW Regional Storage Coordination Centre (STO-CC).** As RES, storage units require specific real-time monitoring and control, especially when they become relevant to the operation of transmission networks. CROSSBOW proposes a Regional Storage Coordination Centre to provide, real-time supervision and control, incident management, seamless interaction with system operators and optimisation of installations.

5. **CROSSBOW Virtual Storage Plants (VSP).** A VSP is a platform capable of integrating the characteristics and limitations of distributed individual storage units – using the same or different storage technologies – while maximizing their performance and reducing additional costs stemming from not-optimal usage. CROSSBOW will propose a framework for different stakeholders to promote and adopt the use of VSP.

7. CROSSBOW Regional DSM integration platform (DSM-IP). CROSSBOW will propose a framework for the integration of Demand Side Management existing solutions into the regional Transport Network. The platform will enable the cooperation, between TSOs and DSOs, informing the amount of available energy from accessible controllable loads and the availability of services that can be offered from DSOs to TSOs.

6. CROSSBOW WAMAS (Wide Area Monitoring and Awareness System) consist of an advanced real-time central system and a number of time synchronised acquisition units. The system will be used for real-time data exchange between TSOs, DSOs, RESs and storage devices and will provide information about storage availability, congestions, and warnings. It will also perform control actions to maintain stable operation of the power system. The goal is to ensure the stable power system operation with integration of RES and storages in dynamic electricity market conditions.

PROJECT DATA:

Starting date: **01/11/2017**
Duration: **48 Months**
Budget: **22 M€**

