Progetto Energynius

Energynius è un progetto di ricerca industriale finanziato dal POR FESR Emilia Romagna 2014-2020 nell'ambito della Strategia di Specializzazione Intelligente (S3)
https://www.energynius.it/ Data inizio 22/07/2019 Data conclusione 22/02/2022

ENERGYNIUS
ENERGY Networks Integration for Urban Systems

http://www.cross-tec.enea.it

Il progetto ENERGYNIUS (acronimo di Energy Networks Integration for Urban Systems) (POR-FESR 2014-2020 Emilia-Romagna) intende delineare modelli di sviluppo che mettano le Energy Communities e i Distretti Energetici nelle condizioni di effettuare scambi bidirezionali con le reti energetiche, offrendo quindi energia e servizi al sistema regionale/nazionale. Saranno inoltre sviluppati strumenti software basati su algoritmi di gestione ottimizzata, modelli di simulazione real-time e diagnostica dei distretti energetici per identificare le migliori soluzioni tecnologiche e di controllo dei sistemi di produzione, accumulo e distribuzione dell'energia. Alcuni degli algoritmi sviluppati verranno integrati in un dispositivo hardware per il controllo degli impianti energetici. Strumenti software e hardware saranno validati sia in ambiente simulato che in ambiente reale su almeno tre casi studio. IREN partecipa al progetto come partner esterno, fornendo il proprio punto di vista sullo sviluppo dei tools di progetto ed eventualmente con test sul campo.

ENEA CROSS-TEC

Video

Il progetto intende delineare e realizzare modelli di sviluppo che mettano le Energy Communities e i Distretti Energetici nelle condizioni di effettuare scambi bidirezionali con le reti energetiche.

Partner

- LEAP s.c.a r.l. – Laboratorio Energia e Ambiente Piacenza (Coordinatore)
- CIDEA – Centro Interdipartimentale per l'Energia e l'Ambiente (Università di Parma)
- CIRI FRAME – Centri Interidipartimentale di Ricerca Industriale Fonti Rinnovabili, Ambiente, Mare ed Energia (Università di Bologna)
- Laboratorio MECHLAV
- ENEA CROSS-TEC

Collaborano al progetto anche

Partner Industriali

- Akse
- Antas
- BorgWarner Systems Lugo
- CPL Concordia
- Iren
- Optit
- Siram

Principali articoli sui quotidiani nazionali relativi al progetto Energynius

Research Gate: **Electric Vehicle Aggregate Power Flow Prediction and Smart Charging System for Distributed Renewable Energy Self-Consumption Optimization** https://www.mdpi.com/1996-1073/13/19/5003

Electric Vehicle Aggregate Power Flow Prediction and Smart Charging System for Distributed Renewable Energy Self-Consumption Optimization

by Francesco Lo Franco, Mattia Ricco *, Riccardo Mandrioli and Gabriele Grandi

Abstract

In the context of electric vehicle (EV) development and positive energy districts with the growing penetration of non-programmable sources, this paper provides a method to predict and manage the aggregate power flows of charging stations to optimize the self-consumption and load profiles. The prediction method analyzes each charging event belonging to the EV population, and it considers the main factors that influence a charging process, namely the EV's characteristics, charging ratings, and driver behavior. EV's characteristics and charging ratings are obtained from the EV model's and charging stations' specifications, respectively. The statistical analysis of driver behavior is performed to calculate the daily consumptions and the charging energy request. Then, a model to estimate the parking time of each vehicle is extrapolated from the real collected data of the arrival and departure

sources; self-consumption; forecasting; peak shaving; load shifting; photovoltaics

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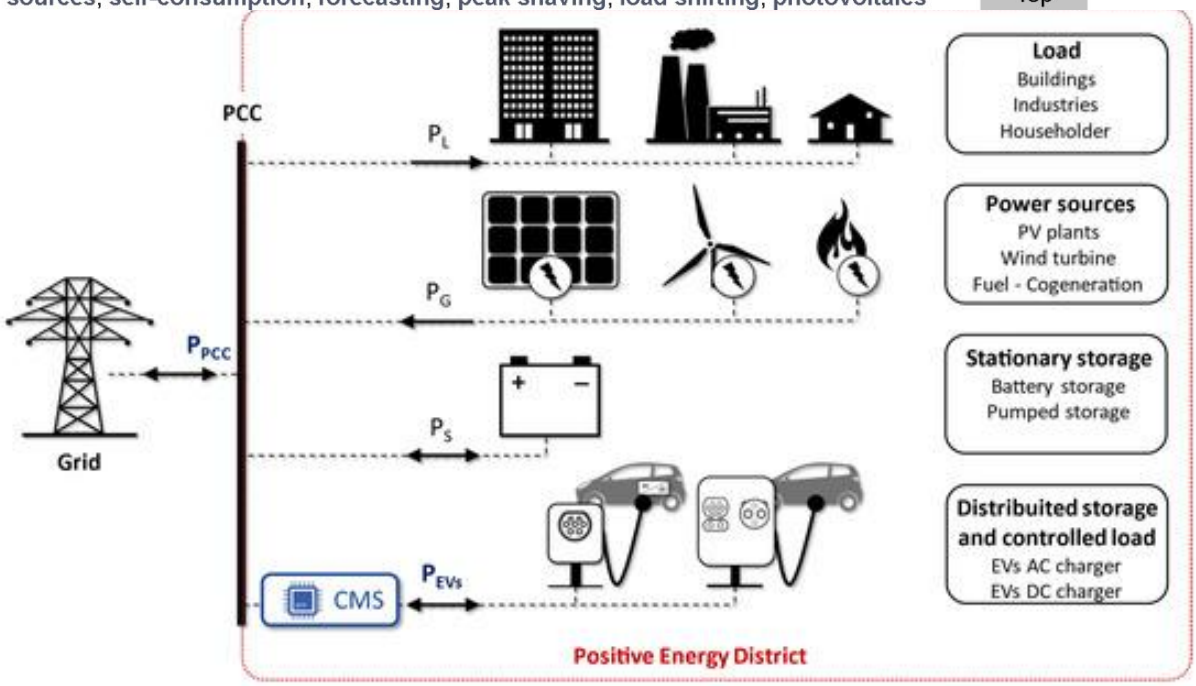

Principali articoli sui quotidiani nazionali relativi al progetto Energynius

Techno-economic impact of collective self-consumption on different energy-related investments for a condominium https://www.e3s-conferences.org/articles/e3sconf/abs/2021/14/e3sconf_100res2021_05006/e3sconf_100res2021_05006.html

Techno-economic impact of collective self-consumption on different energy-related investments for a condominium

Matteo Zatti[1*], Federico Guermandi[1,2] and Filippo Bovera[2]

[1] LEAP – Laboratorio Energia Ambiente Piacenza, Via Nino Bixio 27/c, 29121, Piacenza, Italy

[2] Politecnico di Milano, Department of Energy, Via Lambruschini 4a – 20156 Milano

Abstract

Energy Communities (ECs) are gaining a key role in supporting the transition towards a low carbon economy in EU, since they combine the promotion of efficient energy practices with an expected positive social impact. Legislators are resorting to the concept of collective self-consumption as a tool to favor the electrification of energy needs and the diffusion of renewable energy sources. This work presents the first results in this field of the ENERGYNIUS project, co-funded by Regione Emilia-Romagna, focusing on the economic feasibility of investment decisions that would increase energy efficiency and renewables' penetration in the household sector. To this purpose, a mathematical model has been developed, featuring an hourly time step definition of the internal and external energy exchanges and an accurate modelling of the electricity billing. It has been applied to an Italian condominium case study where the energy requirements of the inhabitants – in terms of electricity, heating, cooling and private transportation – have been considered. Thanks to the model, it is possible to compare increasing levels of electrification (e.g., photovoltaic panels, heat pumps, electric vehicles and batteries) and assess the benefits of collective selfconsumption on the condominium cash flows and environment (fossil CO_2 emissions).

Rassegna stampa

- **Iren report 2020** https://report2020.gruppoiren.it/it/finanziario/relazione-sulla-gestione/ricerca-e-sviluppo
- **ENERGYNIUS – ENERGY Networks Integration for Urban Systems** https://europaquier.it/energynius-energy-networks-integration-for-urban-systems/
- **ENERGYNIUS - ENERGY Networks Integration for Urban Systems** https://www.unibo.it/it/ricerca/progetti-e-iniziative/progetti-unibo-por-fesr-2014-2020-1/energynius
- **ENERGY Networks Integration for Urban System** https://www.centritecnopolo.unipr.it/cidea/ricercaetrasferimentotecnologico/progetti/energy-networks-integration-for-urban-systems/
- **Energynius, innovazione nei sistemi energetici urbani** https://energia.regione.emilia-romagna.it/notizie/notizie-home/2021/energynius-innovazione-nei-sistemi-energetici-urbani
- **ENERGY Networks Integration for Urban Systems** https://cerr.eu/project/energynius/

- **Parte "Energy Networks Integration for Urban Systems", il progetto finanziato dalla Regione Emilia-Romagna sull'integrazione tra le reti energetiche e la sostenibilità** https://www.optit.net/2019/06/06/progetto-energynius/
- **RETI ENERGETICHE INTELLIGENTI – LAB TALKS "INNOVAZIONE IN EMILIA-ROMAGNA"** https://greentech.cluster.it/evento/reti-energetiche-intelligenti-lab-talks-innovazione-in-emilia-romagna/
- **LEAP ed il Tecnopolo di Piacenza – Ex Officina Trasformatori partecipano a R2B OnAir** https://www.sciencedirect.com/science/article/abs/pii/S0306261921010564#!
- **Electric Vehicle Aggregate Power Flow Prediction and Smart Charging System for Distributed Renewable Energy Self-Consumption Optimization** https://www.mdpi.com/1996-1073/13/19/5003
- **Techno-economic impact of collective self-consumption on different energy-related investments for a condominium** https://www.e3s-conferences.org/articles/e3sconf/abs/2021/14/e3sconf_100res2021_05006/e3sconf_100res2021_05006.html