

MI Joint Call 2020 - Funded projects

Project acronym	Project title	Project abstract	Keywords	Funding organisation	Involved countries	Project lead
ADRENALIN	dAta-DRivEN smArt buiLdINgs: data sandbox, competitions, implementation	Buildings represent a high share of peak electricity demand, but thanks to their slow thermal inertia they also offer the potential to be one of the lowest cost opportunities for providing the flexible demand needed to support increasing levels of variable renewable energy resources in electricity grids. To activate and scale this latent flexible demand opportunity, new data-driven software services are needed. ADRENALIN aims at facilitating large scale roll-out of data services and smart controls in the existing building stock. By collecting a large and varied pool of measurement data from real buildings (data sandbox), ADRENALIN will crowdsource to data challenge competitions the development of new algorithms. The best-performing solutions will be implemented in real-life conditions on the digital platforms of the partner companies to test their general validity and replicability, and to demonstrate real-life performance.	Machine learning, smart controls, smart buildings, flexible energy demand	The Research Council of Norway Swedish Energy Agency Danish Energy Agency Forschungszentrum Jülich GmbH The Scientific and Technological Research Council of Turkey (TÜBITAK)	Norway Sweden Denmark Turkey Germany	SINTEF AS
AI-flex	Autonomous AI for cellular energy systems increasing flexibilities provided by sector coupling and distributed storage	The cellular approach addresses decentralized, self-governed energy cells on all hierarchical grid levels. Every cell can encompass electric, gas and district heating grids achieving high efficiency and flexibility due to sector coupling and energy storage solutions such as batteries and Power-to-X systems. Compared to conventional grid operation, each cell optimizes its renewable power generation, energy consumption and storing on a much finer granularity level and a much higher level of complexity of the optimisation due to a high number of participants. In order to address this challenge, an autonomous AI-based cell optimizer will be developed for the efficient energy management of a multitude of energy storage devices from the perspective of an energy cell. The AI-based control is integrated and demonstrated under real-world conditions by means of a digital twin of the energy system serving as a coherent information and interaction layer for all market participants.	Cellular approach, cell optimizer, distributed batteries, Power-to-X technologies, artificial intelligence	Forschungszentrum Jülich GmbH FFG - Austrian Research Promotion Agency	Germany Austria	Fachhochschule Bielefeld
AISOP	AI-assisted grid situational awareness and operational planning	AISOP aims to create an AI-assisted decision support system for the electric distribution system operators (DSOs) to drive decarbonisation that is underpinned by advanced digital technology. The decision-support system securely and privately acquires, processes, interprets, and exploits data for the benefit of DSO operational planning. In this context, AISOP expands data-driven techniques for improved operational planning in distribution/local grids with high shares of DERs by integrating AI/ML-based solutions, enhanced situational awareness and market incentives. Within the proposed project we combine (i) data access and ingestion (ii) distribution grid situational awareness, (iii) decision-support for distribution grid management (iv) dynamic tariffs, (v) digital platform integration with exploitation through test and training environments. The developed solutions will be disseminated within EXPERA and validated using the three demo-sites and living labs in CH, DE and DK.	AI-decision support system, edge analytics, operational planning, digital process twin, dynamic tariffs	Danish Energy Agency Federal Department of the Environment, Transport, Energy and Communications DETEC – Swiss Federal Office of Energy SFOE Forschungszentrum Jülich GmbH	Switzerland Germany Denmark	Fachhochschule Zentralschweiz – Hochschule Luzern
BioLens	BioLens	BIOLENS will form the basis for a new standardized and comprehensive digital transparency within biomethane production and marketing. This creates a new strong data-driven foundation on which sustainability can be evaluated, compared, and traded across countries and borders. The end customer can follow exactly the authenticity of their purchased certificates and where certifying or accredited institutions and auditors can verify that these certificates have not been counted with more than they should, in the emission reduction reports.	Biomethane; Digitalization; End-to-End; Transparency; Optimization	Swedish Energy Agency Danish Energy Agency	Denmark Sweden	Fremsyn ApS

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DIEGO	Digital Energy Path for Planning and Operation of sustainable grid, products and society	The main objective of DIEGO is the development and testing of consistent methods and applications for a digital integrated system and components crosslinking of processes and infrastructures to provide reliable multigrid and sustainable industrial products. With DIEGO planning and operation digital solutions, an optimized local energy symbiosis (optimized energy utilization for all participants) and increase in system resiliency, reliability as well as maintenance management will be guaranteed. The digital building blocks developed and demonstrated throughout the project are (1) Software components for planning multi-energy grids across multiple sectors and diverse types of consumers/producers/storage. (2) Optimisation algorithms and prediction methods for real-time energy balancing in a micro grid comprising different sectors and consumption types. (3) ICT architecture supporting (near-)deterministic data exchange. (4) Digital tools for enhancing the design of photovoltaic cells.	Energy Demand Modelling, Digitalization, Linked Data, Data Exchange	Forschungszentrum Jülich GmbH National Centre for Research and Development (NCBR) FFG - Austrian Research Promotion Agency Ministry of Energy of Israel	Germany Poland Austria Israel	University of Applied Sciences Magdeburg-Stendal
DigiCiti	DIGItal energy solutions promoting social innovation, Circular economy, climate change mitigation and urban resilience	Thermal energy is a core component in transitioning our energy systems to a decarbonised future. Thermal processes possess an inherent flexibility due to their inertia, and can therefore be used to make the whole energy system more resilient to climate change while facilitating the further use of renewable energy sources. DigiCiti will introduce transformative technologies, business models and knowledge sharing for energy user empowerment to enable a true circular energy society in a decarbonised Europe. DigiCiti will merge recent advances in collective intelligence and data-driven AI with innovative business and investment management to fully exploit the potential of a digital society. The project will be evaluated in prototype sites and living labs covering a range of solution use case to prove the ambitious goals for societal, environmental and financial impact of DigiCiti.	Sector coupling, Energy AI, User empowerment	Swedish Energy Agency FFG - Austrian Research Promotion Agency	Sweden Austria	NetPort Science Park
DIGICITIES	Urban Digital Layers to Support the Energy Transition of Cities	The energy transition requires a paradigm shift in how we generate and use energy. Increasing interconnectivity and the rise of Industry 4.0 means that more data is available but there is still a lack of semantic interoperability between datasets. This restricts the development of scalable energy-oriented applications. DIGICITIES aims to overcome the barriers to accessibility and exchange of data for decision-making at a utility and municipality scale. A data architecture will be developed around structured, interconnected digital layers that will be used in the projection of energy demands. A framework for the processing, storage and use of data sources will be demonstrated in a living lab in each partner country. The project consortium has stakeholders from each stage of the value chain. This approach considers the impact of technical advancements and regulatory changes to develop a solution that will accelerate the energy transition to a net-zero energy system.	Local energy communities, edge computing, DLT, IoT, federated analytics	FFG - Austrian Research Promotion Agency Federal Department of the Environment, Transport, Energy and Communications DETEC – Swiss Federal Office of Energy SFOE Forschungszentrum Jülich GmbH	Switzerland Austria Germany	Empa, Swiss Federal Laboratories for Materials Science and Technology
DigiPlat	Digital Solutions for Interoperability of Flexibility Platforms	The energy transition towards the 2050 goals leads to more decentralization, sector coupling and digitalization with scalable digital flexibility platforms playing a major role in this process. A certain level of interoperability of those platforms on national and international levels along with standardization is crucial for security of supply and for fostering an economically efficient and coordinated allocation of flexibility. The aim of this project is to develop new digital solutions targeting interoperability of flexibility platforms based on several ICT, economic, or procedural measures. To derive these solutions, a unique use case of cross-border and cross-platform coordination of flexibility for redispatch, balancing and intraday markets is analysed and tested. The digital solutions will be applied in a field test for technical evaluation. Possible welfare-benefits of platform interoperability and standardization are measured using market and network simulations.	Flexibility platforms, Interoperability, Standardization, Redispatch, Balancing	Forschungszentrum Jülich GmbH FFG - Austrian Research Promotion Agency Federal Department of the Environment, Transport, Energy and Communications DETEC – Swiss Federal Office of Energy SFOE	Germany Austria Switzerland	Technische Hochschule Ulm

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DIWIEN	Digitalization of water supply infrastructure to optimize the Water-Energy Nexus	<p>The water-energy (WE) nexus describes the vital interaction between two essential components for a modern society. Energy needs water for hydropower, cooling and biofuels. Water needs energy for pumping, treatment and purification. This nexus can be optimized through innovative digital solutions, by securing water supply while improving renewable energy production leading to reduced greenhouse gas emission and embraced carbon neutrality by 2050.</p> <p>DIWIEN aims to develop an integrated approach for WE nexus in rural and urban areas by creating a digital twin of the water supply system, identifying possible digitalized solutions as smart sensors or energy recovery units with techno-economic analyses in 4 pilot sites. DIWIEN will create new markets by combining energy and water supply sectors within the WE perspective with minimum environmental impact and maximum energy savings by facilitating the digital transition towards green energy production while ensuring the water supply.</p>	digitalization, hidden hydropower, water-energy nexus, water supply systems	The Scientific and Technological Research Council of Turkey (TÜBİTAK) FFG - Austrian Research Promotion Agency Technology Agency of the Czech Republic (TA CR)	Turkey Austria Czech Republic	Vienna University of Technology
DoRES	Deployment of Smart Renewable Energy Communities	<p>Project aim to ensure to support transition to green energy by wider implementation of ICT and digitalization of RES systems for better control and energy flows redistribution within nZEB communities. The main stakeholders are RES engineers, real estate developers and consumers. Thus cooperation of such sectors in as electrical engineering, mechanical engineering with ICT will ensure transition from fossil fuels to green energy ensuring security of supply and end-users role transformation from consumer to prosumers.</p> <p>Project partners will contribute to the transformation and modernization of the energy sector in accordance with their national strategic plans. By close partners cooperation and cooperation with stakeholders the best practice results will be disseminated and adopted were relevant.</p> <p>Project outcomes will improve knowledge and awareness for policy makers, regulators and end users on digital solutions in deployment of smart renewable energy communities.</p>	ICT, Renewable Energy , Smart Energy Management , Digitalization of Energy Systems	Valsts izglītības attīstības aģentūra (VIAA) Technology Agency of the Czech Republic (TA CR)	Latvia Czech Republic	Riga Technical Univeristy

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FinSESCO	Fintech Platform Solution for Sustainable Energy System Intracting and Contracting boosting energy saving and renewable energy	<p>The mission of the project is allowing a wave of decarbonisation projects easing the set-up of Energy Performance and Energy Savings Performance Contracting EPCo/ESPCo by end-to-end digitalisation of the energy contracting (and the interacting process for public bodies and larger companies). Using pre-existing data from buildings passes and energy audits, a gamified investment process, providing diversification options in an investor dashboard, smart contracts, a digital encrypted meter- based repayment process and machine learning-based fault detection during operation will be offered by platform modules. A guidance tool allows potential portal developers to steer their projects into the right direction.</p> <p>The competencies and diversity of the partners from 5 EU countries + India include skills for setting up energy related services, also using machine learning and crypto-technology, smart metering, legal tech for energy contracting, and social research for a green energy transition.</p>	Fintech Platform, Energy Saving Contracting, Renewable energy contracting, intracting, digitalization	<p>FFG - Austrian Research Promotion Agency Forschungszentrum Jülich GmbH Technology Agency of the Czech Republic (TA CR) Centro para el Desarrollo Tecnológico Industrial E.P.E. (CDTI) Executive Agency for Higher Education, Research, Development and Innovation Funding (UEFISCDI) Department of Science and Technology (DST), Ministry of Science and Technology, Government of India</p>	Austria Germany Romania Spain India Czech Republic	effiziente.st Energie- und Umweltconsulting e.U.
GAMES	Grid Aware Mobility and Energy Sharing	GAMES will focus on how digitalisation could enable electric shared vehicle fleets to answer mobility needs while creating new revenue streams by providing services for electrical grid and energy communities. Leveraging existing digitalised data, GAMES will assess the compatibility of shared electric vehicle fleets with the energy market and the mutual benefits arising from the interoperability between these sectors. GAMES will verify if such cross-sector exchanges can increase the efficiency of both the mobility and energy sectors and reduce their environmental footprint. The innovative digital business models developed will consider the new business-to-business and customer-to-business-to-customer collaboration, made possible through digitalisation, that can emerge from common interest intersections between shared vehicle fleets and energy Distribution System Operators, energy communities, public transport providers, and vehicle/charging station/ridesharing consumer networks.	Shared Electric Vehicle Fleets; Cross-Sector; Energy Grids; Vehicle-to-Grid; Digital Platforms; User mobility choices	<p>FFG - Austrian Research Promotion Agency Federal Department of the Environment, Transport, Energy and Communications DETEC – Swiss Federal Office of Energy SFOE Ministry of Energy of Israel</p>	Austria Switzerland Israel	University of Applied Sciences and Arts of Italian Switzerland (SUPSI)

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GENTE	Distributed Governance for green ENergy communiTiEs	<p>GENTE aims to develop a distributed governance toolbox for local energy communities (LECs). The toolbox exploits advanced digital technologies including the internet of things (IoT), distributed ledger technology (DLT), edge processing and artificial intelligence (AI) for autonomous energy resource management within and across LECs and for flexibility provisions to energy networks. GENTE brings intelligence to distributed energy assets considering users' behaviours, data privacy and interoperability.</p> <p>The toolbox empowers LECs with a decision support tool and innovative services, that will enhance the economic viability of LECs and promote engagements of end-users and self-governance. Need-owners, including technology providers, building owners and system operators will evaluate performances of GENTE's solutions in 6 demos in 3 countries. GENTE accelerates adoptions of new LECs capable of managing high share of renewables with improved energy efficiency and environmental performance.</p>	Local energy communities, edge computing, DLT, IoT, federated analytics	Swedish Energy Agency Federal Department of the Environment, Transport, Energy and Communications DETEC – Swiss Federal Office of Energy SFOE The Scientific and Technological Research Council of Turkey (TÜBİTAK) Centro para el Desarrollo Tecnológico Industrial E.P.E. (CDTI)	Sweden Switzerland Spain Turkey	Fachhochschule Zentralschweiz – Hochschule Luzern
HydroG(re)Energy-Env	New technology to produce hydrogen from Renewable Energy Sources based on AI with optimized costs for environmental applications	HydroG(re)Energy-Env approaches a novel technology which consist in demonstration and validation in OITBs of an economically competitive digitalized solution for the process chain of hydrogen production from RES (when this type of energy is produced in excess). A low energy capacity hydrogen production demonstrator will be made using an electrolyser with an AI-controlled "smart" system integrated, which will be scaled up at medium and high energy production capacity, ensuring its replicability due to the modular equipment. Solutions for hydrogen eco-friendly use will be developed both for the reduction of the pollution in protected wetlands areas and CO2 emissions for the domestic and industrial users of methane. The project will be an in-depth engagement of stakeholders, represented by small and medium enterprises, by providing tools for new joint transnational business models, new investment opportunities, training sessions, workshops and a Policy Brief.	Hydrogen production, AI, RES, tools for Business models, Environmental protection	Executive Agency for Higher Education, Research, Development and Innovation Funding (UEFISCDI) Forschungszentrum Jülich GmbH Centro para el Desarrollo Tecnológico Industrial E.P.E. (CDTI) Valsts izglītības attīstības aģentūra (VIAA)	Romania Latvia Spain Germany	National Institute for Research and Development in Environmental Protection-Bucharest (INCDPM)
LASAGNE	digital frAmework for SmArt Grid and reNewable Energie	<p>The energy transition calls for smart meters to support microgrids. Apart from monitoring home appliances' power cycles, they will need to gather data about other households so as to predict/plan local and microgrid consumption/production. These novel smart meters (Grid Edge Devices: GED), will need to be managed in a collaborative fashion.</p> <p>We want to develop GEDs enhanced with collaborative AI algorithms which are the foundation to build context-aware and self-adaptive energy applications. In essence, we propose to develop a digital frAmework for SmArt Grid and reNewable Energies (LASAGNE) and involve four stakeholders: System Integrator, Independent Software Vendors, Edge Equipment Vendors and Need-Owners. LASAGNE will be empowered by marketplace features allowing stakeholders to implement their financial/technical interactions.</p> <p>To handle the energy transition in an acceptable way, we will consider both social and business perspectives in the development of our GED-based system.</p>	Microgrid, social acceptability by design, context-aware energy applications, Marketplace edge-to-cloud platforms	Swedish Energy Agency Federal Department of the Environment, Transport, Energy and Communications DETEC – Swiss Federal Office of Energy SFOE	Switzerland Sweden	University of Applied Sciences and Arts, Western Switzerland (HES-SO)

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OpenGIS4ET	Open Geographic Information System for Energy Transition	The OpenGIS4ET project aims to extend the H2020 Hotmaps platform, an open-source heating and cooling mapping and planning toolkit and to provide default data for EU28 at national and local levels. These tools and data allow public authorities and energy planners to identify, analyse, model and map resources and solutions to meet energy needs in their area of responsibility in an efficient and cost-effective manner. This project comes as an extension to add open APIs to the H2020 Hotmaps platform, which started to develop a base toolbox and database. The platform reached TRL-7 and we would like to add new plug-ins called calculation modules (CM). It helps authorities to develop local, regional, and national heating, cooling, mobility, and sector coupling flexibility strategies, that are in line with RES and CO2 emission targets at national and European level. New developed plug-ins and functionalities, will be demonstrated by need-owners to reach TRL-8.	Energy Efficiency – Renewable Heating and Cooling – Cloud Infrastructure – Open source – Planning – Mapping	FFG - Austrian Research Promotion Agency Danish Energy Agency Federal Department of the Environment, Transport, Energy and Communications DETEC – Swiss Federal Office of Energy SFOE Forschungszentrum Jülich GmbH	Switzerland Denmark Austria Germany	Haute Ecole Spécialisée de Suisse Occidentale (HES-SO Valais-Wallis)
OWGRE	Optimized weather-related green energy production and consumption	As the energy system is becoming more complex and weather-dependent, weather forecasts are of essential importance for transforming the energy landscape towards decarbonization. In this project, we combine probabilistic numerical weather prediction with machine learning algorithms in order to provide optimized decision-support for green energy production and consumption. Probabilistic forecasts have been underused in this context due to complexity related to their interpretation and data volume. To solve this we will create a machine-readable data portal coupled to machine learning algorithms. We will tailor improved weather forecasts to better support the needs of green energy applications. Our smart solutions optimize specific energy systems based on the latest weather forecast, local observations, and available production from renewable energy. Targeted appliances are heating, ventilation and air-conditioning in buildings, battery charging, and solar and wind power applications.	"Weather forecasting", "Green energy production", "Energy consumption", "Machine-learning"	Swedish Energy Agency Business Finland Nordic Energy Research	Sweden Finland Estonia	Swedish Meteorological and Hydrological Institute
ReliaREN-Pro	Reliability of Long Term Renewable Energy Production based on PV Technologies	ReliaREN-Pro aims to ensure the security of supply in the electric energy system. This is achieved by increasing the trust in renewable electricity supply by increasing the reliability of photovoltaic (PV) power plants as well as plant ICT infrastructure. Today, photovoltaic power plants and their stakeholders (plant & grid operators, M service providers, asset managers, investors, energy suppliers) lack reliable energy provision data due to missing knowledge of plant availability, plant status and missing or outdated network and ICT infrastructure. ReliaREN-Pro will provide needed solutions to secure reliable energy production. Cutting-edge digital tools for performance degradation and failure models (e.g. processing of EL and thermography images using machine learning algorithms), risk assessment and data ICT infrastructure will be investigated, and results and guidelines will be made available to the market, fostering European leadership in the renewable energy sector.	Digital models, machine learning, secure ICT of energy production, photovoltaic power plants, standardization	FFG - Austrian Research Promotion Agency Forschungszentrum Jülich GmbH The Scientific and Technological Research Council of Turkey (TÜBITAK)	Austria Germany Turkey	AIT Austrian Institute of Technology GmbH

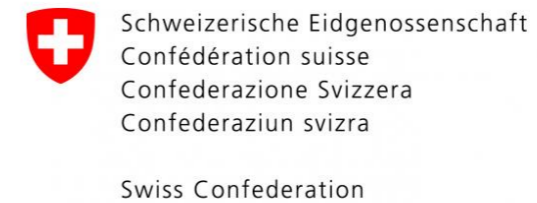
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RESili8	Resilience for Cyber-Physical Energy Systems	Resilience for future energy systems cannot be ensured by over-provisioning, as is done today. It is not socially sustainable and cannot address the complexity and challenges of the digital transformation that energy systems are undergoing. Resilience thinking and practice for energy systems needs to be reinvented. RESili8 does this through a novel resilience solution package for cyber-physical energy systems, including optimal and sustainable planning and AI-based analysis of resilient architectures, continuous implementation and validation of resilient applications, and new solutions for resilient operation of energy systems. This innovative solution package will advance the green energy transition by ensuring security of supply and facilitates the further integration of green energy technologies. RESili8 is executed by leading European research institutes, industry, and need-owners, working together to develop and test the RESili8 solution in lab and pilot demonstrations.	resilience, cyber-physical energy system, AI	Swedish Energy Agency Forschungszentrum Jülich GmbH FFG - Austrian Research Promotion Agency	Austria Germany Sweden	AIT Austrian Institute of Technology GmbH
SmartGEM	Smart Digital Solution for Local Green Energy Management	Smart Local Energy Systems (SLES) is a new concept considered a key approach aiming to support Net Zero gas emissions through decentralization and digitalization to support correlated production, storage, trading at a local scale to reduction of CO2 emissions from buildings-related activities like environmental control, water heating, lighting or use of IT infrastructure. Having as a starting point the microgrid pilot, the specific objectives of the project are: Leveraging digitalization of the energy consumer through the design of low energy hardware devices for data acquisition and control. Building production, consumption, and room temperature propagation models using Artificial Intelligence to enable an energy aware interaction of SLES components. Building an energy management system to support the integration and correlation between the different energy sources according to outputs of the implemented modules, consumption requirements and tackling possible network failures.	Smart Local Energy System, Microgrid, Digital Twin	Executive Agency for Higher Education, Research, Development and Innovation Funding (UEFISCDI) The Research Council of Norway	Romania Norway	Societatea de Inginerie Sisteme SIS SA
STRATA	Smart Transformation for Resilience And community services Through digitAl grid layers	STRATA will develop a new digital-based service concept to be introduced on the MV/LV distribution transformer level. The key idea is to replace traditional distribution transformers with a Smart Digital Node that is able to act as a service centre for local energy communities and at the same time provide new distribution grid services and resilience together with support for flexibility markets. The concept is powered by latest innovations in power electronics and digital platforms for coordination and communication. The customer-level engagement is achieved through local markets and communications, with user interfaces building upon it. Intelligence and analytics are embedded within the Smart Digital Node in order to enable these new services. The system is designed for hybrid grid technologies, thus also enabling DC grids that facilitate greater community benefit through increased flexibility potential, hosting capacity for low carbon technologies and new business model support.	Digital grid, energy community, resilience, renewable energy	Business Finland Forschungszentrum Jülich GmbH Scottish Enterprise	Finland Germany Scotland	VTT Technical Research Centre of Finland Ltd



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ERA-Net SES funding partners



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