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Teesside University



- Teesside University (TU) is based in North East of England.
- The School of Science, Engineering and Design (SSED) carries out multidisciplinary research spanning:
 - Innovation in process control, energy and environment
 - Life sciences
 - Security business and enterprise
 - Consultancy services to industry
- SSED statistics:
 - More than 50 academic and research staff and 35 PhD students.
 - 59% of research recognised as world-leading or internationally excellent, and 90% of research having world-leading or internationally excellent impact.
- TU statistics:
 - 2300 employees, 16000 undergraduate and 2000 postgraduate students.
 - 2009, TU was named UK University of the Year at the Times Higher Education Awards.
 - In 2013 TU received The Queen's Anniversary Prize for Higher and Further Education.

Current and past research projects at TU



Project	Project Title	Project Type	Budget	Aim	Website
E-DREAM	enabling new Demand REsponse Advanced, Market oriented and secure technologies, solutions and business models	H2020 research and innovation project 2018-2020	€3.8M	ovel near real time DR scalable secure blockchain-driven technological and business framework aimed to optimize aggregated system services and flexibility provisioning for DSOs	ТВА
inteGRIDy	integrated Smart GRID Cross- Functional Solutions for Optimized Synergetic Energy Distribution, Utilization and Storage Technologies	H2020 innovation 2017-2020	€15.8M	To integrate cutting-edge technologies, solutions and mechanisms in a scalable Cross-Functional Platform for Smart Grids	www.integridy.eu
DR-BOB	Demand Response (DR) in Blocks of Buildings	H2020 innovation project 2016-19	€5.1M	To demonstrate the economic and environmental benefits of DR in buildings for the different key actors required to bring it to market	www.dr-bob.eu
QatarBIM competencies ¹ QatarBIM ²	Qatar Building Integrated Management Project ¹ BIM Modeling Protocols and Technologies for Qatar Construction Industry ²	Qatar National Research Fund 2016-19 ¹ 2014-17 ²	\$600k ¹ \$840k ²	To improve BIM competency of Qatar's construction industry practitioners ¹ To develop BIM Protocols and Technologies for Qatar Construction Industry ²	www.qatar- bimproject.org ¹
IDEAS	Intelligent NeighbourhooD Energy Allocation & Supervision	FP7 research project 2012-15	€4.1M	To facilitate the development and operation of Energy Positive Neighbourhoods (EPNs).	www.ideasproject.eu
SEMANCO	Semantic Tools for Carbon Reduction in Urban Planning	FP7 research project 2011-14	€3.8M	To provide semantic tools to the stakeholders involved in urban planning and to assist them to make informed decisions about CO2 reduction in cities	www.semanco- project.eu

Energising remote agricultural communities: VINeyard Integrated enERGY with Storage



- Over 2 mHa of the European Union land is covered by vines
- Vineyards have infrastructure suitable for large area photovoltaics
- EU vineyards could potentially produce, at 900 kWh yr⁻¹ mean insolation

~190 TWh yr⁻¹

VINERGY-S

Synergy between vine growth and renewable energy conversion

CoF 17 WS4 Topic 3: Integrated local energy systems (Energy islands)



VINeyard Integrated enERGY with Storage

- Objectives: VINERGY-S is an energy harvesting and storage Smart Microgrid tool for isolated vineyards and agricultural communities in areas with weak or non-existing grid connections:
 - Low cost and easy to deploy on existing vineyard infrastructures
 - Thoroughly compatible with crop growth (vines)
 - Generate, store and manage useful quantities of renewable energy
 - Enabling energy use matching via Demand Response (DR)
 - Eventually deployable on a large (> mHa) scale in remote areas

• Expected results:

- An off-grid, resilient grid management system for agriculture providing energy and food security for remote communities
- Technology for the intermittent renewable energy for agriculture
- Reduced carbon footprint (decarbonisation via renewables)
- Creation of a LOCAL, INDEPENDENT, RESILIENT agricultural microgrid



- Solutions for a remote, local energy system (energy security)
- A centralised energy infrastructure, supporting local agricultural economy (food security) and communities
- Protection and decarbonisation of the environment (air quality, water usage) through the usage of clean energy
- Engagement with local energy consumers and producers, creation of local energy communities and business models (novel markets)
- Safe, secure and local energy system that integrates renewables (electricity, heating, cooling, water, wastes, etc.), energy balancing and demand response, to match generation with local consumption
- Benchmarking technical solutions and business models that can be replicated in many local regions (deployability)

VINERGY-S Consortium for (to be confirmed)



No	Partner Name	Туре	Country	Role in the Project
01	Teesside University	RTD	UK	Intelligent energy management Tools and smart grids for agriculture
02	P. Carroll Consulting Ltd.	SME	UK (TBC)	Tensile, flexible photovoltaic systems
03	University of Cambridge	RTD	UK (TBC)	Novel, highly efficient and resilient power electronics for energy conversion, transmission & storage
04	CRA-UTV (The Institute of Viticulture)	RTD	Italy (TBC)	Energy harvesting impact on crop growth and quality
05	University of Cyprus	RTD	Cyprus (TBC)	Testing and qualification of flexible PV systems
06	ATOS	SME	Spain (TBC)	Coordination

Consortium - required partners



No	Expertise	Туре	Country	Role in the project
01	Pilot management and reporting	SME/ RTD/ IND	Turkey	Deployment, management and monitoring of vineyard pilot trials for VINERGY
02	Data management of intelligent agriculture	SME/ RTD/ IND	Turkey, EU	Innovative methods for collection, management and analysis of big data (agricultural, energy and environmental)
03	Business analysis and market models for islanded RES microgrids	SME/ RTD/ IND	Turkey, EU	 Cost/benefit analysis of islanded RES microgrids Turning technical challenges of islanded communities into food and energy secure resilient micro markets
04	Smart energy storage and management	SME/ IND	Turkey, EU	Incorporation of second life batteries and alternative energy storage technologies into demand response management system
05	Further expertise TBA	ТВА	Turkey, EU	Further roles TBA



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