This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101016854.

AURORAL

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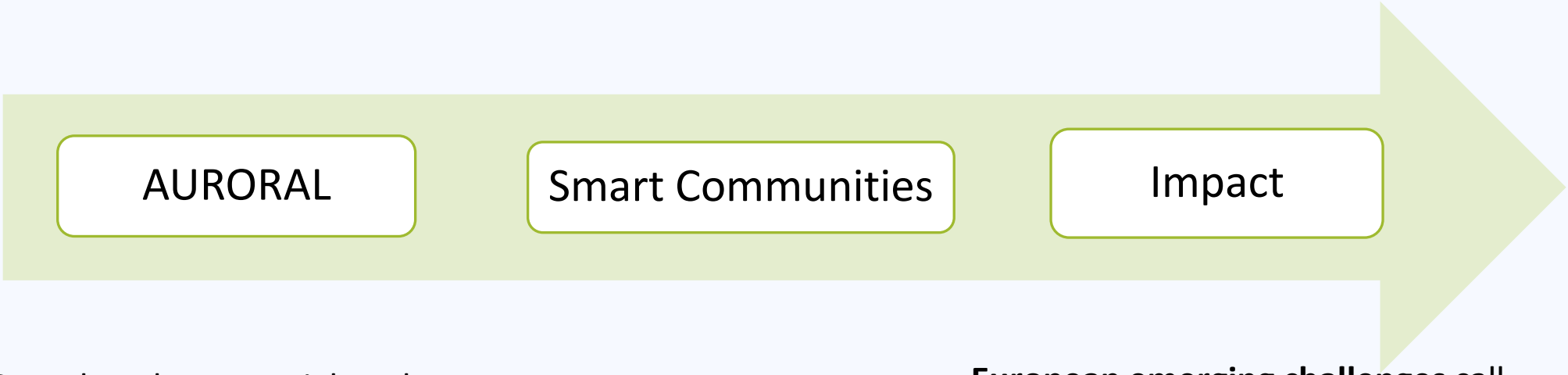
ARCHITECTURE FOR UNIFIED REGIONAL AND OPEN DIGITAL ECOSYSTEMS FOR SMART COMMUNITIES AND RURAL AREAS LARGE SCALE APPLICATION

TOPIC: DT-ICT-09-2020 - INNOVATION ACTION
BOOST RURAL ECONOMIES THROUGH CROSS-SECTOR DIGITAL SERVICE PLATFORMS

AURORAL APPROACH

AURORAL focuses on increasing connectivity and delivering a digital environment of smart objects interoperable services platforms able to trigger dynamic ecosystems of innovation chains, applications and services. It builds on an open, API-based, interoperable and federated Internet of Things (IoT) architecture and includes a reference implementation supporting flexible integration of heterogeneous services, bridging the interoperability gap of the smart object platforms and creating markets for services that may be also viable in rural areas.

AURORAL SMART COMMUNITIES CONCEPT



AURORAL has the potential to shape the on-going discussion about the **"Smart Community"** approach as it provides a methodological framework to the main challenges and provides solutions for technology barriers.

Smart Communities benefit from co-operation and alliances with other communities and actors in rural and urban areas.

European emerging challenges call for a significant response which includes aligning smart communities objectives with the Digital Decade, European Green Deal, European Skills Agenda, Farm to Fork and European Education Area policies.

AURORAL IMPACTS

- Validate the brokerage platforms illustrated by an increase of cross-cutting applications and services.
- Demonstrate and show-case cross-sectorial platforms interoperability**.**
- Increase prospects for future digital industrial platforms by validation of technological choices, sustainability and reproducibility, of architecture models, standards, and interoperability, as well as of verification of non- functional characteristics such as security and privacy.
- Demonstrate the benefits of data sharing across platforms from different sectors.
- Significant and measurable contribution to standards or pre-normative activities.
- Explore and validate new industry and business processes and innovative business models validated in the context of the pilots.
- Emergence of sustainable ecosystems around digital platforms.
- Overcome the digital divide between rural and urban areas, and to develop the potential offered by connectivity and digitisation of rural areas.
- Increase number of services and applications operated by European companies, especially small businesses and entrepreneurs.
- Strengthen links with other, bottom-up programmes and initiatives, supported by regional, national and European policies and funds.
- Create opportunities for entrepreneurs, notably SMEs, by promoting new market openings, providing access to valuable datasets and direct interactions with users, creating new businesses in rural areas.
- Increase number of platforms, applications, business processes and innovative business models validated via large-scale piloting.
- Improve quality of life in rural areas, higher standard of living and services for citizens.

AURORAL WORKING PLAN (1)

WP1 Project Management ensures the high-quality management of AURORAL, adopting the PM2 as reference methodology to plan, implement, monitor, and close the project.

WP2 O-Village aims to empower rural ecosystems with transformative processes and digital technologies. The WP steer of all the activities in the project to keeping focusing on real rural challenges, make the technologies replicable over Europe, identifying innovation gaps in the consortium to be addressed with open calls. Throughout the WP a constant exchange with WP9 (Cooperation) will be established to define the AURORAL stakeholder ecosystem, to align the necessary stakeholder and community engagement and in reverse to give input for the exploitation plan

WP3 Architecture puts the foundation for developing the AURORAL architecture, defining the interoperability requirements and reference architecture for digitalised rural ecosystems. WP 3 reviews the existing literature to extract the rural-tailored requirements, privacy rules, and gender aspects for the digital environment.

WP4 Interoperability creates the AURORAL Data Interoperability Brokerage Middleware and building an ecosystem where vertical and horizontal services integrate. The definition of the WP4 tasks is closely related with the result of WP3 Architecture, and in the same way, WP4 will influence the integration activities of WP5 Pilots and WP6 Cross-cutting Services.

Based on pilot requirements detailed in WP2, the inputs from the reference architecture developed in WP3 and the enhanced tools and services from WP4, the **WP 5 Pilots** ensures the extension of existing Vertical Tools and services through AURORAL's data broker to enable this integration at AURORAL's pilot sites.

AURORAL WORKING PLAN (2)

WP6 Cross-cutting services will adapt and extend the Horizontal Tools and Services and deployment at AURORAL pilot sites. The WP 6 results in creating the rural marketplace services (offering, requests and trading closing) with DLT based contract management.

WP7 Evidence ensures a harmonised approach to performance-monitoring and impact assessment of the technical and innovative features of the AURORAL project, as well as the evaluation of the commercial relevance and compliance with privacy and data sovereignty.

WP8 Investment develops a sustainable finance ecosystem in each pilot site to address the financing needs of rural innovation projects. Under transparent operating conditions, WP 8 opens cascading calls for financial support to Third Parties.

WP9 Cooperation supports AURORAL activities in maximising the impact beyond the AURORAL partnership. The WP defines the strategies for communication, dissemination and exploitation of the project results, and to increase synergies with other fellow projects.

WP10 Ethics requirements sets out the activities that the project implements to comply with ethical principles and relevant national, Union and international legislation.

AURORAL'S MARKET ORIENTATION

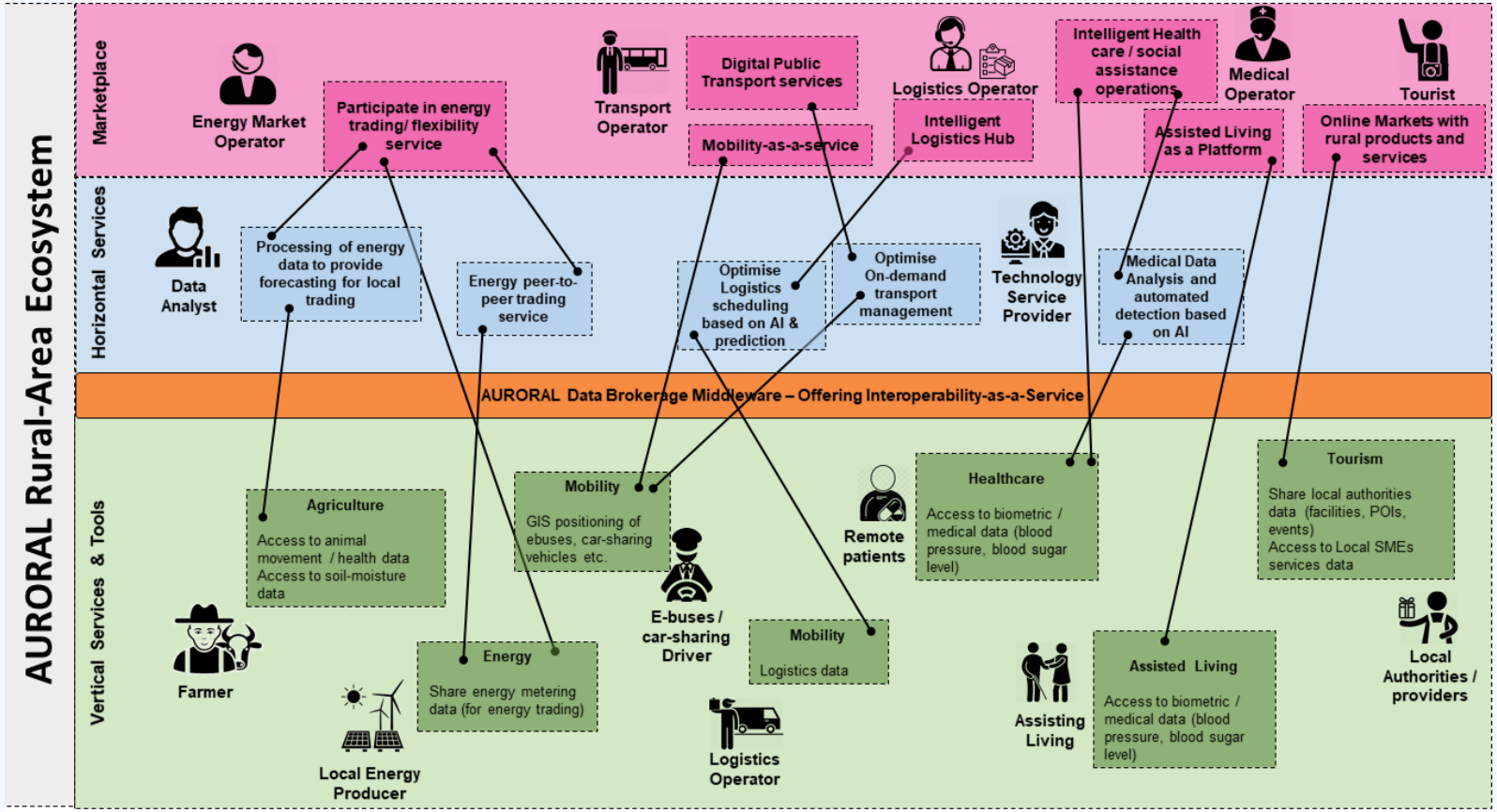
AURORAL digital environment is demonstrated by cost-efficient and flexible cross-domain applications through large-scale pilots in five European regions: Alentejo (PT), Southern Burgenland (Austria), Catalonia (SP), Piemonte (IT), Lapland (FI).

AURORAL is expected to be a driver of the emergence of a widespread network of Smart Communities in Europe and ultimately it is expected to contribute to balance urban and rural opportunities for all Europeans.

Alentejo (Portugal)

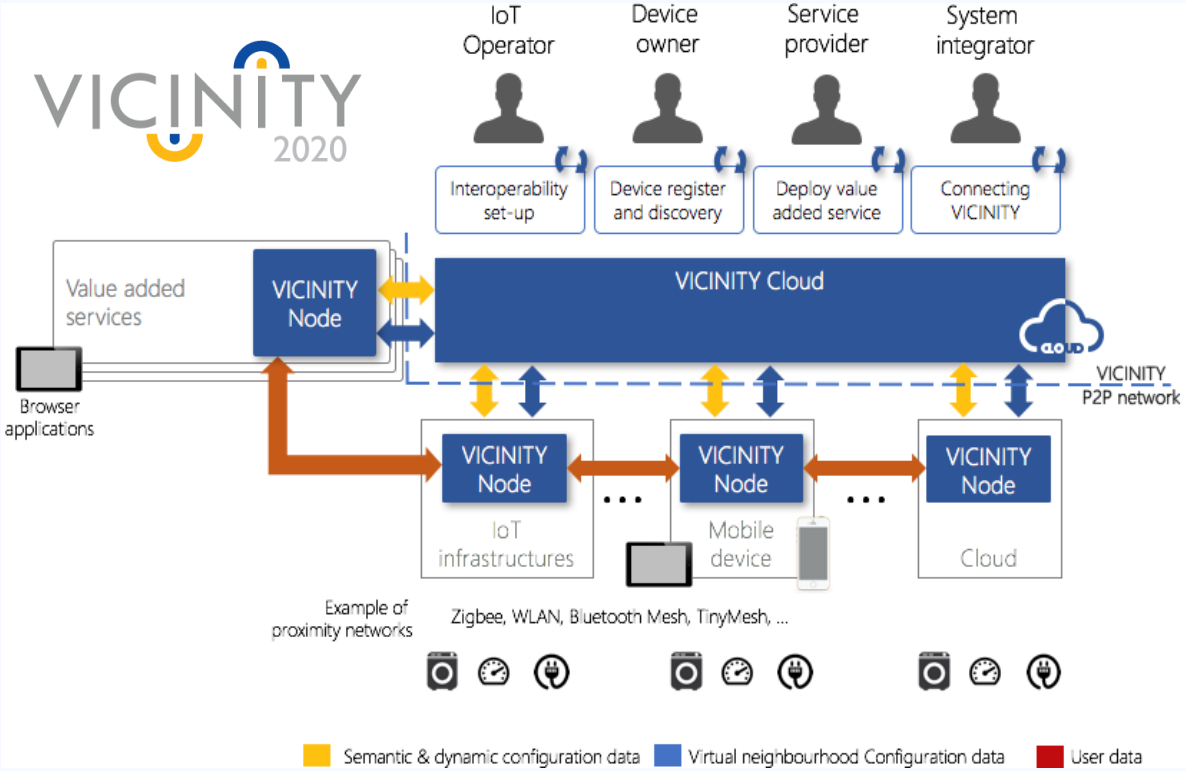
CCDR ALENTEJO

AURORAL REFERENCE ARCHITECTURE



The image highlights how the proposed AURORAL Reference Architecture aims to bridge vertical services on different domains with horizontal services and online digital marketplaces, allowing different stakeholders to cooperate in a seamless and transparent manner.

INTEROPERABILITY-AS-A-SERVICE PLATFORM



AURORAL will be extending VICINITY's core functionalities, in order to promote and facilitate a smooth integration of different entities and services within a smart ecosystem, by:

Extending VICINITY platform to a data brokerage middleware, enabling flexible integration of heterogeneous vertical and horizontal tools and services from cross-domain applications;

Providing enhanced semantic discovery and interoperability features;

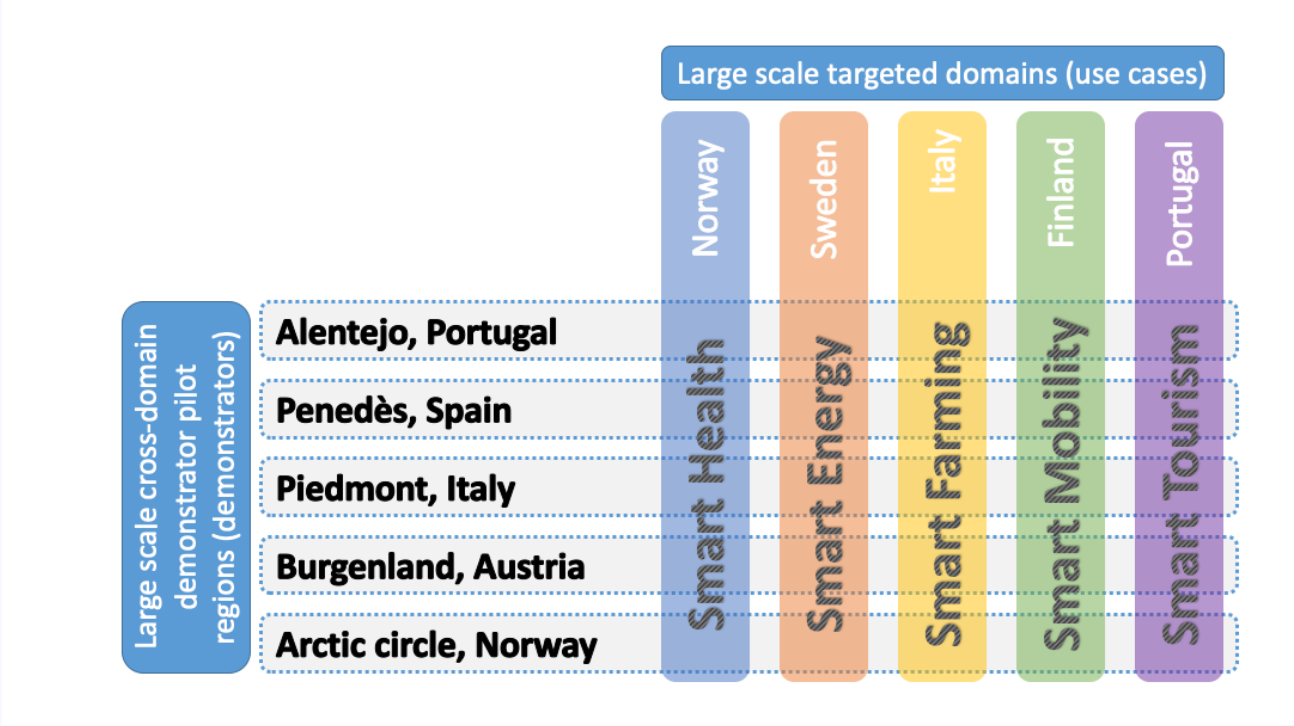
Featuring advanced access control management and end-to-end security, privacy and trust, preserving data sovereignty;

Shifting from a centralised storage to a distributed storage component based on DLT Smart Contract management, facilitating scalable data access & sharing;

Integrating Elliot Cloud middleware to further facilitate the use of core FIWARE components;

Enabling easy middleware integration of external tools/devices/services by open APIs based on open standards.

AURORAL LARGE SCALE PILOTS



To fully reach the proposed objectives, large scale demonstrator pilot sites are divided into 2 categories: **targeted domains** and **cross-domain pilots**.

On **targeted domains**, special focus is given to a specific domain in order to reach higher readiness levels and broader offer of tools regarding that specific domain.

On **cross-domain pilots**, focus is transferred to the cross-domain approach, benefitting from the availability of tools provided by the domain-oriented pilots and the interoperability provided by AURORAL data brokerage middleware.

Domain-oriented pilots are referred to as “use cases” and cross-domain pilots as “demonstrators”.

PARTNERS – REGIONAL HUBS

CCDR-Alentejo, S.A. is the region's public authority responsible for public policies aimed promoting, attracting and securing investment, talent and innovation. Its action strategy is to develop, deepen and intensify its action on driving innovation, transforming, in the region.

Smart Innovation Norway AS has led the NCE Smart Energy Markets cluster since 2009 and recently created an AI cluster. The company has since his establishment initiated or participated in more than 25 research and innovation projects, including 10 EU projects, with a total budget of more than 135 million EUR.

HAFEN is a Norwegian SME having background from intelligent transport systems and mobility services, smart energy solutions, ICT, security and safety, commercialization, marketing and standardization.

Kemin Digipolis Oy is a public business developer, specializing in supporting industrial service businesses.

The European Center for Renewable Energy Güssing Ltd. (EEE), serves as central coordination platform for the ecoEnergyland, which is a co-operative in the surrounding of Güssing.

PARTNERS – REGIONAL HUBS

NARVIK is the third-largest municipality in Nordland county by population and has its administrative centre in the town of Narvik. Business development is one of the core tasks of the municipality, where the main goal is to initiate and facilitate for growth and development to secure jobs and population size in the region.

The main competence of the **Tourism Association Region Oberwart** lies in its many years of experience in tourism product and service development, whereby the association builds on a comprehensive regional network of companies, institutions and partners.

AIGUASOL is a Spanish SME that provides engineering, consultancy and research services, promoting innovative solutions to reduce the impact associated to the use of energy. **Associacio Cluster De La Bioenergia De Catalunya (CBC)** is a non-profit association that represents the professional sector of bioenergy in Catalonia region (Spain) and whose mission is the promotion of the sustainable use of bioenergy.

"I Tesori della Terra" is a small-size farmer cooperative based in the rural area of Cervasca that produce dairy organic products, and is involved in social farming by contributing to social inclusion of person with handicaps and person with disadvantages.

Environment Park SpA is a Scientific and Technological Park located in Turin (Italy), its activities are divided into two business units: Innovation & Development and Real Estate Services.

PARTNERS-SME

The principal focus of **bAvenir s.r.o. (BVR)** is bringing to the market innovative solutions with high usability in the field of internet of things and its applications in the domains of smart energy and smart transportation.

Bosonit is specialized in data analytics and visualization making use of big data and machine learning techniques.

LuxAcitve provides comprehensive consulting and IT solution development for touristic regions and providers.

UNPARALLEL (Unparallel Innovation, Lda) is a Portuguese high-tech SME that develops digital technologies and provides consulting services on digitisation with a strong foundation on research and innovation.

IrRADIARE, Science for Evolution is multidisciplinary, multicultural team, providing support, advise, services, platforms, systems and smart solutions for their clients and partners, advising on new investments, public-private cooperation and regional public policies.

Partners - INDUSTRIAL LEADERS

Atos is a global leader in digital transformation, in Big Data, Cybersecurity, High Performance, Computing and Digital Workplace.

Partners - INTERNATIONAL NETWORKS

European DIGITAL SME Alliance (former Pan European ICT & eBusiness Network for SMEs) is the first and largest European association of the ICT sector exclusively focused on representing the interests of SMEs.

FEBEA federates 28 members (banks and other types of financial institutions) based across 15 European countries, serving more than 700.000 people between customers and shareholders, with aggregated balance sheet assets amounting to over 30 billion €.

PARTNERS - RESEARCH CENTERS

The **Centre for Research and Technology Hellas (CERTH)** is one of the largest research centers in Greece; Its mission is to promote the triplet Research – Development – Innovation by conducting high-quality research and developing innovative products and services.

SINTEF AS is Scandinavia's largest independent research organization and is a non-profit private research institute performing contract research and development for industry and the public sector.

The Universidad Politécnica de Madrid (UPM) is the largest Spanish technological university as well as a renowned European institution. The intense collaboration with governmental bodies and industry guarantees that research at the UPM offers real solutions to real-world problems.

With a long and well-established tradition, **UDEUSTO** has a mission and educational goal firmly grounded in academic excellence and social responsibility, aiming at generating economic sustainable growth and making positive contributions to the construction of fairer and more inclusive and humane societies.

PARTNERS - RESEARCH CENTERS

The University of Oulu (OULU) is among the largest universities in Finland, Structures and Construction Technology Research Unit is focusing its research on intelligent systems for construction, transport, logistics and built environment. There is a special focus on Arctic issues and natural resources industries.

Umeå University is Sweden's fifth-oldest university and currently has 31,000 students enrolled, with 4,000 employees. For more than half a century, Umeå University has been evolving as the premier destination of higher education in northern Sweden. The Department of Applied Physics and Electronics at Umeå University has a well-established energy technology research. Its aim is to develop new knowledge which fit for in the development and introducing new technologies in the areas of energy efficiency with afocus on buildings and thermo-chemical energy conversion.

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THANK YOU!

Contact:
Project Coordinator: Marcos António Nogueira
marcos.nogueira@alentejo-brussels.eu