JOINT FINAL CONFERENCE

Next Generation Energy Performance Assessment, Rating and Certification

Towards a Smart and Decarbonised Future for European Buildings

24 May 2023
Brussels and online

D2EPC ePANACEA E-DYCE

D^2EPC: Next Generation Digital and Dynamic Energy Performance Certificates

Project in a nutshell

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Outline

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Project Identity Card

D^2EPC: Next-generation Dynamic Digital EPCs for Enhanced Quality and User Awareness

|	
Grant Number	**892984**
H2020 Call	LC-SC3-EE-5-2018-2019-2020
Type of action:	Next-generation of Energy Performance Assessment & Certification
Duration	36 months
Starting date	**1 September 2020**
Budget	**€ 2,993,687.50**
EU contribution	**€ 2,499,287.50**
Countries	Greece, Germany, Spain, Austria, Cyprus, Netherlands, Lithuania

D^2EPC Consortium

❑ 12 Partners

❑ 7 EU Countries

➢ 3 Research Centers

➢ 5 SMEs

➢ 2 Standardization Bodies

➢ 1 Industrial Company

➢ 1 Energy Association
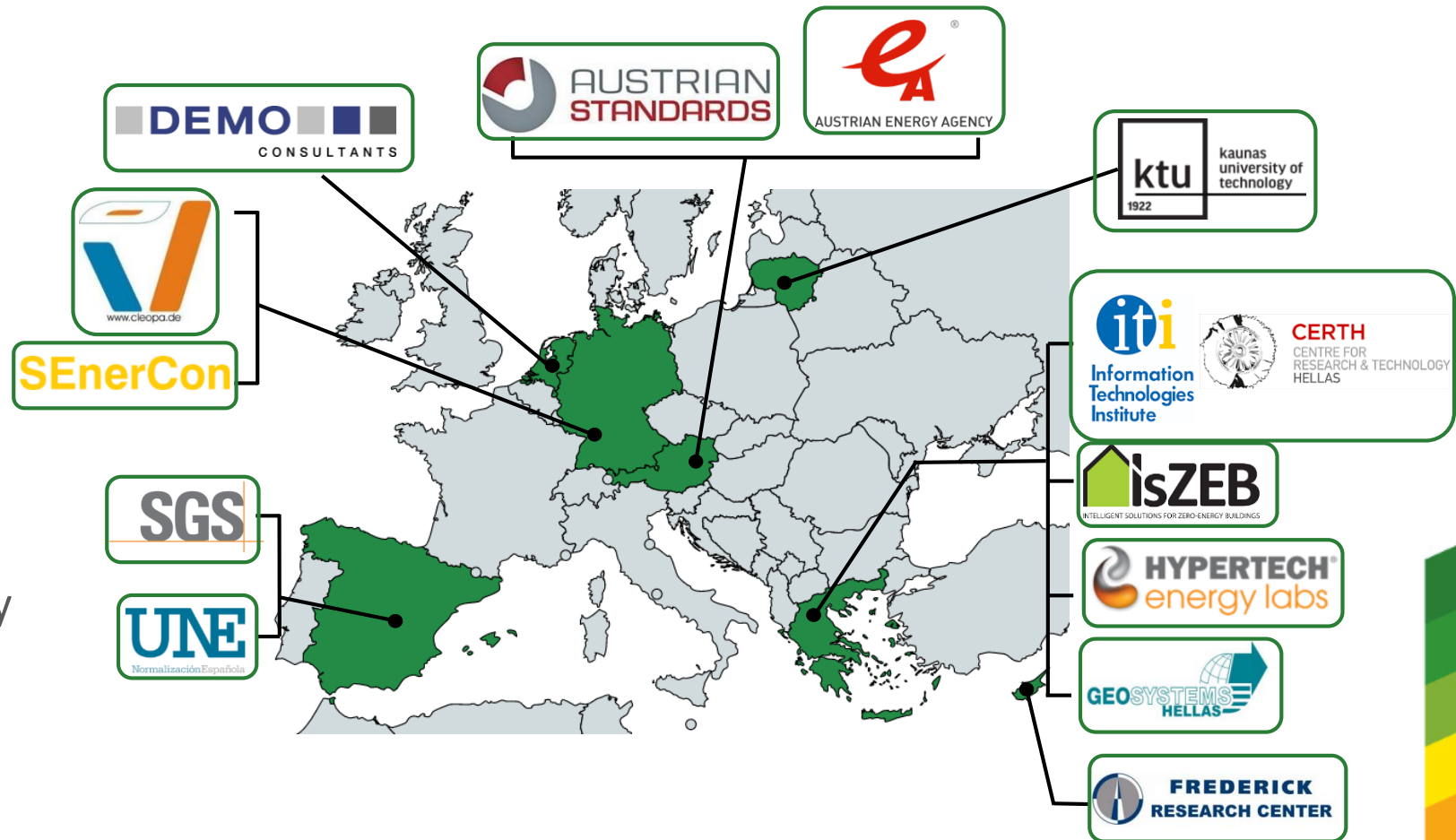
D^2EPC Vision

- Introduce and establish the concept of **next generation dynamic Energy Performance Certificates** to empower the regular energy classification of buildings and allow for an EU-wide deployment.

- Enable **enhanced multi-parameter assessment by the inclusion of new indicators** (energy, smart readiness-SRI, sustainability, human comfort, financial) to facilitate the understanding of buildings energy performance.

- Introduce **BIM-based Digital Twins coupled with a state-of-the-art IoT ecosystem** for the near-real time asset and operational energy assessment of the building.

- Provide **improved AI-driven assessment recommendations** towards energy efficiency and optimal comfort and foster energy saving consciousness.

- Integrate **geolocation and "polluter pays" practices** into the EPC rationale and turn EPC registries into policy feeding mechanisms.

D^2EPC Objectives

- The introduction and establishment of the concept of the **dynamic EPC** (dEPC), an **operational certificate** to be **calculated** and **issued** on a **regular** basis.

- The definition of the **drawbacks** and **discrepancies** of the current EPC scheme, as well as the update of EU standards on the **classification** requirements of **buildings.**

- The **enhancement** of EPCs through a **novel set of indicators** which cover **environmental**, **financial**, **human** comfort and technical aspects of **new** and **existing** buildings, aiming to simplify the understanding of buildings energy performance and to present a more comprehensive overview of the **actual energy performance** of buildings.

- The integration of **actual operational data** from buildings into **the EPCs.**

- The integration of **smart readiness rationale** into the building's **energy performance assessment** and **certification.**

- Intelligent **operational digital platform** for dynamic **EPCs issuance** and actual **building performance monitoring** and improvement, **validated** and **demonstrated** under realistic conditions.

D^2EPC at a glance

- Building Documentation
    - BIM / IoT / Web APIs

- BIM-based **Digital Twin**
    - Near real time asset monitoring
    - Building info integration

- Enhanced multi-parameter assessment
    - **As-designed**/ **As-Operated** energy rating
    - Extended KPIs (**smartness, sustainability, human comfort, financial**)

- Improved **AI-driven** assessment recommendations and services

- Delivery of **Dynamic Energy Performance Certificates**
    - Added value district/ neighborhood information through **GIS**
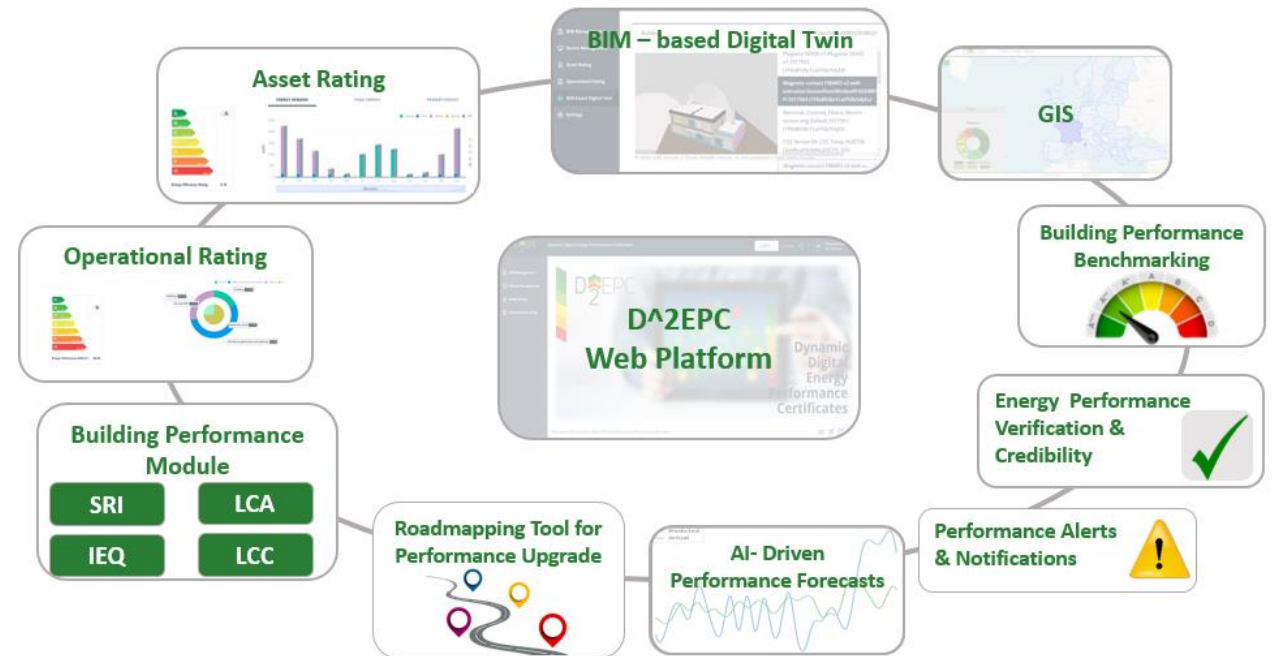
D^2EPC Case Studies

UC1: nZEB Smart house, Thessaloniki

UC2: Multi-family Residential Building, Berlin

UC3: Industrial Building, Velten

UC4: Educational Building, Nicosia

UC5: Multi-family Residential Building, Berlin

UC6: Multi-family Residential Building, Berlin

Business Scenarios & Technical Use Cases

Business Group A: Issuance of Energy Performance Certificates

- **BS1: Definition of buildings energy class and whether minimum requirements are met for Asset Rating**
  - UC1.1 – Extract and Verify Data from BIM
  - UC1.2 – Issue a D^2EPC asset EPC
  - UC1.3 – Issue an SRI report
  - UC1.4 – Asset Rating Indicator Assessment Report (LCC, LCA)
  - UC1.5 – Provide Design recommendations for performance improvements
  - UC1.6 – Asset Rating as a service

- **BS2: Definition of buildings energy class and whether minimum requirements are met for Operational RatingActor: EPC designer – main actor, owner/user, registries.**
  - UC2.1 - Extract and Verify Data from Measurements for the Digital Twin
  - UC2.2 – Issue a D^2EPC operational EPC
  - UC2.3 – Operational Rating Indicator Assessment Report (LCC, HC&W)
  - UC2.4 – Provide Operational recommendations for performance improvements
  - UC2.5 – Operational Rating as a service

Business Scenarios & Technical Use Cases

Business Group B: EPC Monitoring, Evaluation & Recommendation

- **BS3: Provision of (near) real-time building information, deviations, and recommendations**.
  - UC3.1 – Provide (near) real-time building's energy performance information
  - UC3.2 – Provide information on as-designed/in-operation deviations
  - UC3.3 – Provide regular recommendation for improving operational energy performance & conditions in terms of health and comfort

Business Scenarios & Technical Use Cases

Business Group C: Evaluation and Benchmarking of more certificates for policy making / marketing / business purposes (GIS included)

- **BS4: Provision of regional level of EPC statistics for third party stakeholders**
  - UC4.1 – Regional Level Visualisation of dynamic (aspect of time) energy performance information for asset-based EPCs
  - UC4.2 – Regional Level benchmarking and statistics comparison between regions
  - UC4.3 – Building performance statistics for operational rating of pilot buildings and 3d visualisation
- **BS5: Provision of dEPC statistics related to materials, assets, etc. for promoting "greener" equipment campaigns**
  - UC5.1 – Provision and Visualisation of correlation of building materials and energy performance
  - UC5.2 – Provision and Visualisation of correlation of building assets/systems and energy performance

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