

Project: **REViSITE**
 Roadmap Enabling Vision and Strategy for ICT-enabled Energy Efficiency (www.revisite.eu)



Title:
Technical results of D2.2 ICT4EE - Knowledge and Current Practise

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Overview of the deliverable

This document presents the extracted technical outcome from D2.2; it contains the most relevant information from the deliverable D2.2, which undertakes a state of the art review and critical analysis of recent and current RTD and industry efforts of ICT in energy efficiency. D2.2 is a main deliverable of WP2 - Impact assessment of ICT for Energy efficiency. It is a "state of the knowledge and practice" type report detailing that which is homogenous, heterogeneous and synergetic across the four target sectors in terms of ICT enabled Energy Efficiency. The four sectors covered are Smart Grids, Smart Building, Smart manufacturing and Smart Lighting.

Technical results

Deliverable D2.2 begins with a recap of deliverable D2.1 'ICT4EE Data Taxonomy: A common methodology to assess the impact of ICT developments'. The methodology and SMARTT taxonomy were used throughout D2.2 as an integrative classification system and as an aid to cross sector ICT4EE impact assessment . For technical results of this section see D2.1.

Each sector then details a distinct and individual review of their sector, describing its defining 'smart' characteristics, individual energy profile, sectorial framework and usage of ICTs. The ICT's are categorised using the SMARTT taxonomy to assist in cross-comparison. The initial review is concluded by identifying relevant current state-of-the-art and sector specific RTDs of European and national research projects.

The following tables gives an overview about the projects being reviewed in each sector:

Project	Specification & Design ICT'S	Design conceptualisation	Detailed Design Modelling	Simulation	Performance estimation	Specification & Product / component Selection	Automation & operational decision support ICT'S	Automated monitoring & controll	Quality of Service	Operational decision support & Wired/Wireless sensor networks	Materialisation ICT'S	Decision support & Visualisation	Management & controll	Real-time communication	Resource & Process management ICT'S	Inter-enterprise coordination	Process integration	Knowledge Sharing	Technical Integration ICT'S	Technical integration & interoperability	Trading / transactional management ICT'S	Facility energy management	District energy management	Citizen (personal) energy management
Grid Sector																								
Address		•	•			•		•		•	•		•	•			•		•		•	•	•	•

- Standards: → High and low level interoperability

Smart Lighting

- Lighting Control : → Integration with day-lighting
- Total building design: → Methods, Tools, Templates; Utilisation of integrated solutions (lighting + components)
- Maintenance support : → Working conditions and performance monitoring, Lighting facility management

Having completed the individual sector specific reviews the document then focuses on identifying gaps, commonalities and synergies leveraging cross-sectorial heuristics. Each sector describes the most significant links, as they see them, to the other sectors. There is then a focus on the most promising ICT/RTDs as each sector aims to identify points of reference for other sectors, while at the same time, investigating potential adoptions that can benefit their own sector in terms of ICT4EE. The main findings in this section are:

ICT for assessment

- Lifecycle thinking as an integrative approach across the sectors
- No commonly means for quantifying the impact on EE of ICTs
- Development of ICTs for quantitative assessment required

ICT for Design

- Holistic information systems such as PLM or BIM need to be enhanced for design for EE
- Feedback mechanism required in order to bring EE related knowledge back into design phase
- Holistic simulation / estimation of energy uses required

ICT for automated monitoring/control and operational decision support

- Sense, understand, decide, act in energy conscious way
- Smart sensor networks (wired and wireless)
- HEMs, BMS etc for visualisation and decision support
- Intelligent energy based algorithms for automated control systems

ICT for trading

- Management of energy information on macro down to micro level
- Intelligent energy trading management

ICT for interoperability

- Technical and semantic integration across the sectors
- Protocols and standards for data exchange
- Middleware for smart information network

The document concludes with a synthesis explaining the common themes, potential synergies and most significant ICTs and fields of research across the sectors.

- Themes and gaps identified as being critical to EE are:
- Technical interoperability & standards Importance of design for EE
- Gap in clearly defined metrics/ methods for quantitative assessment
- Difficulty in substantiating the casual connection between RTD themes
- Importance of data visualisation and descission support particularly in „usage phase“

It is envisaged this initial synthesis together with the overall output of this deliverable will feed directly into deliverable D2.3 ICT4EE impact assessment model and WP3 RTD roadmap development in the area of ICT4EE.

Keywords: Energy Efficiency, State of the Art, ICT, ICT4EE, ICT, Knowledge, RTD, Smart Grids, Smart Buildings, Smart Manufacturing, Smart Lighting.

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