Overview of IEA ETN Building related activities

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Building Coordination Group

End Use IAs (reporting to EUWP):

- EBC - Energy in Buildings and Communities
- ECES - Energy Conservation though Energy Storage
- DHC - District Heating and Cooling
- HPP - Heat Pumping Technologies
- 4E - Efficient Electrical End-Use Equipment
- DSM – Demand Side Management (Electricity)

Renewables IAs (reporting to REWP):

- SHC – Solar Heating And Cooling
- PVPS – Photovoltaic Power Systems
- (ISGAN - International Smart Grid Action Network)

Highlights from 2014 BCG meeting

BCG role is "to increase visibility of, and coordination between IAs, and provide a more integrated framework for communication with the IEA Secretariat".

Building IAs carry out both technological and non-technological RD&D and differ in participation, target groups, outreach activities

Building IAs declared not to be interested in a common RD&D strategy

An analysis of R&D trends and collaborations was built on the 2013 ETN Future Building Forum (FBF), distinguishing:

- Energy reduction
- Energy Storage
- Energy Production

2013 FBF RD&D priorities

ENERGY REDUCTION

System integration

Demand-response; M&C and interaction with the grid; deep retrofitting/integrated solutions for renovation (building-district); integrated design & planning at district level

Real data & Behaviour

Standardised measurement protocols; open source data on systems and whole buildings; impacts of users on Energy Performance, Governance and participation, ICT

ENERGY STORAGE

System Dynamic Modeling

Dynamics & Modelling (technical and economic)

Multiple Storage Systems

Interactions with adjacent underground functions, interaction with HPP

Seasonal Storage

Balancing the electricity grid with unpredictable renewable energy production

ENERGY PRODUCTION

Data and methods for decision making

Support tools to help cities to make better decisions on energy systems; socio-economic analysis; regulatory framework

System integration

System approach to local production and the grids (electric, gas, heat / cold)
Interaction between the building, district, region levels;
Open source tools for the balancing of production and use in smart districts for planning, decision making and monitoring

2013 FBF RD&D priorities - 2

ENERGY REDUCTION - R&D areas							
RD&D priority areas		Cost-effective technologies (systems)	System integration (including design and planning, monitoring, control)	Real Data and User Behaviour (metrics, protocols, validation, smart metering impacts)	Technical skills , knowledge on operation, …	Other R&D priorities in the Strategic Plan (e.g. ICT; quality of life)	Non technological R&D (Policy tools/Market solutions)
Priority BUILDING	H	4E HPP	4E SHC HPP EBC	EBC	4E	4E	4E DSM HPP
	M	EBC		HPP	HPP		EBC
Priority COMMUNITY	H	HPP, DHC, ISGAN	DSM SHC HPP EBC , DHC, ISGAN	DSM HPP , ISGAN	DHC, ISGAN	ISGAN	EBC, DHC, ISGAN
	M				EBC		

ENERGY STORAGE R&D areas								
R&D priority areas		System Dynamic Modelling	Multiple Storage Systems (interaction with adjacent functions underground)	Seasonal Storage (electric grid balance owing to unpredictable RES es. Wind, solar)	Multifunctional facades (incorporating storage in multifunctional façades)	Time indifferent/Compact Storage Thermo/Chemical materials and reactors (CTM/TCR)	Other R&D priorities in the Strategic Plan	Non technological R&D (Policy tools/Market solutions)
Priority BUILDING	H	ECES HPP	ECES		ECES EBC	ECES SHC	ECES	ECES
	M		HPP EBC	HPP		EBC		EBC
Priority COMMUNITY	H	ECES HPP	ECES HPP ISGAN	DSM SHC HPP ISGAN	ECES		ECES	ECES ISGAN
	M	ISGAN		EBC ECES	DSM	ECES ISGAN	ISGAN	EBC

ENERGY PRODUCTION R&D areas					
R&D priority areas		Data and methods for decision making (Community energy systems)	System integration (interaction between the grids and between the building, district levels)	Other R&D priorities in the Strategic Plan (e.g. Materials, ICT)	Non technological R&D (Policy tools/Market solutions)
Priority BUILDING	H		PVPS	SHC EBC	DSM PVPS SHC EBC
	M	PVPS EBC		PVPS	
Priority COMMUNITY	H	SHC ISGAN	DSM PVPS SHC ISGAN	EBC	PVPS EBC ISGAN
	M	PVPS EBC		PVPS ISGAN	

RD&D trends in the BCG

IAs are already engaged and/or envisage several collaborations on the following RD&D areas:

- **User behaviour**
- **System integration** (e.g. ”deep renovation ”)
- **District and Community research** (society, ICT, environment)
- **Skills, knowledge in operation** (capacity building)

Many IAs bridge research and innovation with energy policy and socio-economic challenges, since **main barriers** are mainly **non technological** (financial, administrative, regulatory)

Research on **cost-effectiveness** is ongoing, to reduce costs and increase reliability

EBC (50-55-56-61), SHC (47-50) are already active on **deep renovation**

Energy Storage: growing role in RES integration, increase of energy efficiency and interoperability between systems

CONCLUSIONS

New proposed RD&D actions aligned to EU H2020

Several new proposals look at the whole **energy system**

Viable opportunities for collaboration on **building renovation :** interoperability among systems, relationship with the neighbourhood and behavioural dimensions

Possible further actions :

- Capitalization of results on **construction skills and capacity building** at designer, workforce and user level
- Contribution to the international dialogue on **smart cities**, addressing **ICT services and applications, consumer engagement and the socio-economic dimension of EE** (links to Transport Contact Group, Future 2016 IEA ETP on *Urban Energy*)
- With reference to research on **behaviour** a more detailed analysis on IA complementarity was proposed by the DSM