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ETIP SNET Virtual Workshop

Parallel Session 5

Efficient Energy Use

18th June 2020

Welcome to the ETIP SNET virtual Parallel Session 5

Survey to see which entities are presented by the attendees

LINK on the chat

Rules for interaction during the PS5

- **ALL ATTENDEES of the Plenary Session are invited to switch on the Camera – if possible.**

- **TO INTERACT WITH THE SPEAKERS DURING THE PS:**
  - The attendees who want to speak or make some questions are invited to **raise the hand** on TEAMS and the floor to them will be given at the end of each speech.
  - The attendees are also invited – if preferred – to **write their questions/statements in the chat**. They will be read at the end of each discussion rounds

- **The link to come back to the Final plenary session** will be shared at the end of each Parallel Session via chat
  - Please note that it is the same of the current Plenary Session.

Parallel Session 5

- *Parallel Session “Efficient Energy use (F10 - Flexibility, F11 - Heating and cooling, F12 - Transport)”*

Efficient energy use	Integrating flexibility in generation, demand, conversion and storage technologies	F10 Flexibility
	Efficient heating and cooling for buildings and industries in view of system integration of flexibilities	F11 Heating & Cooling
	Efficient carbon-neutral liquid fuels & electricity for transport in view of system integration of flexibilities	F12 Transport

General introduction by the supporting Core team: ***Explain the different Functionalities***

The FUNCTIONALITIES are chosen in such a way that together and in accordance with the Building Blocks defined in the ETIP SNET Vision 2050, they represent the **set of features enabling the functioning of an integrated energy system by the year 2030**.

These functionalities are –in principle- independent from each other.

F10 - The future energy system will rely on much higher balancing capacities, including **flexible generation** units, increased demand response and conversion and storage technologies, together with better interconnections at all grid levels. Increasing system flexibility must be achieved also through policies, measures and regulations compatible with further market integration, increased competition and the achievement of climate and energy objectives.

F11 - The recent clean Energy legislation requires that **renewable heating and cooling** must contribute to the progressive increase of the share of renewable energy. Provisions shall be included, at national, regional and local level, for the integration and deployment of renewable energy, including for renewables self-consumption and renewable energy communities, and the use of unavoidable waste heat and cold when planning, including early spatial planning, designing, building and renovating urban infrastructure, industrial, commercial or residential areas and energy infrastructure, including electricity, district heating and cooling, natural gas and alternative fuel networks.

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F12 - An integrated system approach is required to put the **transport sector** on a sustainable path. Central elements of such approach include action on overall vehicle efficiency, promoting low- and zero emission vehicles and infrastructure, and the long-term switch to low- and zero-carbon electricity and to alternative and net-zero-carbon fuels for transport, together with further encouraging multi-modal integration and shifts towards more sustainable transport modes. Conditions must ensure the effective deployment of publicly accessible and private recharging points for electric vehicles and the efficient integration of vehicle charging into the system.

Route towards 2030

- The transition towards 2050 will be ensured by achievements that are formulated in the Roadmap 2030
- Some achievements in relation with F10, F11 and F12 are presented

Route to F10	Route to F11	Route to F12
Flexibilities combined with high energy efficiency in conversion devices for electricity-system integration needs must have reached a mature demonstration level	Electricity generation and cogeneration from any types of primary sources are more efficient then today	Demonstrations for the integrated use of Carbon-neutral liquids must be successfully proven
Energy communities up with a high share of community-RES (relative to community gross electricity demand) test fully coupled energy systems	Near-zero energy building (NZEB) projects, at least for the new constructions are well implemented and their flexibility must be proven in Pilot and/or Local Demonstration	Power-to-Liquid Pilot projects and Local Demonstrations will be implemented and demonstrate the flexibility to be offered to the electricity systems
Integrations of conversion of power towards carbon-free or carbon-neutral gases or fuels (hydrogen, synthetic methane or methanol) and integrated use of these carbon-neutral gases and liquids are to be demonstrated	Renewable heating and cooling technologies could supply over half of the heat used in Europe	
	Demonstrators for RES (bioenergy, solar, geothermal) and power-to-heat conversion show the flexibility offered to the electricity system combined with the use of cogeneration	

Research is needed

- Several Research Areas and Research Sub Areas contribute to F10, F11 and to F12

- Bullet points show the Research Sub-Areas where the Roadmap and the Implementation Plan focus the main R, D &D effort.

Research Areas contributing to F10, F11 and F12
RA 2 – System Economics ▪ RSA 2.2 - Markets
RA 4 – Planning - Holistic Architecture and Assets ▪ RSA 4.1 – Energy System Architecture ▪ RSA 4. 2 - Planning
RA 5 – Flexibility Enablers and System Flexibility ▪ RSA 5.1 - Generation ▪ RSA 5.2 - Storage and Conversion

Discussion rounds

Workshop goal and outcome expected:

- **How do you contribute to ETIP SNET goals?**
- **How do ETIP SNET priorities of fit to your own ETIP/PPP/ … agenda?**

3 successive discussion rounds (10-15 min each) based upon 1-2 general underlying question(s)

Discussion **A** (10-15 min):

Flexibility of Generation

Discussion **B** (10-15 min) :

Heating and Cooling

Discussion **C** (10-15 min) :

The role of Cities in the energy systems integration

Discussion A: Flexibility of Generation

Discussion **A** :

Flexibility of Generation

Our priorities (based on IP) are:

- To define the rules of a “market for flexibility”, that supports the economic based management of all the kinds of flexibility resources
- To increase the flexibility of Thermal Power Plants (operation, fuels → green fuels)
- To develop suitable PtG, PtH, PtX technologies
- To ensure adequate RES flexibility.
- To ensure sufficient dispatchable power
- To increase the role of Storage and develop a suitable market for storage services remuneration
- To support decarbonisation of energy intensive industries

Discussion:

- **How do you contribute to the above ETIP SNET priority?**
- **How do ETIP SNET priorities fit to your own ETIP/PPP/ … agenda?**

Discussion **B** : Heating and Cooling

Discussion **B** :

Heating and Cooling

Our priorities (based on IP) are:

- Flexibility potential from aggregated heating (and cooling) storage at household and building to provide system services
- Near-zero energy building (NZEB) shall be the standard for new constructions; these NZEB shall demonstrate a high degree of flexibility
- Household heating and cooling, due to its high share of total EU energy consumption, shall be a primary target for both RES and district heating and cooling (DHC) grids
- Integration of energy storage systems with conventional power generators (cogeneration, hydropower, thermal plants) to increase their flexibility and improve operation
- Increased exploitation of waste heat resources

Discussion:

- **How do you contribute to the above ETIP SNET priority?**
- **How do ETIP SNET priorities fit to your own ETIP/PPP/ … agenda?**

Discussion C : The role of Cities in the energy systems integration

Discussion **C** :

The role of Cities in the energy systems integration

Our priorities (based on IP) are:

- To develop and demonstrate stand-alone (islands) buildings and living quarters, supplied by renewable generation, sector-coupling and storage components (e.g. P2hydrogen, P2G, P2H, P2fuels ….)
- Centralized and distributed algorithms for efficient management of EV charging, supporting business-to-customers and business-to-business relationships and ensuring easy and secure payments for customers
- Energy management in transport electricity networks to provide ancillary services to DSOs via storage facilities in the substations of the PCC (point of common coupling)
- Flexibility services offered by transport electrification (Grid to Vehicle GtV and Vehicle to Grid VtG) to distribution grid operation,

Discussion:

- **How do you contribute to the above ETIP SNET priority?**
- **How do ETIP SNET priorities fit to your own ETIP/PPP/ … agenda?**

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Thank You