BEST-Storage

ECHO

HYSTORE
Hybrid Services from Advanced Thermal Energy Storage Systems

ThumbsUp

Joint Workshop

Thermal energy storage solutions

Wednesday September 06, 2023 | 15:15 – 17:15 CET

room MA218 | PALAZZINA MARCHI

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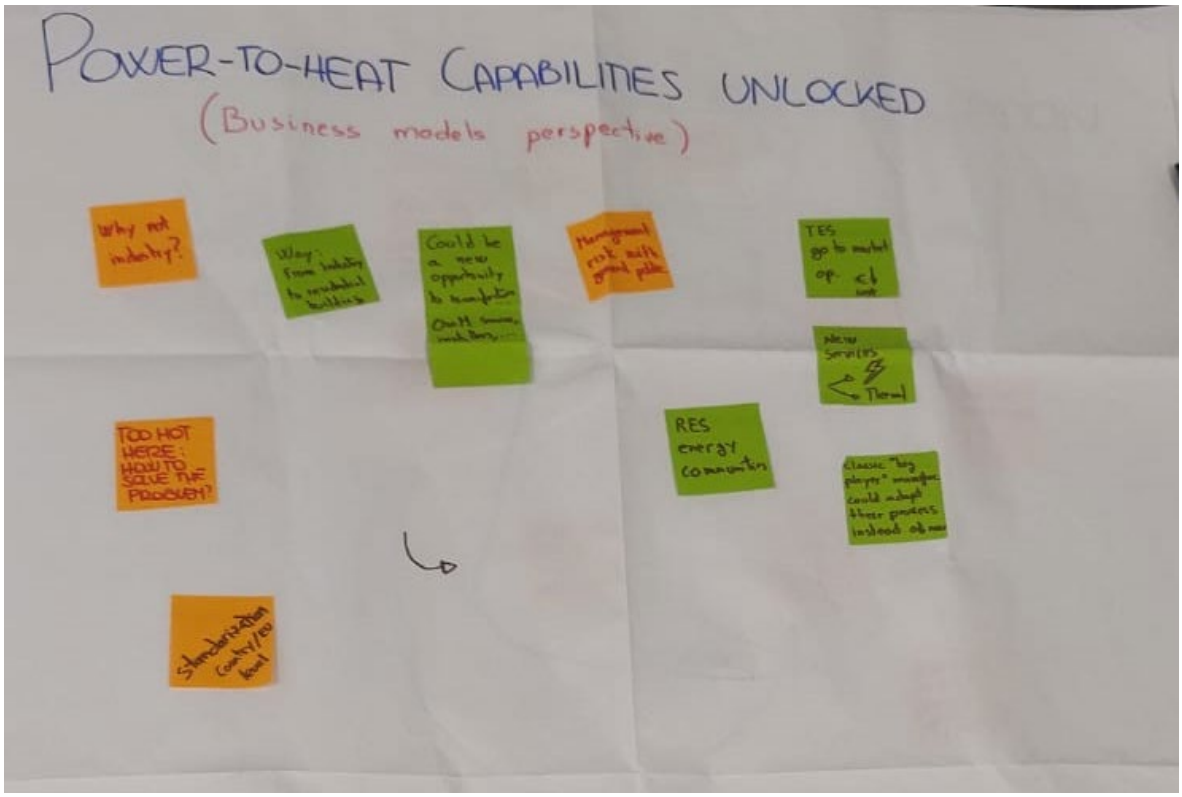
BRIEF RECAP OF WORKING GROUPS POSTER AND DISCUSSION

Power-to-heat capabilities unlocked by our TES

CHAIR: *Javier Martin Sanz* (THUMBS UP)



HIGHLIGHTS

- Possibility to promote power-to-heat solutions via electrical and thermal energy communities.
- The power-to-heat approach is not standardized yet in EU countries (neither from a regulatory nor from an energy market/incentive level).
- At this purpose promoting “Business and supporting schemes” looking first at industrial power-to-heat (thus with larger magnitude of flexibility potential) could be a way to “test” models to be then downscaled or adjusted/transferred to residential.
- Business models could provide gain not only to energy utilities/tenants but also to H&C Systems manufacturer who could somehow in this way reduce CAPEX of their solution (to be sold thus in a sort of “ESCO MODEL” based on revenues collected from Power-to-Heat incomes).
- Power-to-heat business models should provide “compensation” for risk of discomfort to tenants.
- Moreover:
    - Reduce curtailment of renewables.
    - Flexible demand - load shifting frequency response.
    - More cost-effective storage of energy.
    - Lower land requirement compared with typical BESS layouts.
    - Optimal heat production plant will depend on electricity price.
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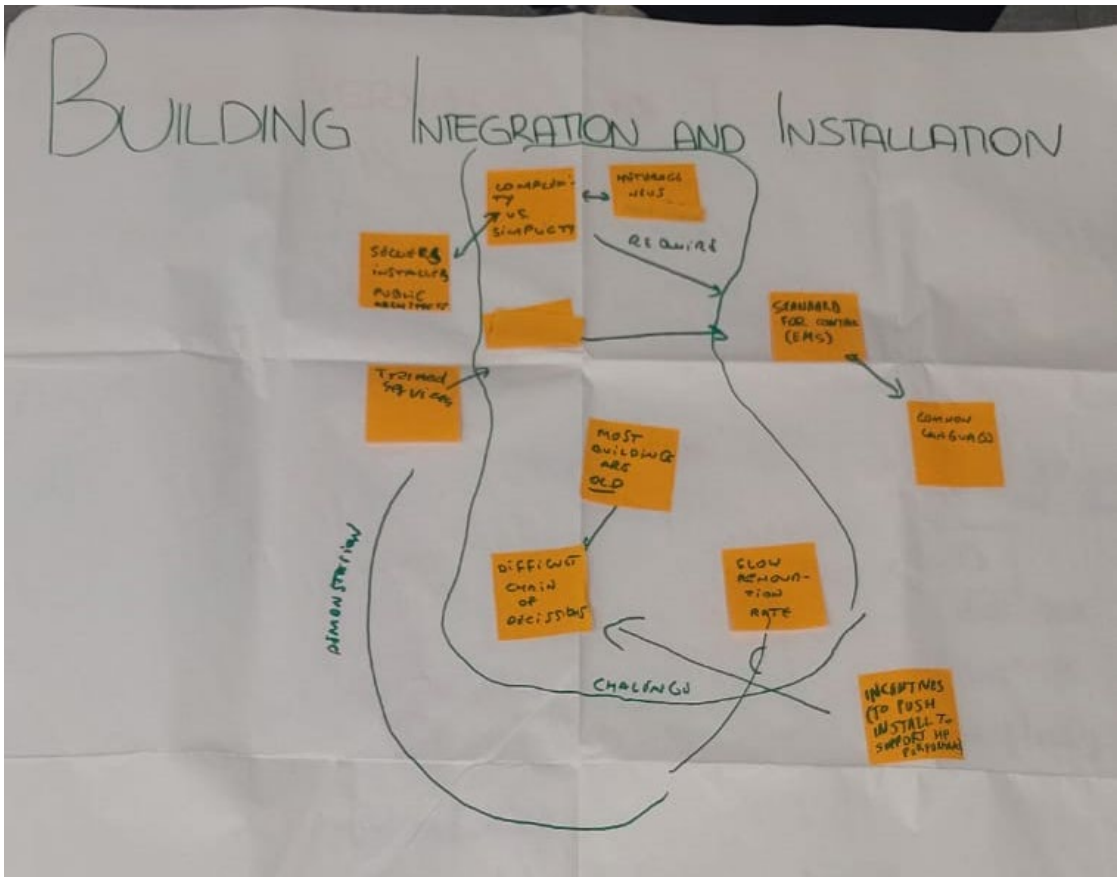
Building integration and installation

CHAIR: *Javier Fermín Urchueguía Schölzel* (ECHO)

HIGHLIGHTS

- EU is facing a slow renovation rate of the buildings; thus, TES seems to be easier to be installed in newly built buildings.
- This slow renovation rate is not only a matter of policy and incentives, but also a matter of "decision making aspects" often involving too many subjects (e.g., multi-family buildings with flat owners) or involving subjects like building manager who could prefer to opt to different technological solutions.
- If we look at coupling TES with HP or Boiler or other thermal RES, there is a complexity in terms of ENERGY MANAGEMENT SYSTEMS which often face challenges in terms of interoperability and dialogue if we look at the different components (heat generation system, heat terminal delivery systems, thermal storage systems…): in this sense a common standard (as per electric appliances) approach should be created for H&C solutions too (also for the metering).
- There is a lack of skilled work force in installing and repairing TES solutions (thus preventing to install or making people looking at these solutions riskier or with hidden costs).
- In many cases manufacturers/sellers/installers are different subjects, thus making more complex the installation in case of absence of standards (for example for coupling).
- Generally speaking, TES provides more flexibility and efficiency but adds complexity to building technical systems and building architecture at 360°, also because TES solutions (except for Sensible Water Tank) are difficult to be standardized also looking at volume/spaces required and installation procedures.
- Incentives could push the demonstration.



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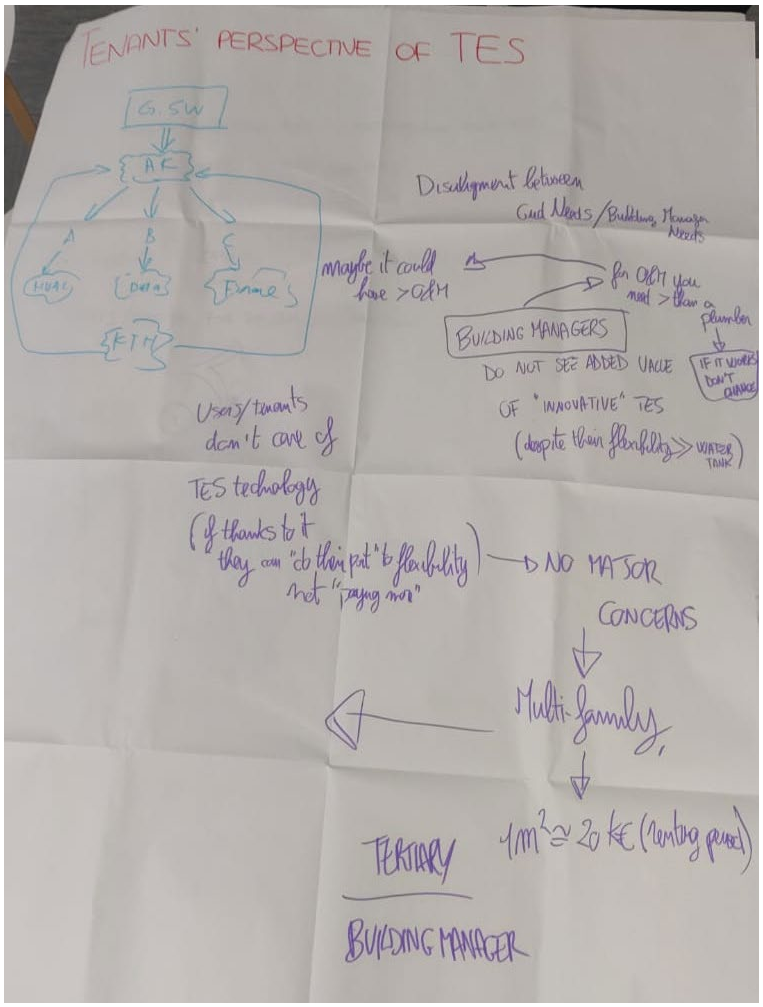
Tenants' perspective of TES

CHAIR: *Qian Wang* (HYSTORE)

HIGHLIGHTS

- Depending on the different EU countries, tenants could have different perspective for example depending on the fact if they owe the estate/flat or if they are receiving a service from a building management/facility management company.



- Generally speaking, tenants are open to "do their part" via energy efficient technologies: they do not take care if it is a "SIMPLE TES" or an innovative one. Of course, this could have a different perspective if they have to take care of the investment of the TES solution: why we should spend more money for a PCM/TCM TES if at the end "hot water tanks" have been working for so many years? This is the perspective of building managers as well.
- There is a lack of skilled work force in installing and repairing TES solutions (thus preventing to install or making people looking at these solutions riskier or with hidden costs): you'd need a plumber. Furthermore, if "Sensible TES" works and already provide a benefit in terms of energy efficiency, which could be the added value of an innovative TES? (Particularly looking at money and comfort?).
- There is a misalignment between energy utility's needs (e.g., flexibility via power-to-heat or flexibility of the DHN) and building owners/manager's needs: who should act then to invest on more expensive TES with benefits to one (limited) or the other (privileged)?
- A different TES could show hidden costs in terms of O&M as well as a higher costs in terms of space occupancy of a building: this means "less valorization" of the building economic value for living or renting to be compensated.

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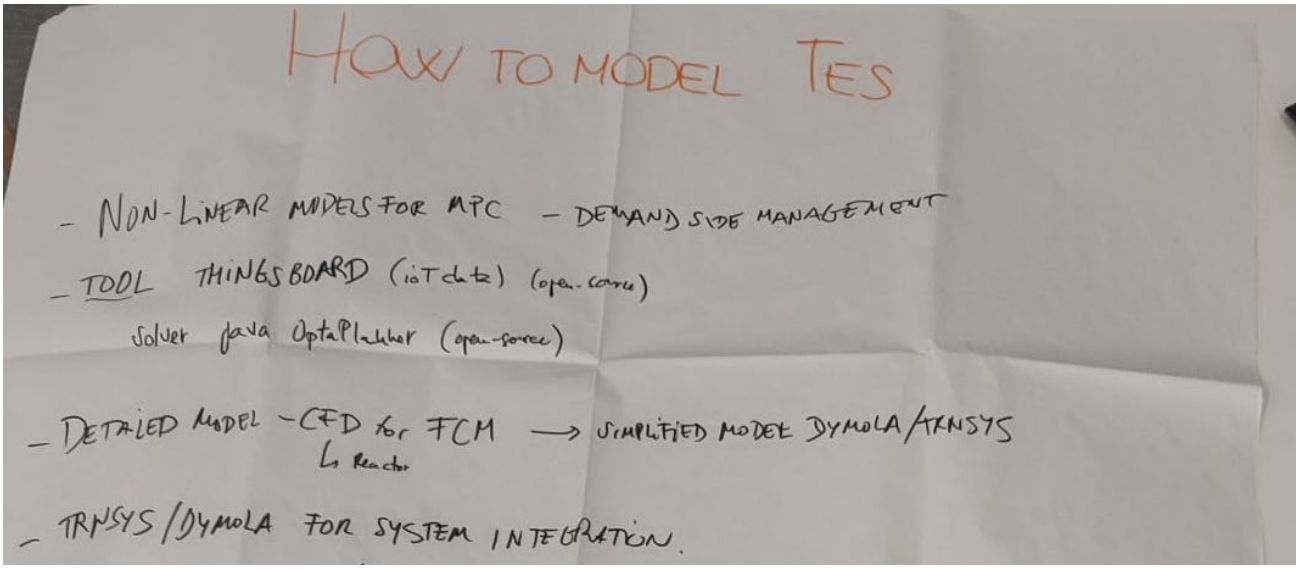
How to model TES

CHAIR: *Daniel Carbonell* (BEST STORAGE)

HIGHLIGHTS

- Development of Energy Management Systems and dynamic modelling of TES (and particularly of innovative TES which could have less data for validation) is particularly challenging, particularly targeting Demand Side Management solutions (e.g., Power-to-heat) and non linear models for MPC.
- At this purpose Open-Source approach should be encouraged, also for planning activities.
- It is challenging to transfer detailed CFD/Heat Transfer project for TCM/PCM to simplified (concentrated parameters models) to be integrated in TRNSYS/DYMOLA particularly looking at systems integration.



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More info

BEST STORAGE

best-storage.eu

ECHO:

echo-euproject.eu

HYSTORE:

www.hystore-project.eu

THUMBS UP:

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