TMCES Panel Discussion August 4, 2022

Creating Projects that Take T-M-C Storage to the Next Step in Commercialization

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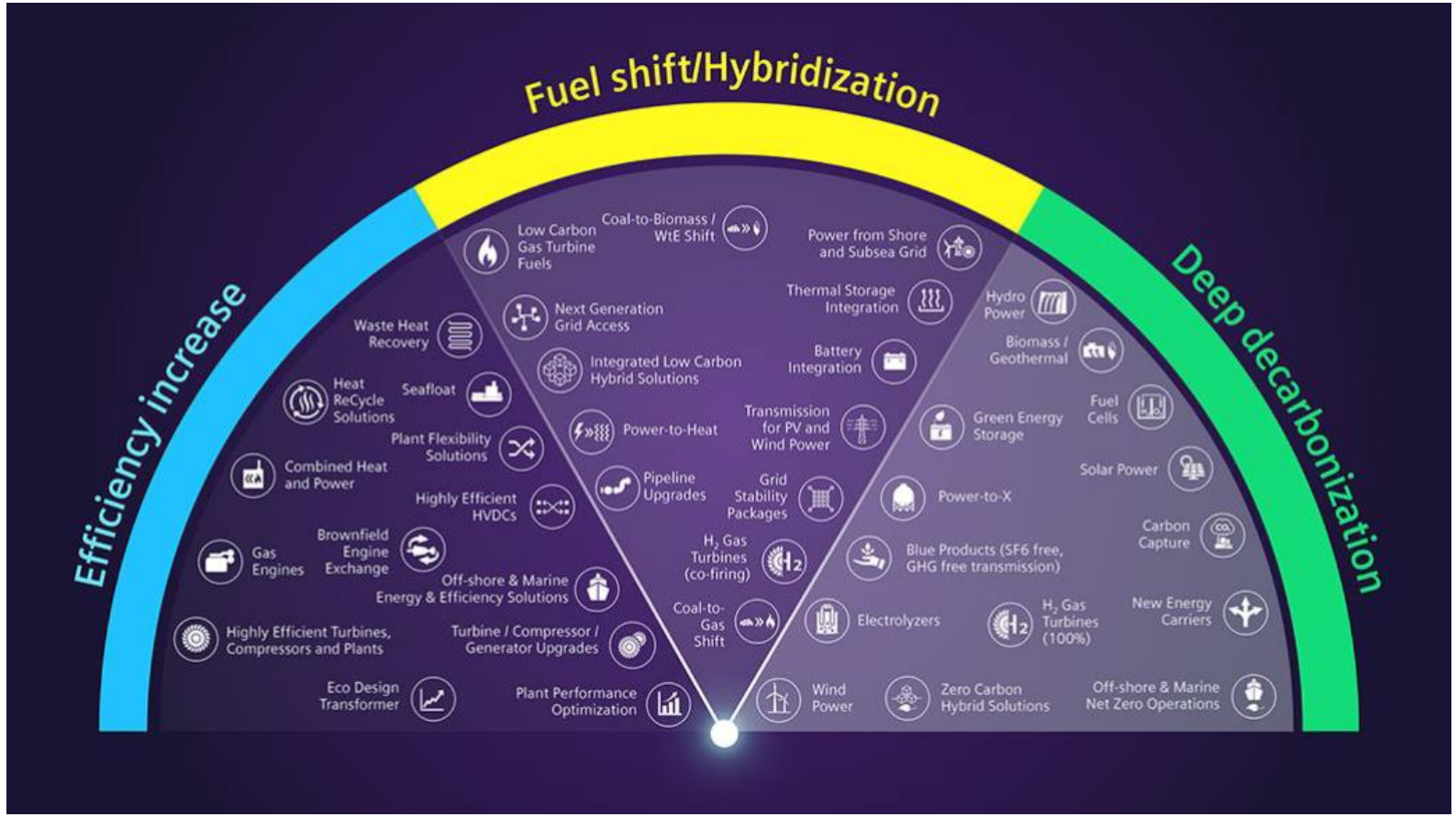
Decarbonization Radar
Siemens Energy Product Offerings



Three main categories all applicable to TMC
Let's take a deeper look

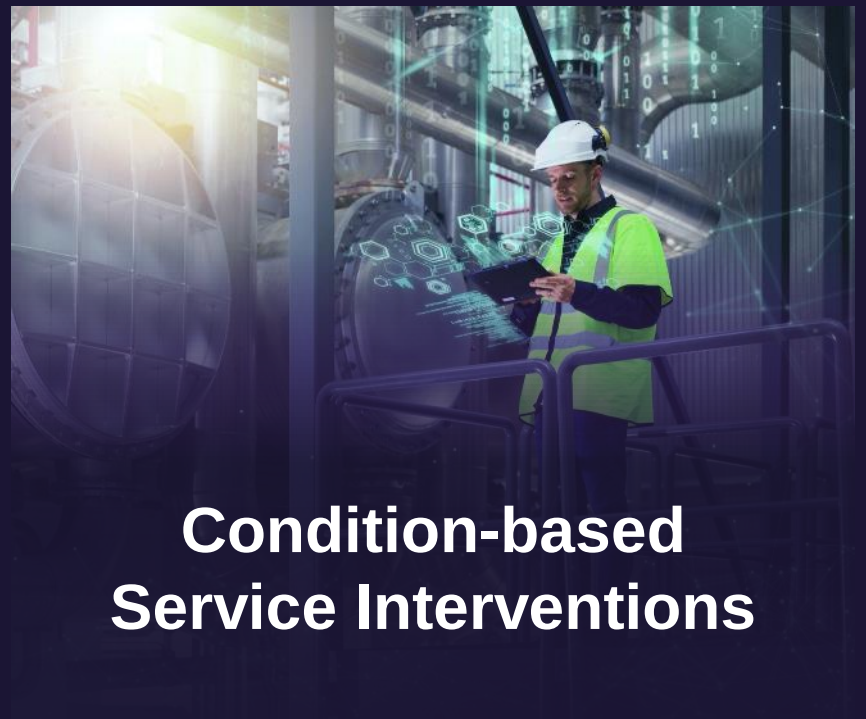
Fields of Action

Leading the energy transformation

Energy Storage

Decarbonized Heat & Industrial Processes

Power-to-X



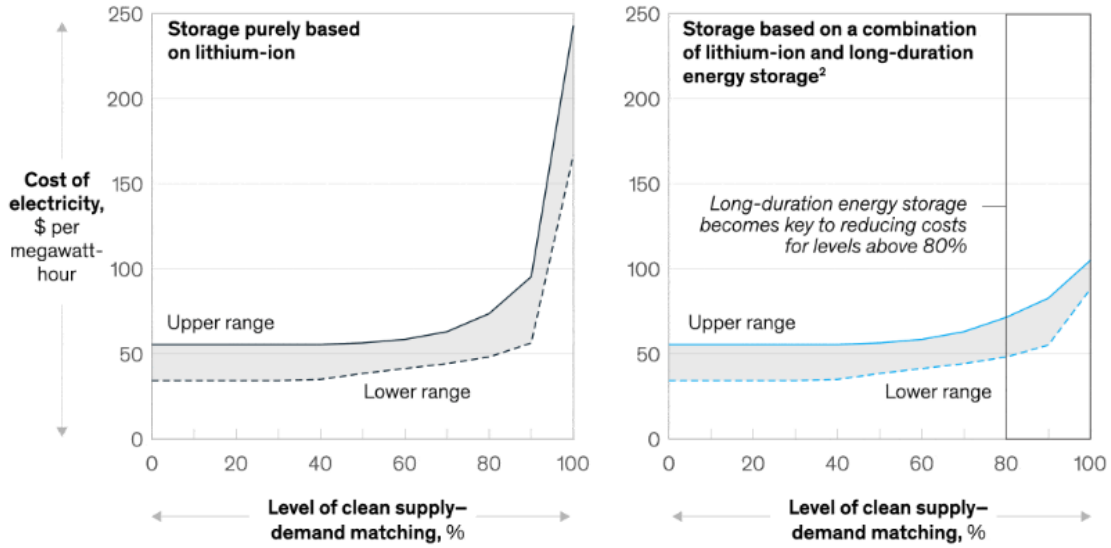
Condition-based Service Interventions

Resilient Grids and Reliability

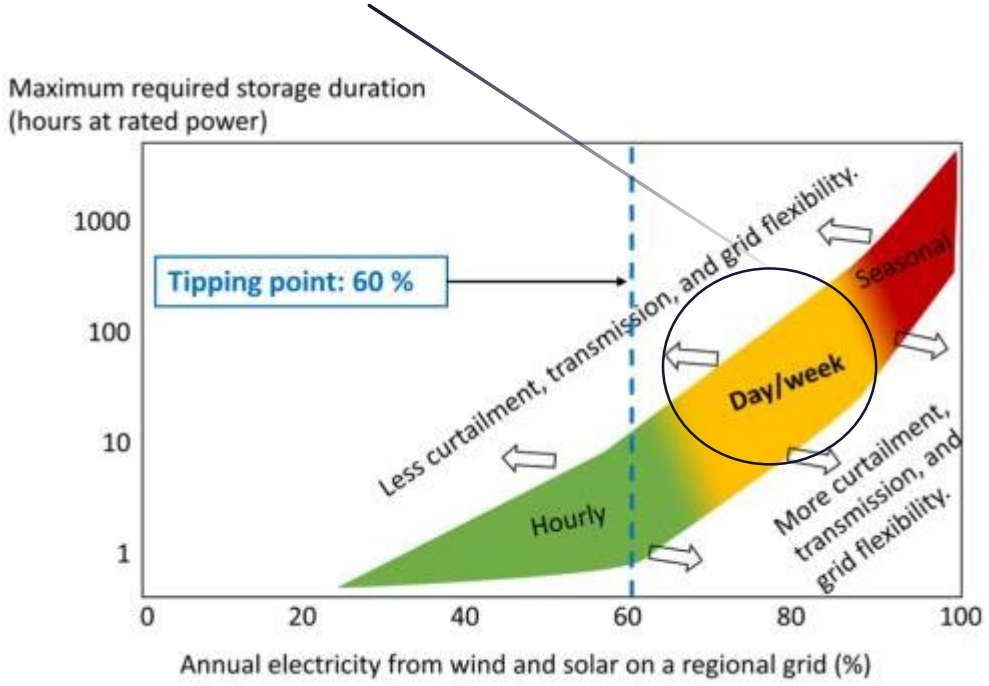
“So. What Do We Need”
#1: Economic Awareness

TMC lower LCOS than Li-ion above 6 hrs.

Levelized cost of electricity for onshore wind, solar, and storage hybrid system by level of clean supply–demand matching, 2025[1]



[1]Based on modeling a baseload in locations with average (UK) and optimal (Australia) levelized cost of energy.
[2]Long-duration energy storage 8–24 hour and 24 hour-plus technologies.
Source: *A path towards full grid decarbonization with 24/7 clean Power Purchase Agreements*, LDES Council and McKinsey, May 2022; McKinsey Power Model



Electricity Cost Becomes Prohibitive at High Non-Dispatchable Penetration
Increasing Penetration of Non-Dispatchable Generation Requires Storage Buffer to Ensure Low Costs

#2: Policy Support
There are three “Horizons”

Description	Early Pilots/Demos, first commercial projects, high capital cost to offset risk	Rising deployment and scale, improved cost and performance, introduction of debt to capital structure	Tech fully mature, funding and investors established, cost of capital competitive with competitors
Level of Support	Comprehensive, revenue certainty and scale-up support (Ex. Proposed H2 PTC)	Significant, tension with existing resources, safeguarded market prices	Phasing out on agreed timeline (ex. Wind PTC)
Policy Mechanisms	Storage capacity targets, procurement mandates, long contract terms, grants, revenue agreements	Cap & floor prices, capacity market with premiums, long-term contracts/targeted tenders	Gradually increasing exposure to merchant projects
Sources of Capital	Public funding (grants/loans) equity investment from technology providers	Project financing from large corporations and debt from commercial banks	Cost-competitive given revenue certainty and low risk

Policy missteps along the way can have a variety of unintended consequences
The first step is already taken, answering the question “What is Storage?”

Germany Now Has A Legal Definition for Energy Storage None Previously Existed

By German law, energy storage is now defined as an asset where **“the final use of electrical energy is postponed to a later point in time than when it was generated“.**

- Eliminates previous double taxation
- Not a consumer, not a generator, unique
- Streamlines grid connection process

The Bundestag, Berlin

With the legal definition, a basic but important prerequisite for unlocking the potential of energy storage as an enabler of the energy transition is in place.

Thank You
Questions?

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