bse methanol

ELECTRIFICATION AND DECARBONIZATION OF THE ECONOMY

Renewable oversupply to e-fuels: the role of e-methanol

Nov, 2025

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Track Record

Milestones

Key Milestones

- 2008 – Opening of Methanol Activities
- 2014 – R&D project: benchmarking catalyst under flexible operation (CO_2 & H_2 feed)
- 2017 – Joint Development Agreement with BASF for process & catalyst development
- 2021 – Global cooperation signed with MAN ES (DWE) for FlexMethanol™ skid supply
- 2021 – Selected Process Provider PTMA (Port of Antwerp)
- 2022 – Passed Technical due Diligence by Munich Re and achieved process warranty as insurance.
- 2024 – Standardization of FlexMethanol Skid 10 & 20 MW® Finalized
- 2025 – Feed Contract Signed P2X Finland and major Brazilian Corn Ethanol producers
- 2025 – Start of Development FlexMethanol 50MW Skid

Why electrification matters

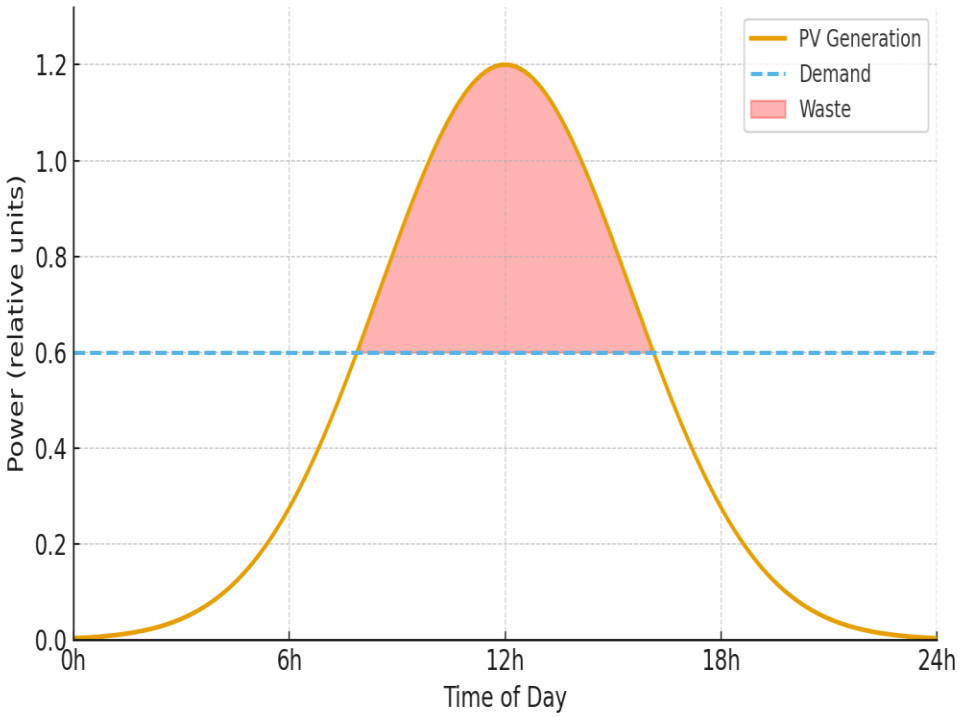
Electrification: the central pillar of decarbonization.

- When electricity is generated from renewable sources, to electrify is to decarbonize.

- The expansion of solar and wind accelerates the transition but adds **volatility and complexity** to the power system.

The challenge of large-scale electrification

The downside of electrification: volatility and waste

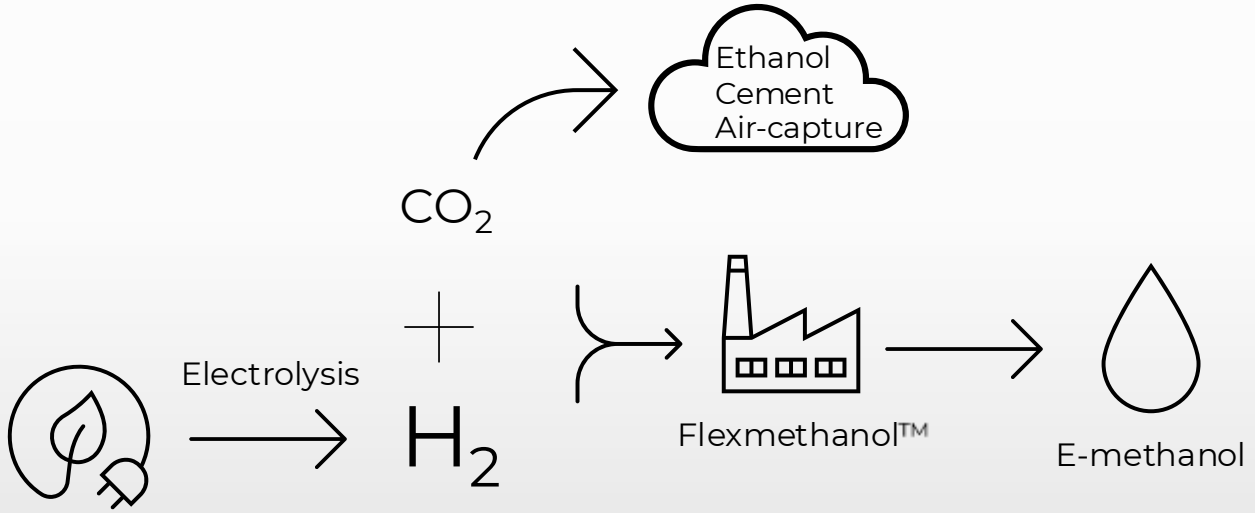


- Peaks of renewable generation lead to negative prices and curtailment. →
- Demand does not always follow the availability of power generation. ↓
- Current infrastructure were designed for dispatchable sources, not for volatile renewables. ←
- Result: we fail to convert clean electricity into effective emissions reductions.

When electrification is not enough

Beyond direct electrification: the role of Power-to-X

- Not all sectors can be fully electrified, such as shipping, the chemical industry and aviation.
- Power-to-X converts **renewable electricity** into low-carbon molecules such as e-methanol.
- This allows renewable energy to be **exported** to “hard-to-abate“ sectors.

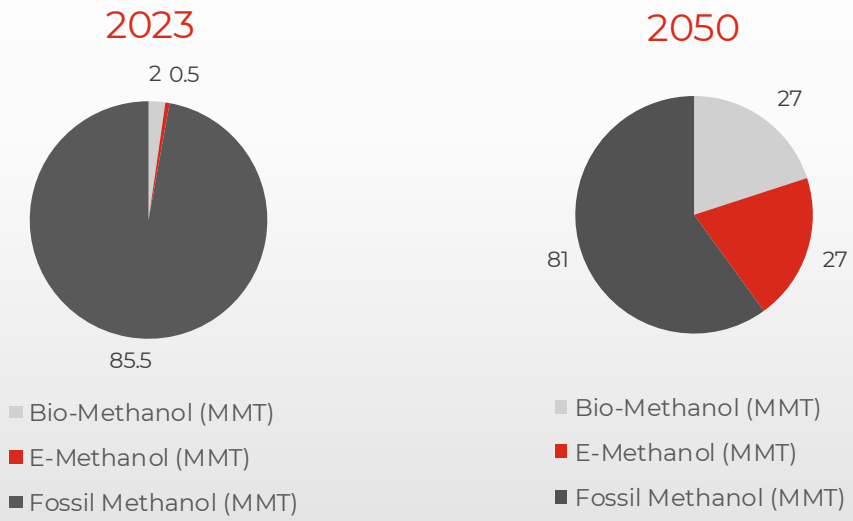


E-methanol as a decarbonization vector

E-methanol: an energy molecule for a renewable power system

- Green methanol demand is accelerating (shipping, chemicals, e-fuels).
- Acts as a **chemical storage** of renewable energy.
- Allows clean **electricity to "travel"** through existing markets and infrastructures.
- Can replace fossil methanol in chemical applications and serve as a **marine fuel.**

Global Methanol Mix



FlexMethanol as a flexible load

FlexMethanol 10 & 20 MW® turns volatility into value.

*Flex*Methanol 10 MW® Skid

Flexible operation → peak-shaves oversupply, avoids high-price periods, stabilizes the grid.

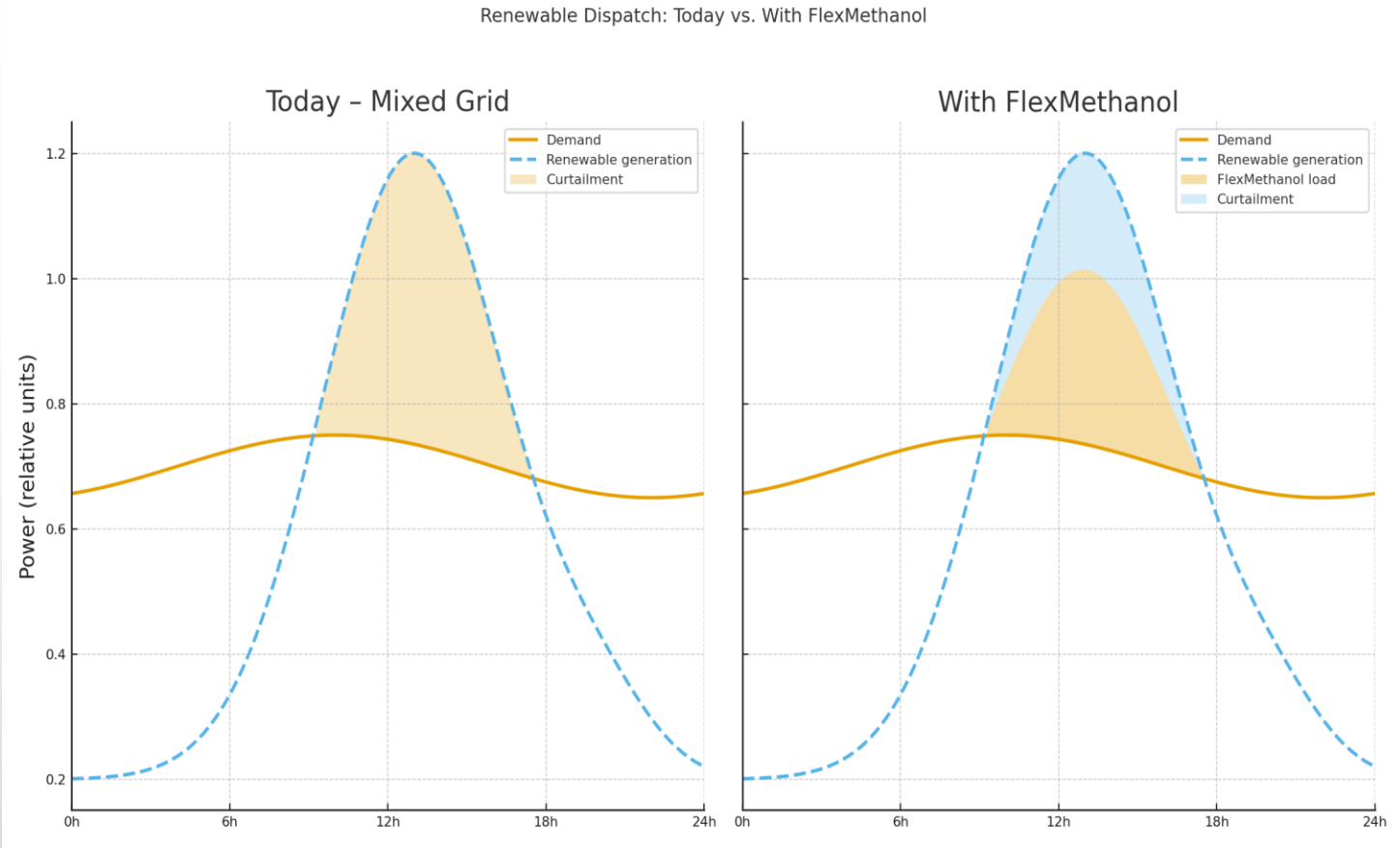
Prefabricated skid design → fast deployment, scalable for decentralized projects, with second-life opportunities.

Modular scaling → multiple skids can be combined to cover projects of any size, from small renewables to industrial scale.

Comparing grid with and without FlexMethanol

Maximizing assets and providing a second option to dispatchers

- In a mixed grid with high renewables, price spikes and negative prices reflect inflexibility and curtailment.
- Without flexible loads, assets are underused and renewables are the first to be curtailed.
- FlexMethanol absorbs low-price/negative-price energy and reduces curtailment.
- Dispatchers now have a **second option**: instead of curtailing, they can dispatch e-methanol production.



Proven Market Traction

From feasibility to multi-MW projects – delivering consistent growth

Track record

- +120 qualified leads worldwide
- 30+ feasibility studies delivered (10 MW-1 GW)
- 6 FEL- 2 studies executed
- 2 FEED Studies
- Several MOUs signed

Industrial Sectors

- Off-grid installations
- Renewable power plants
- Waste-to-energy facilities
- Revenue stabilization for power generators
- Paper mills
- Ethanol producers

Thank you

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