

A YEAR OF CLIMATE &
ENERGY INSIGHTS

Copenhagen
Economics

CE

**SOCIETAL
VALUE
OF DEMAND-
SIDE FLEXIBILITY**

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DEMAND SIDE FLEXIBILITY A KEY COMPONENT IN AN ELECTRIFIED ECONOMY

Electricity markets are facing significant structural changes. The share of renewable energy is vastly increasing as solar and wind replace traditional (fossil-fuel-based) power plants.

At the same time, overall electricity demand is set to increase manifold as energy demand is directly and indirectly electrifying.

ELECTRIFICATION IS COST-EFFECTIVE BUT COMPLEX

COMPLICATIONS

- A higher share of intermittent, renewable energy production in the generation mix increases price volatility, affecting inflexible users who are unable to shift demand to low-price hours.
- More hours with low or negative electricity prices reduce incentives for further renewable energy installations.
- Grid dimensioning is impacted by more decentralised production and changing consumption patterns. For instance, EVs are decisive for households' future peak demand increasing the need for new grid investments.

BOTH GRID INVESTMENTS AND FLEXIBILITY ARE NECESSARY

Flexible demand can better align electricity consumption with production and reduce grid capacity constraints. While demand-side flexibility is sometimes mentioned as *the* solution, both grid investments and increased flexibility are needed in parallel. In an ongoing project, Copenhagen Economics is assessing the potential and societal benefits of demand-side flexibility in Denmark. While conclusions are pending, expected findings include:

- Increased demand-side flexibility benefits both renewable energy producers and consumers.
- Parts of grid investments can be postponed, but not avoided, by incentivising consumers to respond more to the total cost of electricity and grid cost.
- Innovation in technical solutions and regulatory measures will be necessary to nudge consumption patterns in the right direction.

A NOTE FROM THE CLIMATE, ENERGY & NATURAL RESOURCES TEAM AT CE

As 2024 draws to a close, our Climate, Energy & Natural Resources team is excited to share the progress we have made and insights we have gained this year.

We are pleased to present key highlights from our completed and published projects, along with updates on ongoing and upcoming initiatives focused on energy transition, electrification, demand-side flexibility, and green claims.

Stay tuned for more updates!

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