

„Think Battery” – Becoming more dynamic in energy consumption

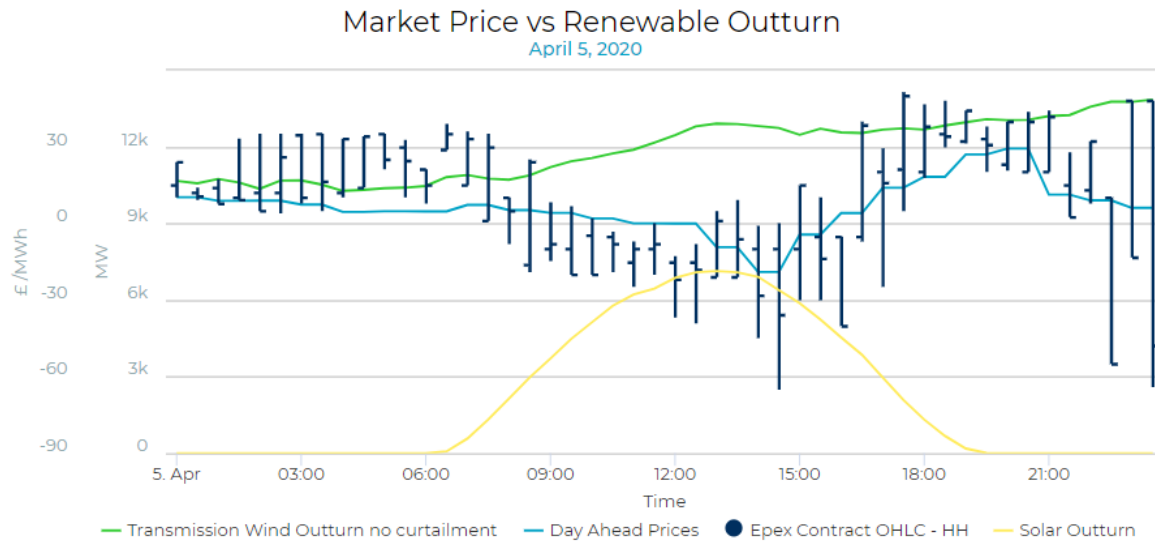
*András DEÁK, PhD
University of Public Service*

A humble request from a macro energy expert:

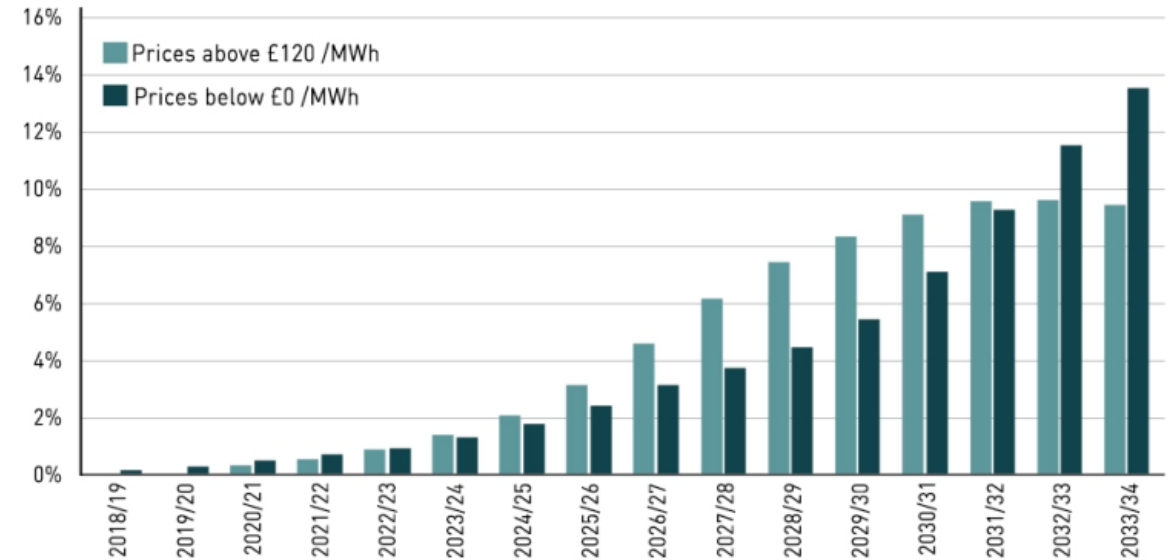
Start space heating/cooling in a „range mode” (i.e. between 20-25 Celsius):

1. Overheat (in Winter)/overcool (in Summer) when decarbonised energy is abundant;
2. Underheat (in Winter)/undercool (in Summer) when decarbonised energy is scarce.

The „new normal” – negative pricing and/or major renewable curtailment, high price volatility



Times per year that wholesale power prices are below zero or above £120 /MWh

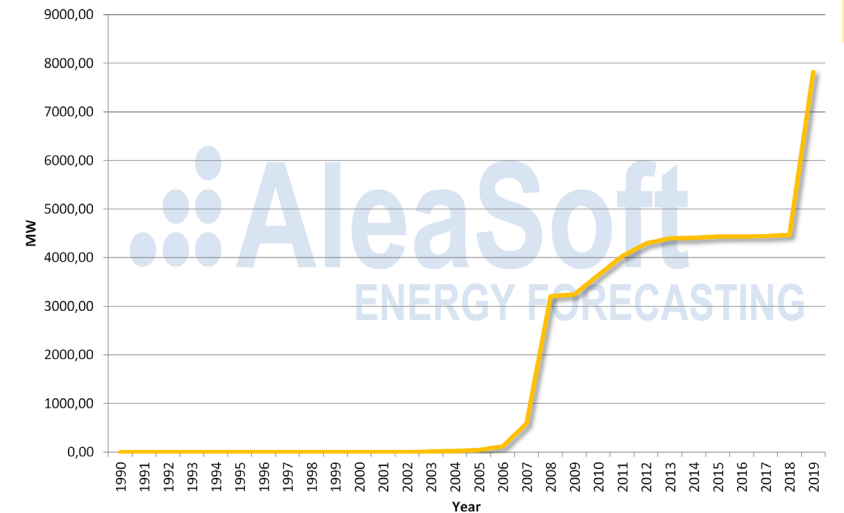


Source: Cornwall Insight

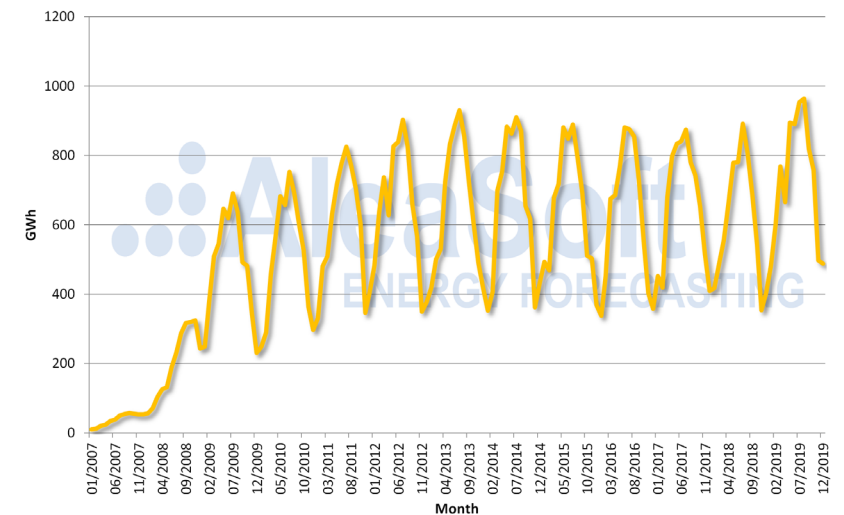
We have too much decarbonized energy in particular time periods

- A logical and unavoidable implication of intermittency.
- The problem remains with us for decades.
- Consuming „overbuilt” energy shall/could enhance decarbonization.
- The cheapest energy is not only the saved energy anymore. We have to *consume the „overbuilt” decarbonized energy en masse, in order to save a fraction carbonized energy later.*

Photovoltaic installed power in Mainland Spain

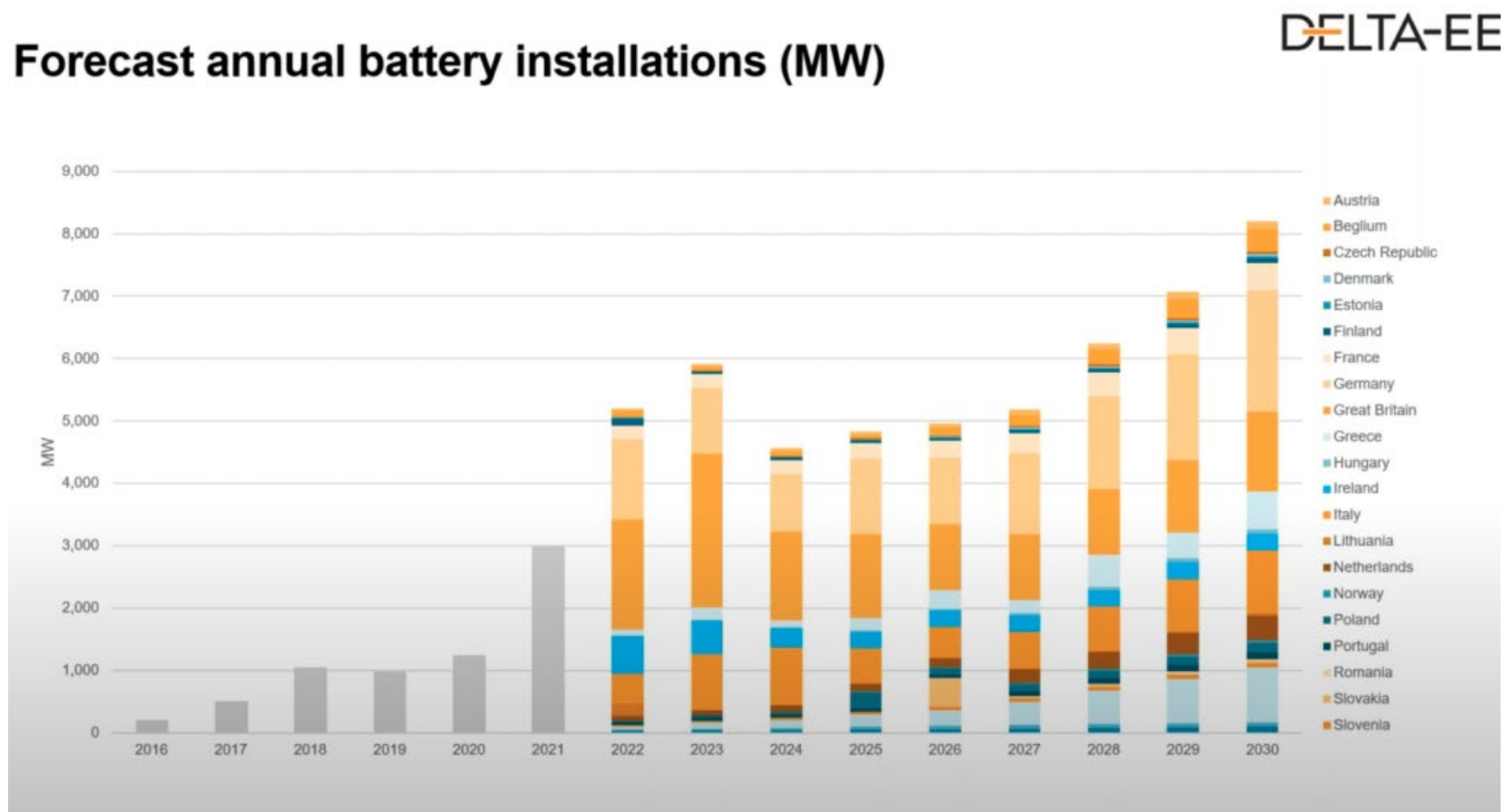


Photovoltaic energy production in Mainland Spain



Do not expect a swift solution from batteries

- Storage flexibility shall only sufficiently increase by e-mobility from the mid-2030s.
- May respond to intra-day challenges, intra-week and intra-month perspectives will remain challenging in the decades to come.



What can be used as a „battery” in municipal energy consumption?

- Energy communities – Nice idea, but too slow, too sophisticated and focus on the wrong part of the network.
- Dynamic pricing/smart charging – Part of the solution, but without accompanied technological solutions and demand management practices, it will fall short of expectations.
- E-mobility/stationary batteries – Comes too late and will provide only a gradual advancement, not sufficient for the 2050 goals.
- Agressive demand management – Using „alternative batteries” – Storage heat in walls, heatwater.



What do municipalities need to facilitate dynamic consumption?

Contract with dynamic pricing



Social support and sacrifice

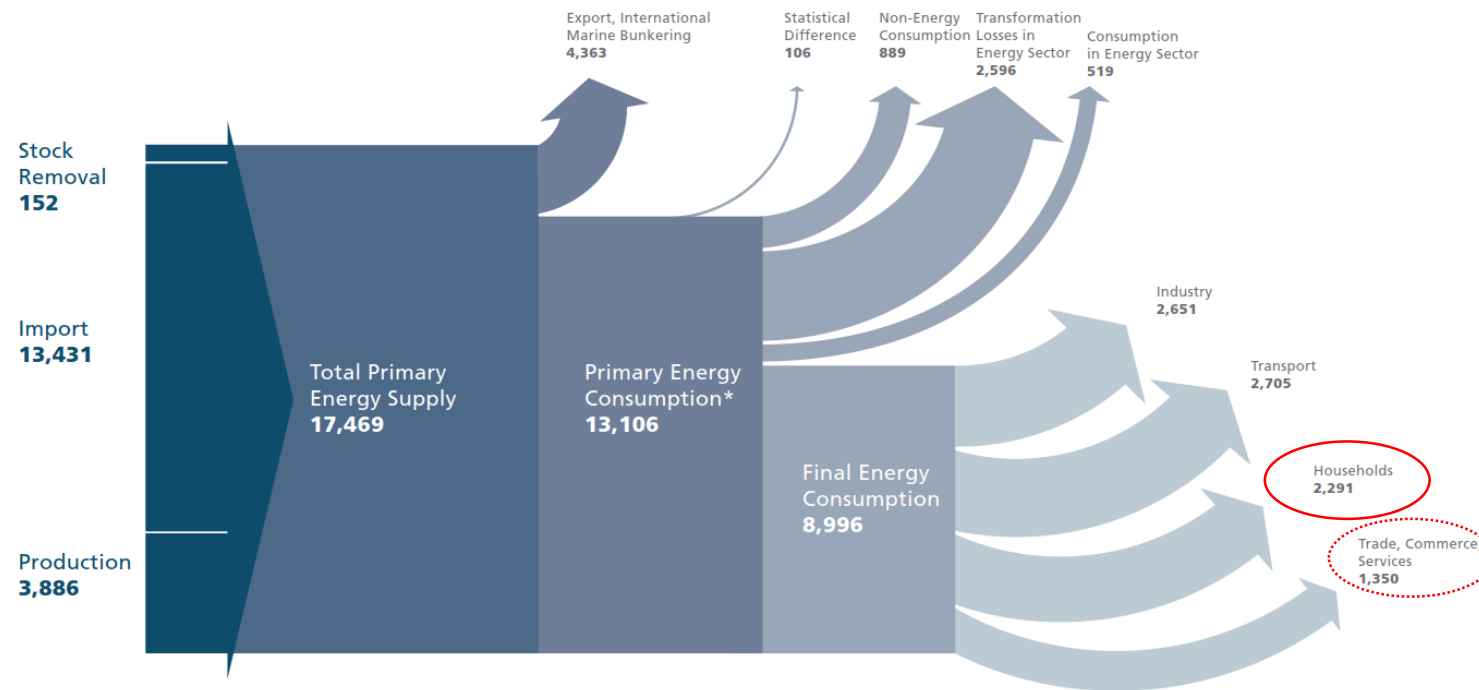


Some overcapacity, smart meters



Space heating/cooling is the single biggest (besides transportation) segment of energy consumption

**Energy Flow Chart
for the Federal Republic of Germany in 2018***
Petajoule (PJ)



Deviations from the total amounts are due to rounding.
 The total proportion of renewable energy sources of the primary energy consumption is 13.8 %.
 * Data preliminary.
 29,3 Petajoule (PJ) ≙ 1 Mio. t SKE
 Source: Arbeitsgemeinschaft Energiebilanzen 09/2019

Thank You for Your attention!