

ETN WORKSHOP

ENHANCED PERFORMANCE AND OPERATIONAL FLEXIBILITY – USER PERSPECTIVE

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Leiden, 21/03/2024



RESTRICTED



INTERNAL

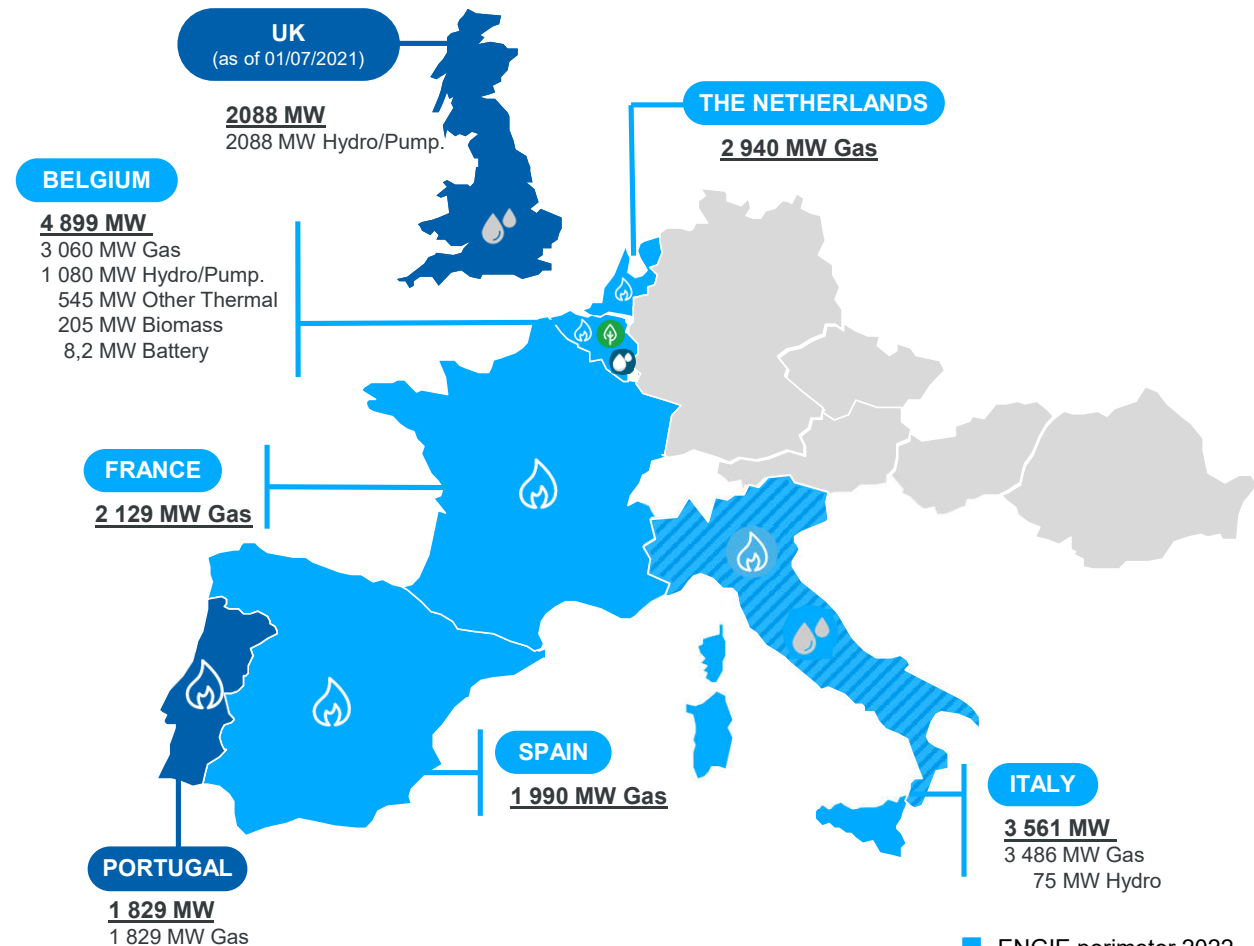
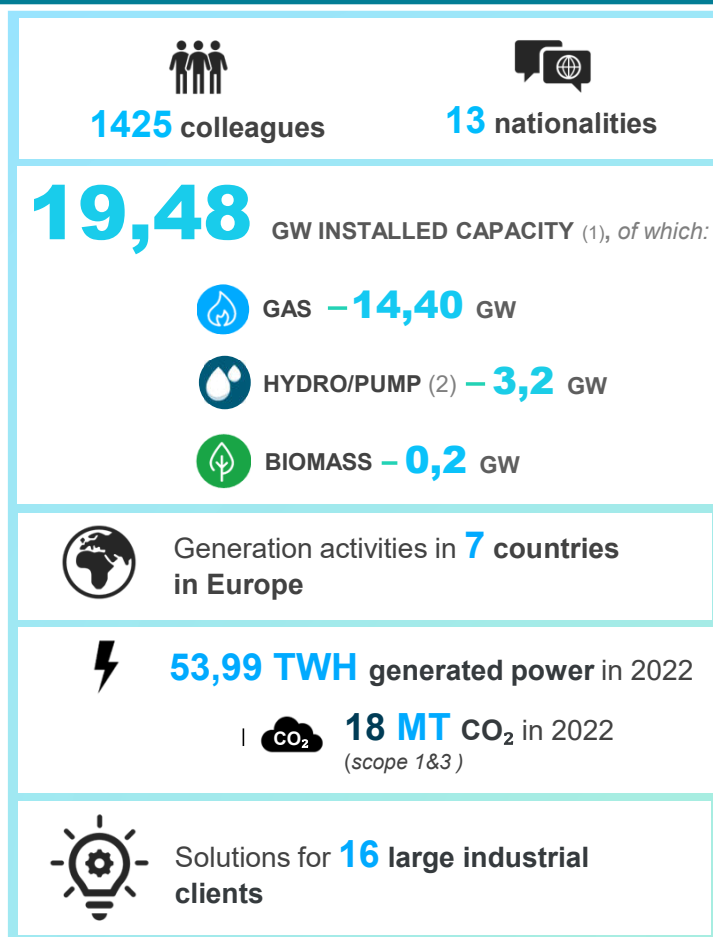


SECRET



Engie Flexible Generation Europe

At a glance



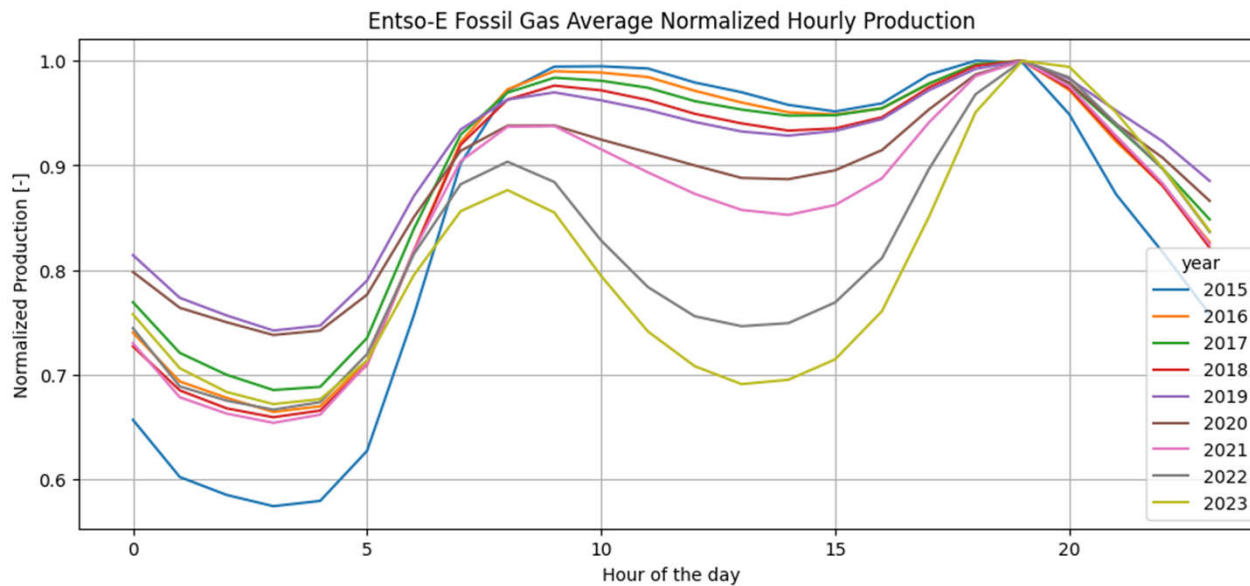
(1) Maximum Net Installed capacity @ 100%. Figures at 01.12.2022

(2) Including Hydro Drawings Rights Switzerland – BKW Hydro (46 MW)

(3) of which ENGIE 1170 MW and Tirreno Power 2 377 MW (consolidated at 100%)

Energy market evolution

Lookback and Future



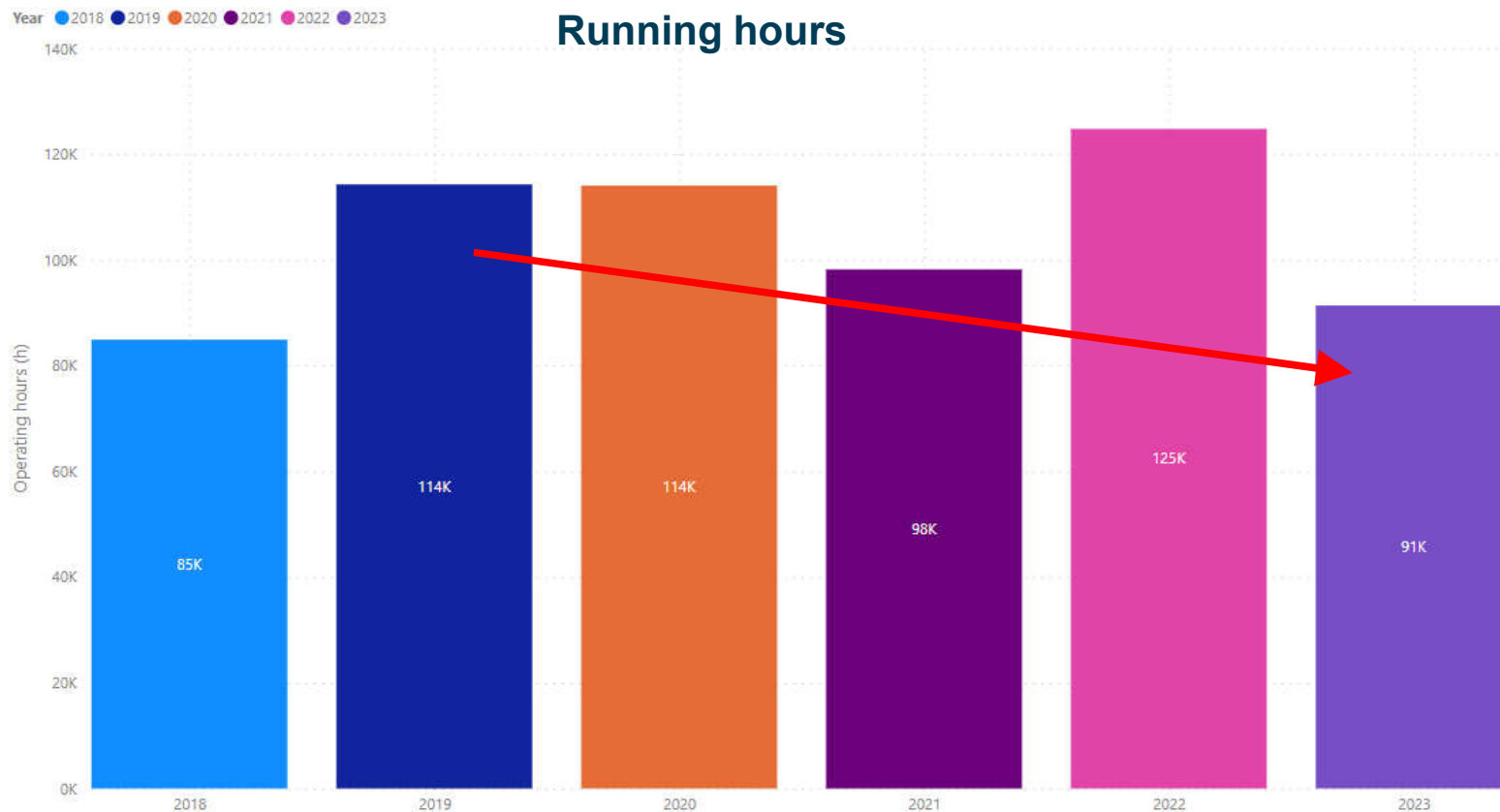
RES is shaping more and more the production shape of the CCGTs
... leading to the famous “duck curve”, or even “flying duck curve”

FIGURE 7-21 — MARKET DRIVEN RUNNING HOURS FOR THE MOST EFFICIENT CCGT, EXISTING CCGT AND OLD CCGT UNITS INSTALLED IN THE SYSTEM IN BELGIUM FOR 2025, 2026, 2028, 2030 AND 2034 FOR DIFFERENT GENERATION MIXES AND FUEL PRICES



From ELIA (B) Adequacy Report

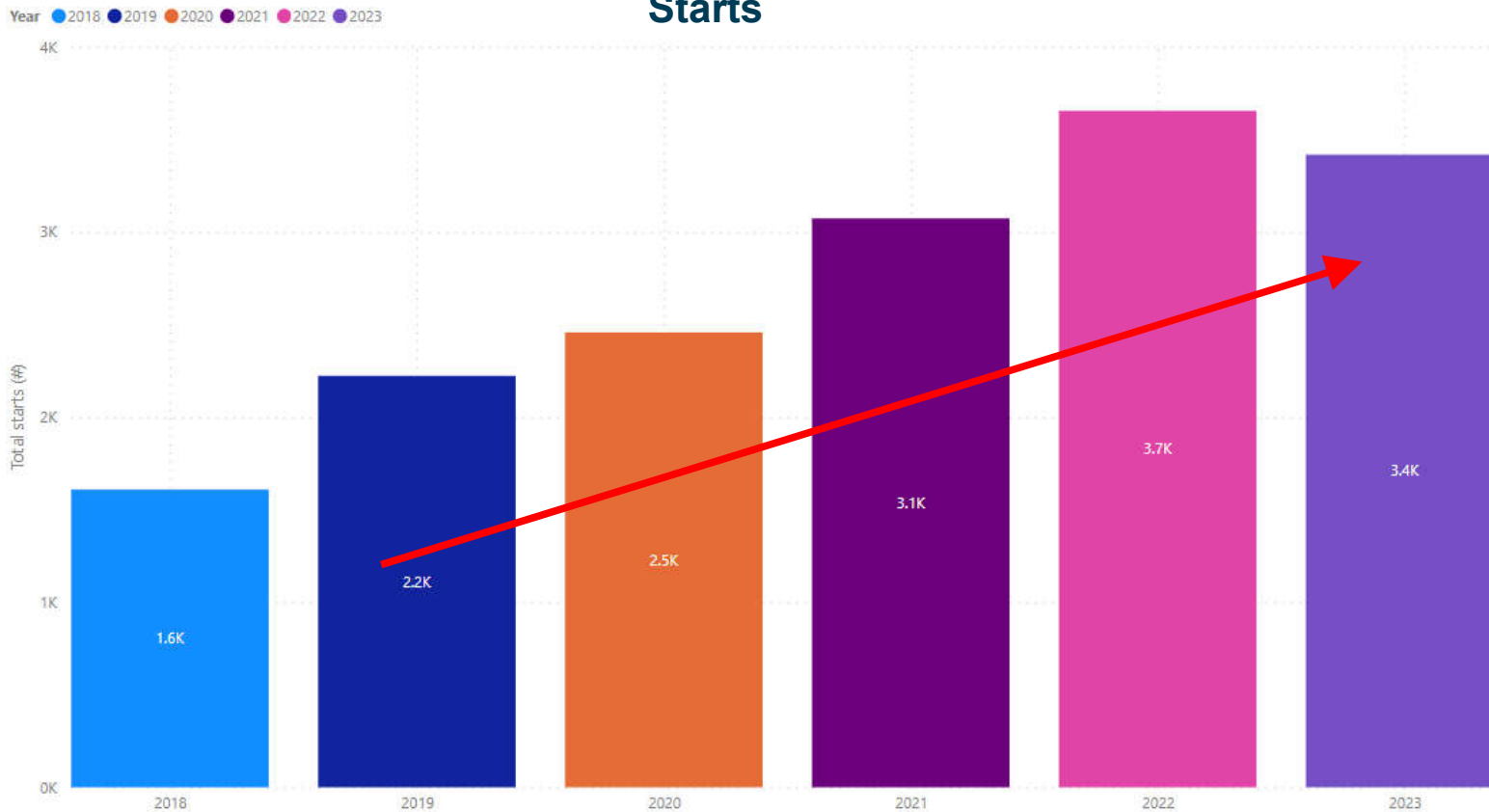
European fleet dispatch Reality



- Start optimization and reliability
- Availability
- Ramp rate
- Pmin
- Efficiency
- Fuel flexibility

European fleet dispatch Reality

Starts



- Start optimization and reliability
- Availability
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MXL3 upgrade Flevo 5: “launch” project

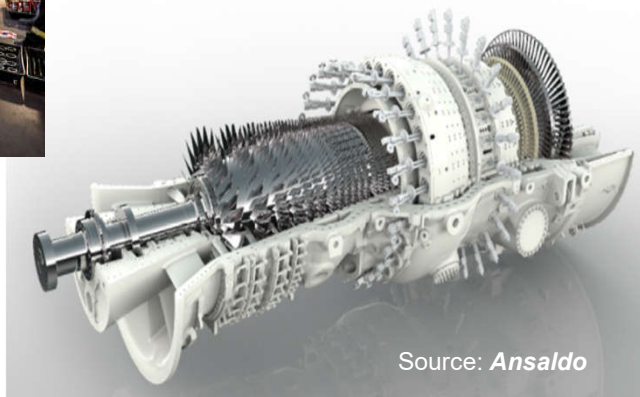
Cooperation Agreement with Ansaldo, the Netherlands: by acting as a launch customer for the **MXL3 upgrade of our GT26 gas turbines**, we are a worldwide first-mover in the market.



“

This upgrade will increase the **flexibility** and **performance** of our units with **co-firing** of hydrogen optionalities.

”



Source: *Ansaldo*

- >60% CCGT efficiency
- Unique F-class performance, big leap ahead of other F-class technology
- Maintenance interval extension
- Increase of H2 co-firing capability to 50vol%

