



E-Production and Consumption mixes in Belgium

Critical analysis of the TSO Report 2024

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Sources of data

<https://transparency.entsoe.eu/generation/r2/actualGenerationPerGenerationUnit/show>

www.elia.be

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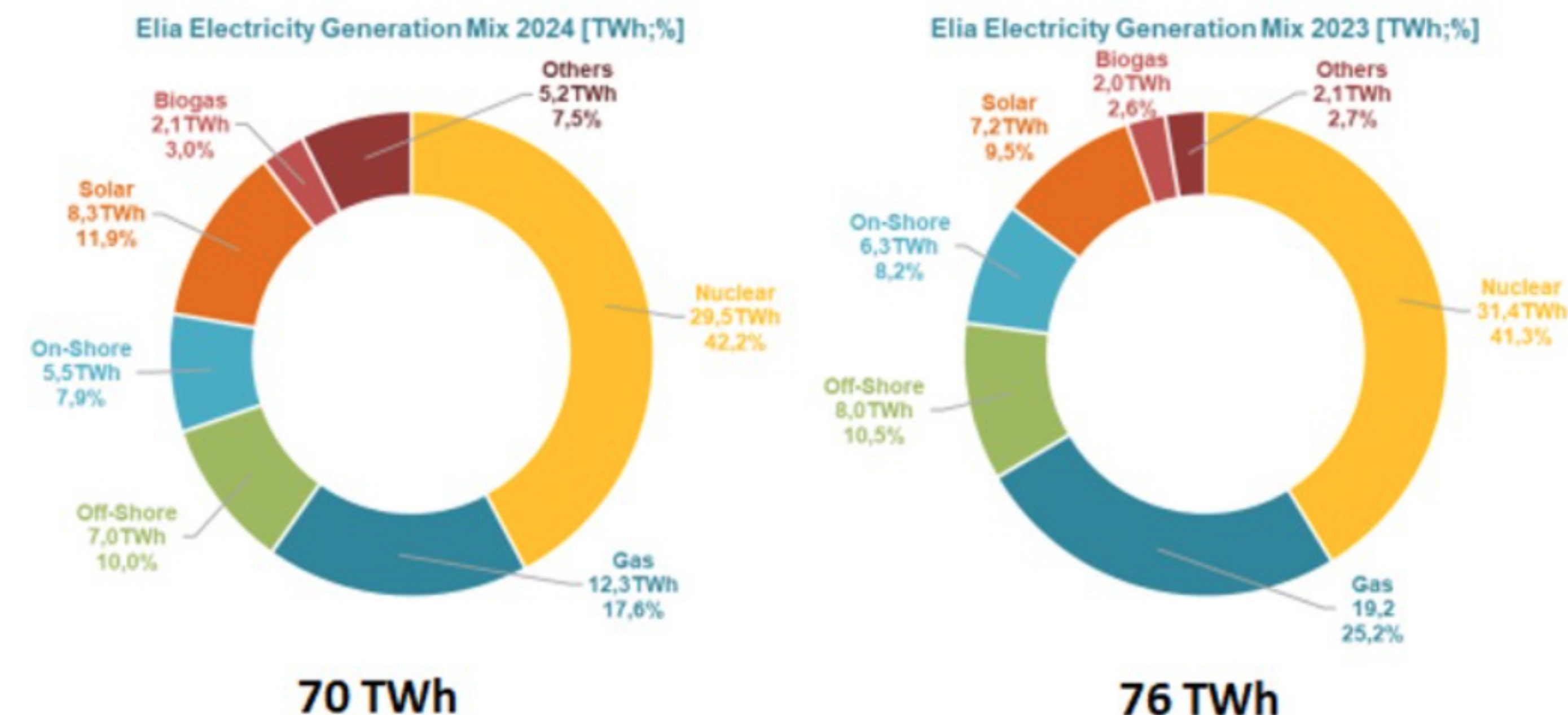


Electricity mix for Belgium in 2024: record international exchanges, significant increase in solar generation, and low use of gas-fired capacities

Trends in 2024*

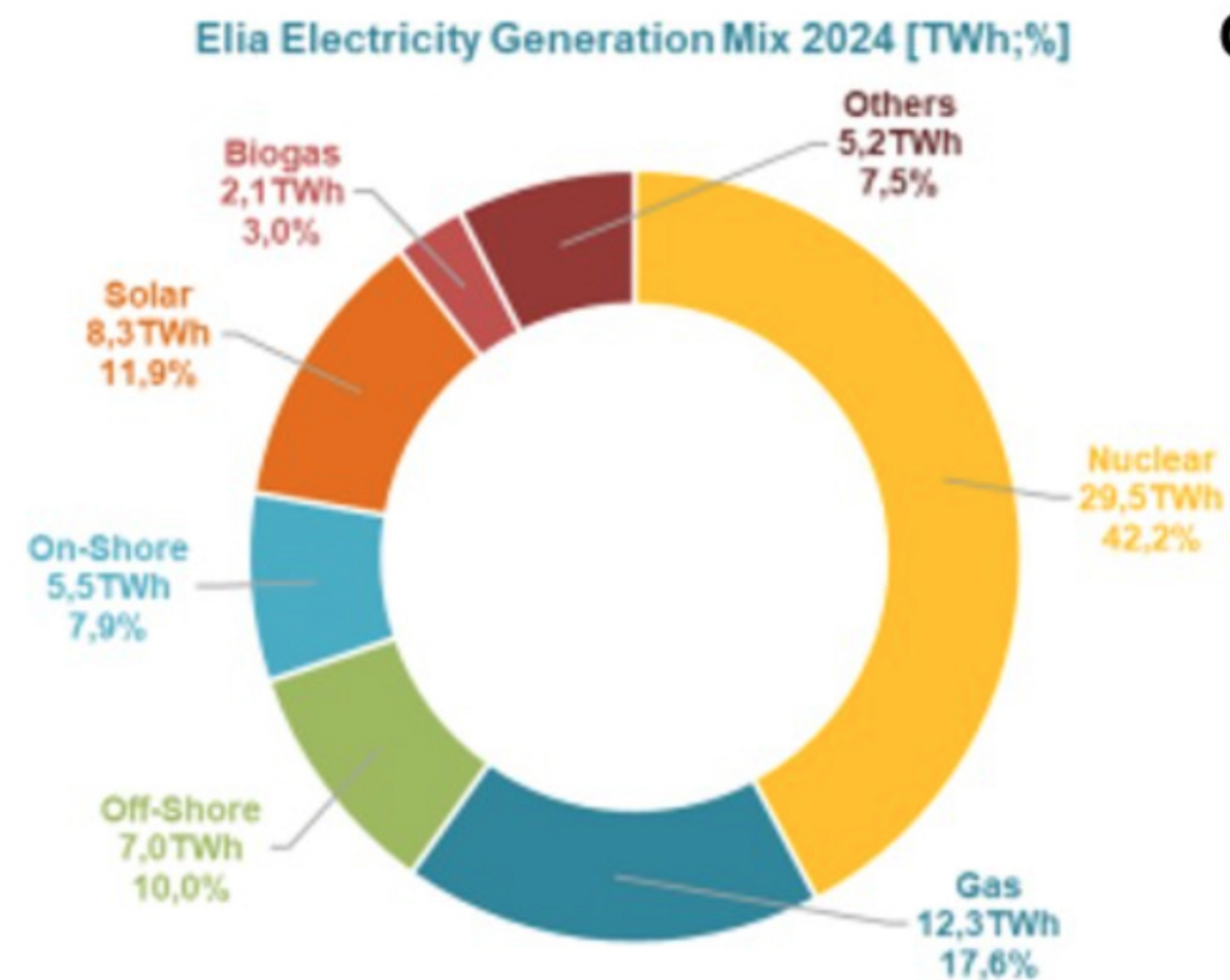
- International exchanges were higher than ever with more than 44.5 TWh traded. Net imports from France reached 12.6 TWh.
- With a 23% increase in installed capacity, solar is breaking many records. Renewable generation in Belgium hit a new record, accounting for 29.8% of the electricity mix (compared to 28.2% in 2023).
- Gas-fired generation hit an all-time low, making up 17.6% of the generation mix (compared to 25.2% in 2023 and 26.9% in 2022). The share of nuclear in the electricity mix fell for the fourth consecutive year.
- Electricity consumption started slowly rising again, surpassing 80.5 TWh (compared to 78.9 TWh in 2023).
- Prices were down on average by 28% compared to 2023 but remained higher than they were prior to the gas crisis.

Belgian electricity generation mix in 2024 and 2023



*Results based on data up to and including 29 December 2024

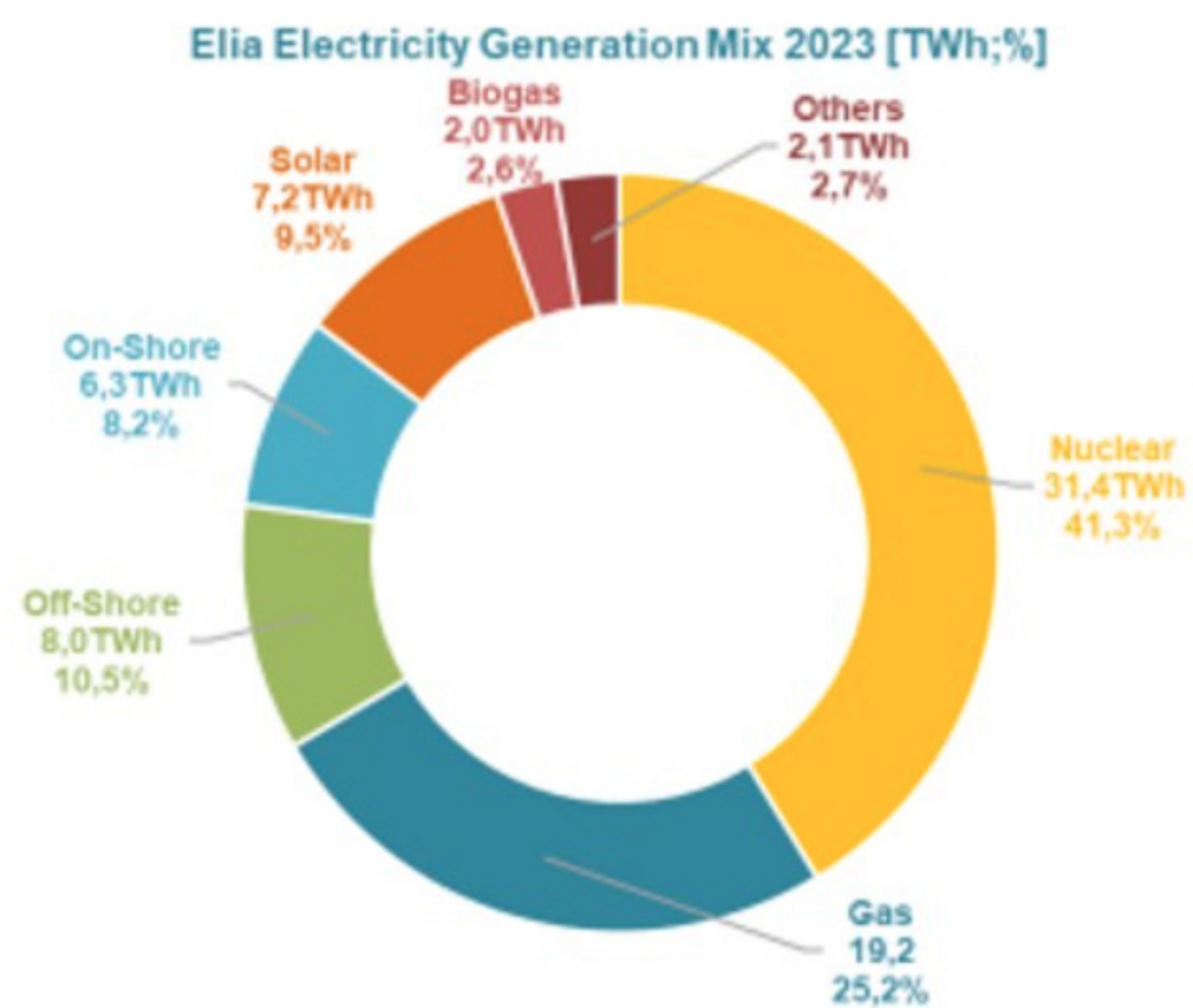
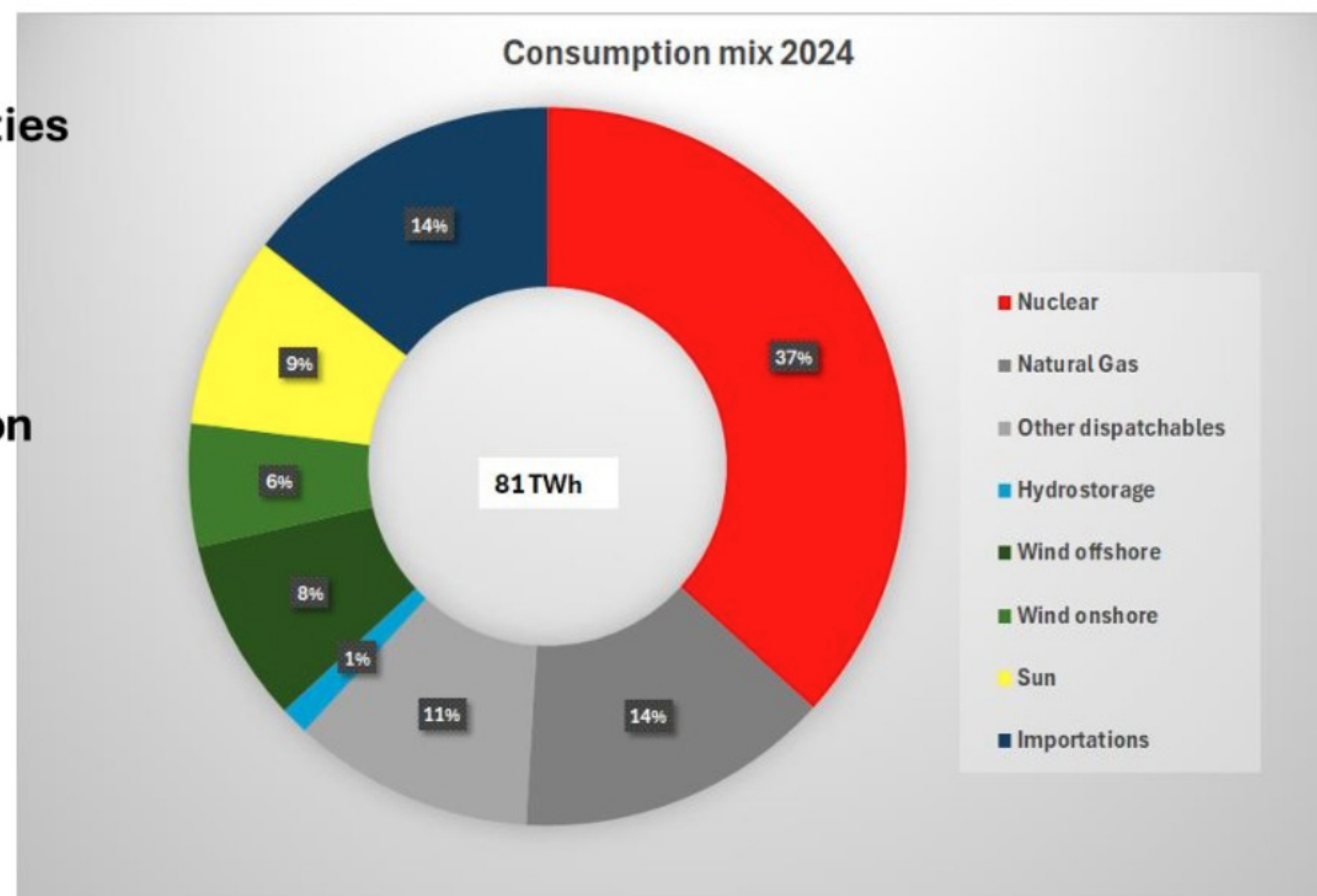
- **Stressing records on international exchanges: i.e., ELIA Belgian TSO key business**
- **No mention of usefulness of RESi production with respect to actual E-demand**
- **Graphics on % comparisons with production rather than with actual demand usage**
- **No inclusion of Exports or Imports into graphs, no valuation of Hydrostorage**
- **No mention of CO₂ emissions, the main incentive for implementing RES (Renewable Energy Sources)**
- **Lists of irrelevant so-called 'records'**



70 TWh

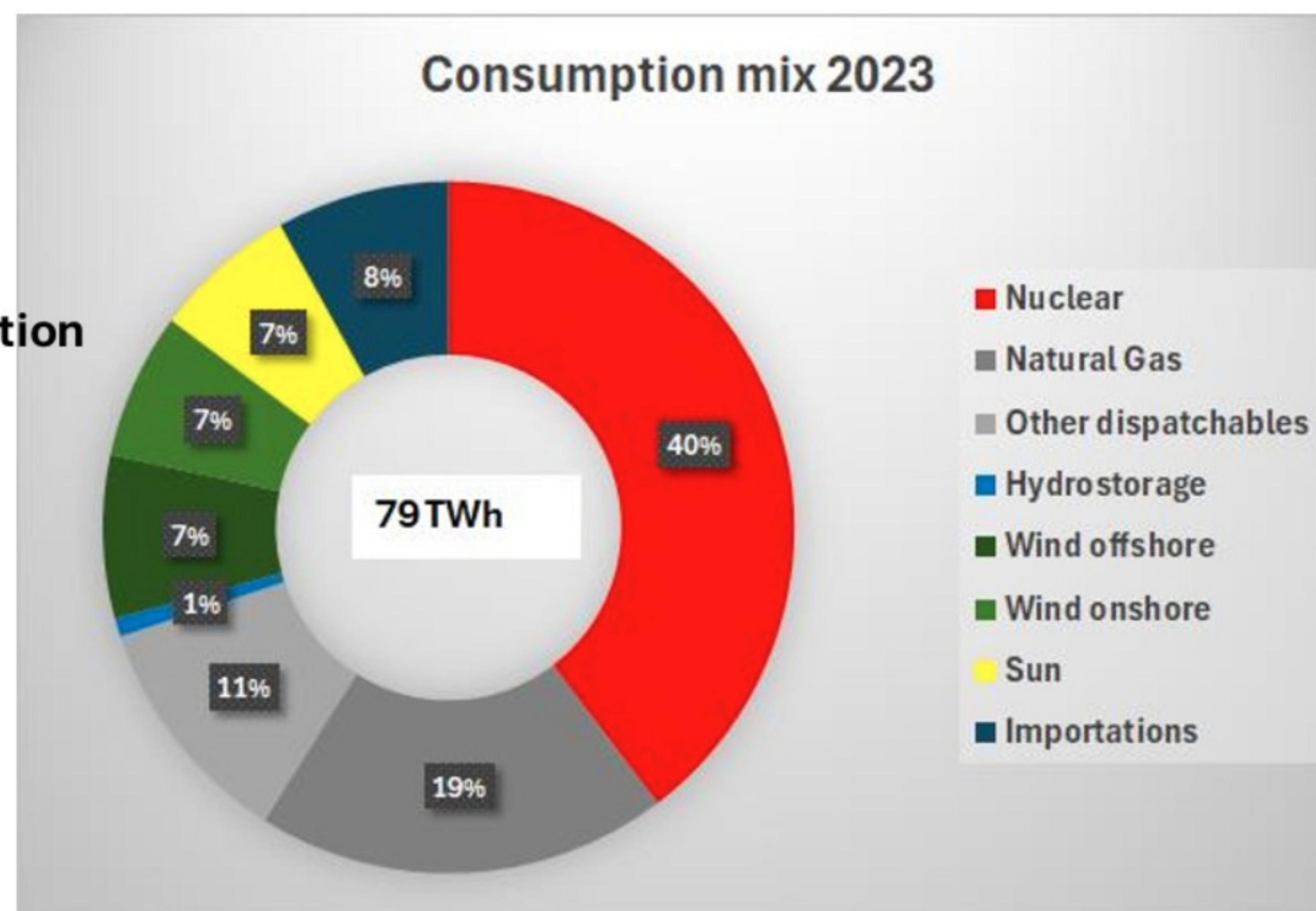
CO2 emission intensities
(Own evaluation)

155 g/kWh production



76 TWh

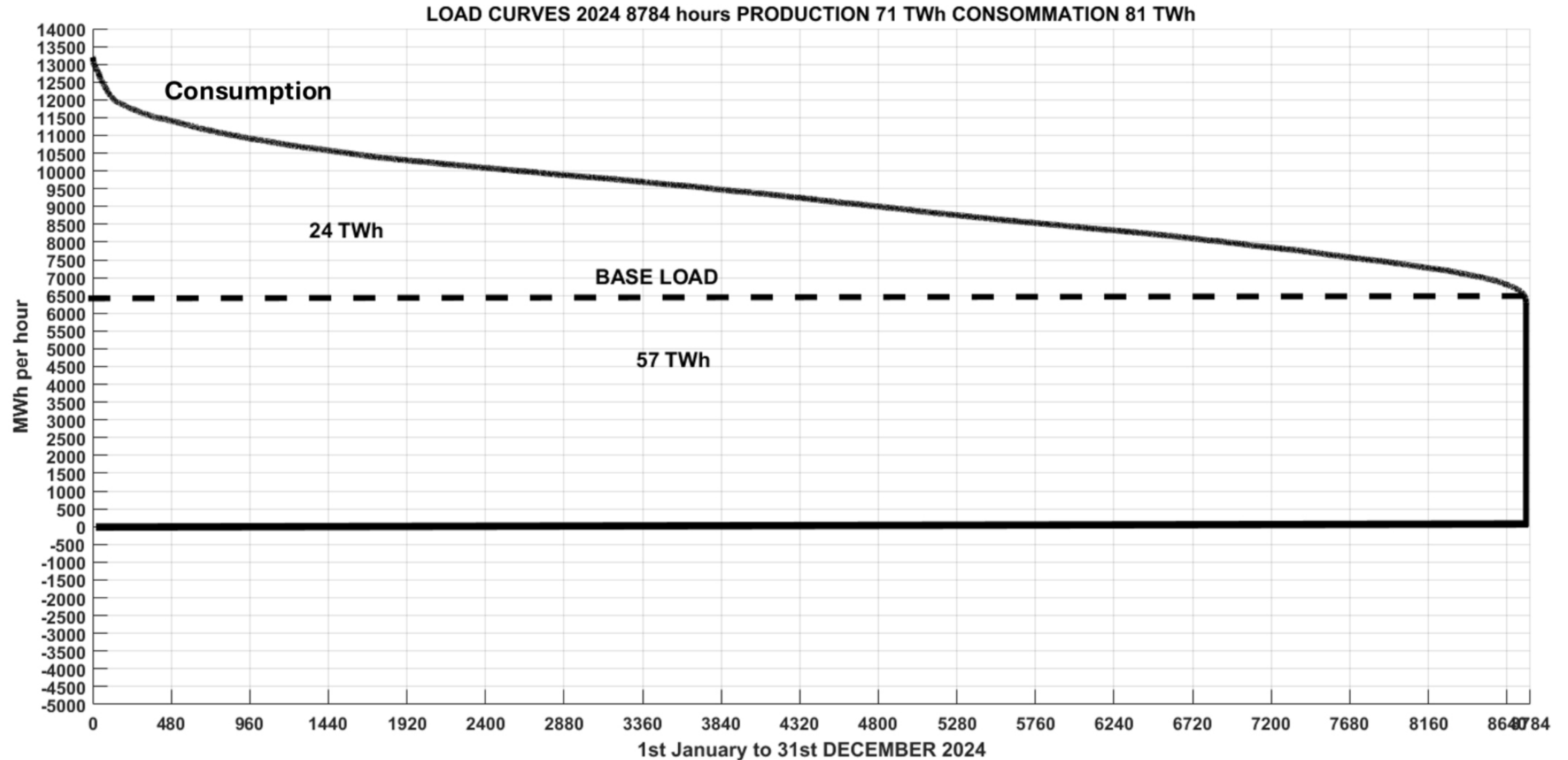
166 gCO2/kWh production



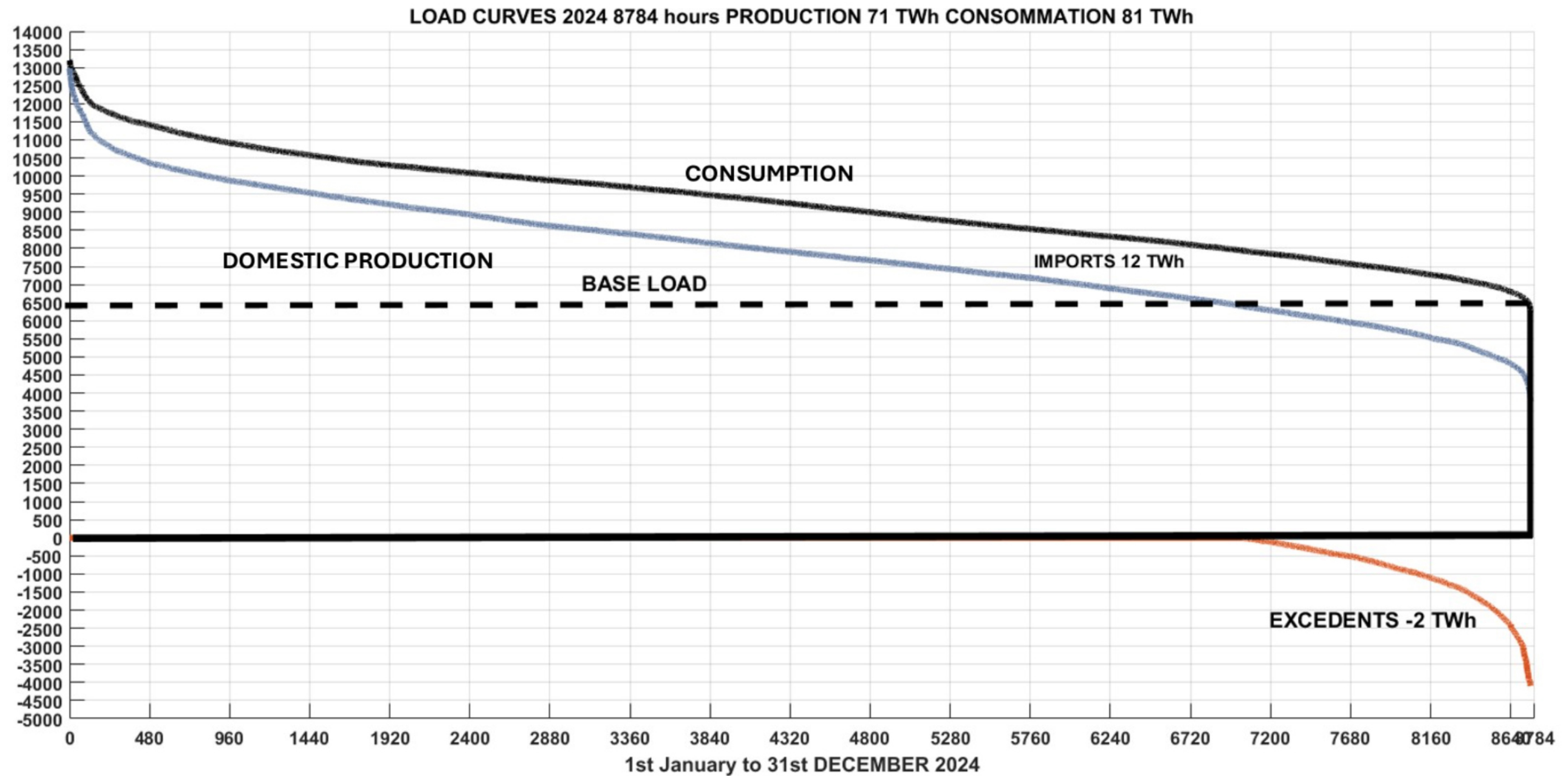
Better addressing those important questions

THE COMPLETE EVALUATIONS WITH LOAD CURVES IN FIVE STEPS

HOW TO FILL THE E-PUZZLE



Methology: at each step order power data per hour in descending order



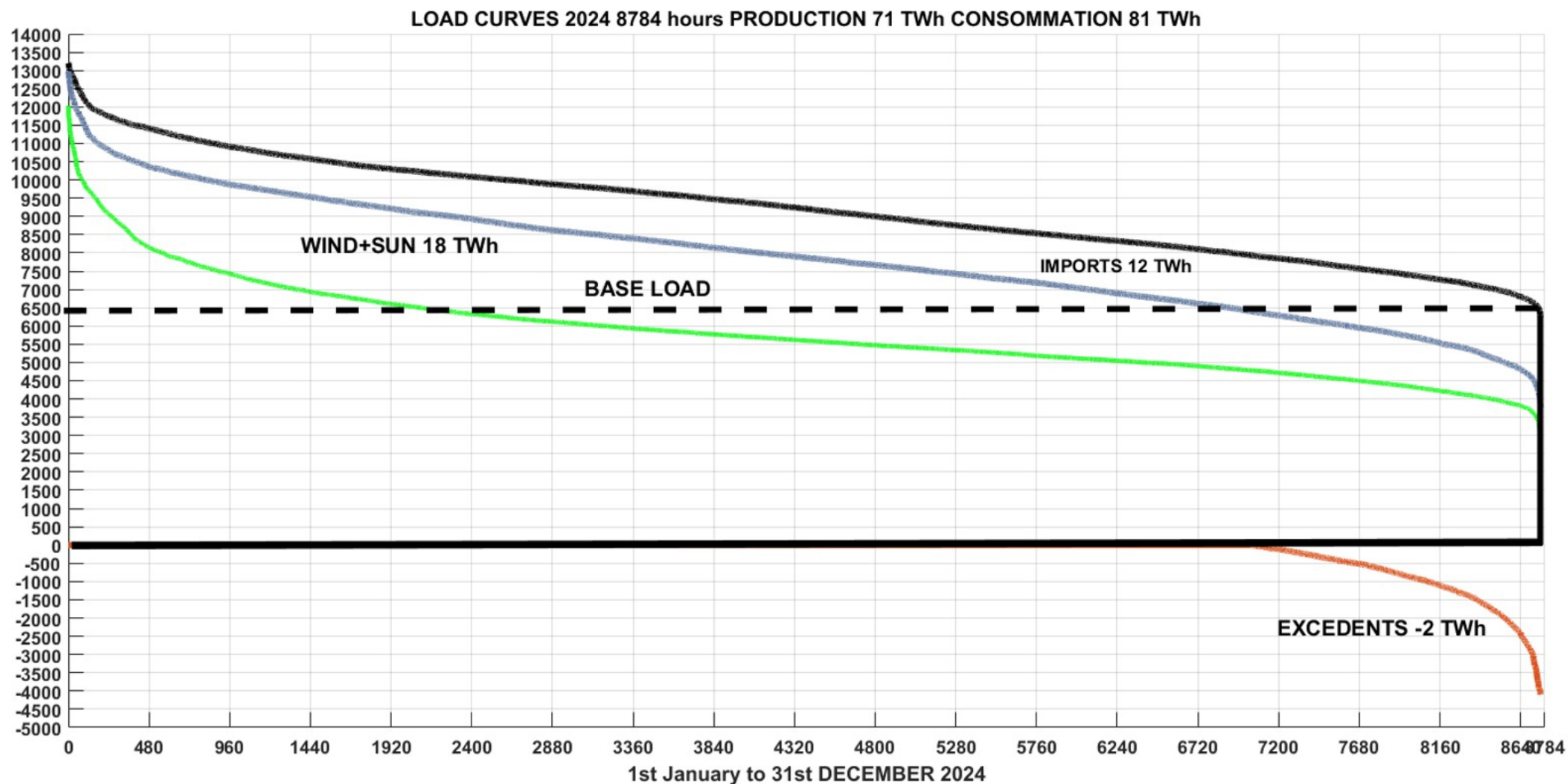
Methodology:

Calculate needs for imports as positive difference (demand-production*) each hour

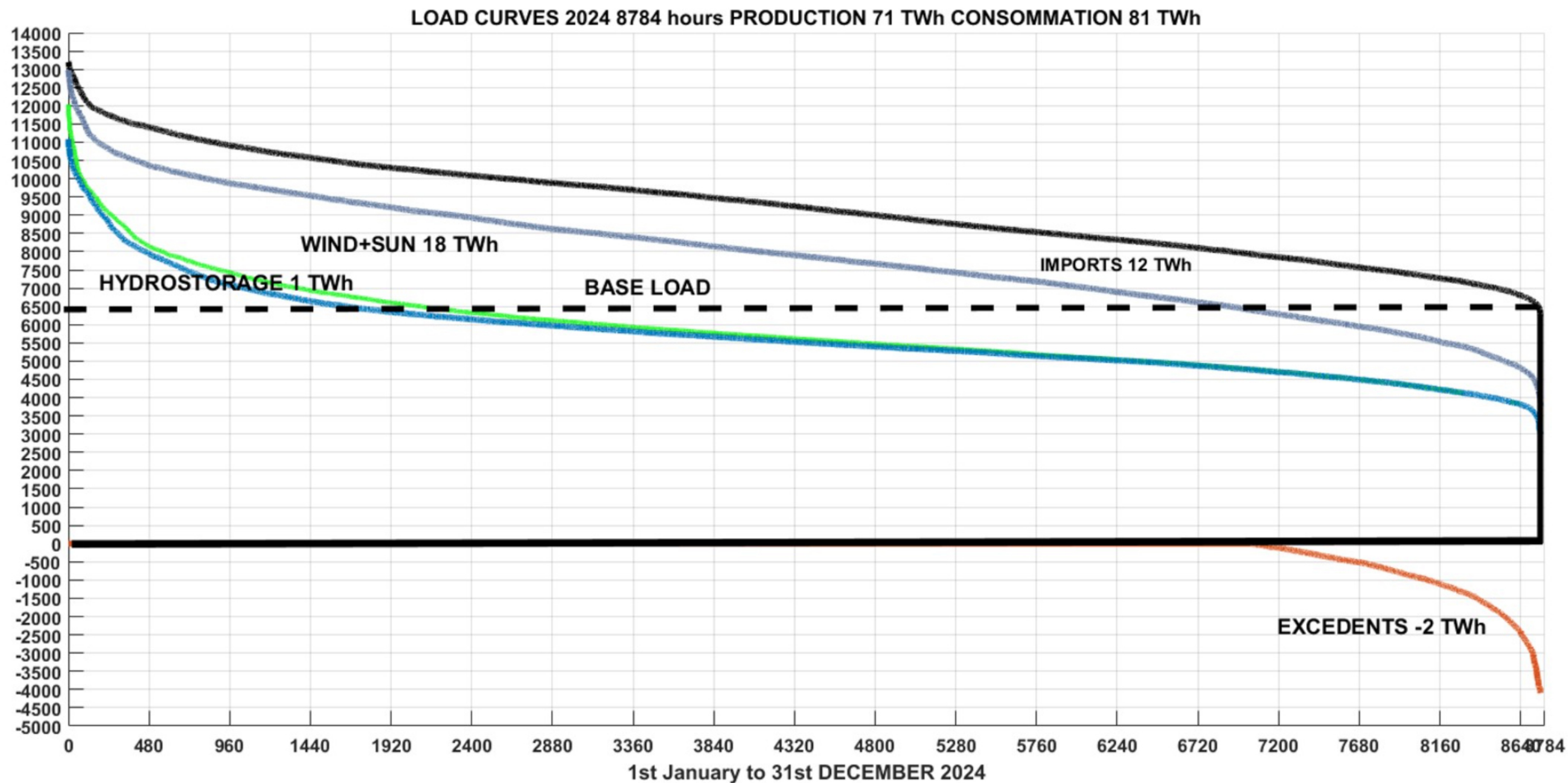
Calculate excedents as positive difference (production*-demand) each hour

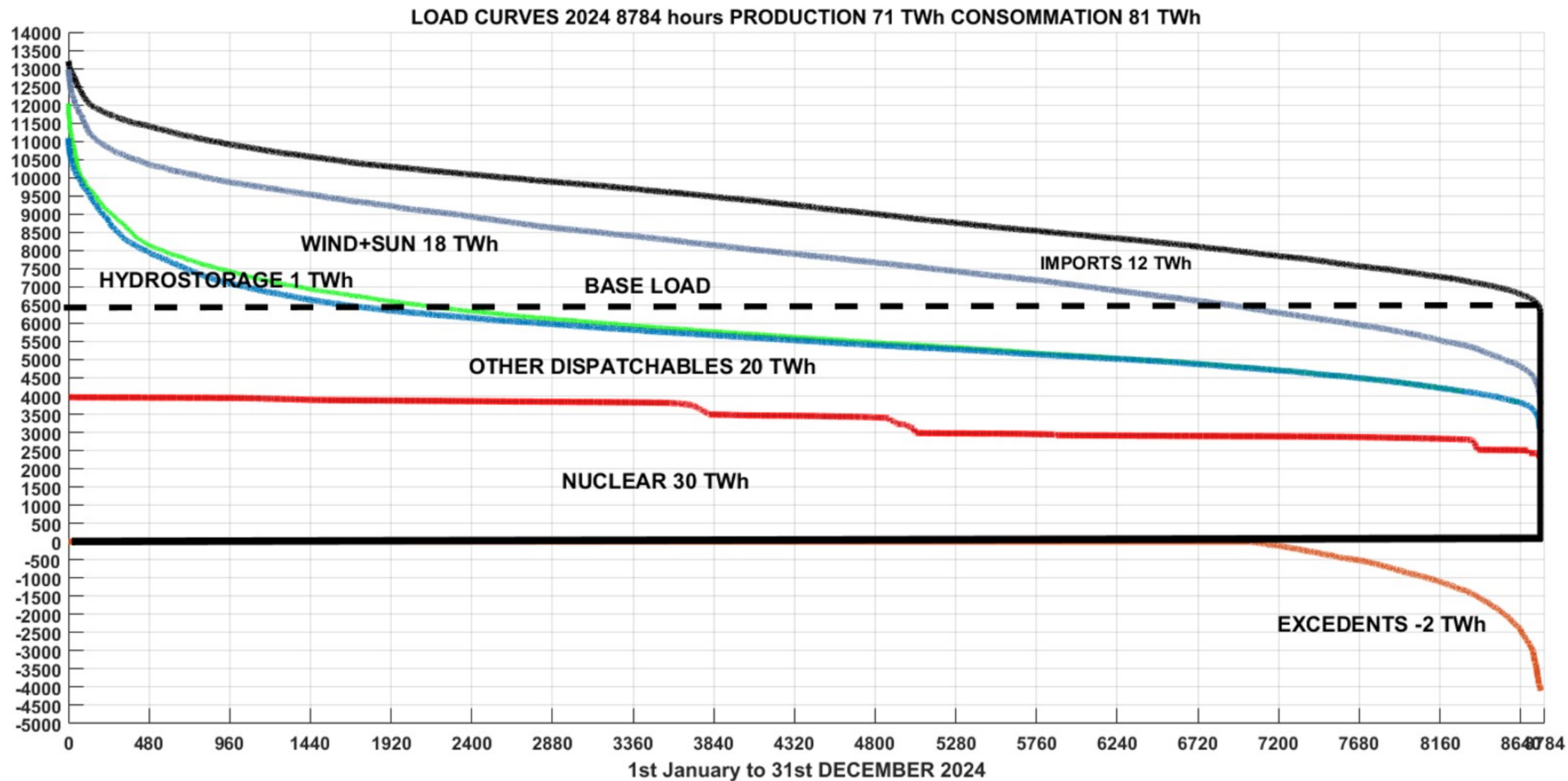
*excluding losses in the hydrostorage cycle

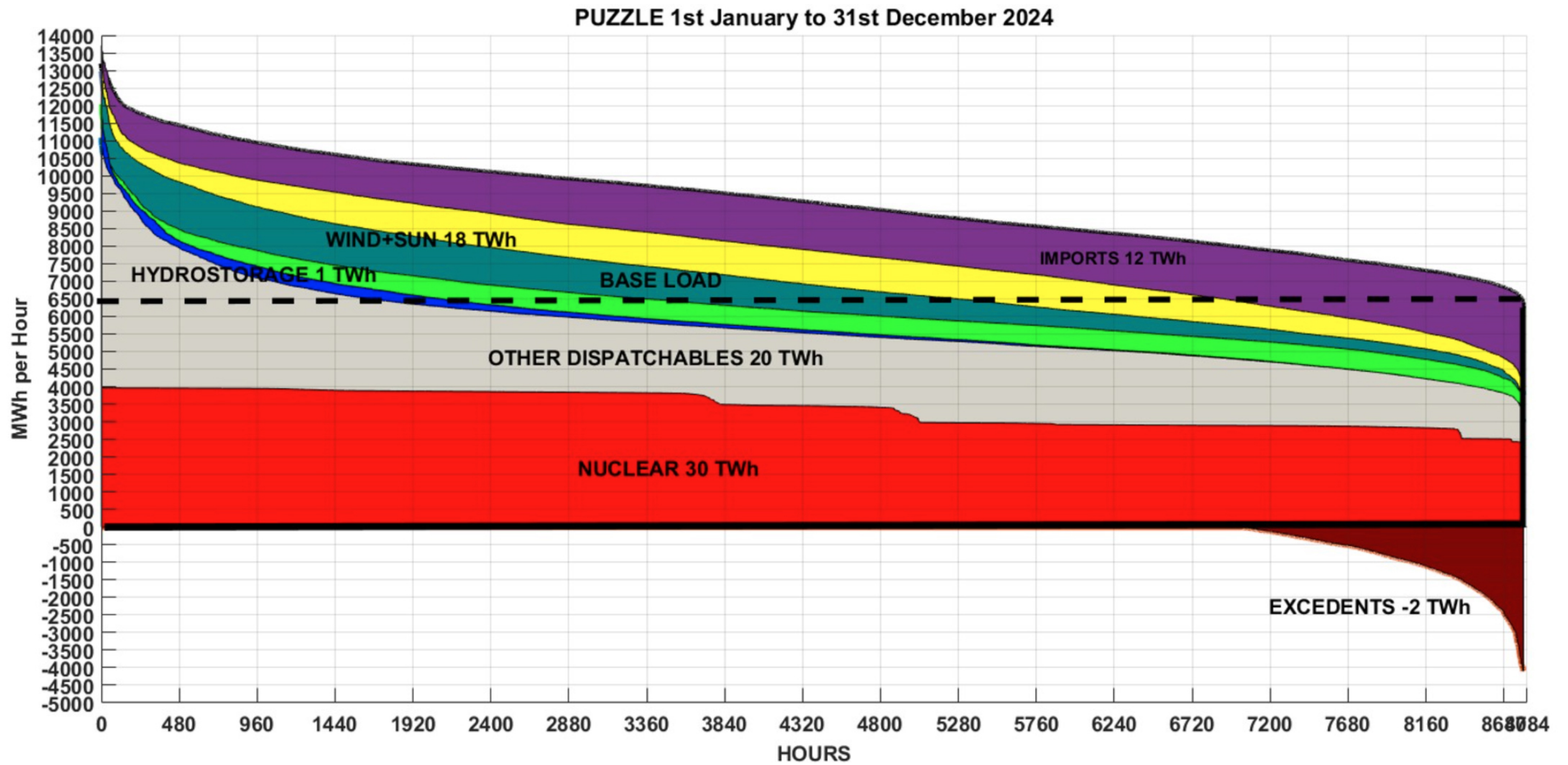
Note: Excedents mainly result from RESi production



Methodology: subtract in turn each domestic source keeping at each hour the minimum value between the resulting residual power and the consumption power

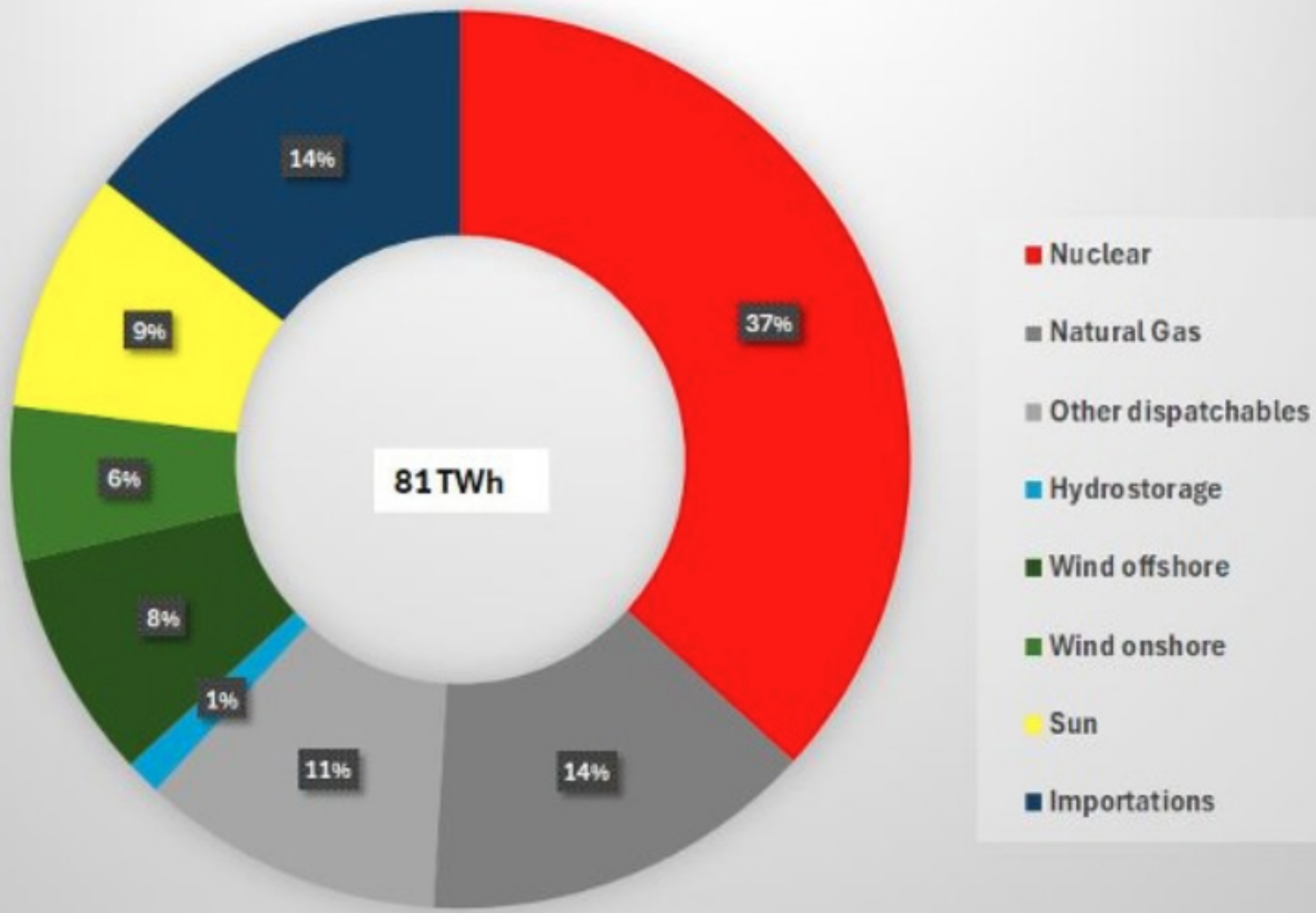




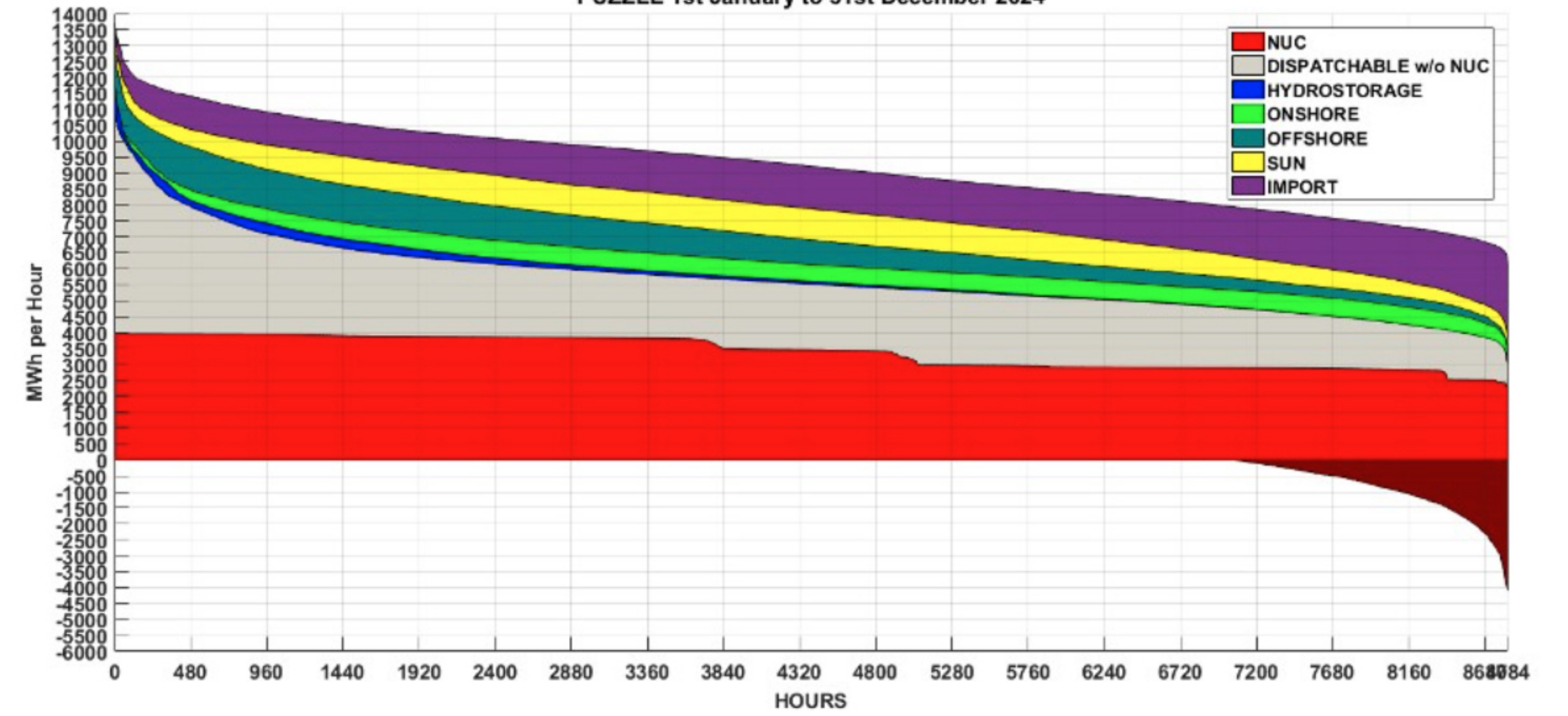


It appears here that nuclear production is best fitted to cover base load consumption

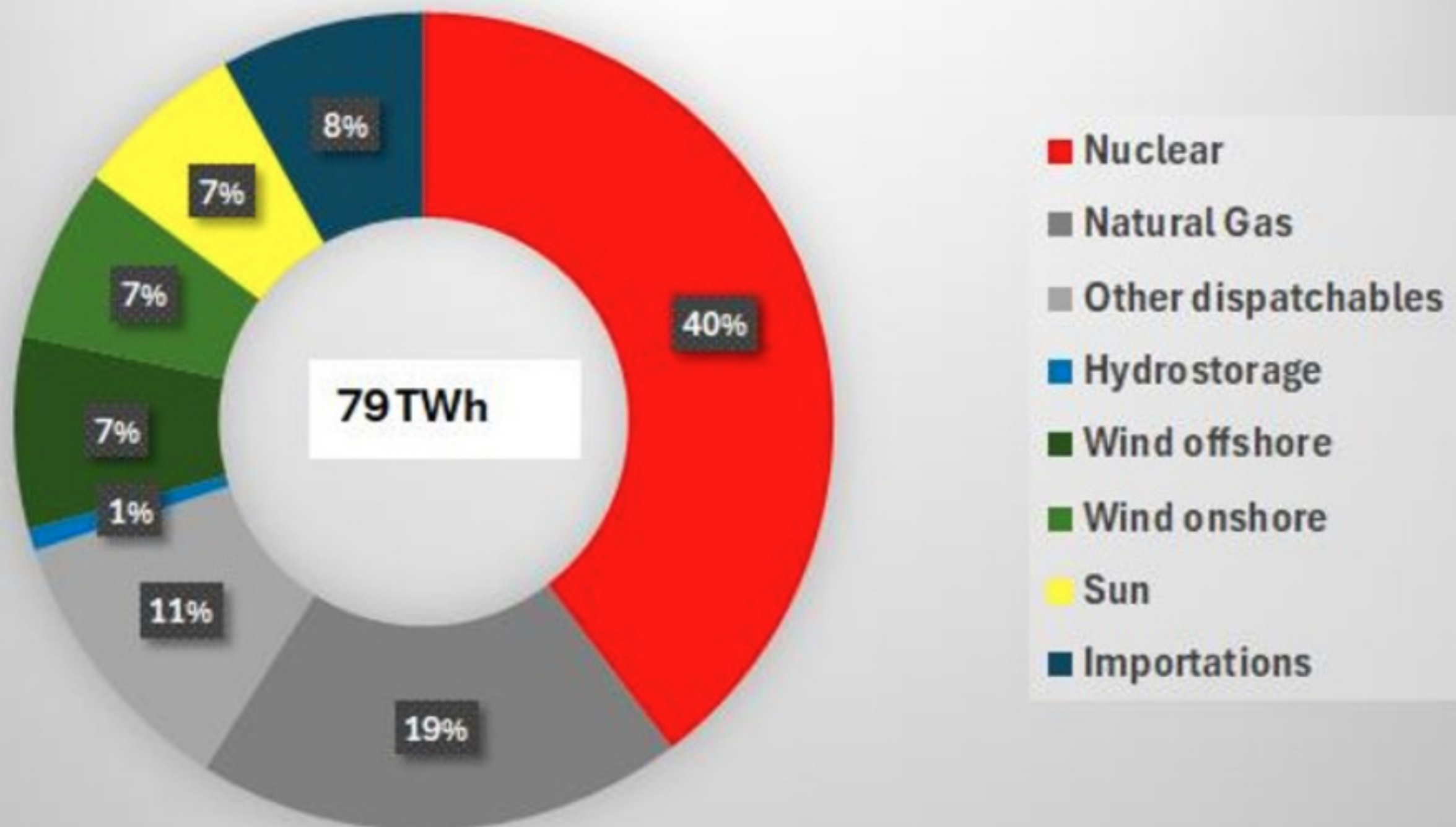
Consumption mix 2024



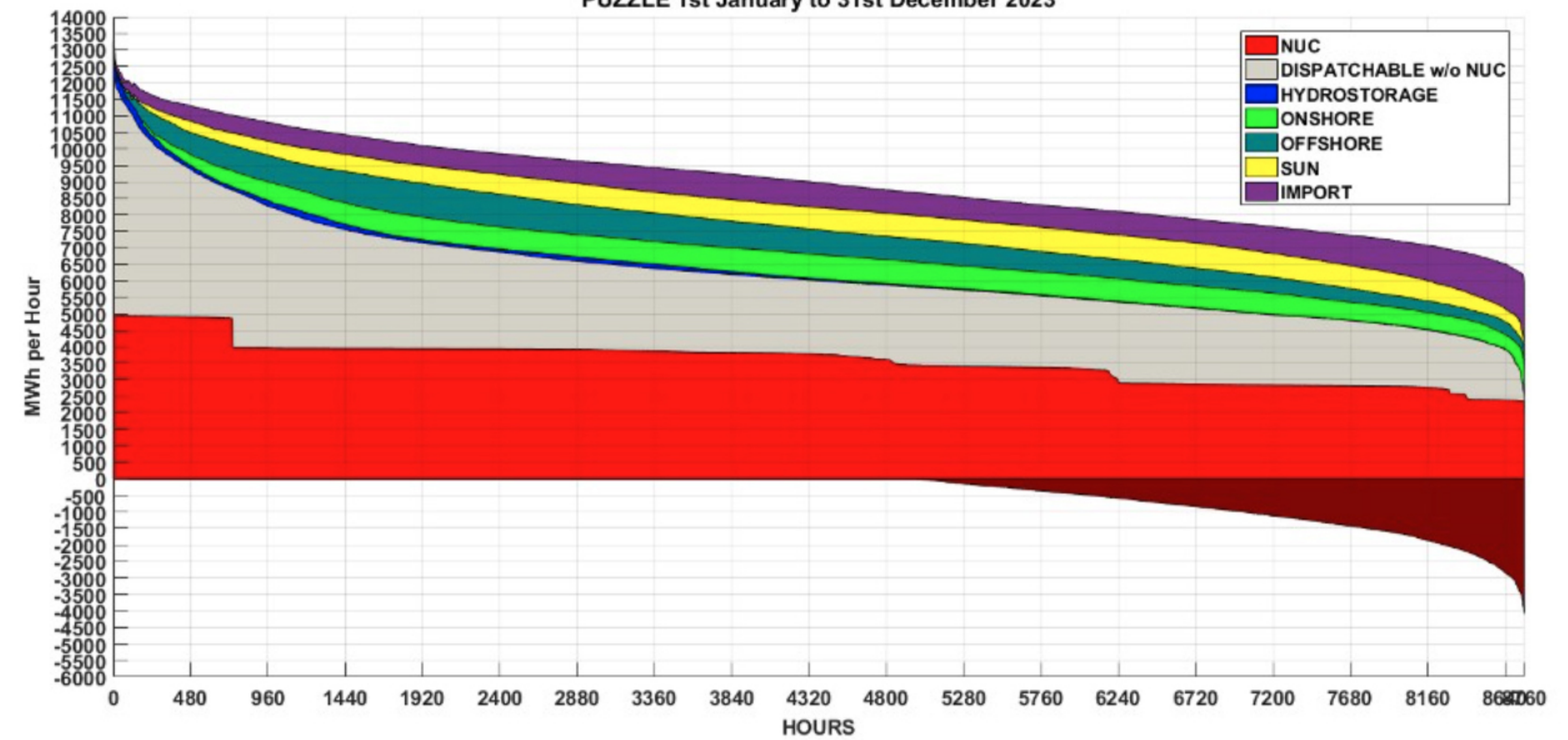
PUZZLE 1st January to 31st December 2024

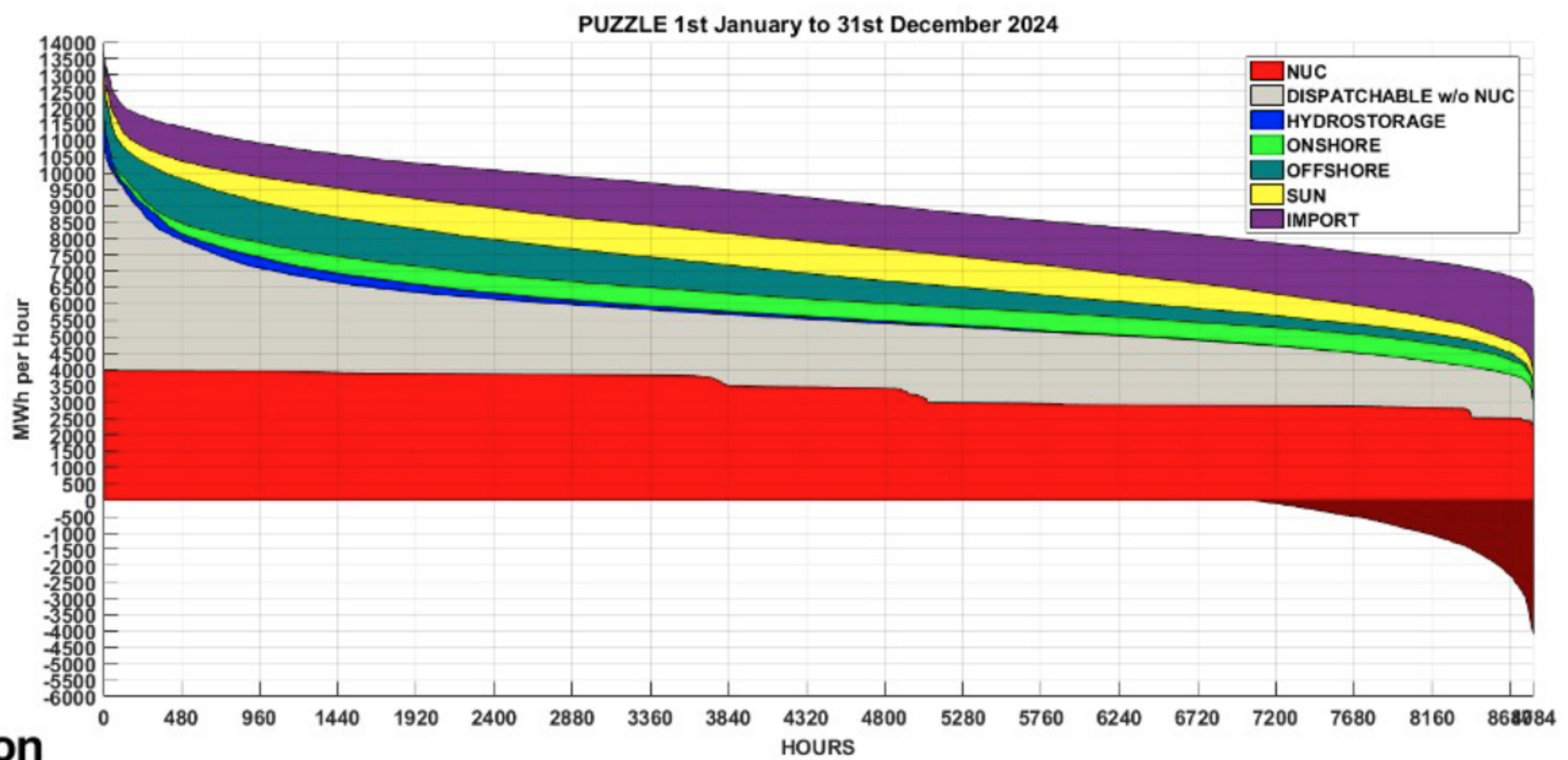
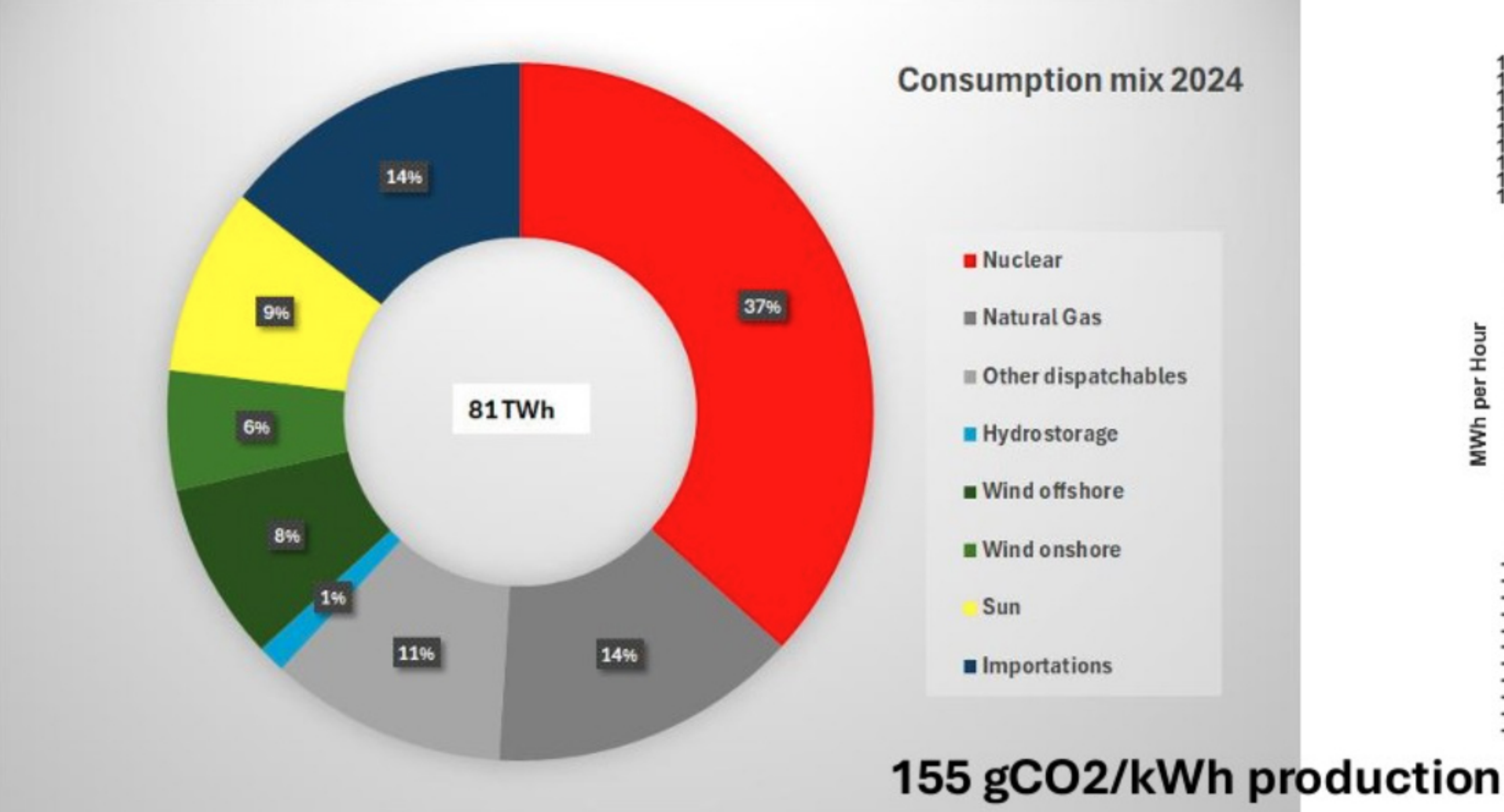
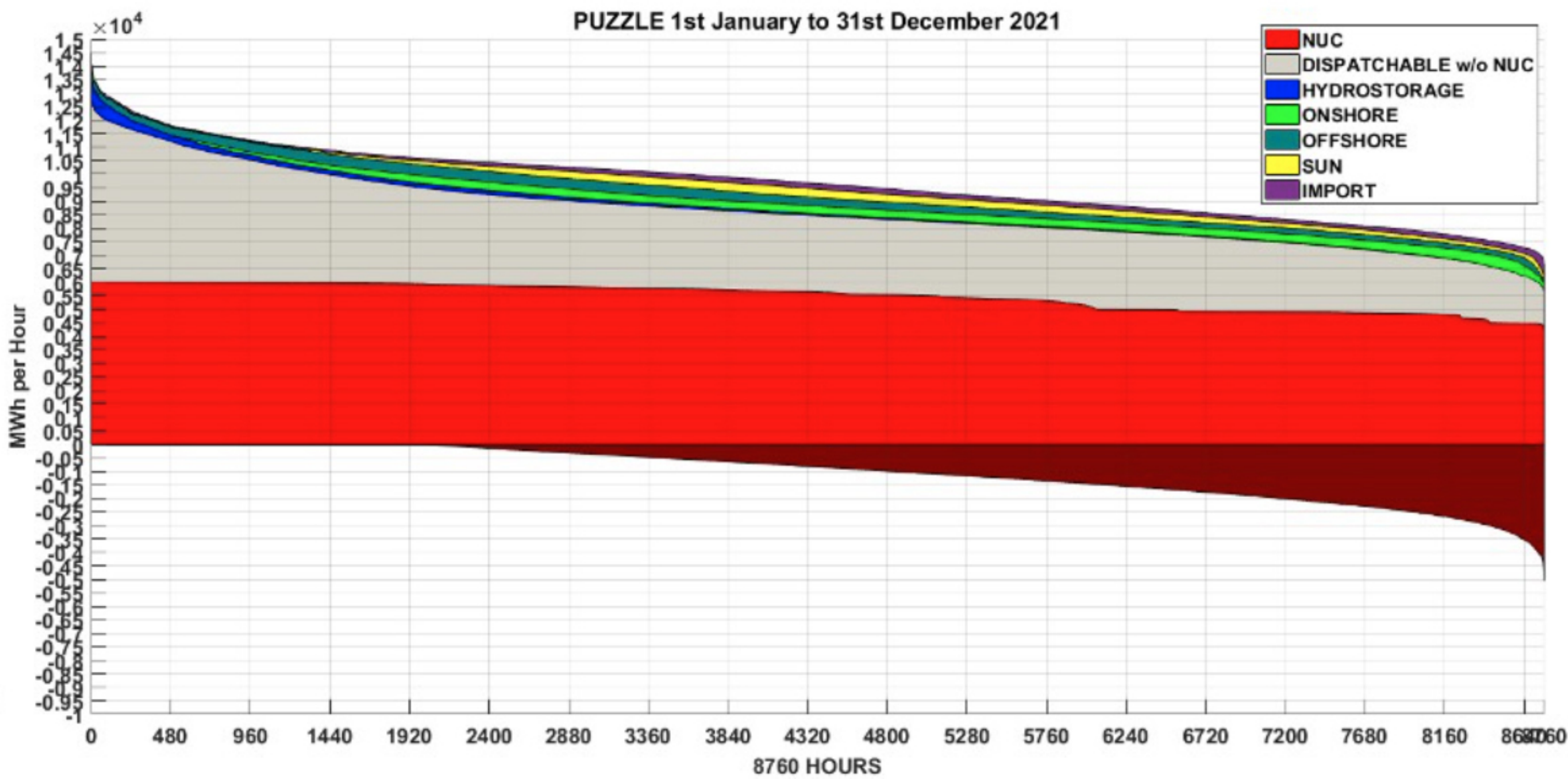
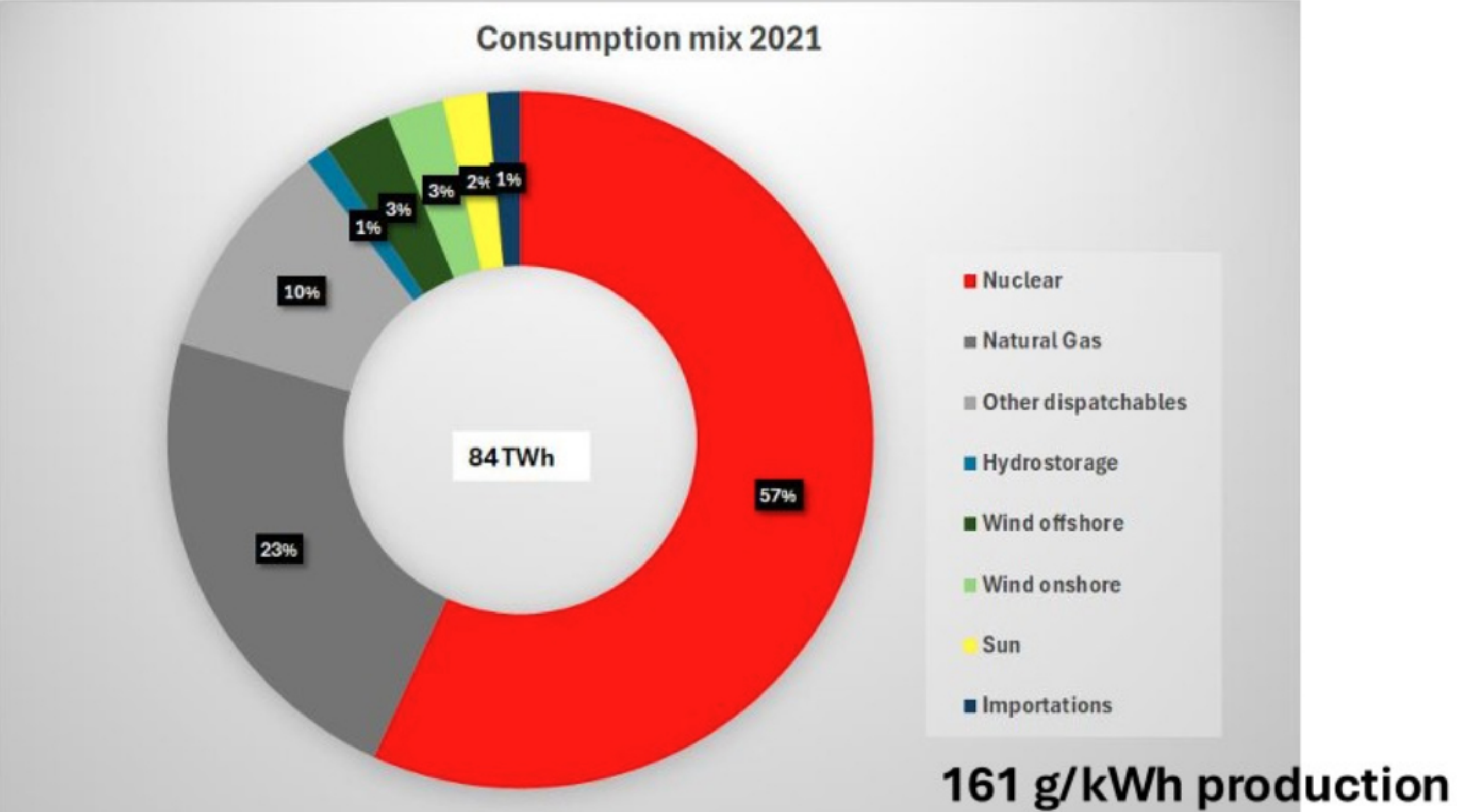


Consumption mix 2023



PUZZLE 1st January to 31st December 2023





The most useful comparison is with the year 2021 with still 6 GW nuclear capacity reduced to 4 GW in 2022/2023

ENERGY CONSERVATION IS THE BASIC LAW

SITUATION 31st DECEMBER 2024 MIDNIGHT					
ITEMS in TWh per year	2021 8760 h	% CONSUMPTION 2021	2024 8784 h	% CONSUMPTION 2024	2024 vs 2021
DISPATCHABLES + HYDROSTORAGE	76,68	90,8%	51,10	63,1%	-33,4%
NUCLEAIRE	47,96	56,8%	29,73	36,7%	-38,0%
DISPATCHABLES w/0 NUC	27,81	32,9%	20,34	25,1%	-26,9%
HYDROSTORAGE	0,91	1,1%	1,03	1,3%	16,8%
TOTAL WIN + SUN	6,50	7,9%	18,20	22,5%	172,8%
WIND	4,80	5,7%	11,18	13,8%	132,8%
SUN	1,70	2,0%	7,02	8,7%	313,9%
DOMESTIC PART of CONSUMPTION	83,18	98,5%	69,30	85,6%	-16,7%
DOMESTIC PRODUCTION	92,52	109,5%	71,37	88,1%	-22,9%
EXPORT	-9,04	-10,7%	-1,69	-2,1%	-81,3%
HYDROSTORAGE LOSSES	-0,30	-0,4%	-0,38	-0,5%	26,7%
IMPORTATION	1,28	1,5%	11,68	14,4%	815,1%
TOTAL CONSUMPTION	84,46	100,0%	80,98	100,0%	-4,1%
gcO2/kWh	160,6		155,4		-3,2%

TOTAL CONSUMPTION=DOMESTIC PART OF CONSUMPTION + IMPORTATION
=DOMESTIC PRODUCTION – EXPORT –HYDROSTORAGE LOSSES+IMPORTATION
= DISPATCHABLES+HYDROSTORAGE+TOTAL (WIN+SUN)+IMPORTATION

TOTAL (WIN+SUN) refers to the useful part of RESi production to covering demand, most excedents outside hydrostorage (=export+hydrostorage losses) stem from these sources