



FORATOM takeaways analysis from the Compass Lexecon report

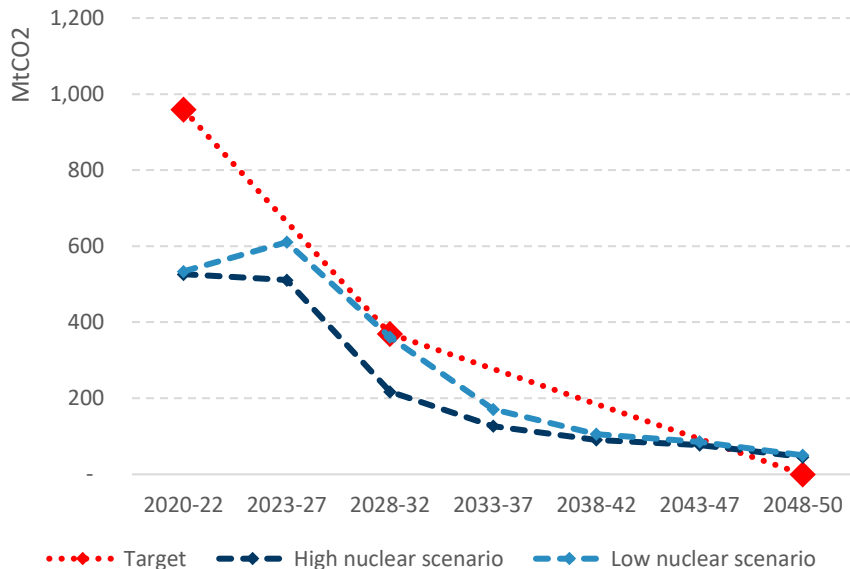
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NuclearEurope 2021 online conference - 15 June

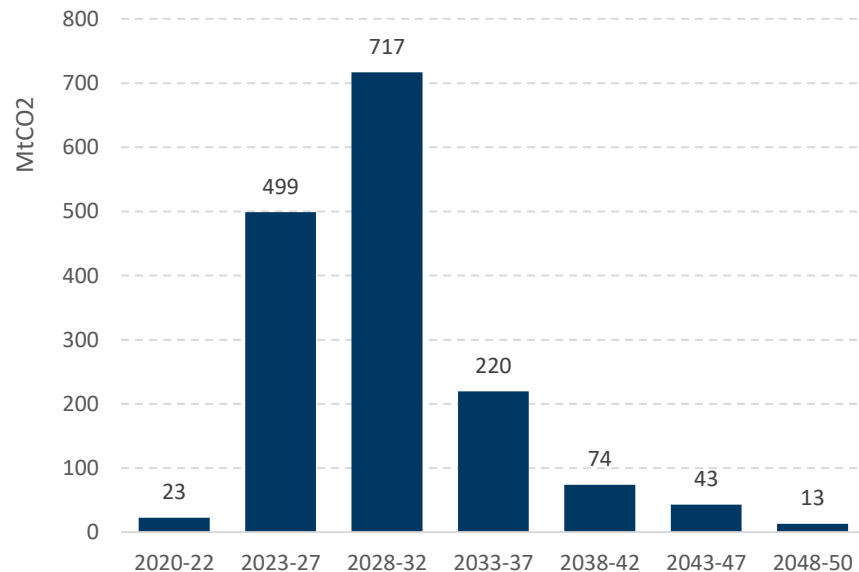
EU's decarbonisation ambitions and CL findings



CO₂ emissions outlook for the power sector

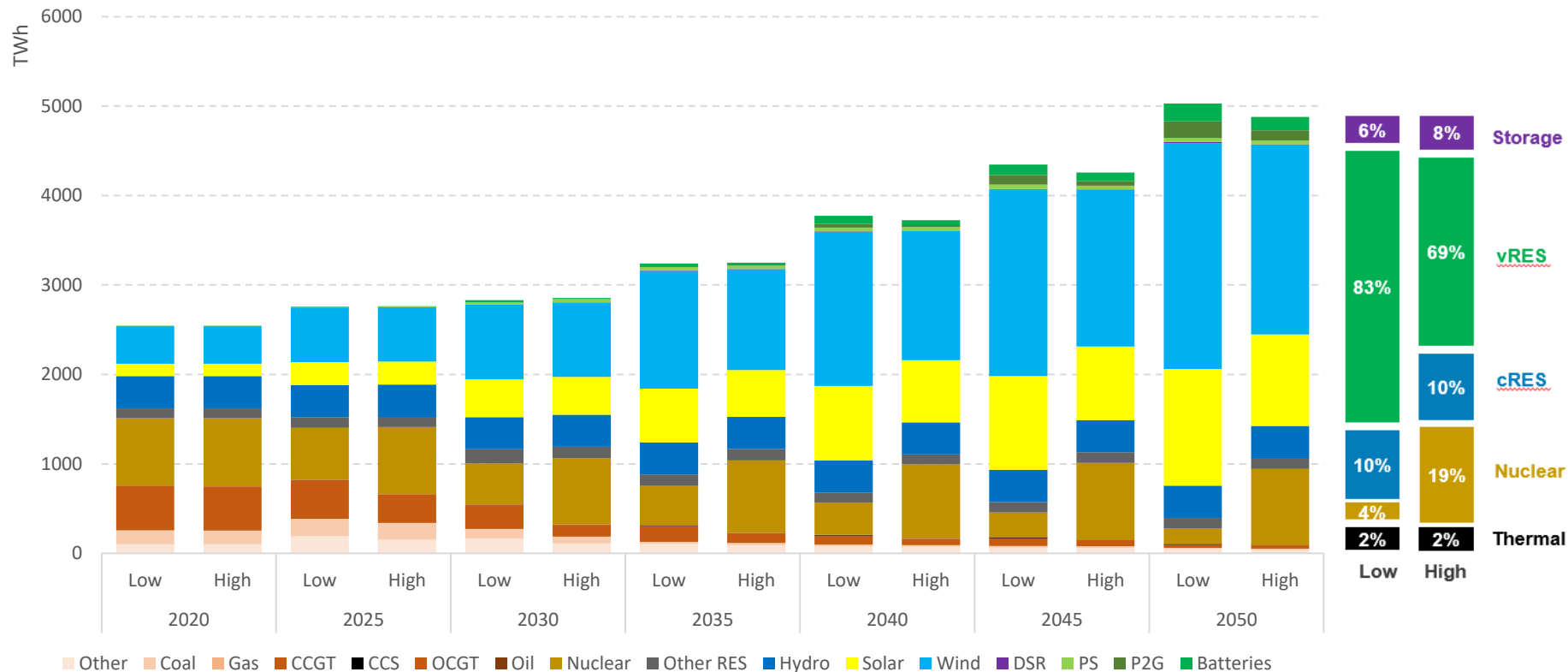


Emissions difference Low – High nuclear scenarios



EU's decarbonisation ambitions and CL findings

Nuclear Low and High scenarios generation outlook



Compass Lexecon 2021 – Environmental Sustainability takeaways



Environmental Sustainability Impacts	Main takeaways
NOx, SO2 and Particulate Matter (PM) emissions	<p>In the low nuclear scenario are expected:</p> <ul style="list-style-type: none"> ✓ 2.4Mt of additional SO2 emissions over 2020-2050. ✓ 1.6Mt of additional NOx emissions over 2020-2050. ✓ 1650kt of additional PM emissions over 2020-2050.
Land use	<p>An early closure of nuclear plants would require new solar and wind capacities in order to meet environmental objectives, which would generate an estimate of 9890 km2 of additional land requirement or 7% of total land use over 2020-2050</p>
Raw material usage	<p>According to recent and ongoing studies, the high nuclear scenario will translate into lower raw material consumption</p>
RES curtailment	<p>The anticipated nuclear closure and limited new nuclear investments in the low nuclear scenario would induce about 112 TWh of additional curtailed energy from RES in 2050, making the low nuclear scenario a less sustainable path to achieve the long term targets</p>

Compass Lexecon 2021 – Security of Supply takeaways



Security of Supply Impacts	Main takeaways
Fossil fuel consumption savings	<ul style="list-style-type: none"> ✓ 3625 TWh (gas) and 525 TWh (coal) saved in the high scenario over 2020-50 ✓ Avoidance of the lock in effect for fossil fuel sources
Increased dependency on imported fuel	The low nuclear scenario would increase fossil fuel consumption (gas and coal) by 4150TWh , pushing up Europe's dependence on fossil fuels to an equivalent of +26% in gas consumption and +12% in coal consumption between 2020 and 2050.
Grid stability	A higher share than 40% of RES could put grid stability at risk
Reliance on yet immature storage technologies	A low share of nuclear in the energy mix will significantly increase the power system's reliance on large scale yet immature storage technologies (reaching around 325 GW of batteries and seasonal storage such as Power-to-X-to-Power in 2050 in the Low scenario)

Compass Lexecon 2021 – Economic takeaways

Economic Impacts	Main takeaways
Consumers costs	With the high nuclear scenario, customer costs savings amount to 392 billion € in 2050 thanks to lower total generation costs, in particular during the transition years of 2015 – 2040, where fossil fuels are phased-out.
In future flexible and integrated power systems, nuclear does provide large scale competitive advantage	Balancing and network costs are being reduced by 168 billion € in 2050 in the high scenario.
Nuclear plays an important role in the hydrogen economy	Nuclear will play an important role in ensuring economic production of decarbonised hydrogen as it enables a high capacity factor. A developed hydrogen industry will also bring greater flexibility and storage capacity in the event of massive variable RES deployment
Residual value of investments	Given the long lifetime of nuclear assets (60 years of Gen-III nuclear power plants) the low scenario would reduce the residual value of investments by €942 billion in 2050 compared to the high scenario.