

LES ORRES 9 JANUARY 2023

Smart
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for tomorrow

2023 OCOVA FORUM

THE ELECTRICAL CONTEXT

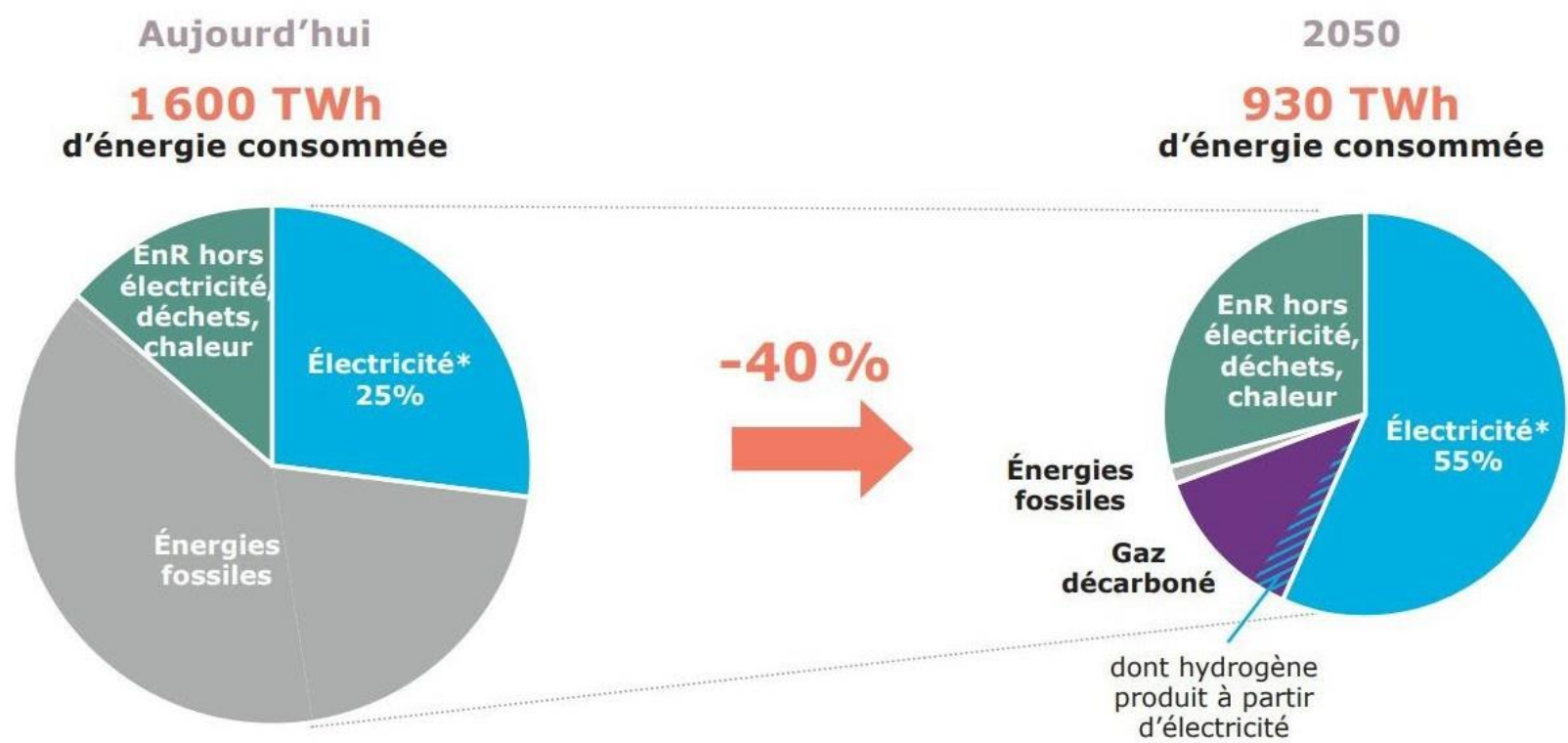
Challenges and Perspectives



ENERGY FUTURES 2050

Consumption trajectories to 2050

Final energy consumption in France and in the SNBC

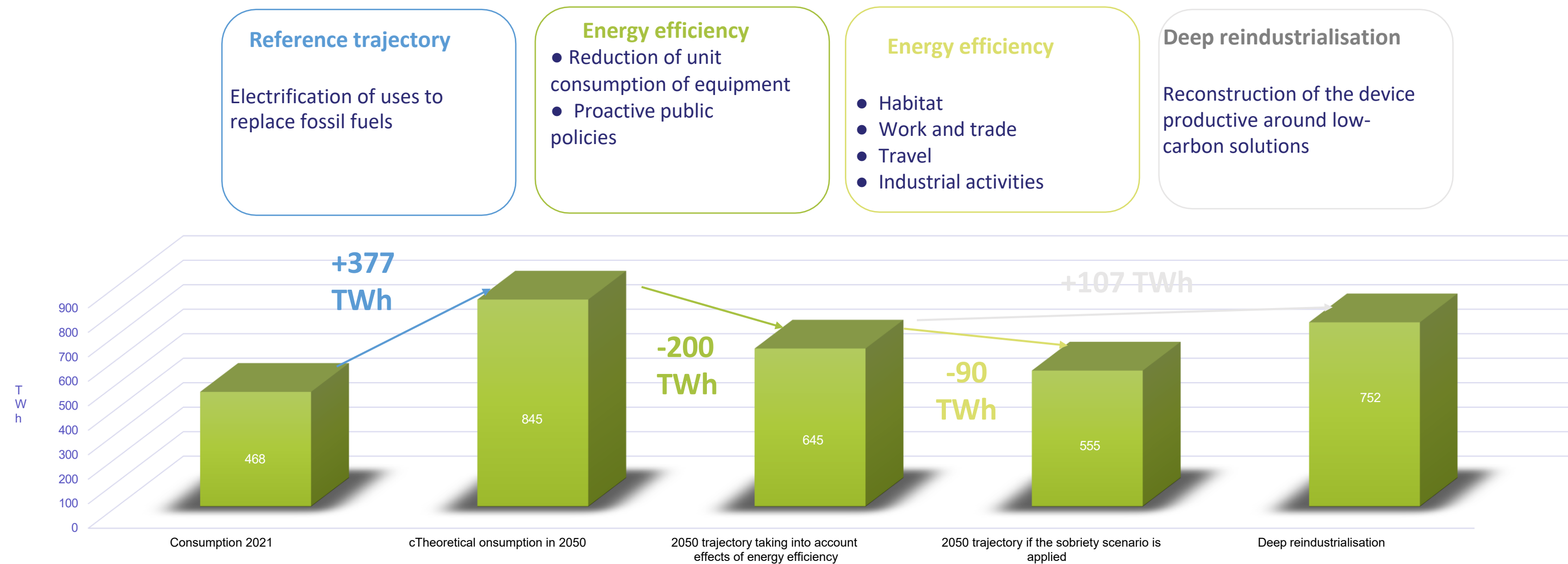


* Consommation finale d'électricité (hors pertes, hors consommation issue du secteur de l'énergie et hors consommation pour la production d'hydrogène)
Consommation intérieure d'électricité dans la trajectoire de référence de RTE = 645 TWh

All the scenarios necessarily imply a higher production of electricity.

ENERGY FUTURES 2050

Consumption trajectories to 2050



Expected effects of energy efficiency and potential effects of sobriety on the level of electricity consumption

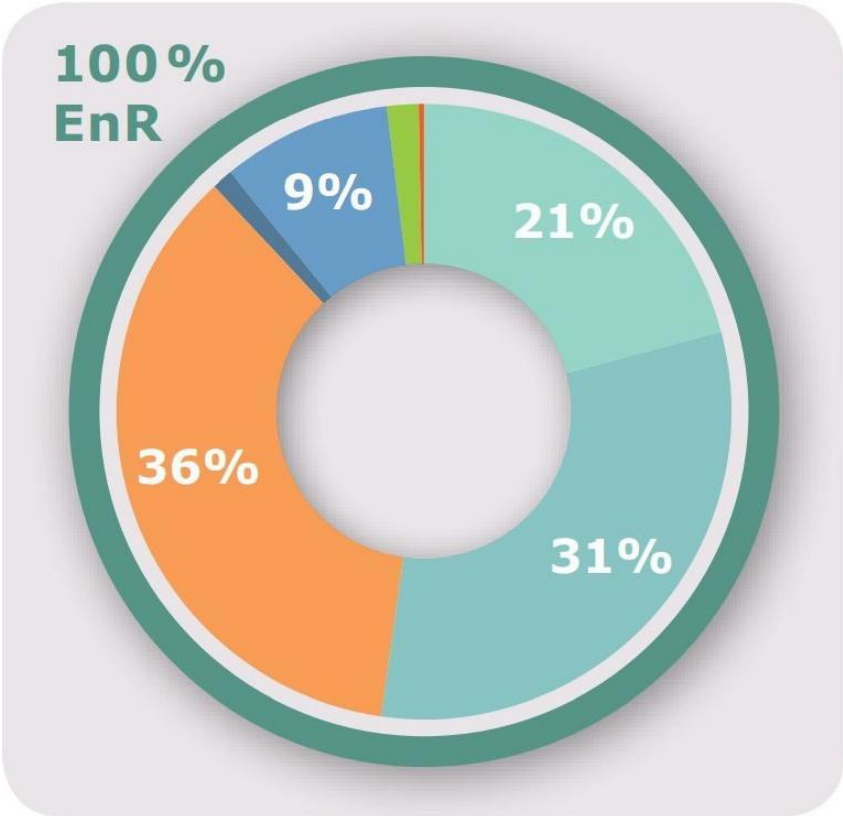
ENERGY FUTURES 2050

Generation mix scenarios to 2050



M0

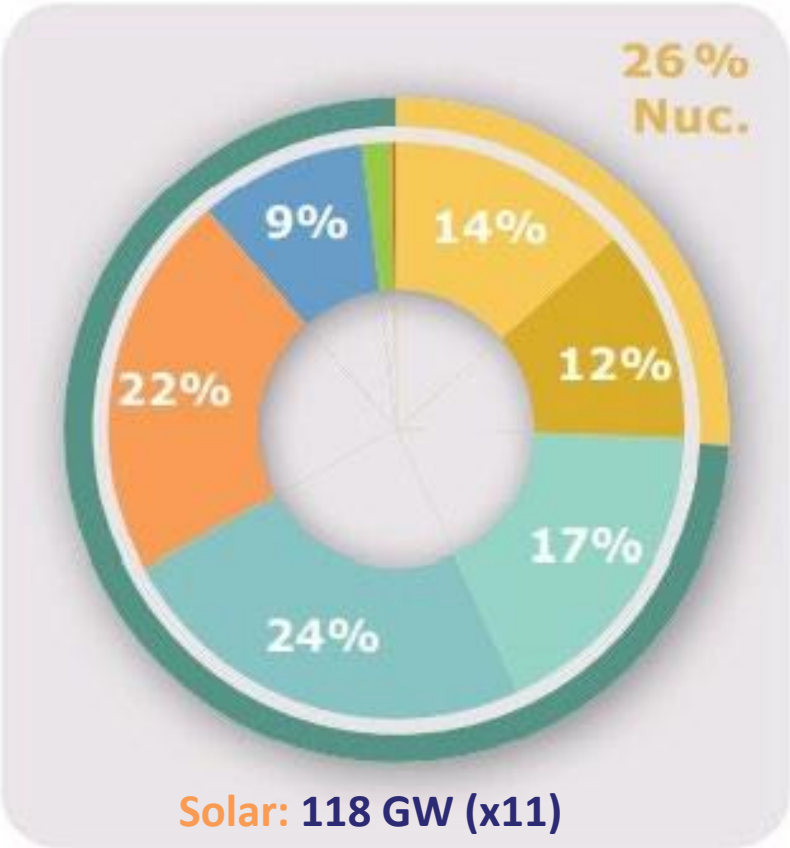
Nuclear phase-out, 100% RE with a maximum development rate



Solar: 208 GW (x21)
Onshore wind: 74 GW (x4)
Offshore wind: 62 GW
Historic nuclear: 0 GW
New nuclear: 0 GW

N1

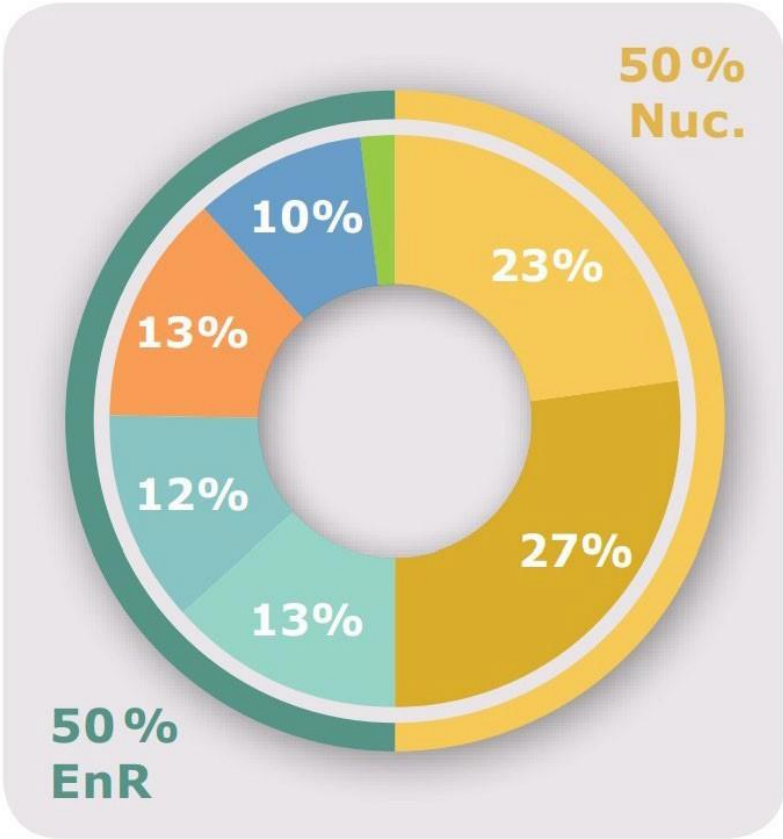
Construction of new nuclear reactors and development of RE at a steady pace



Solar: 118 GW (x11)
Onshore wind: 58 GW (x3.3)
Offshore wind: 45 GW
Historic nuclear: 16 GW
New nuclear: 13 GW (8 EPRs)

N03

Equal share between nuclear (historical + new nuclear) and RE



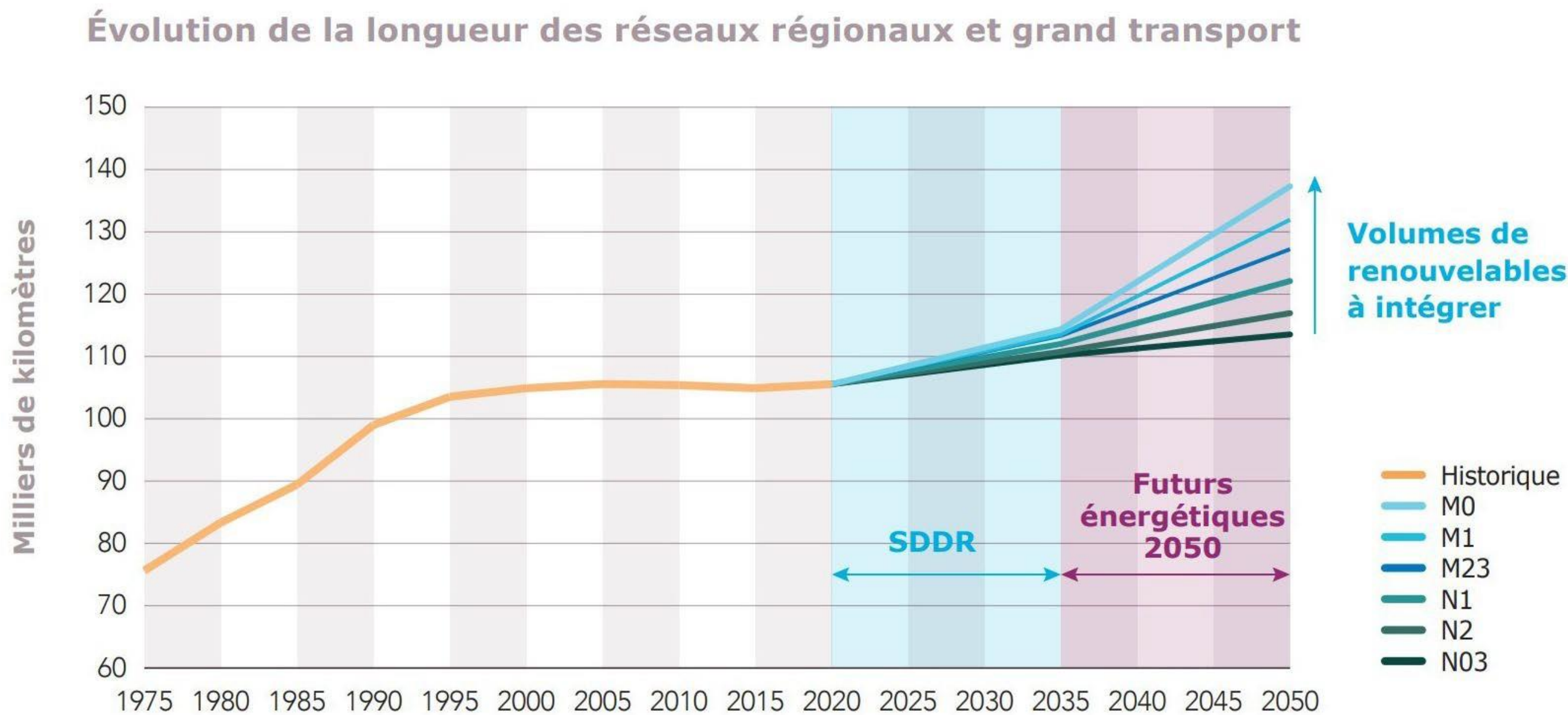
Solar: 70 GW (x7)
Onshore wind: 43 GW (x2.5)
Offshore wind: 22 GW
Historic nuclear: 24 GW
New nuclear: 27 GW (14 EPRs)

ENERGY FUTURES 2050

Adaptation of the electricity network by 2050

Electricity grids must be **resized** to make the energy transition possible:

- ✓ **Development of the existing network:** structural changes are planned from 2030 (SDDR)
- ✓ **Networks are at the heart of the energy transition** (S3REnR, low-carbon industrial zones...)

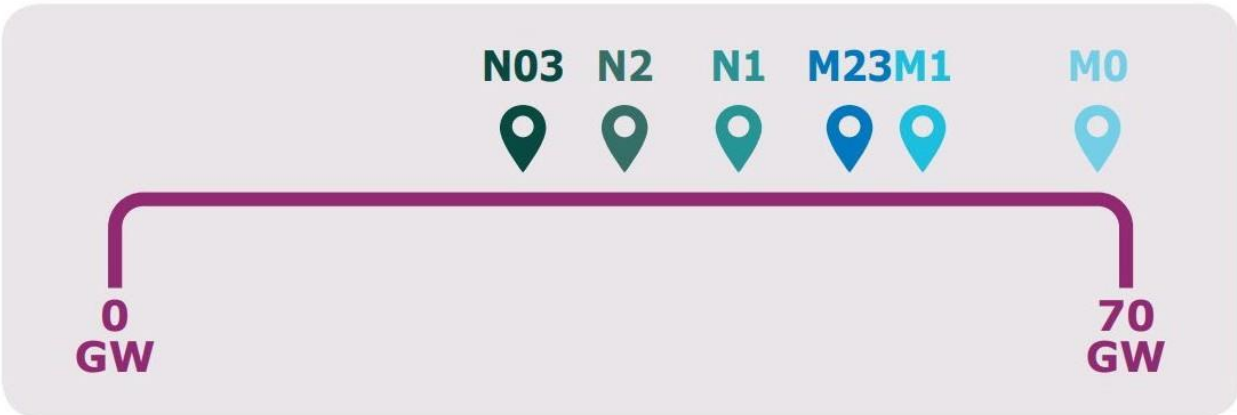


ENERGY FUTURES 2050

Adaptation of the electricity network by 2050

The need for flexibility :

- ✓ **High** flexibilities needs in all scenarios, **between 28 GW and 68 GW**
- ✓ Much greater need in the scenarios with very high **penetration of renewables**



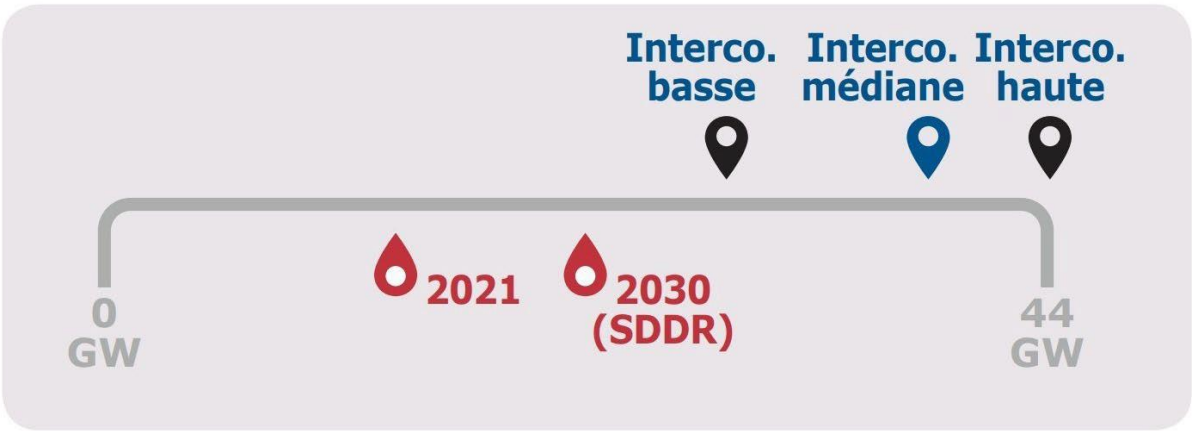
New capacity requirements expressed in "perfect" GW (100% available and without activation constraints)

Interconnexions
~12 GW import
~18 GW export



Interconnections :

- ✓ An **economic interest** for France and for Europe to develop interconnections in order to pool flexibility levers
- ✓ Growing **interdependence** of national electricity systems in Europe, which raises issues of political acceptability
- ✓ A compromise between the **economic optimum (~45 GW)** and **technical and political realism**
- ✓ Different variants to reflect uncertainties



Import capacity

+ 0.9 GW

Per year (average over 30 years) of interconnection development

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THANK YOU FOR YOUR ATTENTION

