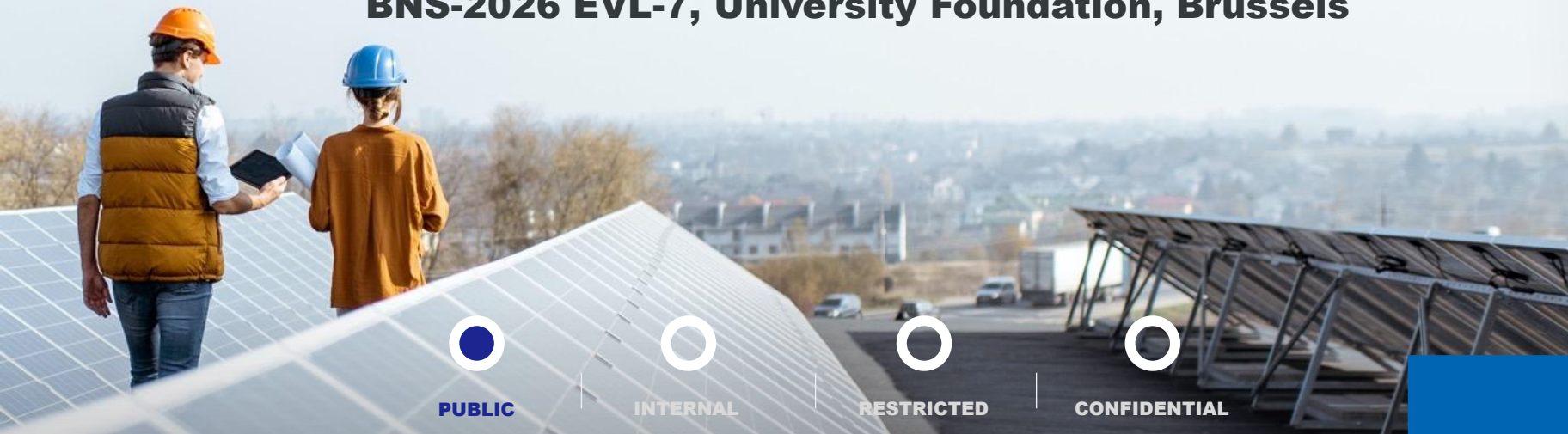


UK Nuclear Roadmap Balancing Lifetime Extension & New Build



David Hamilton, September 24th 2026

BNS-2026 EVL-7, University Foundation, Brussels



PUBLIC



INTERNAL



RESTRICTED



CONFIDENTIAL

Delivering
nuclear
projects can be
a challenge...

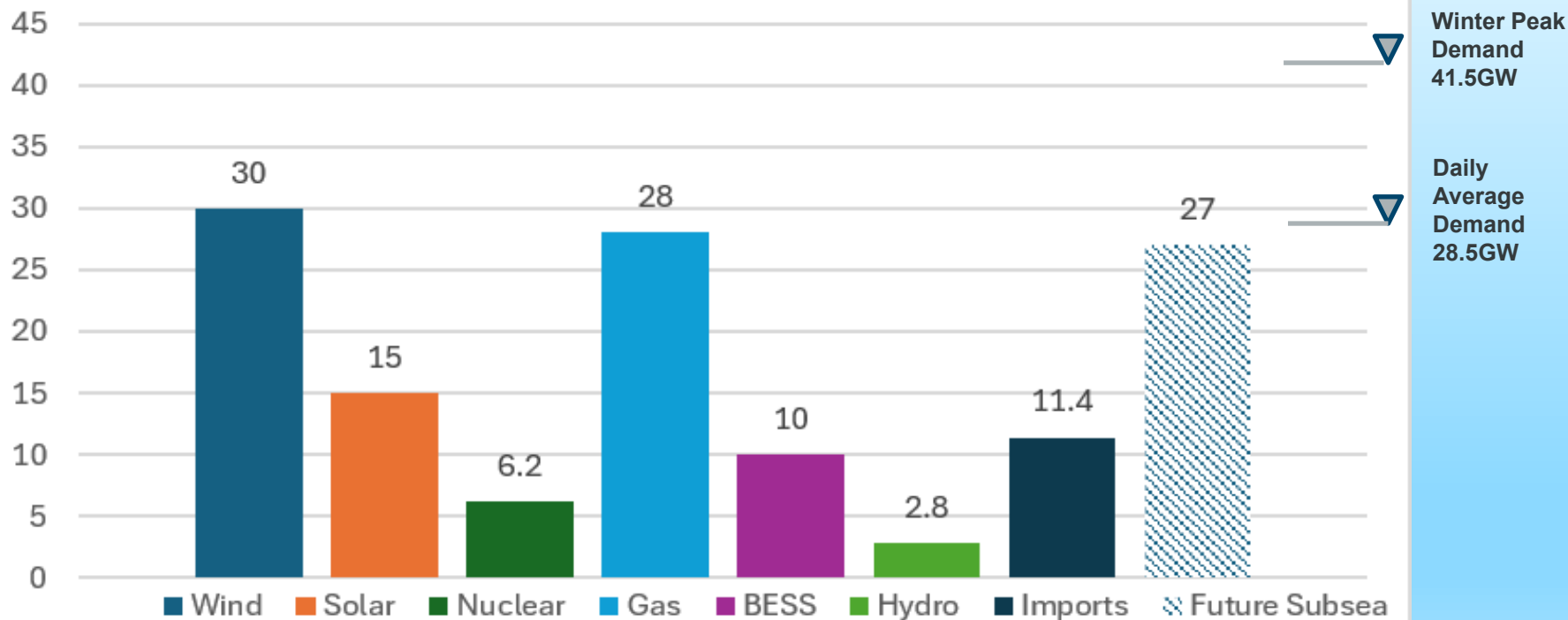


The UK Energy Problem – same for everyone?

- **Decarbonisation targets** – remove/reduce fossil sources from mix
- **Geopolitical risks** – Ukraine, Middle-East, oil prices, energy security & sovereignty
- **Ageing nuclear assets** - end of generation horizon (in UK AGRs close 2030...)
- **Loss of nuclear build skills** – reinvigorate the engineering supply chain
- **Multiple new reactor technologies** – FOAK risks, novel designs, safety
- **Barriers to permitting & licensing** – planning, regulation, grid capacity
- **Investor appetite** – bad experience of funding large nuclear projects
- **Govt contingency** – develop short term overcapacity via large wind / solar developments (variable renewable sources) + imports for margin

GB Electricity Mix

GB Electricity Capability Mix v Demand (GW)



UK Existing Nuclear (status last 5 yrs)

Hunterston B

1.2GW Twin AGRs

EoG: Jan 2022

Status: Decommission

Heysham 1

1.2GW Twin AGRs

CAL: 2030

Heysham 2

1.3GW Twin AGRs

CAL: 2030

Hinkley Point B

1.2 GW Twin AGRs

EoG: Aug 2022

Status: Decommission

Torness

1.3GW Twin AGRs

CAL: 2030

Hartlepool

1.2GW Twin AGRs

CAL: 2030

Sizewell B

1.2W PWR

CAL 2035

LTO Business Case
2035-55 (20 years life
extension)

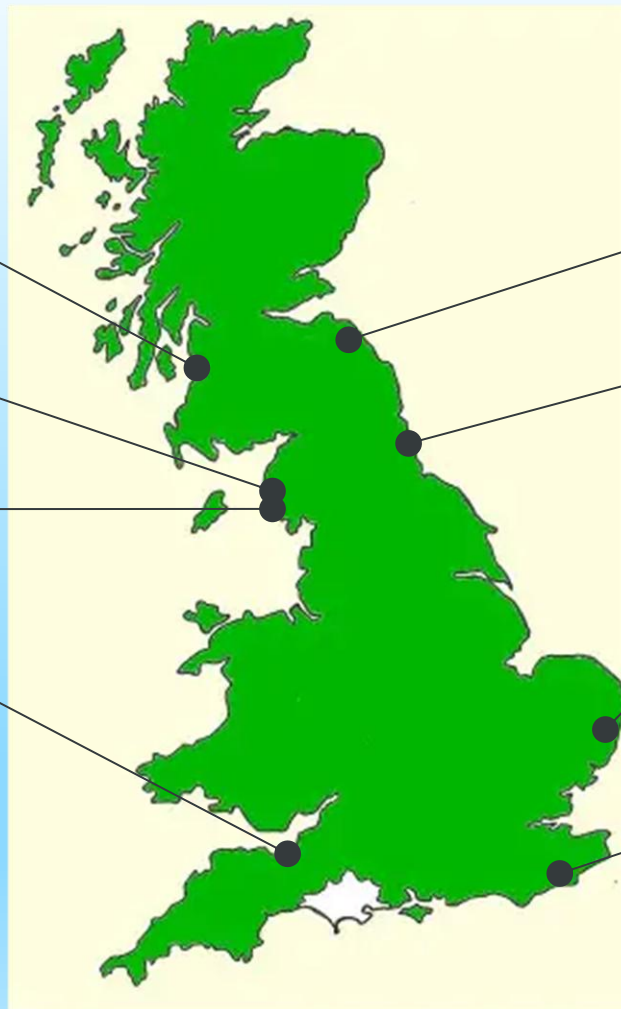
Dungeness B

1.1GW Twin AGRs

EoG: June 2021

Status: Defuelling

EDF plan incremental annual reviews
for potential safe generation > 2030 –
subject to Safety Case



UK Civil Nuclear Roadmap 2050 – Pathway



**Large-Scale
Nuclear Reactor**



**Small Modular
Reactor (SMR)**



**Advanced Modular
Reactor (AMR)**

- Deliver HPC, SZC and beyond....further large reactor
- Develop SMRs in UK – unlock benefits from modularisation & replication
- Deploy up to 24GW by 2050 – secure investment decisions to deliver 3-7GW every 5 years from 2030 to 2044
- Collaboration framework: Government & private AMR technology vendors (ANF)
- Alternative Routes to Market consultation inc. CFD, RAB, flexible off-take, COGEN

UK New Nuclear Plans

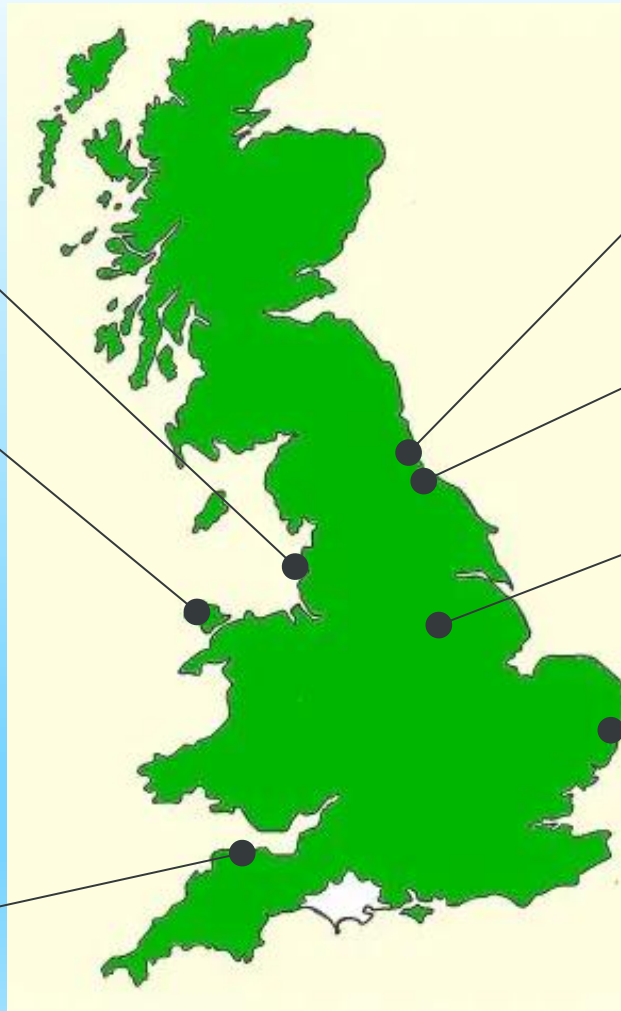
Hillhouse
1.3GW 4 units
AP300 SMR GDA-1
Fylde Coast Energy

Wylfa RR SMR
1.4GW up to 3.76GW
3 units (up to 8)
GBEN GDA-3

Terrapower AMR (site TBC)
2 to 4 units (2-4GW)
Natrium SFR: GDA-1

GE-H BWRx300 SMR (site TBC)
4.2GW – completed GDA-2
14 units – applied to UK
Advanced Framework for review

Hinkley Point C
3.2GW
Twin EPR units
EDF / NNB



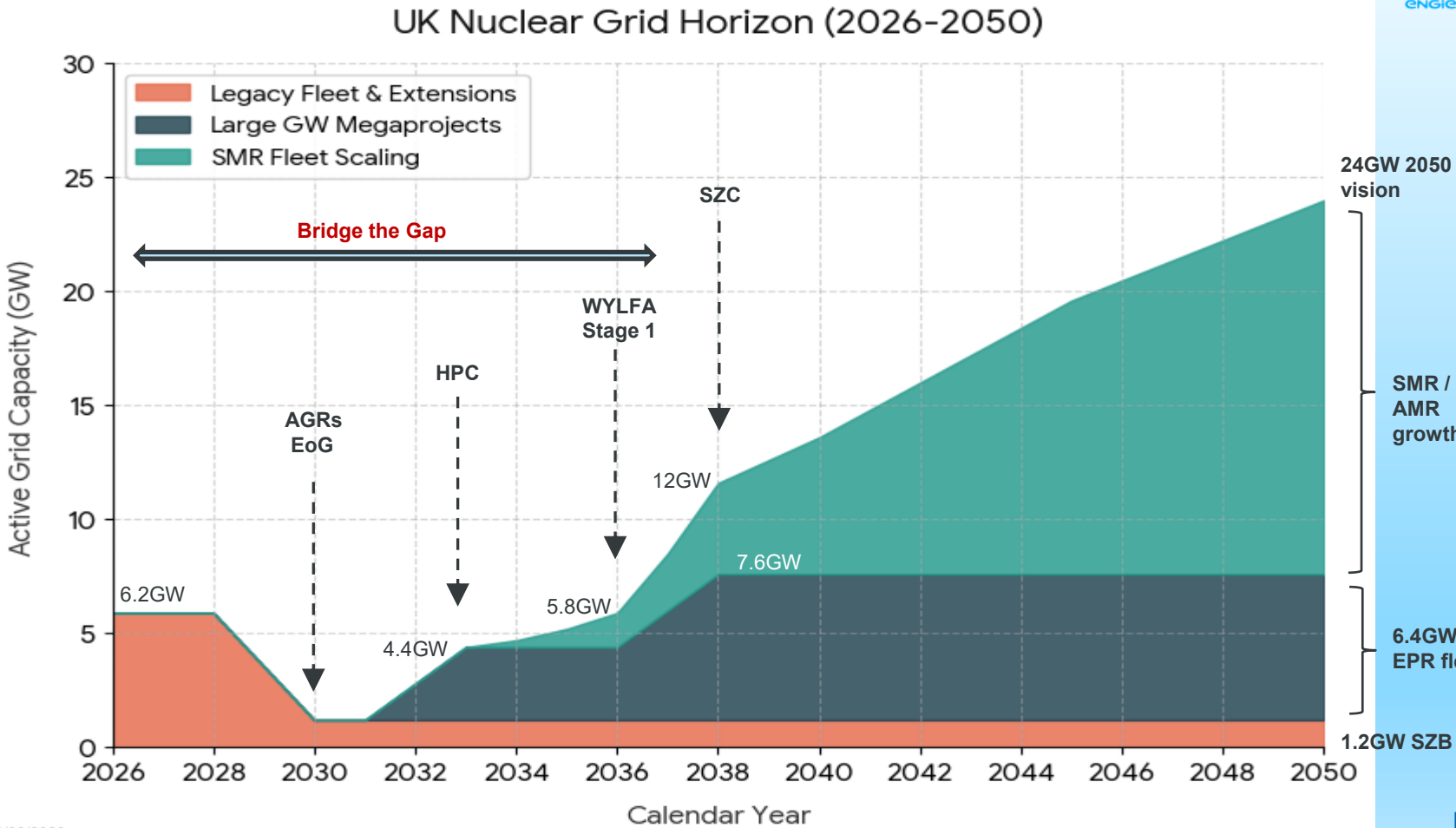
Hartlepool
960MW
12no. Xe-100 AMR units
X-Energy/Centrica (GDA-1)

North Teeside
1.3GW
4 units AP300 SMR GDA-1
Community Nuclear Power

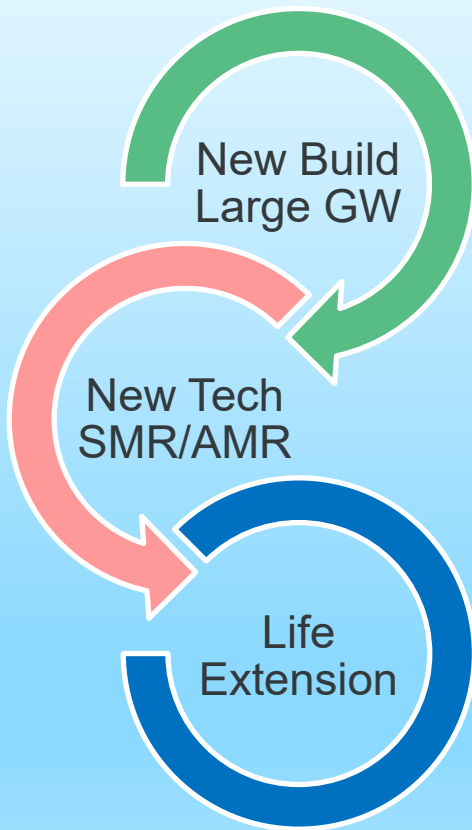
Cottam
1.3GW
4no. Holtec SMR-300 units
Holtec / EDF (GDA-2)

Sizewell C
3.2GW
Twin UK-EPR units
EDF SZC Ltd / UK Govt





Small Modular Reactors (SMRs) *The Agile Infantry:*
Factory-built, rapidly deployed units to power localized industrial & AI growth zones.



Gigawatt-Scale Giants

The Heavy Artillery:

Traditional mega-projects providing massive, centralised baseload power for 60+ years.

Legacy Asset Extensions

The Bridging Buffer:

Immediate protection against energy deficit, secure grid capacity while new builds are developed

LTO

Capital Efficient
Regulator Baseline
Grid Ready

Material Ageing
Load Factor
Political Complacency

SMR/AMR

Standard Scalability
Siting Agility
Agile Load Follow

FOAK cost premium
Technical Lag
New fuel supply

Large GW

Colossal Output
Grid stability
Long Term Value

Capital Outlay
PPA
Construction Delay

Value of Lifetime Extension to UK Nuclear Capacity

Station	Open	Orig. Close Date	CAL	No. of Lifetime Reviews	Total Extra Gen. (Yrs)	Add. PLEX Output to 2026 (> original close date) (TWh)	Add. PLEX Output to CAL (>2026) (TWh)
HNB	1976	2016	2022	2	6	42.5	-
HPB	1976	2016	2022	2	6	54	-
HY1	1983	2014	2030	5	16	55	22.5
HAR	1983	2014	2030	5	16	52	22.5
DNB	1983	2018	2021	2	3	0	-
HY2	1988	2023	2030	3	7	31	27.5
TOR	1988	2023	2030	3	7	28.5	27.5
SZB	1995	2035	2055	1	20	-	170

PLEX & LTO value:

23

81y

263TWh

+ 270TWh

PLEX & LTO invest:

£8.6Bn

+ £1.2Bn AGRs
+ £0.8Bn SZB

Risk Category	Sizewell B (PWR)	AGR Fleet
Regulatory & Licensing Risk	Very Low. PWR global operational feedback. Proven standardised REX to 60yrs.	Extremely High. Continued Safety Case compliance (incremental inspections)). Continued operational risk if core degradation accelerates.
Asset Degradation / Engineering Risk	Low. Standard ageing on heat exchangers & turbines. Components are accessible, modular & replaceable.	Critical Structural Threat. Primary risk is graphite core and boiler integrity – cannot be re-engineered or repaired.
Amortization & Capital Stranding	Protected. £800m spend has 20yrs to recoup value. Stranded capital risk from abrupt technical failure is distributed	High Exposure. If fleet asset suffers an unresolvable safety fault - remaining un-amortized investment is written off
Generation Predictability	High. Ave. performance factor ~85% (peak 99% in 2025). Highly predictable baseline - steady grid support.	Volatile. Subject to sudden, lengthy outages for core inspections, output uneven.

Lifetime Extension Value Comparison

Metric	AGR fleet Pre-2026	AGR fleet 2026-30	SZB LTO 2035-55	D4/T3 LTO
Extra Lifespan	61y	4y	20y	10y (initial)
CAPEX	~€9.9bn	~€1.4bn	~€920m (£800m)	€2.4bn
~ Extra Gen. Output	263TWh	100TWh	170TWh	150TWh
Cost / MWh	~€37.60/MWh	~€36.80- €48.30/MWh	€5.08- €5.71/MWh	€9.76- €16.47/MWh
Est. O&M and Fuel	~€55/MWh	~€48/MWh	~€42-48/MWh	~€45-55/MWh
Strike Price	n/a	n/a	€81/Mwh (2025)	€90.13/MWh (2025)

Note: Assumed operational availability used for calculations:

- Historic AGR: 75%-82%
- Current AGR: 60%-70% (Risky due to outages)
- Sizewell B LTO / Hinkley Point C / Sizewell C: 90% Baseline Target.

BNS-2026 EVL-7 Nuclear Balance

- Plant extension (LTO) - short term financial & generation value (target long term extensions)
- Key LTO risk is operational & material risks – robust Safety Case, performance reviews
- SMRs present future grid flexibility & industry located value – unproven at scale but clearly positive progress
- Large GW must continue to have a place – unyielding output & rotational inertia – underpin national energy sovereignty

Energy trilemma – national policy must include the three energy pillars of LTO / SMR / Large GW, not as competing options, but as mutually dependent components of a balanced energy system

Nuclear balance is based on “AND” not “OR”

