Small Modular Nuclear

MST Sector Council Norwich

Role of nuclear in decarbonisation

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11th May 2023

Content

1. Background
2. Why trend to small modular
3. Regional benefits

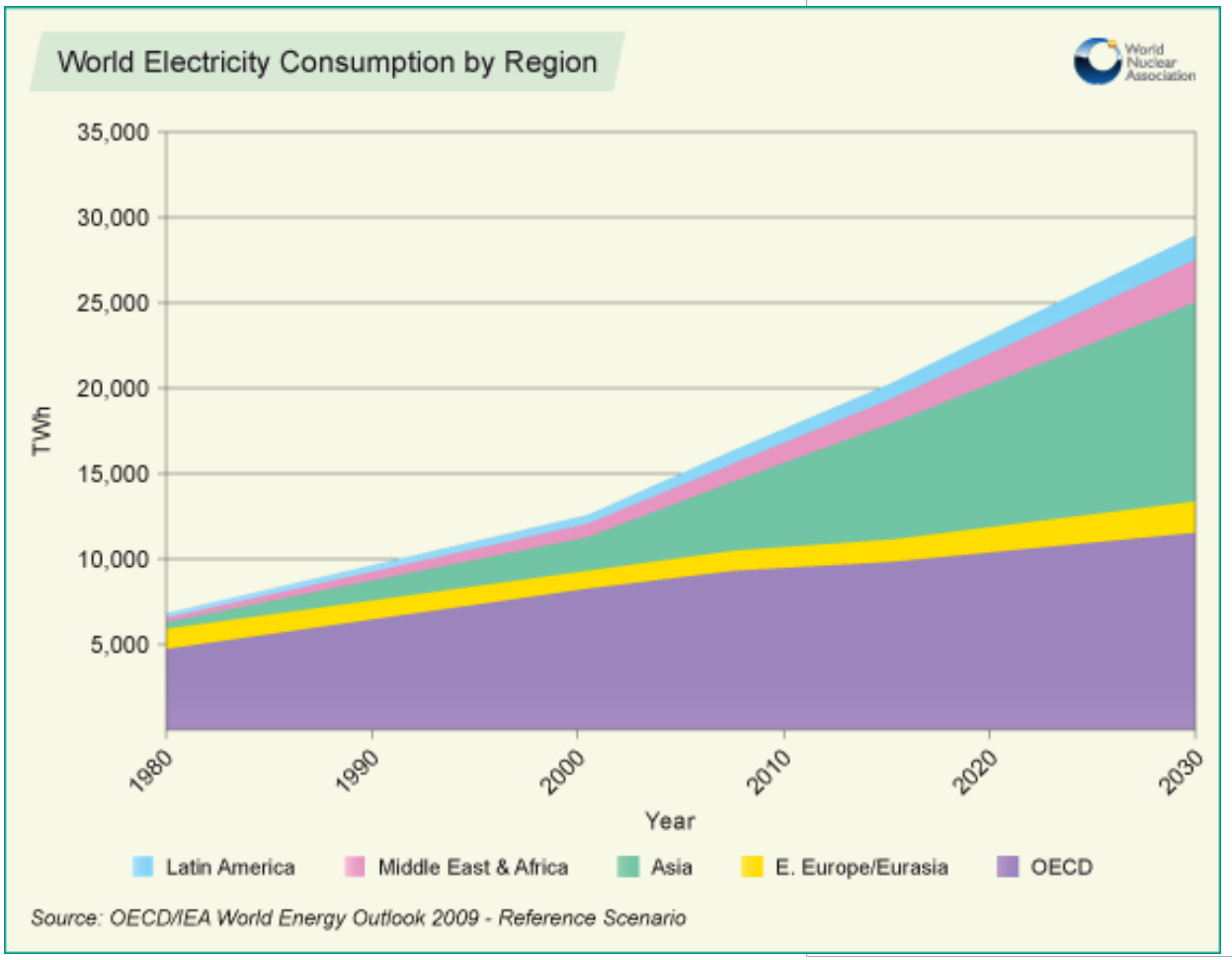
Background: Atomic Acquisitions

- Consulting/developer of small nuclear power plant
  - Have been in the nuclear sector since 2007
  - NDA (history of nuclear)
  - Started UBattery programme (5MWe, 15MW)
  - Co-wrote the 2015 Micro nuclear study for HMG
  - Developers of conventional power
- Team of ex regulators, nuclear insiders, conventional power
- During 21-23 have engaged with a number of vendors re UK entry
- Facilitation of investment for technology and project development in UK and elsewhere

Global Energy Demand Forecast

- Energy consumption rise by +50% by 2035

- Energy diversification/ security is vital: nuclear seen as part of the low carbon mix



Why nuclear

- Nuclear is a zero-emission clean energy source.
  - Reliable base load power
- Nuclear energy's land footprint is small*
  - A typical 1,000-megawatt nuclear facility in the USA needs 1 square mile. Wind farms require 360 times more land.
  - Solar require 75 times more space.
- Nuclear energy produces minimal waste
  - 1 kg of uranium fuel yields the same energy as burning 120,000 kg of coal, or 500 barrels of oil
  - A piece this size would contain the total high-level waste for one family's lifetime electricity consumption
- Allowing for system costs and plant lifetime, SMRs have similar LCOE to offshore wind.

*Source NEI USA

Nuclear technologies of interest

- Small Modular Reactor
  - 50-470MW
  - Light Water cooled
  - Grid/Embedded power and heat
  - Modular construction
  - Commercially ready with 2030 COD

- Advanced Reactors
  - 1 MW – 100 MW
  - Various coolants – metal, molten salt, gas
  - High temperature output up to 950 deg C for industrial applications
  - Potential deployment mid-30s onwards?
- Fusion
  - Rapid advances and investment
  - Regulatory advantages but tech further from deployment – 2040s?

Nuclear in different guises

Embedded
Modular Build
24 month construction
Eg UBattery; 15MW
$70 million 350 sqm

Embedded/Grid
Modular Build
36 month construction
Eg NuScale; +77MW x12
+$2billion 35acre.

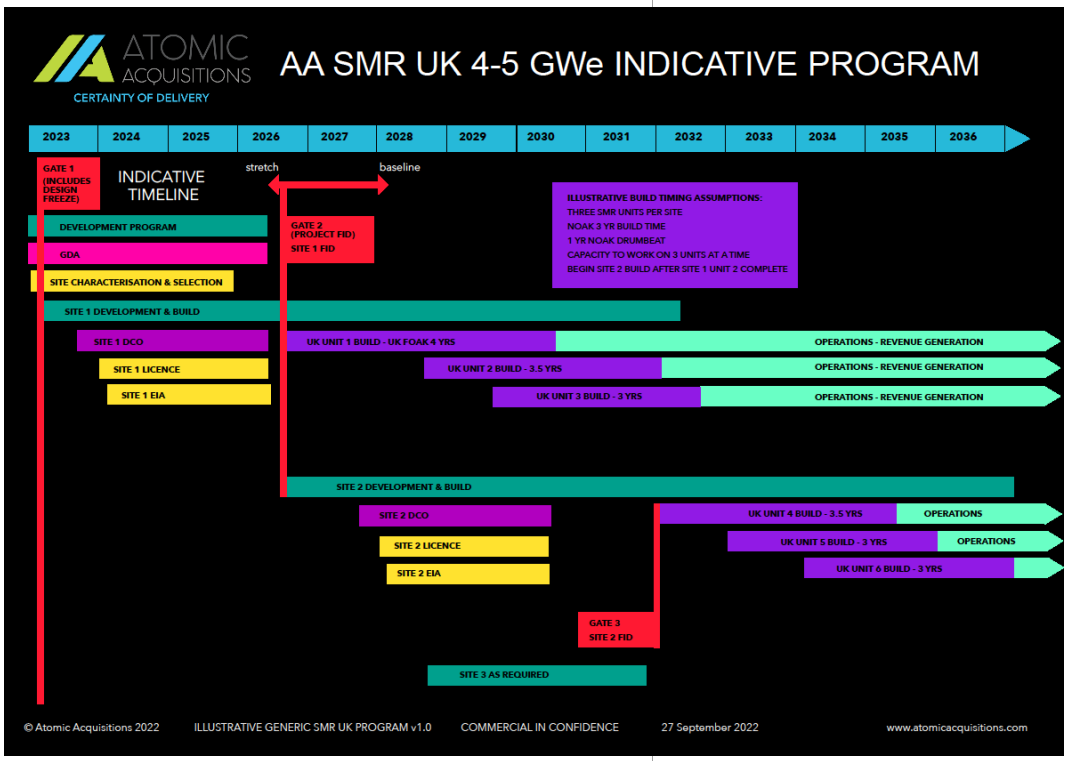
Russian floating barge 70MW

Grid scale
On site construction
Long construction period
Eg Hinkley Point C;3200MW
+$28billion +1 sq mile

ATOMIC ACQUISITIONS
CERTAINTY OF DELIVERY

Benefits of SMR to the Region and UK

- Local jobs*
  - Manufacturing: 4200
  - Construction:1600
  - Operation:270
- Skills development
  - Partner with local and regional educators
  - Centre of excellence
- Economic benefit through local redevelopment
  - Platform for EU deployment
- Powering green energy infrastructure**
  - Flexible heat and electricity generation
  - Embedded power as needed
  - Decarbonise transport etc
  - Hydrogen production, process power, battery storage surplus to the grid



*Based on NuScale VOYGR technology
**EU has classified nuclear energy as green energy

Summary: Way forward

- Opportunities for the EoE
  - Jobs creation/Skills Development/Inward Investment
    - Engage regional education stakeholders
    - Onsite/offsite market for power and heat
  - Fleet deployment of SMR that is commercially led
  - Initiate feasibility for manufacturing facility
  - Initiate feasibility study for nuclear power
  - Community support
- Delivering through clarity of policy
  - Clear definition on “route to market”
  - Regulatory alignment with other jurisdictions (USA/Canada)
  - Innovation: Siting policy to reflect demand vs nominated directive
  - Engage with Great British Nuclear & DESNZ

Collaborate to generate momentum for early deployment

Thank you for listening
Q&A

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