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The Global Advanced Nuclear Market 2027-2047

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Abstracts

The Global Advanced Nuclear Market 2027-2047 is a comprehensive assessment of the technologies, companies and capital reshaping nuclear energy as the sector moves from announcement to execution. It covers three converging segments: small modular reactors, nuclear fusion, and emerging advanced nuclear technologies including molten salt, high-temperature gas-cooled, lead- and sodium-cooled fast reactors, microreactors, advanced fuel cycles, integrated energy systems and AI-enabled plant operations.

The two years to the 2027 base date reset the sector's starting position. The first US construction permit for a commercial non-light-water reactor in over four decades was issued; the first pure-play advanced reactor developer completed a billion-dollar IPO; the first fusion company listed on public markets; and a single European vendor swept every competitively tendered SMR selection process in the United Kingdom, Sweden and the Czech Republic. Hyperscale technology companies have become the most important new class of nuclear offtaker, with multi-gigawatt commitments now anchoring project pipelines across North America and Europe.

The report quantifies market size by reactor type, application and region across a five-point series to 2047, with capacity, investment and cost trajectories under multiple deployment scenarios. It examines the shift in the binding constraint from licensing to supply chain, covering forgings, pressure vessels and HALEU/TRISO fuel availability, and assesses the delivery-model progression from onsite construction through shipyard manufacturing to design-for-manufacture-and-assembly.

Coverage includes regulatory frameworks across all major jurisdictions, economic and environmental impact analysis, competitive positioning, business models, and investment landscape analysis spanning venture capital, public markets, sovereign wealth and utility equity. Fusion is treated as an option on the post-2040 energy system

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rather than a base-case contributor.

Contents include:

- Market opportunity and scale
- Industrial application requirements and market segmentation
- Market access scenarios and deployment pathways
- Regional market access analysis
- Top industrial markets and deployment timeline
- Critical market drivers and transformation requirements
- Advanced nuclear delivery models and manufacturing innovation
- Current industrial energy challenges
- Industrial nuclear energy case studies
- Competitive position and strategic implications
- Pathway to market transformation
- Policy and economic framework
- Nuclear Small Modular Reactors (SMR)
  - Introduction; definition and characteristics of SMRs
  - Market forecast; market access scenarios
  - Market drivers for industrial deployment
  - Technological trends; technology analysis
  - Regulatory landscape, framework and licensing

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- Established nuclear technologies; history and evolution of SMR technology
- Advantages and disadvantages; comparison with traditional nuclear reactors
- Industrial technical requirements and SMR capabilities
- Current SMR reactor designs and projects; types of SMRs
- Applications of SMRs; safety of SMRs; market challenges
- Global energy landscape and the role of SMRs
- SMR market analysis; competitive landscape
- Economic impact analysis; environmental and social impact
- Policy and government initiatives
- Challenges and opportunities; future outlook and scenarios
- Case studies; investment analysis
- SMR company profiles

Nuclear Fusion

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- Nuclear fusion energy market
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- Materials and components
- Business models and nuclear fusion energy

Future outlook and strategic opportunities

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Emerging Advanced Nuclear Technologies

Advanced reactor concepts

Energy conversion

Specialized reactor applications

Advanced fuel cycles

AI and digital technologies

Integrated energy systems

Technology readiness and investment landscape

Market value and investment requirements

Company profiles

Companies profiled include Aalo Atomics, Acceleron Fusion, Anubal Fusion, ARC Clean Technology, Astral Systems, Avalanche Energy, Blue Capsule, Blue Laser Fusion, Blykalla, BWX Technologies, BWXT Advanced Technologies, China National Nuclear Corporation (CNNC), Commonwealth Fusion Systems, Copenhagen Atomics, Deep Fission, Deutelio AG, EDF, Electric Fusion Systems, Energy Singularity, ENN Science and Technology Development, Ex-Fusion, First Light Fusion, Flibe Energy, Focused Energy, Fuse Energy, GE Hitachi Nuclear Energy, General Atomics, General Fusion, HB11 Energy, Helical Fusion, Helicity Space, Helion Energy, Hexana, HHMAX-Energy, Holtec International, Hylenr, Inertia Enterprises, Kairos Power and more...

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Figure 76. Liquid-Fluoride Thorium Reactor schematic.

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