

## The World Nuclear Supply Chain

2023 Edition

**WORLD NUCLEAR**ASSOCIATION

Title: The World Nuclear Supply Chain 2023 Edition Produced by: World Nuclear Association Published: August 2023

Series: World Nuclear Association Report

Report No. 2023/002 ISBN: 978-0-9931019-8-4

Cover image: PreussenElektra; Photographer: Regine Rabanus

© 2023 World Nuclear Association. Registered in England and Wales, company number 01215741

All rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means, including photocopying and recording, without the written permission of the copyright holder. Such written permission must be obtained before any part of this publication is stored in a retrieval system of any nature.

The information and opinions are those of the World Nuclear Association. This report reflects the views of industry experts but does not necessarily represent those of any of the World Nuclear Association's individual member organizations or any government or organization with which individual member organizations may be associated.

## **Contents**

		Page
1	Nuclear power in the world energy market	1
1.1	Report methodology	1
1.2	Report structure	2
1.3	Nuclear power deployment	2
1.4	The drivers of nuclear growth	7
2	Outlook for nuclear power	9
2.1	Nuclear power projections	9
2.2	Market value projections	11
2.3	Business and economic considerations	15
2.4	Conclusion	16
3	Nuclear supply chain segments	17
3.1	New build	18
3.2	Small modular reactor industrialization	22
3.3	Long-term operation	28
3.4	Decommissioning and waste management	32
4	The nuclear supply chain	36
4.1	Reactor owners and developers	36
4.2	Reactor vendors and equipment	39
4.3	Capability and capacity along the supply chain	44
4.4	Localization and globalization of supply	48
5	Supply chain delivery and optimization	57
5.1	Nuclear plant components	59
5.2	Supply chain management and responsibilities	61
5.3	Key materials for construction and operation	75
5.4	Innovation within the nuclear supply chain	80
5.5	Supply chain challenges and mitigation strategies	92
Cond	clusions and Kev Take-Awavs	101

## **Appendices**

Α	Acronyms and abbreviations	103
В	Glossary	104
С	Long-term operation outlook considerations	106
D	Nuclear new build outlook	113
Е	SMR industrialization and supply chain considerations	121
F	Regional SMR industrialization and deployment	129
G	Decommissioning and waste management market	133
Н	Reactor vendors and supply chain	137
I	UK: Hinkley Point C Supply Chain	155
J	UAE: Barakah Localization and Industrial Development	157
K	Additional analysis on materials use	159

World Nuclear Association Tower House 10 Southampton Street London WC2E 7HA United Kingdom +44 (0)20 7451 1520 www.world-nuclear.org info@world-nuclear.org

The imperatives of climate and energy security – together with innovation in the nuclear sector – are leading an increasing number of governments and industrial end users to include nuclear energy in their plans to achieve net-zero greenhouse gas emissions targets.

In this context, this 5th edition of *The World Nuclear Supply Chain* provides a market-oriented view of the status, opportunities and challenges of the supply chain for nuclear power plants focusing on nuclear-grade structures, systems, components and services. The report covers the life-cycle of nuclear power plants through construction, operation and decommissioning. This includes new build of large gigawatt-scale and small modular reactors (SMRs) including advanced and microreactors, as well as reactor refurbishment to support long-term operation.

The report also advances recommendations on how to optimize the international supply chain to support resilience and efficiency.

The World Nuclear Supply Chain is prepared with the support of the Supply Chain and Long-term Operation Working Group of World Nuclear Association. The Association is the international organization that supports the global nuclear industry, its people, technologies and enterprises. It facilitates business-to-business interaction to advance good practice and represents the industry in the international forums that influence its regulatory and policy environment. Its mission is to promote a wider understanding of nuclear energy by producing authoritative information, developing common industry positions, and contributing to the energy debate.

