

# **The Global Nuclear Industry**

#### Historical, Present, and Future Generation Statistics to 2025

### **Market Intelligence**

The nuclear renaissance has been long overdue and finally appears to be materialising, but not with the anticipated surge of new build worldwide. Instead there is a clear East-West divide. Asian giants are focusing on new build to meet supply shortages and countries in Europe and North America are opting to uprate existing facilities and extend their lifetime. As often this is cheaper and more acceptable to public opinion.

As there has been limited new build in the West over the past ten years, South Korea and China are starting to gain a strong hold in the domestic and international market. Both countries are reportedly producing reactors at lower cost, to schedule and in a short time. They also have developed expertise in the area, which has been lost in many Western countries due to nuclear stagnation. Thus a consortium led by Korea's KEPCO won a contract for nuclear projects in the United Arab Emirates over more experienced companies such as Areva and EDF.

Consequently, some of the more established nuclear companies are using or considering using international collaboration to win contracts; or, like Russia are offering discounts on new build for long-term uranium supply contracts. With uranium prices rising, the latter seems a good strategy. Presently Russia is conducting extensive exploratory work both internally and in neighbouring Mongolia and Kazakhstan. In the hope of Russia becoming a major uranium supplier for domestic and international projects and, consequently, a major project developer.

In the long-term competition may come from Kazakhstan. Now that Kazakhstan is the number one producer of uranium and has entered into co-operation agreements to develop nuclear technology within the country.

There has also been an increase in the number of countries adopting reprocessing of uranium fuel as a waste management strategy. This has the advantages of security of supply and a reduction in the amount of waste going to storage.

### **Highlights**

In the short-term in Western countries, NRG EXPERT expects the sector to focus on plant upgrades then new build when upgrades on existing facilities are no longer economic. Then new build plants maybe smaller, as they are cheaper to build. By contrast, in the East and Russia, some upgrading of existing facilities will take plant, but new build will continue apace. The local manufacturing requirement in many of these countries will mean that only western companies with international links or desirable licensed technologies will secure contracts.

Although for both the East and West, the extent of the renaissance will largely depend upon the consequence of the March 11<sup>th</sup> earthquake in Japan. In terms of the actual damage caused to the reactors themselves and residents in the vicinity and to public opinion on nuclear power.

Price - £1,050

Code - NRGNR2

\*Please note - prices are also available in US Dollars and Euros. Please consult

www.nraexpert.com

For further information on these products or future editions please contact us at:

Tel: + 44 (0) 20 8432 3059 OR info@nrgexpert.com



## **Table of Contents**

Executive Summary	4
Statistics of nuclear energy and power	14
Nuclear fuel cycle and supporting industries	18
Front End and Service Period	18
Back end	19
Nuclear Technologies	27
Generations of reactors	28
Basic principles of nuclear reaction	32
Types of reactor	34
Outline history of nuclear energy	43
Risk and safety issues and INES, International Nuclear Event Scale	46
INES, International Nuclear Event Scale	47
Uranium reserves and production	49
Economics of Nuclear Power	58
Nuclear power manufacturing companies, the global leaders	69
International nuclear associations and organisations	71
Non-power uses for nuclear energy	74