

## Future nuclear power – the practicalities

### ABSTRACT:

There is renewed worldwide interest in nuclear power generation. Over recent years there has been a wave of new nuclear plant construction in the Far East, most notably in China and South Korea. Many EU nations now face important decisions as to whether new nuclear plants are required in order to help meet their increasing demands for electricity and reduce their dependence on imported natural gas from politically unstable gas-producing nations.

Nuclear power plants provide large amounts of dependable baseload electricity, operate efficiently for several decades, and have made a significant contribution in helping many EU nations reduce their carbon dioxide emissions. New nuclear plants could play a role in maintaining and improving Europe's current diversity, security and environmental balance of electricity supply. This session will highlight:

- the development of new nuclear reactors;
- the economics of new nuclear build compared with other low-carbon technologies;
- the management of legacy and future radioactive waste;
- the capacity for EU nations to engage in an expansion of nuclear power in terms of technical capability, legislative and regulatory frameworks; and
- how nuclear power can be seen to be more publicly acceptable. Furthermore, the session will explore some frequently discussed concerns, such as whether there is enough uranium to fuel a worldwide expansion of nuclear power, whether the global supply chain can meet demand, and whether there are going to be the skilled maintenance and operations staff needed to keep a much bigger fleet of nuclear stations running safely.

### SPEAKERS:

#### Session chair: Friedrich Wagner

President of the European Physical Society

#### 1. Adrian Bull

##### Biography:

Adrian Bull is UK Stakeholder Relations Manager for the nuclear company Westinghouse – with particular focus on the market for new nuclear power stations and the potential for Westinghouse's reactor – the AP1000. He is involved in dealings with government, media, trade unions, regulators, as well as representing the nuclear industry to a wide range of groups.

Adrian had over 20 years experience in the nuclear industry with British Nuclear Fuels (BNFL) plc, prior to joining Westinghouse in 2006. He held a variety of technical and commercial roles and latterly was BNFL's Head of Energy Policy Studies. In this capacity he worked on many submissions to government consultations on nuclear and energy policy matters.

##### The need for nuclear energy in the 21st century:

Adrian Bull will highlight the need for nuclear power, in terms of the amount of electricity that is currently produced by European nations, and to what levels this might need to be increased in order to combat climate change and reduce Europe's dependence on fossil fuels, especially imported natural gas.

He will also highlight some of the barriers that need to be overcome for nuclear power to become a more readily acceptable form of electricity generation, such as economics

(compared with other low carbon technologies), regulation, waste disposal, a skilled workforce, and public acceptance.

## **2. William Nuttall**

### Biography:

William Nuttall is University Senior Lecturer in Technology Policy at Judge Business School, University of Cambridge. He holds a shared post with Cambridge University Engineering Department. Trained in Physics, Dr Nuttall received his PhD from the Massachusetts Institute of Technology in 1993. He went to MIT in 1987 as the holder of a Fulbright Scholarship (postgraduate student award). Following postdoctoral research work in physics at Keele and Birmingham universities he moved to the Institute of Physics based in its London headquarters. The IOP is a learned society and professional body for which Dr Nuttall was Policy Manager. In 2002 moved to the University of Cambridge to be the founding Course Director for the MPhil in Technology Policy, a course launched by the Cambridge-MIT Institute. He is the author of the book Nuclear Renaissance – Technologies and Policies for the Future of Nuclear Power, Taylor and Francis (2005). He is also a member of the leadership team of the ESRC Electricity Policy Research Group.

### The technical challenges of a nuclear renaissance:

William Nuttall will discuss the technical advances that are being made in reactor designs worldwide. He will aim to highlight how new reactors are being developed, which are expected to have lower capital costs, to be more efficient, to produce significantly less radioactive waste and to generate electricity at a lower cost unit than the current fleet of nuclear reactors.

His talk will be underpinned by the challenges that lie ahead for a European-wide nuclear renaissance, which must meet the stringent demands of sustainable development and reliable energy generation in the 21<sup>st</sup> century.

## **3. Sami Tulonen**

### Biography:

Sami Tulonen is the Director of Institutional Affairs the European Atomic Forum (FORATOM) which is the Brussels-based trade association for nuclear energy. His main responsibility in the organisation is to coordinate the nuclear industry lobbying activities in EU institutions. Mr. Tulonen graduated in 1995 with a Masters Degree in Political Science and International Law from the University of Turku (Finland). In 1995-96 he studied EU Law at the Université Robert Schuman in Strasbourg, France. Prior to his career at FORATOM Mr. Tulonen worked for several years for the Finnish Conservative MEP Delegation in the European Parliament in Brussels.

### Is Europe ready to embrace a new wave of nuclear power?:

This talk will highlight the political and practical circumstances of individual European nations in terms of their energy requirements and whether there is the political will to implement a new nuclear build programme. Certain European nations, such as France, have put their faith in nuclear power to meet their rising energy demands, and this talk will highlight whether there are any lessons that can be learnt and adopted by other nations, if they decide to go down a similar path.

### **FURTHER INFORMATION:**

Please contact the session organiser: Tajinder Panesor [tajinder.panesor@iop.org] at the Institute of Physics.