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## **Preface**

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**Biographical notes:** Ferenc L. Toth is senior energy economist with the Planning and Economic Studies Section, Department of Nuclear Energy at the International Atomic Energy Agency. His work is focused on energy-economy-environment interactions and includes: energy economics and energy policy analysis at national to global scales, indicators and national and regional studies on strategies for sustainable energy development; economic and policy analyses of climate change impacts, adaptation and mitigation. He has contributed as coordinating, lead and contributing author to several reports of the Intergovernmental Panel on Climate Change over the past ten years.

Hans-Holger Rogner is Section Head of the Planning and Economic Studies Section at the International Atomic Energy Agency. He is an expert in the application of systems analysis to long-term energy demand and supply issues and their underlying driving forces. He also provides leadership and guidance to international and multidisciplinary research teams. Since 1993, he has been involved in the activities of the Intergovernmental Panel on Climate Change. The results of his research assist the formulation of long-term energy strategies and policy targets for national and international institutions.

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Nuclear power has been receiving increasing attention in recent years. After a dormant period of almost two decades in most parts of the world (except Asia where growth continued unimpeded), it is back on the economic, energy, environmental and political agendas in many countries. A growing number of developing countries, currently not using this technology, seriously consider introducing it. The relative importance of the reasons and motivations behind the rising interest diverges widely across regions of the world. They include fears of persistent high prices of fossil fuels and the security of their supply, mounting pressure to reduce greenhouse gas, particularly CO<sub>2</sub>, emissions, increasing damages from local and regional air pollution and the need to reduce related emissions, and others. Concerns surrounding the introduction or increasing use of nuclear power (e.g., economic performance, waste management, operation safety, proliferation, political and public acceptance) also vary broadly across countries and change over time.

In this special issue, we invite our readers to a world tour into the future of nuclear power. Our tour is guided by experts who are intimately familiar with the current socioeconomic and political situation in their regions and the plausible paths forward. Simultaneously, they are also recognised experts of the regional energy scene,

in particular the questions surrounding the present and future of nuclear energy. Accordingly, the 13 regional papers in this special issue provide a comprehensive global picture of the issues and prospects for nuclear power.

The regional studies are supplemented by six thematic papers. Three of them at the front-end of this special issue set the stage and provide the broader context for the topics discussed in the regional papers. They provide a succinct comparison of the regional motivations and concerns related to nuclear power and discuss long-term performance targets in the context of long-term global economic development and energy supply scenarios. Three other thematic papers at the back-end address selected topics that will be important in shaping the prospects for nuclear energy: nuclear knowledge management and the availability of skilled labour, nuclear proliferation and the efforts to progress towards proliferation-resistant nuclear energy systems. The thematic arch opened by the discussion of performance targets is completed by a presentation of current efforts to develop advanced nuclear power plants.

We thank Professor Mohammed Dorgham (Editor-in-Chief) for the invitation and the opportunity to put together this special issue. We also thank our authors and referees for their time and effort they invested in the papers. We are grateful to Janet Marr and the production branch of Inderscience for their help in the production process. Finally, we are indebted to our colleagues at the IAEA for their help at various stages of the long process from committing authors to checking the final proofs: Aurora Badulescu, Andrii Gritsevskiy, Eugenie Hartzell, Thayyib Kadher Mohien, Gaurav Monga, Hilda Mwathi and Daniel Weisser.

For all contributions in this special issue, the same disclaimer applies: the views expressed in the papers are those of the authors and do not necessarily reflect those of the IAEA or its Member States.

We hope that our readers will find this special issue a useful addition to the flourishing number of studies on nuclear power and its potential contribution to steering the global energy system in a more sustainable direction. In this spirit, we wish a pleasant and informative tour.