

# Foreword

The International Energy Agency (IEA) was founded in 1974 to help co-ordinate responses to disruptions in the supply of oil. While oil is not quite the force that it once was in the global economy, risks to oil security have not gone away. As such, the IEA continues to play a pivotal role in safeguarding global oil security. But our work has also evolved and expanded significantly over the past four and a half decades. We are now working hard to ensure security of natural gas, particularly the large and growing markets for LNG. And we are increasing our focus on the ever-growing importance of electricity – both for today’s economies and societies as well as for the future of energy.

The Covid-19 crisis has underscored electricity’s vital role in modern societies. Reliable electricity ensures the smooth functioning of hospitals and enables many people living under lockdown to continue to work, study, shop and socialise from home. At the same time, electricity is critical for successfully achieving transitions to clean energy. The electricity sector is the biggest single source of CO<sub>2</sub> emissions today. Thanks to the spectacular rise of wind and solar, electricity is a driving force for reducing its own emissions and those of other sectors.

For rapid clean energy transitions to succeed, electricity security is more important than ever. Today we are witnessing the biggest transformation of the electricity sector since it started to emerge over a century ago. These changes come from new sources of power generation, new digital technologies, new business models, new forms of storage and more. They are exciting and hugely promising, but they also bring new challenges as they disrupt the ways in which complex electricity systems operate.

For years, the IEA’s analysis and recommendations have been helping policy makers and other electricity sector leaders tackle these evolving challenges. In this special report, *Power Systems in Transition*, the IEA lays out in one place what secure power systems of tomorrow will require. A vital step is to increase investments in electricity networks and sources of flexibility such as demand-side technologies and storage resources. This should be complemented by better-designed markets that reward resources that deliver flexibility and capacity.

The growing digitalisation of electricity systems, the rise of smart grids and the diversification towards a wider distribution of generation sources calls for strengthening cyber security measures and making them a central part of the planning and operation of systems. And the effects of climate change mean that systems need to become more resilient to the impacts of rising temperatures and extreme weather events. This can be accomplished through better standards that guide the necessary investments.

Many countries around the world are facing similar challenges. Policy makers, regulators and operators can learn from the experiences of others. As the world’s energy authority and the leading global hub for clean energy transitions, the IEA will be at the heart of such co-operation. This is demonstrated by the launch of this report at the IEA’s 2nd Global Ministerial Conference on System Integration of Renewables on 27 October, where Ministers and electricity industry CEOs will share best practices and innovative solutions for enabling growing shares of wind and solar power.

The Ministerial Conference is being co-hosted by the government of Singapore, which I would like to thank for their excellent collaboration. I would also like to thank the IEA team who worked hard producing this report under the outstanding leadership of Mr Keisuke Sadamori, the IEA Director of Energy Markets and Security.

The IEA will continue to expand its energy security work to cover emerging global challenges. A notable example is the supply of critical minerals that are used in a wide range of key clean energy technologies – from wind turbines and solar panels to electric vehicles. We will produce a special report next year to provide a forward-looking global picture on this on this important issue.

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