

Foreword

Technology will largely determine our energy future. The International Energy Agency (IEA) has long been cognizant of this, which is why for more than a decade we have produced the *Energy Technologies Perspectives (ETP)* series to help inform policy makers as they plan for the sustainable and resilient energy systems that people and businesses will need in the years to come.

When I became Executive Director of the IEA in late 2015, it was clear to me that the ETP was in need of a revamp to increase its relevance for decision makers in government and industry. My objective was to prepare “a global guidebook on clean energy technologies” for policy makers and others seeking to navigate the fast-evolving technological developments across a wide range of energy-related sectors. With the publication of this report, *Energy Technologies Perspectives 2020*, I believe we have come close to reaching that objective.

This report is an essential contribution to the global conversation on energy. As the report’s rigorous analysis makes clear, achieving international climate goals hinges on dramatically scaling up clean energy technologies to reduce greenhouse gas emissions. And having those technologies ready in time hinges on a rapid acceleration in innovation. In the *ETP Special Report on Clean Energy Innovation* that was published in July, we examined the innovation element of that challenge. This report, *ETP-2020*, gives the full picture, analysing the major energy technology challenge the world faces and identifying the needs and opportunities that result from it.

Today, I am increasingly optimistic about the world’s clean energy future, despite the grave challenges we face. *ETP-2020* shows that we know what needs to be done to develop and deploy the technologies that can put emissions on a sustainable path. The spectacular success of solar PV in becoming the cheapest source of power in many economies and the impressive rise of offshore wind demonstrate the ability of clean energy technologies to break through if governments put in place the right policies to support their expansion.

At the same time, more and more governments around the world are backing clean energy technologies as part of their economic recovery plans in response to the Covid-19 crisis – as was made clear by many of the 40 Ministers who attended the IEA Clean Energy Transitions Summit on 9 July 2020. The private sector is also upping its game, with some oil and gas majors betting their futures on becoming lower-carbon energy companies and top information technology companies putting increasing resources into renewables and energy storage. Moreover, investments in

clean energy projects can benefit from the extended period of extremely low interest rates in some regions that appears likely following the massive easing of monetary policy by central banks in response to the Covid-19 crisis.

As the ETP analysis underscores, energy innovation will be crucial. Despite the disruption and uncertainty caused by the pandemic, I see reason for optimism there, too. Investment in clean energy start-ups by venture capital funds and companies rose to a new record in 2019. And governments and businesses are finally putting serious resources into the clean energy potential of hydrogen, which this report makes clear will be critical for reaching net-zero emissions.

However, my optimism should not be mistaken for naivety. Even if these encouraging trends continue, there are significant challenges to overcome. For instance, more work needs to go into mapping out pathways for fair and inclusive clean energy transitions for all parts of the world. Moreover, huge portions of the global energy sector are yet to make reducing their emissions a top priority.

The major challenge studied in depth in this report is how to tackle emissions from the vast amount of existing energy-related infrastructure around the world. The enormous fleets of inefficient coal plants, steel foundries, chemical facilities and cement factories – many of them recently built – are set to produce enough emissions in the coming decades to put international climate goals out of reach. But, as *ETP-2020* shows, we can develop the technologies to address this through smart policies and investments today.

The transformation of ETP has been three years in the making and has involved a tremendous amount of hard work from the team behind it. I would particularly like to thank Timur Gül for leading the overhaul of the series and his team for the research, modelling and writing that has produced these important reports. I look forward to many more ETP publications full of valuable insights and guidance in the years to come.

Dr. Fatih Birol

Executive Director

International Energy Agency