

Keynote

by

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at the

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Your Excellencies,

Distinguished guests, Ladies and Gentlemen,

I am particularly delighted to be here for the 10<sup>th</sup> anniversary of SIEW, which has truly become a key forum on energy discussions in Asia and beyond. I would like to thank the organisers for the invitation. Singapore has not only shown to the world how a country with limited resources can become one of the most advanced economies, but it has also proven to be a leader in global sustainability efforts.

A lot has happened in these past 10 years. Ten years ago, IRENA did not exist, and renewable energies were seen as a luxury that only some rich country could afford. In a short period of time, the picture is completely different: IRENA, established only six years ago as the global inter-governmental organisation mandated to promote global renewable energy deployment, has quickly grown to 152 Members, with another 28 countries in the process of joining the Agency; and countries have signalled their resolve to take decisive action to tackle climate change with the adoption of the Paris Agreement. Meanwhile, the world's energy system is experiencing an extraordinary energy transformation.

In a few years, renewables have moved to the centre-stage of the global energy landscape and are now competitive with conventional energy sources in many places around the world. A total of 161 GW of renewable power was added last year, half of total power generation capacity additions, setting a new record. As a matter of fact, since 2011, the majority of all new power generation capacity added globally came from renewables, and remarkably over 50% coming from developing countries. Cost reductions coupled with innovation and enabling policies have paved the way for these record capacity additions and investments. The cost of solar photovoltaics (PV) has fallen by as much as 80 percent since 2009 and the cost of wind turbines by 30%. And we expect these cost declines to continue. We anticipate that the cost of solar PV will drop by a further 60 %, over the next decade and the costs of offshore wind and CSP would drop by respectively 35 % and 45 %. Our latest report on battery storage costs shows that by 2030 total installed costs could fall between 50% and 60%.

Everywhere, countries are picking on these developments and they are raising their ambitions, including in this part of the world. Earlier this year, China announced its intention to invest USD 361 billion in renewable power generation by

2020, and that it was cancelling plans to build more than 100 coal plants. ASEAN has committed to an ambitious target of 23% of total energy supply coming from renewables by 2025 for one of the world's fastest-growing geographic areas. Singapore, despite its limited renewable energy resources, is planning to raise installed solar power capacity to 350 MW by 2020 and to 1 GW beyond that year. In the Philippines, the deployment of renewables has witnessed a considerable acceleration in the recent years, with the country setting an ambitious target of 15.3 gigawatts from renewables by 2030 – a near tripling of 2010's figure. Indonesia has set to achieve a 23% renewable energy use target by 2025, and 31% by 2050.

However, it is most revealing that remarkable developments are taking place in the world's leading oil and gas-producing countries. Last April, I visited Saudi Arabia and took part in the launch of its National Renewable Energy Programme that aims to deploy 9.5 GW of renewable-based electricity generation capacity by 2023 and attract up to USD 50 billion in investments. News from some weeks ago tell us that the first solar power project in that country has attracted a record-low bid of 1.79 US cents per kilowatt hour, which would shatter all previous records if awarded. Two weeks ago, I took part in the opening of the first Russia Energy Week,

as part of a panel with President Putin, where the prospects of renewable energy in that country were at the centre of discussions.

Cities, companies and private citizens are also increasingly engaged, adding strength to this momentum. Major global businesses, such as Google, Apple and Facebook, are increasingly procuring renewable energy to power their operations in a sustainable manner, with corporate sourcing accounting for USD 25 billion of new utility-scale renewable energy since 2010. Microsoft, for example, has directly purchased more than 500 megawatts of wind and solar energy in the US. At the same time, conventional energy companies like Statoil, Engie, and Total, are ramping up their investments to diversify and grow their renewables portfolios.

In addition to its strong business case, the global drive to address climate change is providing further impetus to the deployment of renewables worldwide, given that the energy sector accounts for two thirds of global emissions. Earlier this year, we released a new study under the auspices of the G20 and in collaboration with the IEA, which outlines how a decarbonisation of the energy sector by 2050, in line with the ‘below 2 °C’ objective of the Paris Agreement, is both technically feasible and economically attractive. Renewable energy and energy efficiency would

meet 90% of emissions reductions needed. This energy transition will fuel economic growth and create new employment opportunities. Global GDP will be boosted by around 0.8% in 2050, the equivalent of almost USD 19 trillion in increased economic activity between today and 2050. Renewable energy jobs would reach 26 million by 2050 from 9.8 million today. So, we now have a long-term vision of the energy transition and a better understanding of the immense socio-economic benefits it brings.

Ladies and Gentlemen,

Southeast Asia, as many parts of the world, is at a crossroads in terms of its energy future. The region has made remarkable economic and social progress, nearly doubling its share in the global GDP and lifting millions of people out of poverty. At the same time, economic growth has been accompanied by soaring energy demand. The region is however endowed with a wealth of renewable energy resources. According to IRENA, by 2025 renewable power technologies in South East Asia will have fallen within the cost range of conventional generation, which could bring up to USD 40 billion in savings from reduced expenditure in fossil fuels across the region by 2025, and produce savings from reduced externalities wrought

by climate change and outdoor air pollution by USD 10 billion per year. Moreover, renewable technologies can now help tackle decisively the energy access challenge. More than 80% of those without access to electricity in the region live in rural areas, many of which are located in small islands scattered through vast archipelagos. Off-grid, decentralised renewable energy solutions such as stand-alone and mini-grid renewable electricity solutions are more adaptable and are increasingly viable. According to IRENA estimates, stand-alone and mini-grid renewable solutions will account respectively for 19 and 44% of electricity generation in developing Asia by 2030.

Through its aspirational target of 23% of total energy supply coming from renewable energy by 2025, ASEAN has demonstrated that it is well-aware of the potential of renewables to address its energy security and climate change challenges. IRENA's *Renewable Energy Outlook for ASEAN* report, carried out in cooperation with the ASEAN Centre for Energy (ACE), established that ASEAN countries are well positioned to achieve this objective, and identifies the technology options to close the gap of 6% between this target and the reference case. Last month, I had the pleasure of co-chairing the First Dialogue between the ASEAN Ministers on Energy

Meeting (AMEM) and IRENA, which resulted in the adoption of a joint statement that outlines a bold agenda for cooperation between our two organisations. Singapore will be chairing the next AMEM, which will take place here in Singapore during SIEW, and I am sure that with its leadership we will adopt at the IRENA-AMEM Dialogue an ambitious strategy for uptake of renewable energy throughout the region.

With opportunities, however, come challenges. IRENA's REmap 2050 finds that final renewable energy use needs to be four times higher in 2050 than it is today, and heat/direct uses (44%) and transport (16%) would consume 60% of the total renewable energy, respectively. Renewable energy can be heavily exploited in these sectors, either directly or through the production of carbon-free energy carriers from renewable primary energy. This can be electricity, but could also be hydrogen. As the energy transformation accelerates, broader and deeper decarbonisation efforts are required – beyond the power sector, more emphasis must be placed on the use of renewables and energy efficiency for heating and cooling in buildings and industry and for transportation. It is critical for example that new buildings be of the highest efficiency standards and that existing buildings be rapidly renovated. With its Green

Mark Incentive Scheme for new buildings, Singapore has provided an ambitious model on reducing emissions from our cities.

If we want to scale up renewable energy, we will also need to step up innovation efforts in policy, business models and market design, especially to enable greater integration of variable renewable energy in power systems. New batteries that can store more energy per unit of weight and volume, charge faster and last longer, avoid scarce materials and are above all cheaper must be developed. New forms of pumped hydro, including seawater lakes in mountainous coastal desert areas will also be needed. IRENA's recent *Electricity Storage and Renewables* report finds that the total capacity for pumped hydro storage will increase to reach 235 GW in 2030, while battery storage capacity will grow to from just 2 GW today to 175 GW in the same year.

Paramount to overcoming these challenges also means embarking on smart, sustainable cities that are underpinned by renewables. Cities already account for nearly two thirds of global energy use and an even larger share of energy-related carbon dioxide emissions. As the urban population grows to a projected two thirds of the world's total by 2030, that demand is reaching enormous proportions. For this

reason, cities are playing a leading role in the effort to scale up renewables. Nowadays, 40 cities in the United States have committed to moving to 100% renewable energy sources. Switching to renewables means rethinking the entire urban energy landscape, from buildings, to transport, to industry and power. Sustainable transportation will play a key role and we have seen exciting developments in this field these past few months, with both France and the United Kingdom announcing their pledge to ban all sales of petrol and diesel cars by 2040. Meanwhile, electric vehicles are booming in China, which announced its target to sell between 5 and 7 million new electric vehicles by 2025 and registered more than 350,000 new electric vehicles in 2016. We will also witness the increasing integration of supply and demand across the board, through smart technologies, rigorous planning and holistic decision-making. Governments can support these needed developments by adopting strategies like Singapore's Smart Nation Initiative, which aims to digitalise services across multiple domains.

Ladies and Gentlemen,

It is clear that we have much of the renewable technology needed to move towards a low-carbon, sustainable energy future. However, more action must be

taken to accelerate the energy transition across sectors and stakeholders, and regulations and policies have a key role to play. I am confident that forums such as the International Singapore Energy Week can continue to help us find the solutions we need to advance speedily towards a sustainable energy future.

Thank you.