"REmap 2050: towards a decarbonised energy system"

Remarks

by

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at the

Launch of the study "perspectives for the energy transition: investment needs for a low-carbon energy system"

During the

3rd Berlin Energy Transition Dialogue

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Your Excellency Sigmar Gabriel, Minister of Foreign Affairs,

Your Excellency Brigitte Zypries, Minister for Economic Affairs and Energy,

Distinguished Ministers, your Excellencies,

Ladies and Gentlemen,

I am delighted to be here today to talk about this study, which has been commissioned by Germany in its capacity as presidency of the G20. It is always a very special pleasure for me to be here in Germany, which is IRENA's second home, but also its birth place. Many in this room have been at the forefront of a decades-long journey to create a global organisation for renewable energy, recognising its transformative potential. Today, 180 countries are participating in IRENA, in a global *Energiewende* that is taking hold across the world. This third Berlin Energy Transition Dialogue is a testament to Germany's continued vision and leadership in the drive towards a sustainable energy future. And so also is this initiative by the German presidency of the G20 to commission this important study, undertaken in collaboration between IEA and IRENA.

As I was listening to Bertrand Piccard – I had the pleasure to be both at the launch and the landing in Abu Dhabi of the Solar Impulse – he said: "If the paradigm is creating problems for us, it's time for us to change the paradigm". That is what the international community did by creating a new international organisation looking at the future and technology in energy in a new way completely. That is the challenge we have to run up to.

With the adoption of the Paris Agreement and of the Sustainable Development Agenda, the international community has demonstrated an unprecedented determination to address climate change and dramatically reduce carbon emissions. Yet many countries are grappling with translating the objectives of the Paris Agreement in the energy sector, which is responsible for two thirds of emissions. A long term vision for the transformation of the energy system is needed to guide their policies and actions. Around the world we see the emergence of new business models, growing investment, innovative policy, and new forms of leadership where like-minded countries are coming together and looking at high levels of ambition to drive change in the future. These are remarkable developments.

Building on IRENA's previous findings that significantly scaling up renewables is feasible and affordable, and combined with increased energy efficiency, can set the world on a pathway to limiting temperature rise to below 2 degree °C, this new study extends the analysis to the 2050 horizon using the same REmap methodology, which was developed through a bottom-up approach working directly with country experts from all over the world that have validated these conclusions. It shows that an energy transition in line with the 'below 2 °C' objective of the Paris Climate Agreement by 2050 is both technically and economically feasible, would result in lower overall costs, and improve and save millions of lives due to lower air pollution, increased economic growth and employment.

Our findings are that energy efficiency and renewable energy can provide 90% of the energy CO2 emissions reductions needed by 2050 with each being of roughly equal weight, and that renewable energy would account for two-thirds of energy supply by 2050.

This means that renewables will assume a dominant role in power generation – as was mentioned by Sigmar Gabriel and Brigitte Zypries - and trends indicate that we are on the way to reach this goal, with a share of 24% in the power generation mix, while falling technology costs in the

coming decade will add further momentum to the transformation of the power sector that we are seeing today.

Since we met here last year, renewable energy costs have continued to drop dramatically with solar and wind energy projects now offered for 3 US cents per kWh and even less in some countries around the world. In 2015, for the third year in a row, the majority of all new power generation capacity added came from renewables, and remarkably over 50% coming from developing countries, indicating the global nature of the opportunity before us. This is no longer a rich man's game, as we used to hear many decades ago. This is a transformational opportunity for all.

And, around the world, countries are raising their ambitions in terms of renewable energy deployment. China announced earlier this year that it was canceling plans to build more than 100 coal plants and investing at least USD 361 billion in renewable power generation by 2020. Remarkable leadership continuing in China. In the oil producing Gulf region, the United Arab Emirates (UAE), our host country where IRENA is headquartered, announced last January that it would cut carbon emissions by 70% and have 44% of power generation from renewables by 2050. And now Saudi Arabia, as part of its newly announced 2030 vision, plans to invest up to US 50 billion to achieve a target of 9.5 gigawatts of electricity from renewables by 2023, showing that oil producing countries

share the conviction that we all do, that an energy transition is unfolding, and that the opportunities that it presents are transformative.

Meanwhile, the private sector is increasingly using sustainable energy to power its businesses. Major global corporations are actively sourcing renewable energy for their operations, providing strong signals to the market. Energy companies are expanding their renewable energy portfolios. Last month, Statoil announced that it aims to increase its investments in renewables to between 15% and 20% of total spending by 2030, up from the 5% today.

What these remarkable developments tell us is that the future of the power sector increasingly belongs to renewable energy – because its business case has never been stronger.

Beyond the power sector, our findings also show that 60% of renewable energy potential can be realised in buildings, industry and transport. Part of this will be done through electrification of these end use sectors, powered by renewables. We project that the share of electricity in TFEC will rise already to more than 30% in 2050. And, we are seeing signals that we are headed in this direction. In Norway, Electric Vehicles (EVs) constitute nearly 40% of newly registered passenger cars last year. China, the world's largest automobile market, has established an

ambitious plan to deploy 5 million EVs by 2020, up from 600,000 currently in use. Again, transformative changes.

Ladies and Gentlemen,

This energy transition is not only technically feasible, but it is also affordable and it brings, in our view and from our analysis, an array of economic benefits.

We estimate that the net additional investment needed to undertake the transition would amount to USD 29 trillion over the period 2015-2050. These investments are affordable, in part because of further significant cost reductions we will see in renewables expected between 2015 and 2050, and some of these quite dramatic. In addition, savings due to reduced health impacts from air pollution and climate change exceed the costs by a factor between two and six in 2050. These are important considerations when we know that globally, more than 6.5 million people died from air pollution in 2012 alone, according to the World Health Organization (WHO), an unacceptable loss of life. However, if we delay action, total investment costs will rise, and stranded assets will increase, and negative climate trends will escalate with major social and economic repercussions. The cost of inaction will be much higher than the cost of action.

More importantly, our findings show that decarbonisation will bring a net economic benefits. Investing in the energy transition can fuel economic growth and create new employment opportunities, in our view boosting global GDP by 0.8% in 2050 compared to our Reference Case. That is the equivalent of almost USD 19 trillion in increased economic activity between today and 2050. Renewable energy jobs, in our view by this time would be around 25 million by 2050, from a current estimate of 9.4 million jobs today, with solar and bioenergy being the main employers. And in an employment-constrained, slow economic growth scenario that we see in the world today, this is surely an issue of central importance to national decision makers.

We need to understand that the transformation of the energy system is also fundamentally economic policy that creates stimulus and growth in new business and industry.

The employment opportunities offered by renewables can be transformative for our economies. In Morocco, the largest solar thermal plant in the world, being built in Ouarzazate, will not only be supplying electricity to one million homes, but will also be creating jobs and improving livelihoods in a disadvantaged region. The benefits of renewables are also palpable for consumers. In my own country, in Kenya, consumer electricity bills have recently been reduced by 30% as a result

of a substantial increase in the country's geothermal output, providing a strong stimulus to the economy.

While the pace of the energy transition is growing stronger every year, it needs to be accelerated to meet the objectives of the Paris Agreement. A seven-fold growth acceleration in renewables deployment compared to recent years is needed. Energy intensity improvement rate needs to increase by one and a half times.

This cannot be achieved through a piecemeal approach. A system-wide transformation is needed that calls for a broad range of solutions and actions. For instance, boosting innovation is critical to accelerating the energy transition, as investment in R&D for renewables is not currently growing, and remains miniscule for end-use sectors. Bertrand Piccard is here with his Solar Impulse project, which is a testament to the importance of technological innovation in taking us to a sustainable energy future.

But innovation is also needed in policy, business models and market design. Innovative solutions and approaches can help integrate higher shares of variable renewable energy in power systems. Countries such as Germany and Denmark are showing the way in this respect, and we heard, at our last Assembly in IRENA, how a number of utilities and grid operators are creating robust business models that allow the reliable

management of variable renewable energy at higher and higher levels. Innovative policy frameworks can attract investments, drive cost reductions, and provide incentives to enhance system flexibility.

The world community decided on an irreversible global compact in Paris. In this regard, IRENA's REmap 2050 and this study present one of the most compelling messages to date that the long-term decarbonisation of the energy system is not only feasible today, but it can bring with it new forms of sustainable growth. We underline the message that the energy transition is not a burden but a transformative opportunity, and that concerted international and national action will result in benefits that well exceed the costs.

However, to unlock these opportunities and benefits, bold leadership is needed at all levels. From countries, in particular frontrunner countries but also groupings such as the G20, which accounts for 75% of the renewable energy potential worldwide. The private sector and citizens can also lead by example, as this is a collective responsibility and we are seeing this every day in the actions of individuals and companies around the world.

Ladies and gentlemen,

We face a clear choice between outdated models and approaches rooted in the past and forward-looking, win-win solutions that embrace the future. I am convinced that with the drive to progress, coupled with the vision of the *Energiewende* frontrunners and international cooperation, we will increasingly adopt these solutions, reduce atmospheric emissions and secure a prosperous, sustainable energy future for all. And why is this important? Energy is not an end in itself. Energy is a driver of how we all live, how we consume, and how our lifestyles are sustainable. We discussed this morning, in another meeting, how investment in clean energy in developing countries that are facing severe economic stress can be a driver for sustainable development but also a major plank of our strategy to create fairness and equity in a world where people do not have to leave their homes for fear of their survival to find new ways of living. This is the optimistic vision that we have of the future with our perspective on renewable energy. I wanted to take this opportunity to share with you this bigger picture, but also the sense of optimism that we carry as we go forward in this important endeavour.

Thank you very much.