MUSTAPHA BAKKOURY

President of the Moroccan Agency for Solar Energy (Masen)

Dear Thierry, Mr. President, thank you for giving me this opportunity, and thank you for the honour you are all doing me. Hello to each and every one of you. Thank you for allowing me to take part, as a speaker, in this conference which has reached the age of maturity, and offers, as I have been able to see, subjects of the highest calibre. I will not venture to position myself as an expert, as I am not one, but perhaps as a practitioner of this or that, and call upon examples of what we are doing in Morocco, solely to point out or underscore a number of points which I would like to share with you today, which are somewhat the fruit of our experience: Morocco's experience in renewable energies, which was formally set out and implemented, nearly nine years ago today. It all started in late 2009-2010. I will start passing on some of the messages I wanted to share with you. At the time, our concern was two-fold.

The first concern had to do with development, because any discussion of energy is necessarily also a discussion about development, whether renewable energy or fossil fuel energy. Ten years ago, Morocco needed to find ways and means to stay on its growth dynamic, to a sufficient degree to both close the gaps that we had let develop, and this meant acknowledging them, identifying them and setting them inside widely-mobilising national strategies. The second component of this work involved maximising the country's resources and sources of potential, which exist to a good extent as well. Obviously, the corollary to this was to have available, competitive energy, as all of this was taking place against a backdrop of increasingly swift opening up of the Moroccan economy to the outside world. And whenever there is opening up, there is a need to guarantee to the economic or other players that they will have the means to remain competitive. All of this had to be addressed by a country that was not the only one in this situation, did not have fossil resources and was totally or almost totally dependent on import for its primary resources.

The growth rate to which I was referring, which would be the minimum to achieve in order to reach both those targets, is amounting to around 5 or 6%, which means, in energy terms, the need to double electrical capacity every ten years. In other words, it is a very big challenge, but it is also an opportunity. It is a very big challenge, because it means revising the projects development plans, but it is an opportunity, because a strategic disruption was called for, and renewable energies needed to be substantially incorporated into the electricity mix. This was, in a sense, facilitated by the fact that we needed to develop new capacities, which was not the case in a certain number of countries that have trouble replacing existing capacity with new capacity. We had to do everything from the ground up. That was our challenge.

Depending on how we went about it, we would be faced either with an opportunity or, in contrast, a further challenge that would only add to the complexity of the task. We tried to make it into an opportunity, and to make the necessary adjustments at the institutional level to have players, protect the legacy players so that they would not have to bear the brunt of such an approach, because it was obvious to all of us that this break with the past would mean our entering into a transition phase, during which we would require a certain degree of support. Whenever a transition is needed, so too is adequate attention to ensure that the phase is kept to the shortest possible time, and if the support mechanism proved necessary, that it be designed in a healthy manner, and that no additional factors enter the picture to further add to the costs which public finance will have to bear. In other words, we had to find the right support mechanism, which would ultimately be a leverage mechanism, rather than additional subsidies, which would have made this new direction an uncertain venture.

Why did we do this in 2010, and what encouraged us to set out on this path, which some had called bold, and rightly so. Some said that it was a venture that had not been thought out to the end. We deciphered a number of dynamics at the international level. First of all, greater sensitivity to the environmental issues that was starting to play out as true concern, at the level of certain regions of the world. It came from our perception, but another factor also proved a major influence, it is that we identified a real and concrete leaning toward renewable energies, in the research budgets which the largest countries were starting to allocate. These were large European countries, as Europe continues to be in the lead when it comes to research budgets allocated to renewable energies, slightly ahead of the United States and China. Obviously, and without overlooking what Japan and Korea are doing, when you look at the budgets, there are

really three major blocs that stand out. In our view, the research budgets on these often very concrete issues could not fail to yield results. These results included the start of a period of reducing renewable energy costs, at a time when, on the other end, we were entering a period of increasing costs for fossil energies and, at the very least, a period of volatility that was extremely difficult to incorporate into long-term strategies. All of these factors weighed in heavily, proving that for Morocco, the time had come. What's more, for our strategy to be taken seriously, it had to be consistent. Not content with only having a vision and having laid out the institutional framework, in 2010, we set a series of objectives so that all of this would have meaning and mobilise us on the domestic front. We set ourselves the objectives which everyone knows to be ours today. 42% of our electricity mix should come from renewable sources by 2020. That was our starting point.

The international dynamic which we picked up on has largely become reality and, in some cases, exceeded expectations. We now have a different dynamic, a more advanced one, in that we have moved past the design and planning stage. We are indeed in the execution phase. The first big projects have been completed, whether in solar or in wind, those being the two pillar sources for our strategy, in addition to maximising the potential of hydraulic power, even if the latter is low, as we are not a hydraulic country, but still a country that needs to manage its hydraulic power. In fact, the hydraulic strategy, the water strategy which Morocco initiated a few years earlier gave us a great deal of encouragement to have confidence in the direction we were taking.

A country's activity does not stop at the ten-year mark, and the energy sector being an infrastructure sector, we need to continually strive to give it ever greater visibility over the long term. Each time, we pushed the forecasting horizon back a bit further, first reaching 2020. Are we more sure today than we were before about our ability to achieve our targets? The 2030 deadline has already been announced and His Majesty the King is tracking this very closely; and this is also one of the factors encouraging mobilisation and success. It gives the undertaking permanence over time, with the objective now raised to 52% of electrical sources by 2030, that is 52% in dynamic terms - all the while continuing to follow very closely what is happening at the international level.

The research budgets have not decreased, and rather increased in Europe, in the United States, despite all we might have come to believe about the attitude of the current government there as regards the commitments and the Paris Agreement. This also gives me the opportunity to observe that the United States' withdrawal from the Paris Agreement does not mean a withdrawal from renewable energies. The figures we have show the opposite. The US' investments in renewable energies are continuing, for the plain and simple reason that some States, such as California, but it is not the only one, have kept up all their commitment. I am saying this very humbly, in front of experts who are much more discerning than I am on the matter: the United States' strategy on energy involves becoming less dependent, and it has successfully done so between 2007 and 2017. They were 28% dependent on foreign export; today, they are much less so, at 10%, in particular by drawing on non-conventional gases, non-conventional oils, as well as on renewable. I would be interested in hearing other opinions on these matters.

This has obviously opened the door to some doubt about the environmental dimensions, which is more a way of approaching international agreements. We saw that the attitude on other agreements is exactly the same. The challenges being levied against some trade agreements does not mean a withdrawal from trade itself. I think that, where energy is concerned, the United States wants to have its own strategy, be the maker of its own fate, unlike other regions of the world. China, too, has significantly stepped up the share of renewable energies in its mix, and today, 40% of renewable projects, in particular solar and wind, solar in particular, are developed in China, not to mention its very strong position on the industrial front, in both these sectors. At the same time, China's energy dependency has grown, and become more deeply rooted. This can also inform us as to the relationship it has with the energy sector at the international level. We think, in any case, that renewable energies will continue to be developed, and I would like to stop here to voice another message, because there are still controversies between renewable versus fossil. The question is often: "Is it possible to do without fossil energy?" Today, I would like to ask the question: "Is it possible to do without renewables?" I do not want to give an answer, I just want the debate to go further. Simply speaking, if we all had in hand today the ability to decide to halt, from this point on, the development of any renewable electricity projects, what would happen? There would obviously be additional strain on fossil resources, and a sharp increase in the cost per kilowatt-hour of electricity. If we did the opposite, if we stopped all projects based on fossil resources, and decided today to develop our future capacity, our new capacity from renewable electricity, the opposite would happen, because 70-80% of the kilowatt-hour from renewable sources is based on Capex. Thus, it is a matter of market size. We

obviously need to qualify this in greater detail, as regards certain materials that may also be missing, but overall, the equation is reversed.

I obviously don't want to come down on either side, but the aim is also to be able to see these issues from a slightly different standpoint. We are used to asking ourselves questions in a traditional way. Moreover, personally, I am not worried about the need we all have to use all our energy sources in the most intelligent way possible. I do not see us as being able to do without certain fossil resources; I do, however, think there are other ways of using them, provided that we deal, in parallel, with the issue of emissions and the carbon problem and CO2in parallel, avert it when it is not necessary, and make better reuse of it. There is also a need for CO2, so the aim will also be to see how we can better manage this.

The agreements which we have today, in particular the Paris Agreement, which is an a minima agreement, need to be preserved; however, this alone is not enough. It is a "minimum wage" of sorts, to collectively prevent emissions. That is the issue we need to address at the same time.

The next message, which I believe is the fourth, is that today, where renewable technologies are concerned, there is a proven maturity that is indisputable. However, what is not necessarily so is our approach to using such and such a technology, which should not be based on determinants such as cost, but rather on what we are supposed to do with them. What economic use should be made of them? That, as I see it, is the real question, and that is what must determine whether we use one technology or another. In other words, it is the economic use I can make of it that should be the foundation for judging its economic, technical and institutional worth. I believe we would use renewable energies much more efficiently by making them part of integrated systems. In doing so, we would also avoid getting caught up in the discussion, within renewable energies, about competition between technologies. Because the real question is, "What am I supposed to do with this?" Each technology has specific characteristics that result in benefits and drawbacks, but it is the sum of those benefits and drawbacks that needs to be analysed, identified and worked with to determine what we are supposed to do with them. When the topic is approached from this angle, the outcome can generally be positive, first of all with respect to the energy equation, and secondly, through the many externalities that can result across the industrial sector, as renewable energies open up many doors, in particular to create attractive local job opportunities, something within reach for many countries, from the industrial standpoint. In that respect, they would make a real contribution to reducing inequalities, by getting new territories off the ground. Some of the workshops discussed this. Reducing disparities also means generating sound economic activity, capable of maximising resources. Often, where there are renewable resources, there is a territory at a lesser stage of development than that observed at the national level. In my view, this dimension is important for overall success.

To conclude, perhaps as a message at this stage, for me, renewables have one extremely powerful characteristic. Renewable resources, solar, wind, hydro, biomass, geothermal, when available, are generally available to a very large number of people. Consequently, there is no competition to use them. It's quite the opposite. Not to exploit it, not to take advantage of it, would leave everyone on the losing end. Meanwhile, putting it to use does not make anyone any poorer. That is, using a solar or wind project does not make anyone any poorer, in any way. As such, these energies can be an extremely compelling area of cooperation to bring us back to integration, and in this capacity, we are working with European countries on an initiative we call the SET (Sustainable Energy Transmission) Roadmap, which needs to be quickly developed with Spain, Portugal, France, Germany and the European Commission. Taking that very simple idea which others came up with at a time, but which stayed at a theoretical level, our collective ambition today is to make it operational, to develop renewable projects where the resources are best, and to rely on technology, especially transmission technology, to bring it to places of consumption, through collectively designed efforts. This is a prospect that is moving forward very smoothly. It will be presented at COP 24 in Poland, and will probably give rise to its first project, I hope, as early as next year.

So the dynamics really are there, in my opinion, and we continue to look at them very closely, to build projects, to look at how to improve them, how to do better next time around, namely with hydrogen storage. I will say no more. These are topics of the future, but sometimes the future starts earlier than we think. Thank you.

Thierry de MONTBRIAL

Common courtesy requires that you stop eating while you are still a little hungry. It's the same for good intellectual things. I think that the same rule is applicable to the WPC: we would like the debates to go longer. I would just like to inform Mr. Bakkoury, who is currently monopolised by Mr. Moratinos, that one of the defining characteristics of our friend Miguel Moratinos is that he is very talkative. It's always interesting, but he never stops talking. We like that. I would like to say that all the perspectives you outlined, and the questions you did not want to answer yourself, as you said, not only applied to Morocco, but of course to many other countries.

I will make Morocco's propaganda for a minute, what strikes me more generally in Morocco is the efforts that are being made, in particular in the technological fields, not only in the energy field, to find solutions that are applicable in developing countries, particularly in Africa, which are not necessarily the same solutions as those implemented in highly developed countries. Some of Morocco's strategies are exemplary and worth noting, especially in the energy sector.

Before I conclude, and unfortunately without bouncing back, I would simply like to follow up on the questions you asked about renewable energies. You will give me the answer of this one once we sit back at our table: "Are there physical limits to solar energy?". We currently see a decrease in the costs of photoelectric cells, etc., which reminds us of what we have seen in the semiconductor field, which more or less resembles Moore's laws, but are there any physical limits?

And then you didn't mention nuclear power. It is of course solar energy, but non-renewable energy, coal, etc., is also solar energy, on a different time scale. Anyways, let me stop here, because otherwise, I know a prominent Moroccan personality, wherever she is, who will tell me I have spoken too much. Thank you anyway, Mr. Bakkoury.