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Event: Towards energy self-sufficiency in Namibia

Host: Economic Association of Namibia

Key-note speaker: Honourable Minister of Mines and Energy, Tom Alweendo.

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Good day everyone,

First of all, I would like to thank the Economic Association of Namibia for having invited me to participate as a speaker in this business breakfast, and secondly, but definitely not least, I would like to thank the honourable Minister, Tom Alweendo, for participating in the event.

The event is named ***towards energy self-sufficiency in Namibia***, and I have been asked to speak on how investments in renewable energy could move Namibia towards achieving said energy self-sufficiency. I will talk about that point, while also talking about how investing in renewable energy can prove to be a catalyst for generalized economic growth and job creation, it is not just a means to end the dependence on consuming energy that is generated outside of the country.

But before I go into my speech, let me introduce myself (like the moderator has said), I am Mario Rodríguez and I am working for Alten Renewable Energy as their representative here in Namibia. Now that introductions are out of the way, I would like to start this conversation by talking about what happened in Spain in the sector of renewable energies. In this regard, I will get into the specifics of what happened with solar PV, which is the sector of this industry that Alten specializes in and the one in which as players in the private sector we have most experience in.

I am going to talk about Spain because I believe that Namibia stands at a point where similar outcomes that those that Spain experienced in the early 2000s could be achieved. You will see why I say this as I progress on my talk, and also will see what these outcomes are.

Let's go back to the start. Back in the year 2000, the government of Spain issued a Plan for the Promotion of Renewable Energy. It was a 10-year plan and its main goal was that 30% of the energy generated should come from renewable sources by 2010. The plan's goal was met, and in fact its effects carried on and have improved and last until today, that is to say, we have not gone back to the old ways. For example, in 2018 40% of the electricity produced in Spain came from Renewable Energy.

What were the effects of this plan, you may wonder, other than achieving the figure that I have just given you? Well, allow me to illustrate a couple of the ramifications of the aforementioned plan: in 2008, at the very cusp of the latest financial crisis, the Renewable Energy sector created about 100 thousand jobs in Spain. So, we have the first interesting consequence of investing in renewable energy: job creation.

And linked with job creation comes a second consequence, which is developing an industry and creating market leaders within it: for example, when speaking about Solar Photovoltaic technology, nowadays 4 of the world top-10 tracker suppliers for PV are Spanish companies, and 3 of the world top-10 inverter suppliers for PV are also Spanish (Siemens-Gamesa, Ingeteam and Power Electronics).

This is the consequence of Spain deciding to invest in what was very expensive technology back then (PV solar), and as a result, our companies grew to become experts in the technology and experts in providing solutions all across the value chain of a PV project. Nowadays Spanish companies deliver energy solutions to other countries who want to go down the green route. Renewable energy is the future and investing in the future is ever so rarely a bad idea. However, after the initial plan reached its objective in 2010, and due to the harsh economic conditions

that the country was facing back then, Spain cut most investment in Renewable Energy. You can see that despite the lack of continued investment, the industry and the leadership of Spanish companies in it still managed to grow, but we think the growth could have been much bigger, and our companies could be in a much better position, had investment not been cut drastically. This I think is a lesson learned that Namibia should take into account for their future approach when drafting investment plans for the renewable energy sector.

Now, let us bring all of this back to Namibia in the present day. And just as a disclaimer, given the expertise of my company and my own professional experience, which deals mostly with solar projects, I will speak about the possibilities that I see in this particular field. However, it should go without saying that if Namibia is going to invest seriously in Renewable Energy to achieve energy self-sufficiency, then other Renewable energies such as wind and hydro, must of course be considered and included in an eventual plan to promote investment in renewable energies in the country.

With that said, let's take a general look at Namibia's current situation energy-wise:

- The most notorious fact is that Namibia is still heavily dependent on procuring energy from the outside, mostly procuring its energy from South Africa. And we all know the challenges that Eskom is facing. But that is not the topic of my speech. Anyway, Namibia has been importing between 60 and 70% of its energy demand in the past 4 years.

Now we have reached the topic of this conversation. Is it possible to reduce the amount of energy that is imported to 0%? Furthermore, is it possible to actually turn the situation around and not just import 0% but also export energy to other countries in the region? We believe that these things are achievable. However, these are not things that will materialize in the next 2, 3 or even 5 years. We think that it would be possible for Namibia to achieve self-sufficiency and become a seller of energy within a 10-year temporal frame of complete commitment to the development of a renewable energy industry and the investment in it.

What are the contributing factors to this line of thinking, and how is Namibia strategically positioned as of today to make this happen? And also, why do we think that Renewable Energy is the way to go when achieving energy self-sufficiency, instead of say, Nuclear energy?

First of all, Nuclear energy is too expensive and is already developed, there is no learning process taking place from which Namibia could benefit. Regarding this last part, other countries would come and sell you their solutions for Nuclear power, and even if somehow locally some know how were to be gained, Namibia would not be able to export Nuclear solutions anywhere else. Also, on the point of price, Nuclear energy takes a long time to develop (a long and expensive process) and also for a project of this kind to be bankable you would have to install probably over 100% of Namibia's capacity (not a single nuclear plant has less than 1000MW capacity).

Now, when it comes to renewable energy, and Solar specifically, there are several aspects which make it a better option: first of all, two things - price and necessity (it's a cheap energy and the global policies on climate change require that countries must adopt Renewable Energies).

Secondly, solar has room to develop new technology solutions, and this is key. In my example about Spain, the industry and companies achieved success because it was new, and there was a

learning process to be had, which could in turn be exported. Take Alten for instance, and the projects that we have developed over the world. It has been only thanks to the knowledge gained during the nascent (and expensive) moments of the technology.

Allow me to elaborate on this, using Solar Energy and PV technology as my example:

- As I have mentioned before, there are important consequences that come from investing in Renewable Energy:
 - o First, job creation. Companies will start to pick up traction and employ more people to make their projects a reality.
 - o Second, the consolidation of an industry, and the possibility of turning local players into global world leaders. This in turn will allow for the companies to travel abroad and sell their expertise and knowledge to other countries, companies, regions, and so on.
 - o Third, a higher ability to meet the energy demands of the country will mean that less energy will have to be imported, and eventually, 0% imports should be achieved, and Namibia could make use of its position in the Southern African Power Pool to sell to other members.

Let us look at PV technology within the solar industry and see how the previously mentioned results could work out for Namibia:

First, I need to say that we firmly believe that PV is going to be the king within the solar energy sector, because of the following factors:

- The cost curve has been on a massive downhill trend. If you take 100% of the cost for solar modules back in 2008 now it has gone down to represent only 5% of said initial cost. This together with the economies of scale make it a very affordable energy solution.
- It is a very modifiable technology, meaning that nothing significant changes, whether you want to build a 5Mw plant or a 100MW plant, other than the number of panels and other components involved.
- It is a simple technology, when it comes to its design and construction, as well as its operation. The alternative, CSP is much more complicated, and also much more expensive (around 5x more expensive for the same installed capacity), and it also faces the same hardships that the plants operating on PV technology face.
- Speaking of which, these challenges are the following:
 - o First, solar energy is difficult to forecast this is due to the variability and unpredictability of sunlight. If it is overcast or the day is cloudy, then the photovoltaic cells are unable to produce electricity, or will do so inefficiently.
 - o Second, and very important, the energy is non-dispatchable: this means that you cannot ring up to the solar plant and ask them to generate a certain amount

of energy at a given time. When the sun is shining energy is produced, and if not used it goes to waste. And many of the high energy demanding moments take place at night.

And it is in this last challenge, where the opportunity comes up. In Alten we are committed to exploring the possibility of battery of storage for PV plants, currently developing solutions for our existing plants to be presented to our clients in the future. As you are aware, the technology already exists, although it is far from being perfected. Which means that those who would raise to the challenge of learning the technology now, and being proficient at implementing it, will be able to capitalise in the future, when it is adopted everywhere else.

Namibia, with the Hardap project has carried out the first Private Public Partnership project of this kind in the continent. NamPower is a stakeholder and the technology of the plant is also theirs, NamPower, and therefore the country, has gained know how in PV technology, in complex long term PPAs and in project finance through this project, and already a small industrial web is forming, take for instance the presence and growth of HopSol Africa and other subcontractors in the solar field.

The fact is, NamPower has the possibility of investing and developing their own small-scale PV plants (of around 5MW or smaller) where they could experiment with storage solutions, invest in battery storage technology and become knowledgeable in it while promoting local companies to research and develop solutions in this field, helping them master this technology as well.

In Alten we believe that when storage solutions are implemented in PV plants the problem of the energy being non-dispatchable will cease to exist. This would allow to meet demand during night time, or even sell excess energy to other countries, which could help contribute towards the goal of Namibia becoming an energy exporter.

And yes, we are aware that the technology is still expensive, and I am going to anticipate myself to the following question: why invest in the technology now and not wait for the price to go down? Because, like I have hinted before, if you allow for the price to go down, it means that other countries meanwhile will have learnt and invested in the technology. When it comes to this geographical region maybe South Africa will take the chance and develop the storage solution in the meanwhile and help build their industry around and grow, and in the future, they would be the ones selling the solution to you and other Southern African countries. They would do it at a cheaper price than today, that is for sure. However, is it worth letting this opportunity pass by?

Seizing the opportunity to develop storage solutions for PV plants could mean for Namibia the same thing that investing in PV technology meant for Spain back in the early 2000s: job creation, industry consolidation and giving birth to market leaders who can then in turn use their know-how to implement storage solution in the PV plants built all around southern Africa. And let's not forget, all the while reducing the need that Namibia has of energy imports.

Thank you very much for your time, that is all from my side for now.