**Back in October 2021, we checked out a brand-new enterprise called X-Links, that had the extremely ambitious goal of bringing an almost constant supply of electricity all the way from the desert of South Morocco to the shores of the United Kingdom via huge subsea high voltage direct current transmission lines.**

**The target was to provide enough power for about seven million UK homes.**

**The company even planned to build its own production facility to produce the sixteen-thousand kilometres of cabling required for the project.**

**No shortage of risk in that endeavour then, eh? So, the question is…three years on, with a global pandemic and an economic crash behind us, and with arguably one of the most volatile global commodities markets in decades, how is the X-Links project holding up so far?**

**Hello and welcome to Just Have a Think.**

**The original video that I mentioned a moment ago gives a pretty good idea of the magnitude of the X-Links project, and I’ve left a link to it in the description section, so you can jump back and have a look if you haven’t already seen it. To put a bit more flesh on the bones of that presentation, I recently visited the ten-million-pound research centre of Octopus Energy, who, as well as being Britain’s largest electricity supplier, also just happen to be the most recent company to invest in the X-Links project. While I was there, I was lucky enough to be joined by the new X-Links Morocco CEO, James Humfrey and also the Chief Executive of Octopus Energy itself, Greg Jackson.**

**Back in twenty-twenty-one, X-Links had identified fifteen hundred square kilometres of unused and unallocated land out in the Moroccan desert that was deemed suitable to build out eight gigawatts of solar PV panels, another three-point-five gigawatts of wind power, and a five-gigawatt, twenty-two-point-five-gigawatt-hour battery energy storage installation.**

**To give a bit of context to those numbers, Britain’s world-leading offshore wind capacity in twenty-twenty-three was just short of fifteen gigawatts, so even without the batteries, this one single site in Morocco will increase that capacity by roughly two thirds. So, the new CEO has quite a challenge on his hands.**

**“Imagine a piece of land the size of greater London, and then that will 11.5GW of solar and wind power, 5 gigawatts of battery, and then the electricity will go a hundred kilometres to the sea, 4,000km hugging the coast through Portugal, Spain, France and arriving in Devon, and then that’s where it connects to the UK grid.”**

**“So, why, why Morocco? Why have you chosen Morocco, what’s so good about the situation there?”**

**“Yeah, I think two things. First of all, the Morocco government has shown great foresight with the renewable industry, and over the last decade it’s developed its own renewable power set of projects for domestic use and built a lot of capability and it has the foresight to see the opportunity in exporting renewable energy. And then I think secondly when you look at it from a wind and solar perspective, the solar’s got great irradiation, as you might imagine that far south in the desert, 20% more than Spain for example. And then even better, the wind is a trade or convection wind, which means it comes in the evening. And it not at all correlated or linked to the type of wind we get in Northern Europe. So, it is windy on a constant basis, and that helps us supply electricity when the UK needs it, especially in the evenings.”**

**“And is that because…is the convection as a result of the sun heating up the atmosphere during the daytime and then that moves up and causes a movement of air?”**

**“Exactly, and therefore it’s much more reliable, and you don’t get these periods of weeks where cyclonic wind doesn’t blow, so in that sense it’s much more consistent.”**

**There’s enough sunshine down there in Morocco to provide a significant contribution to the UK’s daytime grid AND charge up the five- gigawatt battery bank. That means when the wind does die down in the early hours of each morning, the batteries can seamlessly kick in and keep the electrons flowing during our country’s off-peak hours.**

**So, ostensibly great news for UK homes, but what about the people of Morocco? What’s in it for them?**

 **“The overall vision is very much about benefits for everyone involved. Both sides. So, speaking about Morocco specifically, you have enormous foreign direct investment. You have export revenue. You have local jobs, both in terms of construction – 10,000 jobs at least. 2,000 in operations. And then you have the building out of local industry to supply and to set up as part of the wider green industrialised agenda of Morocco. Supply chains, local supply chains with even more jobs. So, you then get not the sort of indirect multipliers. It helps transition Morocco industrially as well. So, all of those are at play. In terms of the local community, yes, on the site – no-one lives on the site. It is pretty remote. But there are villages within a number of kilometres. We have someone on the team who is from there, lives locally, you know to sort of talk to them, so that we can also build community support. You know, and talking to them, they’re probably most interested in A) jobs, and B) potentially the chance to sell things to the workers on site. So those are the sorts of things that are on their mind.”**

**Now, right at the start of the video I mentioned one or two minor hiccups in the entire global geo-political and economic system. Those events inevitably pushed back the activity of just about every major development company in the world, and of course X-Links was no exception.**

 **“Yeah, so a lot of things have happened, and are now ongoing. We’ve been surveying on the actual site itself in Morocco for over two years, doing wind and solar measurements. We’ve done surveying across the route where it will move through Morocco to the sea. And then we’ve got surveying that’s been happening last years and now we’ve currently got vessels on the water along the sea route. So, currently off the coast of Frans you’ll see a Geo xyz vessel, and we’re beginning to get all of that coming in.”**

 **“We’re also looking at environmental surveys that’s all linked to permitting as well. So, geophys sort of surveys that are happening as well.”**

**Meanwhile, back here in Blighty there’s another workstream ongoing to ensure everything gets properly permitted, regulated and connected when the time comes.**

 **“All very much going ahead. One of the early successes for the project was the National Grid acceptance, and in fact we’ve just had the modified application approved last month. So that’s all in place, and that’s worked very well. And then we have a relatively short distance, about 14km in Devon as it comes onshore and into where the sub-station is located.”**

 **“We’re totally focussed on getting operational delivery within the decade. And then you sort of work backwards from that”**

**When I first spoke with X-Links group CEO, Simon Morrish back in 2021, the estimated cost of the entire project was in the region of £16 Billion, with £40 Million having already been secured for the development phase from a group of 20 investors, perhaps most significant of which was a German company called Con|Energy, which has more than 25 years’ experience investing in numerous sustainable infrastructure and energy supply projects, including companies like the global charging infrastructure leader Chargepoint and many other startups.**

**Now, as I mentioned earlier, the reason James and I were sitting in Octopus Energy’s UK Research Centre was that Octopus are also now an investor in the X-Links project. So, I was keen to understand directly from their visionary CEO, Greg Jackson exactly why he feels this kind of infrastructure is something we should be shooting for here in the UK.**

**“You know, years ago I was speaking to friend who worked in oil and gas. His job was doing the legals, negotiating for pipelines to carry oil from one country to another. And I said like ‘is there a reason we don’t do this with electricity’? You know, because you see all those images on the internet that show a tiny bit of the Sahara, and they’ll say ‘solar this size could power the world’. Well, why don’t we do that? And it’s quite interesting actually because he said, ‘well, it’ll probably easier for electricity than oil and gas, because it’s kind of less leaky’! But no-one at the time could really look to the value of it, and I guess all the power and investment were going into fossil fuels. But as we’re electrifying, hopefully everything, we need to ask about how do we power heat pumps in winter, you know when its not windy or sunny. And we need to answer those questions.**

**And you revisit that old question…’could we ship electrons around the world the way we ship oil and gas. And it turns out, not only can we, but there’s this company X-Links who are looking to do it. And when I met them I was just blown away by the amount of progress they’d made in creating the outline of the project, the finances and the coalition of talent they’d brought together, some incredibly accomplished people. And so actually, what this is all about is not trying to meet the needs of the system as it is today, but to meet the needs of the system we’re building. “**

**If you’re a regular viewer of this channel, or if you just take a keen interest in green energy generally, then you will no doubt already be aware that solar PV prices have tumbled more than 80% in the last decade or so. So, projects like X-Links serve as a great example of how interconnectors can overcome at least one of the remaining concerns among renewable energy detractors and sustainable technology laggards, which is their obsession with intermittency. Battery energy storage is already dealing with much of the short-term so-called ‘frequency regulation’ to keep our grids stable of course, and the price of that technology is also dropping like a stone. But interconnectors offer a whole new dimension of energy delivery security. According to** [**this recent analysis**](https://ember-climate.org/insights/research/breaking-borders-europe-electricity-interconnectors/) **by the independent energy think tank Ember, Europe’s electricity system is already the**[**world’s largest**](https://eepublicdownloads.entsoe.eu/clean-documents/tyndp-documents/entso-e_Vision_2050_report_221006.pdf)**interconnected grid, with more than four hundred interconnectors linking nearly six hundred million citizens. The current interconnected capacity of ninety-three gigawatts is expected to grow to a hundred and thirty-six gigawatts by twenty-thirty and a hundred and fifty-five gigawatts by twenty-forty. The Ember report points out that forward-looking planning decisions taken now will lock in place the cost-effective interconnections that would bring multiple co-benefits, for all the countries involved, so in that respect the X-Links projects looks very well set to play a major role in the future of UK energy security and perhaps even to become a template for similar projects all over the world.**

**Now I’m sure you have your own views on all these developments, so as always, the place to leave your thoughts is in the comments section below, and I very much look forward to seeing what the consensus view is.**

**And by the way, you can watch the full unedited interviews with Greg Jackson and James Humfrey exclusively over at our Patreon page, where you can also get early access to all my videos and have YOUR say on the direction of the channel via monthly content polls. And the link to that page will be on the end screen of this video and in the description section.**

**That’s it for this week though. A massive thank you to all our existing Patreon supporters of course, without whom this channel quite simply would not exist.**

**And if you don’t want to miss out on notifications of new videos each week, then make sure you click on that subscribe button. It won’t cost you a penny to do that, and it’s just a simple click away either down there somewhere or on that icon there.**

**As always though, thanks very much for watching! Have a great week, and remember to just have a think.**

**See you next week.**