Denis Phares

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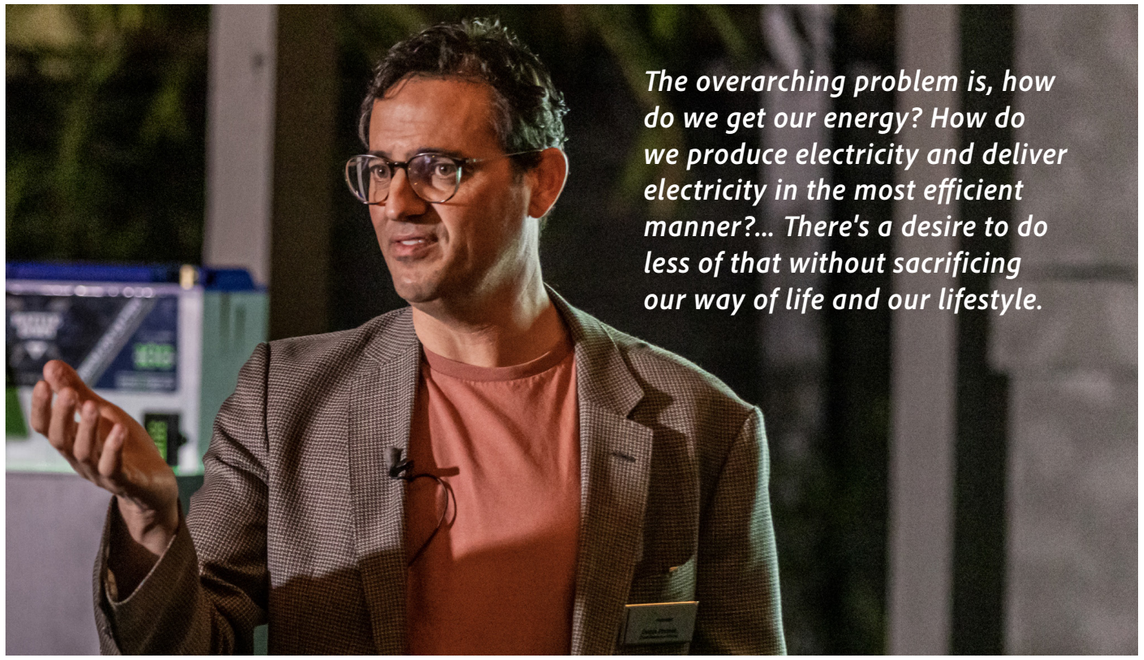
CEO at Dragonfly Energy

Interview with **Denis Phares**



Alan Ross: We are here at the RE+ 2023 event in Las Vegas. My guest is someone that I've had interviews with before, and he's a delightful interviewee. Denis Phares is the founder and CEO of Dragonfly Energy. And you've got your pulse on the marketplace. First of all, we are going to talk about what changed since the last time you and I had an interview.

Denis Phares: It's great to be back. Alan, thanks for having me back. It is a rapidly evolving industry, obviously. There's so much that is happening because we're in the middle of this major global transition. If I were to, say, identify what has been changing lately over the last half year, over the last year, a lot of it has to do with just exposure in terms of understanding what needs to change over the next decade, next couple of decades. If you look at RE+ here today, what I've noticed, it's all batteries.

AR There's a lot of batteries here. Batteries, batteries, batteries. You said something about it evolving, but we're still identifying the problems and still trying to figure out how to merge a thousand solutions into the problems. And there'll be winners and losers. The people that figure it out will be the winners. But a lot of it comes about to collaboration of the overall problem. Define the problem a little bit more clearly today than maybe it was a year ago.

DP Well, the overarching problem is, *how do we get our energy?* How do we produce electricity and deliver electricity in the most efficient manner? And one thing that we are recognizing, especially over the last year or two, is that there are tangible effects on climate that we have seen from burning fossil fuels. There's a desire to do less of that without sacrificing our way of life and our lifestyle. It is now a very interesting mix of technology and money and financing and politics and just general public perception.

AR Where does storage fit in the midst of all of that? From a generation standpoint, we're moving to much more wind and solar. That's part of this. They're trying to say, *Okay, let's move to that*. We'll get some geothermal in there. People are still trying to build a nuclear plant. It's not going to happen in the United States, in my opinion. But let's assume that the generation is working. Now, on the other end, you have electrification of everything, especially transportation. That creates a whole storage problem of where things are. I know Dragonfly has a very unique solution we're going to talk about because you've applied it, you're out there in the marketplace. But talk about the gap between the transmission, generation transmission, let's assume that the politics will figure it out, but really the distribution and the electrification of society, because that's what we're really about, electrification of society. Talk a little bit about where storage as a part of that.

DP Well, you've got the downstream aspect, which is the electrification of things like transportation, and you've got the upstream aspect, which is the solar and wind that you talk about. From a downstream perspective, we need to have the energy delivered when it's needed. From an upstream perspective, the energy is delivered only when the sun is shining and the wind is blowing. That's what needs to be matched up. You need storage to basically create that and it has to be large enough to be able to take in the energy when it's being produced and deliver it when it's needed.

Photo: Dragonfly Energy

AR That's not necessarily what Dragonfly does, but talk about some of the technologies that seem to be more promising in terms of large energy storage, that may be, for example, in large cars. Talk a little bit about what's happening in that space.

DP There are so many ways to store energy. You can store energy as electrochemical energy, like in a battery. You can store it as gravimetric energy, like pump hydro. You can store it in kinetic energy, like fly wheels. There's just so many ways to do it. And ultimately, what technology needs to is whatever you're doing, it has to be cheap. It's all about bringing the cost down, whether you're making new batteries, whether it's flow batteries or lithium batteries or fly wheels or whatever you're doing. It's got to be inexpensive enough that it makes sense for our application, either by end users if you're off-grade or by utility companies if you're on-grade.

AR Excellent. I want to go specifically to Dragonfly. Talk a little bit about your particular technology in this space, because you've invented it, correct? And then let's talk about what you're experiencing as one of the solution providers to the marketplace.

DP We have been working on cost reduction. The way that we've done it is by changing the way lithium cells, in particular, are manufactured. We've reduced the cost of manufacturing. Now, we haven't done that in our current core business, our current marketplace, where we are assembling battery for things like RVs and boats and industrial solar applications. In that regard, we're competing with lead-acid batteries, so from a cost perspective, we're already there in that arena. But when we want to revolutionize the grid, the cost has to be much, much lower. That's where we need to deploy our cell manufacturing technology, the dry electrode process we've developed. We just completed our pilot line. That's what happened since the last time we talked. We've begun to produce anode. The next step is to produce cathode, and then by the end of the year, we expect to produce full cells.

AR When you say the pilot project that happened, talk a little bit about that. How did you decide to do it? Did you get financing and funding for it? Because it's not cheap to do everything that you're doing.

DP It's actually a pilot line. We built a pilot line to produce on the order of about 150 megawatt-hours a year. It's not a very large scale gigafactory, but it applies our innovative

dry electrode process. And how did we finance it? Well, that's why we went public last year. We had to raise the capital to do that.

AR I hope we help get the message out about you going public last year. That's good. I want to talk about that scale up. You got to go now from the anode to the cathode to the scale up. The plan for doing that, and you talk about 150 megawatt-hour. Is that what you're trying to Scale, what does that mean? Does that run a city? Does that run my house? Talk about what you're trying to scale it to.

MS A 150 megawatt-hours annually for a lithium cell manufacturing plant is small. You're talking niche applications there, maybe a consumer electronics application by scale. Not that we're making those types of batteries, but if you want to make enough batteries to make a dent on the grid, then you need many gigawatt hours. We need to be in the terawatt hour range to really make a dent there. So everything's going to help. We're doing our bit. We're doing what we can to apply one technology and lower the cost. But I think everything is going to contribute.

AR Is that a proprietary technology?

DP It is.

AR Do you think you will scale? You'll just be able to scale, or are there certain size factors? Size matters, right? You get to a certain point where you say the technology won't work at this level or not.

DP No, I know we will scale. The point of the pilot line was to demonstrate that we can scale.

AR Denis, you got to save the world. That's what we need. We need technology that fits, that works because your technology has been applied before. It's not like it's a new technology, and it works in boats, RVs. Does it work in automotive?

DP I want to be clear. The technology that we've deployed in terms of our battery pack assembly is not the same as the cell manufacturing that we've completed the pilot line for. We will make the cells and then put them in the packs that we're already assembling and putting it out in the marketplace. Can the process be applied to EVs and car batteries? The answer is yes, it can. It's a chemistry agnostic process. We can make lithium iron phosphate cells, LCO cells, NMC cells. It is very versatile.

Photo: Dragonfly Energy

AR Excellent. You're part of the future.

DP We're working on it.

AR I appreciate that. Last question for you. You're here at RE+. This is what? Your third, fourth? What are you trying to say to the market from being here at RE+? What's your message?

DP This show used to be the SPI show, the Solar Power International. Now it's the Renewable Energy Show. It highlights the fact that it's more than solar. Now you've got the issues associated with the storage and the transmission and all that stuff. The reason that we're here and what we hope to get out of it is we want to form collaborations. We want to form partnerships, potentially find investors, potentially find customers. This is the place to be. I mean, my goodness. You have to be here. Everybody's here.

AR I hope this will convince investors to say, you got to put your money where it's going to make the biggest impact for the longest period of time that can scale. And I absolutely believe in what you're doing at Dragonfly. Thank you for meeting me again. Thank you for being here.

DP It was my pleasure. Thank you, Alan.