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[BILL DERASMO]

Hello, welcome back to the Troutman Pepper Battery Storage podcast and today we have a guest coming to us all the way from Shanghai, China – Mr. Andy Klump. Welcome Andy.

[ANDY KLUMP]

Thanks so much for having me Bill, happy to be on.

[BILL DERASMO]

Absolutely, we're happy to have you. You are the founder and CEO of Clean Energy Associates and this is your company. This is an American company, your company, but you're sitting in Shanghai, China and you have an interesting life story and career story. I'll just give the audience just a few details. Andy is from St. Lois originally, you got your BA from Northwestern and your MBA from Harvard Business School and you've had a really interesting career. You've done a stint with Intel, sales of Dell computers, I think you helped found Trina Solar. You've got a really rich career history that led to where you are, but why don't I let you give the audience the flavor of that and then we can go from there.

[ANDY KLUMP]

Perfect. I will say everything is correct except I did not found Trina Solar. I was one of the early team members so I joined when they had about 500 folks, but I was the first non-Chinese member of their Executive Management team. So there's an interesting story or two behind that. But to back up I grew up in St. Lois and ironically my high school was the first one in the mid-west that actually had Mandarin offered but I grew up in the 90's in St. Lois saying why would I ever study Chinese, it seemed like a boring concept. So, I studied French, never used it, but consequently I always had an interest in traveling and pursuing a life abroad, I never lived outside the country until I had the chance to come to China. And I traveled first to China in 2001 as a tourist while I was in business school, absolutely loved it and I said I absolutely have to learn the language, understand the culture. And so I went down a path in my second year in business school to study Chinese on the side and then I said come hell or high water I'm going to make the trip to China. And so I took a full-time job with Dell Computer, I had a small stint with Intel and then made a shift from high tech to clean tech in 2006 when I worked in Trina Solar. So it's kind of an unusual path but I ended up landing on my feet in China.

[BILL DERASMO]

And what was that transition like in terms of going from tech, straight up tech, to clean tech or energy tech? Why don't we start with that.

[TITLE OF FILE]

[ANDY KLUMP]

It was a really interesting time in the market and I really once again, to give a little more background on my work history, when I finished up at Northwestern I did have a little stint in the late '90's in the high tech sector working first in Austin, Texas with a software company and then later with an internet services company in Chicago and Atlanta. I enjoyed working at a high tempo, fast-paced, high growth companies and when I entered business school in 2001 was right at the start of the recession and I thought everything was going to be great when I came out in 2003 and that clearly was not the case. But I had a trip to Southeast Asia right before business school, I had a little bit of wanderlust left in me and I said, it's such a good time traveling around, let me try to stake my claim in one spot and I did the look through different markets and I just said I have to be in Mainland China, the language is so different, the culture is dramatically different than anything I knew. And so after spending a couple months on the ground in Shanghai I said I'm absolutely going to come here. And so that's why I was just very, very dedicated to study Mandarin during my second year of business school and then I said I want to stake a claim in China, but I first want to start with an international company. So that's why I started off with Dell Computer because I thought they might benefit from my international background and upbringing. Nothing could be further from the truth. In 2003 the market was already highly localized, I had no competitive edge whatsoever. The whole trend of expats was kind of drying and there were a number of half-paths, like myself, who took massive pay cuts to go to China but I said, look, this is where my heart is taking me. I've got to try it out. And I sure as heck did not want to be the first one from Harvard Business School to get fired after 6 months but they told me if you don't hit your quota the first 2 quarters, you're out. And I had a six-figure debt that I had to pay off so I was highly motivated to hit my numbers and to figure it out but it was definitely jumping into the deep end.

[BILL DERASMO]

Yeah that must have been scary when you're in a sales position and it's getting down to the wire and as a young professional and as you said you've got probably student loan debt or whatever it was and trying to just meet that and there's probably a lot of lawyers out there who can relate to that last point about debt. I went through a little bit of that back in the day but just an interesting path. Well tell me about when you decided to start Clean Energy Associates.

[ANDY KLUMP]

I guess I should back up a little bit when I went to Trina Solar, one of the reasons I was just super passionate about entering the solar industry is I thought wow, this is a phenomenal market, it still seemed at the very early stage, hardly any market research on any of the Chinese companies but I will say one of the trends I noticed and in my experience with Dell, I have the habit of visiting a lot of clients on a daily basis, you know 20 meetings a week. So I was constantly going to different facilities and visiting different manufacturing shops and so I saw that the different types of operating styles. When I went to visit my first solar factory at the time I had an interview with Trina Solar I just thought this is amazing. It's just a bunch of disparate systems, there's no continuous flow, it's just all just kind of like a bunch of chop shops and I just said this seems like a very, very early stage cottage industry and if I just think of the need for energy it's just eventually going to grow. And if it's anywhere close to the projections in terms of cost production, there's a lot of potential. So I spent the better part of

two years at Trina Solar helping build up the company. As part of the company's IPO on the New York Stock Exchange in 2006 and then we effectively grew the company about 10X metric in the course of 2 years. So after 2 years I kind of came to the point and I said look, I'm tired of traveling around the world and hardly ever seeing my wife. I had just gotten married the year before and my wife is from Dallas, Texas. And so I said I want to stay married to her and forge down our eternal path. So I set up CA in 2008 right after another global financial crisis and so it was a very interesting path those first few years. But we kind of found our way, kind of worked through a lot of market fluctuations and started to grow and scale the business. And so that's where we've expanded now to we have a presence in 13 countries. We have teams in roughly 190 around the world and we completed over 125 gigawatts of engagements of solar and about 8 gigawatt hours of energy storage. So it's been a wild ride over the last 14 years.

[BILL DERASMO]

That sounds like a tremendous ride. Most importantly though, cause I'm an NFL fan, is your wife a Dallas Cowboy fan?

[ANDY KLUMP]

She is absolutely a Dallas Cowboy fan.

[BILL DERASMO]

And how do you get the games – do you get the games over there?

[ANDY KLUMP]

There are bars where you can go and watch the game. They pretty much are out there when it's playoff time so there's quite a few foreigners who will and watch. So football is not a big pastime yet but there's plenty of options to watch the games.

[BILL DERASMO]

That's fantastic. Of course I go into the frivolous when you just ran through how successful CEA has been and the tremendous amount between Trina Solar and CEA – the tremendous amount of renewable development and now storage that you've been involved in and we should probably turn to that. In terms of CEA I mean right now it seems like your company would be certainly well positioned to help with a lot of the unprecedented challenges, I would say, that developers probably faced and other entities faced just in terms of managing supply chain issues, managing commodity issues. Why don't you just tell me a little bit about sort of the typical – maybe typical is not the right word because it sounds like you guys do a variety of services. But just tell about some of the things that CEA could help companies navigate in today's world.

[ANDY KLUMP]

Absolutely so I find that really categorizing we have 4 different business units that's really kind of covering the whole life cycle of a solar energy storage project. So we help people buy things, we help inspect in the factory because you don't get what you expect, you get what you inspect. And then third we actually do the final checks on the sites where the deployments are happening. And then finally we have a fourth team that actually tracks all

the data and makes sure that we put that in a way that our clients can digest that doing market intelligence. So once again supply chain helping make curing decisions, the second was the quality assurance, checking the factory. The third is our engineering services at the job location and finally the market intelligence team. So each of those groups has a separate P&L.

[BILL DERASMO]

Okay, well let me ask about one of those because I have a personal interest in it. I was involved in a case where there was a solar development, I wouldn't say it went bad, it ultimately ended up getting built. But there was a dispute between the prime contractor and the sub and we represented the sub and I don't want get too into the details of that but we ended up settling out and so for client confidentiality purposes I won't go too much further. But I'll just give you just the sort of hypothetically speaking, there was a project in upstate New York and it ended up going bad in the sense that the actual site ended up being something other than what I think the sub was lead to believe maybe. And so there were problems with literally moving the purlins(?) which are the metal brackets, basically, that you end up affixing the solar panels to. And it was because of this ridiculously steep hill that they had to go up and it was muddy and it was just a mess and the project ended up in significant cost over-runs and delays and so is that the kind of thing where CEA, as you say, goes in and looks at the site and that's the kind of thing that you guys might have been able to help with?

[ANDY KLUMP]

Yes, absolutely. We could certainly help with anything from early stage design to helping debride the owner's engineering oversight on the job and so, once again in that case, we would often be hired by the developer or the IPP that's actually owning the project. They want to make sure that the EPC that's constructing and building the project is actually following the right industry standards and can help avoid those problems that happen. Quite often we're brought in after the fact. Once again there's a lot of extreme weather events, in many cases micro cracks and undetected problems occur maybe during installation and so we find that we're brought in because a high number of systems are under-performing. So once again that's part of our engineering services team that resides both in the U.S. as well as in Europe and so we go to a number of countries to remediate those type of challenges.

[BILL DERASMO]

People don't realize that solar installation because it's so ubiquitous at this point, there are certain aspects of it that are highly technical. The panels have to be put in in a very precise way, the purlins have to line up in a very precise way. I'm not an engineer but I learned a lot through that case. So that's the kind of thing that you guys can jump in and help quite a bit with.

[ANDY KLUMP]

Absolutely. If you look at all the issues related to poor quality once again it can cause a lot of delays, a lot of safety risks. We've had a lot of cases we've been brought in because there have been fires on rooftops or in utility scale installations and so once again it leads to under-performance and warranty claims and so once again we handle a whole host of those types of issues for both large utility scale, as well as C&I in some cases residential fires and owners of these systems.

[BILL DERASMO]

Yeah and on the storage side, the fire risk is obviously real I mean we've had real cases here in the United States, Arizona is a notable one where if you don't handle the particular lithium ion batteries in the right way, you create a fire risk and it could be a real dangerous situation. So I can appreciate that you guys can advise on those things. Safety, that was another issue in the case I was involved in. Here in the United States there are OSHA issues and it was a mess. But in any event, one of the things I am pointing to here, there was a report and I have no connection, the firm has no connection with Wood McKenzie, but they're another advisory and you can pick up this report at woodmac.com. The only reason I mention is this came out in March 2022 it just shows the explosive growth in battery storage deployment. And it talks about, you know there were basically 257 megawatts in 2016, this is in the United States, U.S. annual energy storage deployments across all market segments. And then in 2021 you've got 3,508.6 megawatts and that's a 1,263% increase in deployment. I was told there would be no math but somebody else did the math for me. And if you want to give megawatts hours, which is a different way of looking at storage, it's a similar type of picture. And so with that explosive growth in storage and in particular here in the United States, tremendous growth in storage, how has your company pivoted into that. Cause you know it started out like with Trina and maybe at the time you're talking about there, solar and wind to some extent, right. That was the big growth picture. Now you've got storage onto the scene and that's got explosive growth. So how has CEA pivoted into that space?

[ANDY KLUMP]

Well I would say we certainly didn't pivot. We had many years of tracking the energy storage market and planning the expansion of our team but we actually have gone through pretty strong growth in terms of demand for those services and we're certainly on the hockey stick of a very high trajectory. Just to back up a second, my first visit to a battery facility was back in 2011. I was invited by one of the investors to take a look at one of their investments. And I was eyeing the market very closely but it was still very expensive technology. But really around 2014 we had some of our largest clients start to call us and say hey we want to start visiting some of these battery cell manufacturers. Can you take us around? So we started doing that in China, Korea, and the like. And really helping to establish relationships with some of the up and comers and at that point in time it was still Samsung, LG, Panasonic that really dominated the market, but low and behold once again a number of folks started to grow and expand and then the costs started to come down as the ED market took off. And so once again you have to think that stationary energy storage is still the gnat on the back of an elephant and the giant growth in EDs has caused massive expansions of major battery cell manufacturers. So CE does a lot of work about tracking the capacities of these manufacturers, providing that marketing intelligence to our clients, we're really helping to identify who are the right suppliers are. And also make sure these contracts are actually being executed. Because the reality is there have been a lot of increases in key raw material inputs and so a lot of manufacturers are now going back and trying to retrace contracts and it's a very tricky time in the industry. But I will definitely say it's also crucial, and this is one to keep, the services we provide is having the inspectors on the ground both at battery cell levels and also at the module, you know in the battery pack. That's extremely important. A lot of people don't realize. I had a CTO of a top 5 manufacturer tell me oh well we always have a little of b-grade product but we always have to give the a-grade product to the elite players. And I was like why is that. They said well their teams are in there inspecting. And I

said well who do you give the b-grade product. We sell that to the energy storage guys because they don't send anyone to check.

[BILL DERASMO]

Now that is a scary statement but you know this audience should pay attention to that. Because as much as we've had guests on talk about the ED sector and the crossover potential between ED sector and stationary in some of our past episodes but I think a good chunk of our audience is really more focused on the utility scale stationary application. So maybe what your contact was referring to was the energy storage guys. And so you really got to understand what you're getting. And that's a key point that you bought up that I don't think we've ever talked about before in this podcast. So I appreciate that nugget. That's a really important point I think that you're raising. That you could, just because you're not paying attention, you're getting a lesser-grade product, perhaps.

[ANDY KLUMP]

Absolutely. And the reality is manufacturers who are working in the factories, they don't often know where the product is going. And so once again you're dealing with a sales guy who is in another country or is just new to the job, they don't know the manufacturing facilities. And that's a part of reality is that right now we have travel restrictions. It's very difficult to get into China if you're not very connected or have your own company here. So that's where once again we have a 90+ person team here in China doing these inspections. The head of our QA team has 20 years of battery cell manufacturing experience including 10 years at Panasonic. So we've developed a lot of proprietary approaches to knowing how the product is made and to make sure we're not bamboozled in the process. So you have to hire independent third-party inspectors who are very knowledgeable. You can't just throw anyone into the factory, otherwise they're not going to know what's going on.

[BILL DERASMO]

Really interesting to know that, hear that. Let me ask you your company just put out what I guess in the law firm world we would call a client list but it's a paper basically about the U.S. Department of Commerce, the anti-circumvention investigation that the U.S. Department of Commerce has begun and it seems like it could have far-reaching implications. Your company put out this paper on March 28 and it's available on your website, why don't you just tell us a little bit about this anti-circumvention investigation and ways that CEA might be able to help.

[ANDY KLUMP]

Absolutely so once again the anti-dumping and counter-veiling duties case that's been brought about by the Department of Commerce, is a major development in the solar industry because it does target 4 key countries that are the primary producers of modules that are destined for the U.S. And once again that's in Cambodia, Malaysia, Thailand and Vietnam. And those 4 countries account for roughly 85% of the imports that went to the U.S. in 2021 and there is a potential for a retroactive ruling which would effectively, could encompass all modules that are imported into the U.S. right now. And it could go as far back as November of 2021. So right now we're helping a number of developers, EPCs and IPPs who are now

faced with the reality that their projects may have a large increase in duties and they may, depending on how they structure their contract, they may be paying these after the fact. And so we do have a team that's focused on marketing intelligence who follows the tracks, all of the policy developments. We have teams that are closely in discussion with a number of parties who are obviously trying to buy into this. We've been approached by folks in the industry who want to use our knowledge and insights to help guide this investigation and the reality is that the solar supply chain is very convoluted. But there have been cases that have happened as early as 2012 in our sector against solar cells made out of China and those duties are still in place. So once again once the Department of Commerce chooses to start an investigation there's a high likelihood there will be some type of duty that is put in place and may potentially be in place for a decade or more. So a different player to this space absolutely needs to know what's going on and seize the source of truth around where the supply chain is and what parts of the supply chain are not impacted. Cause there still are manufacturing facilities that are in different locations and so we know one way or the other the solar market will grow and expand but there may be a period of indecision for some of these facilities that are in these regions.

[BILL DERASMO]

I think the scariest part of that is the retroactivity right. I mean well it's all creates a challenge if you're in that space, but going back in time if there's one thing I've learned it's that clients don't like surprises. We fell like, okay, we've got this project done and it's in the past and that's water under bridge well it might not be so that is a particular scary aspect all of it. So I think that's something I'm sure you guys are going to be heavily involved in going forward and it's something that the entire industry here in the States are going to have to deal with.

[ANDY KLUMP]

It's certainly a scary phenomenon for some but I'll also comment, what we are seeing is a massive pivot of manufacturing capacity in different locations. There are regions like India who are growing quite impressively right now. And there are a number of multi-gigawatt manufacturers that are now expanding quite aggressively. There's roughly 20 gigawatts of new capacity expansions throughout India. We also have a 15 person team on the ground there so a lot of our clients have pivoted to those manufacturing facilities. And once again there are manufacturing facilities that are going to jump up in different regions, including the U.S. And that's where we do have a team with on the ground manufacturing experience in the U.S. and we do see U.S. manufacturers starting to grow and expand. So I will expect that there are going to be more manufacturing locations that pop up in the U.S. But our common theme that we've seen in our 14 years of history in our 125 gigawatts of engagements is the fact that new facilities almost always have problems. It doesn't matter if they're in the U.S., India, China or Southeast Asia. So whenever there is a new manufacturing facility, one absolutely must engage in a third-party with the right know-how to ensure that they're getting high quality product. We've had cases of U.S. manufacturers where we've had worst quality than what we have seen in Southeast Asia or China. So even in the U.S. a new facility still has a lot of risk.

[BILL DERASMO]

I neglected to ask you about your team here in the United States cause obviously it's probably a big part of what our audience is most focused on the domestic situation here in the States. Just tell me really quickly about CEA's team here on the ground in the United States.

[ANDY KLUMP]

I established CEA once again in 2008 first in Hong Kong and then later in China but in 2013 we set up an entity in the U.S. and started hiring and building a team and we've now grown that team to over 60 professionals and most of those folks are inspectors and engineers as I mentioned who are often on rooftops or in field installations and we have separate teams focused on field's owner's engineering, independent engineering as well as field engineering, but we also have various folks around the supply chain and quality who have background and knowledge to help support those who are executing projects on the ground and requires to be in different manufacturing facilities. So it's not just solar modules but it's also once again inverters, in trackers, every other balancing system component and also in energy storage site. We have professionals in that domain as well. So we have built and grown a strong team in the U.S. over the last 9 years and we're going to continue to grow and expand as long as there are massive deployments and the U.S. solar market will continue to grow so we do see this as kind of a short-term hiccup but the long-term prognosis is very strong so we're going to continue to expand with the market needs.

[BILL DERASMO]

I totally agree with you. Everything I see in the market even though it may be temporarily with the situation with things going on, the conflict in Ukraine, there's concerns about natural gas supply, oil supply, those sorts of things but the macro trend here in the United States is to try to get to net zero so to speak in many different scenarios whether they be corporate or individual states or the federal government. In other words the drive is to try to deploy solar, wind, storage, other forms of renewable energy and I think there will always be a place for some baseload resources but it's going to be a continual movement towards the greater deployment of renewables. I think if you're in that space of being able to assist developers, clients, off takers, whoever, in the solar development process and the storage development process, etc. I think you'll have a lot of work going forward because that's the pace of development is not going to slow down.

[ANDY KLUMP]

I completely agree with the macro trend and once again there's a greater awareness in the industry than ever before for the need for renewable deployments. This has happened not just on solar but also wind. But as we talked about, the reason energy storage has grown so dramatically is there's a massive attachment rate for all of these renewable energy deployments. So we will see the growing market and a lot more demand for energy coming from renewables. And it's driven across the board. It's not just utilities that are now demanding this. This is also The RE 100 corporates, you know you had oil and gas majors who are getting into this space. So we do have clients in each of these segments and there's also increasing demand in the market around traceability and ESG and so folks want to know where are their products coming from? What is the carbon content of that product and what's

their overall footprint. That is also an area over the last year or two we've grown a big team around, traceability and ESG and so that's also where CEA looks holistically at the broader set of needs and challenges our clients are facing and we're responding to that need with the solution. So that's going to be an ongoing trend we're going to continue to see as well.

[BILL DERASMO]

Well we really appreciate you taking the time today to visit with us. A lot of interesting issues. Appreciate the client work you guys put out on the anti-circumvention investigation and please stay in touch with us. Maybe we'll have you on again in the future because it seems like you guys are right in the middle of a lot of interesting issues helping clients navigate a lot of complicated issues in today's world with all the different challenges, supply chain, conflict in Europe, which I never thought I'd see in my life time and other things that are going on in the world so, again we really appreciate you taking the time to visit with us Andy and wish you and your company the best of luck going forward.

[ANDY KLUMP]

Excellent Bill. Thanks again for the invitation and once again anyone who would like to download a free copy of our circular on this topic just go to CleanEnergyAssociates.com or feel free to reach out to me on linked in. Always happy to have the dialogue Bill so look forward to being on again.

[BILL DERASMO]

Absolutely, thanks.

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