Nostromo Energy’s Yaron Ben-Nun and the Need for Thermal Storage in Decarbonization Transcript

Welcome to Green Building Matters, the original and most popular podcast focused on the green building movement. Your host is Charlie Cichetti, one of the most credentialed experts in the green building industry and one of the few to be honored as a lead fellow. Each week, Charlie welcomes a green building professional from around the globe to share their war stories, career advice, and unique insight into how sustainability is shaping the built environment. So settle in, grab a fresh cup of coffee, and get ready to find out why. Green building. Green Building Matters. Hey everybody. Welcome to the next episode of the Green Building Matters podcast. Sometimes I talk to someone that's an architect or on the building product manufacturer side or an engineer or a professor. And today we've got someone that's got some fascinating technology. You hear a lot about clean tech and just this green technology we need in and around our buildings and our communities. And that's our gift today. I can't wait to unpack the story here. So, Hiran, welcome to the podcast. How are you doing today?

01:01
Yaron
Thank you, Charlie. I'm happy to be here with you.

01:04
Charlie
Fascinated by what I've learned about you and your company. Our podcast is kind of about your journey, but we'll definitely talk about a lot of the technology you're putting out to kind of fight the good green fight. So take us back though, if you would give us that kind of origin story. Where'd you grow up and where'd you go to school?

01:22
Yaron
I grew up in many places. My father was an air one of the Israeli Air Force commanders. He was chief commander, so until he came to this position, we were moving from air base to air base. I'm an air based child. And this is a very unique experience that cannot be really compared to any other. It has its own ups and downs and interesting way of living between soldiers and jet fighters.

01:53
I'll have to connect you with some of my colleagues that were also in the Israeli Air Force, One in San Francisco in particular. Maybe there's some stories you could share there. Did you have any exposure to the environment, sustainability? Did that show up later in your career? I like to ask my guests, since clearly you've made a career out of decarbonization, energy efficiency and green buildings, when did that first show up for you?

02:21
Yaron
It's a great question. I was myself an officer and pilot in the Air Force and when I finished this part of my life, I left the air force at 95 and I went to my second career, which was being a film director. For 12 or 13 years, I was a film commercial, TV commercials, music videos and documentary, and a teacher in the realm of the Academy of Film. But I was late. In 2009, I was at a stage where I could not do any more commercials. That part of my life, I had to leave it behind. And I think that was my first understanding that I was looking for a much more meaningful job or actually to designate myself into something more meaningful. I went through, I would say, some crisis, career crisis, because in Israel, if you're not part of the commercial arena, you cannot really make a living out of it. And then I had some it was during a film festival in Basel, Switzerland, and I was exposed to a series of shorts, of doc, of students shorts, like one and a half minute each. So there

were a bunch of them. And I was exposed to many of these shorts. And one of them stayed in my mind. And I did not realize it while seeing that, only way later came back visiting me and grabbed my attention. And I think that looking backwards, this experience was the actual call for duty, if I may say so, to change my career.

04:06
Yaron
And I would like to tell you what was in this short, so maybe you can relate to it. So it was animated. I cannot remember what language it was. I think it was French. And there were many languages during this festival. And what we saw is a very old man, like very old. And it started with a close up on his face. And he was playing with a 10 franc coin and catching it, throwing it in the air and catching it. And he started to talk. And when he talked, he said, I'm 93 years old. In my lifetime, I ate 1,500 pounds of bread. I ate 16 and 3/4 of the sheep. I ate 15 octopuses. I ate 200 pounds of onion. And he just kept on saying everything that he ate. And the camera pulled back and slowly but surely you understand that behind this a very small, thin, old man, everything he said was just standing there buckets and piles of the food that he just grabbed. And when the camera finished, after he finished a long list, many metric tons of food that he ate, he shouted from a distance. And what is amazing with all this around and the camera just pulling to his face and he showed the coin of the 10 francs and he said that all that came through my butthole, which is not bigger than this 10 franc coin. Now then of course, the credit starts and it was the end of this troll. The audience was in awe and nobody really understood if he should laugh, if he should be. I had the same feeling and then started a new one. I forgot about it. A new sword. But later on, this film came revisited me and I felt this emptiness, strong feeling that if this old man ate so much and there are eight billions like him, and he didn't mention all the clothes he used, all the energy he enjoyed, all the flights he did, all the gasoline he used, whatever. I mean, all the resources that this small man took are immense. The big question was, but for what? What is the. What came out of it? What are

well consuming so much, what we have to give back and how we can balance this petrifying imbalance.

06:42
Yaron
And then I started to understand that if I won't be doing something that I have some kind of certainty that it gives back. I will finish my life with a debt that you cannot enjoy. I won't balance in any way with whoever is going to judge me in the next level of this game. At this time, I think I was already on my way to think, what am I going to do? And the clean energy arena then in 2009, 2010, was rising very strongly with solar. And I decided to go and restart my life in the energy, clean energy arena, startup arena, because I am very attracted to this way of living and excitement and new ideas. And for the first six years I was actually working in other clean energy companies before Nostromo. This is my own company. And I acquired some deep knowledge about this environment, the technology and the ideas and trying to grasp where I should put myself. I will be useful or I'll be effective in this new journey. And it's 2016, I think I have matured enough in my new way to fall in love with the idea of Nostromo, which came to me at one glorious moment. And I need to go and and give everything in order to manifest that and build and create.

08:25
Charlie
What a beautiful story. First of all, as a film professional yourself, I'm sure you're like, wow, what an impactful film. But that epiphany, you were a great storyteller, I feel I watched the film. So thank you for that to our listeners. Just think of our impact . As an individual on planet Earth. And you're right, we didn't even mention all the other carbon side of things and our travel. I know I travel for work. And maybe I buy some offsets, but still, there's just such an impact for one person. And that was an epiphany for you. As I understand your background, you had the electrical, you moved around some of the film, and then here you are just learning and then go all in with

your startup on clean energy. But as you look back, what's on the highlight reel? What are some of your proudest accomplishments so far?

09:17
Yaron
Well, it's easy for me to say, of course, my family, my wife and my two kids. But this is quite not very original, but I am very proud of that scene in my life. And of course Nostromo, because this company I had many ideas in my life, but I really fell in love profoundly with this one and gave everything I had, every resource I could grab in order to give it a good chance to become something. And eight years later, we are on the verge of becoming really I would say a substantial technology in the energy storage evolving arena. I'm totally. This is my greatest achievement till this day.

10:09
Charlie
Oh, love that. And you need that rock solid family to support you, as the crazy entrepreneurs we are. I love that. And it's hard work, man. It is hard work. Why don't you take us to the present day? Tell us about your company. How you help in this green building movement. Tell us about yours and what keeps you busy day to day.

10:36
Yaron
So maybe a little background. Nostromo is learning one very simple idea, which is that water has the highest latent heat in nature, actually second only to ammonia. And I will clarify this sentence. When water changes phase from liquid to ice, there is a substantial amount of energy invested in this phase change rather than in changing the temperature of water. And the meaning of that is that you can actually use water as a very patent way to store energy in the form of sub energy or absence of calories or whatever you would like to call it. It's called cold matter. And this is so potent that it is among the highest materials in nature. And water is

abundant and available and cheap and clean. Knowing this fact and understanding that peak demand at most breeds around the world is subject to cooling demands, to thermal comfort, to air conditioning, dramatically. I mean in the southern belt of the United States, at peak demand, 45, 40% of all energy of all electricity produced goes to the HVAC system to the cooling system. And you know these two facts got me to the point that I was asking how come water is not being used in order to turn buildings into sustainable batteries so they can participate in this growing need of demand side management. And the question was at first why it is not being utilized this way. And the answer was very simple. It is utilized. There are companies doing ice storage for the last 70 or even more years.

12:35
Yaron
I was researching the current technologies and my question was, if there is such technology, how can I not meet this technology How? Well, why not? Every big commercial building is actually using this material, this substance in order to shift its loads and helping all this stress combined on the grid. And the answer was the legacy technologies or the traditional technologies are, I would say, not totally not compatible with retrofitting existing buildings and partially inefficient. The space has very high space requirements. And in real estate space is almost everything. And beside that, usually they do not have an envelope of software that can actually manage these systems. And there are non retail managers that would like to deal or learn how to optimize their energy storage.

13:39
Yaron
There are actually zero managers or building owners that would actually like to learn this arena. And I understood that if maybe the world is waiting for something in this field, it might be a technology that is enabling retrofitting existing buildings in a sustainable and affordable way. And I must provide them with the whole A to Z envelope. So the building owners

will be agnostic to whatever this system is doing when they are operating their normal businesses. With the growing solar demand or actually penetration of solar and the demand drop at sunset comes the downside, which is called the sunset, meaning you have as much as solar that you have, that's how big your drop will come when the sun is setting down in California, there are 22 gigawatts of electricity lost every sunset. And the meaning of that for everybody to understand what's going on with the electric grid is that instability is threatening the quality and the supply of electricity. And therefore energy storage is in a great need. Having said that, lithium ion batteries have many downsides. But in our case, in our conversation, the biggest downside of lithium ion batteries is the safety issue. So buildings cannot really embrace big lithium ion systems. Meaning if you would like to put 1, 2, 3 megawatt hour equivalent of lithium ion batteries, there will be almost no commercial buildings that will let you put it inside the building. There might be some solution putting it outside, but actually behind the meter. It's called behind the meter. Energy storage in the form of lithium ion batteries is very rarely found. But the biggest problem is where the demand is actually generated. So the greed is starving or truly in a need that is just growing bigger and bigger to have relief on the demand side, meaning on the customer and customer side. And in our case, our technology, which I will throw some words on it soon, is actually relieving this side of the grid, which is actually lowering needs of enhancing the transmission, distribution, whatever which the grid is struggling at, mainly at sunset, our system can support at the point that the consumption is actually being made. So the company developed for the last eight years amazingly potent and efficient ice cells. Our technology is encapsulated ice and our cells look like legal blocks. So there are small modular cells that can be installed almost anywhere. They can be installed on rooftops, they can be installed in the basement, they can be laid along walls. A lot of space can be used without using a retail, expensive space and without hurting the everyday operations of commercial buildings. And that on top of that modular, very efficient cell, we build a system which gives answers to many challenges that energy storage in this situation

behind the meter, on the customer side needs to comply with like optimize the charge and the discharge operation according to the exact tariff rate structure of the customer and comply with other possibilities. And we are the first company ever to get resource adequacy credit. I'm talking about thermal storage. So we are the first one, Nostromo is the first one in California. Starting this February, I hope we will start engaging with Caiso and get paid for day ahead and operations of charging and discharge on the resource adequacy and the wholesale. And this is very new. So we are bringing, I say an umbrella of cost, a reduction on the customer on the electricity side, but gaining the ability to actually sell services to the grid, which is totally new. I think that with that and with the itc, of course, rebate and the SG, the self generation incentive program, we can actually bring these systems for a very short roi. I am talking about five to six years. It might be very short to some of the people that hear that, but for a new, this is kind of.

18:37
Charlie
Short Five to seven years is for a substantial system like this. if we're doing a lighting retrofit maybe 18 months, 24 months. But this is a substantial amount that will pay back for a long time. And you know what I've seen about ice storage, I've done a lot of LEED for existing building work. I'd love to outside the podcast talk to you about some of our clients in New York, some in San Francisco. BSometimes I store them for peak shaving. And just let's make sure we're paying a lower rate with our utility company for the year. And let's make sure at night we're where that's when we're really going to go ahead and create the ice and during the day and that cooling, it's running through there. When I look at some of the true storage. We're so used to batteries. Here's a different way to store energy. I love what you're doing and you could almost say, hey, we have hybrid cars. Well, maybe we need hybrid buildings. And so I love the tech, I love what you're doing. It sounds like it's a little more on the new construction install or maybe an adaptive reuse or a major opportunity there. I have seen some

buildings in New York. One of our clients asked al Green, took 11 Madison huge building, 2.3 million square feet and retrofitted, installed ice storage after the fact. There's actually money from NYSERDA up there in the state of New York to pay for some of this. And so that's something we should collaborate on.

19:54
Charlie
But my favorite project is a Morgan Stanley building just north of New York city. They have 1 megawatt of solar fuel cells and ice storage. They have all of it. And so beautiful. That's one of my favorites. To the listener that doesn't quite understand, hey, how do I even budget for this? What's the ideal project? So give us a few tips if one of our listeners has an opportunity to maybe call you. And what's the order of magnitude? What's the right type of project? Is it a certain size building a certain amount of electricity bill? What's the right project for your technology?

20:36
Yaron
So hands down, the electric bill structure is the most important fact we need to look at first. Because if the electric bill structure is not supplying a substantial arbitrage between off peak and on Peak either if it's on the KWH cost or the demand charges actually financially the system cannot really make a lot of savings. So that will be the first thing as far as our territory now we are concentrating on California and this is because of a few reasons. One of them is that the pill structure in Southern California, Edison, SDGE and PGE are very supportive towards shifting your electric loads from on peak to off peak. And then we have a good base to actually make money out of this. Every cycle of charging and discharging the system. The second thing I would say is that the minimum size of a building in order to actually be a viable economy has a viable economic outcome is I would say between 200 to 300,000 square feet or on the installed refrigeration ton or the capacity installed power that would be around 500,

600 tons. This is for whoever knows chillers, this is a capacity of cooling capacity. So we need substantial cooling loads that we can actually deal with and lower them in order to be effective and that the peripheral cost of installing the system will spread on more general energy capacity of the system.

22:24
Yaron
So the minimum size of our system we are actually aiming TO is around 1.5 megawatt hours of electricity equivalent and that will be about 2,500 refrigeration ton hour in the size of the cooling capacity and the meaning of what I just said, if you would like in pounds of ice, so that will be about 200,000 pounds of water that we turn into ice every night or morning and then discharge this cold energy in order to avoid on peak consumption which is between 4 to 9pm every day.

23:04
Charlie
So smart and well, I know we should connect more. I just want everybody to check out though the website and I got to ask about the name. It's tough to name a baby. It's tough to name a company. So tell us about the name of your company.

23:18
Yaron
Joseph Conrad, who is the author of Heart of Darkness, this is one of my favorite books, wrote a romance called Nostromo. And that romance, that book influenced me in many ways because this is like many of Conrad's writing, it's about the struggle of a man with his desires and looking for I would say the meaning of whatever you are doing and how you're gonna go through this life and get out on the other side better. So I would say it's Nostromo. The name is actually two Italian names. It's Nostro Uomo. It's in Italian. And it was an officer rank on the commercial fleet of the Portuguese

fleet in the 19th century. And this rank is very interesting. It was the lower of the officers and of course above the sailors.

24:20
Yaron
And it was the trusted men on board by all people, the sailors and the commanders. And at times of storms or losing your way in the Pacific or whatever, and when the rum is down, there is no rum left and there is a chance for mutiny. The Nostromo guy on board was the trustworthy guy that everybody could talk with. So be no mutiny. Because sailing in the middle of the sea, if you have mutiny, everybody might go. So when I understood the meaning, I thought that for our company, it is actually balancing extreme phenomena of the grid which can lead to a crisis. We are the negotiator. We are the one that calms things down, that balances the imbalance. And I thought that Nostromo might fit this company with goodwill and sustainable means, trying to help the grid thrive towards clean energy.

25:26
Charlie
I love that trust and you come out better on the other side. I'm glad I asked you. You're a wonderful storyteller. Okay, so let's talk about the future. Arguably you've got some technology. It's a big part of the future. What's next in this kind of green building movement?

25:41
Yaron
I'm very biased. So please excuse my being so biased, but look, until the early 70s, underground parking lots were not mandatory. But there was a point in history that every city in the world embraces mandatory regulations. So if you build a skyrise, you will have to put some space for cars, otherwise you won't get your permit. Now if you ask yourself who was the first regulator that had the guts to call all the developers and tell them what,

from this day onwards, you cannot get a permit without building a car storage below your building. I couldn't find the name of this guy, but I did in my research, understood that other than the need that was growing for storage for cars, for parking lots in the cities, there was another thing that had to actually appear. And this is that these regulators should see with their own eyes 15 stories below ground car storage working. Otherwise they wouldn't have the courage or the way to go to developers and tell them, from now on, from this day and onwards, you have to put this into your design. I believe that Nostromo and other technologies that will come and I'm talking about safe batteries like maybe , air, iron hair batteries, maybe other technologies of safe batteries or any other means that will be presented are valid. I think the future of building must be in order that the clean transition will keep on moving. Buildings must take part in this load management thing. The grid itself cannot go beyond a certain point because the instability of the demand of the buildings towards the ability of green is so immense. So I think that the next thing and billing has been doing huge steps from the sustainability side and you know, and lead certifications and you know, and being much more efficient in any way. And the next thing is becoming proactive. And I think if you think about it, we are saying that the distributed era is actually taking power from the centralized power plants and giving it back to the distributed resources. And so the whole electricity market is shifting towards a much more democratic, pluralist market and actually transforming your asset, your commercial asset into a player, a proactive player in this emerging field of right on time services to the grid. This is a huge opportunity and building owners should have gotten a good glimpse into how they can support the value of their building in the years to come. And I'm sure you know about the Low Cologne 97 in Newark City and I would say that this is the first sign that carbon liability is coming to the end user. So you need to be liable for your carbon emissions. Scope one or scope two, the one that you actually burn on site or the one that derived from the electricity that you are using putting in a building that can actually give you the room and to lower your carbon

liability and actually control the fees that are coming and of course enhancing your property value. I think this is the next big thing.

29:37
Charlie
You're speaking my language. Local law 97, that accountability, that carbon cap on a building. Other cities around the world are mimicking New York City's local laws. You're right. And I love what you said about distributed energy and the microgrids. Your technology helps with that. And I'm fortunate to have traveled a little bit around the world. I know you do too. And I think sometimes here in the US I'm American, we take it for granted that we don't have blackouts and brownouts. Whereas I have a colleague in the Philippines and they have scheduled rolling blackouts. It's like hey, I need a battery to power up my router and my computer if I'm going to connect and work. And so maybe until it really has affected the person we don't make that change. But then sometimes it's a little too late. We're talking the same language, man. And I. Well, let's get to know you a little bit more. You're on. What would you say, your specialty or gift?

30:26
Yaron
I would say that Steve Jobs said stay hungry. I think my message is to stay naive in a way. I mean you must we're growing up and we've seen it all and we might be really more sarcastic and have less trust in the world. But I think you cannot recognize true or opportunity if you're not doing two things. First, you keep your naivety close to your heart and try or you cannot really urge that but just keep, don't lose it. And the other thing may be to be able to listen. So I think the most good thing I would have to say to somebody if I have to give great advice. Doing these two things can bring you a lot of great understanding of what to do, where to go, how to act. And maybe the last thing which is connected to listening and to keeping your naiveness or whatever you call it is to understand where what makes you most enthusiastic. Try to recognize where you are, what makes you

happy or enthusiastic or you know, keep your passion working and invest everything you have in something that you know that will comply with this request or will bring you joy. Otherwise you're lost.

32:04
Charlie
Thank you. I think when you stay, in my opinion that keeps you curious, which makes you a better listener. Right? That means you're actually kind of doing follow up questions. You're listening. But I will tell you're a great storyteller too. So those are some gifts I've picked up on you. Okay, so let's keep moving. You know, do you have any good habits, any routines or rituals that help you stay on point?

32:24
Yaron
I'm finding bad habits that I can.

32:27
Charlie
Tell you, but we all have some of those. Any good habits or some that you want to implement in the new year.

32:32
Yaron
So of course I have new year resolutions for myself to be better at some stuff like going to the gym more, to be more aware of my body and to listen to my body and make peace with my body in many ways. I started to bake bread lately and that gives me a whole lot of joy. It's amazing. And I'm making a sour bread array and I really like the process. It makes me. You don't need to be patient. There is a very structured process. The outcome is very satisfying and fulfilling and reconnecting, I think, reconnects to my ancestors baking bread. I find this like a simple thing that I haven't really tried before and for the last few months became really good at it. And that

brings a lot of joy. This is something really simple, but it is a structured way. You need to learn it. You need to understand, you need to learn to feel things with the dog and. So this is my new routine.

33:40
Charlie
I love that. You're right. It's chemistry, it's procedural, it's therapeutic. It's your space. That's cool. Thank you for sharing. So as we get to know each other more, I'm a fan of the bucket list. Not everybody has a bucket list. That's okay, but maybe if you could share. Do you have any exciting adventures one day, any travel? Do you want to write a book? I don't know, what are a couple things maybe on the bucket list? So everything I have in mind as a bucket list is internal work. Don't have a passion. I have, of course, a passionate person to travel, to see the aurora or whatever. I have these. But I would say that if I would really like to accomplish something it is to get to a point of understanding meditation, doing and experiencing meditation in the deepest way. And lately I'm very intrigued with a story that I heard. A rabbi said that everyone should have two pockets. In one pocket he should put a note which is written on the whole world that was created for me. And on the other pocket you need, it's another note that will be written and I'm nothing but ashes and dust. And these two notes, you should understand that you are actually both.

35:09
Yaron
That these two ideas are coexisting in your life. And this is, of course we cannot comprehend that it can be true that I'm the world that was created for me. But on the other hand, and parallelly, I'm nothing but ash dust. But a quantum mechanic tells us that things which are opposite can actually coexist. A particle can be at two places at the same time, the same particle. Or we are enclosed with the general mechanics. And I think that I would say that doing for me the next level of spiritualism, for me doing some spiritual work is to understand how, where to put myself in between these

two notes and accept the idea that both of them are true. They're actually so this is, I think in my life journey, this is a great goal.

36:10
Yaron
Otherwise find this point of balance and act with these two ideas coexisting and you got me fired up.

36:21
Charlie
This is good stuff. I hope my listeners are enjoying this. Thank you. Just a couple more questions here. This is fantastic. I like to ask my guests, is there a book you'd recommend or a documentary? Heck, you're in the film industry, just kind of something that's inspired you. You could share.

36:38
Yaron
Oh my God. You just step on something. I just saw Super/man that Christopher Reeve documented? I don't remember if I've ever seen an impactful documentary and I've seen some. This is amazing. Of course everybody knows the story of Superman and Christopher Reeve, but actually nobody really knows. And when you see this amazing DC movie,it's a journey seeing that. So this is the documentary. I'm telling you, it's a must see. I'll give it 0. Another movie that I just saw a few days ago for the time is 2007 into the wild and directed. This is again, I think that this is one of the movies that you go into one person and you go out a little bit different. It makes you wonder, it makes you think, it makes you do a little bit of soul searching and it drives you, it shakes you. And after this film you feel that you understood a little and knew something about this experience of being alive. Both films are complying with this, with, I think, this worst journey worth taking.

38:02

Charlie
All right, we're going to go back and put links to those for those that just want to make sure they can reference those movies and those documentaries. Amazing last couple items here as we start to wind down. As you look back on this career and you've had a couple seasons, a couple different careers, is there any career advice you wish you'd have known earlier?

38:22
Yaron
Yeah, there are no mistakes. Meaning that I really think this is a great truth that winning or becoming an accomplished whatever you are doing, a businessman or whatever is not about your success, is all about how you can actually stand up after failing. How you conceive of failure. This is everything. It's a statistical game. If I will redact it to a very simple truth, you're going to fail. And a mistake is the greatest way to learn your way. How to make things that will work. I think that mistakes are the greatest teacher. This is actually and if a mistake or a failure comes soon, you just won the lottery. Because if a failure comes late, you already invested years of your life. So this lesson cost you a lot. You should wish to fail fast. That's what I'm saying. After a few failures, if you actually learn something from it, you will have success. So you need not only to get up on your fast, you need to know that it's all about how you get up from a failure. If you will agree with, or you will embrace this concept that a failure is your greatest guidance towards success. There is no other better guidance. So, if I would like to simplify it, remember to stay playful. This is what I'm trying to say. Because you know, Ellen Watts said why we are playing music. You know why music is being played? Because if you're not playing music, you cannot do music. You must be in a playful and calm mood or you need to be happy and playful with what you're doing. This is how your outcome will of course be the best and the failure will be just part of this game. I would say that this is hard to embrace at failure moments, but I believe it's true. So if you keep on looking at this way, it will help you a lot to get back

to whatever you are doing and then reach success. This is how it goes. It's just statistics.

40:56
Charlie
I think with the word failure, our listeners, you may hear that a lot in books and tips, but it's never catastrophic failure. It might feel like it at the moment, but you have to have enough self awareness and enough self confidence. It's like, hey, I'm pretty resilient, I'm pretty resourceful. It's never a catastrophic failure, right? So that when you hear failure fast, seek failure. I agree with you. I just want to make sure people listening that maybe haven't experienced failure, they're adverse to it. We're entrepreneurs. You got me fired up, man. We're going to go for a couple more minutes here. I think with entrepreneurship, many people think entrepreneurs are just, it's about risk tolerance. I've changed my mind on that recently. I saw a quote that said entrepreneurs are really good at what it say.

41:47
Charlie
It said entrepreneurs are comfortable being uncomfortable. Entrepreneurs are comfortable being uncomfortable. And I think that sums it up, right? There's risk there, there's always challenges, fires you have to put out. But I think it's kind of related to what you're saying is it's okay to have some failure, but you have to have enough self confidence, resilience and really self awareness that hey, I'm pretty resourceful, that's not a catastrophic setback and something really good is about to come out of it. So I agree with you. What I heard you're on was stay curious, stay playful and this is amazing. Okay, last question. As we come to a close, let's say someone listening is getting fired up. Like I'm getting fired up. I love your story, man. And they're just now jumping into clean energy, clean tech, green buildings. Maybe they're having a career change, maybe they're a young professional, but they're just now getting in. Any words of encouragement for someone that's just getting into our industry?

42:40
Yaron
I think that the green economy and then the green transformation has just started and whoever looks at the economics of clean energy manufacturing and whatever can put his trust that this is going to grow up and it doesn't even relate if you're a tree hugger or looking for sustainability and to cure the world or you just a smart businessman. And of course this, I would say field or arena is challenging because this, everything is new and everything needs to change and we are struggling with the old structure of the grid and we are trying to reinvent it. But I truly believe that this transformation is inevitable. So if you are looking for something that is a career or that will have humongous prospects. So like I said, not related. If you're coming from the committee of clean Energy enthusiastics or you are just believe that this is something you should consider.

43:46
Charlie
Yeah, I love it. Well, hey, I've been inspired today everybody connect with your own on LinkedIn. Check out Nostromo. Maybe you have a project that needs to look at this technology. Make sure you reach out and connect on LinkedIn. In our podcast show Notes, I'll put links to everything we talked about and I can't wait to connect with you outside the podcast. We have some things to talk about but thank you for inspiring us on the Green Building Matters podcast today. Thank you,

44:08
Yaron
Thank you, Charlie. We'll keep on talking. Thank you.

44:12
Charlie
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