

Utility Solar and Storage Executive - Tim Montague

Introduction ([00:02](#)):

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 LEED 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. Settle in, grab a fresh cup of coffee and get ready to find out why Green Building Matters.

Charlie ([00:34](#)):

Hey everybody. Welcome to the next episode of the Green Building Matters podcast. I'm your host, Charlie Cichetti. This week I've got Tim Montague with us. He's in Champagne, Illinois. We're going to talk about construction. We're going to talk about solar and even probably battery storage. I can't wait to learn a little more about what Tim's been up to. Hey, Tim, welcome to the podcast.

Tim ([00:53](#)):

Thanks Charlie. It's my pleasure.

Charlie ([00:55](#)):

Where did you grow up and where did you go to school?

Tim ([01:00](#)):

I was born in Bloomington, Indiana, home of the University of Indiana, Indiana university as they call it. I moved to New Mexico when I was two years old. My dad was in grad school getting a PhD in American studies, but he was studying mercury and the social impacts of mercury poisoning. We moved to Albuquerque, New Mexico, and that really got me interested in sustainability. I Was doing backyard solar thermal with my dad. He was a professor. He became a professor at UNM and in environmental studies. Sustainability is really in my blood.

Charlie ([01:37](#)):

He was really into some of the environmental impacts early there. What about college? When you were going through college, tell us where you went and how you navigated what you wanted to do with the environment? How did you choose the degrees that you pursued?

Tim ([01:57](#)):

I like to say I'm a nowhere man or a global citizen. I've moved a lot. I lived in Albuquerque for 12 years and then my family moved to the Princeton area of New Jersey. My dad became a professor at Princeton, and I went to high school there and then wanted to get away from the east coast. I didn't quite resonate with the east coast, although all my family's there now. My siblings and my father, I am very much a Midwesterner, but I went to school in Southern California at UC San Diego. An awesome experience. UCFC, it's a weird blend of a lot of engineering and science and technology, but also arts. I was able to take courses in literature and film and it has amazing beaches.

Tim ([02:47](#)):

I tried to learn how to surf. I failed miserably at that, but I got interested in vegetation, ecology and restoration. Ecology repairing ecosystems that have been damaged by humans. I went to the University of Wisconsin, Madison for a master's degree in botany. I ended up not doing restoration for my master's. I studied a swamp forest in Northern Wisconsin, two particular species of pine trees, one, the black spruce, which is never green and one the Eastern large, which is a weird tree. It's deciduous, but it's a pine tree. In the fall its needles turn yellow and fall off, but they're a huge swath of Wisconsin and then Minnesota and of course, Canada that have these swamp forests. A lot of fun. I got a lot of mosquito bites and I realized that ecology is fascinating, but I really didn't want to study nature.

Tim ([03:42](#)):

I wanted to enjoy nature. I was more interested in the business arena and it took me a while to get my way there. It wasn't until 1997. I graduated from grad school in 94, and then in 97, I got a job as a recruiter and that was my entry to business. I just had efficient water and off to the races. It's funny because both my grandfathers, my dad's dad and my mom's dad were entrepreneurs and very steeped in the business world. My mom's dad ran a magazine in Chicago called the Black Diamond, which was a coal industry

publication. I like to say energy's in my blood, here in Illinois and a coal state. On my dad's side, my grandfather had a cloth printing business and he had factories in Pennsylvania and Georgia. He became very successful through that business. My father helped him for some time, but ultimately that was not his passion. He's pretty much an academic and then an activist and nonprofit leader. Happy to tell you more about that, but it's been a very strange trip, but a fascinating one.

Charlie ([04:55](#)):

There's been some great influences and mentors. I mean, you have the environment, the research, the business and now I see your entrepreneurship straits. Who else might you say, Tim, as you've built this green career, would you call a mentor?

Tim ([05:13](#)):

I had a professor in college named Tad Case, who was the first person who really got me interested in the natural environment in a serious way. He specialized in island biogeography. He studied these little islands off the coast of Mexico. I'm super grateful for Ted's case. Somebody more recently Kat Klingberg, who's the founder of the Passive House Institute US, which is based in Chicago. The birth of my modern sustainability career that happened in 2012. When I got to know Kat, she was based here in Champagne. Initially she had been married to a professor at the University of Illinois and she had come from Germany and really brought the Passive House framework to the United States. She wanted to modify it to our continent.

Tim ([06:12](#)):

We have a very large geography here with nine different climate zones. She recognized that you can't just design a standard for one whole country when it's the size of a continent. Kat has been an influential person in my life as has the Passive House movement. I continue to this day to have quite a few friends and colleagues in that space and am super grateful for a high-performance building. I did consulting in sustainability and high-performance building for a number of years working with manufacturers and organizations like FIA's, but ultimately got into solar because as you know, it has a massive growth opportunity, massive

economic opportunity. I was at the right time at the right place. We got new legislation here in Illinois in 2016, and it's been a rocket ship ever since.

Charlie ([07:14](#)):

It's exciting, the movement we're in. I'm going to give a shout out to Passive House. I think for any of our podcast listeners make sure you're really reading up on Passive House, check out some of the case studies here. It's not just for single family residential. You can apply it to commercials. It's truly a fantastic program there and make sure you get more familiar with that. Let's piece together a little bit of the career journey. I want to know what you're up to today. You've had your own businesses, but anything else you want to fill in here on that career timeline for us?

Tim ([07:48](#)):

The main theme for me is sustainability technology. We need to make the economy serve humanity as much as humanity serves the economy. There are some people who make the analogy between artificial intelligence and the modern corporation. When you think of how people plug into teams of people that then are a force in the economy, say workers at Amazon or Tesla or Facebook. These are tens of thousands of people sometimes, right? These ginormous organizations, we are a force. The question is, what are we serving? Are we serving as a safer, better future for humanity? Or are we serving the degradation and the brutalization? That's a tongue twister. We have a very brittle economy and society right now in the United States and that's very troubling to me. I am somebody who thinks deeply about the long-term, that's my ecology.

Tim ([08:55](#)):

I like to think in terms of thousands of years. That's how we evolved in all of the living world. We are part of the natural ecosystem. We have created something called "the built environment", which is roads, bridges, buildings, streets, sewers, power plants, the grid, cars, trains, planes, et cetera. Right? Now we are in a place where our built environment has become a major force in the world. We have filled the atmosphere with CO₂ and methane and other pollutants. The atmosphere is very thin. We were not aware of that because we're not flying animals, but you only have to go a hundred miles and you're in space. If you go a hundred miles on the ground, you're like, "Oh yeah." I mean, the next town over to Chicago is 140

miles from me. We're grappling with a brand new world, which we are really not psychologically prepared for because we evolved for thousands and thousands of years in a world that was mostly empty.

Tim ([09:59](#)):

We were just scrapping it out, trying to figure out how not to starve to death. That served us well. It got us here. And then we had industrialization, which allowed us to really ride this rocket ship mainly on fossil fuels most recently, but now we're at a turning point. We are at a crossroads as a species. We have an opportunity to really lean into sustainability and make the transition to a clean energy economy and a sustainable future. But we are going to have to really make a right-hand turn because right now we're headed off a cliff, unfortunately. In parallel, you see guys like Elon Musk talking about going to space and becoming a spacefaring or a civilization. That's also very important because we know from history, from the geologic record that meteorites do hit the earth and pretty much snuff out 90% of what's going on on earth.

Tim ([10:51](#)):

Not all of it, some of it survives, but humans would probably not survive a major meteor strike, like the one that killed the dinosaurs 65 million years ago. I like to geek out on these big picture things and try to be part of it, both at the very local level. I work for a solar construction company called Phosphor Solar. We install a small utility scale and utility scale solar and storage battery systems. I'm helping to green the grid. That's my main way of making a living right now and that's a wonderful thing because we do need to green the grid. That's something like 40% of our carbon emissions, maybe more. I'm struggling to find that statistic, but it's a very exciting time. It's a time when we have to really pay attention and we have to pay attention.

Charlie ([11:45](#)):

You really walked us through a lot of things we need to pay attention to. I can tell you're passionate about this movement and it's not just the building but many other things you listed off. We've got to rally together. There's still work to do. I know on the building side, we can't wait until we have more regenerative buildings, but in the meantime, we've gotta have everything a little bit better in the built environment. Let's just talk about the present

day. Tell us more about what's going on in the world of solar. In your bio it says paybacks can be three to six years now. In Illinois, there's really good incentives. I'm here in Atlanta, Georgia. I think when I calculate it, maybe I'm closer to seven years. Maybe you're in Arizona or Southern California or Hawaii. It's three, three and a half. I'm not sure, but tell us what's going on with solar? What does the lay person here need to know about what's going on in the world?

Tim ([12:37](#)):

It's a very exciting time for the solar industry. Solar PV, photovoltaics is now the fastest growing source of new energy on the grid globally. The reason for that has nothing to do with sustainability. It has to do with economics. Solar is the cheapest source of power bar, none and also wind and batteries now. But depending on where you live, solar might be common. If you go to California, if you go to Colorado or you go to New Jersey or New York, you see a lot of rooftop solar, and those are some of the early adopting states. California is the most mature market, California and Hawaii. People might pay 30 cents a KWH. They have a lot of fossil fuel generated power, and they have to bring all that oil to the islands by boat. Energy is expensive.

Tim ([13:30](#)):

When energy, when grid power is very expensive, new technologies like wind solar and batteries, pencil better, faster, meaning the ROI is quicker. The modern solar industry took off in 2010. The technology is now 70 years old. It was invented. The modern PV cell was invented at Bell labs in New Jersey, which was a major research and innovation park. Tom Edison was based in North Jersey. I'm sure there's a connection between Bell labs and Thomas Edison's a myriad of companies, but fast forward to the early two thousands. It was only then that the technology reached a price point where it could reasonably be mass adopted before that it was powering satellites and doing a good job at that right. Need power on a satellite and remote telecommunications operations. You're on a mountain top and you're sending a signal to and from this tower. Got power from the tower. Solar and batteries are great for that. Very, just very expensive. You didn't see it in the residential and commercial space. We're just 11 years into the modern PS economy. A few years is when that cost adoption curve really made the economics of PV favorable. In places like California, where replacing natural gas, power plants, and of course coal plants, but natural

gas plants are the big thing in California with solar wind and battery storage, power plants. Of course we see very local energy. That's a good description for rooftop solar on homes in California, they've mandated all new residential construction has solar on it.

Tim ([15:26](#)):

We're going to see these rules coming across the country. The writing is on the wall that New York state will also be an early adopter of that. You see states also phasing out ice engine cars. The internal combustion engine vehicle is going to go by. It's both a matter of good legislation, but then also the cost adoption curve. When you double the adoption of a technology, you bring down the price by about 25%. As the technology becomes more popular, it becomes more affordable and that's a virtuous circle and that's what we're in. We're in a tornado of that virtuous circle right now. I live in Illinois. We have great legislation, which is driving massive growth of the solar industry, but this has happened in other places. There's big solar in Florida, but mostly big scale, solar, big solar farms, the utilities are not friendly to rooftop solar.

Tim ([16:18](#)):

Every state has different rules and the utilities are like God. You have to play by their rules and you have the people to organize in the form of government and other ways to make the utilities play nice. And that's a constant struggle because the utilities have done a great job providing a grid that's 99.9% up by the same token, they are very slow to adopt or adapt new technologies and that's kind of in their blood, right? We find ourselves in a world where we now have local technology, local energy technology, and we'd like to be able to produce for ourselves so that we have the possibility of resiliency. And you see the importance of that, right? When you have rolling blackouts because of forest fires, or you have rolling, or you have blackouts because of hurricanes like we had in New Orleans, this fall. When the deep freeze hit Texas in February, when the grid went down there, you see the importance of having solar and storage and microgrids.

Charlie ([17:22](#)):

It showed where we're vulnerable. We need to pull this off. We've got to have more micro grids, not just the large scale solar. I know when I drive through south Georgia, very large solar installs there. Tim, tell us a little bit

more about what it's costing these days for solar? Do you see a big push for community solar? The micro grids? I know in New York City there's local law, 97 and then the state of New York is really trying to put more renewables in the grid. By 2024 and 2030, when there's penalties coming for large buildings that are emitting based on their operations they really want it to be localized for renewable energy. Can you tell us a little bit about that trend and what do we need to know on the cost side? Is that going down? Is it more economical than ever?

Tim ([18:16](#)):

There's basically three segments of the solar industry. There's the residential or rooftop solar industry there. The costs are between three and \$4 a watt. A solar array for a home might cost 20 to \$30,000. It's like buying a car and it's interesting, people don't really do a payback calculation on their car, but they very much want to do that with a rooftop array. If you have net metering, which is one of the foundations of a good local energy economy, more than 30 states have good net metering rules. Now we have what's called full retail net metering here in Illinois. Meaning in the summer, let's say I have a seven KW rooftop array, which is the average here in Illinois in the summer, I'm going to be over producing with my solar Ray and pumping power back onto the grid.

Tim ([19:11](#)):

In the winter, I'm going to under produce because the sun is very low in the sky. Over the course of the year, though, I can produce a hundred percent of my kilowatt hours of electricity with the solar array and get credit for those that I'm putting back on the grid. When I'm under producing that credit is coming back to me, so to speak, and that really helps the economics of solar. Then there are other special incentives in some markets like Illinois, like I pay four and a half cents per KWH, which is incredibly low. There's many externalized costs there that are not represented because I do have a grid that is dominated by coal power. Although it is also dominated by nuclear power here, which is low carbon energy and existing nuclear plants are basically a pretty good thing for the environment.

Tim ([19:59](#)):

The question is moving forward, is nuclear economical. Our fleet of nuclear plants here in the US is aging. I live in the most nuclearized state in the

country. I grew up fighting a nuclear waste dump in Southern New Mexico at my kitchen table. I was a kid, but my parents were fighting. This site it's called a weapon. It became a real facility. They did end up building it and they've had some real problems. Nuclear waste is dangerous stuff. You have to be very careful with it. You want to make sure that it's protected from groundwater and leaking into the environment. It's highly radioactive for 10,000 years. The challenge with nuclear, but anyway, rooftop solar, if you don't have incentives or you don't have net metering, it can be problematic like in Florida.

Tim ([20:49](#)):

The rules can be very tricky and they can be a real barrier. If you're in a good solar state, then rooftop solar is definitely a thing. There's many, many states now where that's happening. I can rattle off a handful of them. You just need to Google it and find your local solar association? Here in Illinois, we have the Illinois Solar Energy Association. We have a national organization called SIA, the solar energy industry association. There's also ACEs. I can't remember exactly what ACEs stand for, but it's another solar organization for residential. Then we have a small utility or a commercial and small utility. These are one megawatt to 10 megawatt facilities. Some of them are behind the meter. Some of them are what's called community solar facilities, where you build a small solar farm here in Illinois.

Tim ([21:38](#)):

We have 20 acre solar farms. These are two megawatt AC facilities. We have 200 of those now, no, sorry, 111 of them, 200 megawatts AC of those. We're about to get several waves more. What that is great for is anybody who doesn't own their own roof or who doesn't want to put solar on the roof, or who has a shady roof or lives in an apartment, or for whatever reason. Can't do rooftop solar. You can subscribe to a community solar array and thereby really directly participate in the clean grid and support those solar installations and then buy power at a discount here in Illinois, you can expect about a 10% discount on your power bill when you participate in community solar and the rules are very generous around geography. An array here in central Illinois, I could participate in any community, solar Ray in Amerind territory, which covers the Southern part of the state.

Tim ([22:34](#)):

I'm in Northern Illinois in comment territory, same rules. If you're in a calm mood, you can participate in any community solar project in combat. We have what's called utility scale, which depends on who you talk to. That definition is changing, but historically 10 megawatts and up now, really a lot of companies say 50 megawatts and up just because the size of these facilities is growing dramatically. I'll give you an example and people can Google this. There's a project called mammoth solar being built in Indiana. It's a 13,000 acre solar farm. It's going to be built in several phases. I'm not directly involved. Some friends of mine have a company called Durrell, which is an Israeli solar developer. They have a headquarters here in Chicago, and they're very ambitious about large scale solar, and they're very serious and they have a wonderful video on YouTube.

Tim ([23:26](#)):

Just go on YouTube and Google Dorel solar, D O R a L and Mammoth solar project. They interviewed a bunch of local people from the counties where the projects going and what this does is not only is creating a huge amount of green power for the right, which is replacing coal and natural gas and reducing our carbon footprint, but then it's also providing a tax base for the schools and other local government entities. It's providing clean jobs, right? This is construction. Lots of jobs, both in construction, and then a smaller amount of jobs in the O and M the operations and maintenance of the facility. This is a very big facility. It's a power plant. It's big coal plant is a one gigawatt coal plant. This is on par with some of the larger power plants.

Tim ([24:21](#)):

A big nuclear plant is three or four gigawatts. They do get bigger, but the solar power plants are getting very large and we're very rich in land. Charlie, one of the beauties of living in America, is swimming in real estate. I don't want to pave over the earth either. We've already paved over 6% of the United States with roads and buildings. Of course, we want to use that fraction of the built environment. We only need to take about 1% of the entire landscape. You could turn this into a square. If you consolidate it about a hundred miles on a side or 10,000 square miles, and that's the amount of solar we need to produce all of our power. If you made a solar array, the size of New Mexico, you could power the entire earth. And we actually get 10,000 times more solar energy than we need.

Tim ([25:14](#)):

The solar that we received from the fusion reactor in the sky, the sun is immense, and we only need a small amount of land. Don't worry. We're not going to pave over the bread basket. I want to keep the bread basket rolling while growing food, but there are other benefits to converting land to solar rays. I want to address some of those benefits because there are many ways you're going to reduce the runoff. Water runoff from land is a major issue because it's pulling nutrients into rivers that are going to the Gulf and creating a dead zone in the Gulf of Mexico. When you have a solar farm, you're going to get less runoff. If you plant it, especially in native plants with deep roots. These are Prairie plants. You have to plant low growing plants because you don't want to shade the array and then that reduces the maintenance costs. You have to mow less, you can graze sheep, you can do dual use Agra. We call this Agricole tax. This is a growing subset of the industry. I'm very excited about Agricole. If you're really doing it right, you're creating organic farm ground. That ground just has steel piles that are driven into it. That the glass solar panels are mounted on top of there's very little permanent infrastructure in a solar array. It's just some steel in the ground. Some wires that are buried under the ground or cables as we call them, they're thicker, all of that can just be pulled out and then you've got organic farm ground. You could convert it back to grant to farming. No problem. There's no permanent damage to the land. These panels are not toxic.

Tim ([26:49](#)):

That's a misunderstanding. Some people who just don't know what solar is, have heard, " Oh, it's so dangerous. There are technologies called thin-film that do involve toxic chemicals or toxic elements. And that's called cadmium Telluride. "There Is a big company called First Solar HIO that makes panels with cadmium Telluride. You have to be careful with the waste product in 25 years when we're re-powering these facilities, you have to be careful what you do with those panels. We need to get serious about making panels to be recycled. It is a growing, burgeoning industry. We want to do it in an environmentally friendly way. We can talk more about that if you like.

Charlie ([27:33](#)):

This is a great education here. I admittedly I do green buildings and LEED and WELL, and in some of our projects do have renewables. It's fantastic. Clearly you're the expert on this. I think to all of our listeners, thanks for giving us the lay of the land on the residential side, all the way to large scale and utility scale. That was very helpful. Tim, if you look back on your life and career, what are a few accomplishments that stand out to you?

Tim ([27:59](#)):

My greatest accomplishment is raising two beautiful children who are thoughtful, productive members of society. They're freshmen in college now in Norway. I have two sons who are dual citizens. I like to say my work is done. I'm very proud of my two children and I poured my heart and soul into raising some upstanding young citizens. On the career side, I am super pumped for my work with Passive House Institute, helping them grow super Palm for my influence in the media world. I have a podcast called The Clean Power hour. I have a co-host on that show, John Weaver, who is a journalist with PB magazine. I'm very dedicated to being a spokesperson for the industry. We need more people to be knowledgeable and informed and actually coming into the industry. The industry is growing so quickly that we need people of all backgrounds, all trades, whether you're in the trades like electricians, carpenters, laborers, et cetera, we need those skilled trades.

Tim ([29:04](#)):

We also need salespeople and marketing people and engineers and executives, analysts, et cetera, developers. There's so many opportunities. And I'm very proud of my work in the media like yourself. I've been podcasting for several years and that's in my blood. Both my parents were writers and journalists, and I just love being part of the newer media podcasting that is exploding. I've been documenting all the sustainability related podcasts, Charlie, and there's over 200 podcasts, produced in the, in the US and Australia and Europe now that are to sustainability in some way or another. That's a burgeoning ecosystem. It's just wonderful to be part of that. I'm very proud of that. I've set a personal goal of being involved with one terawatt of solar installations in the US we're going to install a terawatt of solar in the US by 2035.

Tim ([30:03](#)):

We're going to go to three terawatts by 2050. At which point 45% of our power will be coming from solar PV. Right now we get 40% of our power from natural gas. That is the largest single source on the grid. There's going to be a flip-flop and solar is going to displace natural gas and that's just a natural part of the evolution of energy economics. These transitions have happened historically many times. We went from wood to coal, to whale oil, to fossil oil, to natural gas and nuclear, and now to wind solar and battery storage. Together with the team at fossil or solar, which is a Babcock and Wilcox company, there's a cool story there because Babcock and Wilcox make boilers for coal plants that they became famous for.

Tim ([30:56](#)):

They're a 150 year old construction company, but the Babcock boiler is like the Cadillac of boilers. Of course now the coal industry is a dying industry. It's nobody's fault. It's just economics. It also happens that we do need to decarbonize the economy to create a safer future for humanity. There's a huge economic opportunity to segue to other sources of power. What Babcock and Wilcox is doing. They bought a controlling stake in foster this past September, that deal closed, I think, October 4th. I'm just three weeks into my tenure at foster. I worked for another, what we call EPC called continental energy solutions prior to this there another major solar installer here in Illinois. It's very heady here in the Midwest. There's just a lot of rooftop, local solar happening, but there's also a lot of large scale solar and I've had the pleasure and honor of being involved in both sides of that business. That's a legacy that I want to leave and grow and share with my family and grandchildren.

Charlie ([32:03](#)):

Oh, absolutely. That's that really, those are great accomplishments. Tell us just a little more about your Clean tech podcast, your solar podcasts. I'll put a link in the podcast, show notes here, Tim, to make sure everybody listening to go check out Tim's podcast. What did we learn there and how frequent do you put on a podcast?

Tim ([32:22](#)):

I'm just getting back on the bandwagon. My podcast, normally we release an episode every week. We've been releasing on Fridays that are in transition. I took a two month hiatus working with a coach now, hot I've

now hired a media company to professionalize the production. You can look for great things coming. You can check out the podcast @ [cleanpowerhour.com](https://www.cleanpowerhour.com) that's its own. It's got its own website and you can listen to it on audio platforms like Spotify, apple podcasts, Google podcasts, but also on YouTube. I'm the first YouTube creator. I always record audio and video in my shows, and we do a news Roundup of the energy transition news. Wind solar and storage, but we also bring on thought leaders and entrepreneurs in energy technology. We've had a couple of bleeding edge, solar PV companies, one called cubic PV, one called Meyer Berger, which is the Swiss company that makes a ultra low carbon solar panel.

Tim ([33:24](#)):

Now they're propping up a solar panel factory here in the US. It's a very heady day for the reassurance of manufacturing. We have a lot of supply chain issues going on in the world. China's having power outages. Those supply chain issues are going to get worse before they get better. We do need to reshore manufacturing and not be so dependent on Southeast Asia for the stuff that we put in our buildings, including solar panels. That's the clean power hour. I look forward to if you're working in clean energy, we would love to talk to you about coming onto our show. Thanks for letting me talk a little bit about that show as well.

Charlie ([34:03](#)):

Oh man. We got to support each other and share what I call our megaphones. Let's look to the future, Tim. What are you reading up on? What do you think next in this whole?

Tim ([34:16](#)):

Many things are next, Charlie. I'm a guy on both ends. You'll see. There's a growing drumbeat of news around green hydrogen. Hydrogen is a great storage technology. Hydrogen is the most common element in the universe. The sun is made of hydrogen. You can take water and electricity, which you can make with solar PV or wind, right. And then split the water into hydrogen and oxygen. You can store the hydrogen in compressed form in, in liquid form, in gaseous form or in metal form. There's a whole ECOS ecosystem of new technologies around storage of hydrogen coming out. Look for that. It's going to be used in long haul trucking here in the near

future. You see that with companies like Nicola that are going to have a hydrogen powered, log haul truck in the near future.

Tim ([35:09](#)):

There's also a company called Ally Power that I've been working with that is going to retrofit diesel trucks with a hydrogen powered fuel cell to electrify diesel trucking. A lot of good innovation coming in green hydrogen, and then also carbon capture and storage is a big one. We can net zero, the economy, Charlie, but we have to net negative the carbon economy, right. We're going to have to suck carbon out of the atmosphere. We're going to be building basically inverse power plants. These are like ginormous air conditioners. There's a company from Switzerland called Incline, which got in the news for a project called Orca, which is based in Iceland. They're literally taking geothermal energy. Building, powering a machine that sucks CO₂ out of the atmosphere, liquefies it, and then pumps it down into the cross to the earth.

Tim ([36:05](#)):

And it turns to stone. You have to find areas where there's a certain geology to make this happen. You want it to turn to stone so that it can't leak out as a gas again, because liquefying it isn't enough. Even if a small fraction of the stuff you pumped down comes back out, that would be a very bad thing. I'm cautious about carbon capture and storage. You have to be, you have to look at the details of that technology being used, but it is going to be necessary for us to prevent catastrophic climate change. I'm a fan and Elon Musk has issued a \$100 million X prize for next gen carbon capture technology. Check out that prize, it's running now, the competition is running. It's not too late to get into that competition. There's special categories for students and existing companies, et cetera. Those are the two things that I'm most excited about besides of course, solar, wind, and storage,

Charlie ([37:02](#)):

Thanks for letting us know how you see the future. It's always important. Let's do some rapid fire questions here, Tim. I'm enjoying our conversation. I'd like to get to know you more. What would you say is your specialty or gifts?

Tim ([37:17](#)):

Curiosity is one of my best gifts. I'm hugely curious and hungry for knowledge. I really resonate with Elon Musk. My goal in life is to be less wrong and he also has an attitude that the best part is no part I'm really into efficiency. I'm very good at finding ways to improve systems and processes and to, to make things go faster. We need to speed the energy transition. I see myself as a catalyst to speed the energy transition, and that is one of my greatest strengths,

Charlie ([37:57](#)):

Really good stuff, man. Thank you. Do you have any good habits?

Tim ([38:02](#)):

I am a trail runner. I'm a long distance runner. Life is a marathon and running is a great metaphor for whatever it is that you're doing. If you want to master a skill and become a meaningful part of the economy, have a wonderful career doing what you love and being reasonably compensated for it. You really need to master certain skills. It's well-documented now that that takes about 10,000 hours of doing that of repetition, of practicing, of training. As a runner, I've learned that I can only be a good runner by doing it regularly. Some days I don't want to go out there when it's dark in the morning or rainy, like it was this morning the sun isn't coming up until seven. O'clock now here in the Midwest. I'm running in the dark.

Tim ([38:51](#)):

Sometimes I don't want to do it, but I know that it's really good for me. My brain feels so turned on the rest of the day when I go for a run in the morning. But I would. I'm reading a book called Mastery, which I recommend, and it's about this process. When you look at the very successful inventors and entrepreneurs, in society, people like Ben Franklin, like Thomas Edison, like Albert Einstein, they only had really great breakthroughs after really slogging it out. There's a great story about Dr. Seuss. He got rejected many, many times before he got his first book published, but clearly the guy is a genius and he only got there though by really sticking it out. That is a practice that I like to lean into is, is repetitive practice to get better at whatever skill I'm trying to master.

Charlie ([39:48](#)):

It's really good. Thank you for sharing. Tim, as we get to know each other more, I'm a fan of a bucket list. What are one or two things maybe on your bucket list?

Tim ([39:56](#)):

I want to go to Italy. I'm a foodie. I love to cook. I've traveled to many parts of the world, but I've never been to Italy. I also want to go to Ireland. My mom's family is a Murphy family, I have Irish and Scottish roots and look forward to exploring the UK more. I also really want to go to China. I've traveled extensively in Southeast Asia, but not to China. China fascinates me. They've set a goal of being net zero by 2060, and I believe they're going to do it. They're very serious about sustainability, even though they are also building coal plants. It's a double edge. It's a fascinating place and one in which they're building cities in the multitudes each year that have millions of people. They're industrializing and modernizing in a way that no other society has done at that scale, in that, at that pace, so to speak. It's a fascinating place that I look forward to visiting.

Charlie ([40:57](#)):

You mentioned Mastery, I can put a link to that book. Is there another book you'd recommend to the listeners?

Tim ([41:06](#)):

Oh, I'm so glad you asked. My all time. Favorite book is by Tony Seba, and it's called Clean Disruption. And Tony is a technologist and he specializes in studying social and technology disruptions and he documents in this book, the myriad of, of examples, of things that disrupted existing technologies and existing. He gives the example of the cell phone, right? The electric vehicle, how the automobile industry has been very slow. The traditional automobile industry has been very slow to wake up to the fact that the Evie is going to be the dominant source of transportation in probably five years. Check out Clean Disruption. He talks about many aspects of sustainability and the clean economy and gives historic examples of how some companies, even though they're ginormous and they have huge R and D groups, just can't see the disruption coming from microcomputers is a great example.

Tim ([42:12](#)):

The DCS of the world, they went extinct when the personal computer burst onto the scene, and it's just a natural part of, of a technology evolution, but it's very real. It's a great example of these tipping points. We are at the tipping point for wind solar and storage. We're at the tipping point for electrification of transportation. You don't see it everywhere yet, but in 10 years, you're going to have a battery in your garage. You're going to have either a solar Ray on your roof, or you'll be participating in a community solar facility

Charlie ([42:43](#)):

As we come to a close Tim. Is there any career advice you wish you didn't own earlier?

Tim ([42:50](#)):

Ooh, that's a biggie. In hindsight, it's quite frustrating for me that I didn't realize that business was such an interesting place. Both my parents worked mostly in the nonprofit or educational sectors. Even though their parents, especially their fathers were entrepreneurial, I just didn't know it was a real blind spot for me. I should have been a business major. I should have gotten an MBA instead of a master's degree from any college, even though I'm grateful for that experience. I learned a lot and I of course can use a lot of the skills that I learned. I just love entrepreneurship. I'm passionate about it. It's such a great force for good when it is for good, right? It's a double edge. It can be for evil too. We can't have unbridled capitalism.

Tim ([43:47](#)):

We have to have constraints and rules to follow and goals as a society, we have to get serious about creating a built environment that isn't borrowing from future generations, right? Our grandchildren are not going to forgive us, man, if we aren't, aren't doing our darndest to turn this ship around, we have the technology, we just need to deploy it. And that goes for the built environment. It goes for energy. It goes for transportation, goes for industrial processes, every clear across the board, we totally can go net negative. We just have to decide to do it.

Charlie ([44:23](#)):

That is good career advice. I'm a fan on the business side too, and there's entrepreneurship.

Tim ([44:33](#)):

Can I ask you a question? How do you make a living?

Charlie ([44:37](#)):

Thanks for asking. We do a few things in this green building movement. We have our online education company where we've helped 150,000 people around the world pass their LEED exams and their new WELL AP exams and do their continuing ed. And that's who sponsors our podcast here. That's [gbes.com](#), but I also get to work on buildings. We have a consulting team and engineering team, working on new construction and existing buildings. I'd like to say we're a small giant and this green building moves.

Tim ([45:08](#)):

Excellent. I should know that, but I'm grateful. I also do some training in energy, in the energy space. It's so important to give back to the rest of the world. Knowledge transfer is one of the most important things. If you're not teaching and mentoring and training others, if you are a master of a skill, please get serious about giving back to the rest of the world.

Charlie ([45:35](#)):

Yeah. We call that tribal knowledge, we've got to protect it and share it. Actually Tim, for being on the podcast, I send each of my podcast guests an organic t-shirt that says, teach everything because that's our motto here on our Green Building Matters podcast. Teach everything, Last question, Tim. Let's say someone's listening. Maybe just get inspired. Maybe they want to get into renewables. What words of encouragement do you have for them as we come to a close

Tim ([46:02](#)):

Let's do it. It's a wonderful career. Every career will have its challenges and opportunities. Retail it to me on LinkedIn. I love to network and I'm happy to help you find your footing in the industry. If I can help you network your way, it's really through your network that you're going to find the best opportunities. Get active on LinkedIn, be active in your association. Be curious and connect with others. We need to just do this. Action speaks. There's an expression done is better than perfect. Don't worry about being perfect. Worry about taking action.

Charlie ([46:44](#)):

No, everyone please do connect with Tim. This has been Tim Montague coming to us from Champagne, Illinois. He is a utility, solar and storage executive. Tim. I learned a lot from you today, thanks for being on the podcast. Thanks

Tim ([46:57](#)):

A lot, Charlie. I really appreciate it.

Speaker 4 ([47:01](#)):

I just want to say thank you to our loyal listeners. We actually are celebrating over one year here on the Green Building Matters Podcast. Me and the entire team were stoked and just so glad to continue to listen every Wednesday morning to a new interview with a green building professional here in this industry, or just some pro tips that we want to make sure that you are getting straight from us straight to you. Thank you for listening to this episode of the Green Building Matters Podcast at gbes.com. Our mission is to advance the green building movement to best in class education and encouragement. Remember, you can go to gbes.com/podcast for any notes and links that we mentioned in today's episode. You can actually see the other episodes that have already been recorded with our amazing, yes. Please tell your friends about this podcast, tell your colleagues, and if you really enjoyed it, leave a positive review on iTunes. Thank you so much. We'll see you in next week's episode.