

Sustainability II: Harnessing the Sun

NOON SALIH: In the previous episode on biomimicry, we introduced you to Expo 2020's commitment to sustainability...

Today, we're going to zoom in on the solar energy initiatives at the Expo and visit a largely forgotten moment in the history of this renewable energy source.

I'm Noon Salih and this is Inside Expo, an official podcast of Expo 2020 Dubai, where history is being made. Listen to legacy unfolding in real time, and across nearly 200 years of Expos around the world.

[INTRO STING]

DINA STOREY: Sustainability and anyone in the sustainability space will tell you, it's not a job, it's not a profession, it's a life calling.

NOON SALIH: This is Dina Storey, Head of Sustainability Operations at Expo 2020.

DINA STOREY: It has to be ingrained and embedded into your life and it's part of my daily life for sure. Of course, I recycle, I compost, I have a little Fiat 500E. It's tiny and small and it gets me from Point A to Point B.

NOON SALIH: And while she's at work, Dina can charge her little Fiat at one of the thirty electric vehicle charging stations. Dubai's Electricity and Water Authority has installed them at the Expo site, according to the Expo 2020 team. They're part of a broader initiative to support the growing electric vehicle industry in Dubai, These

chargers also signal Expo 2020's overarching commitments to minimize its carbon footprint and generate clean energy.

DINA STOREY: When we started looking at different energy sources or renewable energy sources, of course we looked at wind and so on and so forth, but the reality is solar power has become first of all, more efficient, more cost-effective, and we have an abundance of sun. The majority of the year, the sun's out.

NOON SALIH: The sun: we take it for granted. It's all around us. It's what we wake up to. It's what we end our day with. Particularly in the UAE, where the weather is mostly hot and sunny. So clearly, it makes sense to harness as much of it as possible.

MUSIC

DINA STOREY: Our energy generation across the site is about 5.5 megawatts.

NOON SALIH: That's enough power to be able to drive from Downtown Dubai to the Corniche in Abu Dhabi and back 180,000 times.

For listeners not familiar with the UAE's geography, that would be a journey over 52 million kilometers long – almost half the distance between Earth and Mars, when the two planets' orbits are at their closest point.

DINA STOREY: All of our permanent structures are equipped with solar panels, and that's a must, because that also has a legacy. Now, we focused on our permanent structures for a reason, because it is not feasible, but also it is not sustainable to put solar panels on everything, even on temporary structures.

NOON SALIH: So they strategized beyond Expo. They've been working with schools to promote competitions about solar energy, like the Sustainability

Champions Program, which awarded students solar panels that were installed by Expo at the schools.

DINA STOREY: But it wasn't just that, we created a parallel curriculum so that they can teach the children about solar panels at their schools and a school in Dubai one and in school, in Abu Dhabi one, and that program is still going and it's very successful. On-site itself, of course, you've seen Terra, and Terra is a big representation of solar panels and the use of solar panels.

MUSIC

NOON SALIH: Terra is Expo 2020's Sustainability Pavilion. The name comes from the Latin word for 'land' - but it also means planet Earth. And so, in a way, think of the Terra pavilion as the center of all that is keeping planet Earth alive. We sat down with Director of Terra, John Bull, to learn more about the site.

JOHN BULL: So as part of Terra's ambition to be net-zero in its use of energy, you'll find yourself here surrounded by photovoltaic panels, by solar panels. Perhaps my favorite manifestation of them is in the energy trees, our e-trees.

NOON SALIH: The e-trees are just outside the pavilion, along its path - imagine a forest filled both with real trees and rotating mechanical trees.

Each of these e-trees act like their own organism. They have long columns that mimic the shape of tree trunks. At the top are solar panels that look kind of like satellite dishes. These panels provide shade and also equip the tree to rotate throughout the day to follow the sun.

JOHN BULL: But these are really quite unusual beasts in that they move over the course of the day. So the heads of the e-trees act like sunflowers in a way, in that they track the course of the sun, they follow it around over the course of the day.

NOON SALIH: Moving around allows them to generate almost a quarter more electricity over the course of the day than if they were just static. On top of all this, this energy forest is centred on a huge 130 meter steel canopy. Combined, the canopy and e-trees help generate the entire pavilion. But it's not just Expo 2020 that they generate power for.

JOHN BULL: We're not connected to a battery here at Terra. We made the decision to connect to the grid and therefore over the course of the day where we have an abundance of energy, we're pushing it back into the grid, pushing it back out to Expo and the rest of Dubai and the UAE for them to use our clean energy.

NOON SALIH: So it's an entire breathing ecosystem. One made out of many parts that all feed into each other. Neither can survive without the other.

JOHN BULL: I always describe Terra as something that's firmly rooted in the UAE and its values and its history and its future as well. But it has to talk about a global issue because no one country, no one individual can act alone in combating these issues.

NOON SALIH: So it's clear that solar energy is a big topic at Expo 2020 and everyone is excited about it. But at previous world expos, not everybody was as excited about solar energy as they are today.

MUSIC

NOON SALIH: My last question about solar is if you've ever heard of the inventor Augustine Mouchot?

DINA STOREY: No, I'll be honest.

NOON SALIH: Get excited for a rabbithole.

MUSIC

NOON SALIH: In Dina's defense, I hadn't heard of Augustine Mouchot either, and before researching this episode, neither had anyone on the production team.

Searching for answers, we reached out to the writer and researcher Charles Pappas, who you might remember from our first few episodes. And with his help, down we went into a solar energy at World Expos rabbit hole...

CHARLES PAPPAS: I was researching the early expositions and I really hadn't anticipated coming on something as novel and as groundbreaking as Augustine Mouchot.

And it turned out that Mouchot had exhibited a solar collector in 1878 in Paris. He used a parabolic dish, very similar to the tech we're using today, you would recognize it as a solar collector. And the solar collector beamed the sun's rays into this giant black copper container full of water. And the water would heat up, boil over and would power a refrigeration unit to make ice.

NOON SALIH: Yes, you heard that right. Almost 150 years ago, Mouchot, a French secondary school Mathematics teacher, had figured out the essential mechanics behind solar technology.

CHARLES PAPPAS: And accordingly, he won a gold medal for this invention. Again, of course it would - it was so far ahead of its time. But as they say on the internet, you won't believe what happened next. And what happened next was nothing. It all died out. It was all forgotten. They gave us the future at a World's Fair almost 140 years ago and we ignored it.

Can you imagine if we had 140 years of linear development of solar power, instead of basically just starting, let's say in some ways in earnest since the 1970s? What if

we had had that? But it was given to us. Millions saw it and we ignored it and that's on us.

NOON SALIH: So why did we ignore an invention that, could have helped in the fight against the environmental crisis?

CHARLES PAPPAS: The reason for this though is a confluence of events and it's always a perfect storm that either derails something or makes it wildly popular. But in this case, about 19 years before that exposition in Paris, the first oil well in America had been dug. So oil is now becoming a fuel. At the same time in Europe and America, railroads are spreading out, high-speed, relatively, railroads are spreading out, connecting every corner.

CHARLES PAPPAS: And what that means is fossil fuels, coal and then oil can be moved fast to every nook, to every neighborhood - and cheaply. So, we damaged ourselves by the ease, the cheapness of it, which turned out to be probably the most expensive thing we ever did.

MUSIC

NOON SALIH: At first, it seemed like fossil fuels were our only feasible option. They promised electricity, power and heat to millions.

CHARLES PAPPAS: You have this great idea, but is there a need for it? Is the world burning? No. And what does this do? Until that time, the world was lit basically only by fire. Wasn't it? Since the dawn of homosapiens. Now with fossil fuels, cheaply, almost everyone rcould have warmth and illumination after the sun goes down.

That's progress, isn't it? But progress has a price and Mouchot had an almost clairvoyant sense of that price. But when you're one voice among thousands of others drowning you out, sometimes you don't have much of a chance.

MUSIC

NOON SALIH: So nothing really happened with Mouchot's grand invention. The world went ahead with fossil fuel production and after everything, Mouchot ended up dying in poverty in Paris in 1912. And with only a handful of biographies about him in French, Mouchot's legacy is obscure.

CHARLES PAPPAS: If I could do one thing, it would be to popularize his example. His name, his foresight. Because had we listened, we might be in a much different place today. I really think that he is someone who should be drawn from the shadows, drawn back from obscurity, and people really need to listen to what he tried to do.

And if anything, take his lesson to this Expo. Look at what's being shown. Look at the possibilities for technology that can change the way we live to a safer, better future, because it's now hitting faster than ever before. The calamities are coming and they're coming fast.

And then boom it's here... So what are we going to do about it?

NOON SALIH: Expo 2020 is trying to answer some of those questions - it's where sustainable solutions from all corners of the world meet and get pooled together.

CHARLES PAPPAS: Well, at least Expo is trying to show a way. At the very least, it's trying to show the possibilities there and maybe it's for the better that it's international because this country over here has an idea. Dubai has an idea. The United States has an idea. China has an idea. France has an idea. The Netherlands do. All these people have ideas and we need to pay attention to them because

Inside Expo
Episode 10: Sustainability II:
Harnessing the Sun



otherwise Expo is just an architectural marvel and architectural show off and nothing more. But it's the ideas that may make Expo as cool as the buildings are.

NOON SALIH: Inside Expo takes you behind the scenes at Expo 2020 Dubai, sharing our stories and others across the 170-year history of this global event. Learn more by visiting VirtualExpoDubai.com.

Inside Expo is produced by Kerning Cultures Network.

We release episodes every Tuesday and Friday. Subscribe to Inside Expo on your favorite podcast app so you don't miss an episode. If you enjoyed the show, share it with your friends and leave us a review.