

Daniel Barel on Fully Charged Show – Interview Transcript
<https://www.youtube.com/watch?v=zcgqy-roQjY>

Robert Llewellyn:

Hello and welcome to another very exciting episode of the Fully Charged Show. I do get to talk to some really incredible people. Today's conversation is with Daniel Barel from REE Automotive, an amazing startup from Israel. What they're doing – you can see on the screen behind me – is really impressive.

Before we do that though, I just want to remind viewers of the opportunities available to people who have subscribed to the Fully Charged Show on YouTube because you would then be, you're eligible to enter our competition to win a car, an electric car, for a year, and not just in the British Isles, all over the world. It's an amazing offer, please do check it out. Links about it are beneath this video. There's other smaller competitions coming. If you go to our webpage at fully charged dot show, you will be able to find out all about it. It's very exciting.

But that's enough of that, because I really want you to listen to what Daniel Barel is talking about because it is amazing technology that could really change the picture of the transportation industry in a very major way.

So, that's enough waffle from me, let's get on with the show.

The thing that I've come to realize recently is, particularly I've reviewed a lot of cars in the last six months that have come out – you know, they've been delayed and delayed, they've now come out – made by legacy manufacturers; big car companies that make petrol and diesel cars. And you understand, once you go around their factory, why do they put the battery, control system, the engine control system, the motor, the cooling system all in one lump, and then then slide it up into the car as it goes along the production going “oh, because that's exactly how they do a combustion engine.”

Daniel Barel:

You know, we've been building cars the same way for the past – what – more than a century? Because conceptually, if you think about it, an EV today is basically a petrol car, where you've taken the petrol and put in an electric motor. The rest is more or less the same.

Now, being flat, it's an advantage, but it's not really flat if you think about it. All the – today's so-called skateboard chassis – are flat only in the middle. The front and the rear are not flat. Why? Because for the past century we've been packing in between the front and rear axles all the drive components – everything that makes the car go. So it can't be flat; only the middle part is flat. And if you're honest about it, it has been flat also more or less with, with petrol. There's been a dry shaft there, but not nothing else.

What we're doing is we've taken everything that makes the car go – the motor, the suspension, the drivetrain, the steering, the braking and the control – and placed it in a space between the chassis and the wheel. Now that specific space in between the chassis and the wheel hub, we call the corner. And it's all packed there.

Once you've taken it off the chassis, you can change the dimension of the chassis as you want without causing the ripple effect. Because if you take a regular chassis – any EV today – and you change the wheelbase by six, seven inches, there is a ripple effect: you have to redesign the half-shaft, you really have to redesign center of gravity, suspension, etcetera, etcetera. You build a new vehicle that cost about a billion dollars in about eight years. That's basically the most expensive six inches in the world. And it's only because there's a ripple effect. But when you've taken it off the chassis, there is no ripple effect; it's agnostic to the chassis – you can put on different kind of chassis.

We've built four different families of corners, with different attributing capabilities. Now we have, of course, different permutation of each of those families, but according to your requirement from the vehicle we choose together with you the right family of corners, and then you're sorted out – that's all you need. It's everything in those corners, regardless to the size, shape or use of your vehicle.

Robert Llewellyn:

Because I think the exciting thing is, and – correct me if I'm wrong – but theoretically, if someone was using your system, and decided to build a vehicle on top of it, that accompany wouldn't necessarily have to be a car company now; or have that sort of long-term legacy of drivetrains, of stability, of traction control, all those – that's a huge, it's a huge topic. But they could build really good body work, really useful carrying capacity in a commercial vehicle, or passenger vehicle, or whatever, and concentrate and focus their energy on that.

I mean that this is a leading question, but I'm assuming that's the goal in a way – that it makes that side of it very exciting for different people.

Daniel Barel:

Our all motto is: we complete, we don't compete. And this is exactly what we do – we're enabling.



It's, it's very similar to Intel powering a Dell, a Lenovo, or an HP – whatever brand you want. We do the same thing you can do, whatever you want on top. We're not competing with you; we're not going to build bodies ourselves. We're going to enable you with a platform with everything you need – you don't need to do the build of that, the safety of that, the kinematics, calculate... that's all on us.

Robert Llewellyn:

The ramp up, you know – we can make – look we’ve made five, and they all work, and they’re really good – but we want five hundred thousand, you know. So that ramp up, so where, how do you see that happening and where will manufacturing take place? Do you, have you got around to that yet?

Daniel Barel:

What we’ve done, which is different than anybody else, is that we created a very unique and exclusive network of tier one partners that are working exclusively with us globally in more than 30 countries, 300 production lines across the world. And we’re taking their free capacity, from everywhere across the world, and then we move that – according to what we need to make – to the point of sale.

So let’s say if we need to make vehicles in the US or in the UK, will have what we call an “integration center,” which is essentially an assembly line. No heavy machinery or anything like that, just an assembly line – close to the customer, the point of sale – and all the parts coming from all around the world to that location where they are assembled. That allows us to build, in the next five years, about 15, one five, integration centers – so we are going to be everywhere being able to meet that demand.

Each integration center has a capacity of roughly between 2,000 – sorry – 20,000 to 30,000 platforms a year, and we can build as many as we want of those. They cost just a few millions of dollars, not billions like any other production line, and that allows us to look at the whole market and address it at once, without the need to invest monstrous amounts of capital into that.

Robert Llewellyn:

It is the sort of standard model which we’re even seeing, you know, with people like Tesla, you know; they’re going to build a gigafactory in another gigafactory. Now they’re going to move that gigafactory to this even bigger gigafactory. It’s just all about – and those are colossal – I mean the cost, I can’t even imagine – and I mean they’re a profitable business, it’s not that they’re not going to, it’s not going to work, but it is a monstrous investment. And what you’re doing is fitting in, effectively with existing logistics and structure and production facilities.

So you say you’ve had your, your – whatever – the vehicle, has been running for five years and there’s this new battery technology – which what you were mentioning earlier – has come in and there’s now, you can buy a competing vehicle with this amazing new, super lightweight, high-capacity batteries that are – and then you can, without taking the vehicle to pieces, you can drop out the batteries that it was built with – is this the case? And then reformat the new batteries and fit them in, I mean is that that’s the, the idea behind that? I mean you don’t have to tear the car to bits to do that.

Daniel Barel:

It’s fully modular it’s built in order to apply that. Exactly. But also the corners, right, in five, six years you might want different kind of corners with different capabilities. It takes less than an hour to replace a corner. How long does it take a vehicle to replace – I would say the drivetrain? Four, five days?

Robert Llewellyn:

Actually it’s huge, a huge cost, yeah.

Daniel Barel:

You have to take half the car out, take the gearbox out, put a new one in, re-put everything; and like my old mechanic – with my old car – used to do every time I put it into the shop, there was a little plastic bag with some screws. I used to say “what are those?” – I don’t know where these go.

Robert Llewellyn:

Yeah I’ve done that myself replacing a gearbox in an old van I had when I was young man, and it was all done – it worked, it started, it moved, it’s fine – and then I looked in a tray there was five big bolts. They never went back in and I drove that car for years. I had no idea what they were for. I never found a home for them, yeah.

For instance say you had a damaged from a hitting a pothole, because of that has the corners got things like shock absorbers and the suspension.

Daniel Barel:

Correct.

Robert Llewellyn:

It’s got to be – that’s built in. So if that was damaged on one corner – it’s just something I’ve experienced where I’ve damaged shock – you could effectively replace that corner; or even a low-speed accident or something, that could be replaced this is its entirety.

Daniel Barel:

Yes, so again think about fleet managers – think about UPS, FedEx, all right – let’s say you’ve got a problem in a shock absorber. So you take it into the shop and a mechanic that is certified on that specific vehicle need to, to check it out, right. And then they say “okay, you need a new shock absorber.” But most likely there is none available currently, you have to order it – takes a couple of days. That supply chain and spare part inventory management is really expensive and complicated.

So we decided to eliminate that; there is only one spare part, that’s all. It’s called a corner. Whatever happened there, take one out, put one in less than an hour. Drive up – we’ll take care of everything later on.

Robert Llewellyn:

So say you’ve upgraded the batteries and upgraded – and replaced – a corner, what happens to that – those items – once they’ve been replaced? I think this is a really important point in going forward for all of us is what do we do with the bits of stuff.

Daniel Barel:

The second life.

Robert Llewellyn:

Yeah the second life.

Daniel Barel:

Mechanical parts are very easy to re-use – right – so that’s a given everybody does it today, we’ll keep on doing that, and probably refurbish and put back to use as much as possible.

Batteries, on the other hand, have to be put into second life. So let’s say you want a lorry going at a certain speed, right, with a certain requirement of that battery, but in a different market in the world they don’t need that high capacity, they don’t need that much power density, they don’t need that performance – because the usage is different. So why don’t take the batteries that you’ve been using for the past five years and put them in a different vehicle that requires lower spec? Not because it’s a bad vehicle – don’t get me wrong – they’re requirements, right?

Robert Llewellyn:

But it could also be cheaper, I'm assuming, as well.

Daniel Barel:

This is where I'm getting to – now usually those vehicles are cheaper, right, because this is the trade-off. I think what Mahindra – now in India – are selling an EV for, what for, four thousand dollars...

Robert Llewellyn:

About four thousand dollars, yes yeah.

Daniel Barel:

It's a brilliant car for the Indian market, but nobody thinks it's comparing to Tesla or Neo, right? But this is the whole idea. And we believe second life is key for those, and this is what we want to allow you to change those while they still have some juice. We've seen others that are looking into putting them into the grid – that's batteries – and putting them into houses, etcetera. But it could be done – not by us, we're not a power company, right? But, but again, could be done.

I think that the future of second life is still yet to be to be decided.

Robert Llewellyn:

It's only just starting, isn't it, really.

Daniel Barel:

Yeah, correct.

Robert Llewellyn:

Yeah particularly for people in the British Isles, I think there might be some interest in the fact that you're establishing us an Engineering Center of Excellence at MIRA. So I've actually filmed at MIRA in the past, so I know that is a technology park here.

Daniel Barel:

MIRA – and their testing track, I mean it's, what, more than 800 acres.

Robert Llewellyn:

Yeah, it's incredible.

Daniel Barel:

Yeah its testing track, it's huge! We can drive in there, we can test our vehicles, we can do everything we wanted. It's perfect.

Robert Llewellyn:

Yeah – this is very selfish of me: when am I first going to be able to go in a vehicle that is powered by REE? Have you got any idea when the, sort of, first thing that we can see that is actually a vehicle as opposed to just the skateboard – when we might see that?

Daniel Barel:

When can you travel to Israel?

Robert Llewellyn:

I knew you'd say that. I'm hoping soon – I have no idea. But I see, so it's not impossible, we could see something quite soon.

Daniel Barel:

We would more than welcome you here and you know – show you – and, and let you play with the toys.

Robert Llewellyn:

That would be great; that would be fantastic.

Well, Daniel I want to thank you because I just think what you're doing is really, really impressive. So thank you very much for explaining it to us today, and you know we will definitely be seeing more of – there's no question now. There's, every now and then I'll see a new company and I'll go "oh," – like Lucid in America – I really wanted them to work and they almost did, then it disappeared, then they almost did –they might do it but, you kind of, you're not sure. Whereas when as soon as I saw REE, as soon as I saw what you were doing

Daniel Barel:

Thank you.

Robert Llewellyn:

I went "these guys are going somewhere." This is fantastic.

Daniel Barel:

Thank you, Robert. Thank you so much. Thank you, it's always fun talking to you.

Robert Llewellyn:

Okay, thank you.

Well I really hope you enjoyed that – we're praying that we can either get to Israel to see what they're doing or, in fact, go to their research and development area center here in the glorious old United Kingdom. Really, really interesting what REE are doing and I'm sure we're going to see a lot more of them on the Fully Charged Show in the coming years because I think what they're doing is incredible.

That's all. I don't even want to talk about subscribing or Patreon – you, I could mention Patreon –but the links to that are also in the show notes for this episode. But that's all, I don't want to make a big fuss of it – I mentioned it up at the top. Please subscribe. There we go, done it. That's all. As always, if you have been, thank you for watching.

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