

# Ep.2.26 - Ray Boeman

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## SPEAKERS

Announcer, Ed Clemente, Ray Boeman

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### A Announcer 00:02

Welcome to The Michigan Opportunity, an economic development podcast featuring candid conversations with business leaders across Michigan. You'll hear firsthand accounts from Michigan business leaders and innovators about how the state is driving job growth and business investment, supporting a thriving entrepreneurial ecosystem, building vibrant communities and helping to attract and retain one of the most diverse and significant workforces in the nation.

### E Ed Clemente 00:28

Hello, I'm your host, Ed Clemente, welcome to the show. And today we're fortunate to have a longtime friend, but in a key position, Ray Boeman he is the MSU IACMI scale-up research facility. It's with Michigan State University. And I know I probably messed it up Ray, but you can also re-explain it.

### R Ray Boeman 00:51

Thank you, Ed. Yes, this is a one of the Manufacturing USA Institute's that was initiated under the Obama administration. And I'm fortunate to be leading this facility, it's in Corktown. It's a one of a kind facility in the country.

### E Ed Clemente 01:11

Yeah, I'm gonna actually, I did get a tour of it, too. And it is just fascinating at all the different companies that were in there using it even when I was visiting, and I had never heard of it. But then I think we'll get a little bit maybe where I was somewhat involved maybe with it when I was in the legislature to help get it started, right? We talked about that a long time ago.

**R** Ray Boeman 01:33

Yeah, absolutely. The root scope way back with some things we worked together on when I was embedded in the MEDC. And actually, as an ORNL employee.

**E** Ed Clemente 01:46

Yeah, and why don't you kind of tell people like, because it is a mouthful to explain. But what do you tell people if you go somewhere and they don't know what it is? What do you kind of tell them it does quickly?

**R** Ray Boeman 01:59

Well, essentially, it's a collaboration space that is open access, meaning that you don't have to compromise an IP position as if we were a company, for example, to gain access to some unique capabilities that help de-risk the commercialization of technologies. In our particular case, this is lightweight, composite materials. And we have production-scale capabilities, so we're sort of at the latter stage of development. Whereas earlier scale development might happen within companies at universities or a national lab, but we make full scale prototypes and validate also run at rate processes. So so it's a again, it's very unique in the United States.

**E** Ed Clemente 02:56

Yeah. You know, and your facility's so physically close to the, you know, all the new at the train depot, I don't know the official name for it.

**R** Ray Boeman 03:09

Yeah. Yeah, they branded it Michigan Central.

**E** Ed Clemente 03:13

Okay. And but you even are working a little bit with them, too, aren't you?

**R** Ray Boeman 03:19

Yes, we've started some conversations because well, frankly, it would be foolish not to. The train station, basically, as the sun would set in the east would cast its shadow almost on us so we can see it from from our building. And I think we fit nicely in terms of some of the other partnerships as sort of a complimentary development partner for them. So we have had some increasingly interesting conversations and some visits. And in fact, I took the MSU leadership, or I arranged rather of the MSU leadership, including the Board of Trustees, the President, Vice President of Research and a Provost for a tour there right before they came to visit us.

E

Ed Clemente 04:16

We have we've had Dr. Stanley actually on the President's Stanley on the podcast, and I think that, you know, that just shows you what a priority it is for Michigan State University, but also for the state. Obviously, the MEDC is very involved with you too, right?

R

Ray Boeman 04:33

Oh, yes. In fact, we would not exist if not for the MEDC. In fact, I could argue that our institute, which is actually headquartered in Tennessee, the State of Michigan through the MEDC, made the first cost share commitment, actually, even prior to the competitive solicitation that was out because we had been working including with some are good colleagues like Eric Shreffler at the MEDC, with informing and advocating for the need for this for the industry. And of course, our industrial partners were involved as well. And so they set the bar by which all the other states that contributed financial support were measured. So first and largest is what I would say.

E

Ed Clemente 05:26

Yeah, no, no, it's great to hear. And I should probably, I've mentioned it a couple of times here now, but originally, I met you when you were still working for Oak Ridge National Labs. And just could you give people a quick sort of definition, what these national labs are, because I absolutely fell in love with the concept because I didn't know much about them until I met you. And we worked on some projects together when I was in the legislature.

R

Ray Boeman 05:52

Yeah, the national labs are perhaps not as well known as they should be. They are really long standing commitments by the federal government to advance technology. And there are different types of national labs or they have different sort of focus areas, I would say. Many of them are what we would call multipurpose laboratories, which means they support many of these missions, of which, of course, there are quite a few. And Oak Ridge is among the largest, if not the largest of the the Office of Science based multipurpose laboratories, and it's outside of Knoxville, Tennessee. It was one of the original sites of the Manhattan Project. In fact, I think the the number is something like 60 cents out of every dollar in the Manhattan Project went through Oak Ridge. It wasn't all spent in Oak Ridge, necessarily, but it went through Oak Ridge. And so it's a very diverse portfolio from very fundamental science to very applied programs. And the program that I hired into originally was just evolving out of a big black program. That was called the Gas Centrifuge Program, which, you know, I don't really know the amount of money spent on that program over the years but successfully deployed gas centrifuge separation technology. And that was the basis of a lot of composites technology that Oak Ridge developed over the years as well as many other technologies that were applicable to transportation. And that's why Oak Ridge had such a leadership position in in the transportation program at DOE with other technologies such as power electronics, for example.

E

Ed Clemente 07:51

Yeah, and I know that when I was the legislature, I know some bills were done in conjunction through the MEDC and Oak Ridge to help attract companies to come to Michigan. I can't remember where you, I forgot if you're actively involved with the battery parts.

R

Ray Boeman 08:07

Yes, so if I'm not mistaken, your fingerprints are on some of those legislations?

E

Ed Clemente 08:15

Oh, yeah, quite a few.

R

Ray Boeman 08:17

And so I was asked because of the the growing relationship between the State of Michigan primarily through the MEDC, but we also worked with our friends like Kirk Steudle, at MDOT and others, but to be an external reviewer on the refundable tax credits for the battery programs. And I can tell you, because I worked in the vehicles office at DOE prior to this, and I had some conversations And that really made a difference to in DOE's thinking about de-risking some of those investments that they made ultimately. Now, of course, everything's not, wasn't successful but, you know, I think there was a very well structured strategy that was highly leveraged. And, you know, you can't control all the market conditions but, you know, I think the state was very strategic about approaching the clean energy space through the Centers of Energy Excellence Program that was developed in those days.

E

Ed Clemente 09:32

Yeah, one of our quarterbacks back then was Governor Granholm who now has a good position too, right?

R

Ray Boeman 09:39

Yes. And I would say, I would say our facility here really has roots back to things that she was directly involved in. So it has its roots back to a nonprofit that we started called US Auto Parts that Governor Granholm and Neil DeKoker, who was the CEO of OESA at the time, and Andy Brown, who was the CTO at Delphi at the time. And in I almost forgot, Bud Albright, who was, let's see, he was the Undersecretary of Department of Energy at that time. We announced that at the Auto Show in 2008 and it really was the model of these Institute's that came later under the Obama administration. It was just at a much smaller funding level, because it wasn't a federal initiative or a presidential initiative. But Governor Granholm was very supportive of that. She, she announced it at the Auto Show and it was it was a pleasure to be able to work with her and her team, especially our old friend, Doug Parks, who was carrying a lot of the water in those days.

E

Ed Clemente 10:59

Yeah, he worked at the MEDC at that point. You know, we should be calling her maybe the Secretary of Energy, right? I don't know, which is the higher title, but I'm sure Secretary might trumpet right now. But, you know, the thing is that, you know, at that time, the economy was so challenged, you know back in 2008, that these were sort of like, sort of the paths and the highlights that we were trying to help pull ourselves out of that economy. And that's why we I think we were more aggressive I think than other states in that area back then.

R

Ray Boeman 11:33

Yeah, but I can tell you also Ed that because we helped organize The National Academy of Sciences wanted to have a workshop in Detroit because of the state's leadership in this area. So I was fortunate to be involved in the planning of that as well. And that that was something DOE and I, if I'm not mistaken, we're going back a few years now so my memory might be a little bit fuzzy, but I believe TARDEC, I'm almost positive.

E

Ed Clemente 12:07

That's right. No, it was, I remember that when the grants were being created by TARDEC. The other thing too, is that, how did you end up at MSU then?

R

Ray Boeman 12:17

Yeah, so I had already moved to Michigan, so I actually as an ORNL employee, basically created two opportunities for myself to come to Michigan, because I was working in the vehicle technology area. And, you know, my motto was, we need to think like a company and companies go where their partners and customers are. And the reason for that was to make the, try to align our capabilities as closely as possible to the industry needs. And to your point earlier Ed, that's a lot of awareness just there. But and it's awareness on both sides, what's going on in the at the National Labs, and what did the industry really need. And so the first time I was embedded in the automotive composites under US CAR for five years, and that was just a tremendous opportunity for me. And, you know, it really set the stage of my career, which is kind of kind of unique within the National Lab system. But then I was asked to go to Washington to the DOE headquarters for a year, which was really part of a professional development activity to prepare me to run our transportation program, which had three offices within DOE and also Department of Transportation. But that's when I started engaging in these activities we talked about a little bit earlier, and actually was recruited as an ORNL employee to come up and sponsor with actually Governor Granholm at the time active involvement in coming up to try to create stronger links between Southeast Michigan, or Michigan overall, for that matter. And it wasn't only automotive, you know, we worked in some of these wind activities with the MEDC and biomass as well. So that's what kind of got me up on the second round and then I was working with the the MEDC on on this composites, you know, Development Center and advocating to DOE and others. And finally, a solicitation came out and Oak Ridge led that team, put the team together and it only made sense to partner with MSU. Because at least in my estimation, they have the strongest and most complete composites program through Larry

Drzal. And so that was a just a natural partnership. And then, you know, to be a little bit crude, I got my points from Oak Ridge, I was really focused on this facility, so it just was a natural retirement, but I still work with them every week I've talked to, in fact, my longtime colleague there, even yet, today.

A

Announcer 15:38

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E

Ed Clemente 15:55

By composites, I just want to make sure people understand, it's not just lightening of the vehicles, it's other things too, right? Like like textile strength, kind of basic things like that?

R

Ray Boeman 16:08

Yeah, so I mean, composites is a very generic term. And thank you, because I probably should have defined it. In our case, most of what we're looking at is polymer composites, which means the matrix that holds a reinforcing fiber together, or a reinforcing particle is a polymer. There could be metal matrix, or ceramic matrix, and even some others. And most of what we do is associated with lightweighting in automotive, but we have other programs that we're working with, that are industry funded, that are not vehicles, so proprietary projects. So I would classify them perhaps as ground transportation infrastructure and some building infrastructure things as well. But generally speaking, it's mostly been for automotive lightweighting, but I would add one thing there is, you know, historically, when we talked about composites, polymer composites anyways, for structures, our arguments were the greatest opportunity to save weight, corrosion resistance, part consolidation, but they cost more. And and I think this is a paradigm that is shifting where I think the value of composites, when you start folding in things like multifunctionality, you know, Industry 4.0, digitalization, embedded sensors, I'm not sure lightweighting is at the top anymore. And so and particularly the cost issue is going to be very interesting as we look at, you know, trends in personal ownerships of vehicles, because lifecycle costs are because of some of those attributes are likely to be less. And so for corporations investing, versus a consumer who's looking at how much do they have to pay for the vehicle today, versus typically not lifecycle costs. I think, you know, with electrification, I think composites are, that's an industry that's just going to continue to, to explode.

E

Ed Clemente 18:34

Well, you know, you already answered my next question, but you might want to add something else. But any other trends besides the one you just identified?

R

Ray Boeman 18:41

Oh, well, so I kind of wrapped in a couple there. One is private ownership. But the other one is

On, well, so I kind of wrapped in a couple there. One is private ownership. But the other one is just the advanced tools that we have, from a computational standpoint, or, you know, Internet of Things, Industry, 4.0, machine learning, you know, that's, that's going to help drive down costs, overall, machine learning and adaptive processing, all these sorts of things are going to have a big impact. The other ones I would say, is sustainability. And, you know, recycling of polymers, whether they're, you know, from oceans or even chemically recycling. Mixed waste is a big emphasis right now, all the companies, all the chemical companies are looking at it. So there's a lot of trends that I think support polymer composites overall.

E

Ed Clemente 19:40

Ya know, and I know that, you know, we've talked about these in the past, but I think, like you said, being proximity to what Ford's doing in, you know, Southwest Detroit, it's going to be sort of like a nice overlap and sort of momentum just for the region. You know, that whole area is transforming right now. It's pretty amazing how fast it's changing that neighborhood.

R

Ray Boeman 20:06

Well, if you're gonna get in the mobility, if you're not already a mobility and you're gonna get in mobility, there's no better time or place right now, then then, you know, to to be involved with the transformational environment I think, that that I see through Michigan Central and Ford's investments. You know, they have several partners, of course, they're partnering with the state and the City of Detroit, they have partnerships with Google, to my knowledge that's largely around coding and workforce development. But you know, they have, they have my understanding, anyways, they have some very strategic goals around workforce development. And they're partnering with an entity called New Lab, which has renovated a, I think it was a Naval Yard in in Brooklyn, into sort of a membership organization, but also incubator space in sort of all kinds of creative developments. And, you know, let me just put this caveat I, and I apologize if I'm mistaking something to my Ford colleagues, I'm just still trying to learn the breadth of it. But it's exciting. I mean, it's really exciting.

E

Ed Clemente 21:32

Yeah, its gonna be a game changer for sure. What, you know, this is the hard part of the interviews over, but is there any advice you would give your high school self about career wise, especially with you having been in this field?

R

Ray Boeman 21:47

Yeah, I'm not sure I'd be successful in everything I say. But and perhaps it's not appropriate to everyone, but for me, you know, you have to choose a sustainable balance in your lifestyle and occupation, right? You know, you know, I had the good fortune to do some instructing when I was a graduate student. And there were certainly students in there that they were there because they thought it was a good way to make money. And actually, engineering is not one of the best ways to make money. But, and so they were in it for the wrong reasons. And so, but you know, you also have to make a living, right? So the other thing is, I would say, you know,

not to be a slave to a predetermined career pathway. So, I mean, I look at my career, and I'm doing I've done different things over periods of time, and I haven't, I haven't ever had a roadmap, I always look to how can I make a difference? What's what's kind of a neat opportunity, and just pursue it. And you know, what, I've been fortunate with the positions that I've acquired, but I never sought them. They just, they just happen by trying to be creative and looking for opportunities. Yeah, I'm lacking the same roadmap in my career, too. It was just, you know, I think the key to those kinds of things is, you just got to train yourself ahead of time, what you enjoy and what's a career, right? [Right.] So, anyway, so your very last question is now that you're a transplant up from Tennessee, what do you like best about living in Michigan? So I would have to give two types of answers. Professionally, it's just the history of innovation and the entrepreneurial spirit and, and I would say, again, I've been very fortunate to work with the MEDC with some really good people. I've worked with a lot of folks at the MEDC over the years and I view that as very strategic and, you know, data driven and opportunity driven. And just the breadth and the depth of the companies in the clean energy and especially mobility area, you know, those are two, you know, areas that are going to be transformational and are imperative to our lifestyle. And then on a personal level. It's just I mean, it's Pure Michigan. I mean, I love the terrain. I lived in Ohio you know, through my undergraduat, well, my father was in the Air Force, so I lived all over, but I had no idea how different Michigan was from Ohio. I just love everything, including snow.

E

Ed Clemente 24:57

All right, we we we've had Ohio guests on so we'll be careful.

R

Ray Boeman 25:01

I like Ohio too. But but the Keweenaw is my favorite place in all the all the country. And like I said, I've lived in all the corners, almost all the corners of the United States.

E

Ed Clemente 25:15

You're fortunate. [Yes.] I should mention too, that you've actually moved here, your whole family, your family, you moved him up here too. So that's really a sign of you appreciating the state. So, yeah, yeah, no, I know. Once again, I want to thank our guests today, Ray Boeman, he's with IACMI and I want to appreciate you with MSU, you know, your involvement and all the good work you continuously do for the state, and keep up the good work and we hope to hear more about your progress as you start building more platforms out there.

R

Ray Boeman 25:54

It's been a pleasure Ed, and an honor. I appreciate your friendship and also the opportunity to, you know, hopefully get our word out because and I guess if I have ten more seconds, I'll just say, you know, we work with companies, so if you've heard something that seems intriguing to you and want to learn more, please feel free to reach out to me.



E

Ed Clemente 26:18

Yeah, just come to, which site would you recommend?

R

Ray Boeman 26:23

Oh, yeah, you can connect through me through LinkedIn and I'll give you my direct information.

E

Ed Clemente 26:29

Great. Thanks again, Ray. [Thank you Ed.] Join us next week where our guest is going to be Natalie King. She is the Founder and Chief Executive Officer of Dunamis Clean Energy Partners, and how this company is moving us into a sustainable future.

A

Announcer 26:47

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