
PODCAST

Why electrifying mining is key to the industry's future

ABB Decoded

Mining is one of the world's most vital, yet hidden-from-view industries. ABB Ability™ eMine is helping transform it for a new sustainable era.

Anthony Rowlinson: Hello! And welcome to episode 12 of ABB Decoded – the podcast that tries to press pause on our fast-moving lives and shine a light on the technology and trends that are reshaping our world.

I'm your host, Anthony Rowlinson, and in this episode, we'll be digging in to one of the world's most vital industries – but also one that is no stranger to criticism: mining.

While the minerals and materials produced by mining, such as copper and lithium, are increasingly essential to equip us with everyday items like computers and electric motors, the industry is under increasing pressure to improve its green credentials.

And like many other sectors of the global economy, mining is looking towards electrification, digitization and automation to enhance its sustainability and productivity.

ABB has been involved in the mining sector for more than 130 years, since developing the first electrical hoist for mines and today it's working with the sector's major players to roll out all-electric mining solutions that collectively are known as the ABB Ability eMine.

And joining us to explain some of these innovations, and why the mining sector is preparing to embrace an electrified future, is Max Luedtke, ABB's Vice President for mining, aluminum and cement.

He'll be helping us unearth a few secrets of this fascinating topic...

Max Luedtke: My name is Max Luedtke. I'm the global product group manager for mining, aluminum, and cement in ABB. I actually have been with the company 25 years. My whole career actually started from another company that were bought into ABB, but I'm electrical engineer right from the beginning. And I think have done a little bit quite a classic career path in ABB, started as a project engineer, product management, operational into sales, more into management and then leading different global positions in ABB. So, that's a little bit my background in a quick way.

Anthony: Thanks Max. And I believe you had some quite interesting experiences early in your career while working in Africa?

Max: Yes. I was actually six years in Africa. I think it's a time that has helped me a lot in where I am today. The time six years in Africa have helped me a lot to understand, first of all, you know, that even if ABB is a big organization, it's built up of a lot of small units. And also, to understand what maybe a lot of my

other colleagues and people have to deal with daily, what maybe we take for granted working at Switzerland in other areas of the world. So, that has helped a lot.

Anthony: Now, mining is a pretty big topic, that relies on big machines and big scale. So, let's start with a big question: why does mining matter?

Max: If we look at mining, and if we look now and now, we want a more sustainable world. And if we now look at mining industry, mining industry is part of the solution. But the interesting thing is here, mining is also part of say, seven percent of the greenhouse gas emission is produced by mining industry. So, I think since mining is part of the solution, the way we want to live the world, mining also has a lot of obligation to say, okay, let's drive and let's do mining in a better way. There are solutions today and I can also see from a lot of big companies, they are really driving this. And on the top of their agenda is really sustainability. That is, you know, going through the whole organizations there, and also, they say that if they don't drive these things, they will also not be able to get employees working for them because, you know, the generation today, they want to work for companies that drive these kind of values. And I think we, and then that is now, I think we all have tools to work on the image of mining because in Europe, if I compare, we want all to drive this electric cars, we wanted to have this life, but we don't want the mines in our backyard, the mine should be based somewhere. So, I think that is what we have to work on, so that the perception also of mining changes so that we say, okay, we want to drive this, but there are ways to drive mining in a sustainable way.

So that we also maybe should open up more mines here, you know, in Europe in other way, but do that in a sustainable way. And not just, you know, I will say export that kind of problem to areas of the world where you maybe don't follow, say the legislations and other things that is how you can do mining.

Anthony: Okay. But for a lot of people, perhaps from a western perspective, the idea of opening a new mine in Europe, for example, might be quite shocking?

Max: Yeah. Exactly. So, I think when we think about mining, you see everybody have this bad picture of mining. But all these technologies today that you can drive it more electric, mining industry can be actually a quite clean industry. So, I think it's our responsibility here where we have the technology and here, we have this say the government is supporting this to open up mines here more, and also to drive this in a way, because I think that will then also help say the image of mining, but also show that, that there are different ways to do mining.

And we can see certain kinds of tendency happening now. And a lot of the say the German car industry are looking at, they want to buy their steel from there because they know then that this is produced in a right way and way with the green energy, green steel. And if you don't want to produce say now new electric cars, I think it's important to follow the whole value chain that that is produced in right way.

And I hope that will come also even more in other kinds of commodities that we, when you and I, are buying because to say that we look at and okay, I want to buy a cell phone that is produced in the correct way. Maybe that costs a little bit more, but that will then also help the mining industry and the other producers to produce this in the correct way.

Anthony: Okay, thanks Max. And maybe for the benefit of our listeners, what are the key minerals that are being mined now? And how are they being used?

Max: One of the key minerals: iron ore is one big and, and copper is another one too, but then of course, there's also we see in the batteries, lithium, cobalt, and all of these other minerals. And then what I mentioned, there's a lot of rare earth, that you need for maybe more efficient electrical motors and other things.

Anthony: Okay, so that gives us an overview of the demand. But that demand puts pressure on the mining industry to keep up – so, how can it do this in a more sustainable way?

Max: Yes, if you say mining trucks are the ones which emit most carbon dioxide on the mine. So, I think the best way actually to reduce these emissions on a mine, it's actually to electrifying the fleets. And there are a lot of technologies, trolley line, battery, and charging already today. What makes that go in a

little bit slower is that, of course it's big, heavy investments for a lot of the mining companies when they're buying these fleets. They are buying a lot of trucks and they keep them down for 10 to 20 years.

So, of course, that will take certain cycles to change this, but I can see already in the industry that there is a very big push from the mining industry that they would like to have more electrical. But, of course, it's also a heavy investment from the OEMs to change this. I think we can compare that with the car industry. If a Tesla wouldn't resell pushing into the market, I don't think that the development of electrical cars would be where it is today. So, you need this push and we as ABB, we are working both together with the OEMs and working too with the customers to actually to support them on this kind of journey.

So, I think it's important when mining companies do this and we as ABB is to make the business model in the right ways because it cannot only be driven by the sustainability, it must also drive productivity.

Anthony: It seems you're saying that it's vital for the industry to change, in order for it to secure its future and attract new talent?

Max: Yeah. Starting with a talent, because I see a lot of comparison if we go back 10 years when there was a lot of discussion about the digitalization, when I then talk to some of the mining CEOs and so, the mining industry per se is not, they're not early adopters, they are quite the conservative industry. And so, if you look at the S-curve of digitalization, they were quite low. And they said, we have to go more digital and things, because that was otherwise, they had issues to attract new talent, to work for them.

And the same thing is now with attracting talent because you have to drive sustainability. When we are hiring new talents today, they are challenging ABB and they are asking actually in interviews directly, okay, what do ABB stand for? What we are driving? So, if they want to attract talent, you have to drive this kind of value.

Anthony: And the issue of productivity seems to be a very important one, also?

Max: Then if you look at the productivity, if we look for example, on electric trucks and things, we can see that also all of us who have maybe changed from going from a diesel or a benzine car to electrical car that the service intervals and things are much less.

And also, if we want to go autonomous in the mines, electric will be the solution because you connect electricity together with the automation and digitalization. And then another thing that we should not forget about is that mining companies, we can really see also the mining companies who really driving sustainability, also their share prices are going up. So, the big pension funds and the investment they want to invest in green energies.

Anthony: So, I guess this is where ABB's eMine comes in, with a suite of solutions that look at the industry's challenges in a holistic way?

Max: We have to say that there is a transition now going on in the mining industry, and this is a journey. So, the eMine is actually the whole concept that brings this whole thing together. And ABB, we are here and we are very committed. First of all, we have to say that there's not one company who can change everything. So, you have to have a collaboration between a lot of different companies, you know, to support the mining customers in this journey.

You have to break it down to certain steps and say, okay, well, what is my vision? Where I want to be? How can I break that down to tangible project and the solutions? And then you take that step by step. And there is where ABB is stepping in on that journey on all electric mine to look at when the customer says, okay, there's where I am today. This is where I'm aiming in the future. How can we now break this down and, you know, take this step?

And a good example is when we have talked to mining houses one mining house in Canada, where they looked into this and they said it was too early to change the electrification on one of the big fleets. But, you know, they have buses that were driving the working people up to-the mine. So only by electrifying the buses and charging the buses, suddenly, there was a change in the perception from a lot of the working people.

You know, normally they came where maybe with a diesel truck to work, but then they stepped into an electrified bus up to the mine, changed, you know, this is really, you know, working. So, so I think the journey is to step by step. And there's where ABB are, you know, stepping in, working with a lot of other partners, early involvement with the customer, looking at their thing and looking how we have to design the mine, how is the steps so that we can get this success so that we actually, from the big vision, breaking it down to tangible projects and then take it. So, that is the role and that is the whole idea with the eMine.

Anthony: Max, there's one specific point I'd like to ask you about and that's the eMining fast charge. Is it right that electric mining trucks can be charged at 600 Kilowatts or even more?

Max: Yeah, this is really interesting. This is a 600 kilowatt, and that is just the beginning and now the idea is to ramp that back to even 1000 and, and up to 2000. This is a prototype that we are testing now, everything goes automatically. So, when actually the truck is coming, it's mating, automatically charging, and then you continue.

And then of course, you want to charge, and you want to build in the charging in your production cycles. you want this charging to be done automatically at that time and then you continue your cycle because what you don't want is to lower your productivity.

So, you have to build in, and that will be a combination. And as a company, as ABB, we have been 10 to 15 years already in the whole charging infrastructure for buses and other things. So, then we also have a lot of knowledge, how you're building this kind of infrastructure that we can bring into the mining industry.

Anthony: Thanks, Max. In any conversation about mining, it seems that the scale of everything is huge – everything seems to be in multiples bigger than in regular life.

Max: When we talk about those big holding trucks, they have 200 to 300 tons, what they can load, and we have to compare a truck like that is big as a one family house, you know? So, so that is the size of them. So, when you see those trucks in a phone far away, they maybe look small. If you walk close to them, you know, they are huge because normally we see those trucks in a mine open pit mine, wherever there's no things to compare them with, but if you put the person behind and, you know, they are huge, they are really, really huge. So, as I say, so if you stand in front of a two-storey houses, you know, that is how big they are.

So that is a huge part. And the mines, they have 20 to 50, they have a lot of them running around. If every truck in every mine were electrified, we could remove 198,000 tons of CO2 every day from the air we breathe.

Anthony: But essentially what you're saying is that all of these technologies can be electrified and powered by green energy?

Max: It's still in early stage, but I can say that the technology is there to do it. It's just you know, to ramp it up. So, we are running tests now for this kind of things, not as a 300 ton is more 100-ton truck that we are testing on. But like I say, this technology is there to be driven.

But we can see today, there's a big infrastructure for mining companies to transport diesel and things like that, and storage of diesel. So, now it's actually, that infrastructure, you could take away, you know, if you're going actually with electrification instead.

Anthony: Just to go back to your earlier point about collaboration in the industry, there are two examples I would like to ask you about. One is Boliden in Sweden.

Max: That is a nice with Boliden they are very innovative company. They want to drive new technology and they have this mine up in the north, very north up, in Sweden where it's cold and snow.

We have installed a trolley line for Boliden. It's 700 meter, and they expect to save 830 cubic meters of diesel per year, only with this 700 meters. So, then we can see, how big changes and savings you can do. Even with short trucks of trolley installations.

Anthony: And could you also tell us about the Copper Mountain project in Canada?

Max: We are currently installing a trolley line assist solution for Copper Mountain, and this installation will reduce their carbon emission at the site by up to seven percent.

I really liked to see how Copper Mountain was talking directly to Boliden, learning from their experience, and helping each other. So, we can see this collaboration between mines as well, to see how they can support each other and that's very helpful.

Anthony: This theme of collaboration in the mining industry seems to be quite an important one.

Max: Yeah, we can see that the big mining houses are actually coming together and inviting in our suppliers like ABB and others, you know, to give us certain challenges and say, okay, how could the future look at for charging and other things?

So, I think the time where we having this supplier and customer relationships are a little bit gone, we have to sit and say, okay, what is the kind of solutions and what problem that we have to solve, and how can we bring this together? And of course, there needs certain kinds of commitment and also from end customers, the things so that we are not developing, and that we are putting our R&D money in the direction, what they want to see.

Anthony: And really ABB is drawing on 130 years of experience to get to the point where electrifying the whole mining process has become a possibility?

Max: It's very interesting that actually 130 years ago, ABB started in mining, with actually installing electrical motors for a hoist solution. And if we now go 130 years later now, we are more now into electrifying all of the rest of the mine. And so, through that whole journey, of course, we have been working in a lot of the focus on electrification, automation, and digitalization. And the nice thing is that we have a broad portfolio. We have been very focused in the processing plant because the processing part of the minerals is where you had needed most electrification, where you needed most automation and then you being focused.

So, we can see, the digitalization, electrification is moved more from the processing area to the mining area out to the mines today. And that is of course, to reduce people on the mine, because that is a very dangerous area, but also to reduce now because most of the diesel and things are used out in the mine in that area. So that is what, you know, is now happening now in this area, in this 130 years. And so, I'm quite happy now that we have this long commitment in ABB and I think now it's like, we're starting a new chapter now with this all-electric mine, and hopefully it will continue 130 years more.

Anthony: And Max if I can ask you one final question: from a personal perspective, what's it like to be working in mining now? It sounds as if the industry is at a moment of incredibly exciting change?

Max: I have to say this is very exciting time. If I compare my 25 years in ABB, I have to say, it's never been that exciting like today because we are driving something daily that I really stand for. It's very interesting how we can influence, other suppliers and OEMs and also customers be part of something that drives something that is important for us all. So, I can say it's interesting time, and I'm really happy to be part of a team and part of this journey that could change this industry.

Anthony: Max, thank you so much for joining us to record this episode of ABB Decoded and shining a light on an industry that's so vital to our daily lives, yet often so hidden away.

And if you've enjoyed this interview, why not like, subscribe, and share ABB Decoded wherever you get your podcasts. Until next time.