

Future of Electromobility in Southeast Asia

Deeshraf Elias, Podcast host, Deloitte Mobility Ecosystem Manager

Andrey Berdichevskiy, Director, Future of Mobility Solution Centre, Deloitte

Terence Siew, President, Electric Vehicle Association of Singapore

Deeshraf Elias: The COVID-19 situation has seen a steep decrease in local air pollution as well as global greenhouse gas emissions. However, this has come as a result of lockdowns and mobility restrictions. So, how do we curb local pollution levels and emissions while still maintaining our level of mobility? Enter the concept of electric vehicles also known as EVs. EVs allow the freedom of mobility, without the associated problems of high carbon emissions typical of internal combustion engine (ICE) vehicles.

As Southeast Asian governments develop capabilities for large-scale electrification, what are the implications for the larger mobility ecosystem and how will this interplay with a city's existing electrical grid? Today, we discuss electromobility in Southeast Asia.

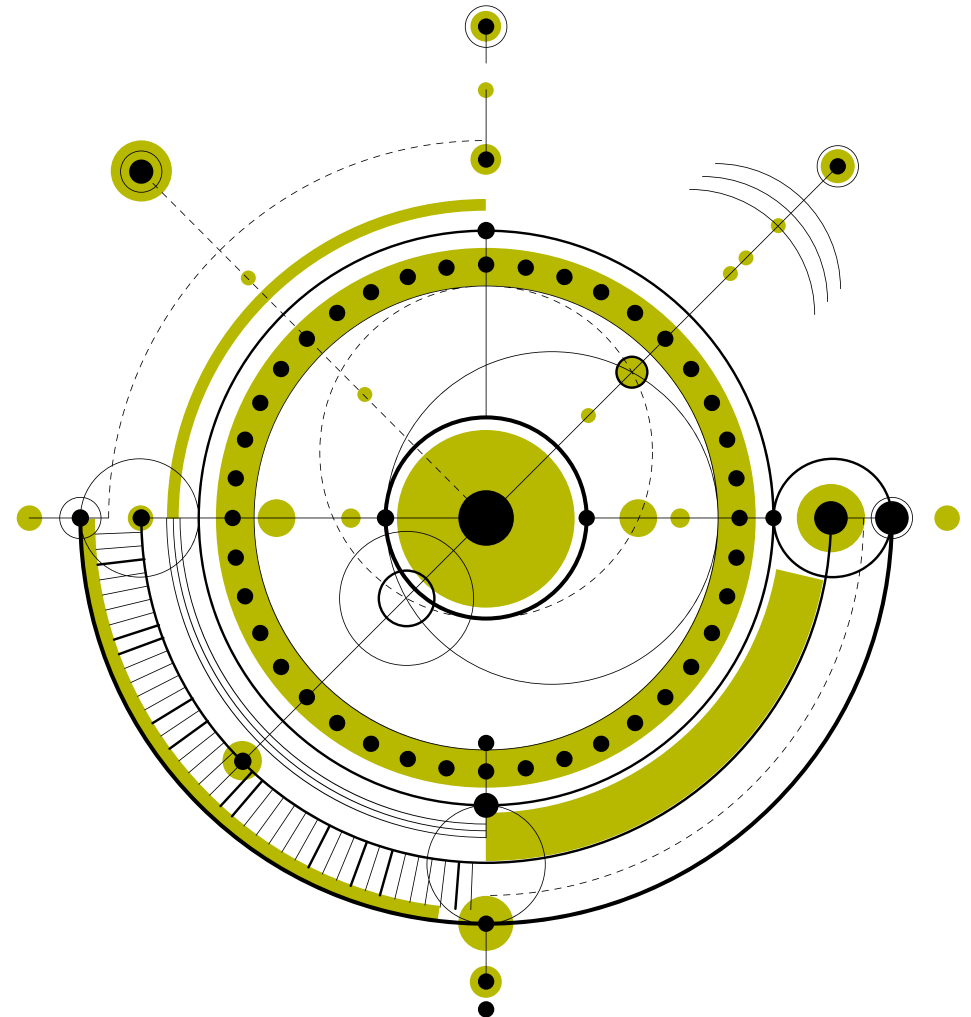
Hi everyone! Welcome to another edition of our Future of Mobility series, bringing you the

top voices from the sector - decision-makers, innovators and shapers pushing the envelope on future ideas for transportation and beyond. I am your host, Deeshraf and today, we are joined by Terence Siew, president of the Electric Vehicle Association of Singapore, and Andrey Berdichevskiy, director for the Future of Mobility Solution Centre at Deloitte. Terence and Andrey, thanks for joining me today.

Terence Siew: Thank you for having me!

Andrey Berdichevskiy: Good to be back!

Deeshraf Elias: I'll like to start off with some introductions. Terence, as the president of the Electric Vehicle Association of Singapore, can you briefly share about the vision EVAS has for electromobility in Singapore and what EVAS has been doing specifically with the ecosystem, public and private, to achieve this vision?



**MAKING AN
IMPACT THAT
MATTERS**
since 1845

Terence Siew: The goal of EVAS is to speed up Singapore's transition towards an all-electric future for road transportation. This association was set up for three reasons. They are first, to promote the usage of electric vehicles in Singapore. Number two, to create a platform for knowledge exchange, industry development and to foster collaboration among the stakeholders. And the third is to provide the Singapore government with industry perspectives and recommendations on policies that will impact the reach of electric vehicles. So why did we create this association? It's because we felt that it was necessary to engage a very diverse group of stakeholders like auto-makers, building owners, utility companies, charging hardware manufacturers, to speed up the adoption of EVs and to accelerate the deployment of charging infrastructure.

Deeshraf Elias: And Andrey, as the director for Deloitte's Future of Mobility Solution Centre, can you share your outlook of the energy industry and how it will evolve with the rising trend of electromobility?

Andrey Berdichevskiy: Thanks, Dee! I will not get tired of emphasizing the environmental crisis is one of the biggest crises of our generation and we need collective action to address it. And companies are already going this way, creating a growing pool of renewable energy resources and distributed solutions which now need to be integrated and enhanced. And here, we are talking about having viable business models that are not only acting on the problem but actually shifts the entire business.

Companies in the energy and industrials sectors are prioritizing moving into cleaner energy sources in the long term, by adopting new technologies, pioneering new partnerships and anticipating changing cost structures. Like

in many other industries, digitalisation is key for this; 70% of executives say that it is the key driver for a low-carbon future.

Considering and coming to the topic of electromobility, of course – not only transport – but electrifying the whole value chain is key to the transition towards a sustainable future. Our 100% renewable energy study from last year showed that the majority of industrial manufacturers have electrified their processes where feasible along the whole value chain, ranging from the production processes to the supply chains.

As many companies electrify their processes, there will also be more use cases where decarbonisation is sped up and electrification becomes one of the major drivers for mobility. However, we also need to consider that there is an interdependence between the demand of electric mobility and the pricing for oils.

Currently, nearly 60% of the global oil demand comes from transportation and as we start replacing oil-dependent modes with electric mobility, we anticipate a drop in prices which can serve as an accelerator for the adoption of electric models.

The rise of EVs can also help power companies to engage more with customers, making the customer more and more an active actor in the whole use of the electricity from purchase to different applications. For example, implementing the vehicle-to-grid (V2G) technologies – deciding when does my electric vehicle serve as a capacitor, giving energy back to the grid and actually earning money for me and when is the best time to charge it – so I'm actively involved in the management of electrified devices. Mobility is being a major part of it.



(EVs) also open up new business models. So for example, the so-called distributed energy resource strategies (DER strategies) will see power companies considering selling, installing and maintaining of DERs as a potential new revenue source. For context, DER systems are small-scale, on-site units of local energy generation that diversify the traditionally centralised grid models. To give you examples, we are talking about battery storage, EV chargers and solar PV units being much more localised and distributed. Power companies can aggregate DERs across time and location and pay DER owners accordingly to provide expanded grid services.

Then, there is the model of transactive energy models. So basically, using – for example, blockchain technology – to manage transactions with EVs like the vehicle-to-grid (V2G) transactions I was talking about before. Many of these new business models are subject to evolving market structures and regulations so there is still uncertainty when they will be mainstream. This is especially so in Southeast Asia – where and when will the technology be adopted? But we are for sure there to support the deployment of these new ideas and new business models across our customer portfolio.

Deeshraf Elias: Both of you have had extensive experiences in Southeast Asia. Terence, from a Southeast Asia perspective, can you share with us the state of electromobility in the region and how it fares in the global context? What can Singapore and Southeast Asia learn from EV adoption in other regions like China, the Nordics and selected states in the US?

Terence Siew: For this question, one key lesson for us is that we have to not repeat the mistakes that are made in those countries that have had earlier adoption of EVs. There are some problems that have emerged (in those countries) – for example, interoperability between charging networks and poor pulling out of EV rebates. These have contributed towards a very fragmented and uncertain market allotment for electric vehicles.

We have the benefit of hindsight given that we are later in the market development stage and we should do well to avoid these problems experienced by these pioneering countries.

To elaborate, a common problem experienced in several European countries was the presence of multiple EV charging networks in different territories, each having their own systems and

solutions. In order to use the charging across different areas – if you are the driver of an electric vehicle – you had to be registered with several networks which means different ways of starting charging sessions, different mobile apps and different maintenance systems. This makes it extremely fragmented for the end-user and it wasn't a very pleasant experience if you wanted to interoperate between the different networks. A better-designed system should have interoperation in mind and the end-users being able to roam seamlessly between the networks.

The other problem with regard to the EV policies is – as we have seen in Hong Kong – a very abrupt removal of EV rebates which led to market uncertainty. For example, just before the rebates were removed, the market actually experienced an extremely sharp spike in demand for electric vehicles, namely Tesla and a few other brands. They experienced the best sales volumes in the months prior to the removal of the rebates but after the rebates were taken away, the market crashed and demand really trickled down to close to zero.

This stop-start way that the EV sales were going off was detrimental towards the market development and what would be more helpful was that if there was more clarity on the EV policies and a more staggered withdrawal of the EV policies as opposed to an abrupt removal.

These are some of the lessons that we could learn. In Singapore, we are a country with a bit less EV development but a lot more learning lessons.

Deeshraf Elias: And Andrey, building on top of what Terence just mentioned, do you think the energy industry in Southeast Asia is positioned for a lower-carbon future?



Andrey Berdichevskiy: I couldn't agree more with what Terence has said. I have worked on the topic of electrification across Europe, US and China and the main thing we have as an advantage in Southeast Asia is that we can learn from the developments earlier on and also adapt newer and more advanced technologies, both on the hardware and software side. So for example, the topic of having a much higher maturity of fast charging right now, when the Southeast Asian markets are entering and starting to build up infrastructure or much-advanced solutions for public transport charging such as bus charging. There are also optimization platforms that can help us to leapfrog in the region. For example, there can be some variable decisions to make. Maybe there are some parts of the city where I can just offer fast-charging infrastructure because I believe this is the future. What I think is important is to go much more into simulation approaches and help to scale up the infrastructure in Southeast Asia parallel to the demand.

We have seen in other markets a land grab approach where a lot of infrastructures has

been built in advance without securing the utilisation of charging stations and that led to a lot of sunk costs and a lot of working capital where the return on investments was not there to justify further expansion of infrastructure. So rather than putting all the investments at once, I would see a gradual scale-up of infrastructure which requires one to understand also where the demand is coming from.

On the one hand, these demands have to be satisfied. The people adapting to the charging stations, which bus routes should I take, which should I electrify first and what will be my financial impact? How can I improve the fleet management in terms of allocating the vehicles to the charging stations and increasing the high utilisation of electric vehicles and the charging infrastructure – these are the questions where simulation approaches and the clear orchestration of the charging station through data can help.

Deeshraf Elias: As with any market, the environment in the Southeast Asian market comes with its own set of advantages and disadvantages for mobility players to navigate

through. I want to hear from both of you – what areas or opportunities do you think ecosystem players should focus on to accelerate the adoption of electromobility in the region. Terence, perhaps we can start with you?

Terence Siew: Sure, Dee. So collaboration is extremely important for a new industry. Electric mobility is at the confluence of multiple industries that are existing. For example, the automotive companies, the real estate companies, the utility companies as well as the hardware manufacturers. This unusual arrangement makes for strange bedfellows because electric mobility cannot be sustained or provided by a single sector. An electric vehicle requires EV charging infrastructure to be installed at buildings and this means that a healthy electric mobility ecosystem needs the participation of multiple stakeholders. Having said that, it is important for businesses and industries to be open-minded about forming partnerships to broaden the scope and expand market size. They should do this instead of competing for limited market share within a very nascent industry.

Deeshraf Elias: And Andrey, anything else to add?

Andrey Berdichevskiy: I agree with Terence. What I would add is that there is a need to define standards early on. This (the lack of standards) is what we have seen decelerating the adoption of certain charging technologies. We need to talk about payment protocols, communication protocols, about pricing – where do we need to standardise and where do we allow the free market?

And I think also for the adoption of technologies which allow for more convenient charging for the private user like plug-and-charge, there is a need for different types of companies to

collaborate. The payment providers, the CPO (charging point operators) and the aggregators have to work on a unified technology platform and share data in order to make the experience of charging more seamless and more convenient.

When we talk about Southeast Asia, this is again where we have the advantage because we have seen these type of models being deployed elsewhere to learn from them. However, we can also go with our own way leveraging on, sometimes very local, ecosystem players. So you will see different ecosystem players being active in the same sectors, dependent on a country by country basis and this is where you will need the local approach and also the decision of what type of collaboration model you are going into. Is this a consortium formed by the ecosystem in the country with the majority of private sector players? Or is it more of a government or third-party-led initiative where you have an orchestrator in the middle or a standard-setting body? These are the

decision points which the countries or the ecosystems have to make – to see what works the most efficiently for the local context.

Deeshraf Elias: Picking up from what both of you have just mentioned, what will be some of the challenges ecosystem players are bound to face in driving adoption and are there any factors they should consider? Terence?

Terence Siew: Well, electrification will be happening at different rates for different countries and the reason for this is because of the different geographies, the different electrical infrastructure and the different availability of EV models. Having said that, when you are operating in a certain country, say, Southeast Asia, what works for your country might not necessarily be easily scaled to your neighbouring countries. On this point, based on the readiness for EV charging infrastructure, an important transition technology is in the form of plug-in hybrids which should be dominant in many parts of Southeast Asia due to the

unavailability of a reliable charging network. This means that when ecosystem players are operating in this space (Southeast Asia), they need to ensure that the charging infrastructure has to be catered to the different kinds of EVs – be it full electric, plug-in hybrids or buses or fleet vehicles. And also to improve the overall public awareness of charging infrastructure that is available.

Deeshraf Elias: And Andrey, what about you?

Andrey Berdichevskiy: So I would add to the point about the types of vehicles that Terence has just mentioned and say that a lot of countries in Southeast Asia also have a very big two-wheeler sector which comes with new models like battery swapping.

Of course, we've seen battery swapping implementations for private vehicles but they couldn't be so much at scale as compared to two-wheelers so this is a solution which might be quite unique to the regional area here.

Additionally, just drawing on the experiences with other countries on the policy approaches, I believe that what I've seen working across different geographies is the topic of incentivizing the usage rather than just focusing on the purchase incentives. How can I create an advantage for the usage of an EV compared to an internal combustion engine (ICE) vehicle, be it in terms of the running taxations or the topic of special parking spaces, special lanes? That will drive the consumer to buy electric vehicles, rather than an ICE one.

Deeshraf Elias: And Terence, I want you to weigh in on this. From the opportunities and challenges discussed earlier, the question that is lingering in many minds right now: what needs to be true to accelerate the adoption of electromobility in the region?

Terence Siew: So I'll like to point back to Andrey's important point about standardisation and that is really the very basic level of requirement in order for electromobility to succeed.

Now, if we look at the charging infrastructure, for example, standardisation is, of course, a very important point. To us, standardisation is important on two levels: the first is the plug standard and the next is also the communication with the charging backend operator. I would like to bring up an example, a very notable example of a company that did not do this well and you know, once again, we have the benefit of hindsight to be able to learn from the mistakes of our predecessors and to make sure that these problems do not emerge again.

This company was called ECOtality. It was back in 2012 when they won several government tender awards for building a nationwide charging network. The charging network that they have developed and implemented was called the Blink charging network.

Well, it was a very innovative company and it was a start-up obviously. And they had a rather aggressive plan to deploy the charging stations. However, because the charging stations were communicating with their proprietary backend systems, that makes it extremely difficult to scale.

When there were several problems emerging with the company due to the mismanagement of funding and the rate that they were expanding, they did not foresee that the company would run into cash flow problems. This meant that a lot of the charging hardware that was deployed out across the U.S. suddenly became stranded assets. These stranded assets came in the form of charging stations that are there and able to charge the vehicles



but unable to send that information to another backend operator easily.

This example points to the importance of having standardisations, communications in the form of open standards. One of such standards is the OCPP which stands for "Open Charge Point Protocol." That is actually a shared industry standard that runs across the industry. This allows different back-end operators to adopt communications standards with the charging hardware so that whenever one of the charging network operators, if for whatever reason, decided not to do business anymore, it would be a more seamless process as opposed to having to take out all of the charging stations and then putting in new ones just to ensure the continuity of business.

Deeshraf Elias: Now, expanding on the question I've just asked, regulation is a huge part of driving the transformation of the mobility sector. Singapore has recently signalled its intention to phase out internal combustion vehicles by 2040. So, what role can organisations like EVAS play in engaging the government and how is EVAS planning to support the transition from ICE to EV for Singapore? Terence?

Terence Siew: Given the announcements from the Singapore government, we can expect the last of the internal combustion engines to be sold out by 2030 and every new vehicle sold to be electric or electrified in some form from the year 2031 and onwards.

Since the vehicle population growth in Singapore is carefully controlled via the 10-year certificate of entitlement (COE) system, we can expect a very gradual phase-out of the older internal combustion engine (ICE) models by 2040. That is obviously a very good government vision for the industry; putting that goal out

there for the industry gives a lot of certainty and direction for what is to come in terms of EV policies.

As for government incentives, some of them – for example, the early EV adoption incentive that has been announced – we feel are needed at the start but they won't have to be relied on eventually as what Andrey have mentioned. To a certain point, the market forces will simply play a bigger role in this transition. The decision to go electric will be a simple matter of economics. The total cost of ownership for an electric vehicle will simply be lower than that of the ICE car.

So, coming back to the role that the EV association will likely play: these announced changes are generating a lot of interest amongst the industry players and that includes the dealerships and the automakers. The rebates generally encourage the dealerships to bring in the newer electrified models while the surcharge will affect several models, especially the older and inefficient ICE cars. However, the details of this new scheme must be well-understood by the dealerships and the automakers so that they will know which are the suitable models to homologate and introduce for Singapore.

Based on this example, the EV association will have to play an important role in aggregating and consolidating information and making sure that information is being parsed very efficiently between the government agencies and fast-growing industry.

Deeshraf Elias: And Andrey, how soon can consumers in Southeast Asia expect a widespread shift towards electromobility?

Andrey Berdichevskiy: Well, I think the shift

is already happening. We see the slow but steady introduction of new models. We see more and more tenders coming towards bus electrification. It starts with a small number of buses – I think about 60 buses right now in Singapore – but there will be more to come in the future and we will only see bigger shifts happening with the introduction of new models. So, a lot of manufacturers globally have already committed to the vision to electrify major parts of their portfolio, even up to the whole portfolio with electric cars. And when the consumers start having the choice, we will also see more and more adoption.

Of course, what Terence has just said is also absolutely correct. The incentives have to be in place and then the economics will play out. But I think it's also because when we talk about the consumer, the emotional aspect of a vehicle/mobility purchase is also there. As we see more variety (of EVs) catering to different tastes, the electrification agenda will also advance.

What's so exciting about the electric cars is that you have a lot of freedom in designing those as you can separate the top hat – the upper part which is used as a driver cell – from the lower part, the skateboard. With that, you can also save costs.

So, I believe the shift is already happening and it will only accelerate in the future and I'm very much looking forward to it.

Deeshraf Elias: Now, looking ahead in the near future, with the ongoing COVID-19 pandemic, how do you think the timeline for EV adoption in Southeast Asia will be affected? Terence?

Terence Siew: So the automotive industry, for example, has been one of the major casualties of COVID-19. And this is not going to be a pandemic that is going away in the short term.



So it's going to be a sort of a medium to long term situation whereby you are going to see depressed demand for car sales as a whole. It doesn't just affect electric vehicles; it affects sales of vehicles across the whole spectrum. As industry players are focused on more immediate and pressing issues – for example, the business continuity in a post-pandemic situation – the electrification of vehicles is likely going to take a backseat as the priority will be on the recovery and operating efficiently in this new reality we are in.

Like Andrey mentioned, although the short-term outlook is challenging, I think the overall long-term electrification trend will be very clear and that is especially important because along with the government's visions for the gradual phase-out of ICE vehicles, we can expect that all new vehicles sold must be electric or electrified by 2031. This gives us a longer time span of 10 years that we can see this shift gradually taking place.

Now, I want to circle back to my earlier point about collaboration. Because this is a new industry, collaboration is extremely important. Collaboration avoids unnecessary competition and avoids having too many overlaps in terms of investment and resources. And by dividing and conquering, each party in their ecosystem should try to figure out their roles in this industry.

I'll give you an interesting example of how some automotive companies are working with the property owners to push their EV models. BMW and Porsche, these are some of the automotive companies that are going to introduce their newer EV models. They do need the support of the property owners – like CapitaLand and Marina Bay Sands in Singapore – and the charging network companies – SP Group, Greenlots, Shell Recharge – to launch these EV models. We will not be able to launch electric vehicles in this new reality without taking care of the EV infrastructure. So when you put your product out there, the conversation about EV charging should immediately come in very seamlessly.

And that is why the collaboration between the automotive sector and the real estate and the utility companies has to be extremely tight in order for this seamless transition to happen.

Deeshraf Elias: And Andrey, anything else to add?

Andrey Berdichevskiy: I have a big agreement and a small disagreement with

Terence. So, the big agreement is that I think the long term trend of electrification, we agree, it's there and it's not going away. But I must state my belief: electric vehicles and electrification are innovations that are less likely to be deprioritised.

There are two factors to this. Number one is a lot of manufacturers globally are already committed to electrifying major parts of their vehicle portfolios. That means that not only the communication has been made and the consumers are expecting the models to come out, but also that there has already been a substantial value of costs invested into developing the new technologies, the new architectures and the new models. Of course, you could stop a vehicle programme but then that would result in very high sunk costs which I think a lot of manufacturers are not likely to take into account.

On the other hand, the nations committed to decarbonising at the climate conference in Paris in 2015 have reconfirmed their commitment recently. Transportation is a major contributor to the carbon footprint of a nation and this will be addressed – very likely through electrifying both the public transportation as well as providing incentives and the regulation to electrify the private transport. For that reason, I believe that electrification is still on the agenda for both private players as well as the public authorities.

Deeshraf Elias: Now to wrap up our discussion, I'll like to ask both of you something

a bit more personal. Perhaps we can start with you first Terence, what excites you the most about the Future of Mobility that gets you up in the morning?

Terence Siew: Thanks, Dee. So you know the future of mobility – a lot of industry experts believe – is connected, electrified, autonomous and shared. I believe we are sitting quite comfortably in the first quadrant which is already connected and the second quadrant would be electrification. I'm really excited to be part of this movement; to drive towards a 100% electric future whereby all vehicles are electrified.

And for me, what got me started was the problem of climate change. I felt that it was an extremely important problem that our generation and our children's generation and their children's generation will face in the years to come – a sort of continuous journey towards doing things better, being able to utilise resources more efficiently and being able to move around more efficiently.

We started this association based on this belief that the electric vehicle is superior to the internal combustion engine. What is lacking though is the coordination of EV infrastructure that is required to support these electric vehicles.

I hope that our work at the EV association is slowly contributing towards positive change. My son is just 6 weeks old and being a very newly minted father, I really do hope that the work I'm

doing today will be able to leave a better world for my son when he grows up and gets his first vehicle – hopefully, it'll be electric. That positive change would be something that is manifested in his life in future generations.

Deeshraf Elias: And Andrey, I know we've asked you this before but what excites you most about the Future of Mobility that gets you up in the morning and has that changed since we last spoke?

Andrey Berdichevskiy: Well, not much has changed. But just to emphasise what Terence just said; mobility for me is a fundamental enabler to being human. We need to make it sustainable for the next generation and the generation after and the generation after in order to provide them with the same or even better choices as we have today to make it more inclusive, more sustainable and safer. Working on this and doing my part is what gets me up every morning.

Deeshraf Elias: Well, that's all the time we have for this episode. I want to thank both our guests, Andrey and Terence, for such an interesting conversation. In the meantime, if you want to comment on this podcast or the topics covered, you can send us an email at seapodcast@deloitte.com. That's spelt S-E-A podcast @ deloitte.com. Also, don't forget to subscribe to our podcast to get the latest episodes – we are available on Apple Podcast, Google Podcast, Spotify, Soundcloud and Stitcher. I am Deeshraf and until next time.