Shaping Tomorrow's Smart Sustainable Cities

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Deeshraf:
Today's cities are larger and more diverse than ever. According to the Deloitte's 2019 smart cities article, more than half the world's population now live in urban centres. And this proportion is expected to increase to nearly 70% by 2050. With a huge population comes the benefit of collective data, which can be integrated with technology into infrastructures to develop smarter cities that promote connectivity and inclusive mobility for its citizens.

However, what needs to be true to accelerate the development of smart cities in the region? Today, we discuss the key drivers to smart sustainable cities 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'm your host, Deeshraf and today we're joined by Esther An, Chief Sustainability Officer at City Developments Limited, and Siddhant

Gupta, Head of Future Grid, Electric Mobility, Photovoltaic, and Energy Storage at Siemens. Siddhant and Esther thank you for joining us today.

Esther An:
Hi, thank you for having me / Good to be here.

Deeshraf:
Great. Now Sid I'd like to start off with you. Siemens is a global powerhouse that operates in 200 countries. Take Singapore for instance, the organization established a digitalization hub to develop and offer new digital applications for smart cities. As the head of future grid at Siemens, how do you think initiatives such as the digitalization hub are essential to drive the smart city vision across Southeast Asia?

Siddhant Gupta:
Thanks Deeshraf for that question. And I think that the digital hub for us was a very important step to really establish a digital ecosystem along with our customers and partners to create digital applications.

Singapore was an ideal location for this hub because of its distinctively advanced industrial and urban infrastructure development. In line with the government's smart nation and future economic programs. The wide ranging digital services offered by Siemens provide greater efficiency and enable cities to meet the challenges of the 21st century. These initiatives are essential to enhance system efficiency, managed system operations and compliance and optimize performance and productivity. Thus, a digital hub was established to drive and make the Southeast Asian city, a smart nation. A rather interesting example of what the digital hub has been successfully would be what we have done with with SAT, Singapore Aquaculture Technologies, or SAT in short, is a smart floating fish farm. Sounds exciting, yeah. They are really a pioneer in utilizing closed containment systems or tropical fish. And I guess, one wonders, what did we do with them. Basically, through visualization of data, installing cameras in the fish tanks to detect, skin anomaly and unusual swimming behavior to prevent disease outbreak, the technologies around video analytics, machine learning help calculate biomass and hunger levels.

With this, SAT and Siemens are paving the way for scalable, highly flexible and above all environmentally efficient aquacultures across the entire value chain. By integrating cutting edge technologies like artificial intelligence, edge computing and blockchain, Siemens is helping SAT continuously optimize their operations.

An additional benefit of high technology farming is food safety and traceability. As the fish is cultivated in a controlled environment, free from contamination, there is minimal use of antibiotics and chemicals. This was just one of the examples and we are driving many more through our digital hub in Singapore.

Deeshraf:
Thanks so much Sid. And Esther according to a 2020 Straits Times article, City Developments Limited also known as CDL is a leading global real estate company that's been ranked by the global 100 as one of the world's 100 most sustainable, big corporations. So as the chief sustainability officer at CDL I wanted to hear from you, what are the keys drivers behind CDL's achievements? And if you can elaborate on some of the initiatives that your organization has introduced to encourage sustainability in smart cities like Singapore.

Esther An:
Thank you for the question and for the kind words. Yes. CDL has started our sustainability journey as far back as 1995. And then when we established the ethos of conserving as we construct and at a time that we did not have to crystal ball that sustainability climate change become the buzzwords today.

So what we feel is the building sector has very high, environmental impact during the whole life cycle, from, a building to management and even today building and construction, account for 39% of greenhouse gas emission. So, the high impact also empowered us to be able to drive change, to make an impact.

I know when I joined CDL in 1995 during that era to tell the truth construction industry building industry were not considered as very eco-friendly. Now of course, that was why we actually established our ethos, that we have to conserve when we construct and manage our properties.

And fast track to today, we are very glad to be ranked really high on the global level on our sustainability best practices. And of course we set goals and targets including the latest that we have actually pledged support of our World Green Building Council's net zero commitment

by 2030, and our directly managed and controlled properties will aim to achieve net zero by 2030.

So how do we achieve ambitious targets and goals? Technology, Innovation, Solutions are the way forward. So, we have always been putting priorities to enable us to design, build, manage our property better, and also communicate with our stakeholders, to be on board with us. And sail towards the global race of net zero.

And now of course, if you want a couple of examples, like, in the early 2000s, we have already embraced like prefabricated technology for bathroom and partition wall. And, in 2014 we have the first VC, the brownstone VC adopted PPVC which stands for prefabricated pre-finish volumetric construction technology.

And within that, three and a half years, we have actually helped PPVC helped us save 55,000 men days and raise productivity by 40%. And that actually also improves the environment and health and safety, performance of our site as well. So simply put technology is an enabler without that, it is very hard for us to make a quantum leap, to make our city or buildings smarter, safer, and more sustainable.

Deeshraf:
Thanks, Esther. And that's a perfect segue to the next question that I have for you. In fact, according to Deloitte's 2020 Smart Cities of the Future article, we know that smart cities could be the key to addressing environmental sustainability challenges. Just like what the both of you just mentioned. So, we understand that in support of Singapore's commitment to the Paris agreement CDL actually has made a bold move to raise its carbon emission reduction target from 25% to 38% by 2030.

And going back to some of the points that you mentioned earlier about technology innovations, I wanted to hear from you, the efforts that CDL has put in place to promote greener and cleaner environments. Could you share some examples of that within your properties?

Esther An:

Yeah. In fact, the targets that you just mentioned, this has been raised already because we actually have already set science-based targets, validated, carbon reduction targets since 2018, based on 2 degrees warmer scenario.

And we are in the process of raising the target to align with the 1.5 degrees warmer scenario. So, you are very right, in order to save the planet towards a low carbon future, no single entity can do so. And our partnership and engagement is very key not just engaging our own internal stakeholder, but also our external stakeholder, as that building sectors engage a really huge ecosystem and along the whole value chain, we got hold up a plot of land to engage architects and designers and engineers to plan for the land and the buildings.

How do we, construct in the end, the contractors that main contractor subcontractor, and also looking at like sustainable building materials to reduce our embodied carbon, all these are getting more and more complex and you need to engage, educate, and empower everyone along the value chain with knowledge and with, technologies and know-how, and that will help to contribute to a sustainable built environment, whether you are the users, whether you're the designer, whether you are, just building users and research show that actually people spend about 90% indoors.

So even if you are not in the industry, you live, work, entertain and play, or even stay in a hotel when you're traveling. So how users use the building real estate, definitely have a strong impact on the overall environmental performance. So, we definitely need to set policies and practices to engage our staff, our builders our suppliers to be going to the same direction. Without knowing that where is the direction, where should we go? Everybody will be at a loss and we also need to achieve buy in only with knowledge and commitment. Then we can, deliver actions and also create the impact that we want.

So if you go to our website, our CDL. sustainability.com, you will actually find a whole host of policies, whether it is environmental health, safety climate change policies, procurement policy, green building, biodiversity policies so that we are very clear that all the stakeholders on board, knows that that is the target.

And of course our latest also set, according to World Green Building Council's net zero carbon building commitment again, with very

clear criteria and where and how, we should, go along when we talk about bringing our built environment and properties. Yeah.

Deeshraf:

Thanks so much Esther now, I really love the way you put it. It's about empowering and educating the entire supply chain as well. And Sid, I wanted to come back to some of the points that Esther mentioned earlier, and I think this is very much relevant, to what Siemens is doing as well.

On the topic of sustainability. We understand that Siemens has developed a city performance tool to provide insights such as CO2 and air quality improvements for city planners to achieve their environmental targets. So going back to some of the points that Esther mentioned about measuring performance, measuring some of the impact that all of the organizations are working on and given your global experience in multiple continents, what are some other tools or technologies that Siemens has developed to support sustainable efforts?

Siddhant Gupta:

Maybe before I share about some of the tools, I think the idea and the purpose behind is very, very important. So as we see today, globally, cities are shaped by multiple factors. The population technologies and their infrastructure. Even today, these forces collide and urbanization and climate change will spur dramatic changes in the metropolitan areas.

Cities need to pave the way for constant evolution. Digital technologies are becoming increasingly important and urban infrastructure building require more efficient and sustainable setup. These changing environments create challenges. Developed cities, for instance, need to focus on cutting carbon emissions, improving efficiency in infrastructure and building simulating a market shift towards cleaner vehicles and more efficient than environmentally friendly public transport.

At the same time, the infrastructure quality in many of the advanced economies is deteriorating. Now on the other side, cities in the emerging markets, face issues such as power outages, inadequate of big transports and roads, which brake on the growth and the development they need. Infrastructures cannot be built fast enough to keep pace with the economic and urban development.

In times of constrained budgets, city leaders carefully need to identify the infrastructure investment, ensuring they address both the environmental and economic priorities. Technologies need to be adapted, to serve local needs, to ensure that the right technologies are applied in the right environment, tailored to the specific characteristics of the individuals. Now to enable the meet of these two different worlds, Siemens developed an interactive and comprehensive tool.

The one you mentioned the city performance tool, as it gives guidance to a city on how to achieve the environmental targets by providing an indication on how each decision will influence job creation in the infrastructure sector, as well as evaluates building transport and energy technologies in the city through more than 70 data points deployed at the desired time period and require implementation level and measures to impact a city strategic plan. And compare these traditional methods with state of art technologies. Additionally, it determines the implementation rate needed for any city to meet its future environmental targets and reports, both environmental and economy KPIs across transport building and energy sectors.

So in addition to this tool, of course, Siemens is also working on multiple other tools. And one of them would be the new web-based application, which reveals the readiness and potential major cities embrace digitalization and develops new ways of living, working, and interacting. We call it the Atlas of Digitalization.

It focuses on three interconnected themes, mobility, sustainability, and opportunity, and assesses how the Fourth Industrial Revolution has already augmented urban life around the world and potential impact it would have in the future. Another tool that we have developed to support sustainability is the Digital Twin and Esther would be interested in knowing more about it.

For example, in the planning phase of a building, the Digital Twin can be used to detect construction errors before they are implemented or create safe evacuation routes during operation. It reveals at real time how an office building is being used and its spaces are occupied. This leads to significant savings for lighting, heating, cooling, and ventilation, which in turn is good for the environment and supports the overall decarbonisation of the building sector.

So these couple of samples beyond the city performance with Siemens has implemented and is also bringing in Southeast Asia.

Deeshraf:
Thanks so much Sid. Now I wanted to ask the both of you something. What needs to be true for the development of smart cities to be accelerated in Southeast Asia? Maybe we'll start with you first Esther, you mentioned about that smart nation pillars that, that the Singapore government is looking into, but also most recently they launched the Singapore green plan, 2030.How does that come into play with what CDL is working on?

Esther An:
In fact well, I've been waiting for the green plan to take place for my past 25 years now. And finally, it is happening so that I think that actually is not just a political agenda or business agenda. That is really good for our future generation, a greener more sustainable planet.

And I'll just now, I can't agree more with Sid that actually, there are technologies and we can apply to raise performance of, how we build, how we design. And digital definitely is an enabler. You just quote an example of our, one of our latest development Bolivar88 we used a virtual design and construction VDC technology, and now, using modeling and also simulation, we actually help us do raise productivity by about 40% and reduce heat gain by about 20%. And we know very well that Singapore is heating up, twice as fast as other cities in the world. And we are near the tropics. So, heat management is very, very important how to provide thermal comfort, but not really causing a lot of stress too.

The utility bills of our users and our home, and also for the environment is very, very key for us. And now we also empower like residential home, like, whether it is <inaudible> or whatever, we actually offer energy efficient air conditioning and lighting system for our, home users to monitor and control this even remotely.

And I think technology is definitely the way forward, and that'll enable us to build better greener and also enable our users to be able to do improve their lives and quality of life. And COVID has actually raised our radars and our concern of like, some of the touch points of, and the public comment area of building.

So we actually have engaged, with NUS, our Smart Green Home Lab. And we came up with some technology that is actually helped to protect and desensitized the lift buttons and all that. And you can, when you go to Republic Plaza, you won't be surprised to come into a little robot that going round to test IAQ the indoor air quality and also desensitizing the space. So now we are looking at technology, how would we improve the life of people and also results and not to take away jobs from some people that really deploy technologies to do the job that you know, to help humans, to do better, to deliver better results.

And now we can use our manpower to put them to better use. So, R&D is definitely the way forward for us. And we have already helped as Smart Green Home lab and tropical technology lab set up with NUS since 2016. And we even have like, investment in an incubator and for SDG and our Republic Plaza, which is a rent-free co office space for innovation, startups to look at how they can come up with businesses that can also contribute to sustainable development.

So there is actually a lot, a lot of opportunities, not just in Singapore. ASEAN is always providing a very, very good opportunity just to share with you some data, which we are all very familiar with, and ASEAN is set to become the fourth largest economic block very soon. And it has a population of like more than 650 a million people.

And one thing very important is almost half of the population are below the age of 35. And whether they are users or innovative technology savvy, younger generation will be the key driving force. And while a lot of cities are suffering from aging populations, I think ASEAN is definitely offering huge potential for growth and for development whether it is on, providing technology or using technology.

So SDG, the UN SDG, sustainable development goals, estimates that, that businesses and investors can maximize the investment opportunity in the developing nations. There is the potential of 12 trillion US dollar to be tapped annually.

Deeshraf:
Thanks so much Esther. Some of the points that you brought up a really interesting and I want to come back to them, but before that, let's go to Sid. And Sid I just want to understand as well from the perspective of how, what needs to be true for the development of smart cities to be accelerated. And we talked about the Singapore green plan Esther also brought up the smart nation pillars. How is Siemens involved in this? And can you share some examples as well?

Siddhant Gupta:
Sure. So I think Esther touched on the building side of the green plan and I can only concur with everything that she said. But also, another element around the pillar of that green plan and the enablement of that would be also not just purely by incentivizing electric vehicle adoption, but also creating the right infrastructure to enable that adoption. And to enable that the plan includes 60,000 charge points across Singapore by 2030. Now that's already a multifold increase from the previous plan. So it's always very heartening to see that. But in addition to that, they also announced that there'll be 8 EV-ready towns by 2025. We will

most likely see lesser diesel vehicles. And already we are seeing in terms of buses, they are moving towards electric as well.

So I'll touch upon the very critical part there, which is the infrastructure and that is where Siemens can play a role in providing the right infrastructure so that this transition can be enabled. When we have a vision of electric vehicle one of the biggest concerns that people always talk about is the range anxiety.

And I think for that go away, what we need to do is make sure that every single place it has a carpark, which can, which has an electric charging. But now that the charging would be different. If you look at the behavioral aspect of today's vehicle owners, they would like go to a gas station, two minutes away and move out.

Now that changes significantly when we move to an electric car, where most of the times when your cars are parked in an office or in a residential area, they are not really doing anything. There are just being charged. So making sure that the right charging technology is deployed there because what you don't need, there is a very fast charging and unnecessary grid load, but there, you could have a slow

AC charging to enable that transition that for whenever you are, as a park for five, six, seven hours, those are getting charged at a slow rate.

At the same time they may be not maybe pickup over here. If you're making a trip to KL, you would want to have charging infrastructure on the way. And there, you definitely don't want to wait for five or six hours. So, there's also a need for these fast charging hubs that could really charge a compete vehicle in a matter of minutes.

And that's the second side of it. So that's where Siemens comes in with our complete technology portfolio to enable the transition and to provide the right infrastructure for the right use. Now the other side of it to complete the story is the decarbonization. Electric mobility definitely is the right step, but unless we also have a greener input and a greener generation of electricity, we will not be able to make transport completely green.

So therefore I think as Esther also mentioned across ASEAN, there's a huge move, to at least half of our energy input coming from green sources just one example to highlight and which is a great success story is probably Vietnam, which the last one year itself has had more than 1000 percent of growth, which sounds unreal, on solar rooftops.

And as well as utility scale solar installations, which are 16 Gigawatt peak. Now those are very strong indications that we're moving in the right direction, both in Singapore, closer to home, but also across ASEAN where we are really looking at the complete value chain of energy, decarbonizing our energy resources, but also making sure that the end users, whether they are building vehicles or any other usage is also going greener and is decarbonizing.

So that's where we are involved as the infrastructure player across the value chain. See optimize, make systems more efficient as well as provide greener energy solutions, both at the generation, the grid edge, as well as the demand side.

Deeshraf:
Thanks so much Sid now from our conversation we've been discussing opportunities, technology innovation over the past half an hour. Now we also want to address the challenges as well, right? With have all of that, that we've actually discussed as well. I wanted to ask the both of you, what do you think are the challenges faced during implementations that, mobility ecosystem players, or generally all of the organizations that are in this should consider when developing smart cities in the future?

Esther, maybe we'll start off with you.

Esther An:
Well, certainly there are always challenges in anything we do. And now of course the most important part is you truly believe in it and you are committed to it. And I think right now we are really in the beginning of this so-called a decade of urgent action.

And we are all working towards like a net zero world. And they're just not what Sid was talking about is like definitely solar power is actually the most conducive in Singapore is still, of course there are actions taken to look at other forms of renewable. So, for us as a developer and landlord, what we feel is - Nothing beats by doing it.

So actually, to our name, now we have two net, zero buildings. One is our sustainability academy, which is at the roof garden of our city square mall, which is actually a space that

we design and build with 12 industry partners. Then we'll come up with a design that, and also, we have RBC gave us, the whole rooftop of a solar panel 3,200 square feet, not a lot, but it's actually enough to power the whole operations of the academy.

And we also partner with Sustainable Energy Association Singapore to build capacity for energy managers in the ASEAN region, not just for Singapore, this is through our connection with the ADB. So, I think we need to build capacity apart from the passion. Apart from commitment, you must have an enabler.

Knowledge is power without knowledge, without, technology, you will not be able to achieve a net zero world. So, for us as a developer, we have to draw people together, bring people together to build it. And the others net zero building that we have is actually at a Singapore Botanic Gardens. We call it a CDL green gallery.

Now again, even the wall is actually using hempcrete, which is outbase based type of concrete very suitable for a garden setting and our full gallery was formed by sticks, modular system that was put together within 24 hours to really minimize environmental impact pollution , and any disturbance tto the garden visitors.

So there are a lot of technology solutions if we have the commitment and belief and passion and the will to do so, there are solutions. So of course, we also look at how we can share technology ideas and all that. Actually Siemens and CDL, both are on the corporate advisory board of world green building council.

So all these international industry organization, whether it is GBC or Urban Land Institute or Asia Pacific real estate association, all these even Singapore Green Building Council, all

these platforms are very good for industry players to come together, to share knowledge, to, share some challenges and solutions. And of course we have been tapping onto RE for the longest time. And our Tampines concourse was actually the first carbon neutral building as far back as 2009. And that concourse used to have the most expensive BIPV, building integrated PV panel.

And right now we are also testing, partnering with the Sustainable Energy Research Institute at our academy testing, the newer generation of BIPV that come with prints and patterns. And hopefully, with all this intense R&D technology will be even more effective.

And because we don't have much time in order to reach low carbon future. Mobility, I would like to just say one more, actually we, one of the earliest, to actually provide a EV charges and EV lots as well. That was into 2009. So of course today, this is almost like common practice back to what we would like to share is you must believe in it and dare to be the first one to start the ball rolling.

Once you do it, there will be people who will come together and follow suit and expand the impact. And hopefully everyone will have a greener and a cleaner feel environment in the future.

Deeshraf:
Thanks so much Esther. Now Sid, what about you? What do you think are the challenges faced during the implementation that, mobility ecosystem players, or even city planners should be concentrating when developing smart cities in the future?

Siddhant Gupta:
Sure. So I think if you look at the mobility aspect for a second it's very important to understand

that the challenges of different cities could be very different. Now, if we think about Singapore, the challenge is not so much that we don't have the energy supply for electric vehicles, but where we do have challenges is at the localized grid level.

So just to pick an example as you mentioned that in 2009, there was a building already with others providing EV lots. Now at that instance, at that building level, they may not be enough out to provide every car park lot with electric charging, but overall as a city, Singapore does not have that challenge.

So I think to overcome this challenge, we have to think very, very local. How do we solve the localized grid challenges? Because not always, it is a possibility to upgrade the complete infrastructure, but at the same time we have to enable this transition. So, I think that's where different technologies coming together, and the complete ecosystem has to play a role where through an integration of renewables, whether that's solar rooftops or an energy storage system at the site, and enables that foundation along with the excess power at the grid, to make sure that the electric charge points can be made available. At the same time that the charge point itself have to be smart enough that they can manage the load.

As, as I said, in my previous answer as well, there is not always a need for very fast charging at every single place. So what that really means is that you can have a slow charging and depending on the number of vehicles that are connected, you can manage the load between the different vehicles. And those smart charging solutions, both coupled with the hardware and the software digital solution is where we can overcome some of the localized challenges.

Taking a different take on this slightly is now let's say we look at the vehicles, which are the fleets like buses or taxis. Now they have a very different set up today. For example, a bus fleet operator had so far only been working on the operations of the bus fleet and has not really thought or had the challenge of looking at how do I fuel these vehicles because that was an easy drive to the gas station. But now if they have to adopt electric buses that that's another dimension that they have to think about is how do I cater for charging at my depots? How do I charge my vehicles on route? And what is the infrastructure that is needed? Some of the role here is played by the operator itself and the depots enabling charging at night when probably the buses are not running. But apart from that infrastructure comes the city itself, which during the day operation, you would need a top up of charge will enable that complete operations. If I can share one example here for one of the bus operators in New Zealand, they wanted to transition into electric buses across two depots in Auckland and Christchurch.

Now, when we talk multiple times to this operator. They were very well aware of their business, this model around operations, but what they wanted is to move to a zero-emission transport, without much changes to their operations. And that's where we come in. Both hardware and software solution.

We'll make sure that that transition is seamless for the operator where they can move from a diesel/petrol vehicle or bus to electric bus. But that does not impact the operations that they are conducting by creating a charging infrastructure that enables that that can meet their needs. And also at the same time that can provide them a complete transparency of what it means to make this transition in terms of investment. And then we can show that the total cost of ownership comes down. So, these are couple of examples where, how, how in segments, we are trying to solve these challenges of multiple stakeholders on the transition to electric mobility.

Deeshraf:
All right, thanks so much Sid. So we've heard about challenges from the both of you itself, but I also want to bring up a topic that's very much relevant today, and that's the COVID 19 pandemic that we are still facing.

There has been much discussion around COVID 19 and the impacts that it has on the industry, right? We've seen a lot of asset accelerations in technology as well as increased focus on sustainability. So I wanted to ask the both of you, can you share some examples of technologies or innovations that you have witnessed being accelerated, which would have normally taken additional resources and even an extended period of time to be implemented? Maybe we'll start off with you first Esther.

Esther An:
Well, 2020 is definitely very memorable, but one thing I would celebrate is actually the acceleration of sustainability because we actually joke that it is actually awakening of a sleeping giant. What happened last one year, it's almost like the activities, the intensity of engagement and that also the growth of ESG investing.

What's almost like the funds was like almost triple. So, things that happened last year is almost equivalent to what had happened in the previous five years. So, things move really, really fast. Why is because people now are convinced that the health of our planet is interdependent with the health of people, businesses and also the economy, and also our future. So, in order to have a strong economy, you have to go back to the basic that the people has to be healthy to planet has to be healthy. So, last year we have seen a lot of - even our tenants, our building users become expert of indoor air quality actually, when we started to open up and all that, of course, we have done our very best to not just follow the safety measure, but also step up on disinfections and all sort of things and tenants need to have a peace of mind.

So they have a lot of questions, which is very relevant because everyone has to breathe the air, right. You can maybe wear gloves or use tissue papers before you press the lift button, but you can't stop breathing. So IAQ I would say is one concern that is at the top of mind of all the building users.

So actually what we have done is also step up on very active IAQ monitoring. And like I said earlier, we have even have a UVC disinfection robots, moving around in our city square more and Republic Plaza. That is not for show. but that really can give peace of mind to our

building users, especially tenants who spend like eight hours, 10 hours in the office.

And a lot of people are also very concerned about the lift button, hundreds of people touch it and all that. So, it actually has driven us to look at the technology. We have the city nexus app. Which actually provides tenants digital ways to book facility, order food and all that. We have actually expanded it, for them to call lift. So, the e-call feature was very, very well utilized. So that means from your office, you just call the lift to your 30th floor, and then you want to go to lobby. You don't need to touch anything. They call that the lift come open, you enter, and then you close and we bring you to the floor that you want.

So all these are very new areas to anticipate the changing needs of our building users. And of course, we are also testing the Anti-microbial vial, disposable adhesive film now, a mouthful name, using nano technology solutions to de-contaminate services of touchpoints, whether it is the lift button or the escalator railing and all that, I will say that 2020 was remembered as a year there was a lot of new technology.

And that at the top of my concern is health and wellness and therefore sustainability has actually become a key agenda, not just about environmental, but it's also about social and economic and sustainability.

Deeshraf:
Thanks Esther. And Sid, what about you? What kind of new technologies innovations have you witnessed being accelerated over this period of COVID-19?

Siddhant Gupta:
I think was just sustainability and decarbonization. Sorry, sustainability and digitalization. Yeah. So I think what Esther mentioned more on the sustainability side, I think what COVID did, and of course there were multiple challenges, but maybe one of the positives to come out of it, it showed people what clean air could mean.

And I think that that really triggered a thought, which previously seemed in many parts of the world, almost impossible. I have seen some other pictures before and after, and I think once humans start really seeing that something is

possible and something that'd be different. I think the questions start coming out, which is how do we make it possible now?

So I think from a sustainability point of view, and I'm really positively surprised that the momentum that it has drawn in the times of challenge, then maybe on the economic side, most of us are getting more and more constrained - most of the countries are getting constrained that the topic of sustainability has become the top priority of a lot of nations.

So that's definitely a huge momentum. And I think that's a very positive one. The second one is of course digitalization. And there was a study that said that COVID triggered a decade of digitalization in six months and some of our management always believed that we're really trying very strongly to push digitalization internally and externally, but the last six months didn't have to convince us more on it.

And I think that that's where the again, a more behavioral side of change where now every new technology deployment, there's a question around how we can do that digitally - do we really need someone to be there or can this service be provided remotely? And some very concrete examples would be when we were really deploying this charging infrastructure in Asia Pacific and we were trying to get the transfer of knowledge from our headquarters in Europe. Pre-COVID time would have been very natural for an expert to fly down and enable or deploy these technologies, at least the first few projects, and then slowly the knowledge transfer happens.

But what COVID really forced us to think is what part of that really needs to the expert travel and how much of that can be really done through interactions on these, on video calls where your site engineer could also have a video call on and get support remotely. Also, what technologies we need to implement in our hardware, that one could look into the challenges or what are, what are the most efficient way of deploying those technologies by sitting anywhere around the world.

And I think that's really become the most standard technology offering now of every piece of hardware that Siemens brings to market. And that's one of the changes that I saw in the last couple of years. I guess, of course not to mention the changes that we see now in our workplace, where all of us thought that the complete team needs to come to the office and there needs to be a certain seat allocated to everyone.

And now the complete change of mindset on how we utilize our building's real estate. What is the purpose behind it? What do we want to bring out of those assets has become questions that have become up the central theme for any corporate. So, I think that overall, a lot of changes that happened and once we are over this COVID we realize that yeah, that there's been some changes in mindset that will remain forever.

Deeshraf:
Yeah, I guess, you can always say that there's a lot of opportunities and it's all about looking towards the future as well as what we've always been mentioning throughout this entire

podcast itself. So, I want them to hear from the both of you in one sentence, can you unpack the term smart cities and what it means for each of you perhaps we'll start off with you first Esther.

Esther An:
Hm. Wow. It's not easy to unpack it in one sentence. I'll try, Smart Cities are where when residents can live, work, play, travel safely, efficiently and sustainably with the support of infrastructure and technology that are user friendly and environmentally friendly.

Deeshraf:
Wow. That's really great Esther, now what about you Sid?

Siddhant Gupta:
Yeah, I think it's always a challenge to unpack it in a single line, but I could only agree with Esther if I have to define it. I think I would say a smart city is one , which has an effective and efficient management of urban areas, improving connectivity, sustainability, and livability, much of the points that Esther also talked about, maybe just a couple of lines to explain what it really means here.

I think in the coming years, we all know that urban communities will face explosive growth, not only in population, but also in geographical size and economic output and cities are, and will be the backbone for economic growth and prosperity in the future for all nations. The goal with smart cities is to help cities evolve and we'll offer strategies and we'll spend sure that they will become social culture and economic hubs.

I mean, across all areas of city life technology and data use, analyze and optimize that does enhance outcomes and improve quality of life. As our cities continue to grow, how do we manage environmental impact and urban resilience questions that often come to mind? Different dimensions of smart city development have the potential to guide cities in the right direction. Urban infrastructure systems and their effective and reliable operation and delivery of energy, mobility, water, sanitation, and information on a daily basis.

And during unplanned and unforeseeable extreme conditions, one which we recently experienced with COVID. So, the idea behind a smart city is really to find innovative ways of thinking. About how to plan design build and manage cities under both challenging and evolving conditions.

Deeshraf:
Thanks so much Sid, that was really well put. Well, that's all the time we have for today's episode. I like to thank both our guests, Esther and Sid for the valuable insights on the development of smart, sustainable cities in Southeast Asia.

In the meantime, if you want to comment on this podcast, all the topics covered, you can send us an email 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.