

SHE STEPS, SHE SCORES

CELEBRATING THE WOMEN IN
SCIENCE, TECH AND ENGINEERING



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TRAILBLAZING A PATH FOR WOMEN IN ENGINEERING

TEH POH SUAN

Chief Civil and Structural Engineer
Housing & Development Board (HDB)



When Poh Suan first enrolled in the Civil Engineering course in the National University of Singapore (NUS) back in 1986, she was one out of only five females in a cohort of 72 students.

But that didn't unnerve nor dishearten the then 20-year-old, simply because Poh Suan always knew that she wanted to study something that would contribute meaningfully to society.

"When I was a student in secondary school, I was inspired by how engineers built homes for people to stay in safely and comfortably. They also built roads and bridges to connect people and communities, built infrastructure to manage waste to protect the environment," shared Poh Suan. "I wanted to play a role in this, so I enrolled myself into Civil Engineering at NUS. My work since graduation has reinforced my belief that civil engineers play a vital role in enhancing the quality of life for the people."

In the realm of engineering, where men have traditionally dominated, exceptional women like Poh Suan are breaking barriers, shattering stereotypes, and paving the way for and inspiring a whole new generation of empowered female engineers.

As the Chief Civil and Structural Engineer at HDB, Poh Suan's three-decade long engineering career with the organisation is the epitome of resilience, determination, and a steadfast commitment to innovation, serving as a powerful testament to the transformative potential of women in Science, Technology, and Engineering (STE).

"Engineering is tough. Back in university, our lessons were from 9am to 5pm, five days a week. But because of the passion that I have for engineering, I enjoyed the lectures and content."

And she remembers exactly how her NUS lecturers and professors treated the male students versus the female students.

"They treated us all the same!" Poh Suan shared candidly. "For example, during the first year, we were required to attend workshop classes – we had to learn how to weld, mill, and pick up physical skills. It was tough but we all made it through!"

For Poh Suan, the impact of engineering on people's lives cannot be overstated, and it's her deep-seated passion for problem-solving that has shaped her trajectory in a field where innovation meets pragmatism.

Civil Engineering, she explained, is about maintaining and adapting the infrastructure that we depend on every day – whether its buildings, roads, and bridges, or energy and water supply. Civil engineers not only have to keep this infrastructure running effectively; they must also find ways to deliver the infrastructure needed when there's little money in the pot to pay for it. Simply put, civil engineers come up with solutions to complex problems and implement them, shaping the world we live in.

"I wanted to practise what I studied and had a passion for, which is why I joined HDB," she said.

When I was a student in secondary school, I was inspired by how engineers built homes for people to stay in safely and comfortably.



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"If you look at HDB, it's the biggest developer in Singapore. The mission of HDB is to provide affordable and quality public housing and that encompasses a lot of varied tasks, especially from the engineering perspective. From land preparation before we construct the building, to taking care of its maintenance after it has been built. When it's due for redevelopment, we need to tear it down and rebuild again. We handle everything – from the very beginning to the end to the beginning again. It is an important part of building a nation and that really attracted me to the organisation. It's never the same work you do, whether it's year one or year 30."

"When I first entered HDB's Department of Structural Engineering, I was the fifth lady to join!" she reminisced. "Today, we have many lady engineers in leadership positions in HDB."

Things have changed and improved over the years, but in an industry that is still largely male-dominated and where gender stereotypes often cast shadows on women's contributions, Poh Suan remains optimistic in her conviction that diversity fuels innovation and progress.

"There is a role for everyone at HDB," she said, emphasising the inclusivity of the organisation. "I believe that the contribution from women is that we bring diversity of thought into engineering. In a male-dominated field, there are unique strengths women bring to the table, especially empathy and creativity. I think this diversity of views is good, because varied perspectives can synergise to create better products."

And she would know. Throughout her career at HDB, Poh Suan has spearheaded numerous groundbreaking projects, leveraging her expertise in the green building industry and sustainability.

Her singular contributions over the years include being a member of several inter-agency committees such as the Solar Capability Task Force, Ministry of National Development (MND) Green Building Committee and Sustainable Urban Living Committee, Energy Efficiency Programme Office (E2PO), and the Technical Review Panel for Economic Development Board (EDB) Clean Energy Research Programme. She also received the prestigious Building and Construction Authority (BCA) Singapore Green Building Council (SGBC) Green Building Individual Commendation Award in 2013 for her commitment and contribution in propelling a sustainable built environment in Singapore. For her professionalism, innovativeness and entrepreneurial spirit, Poh Suan was conferred the Innovative Professional Engineer Award in 2019.

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Image: Housing & Development Board



Pilot implementation of flexible solar thin film at Woodlands.
Image: Housing & Development Board

As a notable female engineer behind a multitude of green initiatives, she has left a significant impact not only at HDB but the rest of the construction industry. She is also the co-author of two books: "Blueprint of Successes for Public Housing" and "The Green Housing Book". The latter is a collation of HDB's green efforts, experience, and knowledge in designing environmentally sustainable development.

She is appreciative and proud of her many initiatives but her contribution to the Solar Capability Building Programme stands out as one of her most rewarding accomplishments. Under the programme, Poh Suan managed large scale solar photovoltaic (PV) test bedding in both new and existing HDB towns and identified the most optimal and cost-effective solar PV solutions for the environment. Expanding this use of renewable energy was a big part of HDB's efforts to promote sustainable development.





Image: Housing & Development Board

"Back in 2008, I was leading the charge to introduce solar panels in HDB. The price of solar panels then was very expensive and there was no return on investment. However, we looked at it as a potential growth area and wanted to build its capabilities. Some people told us not to waste our time – they felt that the implementation of solar panels would never happen during their lifetime. But we continued to push through and in the span of 10 years, we did it."

According to an article from The Straits Times dated February 2024, solar panels are set to be installed at up to 1,075 HDB blocks and 101 government sites by the third quarter of 2026 as part of Singapore's drive to harness more clean energy. Currently, around 3,900 HDB blocks have been equipped with solar panels out of the slated 9,500. The initiative aims to achieve net-zero energy consumption in common areas of HDB blocks, roughly balancing energy usage with production.

Aside from her trailblazing efforts in the solar capabilities programme, Poh Suan is also especially proud of her work on HDB Greenprint – a comprehensive framework to guide greener HDB town development and create sustainable homes.

As Poh Suan explains, with increasing global warming and rising sea levels, it is vital that Singapore can remain a great place for current and future generations to live in.

"When we innovate, we introduce the innovations in new projects. But what about existing buildings? HDB has been building public housing since the 1960s, which means that we need to revisit and enhance sustainability efforts," Poh Suan explained. "We had to ideate on how we could rejuvenate existing towns and bring in sustainable development initiatives. This introduction has expanded and flourished into the Green Towns Programme which is now implemented nationwide."

With such watershed achievements under her belt, what would Poh Suan tell her younger self, a wide-eyed female engineer just starting out?

"I would tell my younger self to be bold and innovative," she shared.

And what advice would she give specifically to the young women of today, who may be slightly hesitant about embarking on an STE career?

"Come join us!" Poh Suan enthusiastically exclaimed. "An STE career is one that is both rewarding and meaningful. It's also an opportunity to reimagine built environments and make tangible difference to the lives of people."

Even after more than three decades in the industry, Poh Suan is excited for the next chapter.

"As the Chief Civil and Structural Engineer at HDB, it is my responsibility to look after the professional development of our engineers. I would want to encourage this group of people to develop professionally and continue contributing to the engineering community as well as our national public housing efforts," she said, without missing a beat. "Keep innovating and keep pushing. Look what happened with the solar panels!"



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WOMEN CAN DO ANYTHING!

ADELE TAN

Deputy Chief Executive Officer (DCEO)
and Chief Planner
Urban Redevelopment Authority (URA)



Image: Urban Redevelopment Authority

It was her love for science...and SimCity which led Adele to her illustrious career at URA where she is now Deputy Chief Executive Officer (DCEO) and Chief Planner.

"That's why I chose URA all those years ago," she shared with a smile. "Because even though I wasn't into video games, I thought SimCity was cool. I liked the idea of planning cities, with their inter-connected networks and systems. Until now, it still excites me!"

Safe to say that in her 27 dedicated years in the Public Service, it's been an ongoing but incredibly meaningful game of SimCity for Adele, with real-life outcomes.

For the Princeton University and Harvard Kennedy School alum, Adele's decision to take the URA scholarship back in Junior College was an easy one.

"I was very interested in planning and systems," she shared. "Even back then, there was something very intriguing to me about the fact that somebody has to plan a drain."

She explained: "When you look at drains, they form a system. Somebody has to think about how they are all going to connect, flow, and make sense. Hidden urban systems and networks are what make a city work, so that was what interested me, more so than structural engineering which involves constructing buildings."

Adele's choice of picking the science route academically from the start, to studying Civil Engineering and Operations Research at Princeton University has certainly served her well.

"I've always found joy in science – its logic, the satisfaction of understanding things, and how they help you understand the world," she said. "In a sense, I like the fact that there are answers out there."

The natural progression of joining URA right after graduation more than fed her passion for urban planning.

"The fit at URA was great because here, we are all about, 'How do we make the city better for people?', and finding better approaches given our limited land in Singapore. When I first joined as a young engineer, my first boss was a real role model in pushing the boundaries and finding new solutions. He did not adhere to the "business as usual" way of doing things, and you can't help but imbibe that culture."

Hidden urban systems and networks are what make a city work.



Image: Urban Redevelopment Authority

According to Adele, that same URA culture is also one that is incredibly supportive of women in general. The team in URA which Adele first joined as a young engineer boasted a good number of ladies who were engineers and technical support staff.

"Recently, I spoke to one of the women who was part of the technical support team from when I first started and is now retiring. We were reminiscing and I was sharing with her how much I appreciated and valued their mentorship, this group of seasoned officers with their deep technical knowledge guiding me, a fresh graduate entering the field of engineering," she shared.

And in what can usually be perceived as a typically male-dominated field of Science, Technology, and Engineering (STE), Adele feels that URA is a great place to work.

"I have never felt disadvantaged as a woman at URA. We have always had a very strong representation of female employees, and a good number of them are leaders and role models," expressed Adele. "We always know that we have a seat at the table."

"There was already a good organisational culture when I first joined URA, and that has only grown from strength to strength since. When you finally get the secret sauce right – and I'm not sure if there's a clear recipe – treasure it. Because it transfers down to people."

And part of this "secret sauce" was gleaned from one of the most influential people in Adele's life – Professor Cheong Koon Hean, Chair of the Lee Kuan Yew Centre for Innovative Cities as well as Professor of Practice in the Singapore University of Technology and Design (SUTD), and concurrently Chairman of the Centre for Liveable Cities under the Ministry of National Development (MND).

Professor Cheong was the first woman to become the CEO of URA and Adele had the opportunity to work directly with her roughly four years into her job at URA.

"I learnt a lot just by observing how she manages issues and deals with various situations. If I were to sum it up, I would simply say, 'Grace under pressure.'"

So, is Adele's management style mirrored after Professor Cheong?

"I don't feel like I have reached the high levels she has achieved, but I certainly think about her occasionally," she shared with a smile. "I often ask myself, 'What would someone like Mrs. Cheong do?' I think having such a tangible role model that you can really observe and learn from is beneficial to any young person, particularly women. It's reassuring to have a role model demonstrate how to be successful, how you can make your point effectively, and be heard."

Indeed, Adele's journey to her current position at URA has been an inspiring mix of passionate urban flair, strategic acumen, and a touch of Singapore sass. She has been involved in various urban planning studies on how Singapore can accommodate its diverse economic, social and environmental needs, and address future challenges. The studies range from ensuring that our land use plans effectively incorporate environmental considerations, planning for an ageing population, to developing policies and plans for Singapore's underground space.

Image: Urban Redevelopment Authority



We always need good women in the STE space.

And why? Because we have something to contribute since we're half the population.

She also played a leading role in the recent Long-Term Plan Review (LTPR), which was a national exercise involving extensive stakeholder engagement to map out the strategic land uses and infrastructure needs of Singapore over the next 50 years and beyond. The LTPR stands as a cornerstone in Singapore's visionary urban planning, embodying a comprehensive and participatory approach that ensures the city-state's development is both sustainable and aligned with the aspirations of its people. This forward-thinking project not only anticipates future challenges but also positions Singapore at the forefront of global urban innovation, setting a precedent for how cities can navigate the complexities of growth, environmental sustainability, and societal well-being.

In a move that bridges the realms of urban planning and national development, Adele also serves in the MND Infrastructure Implementation Planning Office. With one foot in strategic planning and the other in infrastructure implementation, she is at the heart of a concerted effort to ensure that Singapore's skyline and green spaces evolve in harmony.

Having held key positions at MND, URA, and NParks over the years, what's her advice for young women interested in following in her footsteps?

"As long as you're prepared to learn. You can do it. Women can do anything!"

Adele hopes to see continued interest from women to actively participate in Singapore's STE sector.

"We always need good women in the STE space. And why? Because we have something to contribute since we're half the population."

She added: "Don't ever feel intimidated because you're a woman. We need to watch out for each other and remind each other we can do whatever we put our minds to."



Image: Adele Tan, Centre for Liveable Cities (CLC) Lecture Series

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