The future economy is green

Sustainability is picking up speed as a major consideration in economic development initiatives and we see a growing number of green advocates in Malaysia championing urban sustainability. A focus is on the role of green technology and the green economy in creating sustainable and liveable cities.

More than half of the world's population today reside in cities, and the trend is expected to continue. By 2050, the World Bank estimates that seven out of 10 people in the world will live in cities. Over the last 50 years, Malaysia's urban population has increased, from 26.8% in 1970 to 77% in 2020. By 2050, 88% of the country's population is expected to reside in urban areas.

The speed and scale of urbanisation, globally and in Malaysia, mean that cities need to cater to the demands of the growing urban population, from their housing needs to amenities and services such as energy, water, transport and recreational areas. Pressure for land expansion in cities will lead to more green areas, including forested areas and forest reserves, being developed, resulting in a widening rural-urban income gap and worsening pollution.

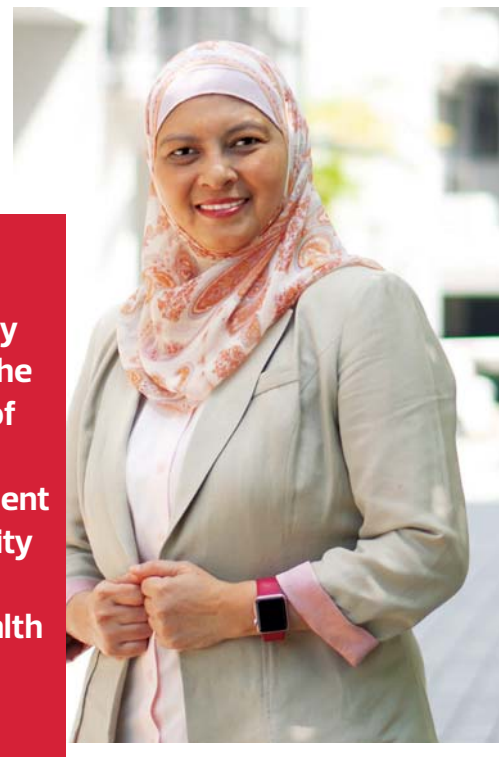
An Organisation for Economic Co-operation and Development (OECD) report titled *Cities in the World: A New Perspective on Urbanisation* published last year noted that many city dwellers are exposed to high levels of air pollution, resulting in a considerable number of premature deaths each year and higher Covid-19 mortality rates.

The latest Intergovernmental Panel on Climate Change (IPCC) report, released earlier this month, points out that for cities, some aspects of climate change may be amplified, including heat (since urban areas are usually warmer than their surroundings), flooding from heavy precipitation events and rising sea levels in coastal cities. As highlighted in the OECD report, many cities are already highly exposed to floods and storm surges, with one in five city residents living in an area that would be submerged in a big flood and one in seven exposed to storm surges.

In the coming decades, a key challenge for cities will be how to reduce air pollution, limit exposure to natural hazards and transition to a low-carbon economy. The UN Sustainable Development Goal 11 defines sustainable cities as those that are dedicated to achieving green sustainability, social sustainability and economic sustainability.

Malaysia has its army of green advocates, people such as Datin TPr Noraida Saludin and Norhasliza Mohd Mokhtar.

"Sustainability really means balancing the conflicting needs of economic and physical development with social liveability and ensuring environmental health and conservation. Urban sustainability also means developing cities that are liveable, ensuring the basic needs of urban living, which include features such as public transport, affordable housing, complete neighbourhoods, walkable streets and vibrant public open spaces," says Noraida, president of the Malaysian Institute of Planners.



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In the last decade or so, green technology has often been mentioned in the same breath as urban sustainability — in Malaysia, from 2009, with the setting-up of the Ministry of Energy, Green Technology and Water. That same year, the National Green Technology Policy was launched. The goal was for green technology to be a driver to accelerate the national economy and promote sustainable development.

Malaysian Green Technology and Climate Change Centre (MGTC) cities and industry division director Norhasliza says the application of green technology in the form of products, equipment or systems can help create sustainable cities. "It can help reduce greenhouse gas emissions in cities to mitigate climate change. For example, using renewable energy sources such as solar panels can generate electricity to power up buildings. It reduces the burden on the conventional utility grid, produces less emissions and helps to save on energy bills. Energy-efficient technologies such as LED lighting in homes, offices, shops and street lights help reduce electricity consumption and lower carbon emissions."

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She adds that the Low Carbon Cities 2030 Challenge (LCC2030 Challenge), implemented by MGTC, has been an important factor in driving the use of green technologies in Malaysian cities. "Cities that participate in the programme have to reduce their CO_2 emissions by 45% in 2030 from their baseline year. They have to reduce emissions from the energy, mobility, waste and water sectors, thus the usage of green technologies is vital in achieving their target."

One of the initiative's success stories is the Shah Alam City Council (MBSA). "MBSA started participating in the LCC2030 Challenge in 2015. As part of its initiatives in reducing carbon emissions and becoming a low carbon city, MBSA undertook a public funded initiative to replace high-pressure sodium vapour street lamps with more efficient LED lighting," says Norhasliza.

"MBSA has also installed electric vehicle charging stations at 10 locations around Shah Alam to spur the adoption of low carbon mobility. Other initiatives include the adoption of the Smart Selangor Bus, which provides free bus services to encourage public transport, and garden waste composting that reduces the purchase of fertilisers and provides environmentally friendly soil mixtures," says Norhasliza.

Economic opportunities from green tech

Norhasliza believes there are many green technology opportunities for Malaysia. Hydrogen technology, for instance, can be used for power generation or fuelling vehicles. "Green hydrogen has the potential to be a zero-carbon fuel that can tremendously reduce greenhouse gas emissions in Malaysia," she says.

The MGTC, she adds, has taken initial steps with key players from academia and industry to build the foundation of the green hydrogen economy in Malaysia. "With the global hydrogen economy expected to reach RM10 trillion by 2050, Malaysia stands to reap many economic benefits by tapping into this sector."

Although much of the focus of green technology is on the energy sector, from tapping into renewable sources of energy like solar to reducing energy use and promoting energy efficiency, innovations in other areas are picking up steam. At Universiti Teknologi Petronas' (UTP) Institute of Self-Sustainable Building for Smart Living (ISB), researchers have several projects at various technology readiness levels — covering advanced materials, water and energy security.

One of the technologies developed, an integrated wastewater treatment unit that integrates all processes of aerobic degradation of organics, biomass and sedimentation in a single reactor, is already being commercialised. Significantly smaller in footprint compared to a conventional wastewater treatment plant, the technology, dubbed i-SGBR (Integrated Suspended Growth Bioreactor System) is already attracting interest from those in the business of wastewater treatment, discloses ISB director Dr Noor Amila Wan Abdullah Zawawi.

Another invention that is in the pipeline is a so-called green solvent, extracted from fruits and plants.

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> Noor Amila

Noor Amila, who is an associate professor at UTP's Faculty of Civil Engineering, says the green solvent replaces conventional pre-treatment techniques in the production of paper, which use diluted sulphuric acid or sulphur dioxide and are energy intensive and laborious.

"Solvents are used to soften the pulp. And by using this green solvent, we've found that it can be applied to oil palm fronds, thus making what would otherwise be a waste product into paper," she says, adding that tests are currently underway at a paper mill.

One innovation that has been commercialised is the mini portable solar still, used to produce drinking water from seawater or brackish water through the process of desalination. The evaporation and condensation processes are the main concept behind this technology, and round-the-clock water supply is guaranteed with the use of the solar electricity generating system. "It has not gained ground in Malaysia because we have ample supply of clean water. But in the Philippines and Indonesia, the technology is getting some attention," she says.

Although researchers are constantly looking at how technology can be used to mitigate climate, energy and water security or waste issues, to name a few, Noor Amila says one hurdle that is holding back progress is cost. "The cost of implementing technologies is still high, which makes the technology unattractive to the end-user. There is also a lack of funding sources to commercialise these new technologies," she adds.

The government has come up with the Green Technology Financing Scheme 2.0, which allows companies to apply for financing from banks, with the government guaranteeing 60% of the amount and providing a 2% rebate on the interest or profit rate charged.

For green technology adopters, there are government incentives such as the Green Investment Tax Allowance, which is applicable to companies that use green technology services listed in MGTC's MyHIJAU directory. Service providers in the directory also qualify for the Green Income Tax Exemption. Despite these financing schemes, they are not able to match the investment costs required to scale up green technology projects, says Noraida.

Norhasliza believes that in time, as understanding of green technology grows, banks will become increasingly active in the field by providing financing for renewable energy projects. In its 2020 annual report, MGTC noted that Malaysian small and medium enterprises (SMEs) have the opportunity to be a part of this shift towards green technology, with MGTC playing the role of enabler in capacity building, creating green products and services, providing financial incentives and promoting local green SMEs internationally.

Awareness, communication and teamwork

Although Malaysia has green technology policies in place, Noraida laments that implementation is somewhat lagging. "We must embrace green technologies as part of sustainable development and make serious concerted efforts in reducing carbon emissions from our cities. Going carbon neutral would be ideal, and maybe overly ambitious, but reducing carbon emissions must be the core objective in our urban development," she says. There has to be a willingness on the part of industry players to really go into green technology and green growth. "Many are still unwilling to integrate green technology into projects such as housing and commercial, citing high development costs."

As green technology affects all aspects of life, Norhasliza believes its successful deployment depends on intensive and continuous collaboration between all stakeholders. "Implementing green technology effectively requires awareness, communication and teamwork at all levels of society," she says.

"First of all, there needs to be cooperation at all levels of government to realise the maximum potential of green technology in bringing benefits to the nation and society. At the federal level, there needs to be dynamic inter-ministerial cooperation.

"Policies and funding from the federal government help to mobilise awareness and green investments, and they need to be effectively communicated to state governments and local governments for effective implementation. All of this is underpinned by active involvement and support from the private sector, which can help drive investments and innovation.

"Individuals in society also have a role to play on the demand side by being willing to pay for and use green technologies such as buying electric cars and energy-efficient appliances, which in the long run will help drive down the prices of green technologies and speed up their adoption."

She points out that here, capacity building is critical.

"Fighting climate change and adopting green technology is a shared responsibility of everyone and a lack of knowledge can seriously undermine any effort. For instance, policies on climate action and the uptake of green technology are bound to fail without public support and awareness. A lack of experts and skilled workers in the green sector will also prohibit its growth," she adds.

Technology alone is not enough

Hamdan Abdul Majeed, managing director of Think City, a social purpose organisation with the mission of making cities more people-friendly, resilient and liveable, says even though technology can help make cities sustainable, it is not enough by itself.

He cites the example of Barcelona, which recently launched an app that helps citizens choose shaded pedestrian paths across the city, from departure to arrival, so they can experience the city in a climate-comfortable way. "It's a great idea, but it couldn't work if the city didn't already have enough green infrastructure, a highly developed network of street trees and high-quality green spaces. In Malaysia, we have yet to build a similar high-quality urban green infrastructure."

An article in *The Conversation* a few years ago posited that a green technology future is a "flawed vision of sustainability", and that technology alone cannot solve the world's most pressing environmental problems. For instance, even more fundamental than greening the supply of energy is reducing demand.

Noraida concurs with this point, adding that changing one's lifestyle by reducing energy and water demand, fully adopting and practising recycling (for waste and water), and shifting one's mode of transport from private vehicles to public transport as well as opting for green mobility options such as cycling and walking will essentially reduce carbon emissions.

Equally important is addressing the costs of our disposable society, where people discard things and buy new ones, rather than repairing them. Although Malaysia is scaling up its circular economy efforts to reduce waste and mitigate pressures on finite resources, it may well be worth considering past knowledge and wisdom in the playbook for future development.

Hamdan points out that many of the issues related to climate change is linked to the Industrial Revolution. "And now, we need to either innovate, reverse or adapt to the changing world. In this respect, there may be clues in the past — we may have to review how we managed waste well and revive systems that support sustainability better.

"A quick example of a small movement, which may create traction, is the use and return of glass bottles in the delivery of milk and soft drinks — a system that we used for decades and which only fizzled out from the 1980s. Many small movements like this in the supply chain can make a big difference to the environment.

"However, political will is always required, and this is complex due to the relationships governments have with big industries, which have great influence over urban policy."

He adds that as the country looks towards green technology and the green economy as a whole, it is important to rethink existing economic models. "There is that larger issue of our economic system — shareholder economy versus stakeholder economy, profit versus purpose."

Developing sustainable cities and managing a city around the well-being of its citizens requires a component of trust and empowerment. "This must include everyone, also communities that may be marginalised for some reason. The fundamental ways in which a city can demonstrate trust in its citizens are by giving them a voice, and giving them the power to decide on some of the issues they face," says Hamdan, adding that this is why ThinkCity has such a strong community-focused approach.

There has never been an era more in need of collaboration, and it is a crucial aspect of nation-building that should not be overlooked.

"The pandemic has heightened the need for collective pooling of resources and action. We will be seeing more collective action and rallying of support for each other, and in Malaysia, there have been a lot of hopeful examples with the recent Covid-related food aid for disadvantaged communities," Hamdan says.

"Malaysians are beginning to look out for each other more, compared with the last few decades. I hope that it will become a norm. It is with this kind of spirit that we will be able to fight the major challenges facing all of us — climate change, inequality, social exclusivity and so on."

The transition to a green economy presents tremendous economic opportunities, and it is through coordinated and focused efforts that the country can make that leap, he adds. "We talk about building back better but in a post-Covid world, it is also about realising that there is an opportunity to build back greener." — *By Sreerema Banoo* E

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