

experience SINGAPORE

THE BLUEPRINT FOR GREEN



focus

Charting Singapore's journey to a low-carbon, climate-resilient future

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ED'S NOTE

Dear readers,

There is no denying that the world is in the grip of an unprecedented crisis. Besides the substantial impact on human lives, the COVID-19 pandemic is also poised to exert other far-reaching implications, deeply affecting the global economy and even the way we lead our lives. However, the pandemic is not the only threat that confronts us. For years, governments, NGOs and individuals have been sounding the alarm bells on the long-term effects of ecological mismanagement — and with good reason. Our **Focus** story (pages 3-5) examines Singapore's journey towards achieving net-zero carbon emissions. This includes plans for the gradual phasing out of petrol and diesel vehicles, as well as the widespread adoption of solar power, among other measures.

Ultimately, these initiatives would not be possible without the commitment of the people. Our **In Singapore** article (pages 8-9) features individuals working from different starting points to sustain the momentum of climate action, both at home and abroad. After all, no single country can hope to resolve climate issues unilaterally. To this end, Singapore has been sharing its best practices in tackling transboundary global warming with other countries. Our **Joining Hands** feature (pages 10-11) explores how this is being done, as well as cooperation in other areas such as disaster relief and the fight against dengue. The emphasis on cooperation is made more evident in this issue's **Reflections** piece (pages 6-7), which presents a round-up of recent knowledge-sharing initiatives on climate change and other salient issues for visiting international delegates, under the Singapore Cooperation Programme.

Through collaboration and unity, we will weather the storms of today and build a better world for our future generations. In the meantime, stay safe and do your part in protecting the wellbeing of the community.



Director
Strategic Communications Directorate
Ministry of Foreign Affairs, Singapore

KEEP IN TOUCH!

Share with us your memories, photos and experiences in Singapore under the Singapore Cooperation Programme. Email us at mfa@mfa.sg



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Sharing knowledge, resources and best practices is key to tackling transboundary global warming

experience SINGAPORE

A NEWSLETTER OF THE SINGAPORE COOPERATION PROGRAMME



MINISTRY OF FOREIGN AFFAIRS
SINGAPORE

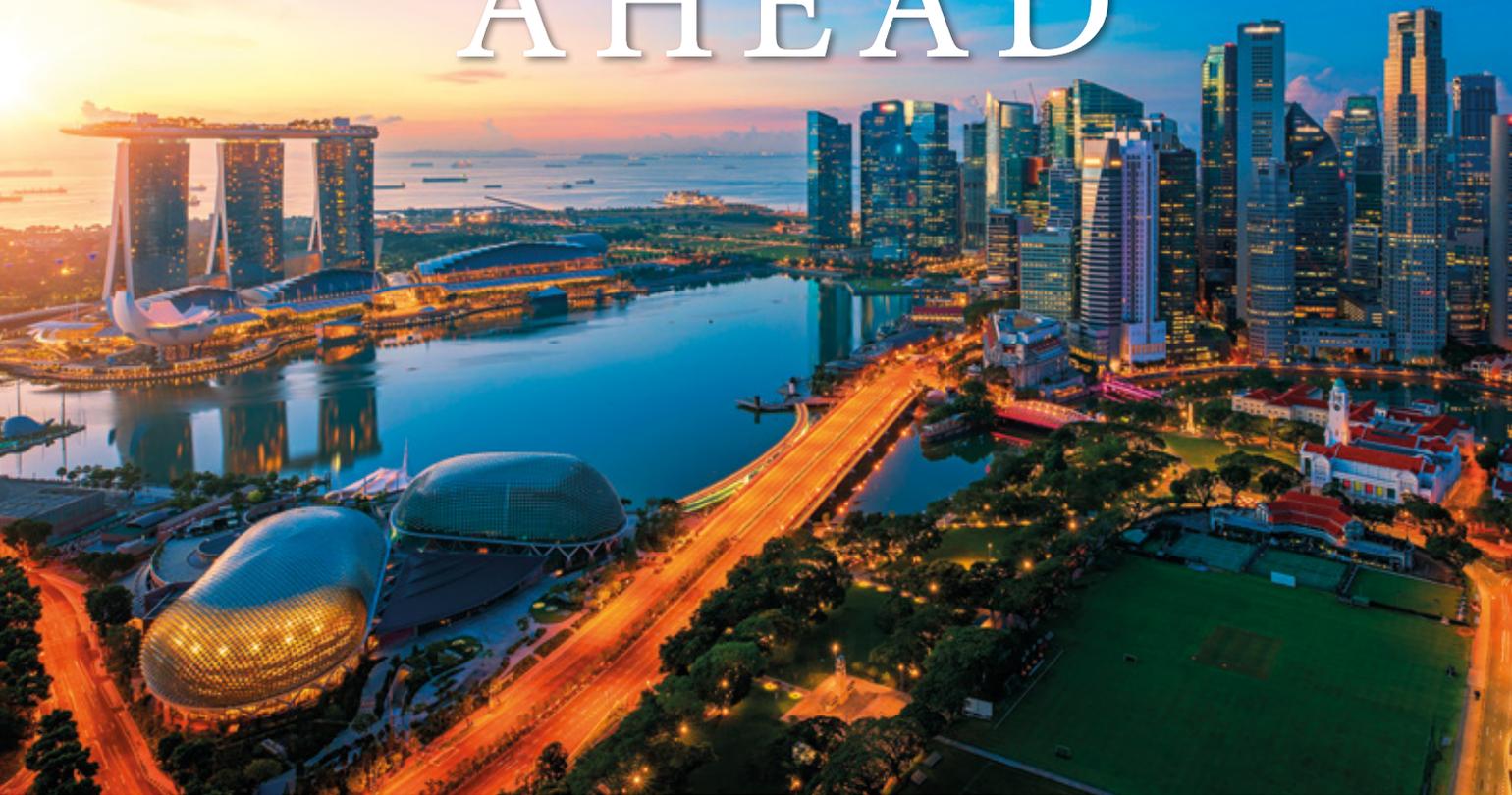
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FULL STEAM AHEAD



Despite the challenges associated with it, Singapore has kickstarted its journey towards net-zero emissions.

2018 was Singapore's "Year of Climate Action". It was a jam-packed year that saw at least two climate-related activities being held per day, as part of an effort to raise awareness on climate change and garner support for policies such as a carbon tax, which kicked in last year. Despite its name, Singapore's commitment to climate action extends beyond a "year". Instead, it has set the pace for the implementation of Singapore's climate-related mitigation and adaptation policies that have carried on even after the Year of Climate Action ended.

These policies are driven by a Whole-of-Government approach under the Inter-Ministerial Committee on Climate Change (IMCCC), chaired by Senior Minister Teo Chee Hean, who is also coordinating Minister for National Security, and supported by relevant government agencies. "The Government will place sustainability at the core of everything we do," pledged Mr Masagos Zulkifli, Singapore's Minister for the Environment and Water Resources.

KEEPING CLIMATE CHANGE AT BAY

Mr Masagos stressed that tackling climate change has to be the concern of the entire community. "Only by living and practising sustainability together can we mitigate the impact of climate change and secure the resources needed to take Singapore into the future," he said. In this vein, Singapore has introduced a Climate-Friendly Household Package to encourage select



● MR MASAGOS ZULKIFLI SPEAKING AT A CO-FACILITATION MEETING AT THE UN CLIMATE CHANGE CONFERENCE COP 25 HELD IN DECEMBER 2019.



While Singapore's efforts to reduce emissions may be modest, our collective efforts with all nations can be substantial.

**Senior Minister Teo Chee Hean,
Co-ordinating Minister for
National Security and Chairman of
the Inter-Ministerial Committee
on Climate Change**

households in Singapore to purchase energy-efficient appliances and water-efficient shower fittings.

This complements other initiatives that aim to reduce carbon emissions to tackle climate change across all sectors. Singapore has made significant strides in reducing emissions from the transport sector. We have made major investments in public transport and active mobility infrastructure, and target for nine in 10 of all peak period journeys to be made using Walk-Cycle-Ride (WCR) transport modes by 2040. Singapore aims to phase out petrol and diesel vehicles by 2040. Commuters will also be encouraged to switch to electric cars instead. To incentivise this switch, authorities will expand the public charging infrastructure to 28,000 points by 2030, up from the current 1,600. Incentive schemes to encourage the purchase of fully electric cars and taxis, and cleaner car models for light goods vehicles will be rolled out.

Industries account for 60 per cent of emissions, the largest source of these in Singapore. Plans are afoot to help firms reduce their emissions, while also capturing new business opportunities and strengthening their competitive advantage.

Singapore is the first country in Southeast Asia to introduce an economy-wide carbon tax last year. The tax is uniformly applied to any entity that produces 25,000 or more tonnes of greenhouse gas annually without any exemptions. Currently



the tax is applicable to 30-40 carbon emitters, which covers around 80 per cent of Singapore's total emissions. Such firms will pay S\$5 for each tonne of greenhouse gases emitted until 2023. The tax will eventually be increased to between S\$10 to S\$15 per tonne of greenhouse gases emitted by 2030.

The private sector has largely shown its willingness to join the Government

in its quest for sustainability, dispelling the myth that carbon emissions are inevitable side effects of economic growth. In 2017, Singtel became the first company in Asia outside of Japan to have its carbon reduction goals deemed effective by the United Nations Global Compact. These goals aim to halve the local telecoms giant's carbon emissions intensity by 2030.

ADAPTING TO A CHANGING CLIMATE

SINGAPORE IS WELL AWARE OF THE RISKS OF GLOBAL WARMING and its many effects, among them warmer seas, rising sea levels and evolving biodiversity. Here's how it plans to manage some of these:



Flood Resilience

Climate change will bring about more frequent and intense storms, and parts of Singapore may experience flooding more frequently. Singapore has already been shoring up its flood defences in the past decade, and will invest another S\$190 million in this area, with six projects commencing this year. These infrastructure enhancements will be complemented with developments in technology, such as short-range radars, to better predict heavy rainfall.



Coast To Coast

The national water agency, PUB, will assume a new role this year: that of a coastal protection agency. This ensures that both coastal and inland flooding is responded to holistically. In the near-term, the agency will study coastal areas to ascertain the type, feasibility and extent of measures required in the face of rising sea levels. Beyond manmade solutions, the agency will continue to champion natural coastal protection tools like mangroves.



Vector Control

Warmer days will lead to a growth in Singapore's mosquito population. "In fact, warmer temperature was one of the factors that led to the surge in dengue cases last year," noted Minister for the Environment and Water Resources Mr Masagos Zulkifli. To combat this scourge, the Government is exploring novel ways of controlling mosquito populations (for more, see JOINING HANDS).

● WHEN COMPLETED IN 2021, THE SOLAR FARM AT TENGEH RESERVOIR IS EXPECTED TO REDUCE CARBON EMISSIONS BY AROUND 32 KILOTONNES PER YEAR, THE EQUIVALENT OF REMOVING 7,000 CARS OFF SINGAPORE'S ROADS.



30 X 30 DID YOU KNOW?

Today, Singapore's food imports come from over 170 countries and regions, making it vulnerable to supply shortages and price changes. To strengthen its food security and resilience, Singapore aims to locally produce 30 per cent of its nutritional needs by 2030, an increase from less than 10 per cent today. Strong investments in an innovative agri-food sector, including a new high-tech agri-food cluster and research and development into more efficient fish farming practices, can help the country realise this vision.



TIGHTENING TARGETS

Embracing the policies and partnerships set out above will help spur Singapore's transition to a low-carbon future. In March this year, the Government announced its commitment to an absolute peak emission level of 65 million tonnes of carbon dioxide around 2030. This is a departure from its commitment five years ago, when it pledged to reduce its emissions intensity in 2030 by 36 per cent from 2005 levels.

Emissions intensity measures carbon emissions per Gross Domestic Product (GDP) dollar, which means that an expanded economy can afford to emit

more carbon. But that will not be the case under the new absolute cap. "Shifting the target from a relative figure to an absolute one will be challenging, but an effort worth pursuing", said Senior Minister Teo.

Reducing carbon emissions is tricky for Singapore, whose limited land space makes it difficult to introduce clean energy options like wind and hydroelectric power. But it is pressing ahead with its plan of widespread adoption of solar power, noted Mr Teo. He pointed out that the country is significantly accelerating its deployment of solar energy, from 350 megawatt-peak by the end of this year, to at least 2 gigawatt-peak by 2030.

● THE USE OF VERTICAL URBAN FARMING TECHNOLOGY IS ON THE RISE IN LAND-SCARCE SINGAPORE.

These plans are part of a wider goal: to achieve net-zero emissions as soon as viable in the second half of the century. "Setting out our vision well in advance, will provide a clear sense of direction, and give ourselves and our stakeholders, the time to effect a well-managed transition to a low-carbon economy," explained Mr Teo. "This will also allow us to grow new sectors in our economy, and create new jobs and opportunities."

IN NUMBERS



US\$200 billion
a year: Estimated green investment needed in ASEAN till 2030. Singapore aims to be a green finance hub to spur investments in low-carbon solutions.

Through upskilling and technology adoption, more than

45,000

people will benefit from higher-value jobs in the environmental services, food and water sectors over the next five to 10 years.



A S\$50 million SG Eco Fund
will be made available to the people, private and public sectors to support the co-creation of sustainable initiatives.



By 2021,
Singapore will be one of the few countries in the world to have
100%
green waterworks.



SOURCE: MONETARY AUTHORITY OF SINGAPORE, MINISTRY OF THE ENVIRONMENT AND WATER RESOURCES

BROADENING PERSP

A recap of some of the courses organised by the Singapore Cooperation Programme.



Climate Action Package: Managing Coastal Biodiversity Under Urbanisation and Climate Change Pressures

14 – 18 OCTOBER 2019

Conducted in collaboration with the Singapore Environment Institute, this course discussed the challenges of striking a balance between economic growth and environmental conservation. Participants visited Semakau Landfill on Semakau Island and Sisters' Islands Marine Park Public Gallery on St. John's Island.

DID YOU KNOW?

St John's Island is part of the Sisters' Islands Marine Park, Singapore's first-ever marine park. The Park serves as a marine reserve to protect Singapore's coral reefs, and houses many rare and endangered marine organisms. The Marine Park even has a sea turtle hatchery!

ACTIVES

Climate Action Package: Clean Energy and Emission Reduction

30 SEPTEMBER – 4 OCTOBER 2019

Participants gained a better appreciation of the importance of clean energy, and how it can help countries meet their energy needs while minimising the environmental impact of doing so. Participants learned about Singapore's policies for clean energy and emission reduction through visits to the Singapore Mobility Gallery (which showcases advances in public transport), Tuas South Incineration Plant (a Waste-to-Energy plant) and Tengah Reservoir (the site of the world's largest floating photovoltaic testbed).

DID YOU KNOW?

The Joint Statement Initiative (JSI) on Electronic Commerce outlines WTO members' intention to develop rules on trade-related aspects of e-commerce. Launched by Singapore, Australia and Japan at the 11th WTO Ministerial Conference in December 2017, more than 80 WTO members have since signed on to the JSI.



Climate Action Package: Climate Change: Adaptation and Mitigation Strategies

9 – 13 SEPTEMBER 2019

Another Singapore Environment Institute collaboration, this programme provided a forum for participants to discuss the impact and risks of climate change, energy efficiency and biodiversity. Participants also gained insights into Singapore's adaptation strategies to address rising sea levels and challenges to food security.



Singapore-World Trade Organization (WTO) Third Country Training Programme: Workshop on E-commerce

6 – 8 NOVEMBER 2019

Conducted in partnership with the Ministry of Trade & Industry of Singapore and the WTO Secretariat, this workshop provided an update on recent developments in e-commerce at the national, regional and global levels. Participants also exchanged notes on how to tap on e-commerce to boost economic growth.

Singapore-United States Third Country Training Programme: Workshop on Disease Outbreak and Response

18 – 22 NOVEMBER 2019

This Workshop sought to enhance the ASEAN community's response to Tuberculosis, with insights from Singapore's National Centre for Infectious Diseases (NCID), the US Centers for Disease Control and Prevention and the University of Florida. Through this Workshop and other healthcare courses under the TCTP, Singapore and the US work together to encourage international cooperation, which is critical as seen in the ongoing COVID-19 pandemic.



THE CHANGEMAKER

As Singapore's Chief Negotiator for Climate Change, Joseph Teo works to sustain the momentum of environmental action, both at home and abroad.

The previous decade saw a flurry of activities in the global climate action movement, with landmark deals like the Paris Agreement being inked and ratified. But getting to such milestones is challenging, explained Mr Joseph Teo, Singapore's Chief Negotiator for Climate Change at the Ministry of the Environment and Water Resources. He added, "This is not an easy task, when you have more than 190 countries with different circumstances and interests collectively deciding each year how to implement the Paris Agreement and take further climate action." But Mr Teo does not just negotiate with foreign policymakers; he also collaborates with other agencies in the Singapore Government on our climate pledge and climate actions in support of the global effort to address climate change. This allows the Republic to adopt a coordinated, credible and long-term approach to climate action, and secure the collective buy-in from stakeholders. "While Singapore's actions alone will not be enough, we are glad that we are contributing to international efforts," he says.

Is sustainability in Singapore a matter for the state, businesses or individuals to tackle?

All stakeholders must make the effort to address the impact of climate change and secure a sustainable future. As Singapore is a small country that is vulnerable to climate change, the Government is taking the issue very seriously. But businesses and individuals are playing their part too: the former play a key role in driving cost-effective, low-carbon solutions. Our companies have been proactively adopting more resource-

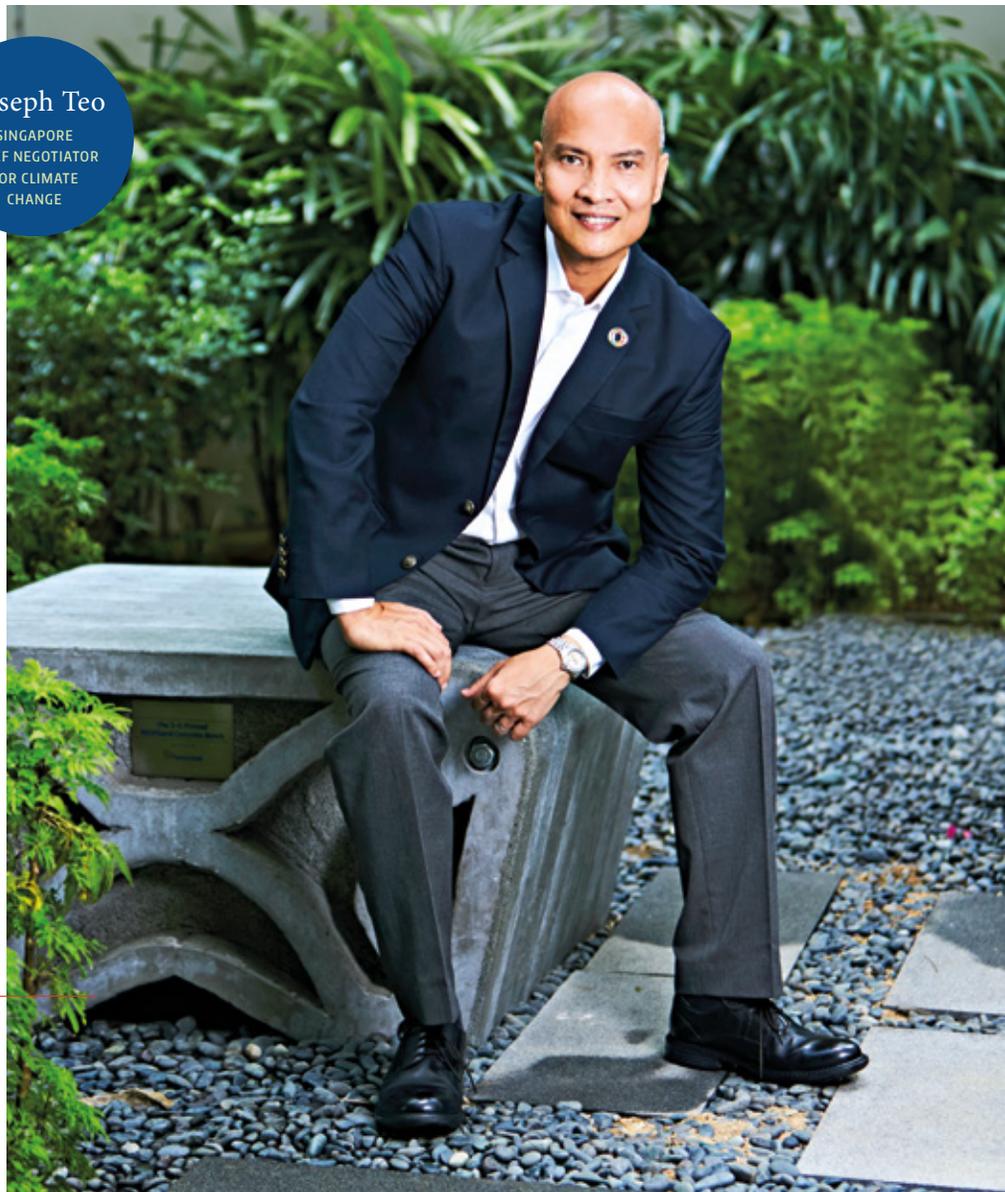
efficient practices, which help to reduce emissions. Meanwhile, we are also heartened that Singaporeans, especially our youth, understand the importance of the issue, and are prepared to adopt climate-friendly habits. To effectively deal with climate change, we need a Whole-of-Singapore approach. We each need to do our part. No effort is too small.

What keeps you up at night when you think about climate change and its impact on our society?

One of my biggest worries is the possible breakdown of the multilateral rules-based system of cooperation in tackling climate change. The Paris Agreement is a young and fragile agreement. It is already facing challenges, key of which is that the climate pledges received under the Agreement so far fall short of what is needed to stay within the global temperature goal. While it is admittedly not perfect, the Paris Agreement is our best bet to address climate change. It would not be in anyone's interest to throw the baby out with the bathwater. This is why Singapore participates actively in the climate negotiations to support a multilateral rules-based approach to addressing climate change, one where every country plays its part to faithfully implement the Paris Agreement.

Joseph Teo

SINGAPORE
CHIEF NEGOTIATOR
FOR CLIMATE
CHANGE



THE 'CONCRETE' BENCH THAT MR TEO IS SITTING ON IS MADE FROM THE ASH OF BURNT TRASH, WHICH WAS THEN 3D-PRINTED INTO ITS CURRENT SHAPE.



MAKE YOUR OWN ECO ENZYME

SUPPLIES NEEDED

- Sugar
- Fruit peels (which are not cooked)
- Plastic container

Prepare an empty plastic container, date and label it.

Fill the container with:

- A) 10 parts water (rainwater, tap water or upcycled rice water)
- B) 1 part sugar (white/brown/jaggery/ *gula melaka*/ coconut/palm/molasses/expired ones are fine)
- C) 3 parts fruit peels/waste

Stir the mixture properly. Leave some air space. Close the lid of the container.

AFTERCARE

During the first month of fermentation, open lid daily to stir the mixture and release gas.

During the second and third month of fermentation, open lid once a week to stir the mixture and release gas.

After three months, the enzyme is ready to be used. Using a sieve/cloth, filter the residue and the remaining liquid is ready to be used. The residue can be used as a fertiliser or kept for the next fermentation.



Teresa Chua
ECO-FRIENDLY LIFESTYLE ADVOCATE

GREEN IN THE GENES

By involving her two children in sustainability projects, this young mother hopes to groom new eco-warriors.

After eight years of working in a bank, Ms Teresa Chua decided to take a break from the corporate world. While she had plenty to do as a young mother of two, the experience also opened her eyes to the global climate crisis. "I was listening to the news a lot more and realised that the world as we knew it was changing... unless we did something," the 36-year-old explains. That was when she decided to form The Green Mama with a friend, offering a variety of workshops tailored to promoting a more sustainable and eco-friendly lifestyle. The blog (<https://thegreenmama.sg/>) is chock-full of tips on living more sustainably. The advice shared is easy-to-follow and caters to Singaporean readers. "When reading advice from people in other countries, you may find that their tips are not as relevant to Singapore, which has its own unique culture and climate." For instance, backyard composting is an often-shared tip for reducing food waste. However, most people in Singapore live in high-rise apartments with little access to backyards. So instead of composting their organic waste, Ms Chua suggests that they use it to make eco enzymes. "These can be used to make anything from mopping liquid to kitchen cleaner and even insect repellent," she shares (see sidebar).

While she primarily uses social media to share such tips, she has also been enlisted by firms like Google to run sustainability workshops. Her workshops aren't just for those in big tech though; as she tells *Experience Singapore*, her little helpers are her two children, aged seven and four. "I hope that by exposing them to such practices at an early age, it will become a way of life and maybe even second nature to them," she says.



Climate change is a global challenge that calls for concerted international action. No single country can succeed in addressing climate change on its own. We need every country to play its part.

Joseph Teo

joining hands

Every year, environment officials from the 10 member states of the Association of South East Asian Nations (ASEAN) gather to discuss an issue that could have devastating effects on the region if left unchecked: climate change. The rising sea levels and changing weather patterns associated with the phenomenon will disproportionately affect the bloc, with some studies suggesting that four of the 10 countries most affected are ASEAN Member States.

In its 11th year, the ASEAN Working Group on Climate Change (AWGCC) is an important plank in the bloc's climate change strategy. For one, it is a useful forum for members to share their interests, concerns and priorities. These are then considered and consolidated, forming the bedrock of the ASEAN Joint Statement on Climate Change, which is read out at the annual UN Climate Change Conference.

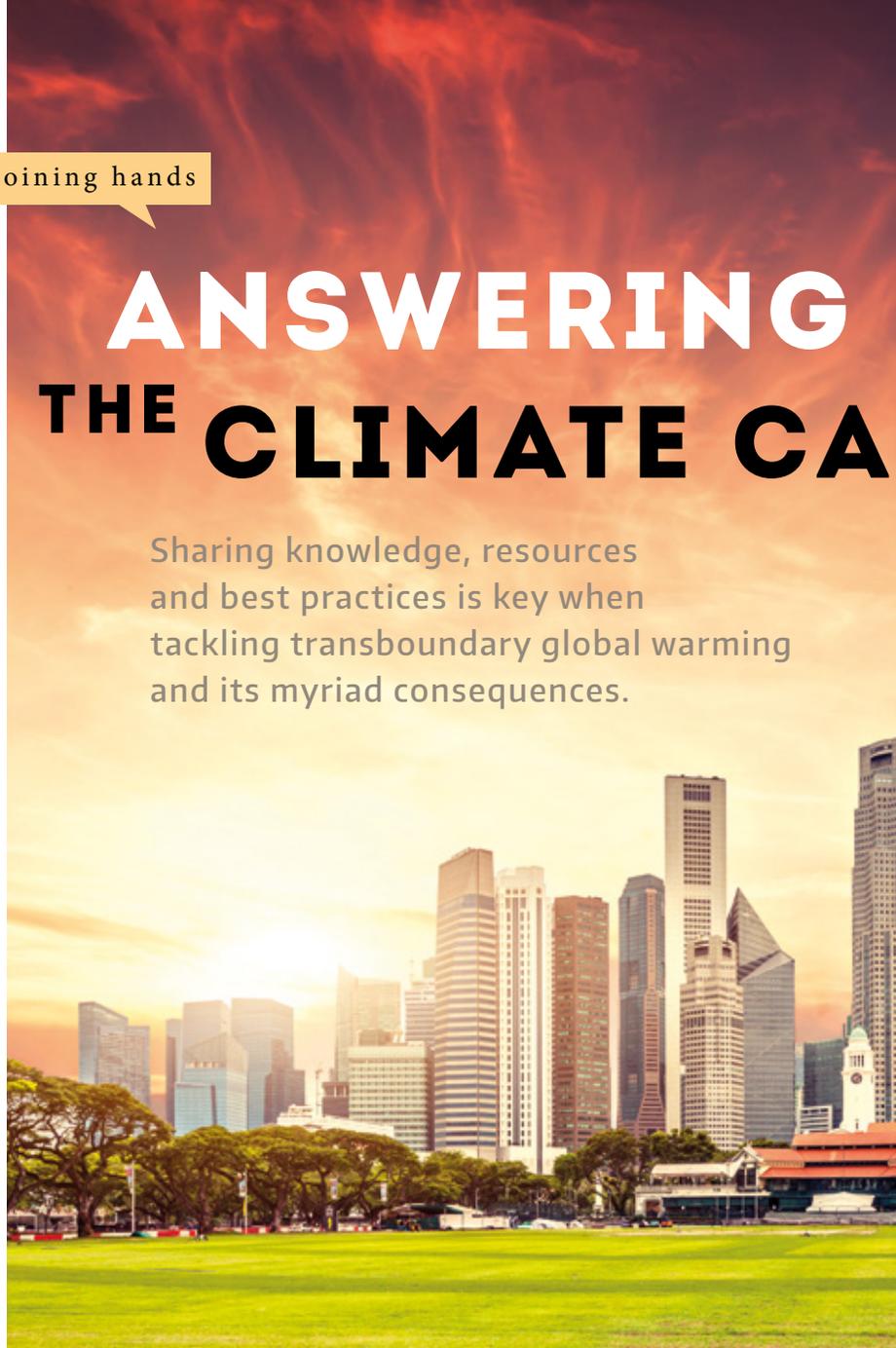
ACTION, NOT WORDS

Beyond symbolising ASEAN's unity in tackling climate change, the AWGCC also identifies areas for greater information- and capability-sharing, not just between Member States, but across sectors and industries as well. Such an approach is effective when dealing with cross-sector issues like climate change, which can affect everything from energy security to transport.

A warmer planet can also pose a serious threat to public health. Changing weather patterns have already caused devastating floods across the world, raising the risk of diseases like dengue and cholera. The former was the subject of a sharing session by AWGCC last year. With its focus on climate resilience, the wide-ranging session attracted close to 50 delegates from ASEAN Member States. At the session, Singapore's National Environment Agency shared novel ways to tackle the dengue menace (see sidebar for more).

ANSWERING THE CLIMATE CA

Sharing knowledge, resources and best practices is key when tackling transboundary global warming and its myriad consequences.



SINGAPORE HOSTED THE 2ND CLIMATE CHANGE PARTNERSHIP CONFERENCE ON 27 AUGUST 2019. THE CONFERENCE WAS ORGANISED UNDER THE AMBIT OF THE ASEAN WORKING GROUP ON CLIMATE CHANGE, AND OFFERED A PLATFORM FOR INTERNATIONAL DIALOGUE AND DEVELOPMENT PARTNERS TO CONNECT WITH AWGCC AND OTHER ASEAN SECTORAL BODIES IN EXPLORING POSSIBLE COLLABORATION ON PROJECTS AND INITIATIVES TO ADDRESS THE IMPACT OF CLIMATE CHANGE IN THE REGION.

TACKLING TODAY'S PROBLEMS

However, cooperation isn't restricted to tackling future issues: it also extends to present problems posed by climate change. The Singapore Armed Forces (SAF) was on hand to help the Australian Defence Force as it battled massive bushfires that ravaged much of eastern Australia late last year. The SAF contingent, comprising some 70 pilots, aircrew and engineers, contributed by delivering firefighting equipment and relief supplies, including water and medicine, as well as fodder for livestock.

The experience is one that First Warrant Officer (1WO) Sukhwinder Singh is unlikely to forget soon. The 40-year-old was especially moved by one encounter with an Australian farmer, whom he met while delivering aid and

PHOTOS: MEWR, GETTY IMAGES, SHUTTERSTOCK

LL



KILL THE BUZZ



Fighting mosquitoes with mosquitoes may seem counter-productive but it could be a viable way of dealing with dengue. Researchers at the National Environment Agency's Environmental Health Institute (NEA-EHI) are exploring the use of mosquitoes carrying the Wolbachia bacteria to suppress the population of dengue-causing Aedes mosquitoes. The study is being carried out across Singapore and its results will be shared with countries grappling with dengue.

Singapore continues to support these countries through the Singapore Cooperation Programme's Singapore International Dengue Workshop, jointly conducted by NEA-EHI and the World Health Organization. For its efforts, the NEA-EHI was presented the inaugural WHO Regional Director's Award for Outstanding Collaborating Centres in 2018.

relief supplies. He told Singapore's *The Straits Times* newspaper, "You could see that there was relief when he saw that there were people trying to help him out," said 1WO Singh. "His exact words to me were 'Thank you, and thank Singapore for me'."

Besides boots on the ground, Singapore also supported relief efforts via two CH-47 Chinook helicopters. In total, the helicopters made over 30 trips, transported more than 260 people, and ferried 73 tonnes of supplies throughout the month-long deployment. So moved were some Australians by Singapore's help that they drew a word of thanks in the sand at a popular beach, just so that the helicopter pilots would be able to see them. The team also received packed snacks from students in Melbourne and kind words from churchgoers as gestures of gratitude.



THREE FOR TOMORROW

Highlights of Singapore's cooperation with other countries to tackle climate change:

- The **CLIMATE ACTION PACKAGE** is an initiative under the Singapore Cooperation Programme. Since 2018, the CAP has been helping developing countries shore up their knowledge and capabilities in climate science, flood management and disaster risk reduction.
- The **ASEAN SPECIALISED METEOROLOGICAL CENTRE** is based in Singapore and allows the region to benefit from the advances made in meteorological science and technology. It also provides weather and climate services to several economic sectors.
- The **SOUTHEAST ASIA DISASTER RISK INSURANCE FACILITY** was established by Singapore, with the support of Japan and the World Bank, to provide flood risk pooling for the region.

SINGAPORE'S MINISTER FOR THE ENVIRONMENT AND WATER RESOURCES MR MASAGOS ZULKIFLI (RIGHT ROW, CENTRE) SPEAKING WITH AUSTRALIAN MINISTER FOR ENERGY AND EMISSIONS REDUCTIONS MR ANGUS TAYLOR (LEFT ROW, CENTRE)



THE **CLIMATE ACTION PACKAGE: DECODING THE PARIS RULEBOOK FOR SOUTHEAST ASIA WORKSHOP** SAW REPRESENTATIVES FROM ASEAN COUNTRIES SHARING AND LEARNING ABOUT KEY ISSUES PERTAINING TO THE PRACTICAL IMPLEMENTATION OF THE PARIS AGREEMENT AND PREPARATIONS FOR THE GLOBAL STOCKTAKE IN 2023.



Singapore will do our full part. But however hard we try, Singapore will not be able to stop climate change on our own. Therefore, we are cooperating with other countries on this common endeavour.

Singapore Prime Minister Lee Hsien Loong, speaking at the Climate Action Summit in 2019



THE SINGAPORE DELEGATION AT THE 2019 UNITED NATIONS CLIMATE CHANGE CONFERENCE.

A NEWSLETTER OF THE
SINGAPORE COOPERATION PROGRAMME

A CHANGING CLIMATE

Warmer temperatures and
changing weather patterns
are part of a reality
Singapore is
preparing for



joining hands

Singapore uses natural resources like mangrove
forests to strengthen coastal protection.