

Singapore's twin imperatives for climate action

Step up climatic defences, and replace fossil fuels with renewable energy

Vinod Thomas

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The continued rise in carbon emissions worldwide, which hit 415 parts per million (ppm) in May, is boosting global temperatures alarmingly. Singapore's warmest days this year exceeded 34 deg C, compared with a 27 deg C average in the 1960s. The top concern at global fora like the recent Group of Seven meeting should have been runaway climate change. And countries, including Singapore, must switch rapidly from polluting fossil fuels to renewable energy,

while building climate defences.

But as scientific evidence mounts on the urgency to slow global warming, CO2 emissions, the main source of man-made global warming, continues to rise in China, the United States and India, the three biggest emitters. Brazil, under President Jair Bolsonaro, is allowing unprecedented deforestation of the Amazon rainforest, which holds 20 per cent of the world's source of oxygen. At the current rate, global carbon emissions would exceed the catastrophic threshold of 450 ppm in just 15 years.

In these circumstances, a two-fold agenda of climate adaptation and climate mitigation

on a fast track is imperative. For one part, adaptation aims to adjust economies to inevitable changes in agriculture, industry and services caused by global warming.

Singapore has been a leader in protecting coastlines. In July, the Government announced it was investing \$400 million over the next two years to boost drainage, and \$10 million to develop projections of sea-level rises.

Singapore is proposing to spend \$100 billion over the next 50-100 years (\$1 billion a year would be 0.2 per cent of current GDP) to guard its coastlines. This is commendable, but the premium is high; front-loading the \$100 billion in the early years rather than waiting because the crisis is here and now, and engineering solutions will be tougher and costlier later.

Singapore's efforts in climate adaptation are integrally intertwined with those of South-east Asia, if not the world.

The Republic's trading route between the East and the West makes it a natural harbour for oil storage and refining facilities, and petrochemical plants. The economy is also dependent on its agricultural exporters' ability to raise the productivity of weather-resistant varieties. Singapore relies on Malaysia, Indonesia and Thailand combined for 27 per cent of the agri-food and seafood supplies.

For the other part, adaptation must be combined with mitigation to decarbonise economies.

The sliver of good news is that solar photovoltaics and wind energy, both non-carbon sources, have become mainstream options with average costs now in the range of fossil fuels. Still, renewable energy accounted for less than 20 per cent of energy consumption in 2017, reflecting its low use in transport, the residential sector and industrial processes where policy frameworks remain patchy.

Meanwhile, energy-related carbon dioxide is rising because of higher fossil fuel consumption, encouraged by government subsidies which increased by one-third last year, to US\$400 billion (S\$555 billion) globally.

Coal plant capacity is set to expand in South and South-east Asia, which together account for half of the world's planned coal power expansion, with India, Vietnam and Indonesia combining for over 30 per cent.

Singapore ranks 126th of 142 countries in CO2 emissions per GDP, but 27th in emissions per capita, largely on account of oil refineries. While renewable energy capacity has expanded in Singapore, natural gas – also carbon-intensive, though half that of coal – is the source of 95 per cent of power generation. Singapore

launched a carbon tax this year, although its starting level is low. DBS Bank is to be commended for ceasing funding for new coal-fired power stations. But Singapore's small land space makes large-scale development of renewables hard. Nevertheless, a wind turbine was built on Pulau Semakau in 2017.

The recent opening of Singapore's electricity market is providing a revealing pointer on consumer preferences. Sign-up rates show that consumers still favour fossil fuel-generated electricity from PacificLight Energy, Tuas Power Supply and other retailers. In a recent survey, less than 10 per cent of 500 consumers were willing to pay more for green electricity, like solar energy from retailer Sunseap. Only 20 per cent said they would choose green electricity if prices were similar. Findings such as these cry out for a campaign to change mindsets on renewable energy.

Among the options for renewables, Australia's Sun Cable proposes to be the world's largest solar farm, with a 10-gigawatt-capacity (one-fifth of Singapore's consumption) of panels across 15,000ha. The solar farm will have battery storage to ensure continuous power supply, with overhead transmission lines plugging electricity into the grid. The bulk of Sun Cable's output could be exported via a

high-voltage, direct-current submarine cable running from Australia through Indonesia to Singapore, replacing much of the expensive gas-fired power.

This month's meeting of the UN General Assembly ought to help propel decarbonisation urgently. Brazil, which is turning the Amazon from a potential carbon sink to a major carbon emitter, must change course. China, the US and India must lead the way in switching radically from polluting to cleaner energy. Indonesia's President just announced that the country's capital will move from sinking Jakarta to a site in sparsely populated East Kalimantan in Borneo – posing a massive environmental risk to its critical rainforests.

Singapore's two-fold priorities are clear. One, the nation needs to accelerate building of climatic defences and adjusting the economy, front-loading these investments for climate adaptation. And two, the Republic needs to replace fossil fuels with renewable energy, partly through imports and partly through local generation.

stopinion@sph.com.sg

• Vinod Thomas is a visiting professor at the Lee Kuan Yew School of Public Policy, National University of Singapore.