

# OPINION

## Calibrating the costs and benefits of Singapore's carbon tax

Higher carbon taxes will aid the drive towards a greener economy, but care must be taken in pacing the increases and setting the rates in view of the trade-offs and Singapore's constraints.

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For The Straits Times

In last week's Budget speech, it was announced that Singapore's carbon tax will be raised from the current \$5 a tonne of emissions to between \$50 and \$80 by 2030. The large hike, which might have come as a surprise to many, is clearly indicative of Singapore's resolve in transitioning into a green economy, even though we contribute a meagre 0.1 per cent to global greenhouse gas emissions.

Leading the region in climate action by raising our carbon tax is a bold move, partly motivated by our vulnerability to climate change as an island state, and our intention to position ourselves as a carbon services hub in the future, which could attract investments and create job opportunities.

But two immediate questions arise: What are the trade-offs involved in reducing emissions? How would our daily lives be impacted?

### THE COSTS OF GREENING

First, a quick explanation about carbon taxes and how they work. Carbon emissions impose high costs on societies and the world. A carbon tax acts as a corrective pricing mechanism to make emitters pay for the social costs they generate. With a carbon tax, prices of carbon-intensive fossil fuels will rise to reflect the negative spillover effects they cause. The intent is to discourage fossil fuel use, incentivise the switch to cleaner energies and processes, leading to a fall in emissions.

The trade-off? Rising business costs and a squeeze on profits. As an export-oriented economy – exports constitute more than 170 per cent of our gross domestic product – Singapore runs the risk of its international competitiveness being hurt by the imposition of a substantial carbon tax as our trading partners turn to competitors who, without a carbon tax, can under-price us.

The rise in costs will also be pronounced in non-traded but carbon-intensive sectors, such as

the power generation companies (gencos).

Thankfully, the staggered increments of \$25 a tonne in 2024, \$45 in 2026, and finally upwards of \$50 in 2030 have been clearly laid out, giving businesses much-needed time to adjust.

The carbon tax will also be revenue neutral and earmarked for supporting decarbonisation efforts, such as through efficiency grants.

Nonetheless, one should remain wary about too quick and too high an adjustment in rates over too short a time, which could seriously hurt growth and competitiveness, and even drive companies out of Singapore. Smoothing the rise in carbon tax rates over a longer period is better.

### DERIVING THE OPTIMAL TAX RATE

With a carbon tax as a given, what would be the optimal rate then? Carbon tax rates vary across countries.

Sweden has a high carbon tax of €114 (\$174) a tonne, but it has more alternatives to fossil fuels in the form of hydroelectric and nuclear power. Singapore does not. Solar power, for example, constitutes about 1 per cent of our current energy mix, with fossil fuels making up more than 96 per cent of the total.

Renewable energy will not become a big part of our lives with the current state of technology.

The effectiveness of Singapore's carbon tax in reducing emissions will ultimately depend on available decarbonisation technologies – for carbon capture, utilisation and storage – and the availability of high-quality carbon credits in the international market. Without them, higher taxes will not lower emissions, but will instead drive inflation.

In other words, carbon abatement is costly in Singapore, and the carbon tax has to be set within our geographical and technological constraints.

### HIGHER COST OF LIVING

The impact of the carbon tax will be widespread. The tax is applied directly on about 50 large emitters with at least 25,000 tonnes of annual emissions – roughly, companies that generate emissions of more than 1,000 households – and will cover 80 per



An oil refinery on Pulau Bukom as seen from Sentosa. Carbon abatement is costly in Singapore, and the carbon tax has to be set within the country's geographical and technological constraints, say the writers.  
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cent of Singapore's greenhouse gas emissions. While consumers are not paying the tax first-hand, every consumer contributes to emissions, and the broad tax will find its way to every one of us.

In his Budget speech, Finance Minister Lawrence Wong said that an increase in carbon tax to \$25 a tonne is estimated to lead to a rise in utility bills for an average household by \$4. What about the impact on our overall cost of living?

This depends on the sharing of the tax, also termed "tax incidence" in economics. When electricity tariffs increase, not only will our utility bills go up, but so will all other expenses such as food, transport, retail and recreational pursuits. The extent to which such costs will rise will be determined by how much of the tax is shared between all the parties: say, between the gencos and the consumers, the gencos and the hawkers, the hawkers and the consumers, and so on.

Each tax incidence, in turn, depends on each party's price sensitivity – whether consumption falls when prices rise. Activities such as eating out and leisure, with more substitutes, will be more price sensitive as compared with utilities and transport, where consumers will bear a larger portion of the tax.

To accurately determine the total passing on of costs requires complex scrutiny. Instead, let us

provide a simpler illustration.

Suppose an average household spends \$100 on utilities and \$4,800 for other purposes. A \$4 increase in utility bills represents a 4 per cent increase on \$100.

Let's consider that utilities make up the most carbon-intensive item households spend on. Now, if the remaining activities are assumed to be half as carbon-intensive, and with half the tax incidence, then there would be a 1 per cent increase in prices on the other \$4,800 of expenses. That is to say, other living expenses are estimated to increase by about \$48.

Extrapolating this, would it mean that when the carbon tax increases to the \$80 mark, utility bills will increase by \$15, and monthly cost of living will increase by even more?

Thankfully, this scary scenario is unlikely. As the carbon tax takes effect, consumption patterns and tax incidences will shift. Energy efficiency is expected to improve as well.

For instance, if as a response to the carbon tax, households switch to more efficient appliances, the electricity cost savings might even outweigh the cost increase. Choosing more efficient air-conditioners and refrigerators could yield energy savings of more than \$30 monthly.

This is, of course, an optimistic projection. However, as long as we adapt and reduce energy wastage

in the longer term, households are expected to be able to cope with the higher carbon tax quite comfortably.

Moreover, with government transfers in place such as U-Save, rising incomes and a general improvement in energy efficiency technologies, most of the regressive impacts on lower-income households will be mitigated.

The trickling down of the carbon tax can also nudge not only large emitters, but individuals as well, to consciously adopt greener practices.

### THE PATH AHEAD

The move towards a robust carbon tax is commendable in signalling Singapore's progress into a greener future, through encouraging research and development activities in sustainable solutions, and changing the behaviour of energy users. This is in line with the international momentum, with countries such as China setting a carbon tax equivalent to \$45 a tonne and South Korea \$61 a tonne by 2030.)

Nonetheless, we must exercise caution in pacing increases in the carbon tax given the economic trade-offs involved. Having some flexibility in the carbon tax rate increases would instil greater energy and economic resilience, especially in the event of energy

crises in the future.

It would also be advisable to recognise that Singapore is unique in its energy constraints, and to pragmatically pace our tax increases with the region to ensure international competitiveness.

Ideally, we should continue to study and recalibrate our carbon tax rate within a reasonable timeframe, adjusting the rate changes in accordance with changing circumstances and international developments. Most importantly, Singapore's carbon tax must be guided by its interest firsts. Whatever the rate in future, it must be guided by two key factors – be effective in reducing emissions and not disadvantage our businesses and households.

The good news is that if firms and individuals are able to transition successfully into a low-carbon world in the years to come, we would not need to be burdened by a high carbon tax rate. The more effort we put into going green, the less we have to pay.

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