

National Climate Change Policies

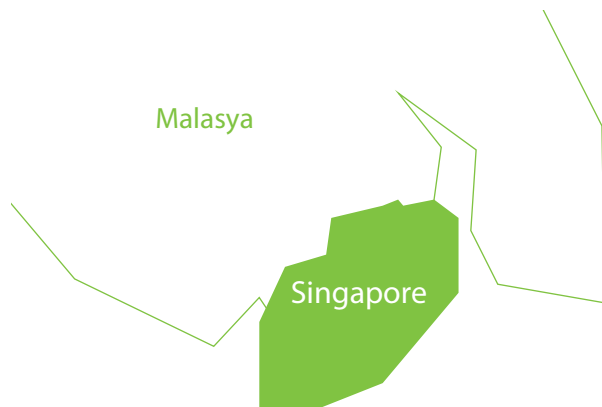
Singapore

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Background Information

Climate Change Policy, both national and international has focused on mitigation. However, as some climate change is inevitable (due to past greenhouse gas emissions), the need to adapt to existing climate variability has been recognized.

Singapore is situated in Southeast Asia, one of the region's most vulnerable to climate change. The country has overcome many environmental challenges in its short history. As a small, low-lying city-state with one of the world's most open economies, Singapore is vulnerable to the harmful effects of climate change, such as rising sea levels, greenhouse gas emissions, and the increased frequency of rainfall.

The occurrence of extreme and challenging weather events has significantly influenced awareness of- and concern about the potential impacts of climate. The dynamic nature of climate change underscores the importance of information gathering and modelling climate change impacts at national, provincial and

Quick facts

Zone	National Territory
Project Started	2012
Theme	Climate Change National Strategy
Leading Agency	National Climate Change Secretariat

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local levels. Singapore recognizes the importance of continually improved understanding of the detailed effects and resulting impacts of climate change in order to facilitate the identification of new, and review of existing, adaptation measures. Therefore, in 2012, the Singapore government launched the National Climate Change Strategy 2012 document entitled “Climate Change & Singapore: Challenges, Opportunities, Partnerships.”

The National Climate Change Strategy 2012 (NCCS 2012) represents Singapore’s “holistic” and “comprehensive” national policy for climate change mitigation and adaptation. This National Climate Change Strategy presents Singapore’s current and future efforts to address climate change in vulnerability and adaptation, as well as mitigation of greenhouse gas emissions. The strategy also outlines local competency-building efforts and the participation in international climate change discussions.

Policy Details

Singapore has a history of climate change awareness. In 2006, the Climate Change Awareness Programme (CCAP) was launched by the Singapore Environment Council (SEC), which was supported by the National Environment Agency (NEA). The aim of the CCAP was to raise awareness among Singaporeans about climate change. Other activities included the release of the National Climate Change in 2008 and 2012, the Singapore Green Plan 2012 (2006 edition) published in February 2006, the National Energy Policy Report published in November 2007, the Sustainable Development Blueprint published in April 2009, and the Singapore’s Second National Communication on Climate Change published in November 2010.

On July 2010, the Government formed the National Climate Change Secretariat (NCCS) as a dedicated unit under the Prime Minister’s Office to provide coordination at the highest level for Singapore’s domestic and international policies, plans and actions on climate change.

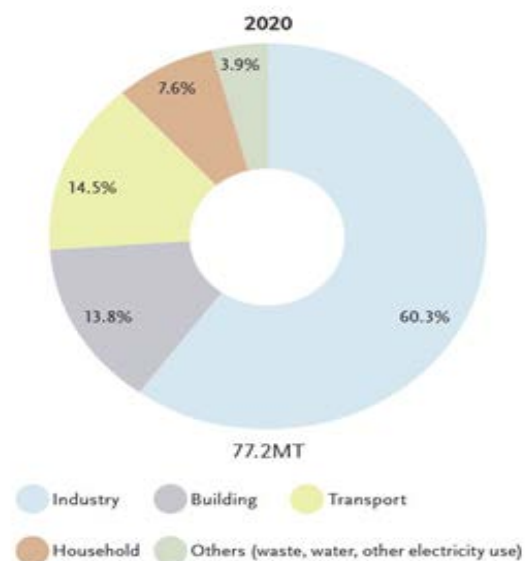
From September 2011 to January 2012, the government embarked on a series of public consultations to

seek feedback and ideas on climate change-related issues on four key areas; households, transport, business & industries, and cleantech opportunities, to prepare the National Climate Change Strategy 2012 (NCCS-2012). After these consultations, on June 14, 2012, Mr. Teo Chee Hean, Deputy Prime Minister, launched the National Climate Change Strategy 2012 (NCCS 2012) at the National Climate Change Youth Conference in Singapore.

The National Climate Change Strategy (NCCS-2012) document entitled “Climate Change & Singapore: Challenges, Opportunities, Partnerships” reflects Singapore’s approach to addressing climate related challenges on four key priorities:

I - Mitigation: Reducing Emissions

Singapore has pledged to reduce greenhouse gas emissions by 16% below 2020 business-as-usual (BAU) levels. Ahead of this, the country has embarked on policies and measures to reduce its emissions by 7% to 11% below 2020 BAU levels. Singapore’s BAU emissions are expected to reach 77.2 million tonnes (MT) in 2020. Figure 1 shows the emissions contribution from the key sectors.



Note: Figure refers to total greenhouse gas emissions. Greenhouse gases other than carbon dioxide (CO₂) are converted to their CO₂-equivalent. The sectoral contributions do not add up to 100% due to rounding of the respective percentages to one decimal place.

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The Energy Efficient Programme Office (E²PO) was established in 2007 to drive energy efficiency improvements in the various sectors of the economy. E²PO is a multi-agency committee co-lead by the National Environment Agency (NEA) and the Energy Market Authority (EMA). Measures are being implemented across all key sectors. The various mitigation measures to reduce emissions in the key sectors include:

(1) Power Generation. Singapore imports all fuel required for energy needs. In 2001, fuel oil was dominant source for generation of electricity at 72%. Since then, natural gas has taken over as dominant fuel source at 81% in 2009. Electricity generated by diesel, syngas and refuse incineration remain around 4%. In its BAU projection for 2020, Singapore's fuel mix is assumed to be around 70% to 75% natural gas, with the rest primarily based on fuel oil. To further reduce energy intensity and become more competitive in the global economy, the Government has enacted landmark legislation in the form of the Energy Conservation Act, passed by the Parliament of Singapore in April 2012, and effective from April 2013.

(2) Building. The Green Building Masterplan, first launched in 2006, focused on the greening of new buildings. The 2nd Green Building Masterplan, launched in 2009, gives greater emphasis to the greening of existing buildings. It sets out specific initiatives in six key strategic thrusts to achieve the national target of greening at least 80% of the buildings in Singapore by 2030.

(3) Transport. Private cars contribute the largest share of land transport emissions (35%), followed by commercial vehicles, taxis, buses, Mass Rapid Transit (MRT)/Light Rapid Transit (LRT) and motorcycles. Although public transport usage has been increasing in absolute terms, the public transport modal split, the percentage of morning peak hour commutes using public

transport has declined from 63% in 2004 to 59% in 2008. Under the Land Transport Masterplan, Singapore targets to achieve a 70% public transport modal split by 2020, up from 59% in 2008. The capacity of the existing rail network will be significantly increased from around 175km today to about 280km by the next decade so as to increase its reach and accessibility.

(4) Household. Households account for about one-sixth of the electricity consumed in Singapore. Singapore implemented the Minimum Energy Performance Standards (MEPS) in 2011, a supply-side measure which prohibits the sale of the most energy inefficient appliance models. Singapore has also put in place awareness programmes to inform households of ways to save energy. The National Environment Agency (NEA) also encourages energy efficiency and conservation through the 10% Energy Challenge.

(5) Industry. Singapore's manufacturing sector is thus expected to continue to constitute a significant part in Singapore's economic mix, contributing to 20% to 25% of its economy. It will account for the majority (60%) of its projected 2020 emissions. Singapore's refining and chemical industries are expected to contribute about half of Singapore's 2020 BAU emissions.

(6) Waste and Water. Singapore's waste management strategy is to reduce waste through the 3Rs (reduce, reuse, recycle), and to incinerate the remaining waste in waste-to-energy plants. In 2006 the overall Singapore recycling rate was 51%, this rose to 54% in 2007 and 56% by 2008. Singapore intends to increase its recycling rate from 59% in 2011 to 70% by 2030, and is looking into more ways to reduce emissions, such as recycling more plastic waste instead of incinerating it. By 2060, the Public Utilities Board (PUB) aims to expand the country desalination capacity by almost 10 times to meet 30% of our long-term water needs.

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II - Adapting to Climate Change: A More Resilient Singapore

Singapore's annual mean surface temperature has risen from 26.8°C in 1948 to 27.6°C in 2011. Rainfall data between 1980 and 2010 indicate that the daily rainfall totals and frequency of days with heavier rainfall show an uptrend. Mean sea level has increased by about 3mm per year over the last 15 years. In light of these potential effects of climate change, the NCCS 2012 paper describes the implementation of various adaptation measures:

(1) For coastal protection, the Building and Construction Authority (BCA) has commissioned a Risk Map Study to better identify the specific coastal areas at risk of inundation and the potential damage associated, which is expected to be completed by end of 2013. According to the NCCS 2012 paper, 70-80 percent of Singapore's coastal areas are protected against coastal erosion by hard wall or stone embankments; the rest are natural areas, such as beaches and mangroves.

(2) For water resources and drainage, the Public Utilities Board (PUB), Singapore's national water agency, has developed a diversified and robust water supply through the "Four National Taps" (local catchment water, imported water from Malaysia, NEWater and desalinated water) to ensure a sustainable water supply. According to the NCCS 2012 paper, by 2060, PUB plans to triple the current NEWater capacity and ramp up desalination capacity so that NEWater and desalinated water meet up to 50% and 30% of Singapore's future water demand respectively.

(3) For biodiversity and greenery, the National Parks Board (NParks) aims to investigate the potential impact of climate change on biodiversity and greenery in greater detail. Thus, tree management and maintenance will be enhanced, and the current health checks on the trees will be conducted more thoroughly and frequently, while more suitable species which are less vulnerable to storms and strong winds will be planted along streets.

(4) For public health, the National Environment Agency (NEA) is collaborating with the Ministry of Health (MOH) to study the relationship between climatic factors (such as temperature, humidity and rainfall) and public health risks such as dengue fever, and heat disorders and respiratory diseases.

(5) For energy demand and urban infrastructure, the Energy Market Authority (EMA) and the Building and Construction Authority (BCA) are studying Singapore's urban temperature profile and the energy consumption of its buildings to understand how temperature increase and wind changes will affect Singaporeans.

III - Opportunities for Green Growth

Singapore's local research community has established strong R&D capabilities in cleantech. Both the National University of Singapore (NUS) and the Nanyang Technological University (NTU) have set up specialised offices, bringing together multidisciplinary teams to develop solutions to complex and wide-ranging energy and sustainability challenges. The growing R&D scene in Singapore has created opportunities for research-related careers.

IV - Local and International Partnerships on Climate Change

(1) Local Partnerships: the National strategy on climate change issues is shaped by an on-going consultative and inclusive engagement with partners from all sectors. Singapore has dedicated significant attention to programmes that raise public awareness and encourage emissions reductions across all sectors. Today, there is a vibrant and growing movement on climate change comprising individuals, businesses, non-governmental organisations (NGOs) and community groups.

(2) International Partnerships: Singapore ratified the United Nations Framework Convention

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on Climate Change in 1997. In 2006, Singapore acceded to the UNFCCC and became the 168th country to adopt the protocol. Singapore plays an

active role in international climate change discussions and efforts (see Figure 2). The country supports the multilateral negotiations under the United Nations Framework Convention on Climate Change (UNFCCC) and its Kyoto Protocol, as well as other key UN specialised agencies.

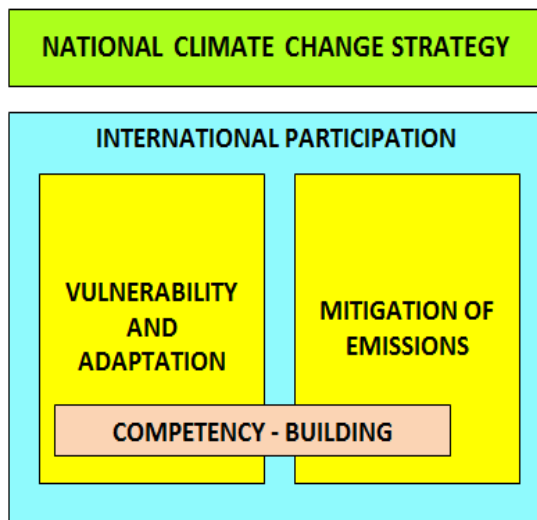


Figure 2: Schematic of National Climate Change Strategy

Policy Challenges

Although Singapore has proactively reduced the growth of carbon emissions through fuel taxes, controlling vehicle ownership and usage, energy efficiency incentives and other policies, there are challenges to use alternative energy sources such as solar, wind and nuclear on a wide scale given its small size and dense urban landscape, with more than 5 million people occupying a land area of about 710km². Such difficulties in switching to alternatives are recognised by the UNFCCC.

Singapore, as an alternative-energy disadvantaged city-state, relies on imported fuels to power its daily activities. In 2010, the Economic Strategies Committee recommended to have 5% of peak electricity demand supplied from renewable energy

sources by 2020. However, at present, there are no renewable energy subsidies, targets or feed-in tariffs to incentivise renewable energy generation, and this is due to the fact that Singapore's climate change policies are directed at research and development, environmental technology, green transport, water saving and energy efficiency rather than renewable energy generation.

Notwithstanding its natural circumstances and constraints, Singapore's climate change policies have helped to significantly moderate its carbon emissions growth. Nevertheless, Singapore is naturally vulnerable to the effects of climate change, and its success and prosperity depends on its ability to overcome the challenges of climate change and to grasp the opportunities it presents. Singapore should regularly review the effectiveness of existing policies and measures, identify new measures and put in place the necessary policies, public investments, information and support the use and generation of renewable energy, in order to stabilise its long-term emissions and remain resilient to the adverse effects of climate change. This will enable the country to continue to thrive in a changing world, and ensure a high quality environment and sustainable growth for the sake of its current and future generations.

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