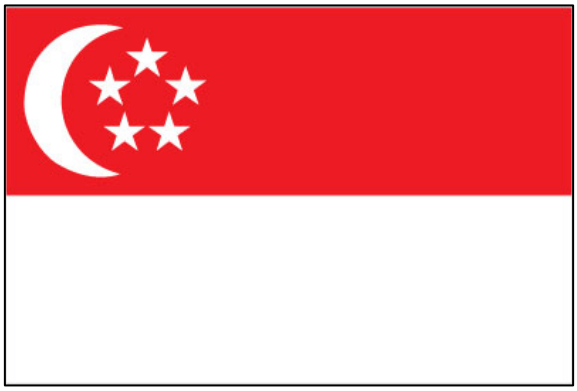
CLIMATE CHANGE LEGISLATION IN

SINGAPORE

AN EXCERPT FROM

The 2015 Global Climate Legislation Study

A Review of Climate Change Legislation in 99 Countries



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Singapore

Legislative Process

Singapore's constitution took effect in August 1965 and is the supreme law. The country is a unitary multiparty parliamentary republic, with a Westminster system of unicameral parliamentary government representing constituencies. General elections must be conducted within five years of the first sitting of parliament; however, since the legislative assembly election in 1959 the government has always been formed by the People's Action Party, either outright, or with an overwhelming majority. A President is elected by popular vote every six years and is largely ceremonial (although has veto powers over certain executive decisions). Together with the President, a Prime Minister-led cabinet forms the executive branch of the government.

The parliament is made up of elected MPs, non-constituency MPs (the best performing losers of the general election), and nominated MPs (appointed by the President). As a result of the 2011 general election, there are presently 87 elected MPs, three non-constituency MPs and nine nominated MPs. The next general election must be held by 8 January 2017. The parliament, together with the President, constitutes the legislative branch of government.

Bills are usually introduced by a minister on behalf of the government, but any MP may introduce a bill (known as a Private Member's Bill). Bills go through three readings, with debate and voting on the bill occurring at the second reading. After the second reading, bills progress either to a Committee of the Whole Parliament or to a Select Committee for detailed examination, debate and amendments. Bills are passed after their third reading in parliament, and in most cases, are then scrutinised by the Presidential Council for Minority Rights. If approved by this council, the bill is then assented to by the President before being published in the Government Gazette to become a law. Other government policies such as strategies and blueprints are produced by various relevant government departments, committees and agencies. These policies either act as executive government policy, or provide implementation guidance for legislative acts.

Approach to Climate Change

Singapore ratified the UNFCCC in 1997, the Kyoto Protocol (as a non-Annex I country) in 2006, and the Doha Amendment to the Kyoto Protocol in September 2014. It submitted its first communication to the UNFCCC in 2000, its second communication in 2010, and its third national communication and first biennial update report in December 2014. In 2009, it pledged to reduce its emissions by 16% from the 2020 business-as-usual (BAU) level if there is a legally binding global agreement in which all countries implement their commitments in good faith. Ahead of this, Singapore has embarked on policies and measures that should reduce its emissions by 7% to 11% below 2020 BAU levels.

In 2007, an Inter-Ministerial Committee on Climate Change (IMCCC) was set up to oversee inter-agency co-ordination on climate change. The IMCCC is supported by an executive committee, which oversees a Long-Term Emissions and Mitigation working group, an International Negotiations working group, and a Resilience working group. The working groups are made up of relevant permanent secretaries and chief executives of ministries and national agencies.

In July 2010 the National Climate Change Secretariat (NCCS) was established as a dedicated unit under the Prime Minister's Office to develop and provide co-ordination for climate change-related policies (both domestic and international). In 2012, the NCCS published a National Climate Change Strategy, which outlines Singapore's plans to address climate change through a whole-of-nation approach and which replaced a previous version published in 2008.

The Ministry of the Environment and Water Resources (MEWR), established in 1972 also plays an active role in climate change legislation and policy. The National Environment Agency is a statutory board operating under the MEWR and is responsible for co-ordinating national communications to the UNFCCC. It also leads various other energy and climate change measures, such as initiatives in conjunction with the Energy Market Authority, leading the Energy Efficiency Programme Office and co-ordinating the Clean Development Mechanism.

The first version of the Sustainable Singapore Blueprint was published by MEWR and the Ministry of National Development in 2009, as a national framework that outlined strategies for sustainable development. The blueprint included targets related to Singapore's GHG emissions, such as energy efficiency and the promotion of public transport. A review process for the blueprint, involving public consultation, was conducted and a second edition, the Sustainable Singapore Blueprint 2015, was published in November 2014.

The key expected climate change impacts for Singapore are sea level rise (most of the country is only 15m above mean sea level, with approximately 30% less than 5m above mean sea level) and water supply and security (both in terms of drought and flash flooding). Other identified impacts include biodiversity and greenery, effects on public health (such as increases in vector-borne diseases e.g. dengue fever, which is endemic), an increase in the urban heat island effect (leading to knock-on increases in energy demand for services such as air conditioning), and vulnerability in terms of global food supply (as Singapore imports more than 90% of its food). The country is also focusing on developing its R&D capacity in the field of climate science. The Centre for Climate Research Singapore was established by Meteorological Service Singapore in 2013 to enhance in-house capacity in climate science and modelling in Singapore and the wider Southeast Asia region.

Singapore, as a member of ASEAN (Association of Southeast Asian Nations) is party to the ASEAN Socio-Cultural Community (ASCC) Blueprint 2009-2015. Within this blueprint, enhanced regional co-operation on the topic of climate change is promoted, including specific actions such as encouraging efforts to develop an ASEAN Climate Change Initiative (ACCI) and developing regional strategies to enhance capacity for adaptation, low carbon economy, and promote public awareness to address effects of climate change. NGOs such as the independent Singapore Environment Council and WWF also operate, with the former running an annual Schools' Green Audit Award to encourage children to cut down on energy and water usage, and to reduce waste and recycle.

Energy supply

Singapore is largely dependent on energy imports, importing all its crude oil and natural gas. In 2013, 160 mtoe of energy products were imported, with primary energy consumption approximately 16.4 mtoe. Gas makes up approximately 75% of primary energy consumption and fuels approximately 92% of electric power generation. A further 12% of the country's energy consumption is diesel, with the remainder predominantly fuel oil.

In 2013, Singapore opened a liquefied natural gas (LNG) terminal, enabling it to diversify its natural gas imports from countries other than Malaysia and Indonesia, and to support trading. The terminal can presently accommodate a throughput of 6m tonnes per annum (Mtpa) and store up to 540,000m³. Plans for the terminal's Phase 3 expansion were announced in 2014. These will add additional storage of 260,000m³ and raise throughput to around 11 Mtpa.

Despite challenges such as the country's small size and dense urban landscape, Singapore is also developing its solar photovoltaic (PV) technology capability, which will help facilitate the deployment of solar power on a larger scale. As of the third quarter of 2014, it had an installed capacity for its grid-connected solar PV systems of 24MW peak, up from 0.4MW peak in 2008. The country is also home to a large solar production facility owned by REC Solar ASA, which produced 722MW of solar panels in 2012. The Solar Energy Research Institute of Singapore was established in 2008 at the National University of Singapore. The country does not have any mandated renewable

energy targets, although there has been some discussion of targets, including a report of the government's Economic Strategies Committee in 2010 which recommended that the country should aim to have 5% of peak energy demand supplied from renewable energy sources by 2020. Through projects such as the SolarNova programme (led by the Economic Development Board), Singapore plans to raise the adoption of solar power to 350 MW peak by 2020, about 5% of 2020 peak electricity demand.

Energy demand

Energy consumption is increasing in Singapore, with electricity sales growing at 1.6% between 2012 and 2013. Industrial electricity consumption grew at 1.4%, commerce and services grew by 2.9% and the household sector by 1.9%.

Energy efficiency is critical for Singapore, particularly given its small size (707.18km^2) and the fact that it is highly urbanised. Singapore established an Energy Efficiency Programme Office (E^{2}PO) in 2007 to promote and facilitate the adoption of energy efficiency initiatives. The E^{2}PO is a multi-agency committee led by the National Environment Agency and the Energy Market Authority, and comprises: the Economic Development Board; Land Transport Authority; Building and Construction Authority; Housing and Development Board; Infocomm Authority of Singapore; Agency for Science, Technology and Research; Urban Redevelopment Authority; Jurong Town Corporation; and National Research Foundation. MEWR and the Ministry of Trade and Industry are also represented in the committee.

Numerous energy efficiency incentive schemes are operated via E^{2}PO including the 'Design for Efficiency Scheme' whereby new industrial facility owners who plan to integrate energy and resource efficiency improvements into manufacturing development plans at an early stage can benefit from a grant that funds up to 50% of the design workshop fees up to SGD600,000 (USD459,458). For owners and operators of existing commercial and industrial facilities undertaking energy assessments, the 'Energy Efficiency Improvement Assistance Scheme' co-funds up to 50% of the qualifying cost up to SGD200,000 (USD153,153) per facility. The 'Grant for Energy Efficient Technologies' allows for owners and operators of industrial facilities investing in energy efficient equipment or technologies to apply for a 20% grant up to SGD4m (USD3.06m). Companies that wish to build their capabilities in energy management and energy efficiency (EE) can also participate in the industry-focused 'Energy Efficiency National Partnership' programme comprising courses and workshops on EE, as well as an annual EENP Award to recognise companies and energy management teams' efforts and achievements.

Other initiatives coordinated by the Building and Construction Authority (BCA) focus on new and existing buildings and aim to accelerate the pace of green building development towards meeting the national target of at least 80% of buildings achieve the BCA Green Mark Certified rating by 2030, with an emphasis on raising energy efficiency standards in buildings. Among the measures, the Building Control Act has been enhanced with the inclusion of the Building Control (Environmental Sustainability) Regulations, to require a minimum environmental sustainability standard that is equivalent to the Green Mark Certified Level for new buildings and existing ones that undergo major retrofitting since 2008. The Green Mark Incentive Scheme for New Buildings was introduced to accelerate the adoption of environmentally-friendly green building technologies and building design practices in new buildings. In addition, the Green Mark Incentive Scheme for Existing Buildings and Premises was launched under BCA's 3rd Green Building Masterplan to encourage small and medium-sized building owners and tenants to adopt energy efficiency improvements and measures within their buildings and premises.

Energy intensive companies in the industry and transport sectors are required under the 2012 Energy Conservation Act (ECA) to implement basic energy management practices. In addition to the energy management provisions stipulated under the ECA, the government has stated that it will continue to price energy according to market forces without subsidises so that there is no waste or

over-use. Several initiatives are currently in place to encourage energy efficient purchasing, such as the Carbon Emissions-based Vehicle scheme where new cars that emit less than 160g of CO_2 per kilometre receive rebates up to SGD20,000 (or additional taxes up to SGD20,000 for new cars that emit more than 210g for CO_2 per kilometre), and a mandatory energy labelling scheme for home appliances (air-conditioners, refrigerators, televisions and clothes dryers), which requires suppliers to show the estimated annual energy consumption and costs of using the product on energy labels. To help consumers avoid being locked into the high energy consumption and cost of operating energy inefficient appliances, the government introduced Minimum Energy Performance Standards for energy-intensive appliances such as air-conditioners and refrigerators since September 2011. The adoption of energy saving habits at home is also being promoted through online resources such as the E2Singapore website, mobile applications such as the Energy Audit and Life Cycle Cost Calculator, media publicity and community outreach.

Carbon pricing

Singapore does not currently have a carbon price. However, in a speech in 2010 Prime Minister Lee Hsien Loong noted the importance of pricing carbon to induce behavioural change at the consumer level as well as the need to work through the market to deal with carbon emissions. Singapore will need to consider the impact of a carbon pricing scheme including learning from the experiences of other countries.

Transportation

Transport accounted for 15% of Singapore's CO2 emissions in 2010. Given Singapore's tight land constraints, the government's priority is to create a space-efficient, environmentally-sustainable and energy efficient transportation network.

The government is promoting public transport for commuting, and has set a target of having 75% of all trips made during the morning and evening peak hours by public transport by 2020. The rail network is being doubled from its current coverage of 178km to 280km by 2020. The public bus fleet is also due to grow by 20%. For shorter distances, the government is encouraging walking and cycling. The Walk2Ride programme is adding more than 200km of walkways by 2018. In addition, the amount of off-road cycling paths is being expanded to 190km in 2020, with more bicycle racks installed across the island to cater to different commuting needs.

The growth rate of the vehicle population and their usage are actively managed, with, the growth rate of vehicles set at 0.5% per annum and set to be lowered to 0.25% from February 2015 through the auction of permits to own a vehicle, called the Certificate of Entitlement Scheme, which was introduced in 1990. The Electronic Road Pricing System, introduced in 1998, limits vehicle usage by imposing a congestion charge on any vehicle passing under a gantry during hours when it is operational. As outlined above, the Carbon Emissions-based Vehicle Scheme, introduced in 2013 under the Road Traffic Act, encourages the purchase of more fuel-efficient vehicles by providing a rebate or imposing a surcharge on registration fees depending on the emissions levels of the car being purchased. The government also aims to improve fuel economy through the Fuel Economy Labelling Scheme (FELS). Introduced in 2009, FELS requires all automobile retailers to display the fuel economy of passenger car and light goods vehicles.

REDD+ and LULUCF

Singapore has started a multi-year project to measure its carbon inventory for vegetation and land uses covering the period from 1990 onwards. Initiated by Singapore's National Parks Board in collaboration with the Austrian Natural Resources Management and International Co-operation Agency, the project will establish a monitoring system to track GHG absorption and emissions from land-use and land-use change.

Adaptation

Minimum reclamation levels for newly reclaimed land have been raised by 1m since late 2011, in addition to the previous level of 1.25m above the highest recorded tide level observed before 1991. The development of drainage infrastructure over the last 20 years has reduced flood prone areas from approximately 3,200ha in the 1970s to 49 ha as at January 2012. More recent flood alleviation projects include the further widening and deepening of drains and canals and the completion of the Marina Barrage, a dam built across Singapore's Marina Channel and which also provides a freshwater reservoir for the country. In addition to this reservoir, desalination plants and the 'NEWater' project which treats wastewater using dual-membrane ultraviolet technology also provide a further source of freshwater for domestic and industrial use (as the country has limited internal freshwater supplies, the availability of water is a key identified vulnerability for Singapore as a result of climate change).

Singapore is situated in a region where vector-borne diseases, such as dengue, are endemic. Although urbanisation and population growth contribute significantly to dengue transmission, higher mean temperature and absolute humidity could result in higher dengue incidence. Concerns regarding the relationship between increases in ambient temperature and vector-borne diseases such as dengue fever have led to the enhancement of the National Environment Agency's integrated vector borne disease programme that includes vector, virus and case surveillance, outbreak prevention and control, and public education and community mobilisation. The programme is supported by research and existing legislations such as the Infectious Disease Act and the Control of Vectors and Pesticides Act. Climate change may also exacerbate Singapore's urban heat island effect, and substantial increases in urban greenery were outlined in the 2015 Sustainable Singapore Blueprint and are being co-ordinated by the Urban Redevelopment Authority, the National Parks Board, and the Housing and Development Board.

Singapore: Legislative portfolio

Name of Law	**Energy Conservation Act (Chapter 92C)**
Date	01 July 2012, last revised on 31 May 2014
Summary	This Act mandates energy efficiency requirements and energy management practices, to promote energy conservation, improve energy efficiency and reduce the environmental impact of energy use. Under the Act, large energy users in the industry and transport sectors that consume at least the equivalent of 54 tera-joules of energy per calendar year in at least two out of the three preceding calendar years must appoint at least one energy manager to manage energy use. These companies or transport facility operators are also required to monitor and report energy use and greenhouse gas emissions, and submit energy efficiency improvement plans on an annual basis to the relevant agencies. The Act also consolidates the legislation for mandatory energy labelling and minimum energy performance standards for household appliances, as well as fuel economy labelling of motor vehicles, previously stipulated under the Environmental Protection and Management Act (Cap 94A). The Act is jointly administered by the Ministry of the Environment and Water Resources and Ministry of Transport. The Minister for the Environment and Water Resources oversees the measures for the industry and households sectors while the Minister for Transport oversees the measures for the transport sector.

Name of Law	National Environment Agency Act (Chapter 195)
Date	01 July 2002, last revised on 31 July 2003
Summary	The Act provides for the establishment of the National Environment Agency, its tasks, functions and responsibilities in preventing, abating and controlling air, water, land and food pollution. Provisions are made for the prevention and control of pollution of the air, water and land both by domestic and industrial pollutants: smoke, cinders, solid particles, liquids, sewage, gases, fumes, gases, vapours and radioactive substances. It is required to promote energy efficiency, the use of clean energy, the use of clean technologies, the use of efficient pollution control technologies and waste recycling. The powers of the National Environment Agency also include the ability to request information from and collaborate or co-operate with any person, whether in Singapore or elsewhere, on matters related to or connected with weather and climate, and it may also collect, compile and analyse statistical information related to or connected with climate and weather (among other subject matters).

Name of Law	Energy Market Authority of Singapore Act (Chapter 92B)
Date	01 April 2001, last revised on 01 March 2012
Summary	This Act establishes the Energy Market Authority (EMA) of Singapore. It states that the function and duty of the EMA is to create a market framework in respect of the supply of electricity or gas which promotes and maintains fair and efficient market conduct and effective competition or, in the absence of a competitive market, which prevents the misuse of monopoly or market power. As well as promoting the development of the gas and electricity industries, and advising the government on national needs, policies and strategies relating to energy utilities, a key role of the EMA is to promote the efficient use of energy in Singapore (with specific provisions for gas and electricity detailed in the Gas Act and the Electricity Act respectively). The remainder of the Act specifies technical provisions, such as the transfer of property, assets, liabilities and employees, as well as the constitution of the EMA. Along with the Gas Act, Electricity Act and the Public Utilities Act, the Energy Market Authority of Singapore Act was passed to restructure and liberalise the energy sector.

Name of Law	Electricity Act (Chapter 89A)
Date	01 April 2001, last revised on 01 May 2006
Summary	This Act creates a competitive market framework for the electricity industry, and makes provision for the safety, technical and economic regulation of the generation, transmission, supply and use of electricity. It specifies that the EMA is to promote the efficient use of electricity by consumers and to promote the economic efficiency and maintenance of such efficiency in the electricity industry. It also specifies that the EMA is to ensure that electricity licensees whose prices are controlled by the EMA are able to provide an efficient, financially viable service. Along with the Gas Act, Public Utilities Act and the Energy Market Authority of Singapore Act, the Electricity Act was passed to restructure and liberalise the energy sector. The Electricity Act makes provisions to open up the generation and distribution of electricity to full competition.

Name of Law	Gas Act (Chapter 116A)
Date	12 April 2001, last revised on 14 February 2008
Summary	This Act creates a competitive market framework for the gas industry, and makes provision for the safety, technical and economic regulation of the transportation and retail of gas. It specifies that the EMA is to promote the efficient use of gas by consumers and to ensure that gas licensees whose prices are controlled by the EMA are able to provide an efficient, financially viable service.

	Along with the Electricity Act, Public Utilities Act and the Energy Market Authority of Singapore Act, the Gas Act was passed to restructure and liberalise the energy sector. The Gas Act makes provisions to open up gas importation and distribution to full competition via licensing.

Name of Law	**Building Control Act (Chapter 29)**
Date	1 May 1989, last revised on 1 Dec 2012
Summary	This Act prescribes standards of safety, accessibility, environmental sustainability and buildability. The legislation provides a blueprint to regulate the design of building works and the periodic structural inspection of existing structures. On 15 April 2008, the Act was enhanced to incorporate the Building Control (Environmental Sustainability) Regulations. This regulation requires developers and owners of new building projects as well as existing building projects involving major retrofitting (with Gross Floor Areas of 2000m^2 or more) to meet the compliance standard which was modelled after the basic Green Mark certified standard. Under this requirement, the professionals appointed by the developers or owners would have to ensure that the building design meet at least 28% energy efficiency improvement from 2005 codes along with other salient aspects of environmental sustainability such as water efficiency, indoor environmental quality, environmental management and the use of green building technologies. On 01 December 2012, the Building Control (Environmental Sustainability Measures for Existing Buildings) Regulations was introduced to the Building Control Act (Act), requiring building owners to: • Comply with the minimum environmental sustainability standard (Green Mark Standard) for existing buildings, as and when they retrofit their cooling system (effective from 2 Jan 2014); • Submit periodic energy efficiency audits of building cooling systems; and • Submit information in respect of energy consumption and other related information as required by the Commissioner of Building Control (effective from 1 July 2013).

Singapore: Executive portfolio

Name of Policy	**Sustainable Singapore Blueprint 2015**
Date	08 November 2014
Summary	The Sustainable Singapore Blueprint 2015 updates and extends the first blueprint published in 2009. Based on a consultation process involving over 6,000 members of the public, the new version is published by the Ministry of the Environment and Water Resources, and the Ministry of National Development. The blueprint contains the following targets: • 200 ha of sky rise greenery by 2030; • 400 km of park connectors by 2030; • 100 km of waterways open to recreational activity by 2030; • 90% proportion of households within 10 minute walk of a park by 2030; • 180 km of Nature Ways by 2030; • Park provision of 0.8 ha/ 1000 population by 2030; • 1039 ha of waterbodies open to recreational activity by 2030; • 700 km of cycling paths by 2030; • 75% modal share of journeys during peak hours made via public transport by 2030; • 360 km of rail network by 2030; • 80% of households within 10 minute walk of a train station by 2030; • 80% of buildings to achieve BCA Green Mark Certified rating by 2030; • 35% energy intensity improvement (from 2005 levels) by 2030; • 140 L domestic water consumption per capita per day by 2030; • National recycling rate of 70% by 2030; • Domestic recycling rate of 30% and non-domestic recycling rate of 81% by 2030;

	• By 2020, reduce ambient fine particulate matter (PM2.5) levels to 12µg/m3 (long term: 10 µg/m3) and particulate matter (PM10) levels to 20µg/m3 (long term: 20 µg/m3); • By 2020, reduce ambient sulphur dioxide levels to a 24-hour mean (max) of 50µg/m3 (long term: 20µg/m3); • By 2020, reduce ozone levels to an 8-hour mean (max) of 100µg/m3; • By 2020, cap nitrogen dioxide levels at an annual mean of 40µg/m3; • By 2020, cap carbon monoxide levels at an 8-hour mean (max) of 10mg/m3; • Reduce flood prone areas to 23 ha by 2030; • 5,000 active green volunteers by 2030; • 2,000 Community in Bloom Gardens by 2030; and • 500 litter-free Bright Spots by 2015.

Name of Policy	**National Climate Change Strategy**
Date	14 June 2012
Summary	The National Climate Change Strategy 2012 (replacing a previous version published in 2008), produced by the National Climate Change Secretariat, provides a comprehensive overview of Singapore's response to climate change. It reiterates the country's pledge, first made in 2009, to reduce emissions by 16% below 2020 business-as-usual levels if there is a legally-binding global agreement in which all countries implement their commitments in good faith. Ahead of this, Singapore has embarked on policies and measures that will reduce its emissions by 7% to 11% below 2020 BAU levels. The strategy identifies accelerated coastal erosion, higher incidences of intense rain or prolonged drought, biodiversity impacts, and disruption to food and other supplies as potential climate change impacts facing Singapore. It reiterates the country's commitment to a multilateral approach to dealing with climate change, and argues that a global approach will be more conducive towards Singapore's long-term growth and development. It highlights Singapore's position on a global climate agreement as one that supports the UN model of common but differentiated responsibilities and respective capabilities. The strategy outlines three key principles that guide Singapore's response to climate change: • Long-term and integrated planning; • Pragmatically and economically sound measures; and • Developing innovative solutions for Singapore and global markets. It also identifies four main approaches that Singapore will follow in addressing climate change: • Reducing carbon emissions in all sectors; • Being ready to adapt to the effects of climate change; • Harnessing green growth opportunities; and • Forging partnerships (e.g. with international and regional bodies). The document contains chapters on the importance of climate change and Singapore's national circumstances and constraints, as well as detailed chapters on both mitigation and adaptation plans and policies. In terms of mitigation, energy efficiency is the country's core strategy (given the country's limited access to renewable energy opportunities). Specific identified strategies to reduce emissions across different sectors include: • Power generation: switching fuel mix away from fuel oil to natural gas; • Water: incinerate sludge rather than dispose in landfills; • Households: extend minimum energy performance standards to lighting and other appliances; • Buildings: require Green Mark certification for all new buildings; • Transport: implement carbon emissions-based vehicle scheme to encourage purchase of low carbon emission cars; and • Industry: develop and support energy efficiency financing pilot schemes. The strategy identifies coastline protection, addressing flood risks, and managing water resources as the three key adaptation priorities of Singapore, and also focuses heavily on green growth as a development model. Finally, it outlines the various local and international partnerships (e.g. with other countries/cities) that Singapore is engaged in.

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