PENANG GREEN AGENDA 2030

Title: Green Economy

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EXECUTIVE SUMMARY

Penang's economy is driven mainly by the manufacturing industry and the service sector, especially the tourism industry. These sectors have grown out of Government's active policy intervention as well as organically. Going forward, these two sectors are expected to remain the main pillars of Penang's economic growth, accounting for nearly 95% of Penang's GDP.[1]

Penang needs to identify new growth opportunities as well as make its economy more resilient to internal and external threats. Economically, Penang can escape from increased domestic and international competition in sectors such as the traditional electronic and electrical sector and concentrate on how it can add value to the increasingly "green" global supply chain. Penang can also tap into the expanding market for green products and services. Additionally, the State can generate job opportunities through the creation of new "green" sectors or the greening of conventional sectors, as well as increase economic resilience through diversification of its economy.

Penang's green economy should be defined as "one that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcity. It is a low carbon, resource efficient and socially inclusive". The aim of Penang's green economy should be three-fold – put Penang on a new growth trajectory that is more prosperous and sustainable, improve environmental sustainability and increase the standard of living of Penangites.

The Working Group on Green Economy proposes the following **six recommendations** for the pathway towards a green economy in Penang, after taking into account their impact and ease of implementation:

1. Waste Industry Policy (2020)

Penang is already leading the country in terms of its target and actual achievement on recycling. It is also trying proactively to deal with plastic waste by banning free plastic bags as well as single-use plastic from 1 January 2019. Penang is also looking into the possibilities of turning waste into energy or other products. Given the land constraint especially on the island, the Government is determined to reduce waste going into landfill. Having a waste industry policy will elevate the status of the sector to one that can enjoy a range of policy incentives that include investment, research and development (R&D), labour and training, as well as incentives for indigenous businesses. A waste industry policy can also address the whole of the supply chain from upstream (e.g. packaging standards and material choices) to downstream (e.g. disposal or reuse of waste). If the waste industry policy is properly implemented, it will reduce the material footprint of Penang and create new job and business opportunities for Penangites. This is seen as a low hanging fruit as the Penang State Government is already in the process of preparing a long-term waste master plan for Penang.

[1] Penang Economic & Development Report PEDR 2017-2018 <https://www.penang.gov.my/images/2019/Penang%20Economic%20&%20Development%20Report%20PEDR%202017-2018.pdf>

2. Renewable Energy (RE) Policy (2020)

At the national level, the Government has set a renewable energy target of 20% by 2030. Penang should also adopt the 20% target at the state level as a minimum. On top of the RE policy and incentives introduced by the Federal Government, Penang State Government should also explore additional measures that will help quicken the pace of RE uptake and energy diversification, especially solar energy that has a huge potential in Penang. Additional incentives may include reduction of local charges or setting aside brownfield or disused land for solar farms. The impact of actively pursuing renewable energy at the state level will be moderately high although energy policy is within the purview of the Federal Government. The adoption of a RE policy for Penang is seen as relatively easy especially if the Penang State Government works closely with TNB and other industry players.

3. Green Public Procurement (2021)

Green public procurement is where the Penang State Government leads by example through the purchase of goods and services with green credentials. Given the size of public procurement, the emphasis on green goods and services will create or expand the existing market for green products. It will help increase public awareness of the viability of green lifestyle as well as help local businesses to cash in on the new trend. Although it may increase the public procurement cost in the short term, the Government will benefit from a more dynamic and environmentally friendly market and society in the long term. Green public procurement can start in areas where green products or services are readily available and relatively less costly, but ultimately it should apply to all forms of purchases by all Government agencies. This can also help accelerate the certification of green products and services in Penang, making it easier for other consumers to opt for a green lifestyle. Green public procurement is seen to have a huge impact on developing a green economy in Penang.

4. Penang Green or Sustainable Tourism (2020)

The tourism sector not only will continue to be the main contributor to Penang's economic growth but also a leading sector in the development of a green economy in Penang. Penang needs a clear long-term vision or a plan to ensure it remains a key tourist attraction, including protecting its natural and cultural beauty. In addition, Penang should also consider creating a Penang Green or Sustainable Tourism brand to attract new and young tourist groups who are environmentally conscious. Local businesses in Penang (including restaurateurs, hoteliers, shops etc) are already subjected to some of the toughest environmental policies in Malaysia (and the region) such as the no plastic bag initiative and waste segregation, Penang can easily build on that to differentiate itself from the other tourist attractions in the region including even Singapore and Thailand. With the move towards a green economy and sustainable development. Penang can and should cash on that to attract tourists who are willing to pay a premium for a "green or sustainable tourism" experience rather than focusing solely on increasing the number of

tourists that will eventually negatively affect the quality of Penang's environment and infrastructure. It will take a few years to establish Penang Green or Sustainable Tourism but once it is established, it will have a positive knock-on effect on other sectors of the economy. The Penang Tourism Master Plan that is being drafted at the moment should identify the main elements of green tourism and the roadmap to achieve it.

5. Green Economy Policy for Industry (2020)

Manufacturing is and will be the key contributor to Penang's growth in the foreseeable future. As such, it needs to play a leading role in greening the trajectory of Penang's economic growth. Penang needs a Green Economy Policy for Industry to help facilitate a systemic and comprehensive transition for the industrial sector. The Policy needs to identify both opportunities and challenges for the industrial green transition, including the fact that the many multinational corporations (MNCs) in Penang should be able to spearhead the move away from business-as-usual. The main challenges will be around persuading and facilitating the transformation of small and medium-sized enterprises (SMEs) that may lack the will, knowledge and financial resources to change. The Policy can encompass a range of mechanisms or instruments to promote 'green' industry in Penang, including capacity building for SMEs (one-stop centre etc), an information platform for financing and technology, incentive schemes, eco-enterprise parks, micro-financing schemes for entrepreneurs and so on. The Penang State Government should also develop a comprehensive "sustainability criteria" – containing high standards of environmental and social safeguards – that all current and future investors will need to meet.

6. Public-Transit Oriented Transportation (2030)

As one of the major components of Penang's economy, it is essential that Penang's transportation become greener. It means transportation needs to be public-transit oriented and the number of cars needs to reduce. Public transport user numbers need to meet at least the target of 40% set by the Federal Government. Given the low number of public transport users (3%) currently, there is a lot the Penang State Government can do. The Penang Transport Master Plan does contain quite a few plans for public transportation (e.g. LRT, BRT) but it also provides for the building of new roads and highways. In order to achieve the 40% target, the Penang State Government needs to take decisive steps, rather than incremental, in order to build up the public transport network and discourage the use of private vehicles. It will take a while to make the transition but the Government needs to start taking action now if they are to achieve this target.

1. Background

1.1 Penang Green Agenda 2030 and Green Economy

Green Economy (GE) is an important tool that will enable Penang to achieve sustainable development by 2030. Penang needs to move towards a green economy in order to ensure sustained prosperity as well as enhance the standard of living of its people and environment. Green economy in Penang encapsulates the essence of a balanced development – increasing the dynamism of its economy while at the same time promoting environmental sustainability and the welfare of its citizens. By transitioning to a green economy, Penang will increase its resilience against risks caused by future uncertainties including natural disasters and economic disruptions.

There are plenty of reasons why Penang can and should move towards a green economy. Economically, Penang can escape from increased domestic and international competition in sectors such as the traditional electronic and electrical sector and concentrate on what it can add value to the increasingly "green" global supply chain. It can also tap into the expanding market for green products and services. Additionally, it can generate job opportunities through the creation of new "green" sectors or the greening of conventional sectors, as well as increasing Penang's economic resilience through diversification of its economy. Penang also has the advantage of having little 'historical burden' of relying on heavy or fossil-fuel dependent industries for the growth of its economy, which makes it easier to make the transition. Socially and environmentally, adopting a green economy can bring about a higher quality of living and a more resilient society as it will increase the efficient use of resources, reduce pollution and preserve Penang's natural habitat and cultural heritage.

The focus of the GE Working Group is to carve out a pathway for Penang to move towards a green economy. The aim of Penang's green economy should be three-fold: to put Penang on a new growth trajectory that is more prosperous and sustainable; to improve environmental sustainability, and to increase the standard of living of Penangites. Ultimately, the Government should use the shift in the economy to generate social changes that benefit all sectors of the society, especially the bottom income earners. For example, it can create new job opportunities and introduce retraining and microfinancing schemes targeting the B40 group.

1.2 Current Situation

Penang is one of the high-income states in Malaysia, contributing 6.6% (ranking 6th) to national GDP growth in 2017.[2] As the second smallest state in Malaysia by landmass with a small population of 1.767 million in 2018[3] (compared to 6.38 million in Selangor in 2017),[4] Penang punches above its weight in terms of economic and social development. It

[2] DOSM, "State Socioeconomic Report 2017" <https://www.dosm.gov.my/v1/index.php?r=column/cthemeByCat&cat=102&bul_id=OE5UdnNRL1VZbjJjcUlSTVdIdFlUdz09&menu_id=TE5CRUZCblh4ZTZMODZIbmk2aWRRQT09>

[3] Vishanthini Kanasan, "Phasing Towards Sustainable Mobility in Penang", <https://prospernet.ias.unu.edu/wp-content/uploads/2019/01/Assignment-1_Vishanthini-Kanasan-Prospernet-RMIT-2018.pdf>

[4] DOSM, "State Socioeconomic Report 2017"

ranks third in terms of GDP per capita (RM49,873) in Malaysia (after Kuala Lumpur and Labuan Federal Territories) and has an unemployment rate of 2.1%, well below the national level of 3.4% in 2017.[5] In addition, Penang also recorded the third-highest Human Development Index in Malaysia after Selangor and Kuala Lumpur. Penang has been governed by a coalition of the then opposition parties led by the Democratic Action Party (DAP) since 2008, which recently formed the coalition Government at the Federal level.

Due to its high-income status, Penang is expected to be self-sustaining and will not have priority access to Federal funding, even after the change in the Federal Government. The forecast for 2019 state income is expected to be lower than 2018 income due to lack of new income sources. At the same time, the Penang State Government aims to reduce the state deficit. Hence, it intends to explore alternative financing sources to help achieve the Penang2030 vision (Penang2030: A Family-Focused, Green and Smart State that Inspires the Nation).

Penang's GDP in 2017 amounted to RM77.6 billion (compared to RM73.7 billion in 2016).[6] Its GDP growth in the past few years hovered around 5.3%-5.6%, which was lower than the annual growth rate of 6.1% forecasted by the 11th Malaysia Plan.[7] Manufacturing (RM34.8 billion) and service (RM38.3 billion) sectors were the main contributors to Penang's GDP growth, accounting for 94% of state GDP.[8] In 2017, the manufacturing industry grew by 5.7% while the service sector grew by 5.6%.[9] The agriculture sector grew by 2.2% (mainly driven by palm oil) while the construction sector contracted by 10.1%.[10] In 2017, aquaculture production grew by 51% and contributed to about 10.7% (RM815.2 million) of national aquaculture production.[11] In terms of livestock value, chicken and pig farming in Penang contributed 84.7% of the overall industry, amounting to RM717.2 million.[12]

Since the 1990s, although gender disparity of labour force participation is still evident, Penang has experienced full employment status with the unemployment rate being maintained below 2.5%.[13] Compared to a decade ago, the number of employed persons with tertiary education had almost doubled. The industrial sector remains an important source of employment in Penang and skills requirements continue to advance corresponding to the industrial evolution. Penang's labour is also more mobile now due to the possession of generic and transferable skills. It is also due to the millennial generation being more willing to move between jobs.

<https://www.dosm.gov.my/v1/index.php?r=column/cthemeByCat&cat=102&bul_id=OE5UdnNRL1VZbjJjcUlSTVdIdFlUdz09&menu_id=TE5CRUZCblh4ZTZMODZIbmk2aWRRQT09>

[5] Ibid.

[6] Penang in Numbers: Buku Data Asas Sosio-Ekonomi Negeri Pulau Pinang 2017/2018.

[7] 11th Malaysia Plan. <https://www.talentcorp.com.my/clients/TalentCorp_2016_7A6571AE-D9D0-4175-B35D-99EC514F2D24/contentms/img/publication/Mid-Term%20Review%20of%2011th%20Malaysia%20Plan.pdf>

[8] Penang in Numbers: Buku Data Asas Sosio-Ekonomi Negeri Pulau Pinang 2017/2018.

[9] Ibid.

[10] Ibid.

[11] Department of Fisheries

[12] Ibid.

[13] Ibid.

Moving forward, the potential for growth in Penang is expected to come mainly from the high-tech and high-impact industries such as electronic and electrical (E&E), LED, medical equipment, avionics, food processing and Global Business Services. At the same time, Penang aims to increase agriculture productivity by 20%[14], partly through the use of technology as well as statistical and geospatial data. Penang already has the second-highest rice yield in the country (average paddy yield per hectare is 5.8 tonnes compared to 4.5 tonnes at the national level)[15]. To promote food self-sufficiency, Penang has also established permanent food production sites and will continue to promote myGAP (good agricultural practices) and myOrganic. There is also an increasing focus and investment in the sports sector.

To spur economic growth, the Penang State Government will continue to prioritise investment in small and medium-sized enterprises (SMEs) and infrastructure. In relation to the former, the Government provides physical facilities such as factories, buildings and land, has set up an SME service centre and micro-financing schemes. In particular, the Penang State Government encourages local entrepreneurship in the digital industry especially in relation to Global Business Services. In terms of infrastructure, the Penang Transport Master Plan aims to create new road links, a new airport, LRT, MRT and a host of other infrastructure over the next 50 years. The Penang State Government will also invest in telecommunication infrastructure (ICT) and increase the number of CCTV systems to more than 1,000, incorporating smart technologies and facial recognition technology. Penang State Government is also receiving RM150 million from the Federal Government for flood mitigation projects, which will form part of the RM1 billion-plus flood mitigation programmes drawn up by the Penang State Government.[16]

Penang aspires to become a smart city by 2025 [17] by adopting a series of initiatives at the State and Local Government levels including digitalisation of Government records, use of smart poles, mobile phone apps and so on. The Smart City initiative adopted by the Penang State Government in 2016 consists of five pillars: smart community, smart environment, smart governance, smart mobility and smart economy. The two adjacent Governments (MBPP and MPSP) also have their smart city programmes that aim to improve service provision as well as increase liveability of Penang.

In terms of social development, the Penang State Government is determined to meet its target of constructing 180,000 affordable housing units by 2030.[18] It will also continue to provide monetary aid to vulnerable groups and set up a Homeless Transit centre that will

[14] The Penang2030 Guide First Edition, <https://www.penang2030.com/files/The%20Penang2030%20Guide_First%20Edition%202019_eBook_.pdf>
[15] "Penang leads in average paddy yield per hectare, exco man said", *Buletin Mutiara*, 16th August 2018. <https://www.buletinmutiara.com/penang-leads-in-average-paddy-yield-per-hectare-exco-man-said/>
[16] "Finally, Penang gets RM150 million for flood mitigation project", *Free Malaysia Today*, 31st July 2018. <https://www.freemalaysiatoday.com/category/nation/2018/07/31/finally-penang-gets-rm150-million-for-flood-mitigation-project/>
[17] Tan Lii Inn, "Penang: Becoming A Smart State", *Penang Institute Issues*, 13th September 2019. <https://penanginstitute.org/publications/issues/penang-becoming-a-smart-state/>
[18] "State govt sets new housing target for 2030", *Buletin Mutiara*, 23rd August 2019. <https://www.buletinmutiara.com/state-govt-sets-new-housing-target-for-2030/>

provide skills training to the homeless population. Penang is also investing in new CCTV to increase public safety and security.

In terms of environmental protection and sustainable development, Penang will focus on improving waste management to turn Penang into the cleanest state in Malaysia and ASEAN, and will promote wider application of the Green Building Index especially for new buildings. It also signed an MOU recently with UN-Habitat on implementing the New Urban Agenda.[19] In addition, Penang will continue with the tree-planting effort and create more green and recreational space including the 18,000 ha of green network by 2030.[20]

1.3 Green economy in Penang

Generally, the Green Economy (GE) Working Group members have agreed that Penang's green economy should be defined as "one that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcity. It is low carbon, resource efficient and socially inclusive" (UNEP). The Working Group members have also explored what a green economy means to Penang:

a. An economy that leads Penang towards a liveable city status
b. An economy that develops a green society
c. A pollution free society
d. Should cover four areas: Climate change, efficiency, market and investment, and environment
e. Improvement of the quality of Penang's economy by moving towards a circular economy
f. Sustainable transportation
g. Green buildings
h. Adopting smart city solutions to sustain Penang's economy with limited resources
i. Conserve the environment while pursuing development
j. Should be more selective on the type of industries entering Penang – ability and means to be selective.
k. Retain local talent and avoid brain drain – reduce the reliability on foreign workers; cater to the needs of the manufacturing sector through the education system.
l. Healthier lifestyle for Penangites
m. Sustaining healthy and clean environment in the ecosystem (food, lifestyle, energy)
n. Economic and social resilience and adaptable to disasters

[19] "Penang says yes to strategic partnership with UN-Habitat", *The Star*, 22nd October 2018. <https://www.thestar.com.my/metro/metro-news/2018/10/22/penang-says-yes-to-strategic-partnership-with-unhabitat>

[20] "Penang to develop 18,000ha green network by 2030", Penang Cat Centre, 4th January 2019. <https://www.penangcatcentre.my/penang-to-develop-18000ha-green-network-by-2030/>

The Working Group thinks Penang's green economy should deliver the following outcomes:

Desired Outcomes of Green Economy in Penang		
Economy	**Social**	**Environment**
Circular economy	Reducing income inequality and increasing social mobility	High resource use efficiency
Strong innovation base	Flexible and knowledge-based workforce	Low pollution
Resilient economy – diversity	Resilient society – harmony, common inspirations and cultural pride	Near zero waste and carbon emission
Open market and access to technology and investments	Open, tolerant and fair society	Preservation and restoration of natural assets
Smart incorporation of Industry 4.0		Resilient environment – biodiversity

The Working Group members have identified the industry and tourism sectors as the main drivers of the green economy in Penang – these are the sectors that need to lead the transformation and will have a huge impact on the economy of Penang. Overall, the Working Group members have identified the following as key sectors that can contribute to the development of Penang's green economy:

a. Agriculture /aquaculture/horticulture
b. Renewable energy - alternative energy
c. Manufacturing
d. Transportation
e. Water
f. Waste
g. Education
h. Green housing/building
i. Town planning
j. Tourism/Cultural and heritage value - greenhouse gases issues (transport) - repurpose cultural and heritage as part of the green economy
k. Ecosystem and biodiversity
l. Logistic

The Working Group proposes that an effective stakeholder engagement process is necessary to get feedback on what a green economy means for Penang and on public expectations. In addition, in order to build a meaningful green economy, Penang needs to assign economic and social values to its environment and natural assets to demonstrate the true "cost" or "price" of growth going forward. Another key component of a green economy is the issue of governance. This includes mainstreaming sustainability across all Government institutions, strengthening NGO-private-Government relationships, and aligning Government agencies with green economy goals.

2. Long-Term Goals

The GE Working Group recommends the Penang State Government adopts a few green economy-related targets, including:

a. Water use or efficiency target: to reduce water consumption per person per day by 20% - 35% by 2030[21] (currently 290 litres per person per day,[22] which is the highest in Malaysia)
b. Waste reduction target: based from current usage, new target should reduce per capita value (e.g. MPSP cut down solid waste from 1.6kg in 2008 to 1.09kg in 2017 per capita per day; aims to achieve 0.8kg by 2022[23])
c. Renewable energy target: at least 20% renewable energy target by 2025 to align itself with the Federal target[24] (currently renewable energy only accounts for around 3% of power generation nationwide)
d. Social equality target: should be less than Gini Coefficient score of 0.356 (2016)
e. Innovation target: number of patents / qualifications / research institutes; impact of innovation (e.g. social innovation).

The GE Working Group has also explored other potential long-term goals, which include natural capital protocol, green GDP, happiness index, resource efficiency and social mobility / inclusivity targets. However, these targets are deemed unsuitable at the moment due to the difficulty of obtaining the relevant data.

3. Main Challenges and Gaps

3.1 Manufacturing Industry

3.1.1 Currently, existing factories and potential investors only have to fulfil the relevant Department of Environment (DOE) and h**ealth and safety regulations, which are not stringent** or comprehensive enough to shift the trajectory towards a green economy.

3.1.2 Penang State Government so far **has not pushed for an additional "sustainability" criteria** or green guidelines for operators to upgrade their production standards to reduce their material and environmental footprints, which include the use of water and energy, and waste generation.

3.2 Transport

3.2.1 Transport infrastructure is the backbone of an economy, which is the reason why Penang will struggle to attain a green economy without a green public transit-oriented transport system. Current projections for Penang show that there will be **more cars on**

[21] The Penang2030 Guide First Edition, <https://www.penang2030.com/files/The%20Penang2030%20Guide_First%20Edition%202019_eBook_.pdf>
[22] "Water usage highest in Penang and Selangor", *New Straits Times*, 12th April 2018. <https://www.nst.com.my/news/nation/2018/04/356563/water-usage-highest-penang-and-selangor>
[23] "Penang council aims for 70pc recycling rate", *Malay Mail*, 20th August 2018. <https://www.malaymail.com/s/1664121/penang-council-aims-for-70pc-recycling-rate>
[24] "Malaysia needs RM33b to achieve 2025 green energy target", *The Edge Financial Daily*, 4th September 2019. <https://www.theedgemarkets.com/article/malaysia-needs-rm33b-achieve-2025-green-energy-target>

the road in the near to medium term as Penang plans to build a series of new road systems.

3.2.2 It is also not clear how the current Penang Transport Master Plan will help Penang achieve the **40% public transport modal share target** by 2030.[25]

3.2.3 Although Penang has built a lot of **bicycle lanes**, both on the Penang Island as well as the Mainland, various challenges remain: relatively narrow roads on Penang island makes it difficult to extend dedicated bicycle lanes and misuse of bicycle lanes by motorcyclists exacerbate this.

3.3 Waste

3.3.1 Given its limited land area and the environmental impact of landfills, Penang State Government is trying to increase its recycling rate and reduce waste generation. However, there remain some challenges that need to be addressed. **Lack of comprehensive and reliable data** makes it difficult to accurately assess the current situation and plan for the future.

3.3.2 **Waste recycling** still needs improvement in terms of proper waste segregation, contamination from liquid and food and proper management of the waste recycling industry.

3.3.3 **Food waste** currently accounts for at least 40% of the waste going to landfill[26], which has not been separated out – there is under-utilisation of organic waste in Penang.

3.3.4 **Public education and awareness** on waste reduction and segregation is currently inadequate and still needs strengthening.

3.3.5 Currently Penang's waste management policy focuses mainly on **downstream (i.e. waste disposal) rather than upstream measures**, with the exception of the ban on plastic bags and single-use plastic.

3.4 Renewable energy

3.4.1 The use of renewable energy in electricity generation in Malaysia is currently very low

– less than 2%. The Federal Government has recently announced a new 20% renewable energy target by 2025.[27]

[25] "Penang Transport Master Plan is to sustain island's development", *The Star*, 28th September 2018. <https://www.thestar.com.my/news/nation/2018/09/28/a-plan-for-the-future-penang-transport-master-plan-is-to-sustain-islands-development>

[26] "Penang folk waste 700,000kg of food daily", *New Straits Times*, 10th July 2017. <https://www.nst.com.my/news/exclusive/2017/07/255988/penang-folk-waste-700000kg-food-daily>

[27] Abdullah, W. S. W., Osman, M., Kadir, M. Z. A. A., & Verayiah, R. (2019). The Potential and Status of Renewable Energy Development in Malaysia. *Energies, 12*(12), 2437. doi: 10.3390/en12122437.

3.4.2 Uptake of renewables, especially solar energy, has been slow in Penang although the number has increased every year. This is mainly due to the **lack of adequate financial incentives and the perceived inflexibility and unpredictability of renewable energy**. However, the new policy introduced by the Ministry of Energy, Science, Technology, Environment and Climate Change (MESTECC) that aims to increase the attractiveness of solar energy should encourage more uptake going forward.

3.5 Tourism

3.5.1 Penang's tourism sector continues to grow and Penang State Government has plans to expand the industry by focusing on medical, youth, education and wedding tourism. The current efforts **prioritise quantity (i.e. number of tourists) over quality**.

3.5.2 Penang **does not have a set of comprehensive data for the sector** e.g. total number of tourists, composition, the impact of tourists on resources etc. This is because the Government does not collect the relevant economic and social data, and also industry players are reluctant to share data due to trade secret concerns.

3.5.3 Without proper data, the Government cannot assess the impact of tourism on Penang's environment, society, infrastructure, cultural heritage and businesses.

3.5.4 The concept of "**sustainable tourism" is not well understood** by the Government as well as industrial players. As the number of visitors is expected to increase, it is imperative that the Government and industry players take proactive steps in making sure that the negative impact of tourism is properly dealt with.

3.5.5 The sector also faces other problems including **rampant corruption** through the "commission" system, uncontrolled and unlicensed development especially in the vulnerable George Town area.

3.6 Water

3.6.1 Given its increasing population and economic growth, as well as very limited indigenous raw water sources, Penang may **face water shortage in 3-5 years**. Currently Penang imports 80% of its raw water from Sungai Muda,[28] which is threatened by logging activities at the water catchment area of Ulu Muda. So far, Penang's proposal to import raw water from Perak is still under consideration.

3.6.2 In addition, cheap water rates in Penang have led to **high consumption of water** among residential and commercial users – domestic water usage in Penang is the highest in Malaysia (286 litres per capita per day in 2016 compared to the national average of 209 litres / capita / day).[29] Cheap water tariffs have also led to the misconception of water abundance in Penang while in reality there is no other major "back-up" raw water resource for Penang currently.

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[28] "PBAPP warns of looming water crisis in Penang, Kedah", *New Straits Times*, 14th February 2020. <https://www.nst.com.my/news/nation/2020/02/565574/pbapp-warns-looming-water-crisis-penang-kedah>

[29] PBA, "Water Demand Management In Penang: Mandatory Installation Of Water Saving Devices In New Development Projects", 30th January 2018. <http://www.pba.com.my/pdf/news/2018/30012018_PBAPP_Mandatory_WSDs3_ENG.pdf>

3.7 Agriculture

3.7.1 The major challenge faced by the agriculture sector is the **sustained loss of agriculture land** to development. The 2030 State Structure Plan of Penang (RSNPP) also expects agriculture land to decrease from 43,278 ha in 2015 to 36,406 ha by 2030.

3.7.2 Other challenges include excessive use of fertilisers, a lack of commitment and interest from the younger generations, low investment from the private sector, small plots that inhibit more efficient mass production and the use of technology, illegal conversion of agriculture land, and lack of innovation among farmers and researchers.

3.8 Labour and Skills

3.8.1 The challenge for Penang with regards to the labour force lies in **attaining and maintaining a high-skill workforce**. The demand for this group of workers will increase as Penang courts investments for high-tech manufacturing and knowledge-intensive services, while labour competition is also the fiercest at the high end of the skill spectrum.[30]

3.8.2 There is a **mismatch between skills demand and supply** in the market. In 2015, a quarter of total new graduates remained unemployed for six months after graduation.

3.8.3 Currently, there is also little emphasis on green innovation and the training of a "sustainability-savvy" workforce who can help lead the green economy "revolution".

4. Solutions

The Working Group has identified a range of solutions to the challenges identified. These solutions are grouped under the individual sectors, although the last section highlights some cross-sector solutions.

4.1 Land Use

4.1.1 A green economy will require a rational and efficient land use policy in Penang. For example, land use planning should **encourage mixed use development to optimise resource use** such as energy, water, transportation, and infrastructure. Properly planned high density areas served by good transport links can also increase labour productivity and facilitate the uptake of creative solutions.

4.1.2 Penang's Structure Plan and Local Plans should contain **detailed physical characteristics, including disaster vulnerability maps**, to enable decision-makers to make informed decisions on the types of economic and social activities allowed in specific localities.

[30] Penang Institute, Penang Skilled Workforce Study: Labour Skills for Growth and Change, 2017. <https://penanginstitute.org/wp-content/uploads/jml/files/pg-skilled-workforce-study/Chapter1-10b_Low%20Res.pdf>

4.1.3 To increase the liveability of Penang and greening of its environment, Penang should create more **public green and "blue" (e.g. public beaches, riverbanks etc) spaces**. It currently has one of the lowest green space per capita in Malaysia, which is 0.29 ha per 1,000 population [31] (national target is 2 ha per 1,000 population by 2020).[32]

4.1.4 Once Penang has identified its priority sectors for a green economy, the Government should consider utilising land use planning and allocation to promote or nurture the development of these sectors. This could involve setting land aside or giving priority approval for land development for these sectors.

4.2 Transport

4.2.1 Penang's green economy requires a public-transit oriented transportation system where numbers of users of private vehicles substantially decrease while mass transit transport is promoted. **Improvement in bus services** can include special lanes for buses, a unified user application (or App) for buses and other public transport modes, better data collection and utilisation, and enhancing the management of public transportation such as better routes and punctuality.

4.3 Renewable Energy and Energy Efficiency

4.3.1 The Penang State Government should introduce strong measures to promote energy efficiency. For example, introducing **energy efficiency requirements** for its industrial and housing sectors, or promoting the use of energy ratings for appliances sold in Penang. The Government should recognize energy efficiency as a low hanging fruit and should consider promoting energy efficiency retrofitting of buildings as infrastructure spending.

4.3.2 The Federal Government is currently preparing an **Energy Act**. The Energy Act is expected to set out a clearer framework for national and state actions on energy efficiency and the use of renewable energy. Penang State Government should participate in the drafting process to make sure that the Energy Act helps push for transformation in the energy sector nationwide as well as in Penang.

4.3.3 Penang should capitalise on its abundant sunlight and its growing solar PV manufacturing industry to increase the utilisation of renewable energy. Apart from **solar energy, biomass from agriculture or waste** also provides a potential source of reliable energy. Penang can consider setting aside brown field or dual-use land areas for solar farms.

4.3.4 The Penang State Government should look into **incentivizing the uptake of renewable energy** in Penang. Although it does not have the authority to introduce financial incentives like feed-in-tariff or net-metering, it nevertheless should explore alternative financial instruments such as setting up a renewable energy fund or consider

[31] Zheng Zhao (ed.), 2018. "Green Development of Asia-Pacific Cities: Building Better Cities Towards 2030," World Scientific Books, World Scientific Publishing Co. Pte. Ltd., number 10897, March.

[32] Maryanti, M. & Khadijah, H. & Uzair, A. & Ghazali, M., 2016. The urban green space provision using the standards approach: issues and challenges of its implementation in Malaysia. 369-379. 10.2495/SDP160311. <https://www.witpress.com/Secure/elibrary/papers/SDP16/SDP16031FU1.pdf>

introducing local tax relief.

4.3.5 Penang State and Local Government should work proactively with Tenaga Nasional Berhad (TNB) to increase renewable energy sources and promote energy efficiency, including installing smart meters across the whole of Penang.

4.4 Waste

4.4.1 Penang should adopt an innovative **Waste Industry Plan** to promote not only a better waste management regime but also a circular economy in Penang. Circular economy is where existing extracted resources are continuously recycled and reused within the economy with minimal input of new raw materials and minimal output of waste materials from the economy. Dealing with the full cycle of waste, from material generation to waste disposal, requires new standards for production processes, packaging of goods, and even the prioritising of recycled materials as 'input materials. Addressing issues within the full cycle of waste can create new job and investment opportunities, of which Penang State Government should take full advantage. Penang's new Waste Management Plan should incorporate a Waste Industry Plan to make sure that going forward, Penang not only focuses on waste disposal management but also waste utilisation-driven circular economy.

4.4.2 Penang should improve waste management using **technologies and innovative solutions** to compensate for space limitation problems. For example, a localized system or a neighbourhood collection centre can offer a cheap and viable solution. Waste transportation also needs to be upgraded to reduce "waste mileage", using green transportation modes or smart technologies (e.g. artificial intelligence or Big Data).

4.4.3 Given its land constraint, the Penang State Government should look into **incineration or thermal treatment** technologies, including waste-to-energy, to make sure that Penang explores all viable clean and sustainable waste disposal options without compromising its environment and health. At the Federal Level, the Ministry of Housing and Local Government has announced that each state in Malaysia is to have at least one waste-to-energy project within two years.[33] To promote recycling and in-situ treatment of waste, the Penang State Government should **limit the growth and availability of landfill sites** for construction waste, which is highly recyclable. This can also spur the development of a new industry focusing mainly on reusing construction waste.

4.4.4 The Government should also consider increasing the recycling rate of municipal waste by offering monetary incentives, such as the Recycle for Life scheme introduced by Cenviro that creates an electronic wallet approved by Bank Negara. In this system residents are given credits for recycling, which they can then use to purchase goods.[34]

4.4.5 The Penang State Government should ramp up the **recycling of organic or food waste**. Food waste recycling can reduce substantially the waste going to landfill (currently

[33] "First WTE incinerator to begin operation by June". *The Malaysian Reserve*, 16th March 2020. <https://themalaysianreserve.com/2019/03/18/first-wte-incinerator-to-begin-operation-by-june/>

[34] Cenviro, "Recycle for Life: #trashforcash" <http://www.cenviro.com/core-business/recycle-for-life/>

in Penang, food waste constitutes 40% [35]of all waste going to landfill). Organic waste can be turned into compost that can be used in organic farming in Penang. Segregating organic waste will also help improve the efficiency of waste-to-energy processes. To achieve this, the Government should establish a viable waste segregation and collection system that allows most organic waste to be safely composted.

4.4.6 Penang should also continue with its efforts to create a **closed system waste management for livestock**, especially the highly polluting pig farming in Penang.

4.4.7 The Government should encourage the **employment of less able-bodied people** in the waste recycling industry, providing the necessary skill training and financial incentives for employers to hire more local workers instead of using cheap foreign labour.

4.4.8 The Government should work with school children and the art and design community to **redesign public bins** that will encourage more people to use them. For example, creating beautiful and attractive landscapes in public places and providing adequate rubbish bins will discourage the public from littering.

4.5 Tourism

4.5.1 Penang's tourism sector depends on maintaining Penang's attractiveness as a tourist destination. This means it needs to retain its identity as a food haven, UNESCO cultural heritage, beach and hill resort destination, and more. At the same time, the tourism sector needs to contribute to the sustainable development of Penang by making sure its impact on the environment and society is kept under control.

4.5.2 To maintain Penang's attractiveness as a tourism destination, Penang needs to **look after and improve its natural assets** by cleaning its beaches, improving its riverbanks, protecting its hills and wildlife and its cultural identity. Penang must build an efficient public transport system to alleviate traffic congestion. It also needs to **increase the safety of its neighbourhood and increase the presence of Tourism Police**. In addition, Penang needs to upgrade its facilities, especially good wifi access, public toilets, safe and clean water fountains etc.

4.5.3 Penang should explore **enhancing its twin city links** to exchange experience on green lifestyle, and mutually supports green-themed festivals and campaigns. It can also foster closer exchange of residents and tourists.

4.5.4 Penang should consider establishing the **"Penang Green or Sustainable Tourism" brand**. Businesses in Penang, especially in the hospitality and retail sectors, already have to comply with strict no plastic bags and single-use plastic policies.[36] Penang also has the highest recycling rate in Malaysia[37], and already has a public bike rental scheme and

[35] Khor Hung Teik 2016. Penang Organic Waste Management Plan: Plan and Policy. <https://www.waste.ccacoalition.org/sites/default/files/files/1_report_on_penang_organic_waste_management_plan_plan_and_policy_0.pdf>

[36] "Is life without plastic bags possible in Penang? Yes, say NGOs", *New Straits Time*, 30th March 2019. <https://www.nst.com.my/news/nation/2019/03/474371/life-without-plastic-bags-possible-penang-yes-say-ngos>

[37] Sonia Henam & Swaity Singh Sambyal 2019. "Ten zero-waste cities: What makes Penang stand out in waste recycling?", Down To Earth, 14th November 2019. <https://www.downtoearth.org.in/news/waste/ten-zero-

dedicated cycling lanes in tourist-heavy places.[38] Penang's tourism should build on these initiatives and use them as a unique selling point for Penang. By promoting a Green or Sustainable Tourism brand, Penang can attract more discerning tourists who intend to reduce their travel footprints and are willing to pay a premium for the experience. This allows Penang to emphasise the quality as opposed to the quantity of tourists visiting Penang.

4.5.5 The **Penang Tourism Master Plan** that is currently being drafted should lay out how the sector can help Penang achieve its sustainable development goals. Specifically, it should emphasise the collection of the relevant data (e.g. through smart Apps and open data) and adopt targets (e.g. waste generation, water and energy use, low carbon transport etc) that can help shape a green tourism sector in Penang.

4.5.6 To help promote social inclusivity, the tourism sector should explore how to increase the **employment of marginalised groups**, which includes engaging pensioners and less able-bodied people as tour guides.

4.5.7 To further develop its tourism sector, the Penang State Government needs to introduce measures to **stamp out the "commission-based" business model** that fosters corruption within the sector. It also needs to **tighten the licensing regime** to prevent uncontrolled development especially in the George Town area and to promote more cottage industry especially in areas that have recently seen the growth of family-run eco- and cultural-tourism (e.g. Balik Pulau). Penang should also encourage more high quality and authentic "Made in Penang" products to further boost local economic and social impact.

4.5.8 The tourism sector also needs a resilience-focused land development policy in order to better reduce the future impact of climate change in Penang. A disaster-stricken and unprepared Penang (such as by flood and landslide) will deter safety-conscious tourists from visiting.

4.6 Water

4.6.1 Penang should continue to tackle water wastage by reducing non-revenue water through pipe fixing and reducing water theft.

4.6.2 The Government should emphasise **water demand management** to improve water security. This involves mandating the use of water saving devices and rain water harvesting in new housing projects, and better utilisation of grey water through the use of technology. The Government should also encourage or even mandate water rating system for appliances. In addition, the Government should carry out campaigns to increase water saving awareness among the public and public institutions (which are currently exempted from paying water bills). It should also mandate water efficiency measures for heavy users especially industry.

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waste-cities-what-makes-penang-stand-out-in-waste-recycling—67766>

[38] Motion Digest Network 2017, Penang Launches Linkbike- First Bike Sharing Services In Malaysia. <https://motiondigest.com/2017/01/03/penang-launches-linkbike-first-bike-sharing-services-in-malaysia/>

4.6.3 The Penang State Government should **increase the water tariff** while establishing safeguards for vulnerable groups (e.g. B40) to encourage water saving behavior.

4.6.4 The Penang State Government should also continue to look for **alternative sources of raw water**. It should look into large-scale reuse of wastewater especially for its industry users.

4.7 Agriculture

4.7.1 The Penang State Government should work with the Department of Agriculture (DOA) to re-strategize the **fertiliser subsidy schemes** to stop excessive use of fertilisers in Penang that causes pollution and health concerns. This should include educating fertiliser producers to promote the proper usage of fertilisers at the appropriate time. Some farmers are not aware that excessive usage of fertilisers will harden the soil as well as reducing yield. The DOA in Penang is also promoting the use of organic fertilisers.

4.8 Green skills and jobs

4.8.1 Green jobs are defined as any type of job that reduces the negative impact to the environment such as energy saving, public hygiene and cleanliness, water conservation, waste recycling and so on. Elements of sustainable development should be **mainstreamed across all sectors** and current job specifications and skills should be upgraded to incorporate green practices.

4.8.2 The Penang State Government should work with the industry as well as higher education sectors to establish **green or sustainable compliance courses** that suit Penang's industries and meet the requirements of employers. The Government can encourage more local industries to meet international standards of production by providing training courses, an information platform and financial incentives.

4.8.3 The Government should also work with employers to set up **skill training and retraining courses** for employees whose skills need upgrading to meet the new requirements of greener production. Shifting from conventional dirty industries to new, cleaner ones also requires extensive skill retraining. If this is not provided, disruption to the labour market may be too much for certain groups of workers, and may result in widespread discontent and ultimately a resistance to the transition to a green economy. To increase social mobility, the Government should invest in skill retraining of the B40 group to increase their participation in the green economy.

4.9 General

4.9.1 The Penang State Government should explore setting up **incentive schemes** for businesses and the public to adopt long term green practices. Incentives do not have to be confined to monetary compensation but should cover a wide range of measures, for example awards and public recognition, priority access to services, public competition, and so on. Incentives need to reward long-term behavioural changes rather than superficial and short-term improvement.

4.9.2 The Government needs to revamp its **microfinancing schemes to prioritise entrepreneurship in green businesses**. Again, the Government should invest in promoting the participation of the B40 group in the green economy.

4.9.3 The Penang State Government can emulate its success in building the E&E industry from scratch by doing the same thing for the green sector. For example, it can set up an **Eco-Industrial or Green Enterprise Park** supported by a vibrant research and development (R&D) ecosystem. Research centres affiliated with local higher education institutions such as USM can be set up in close collaboration with companies in the Park to make sure that indigenous innovation serves the demands of local companies. To grow local companies, the Government can also set up a **Technology and Investment Platform** in the Park that acts as the conduit between green technology suppliers and demanders, as well as green investors and companies. This Platform can specifically target small and medium-sized enterprises (SMEs).

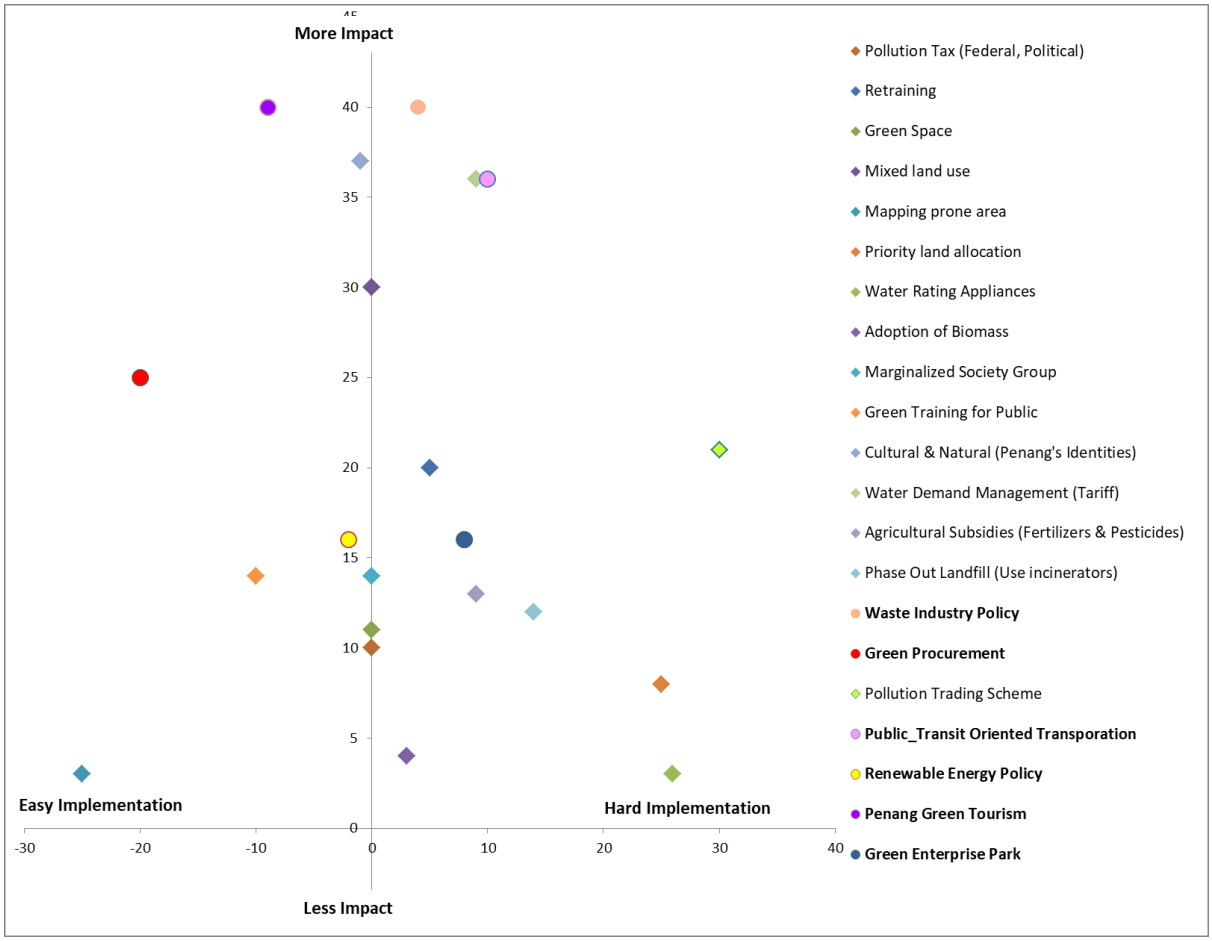
4.9.4 To show commitment and leadership, both State and Local Governments in Penang should establish a "**Green Public Procurement**" policy. Green Public Procurement should mandate all agencies and institutions of Government to buy goods and services that have been sustainably produced, or come from businesses that adopt green practices.

4.9.5 The Penang State Government should set up **investment criteria and safeguards for state investment vehicles** to prioritise investment in green sectors or companies. Government-linked companies like Penang Development Corporation (PDC) should be guided by strict operational as well as investment guidelines to make sure that they do not continue to support businesses that can damage Penang's liveability in the long term.

4.9.6 To reduce pollution in Penang more effectively, the Penang State Government can consider setting up **local pollution trading schemes** targeting a few main pollutants that pose immediate threats to Penang's environment. This would require having a reliable and complete set of data on production and the emission of pollutants by industries, which is going to be a huge challenge given the current lack of such data. Also, in the long run, the Government should work with the Federal Government to set up national schemes for pollutants including a carbon trading scheme to create a level playing field for all industries within Malaysia.

4.9.7 The Penang State Government should also work with the Federal Government to push for **greener product and production standards** in Malaysia. At the moment, negative social and environmental factors in production are shouldered by the general public rather than producers. Having stricter product and production standards will encourage producers to take on more responsibility for the environmental and social footprint of their products.

5. Major Policy Recommendations and Milestones



1. Waste Industry Policy (2020)

The WG has identified waste as one of the major sectors that needs to be developed in order to move Penang towards a green economy. Penang is already leading the country in terms of achieving its target on recycling. It is also trying proactively to deal with plastic waste by banning free plastic bags as well as single use plastic from 1 January 2019. Penang is also looking into the possibilities around turning waste into energy or other products. Given the land constraint especially on the island, the Government is determined to reduce waste going into landfill. Having a waste industry policy will elevate the status of the sector to one that can enjoy a range of policy incentives that include investment, research and development (R&D), labour and training, as well as incentives for indigenous businesses. A waste industry policy can also address the whole of the supply chain from upstream (e.g. packaging standards and material choices) to downstream (e.g. disposal or reuse of waste). If the waste industry policy is properly implemented, it will reduce the material footprint of Penang and create new job and business opportunities for Penangites. This is seen as a low hanging fruit as the Penang State Government is already in the process of preparing a long-term waste master plan for Penang.

2. Renewable Energy (RE) Policy (2020)

At the national level, the Government has set a renewable energy target of 20% by 2030. Penang should also adopt the 20% target at the state level as a minimum. On top of the RE policy and incentives introduced by the Federal Government, Penang State Government should also explore additional measures that will help quicken the pace of RE uptake and energy diversification, especially solar energy that has a huge potential in Penang. Additional incentives may include reduction of local charges, or setting aside brownfield or disused land for solar farms. The impact of actively pursuing renewable energy at the state level will be moderately high although energy policy is within the purview of the Federal Government. The adoption of a RE policy for Penang is seen as relatively easy especially if the Penang State Government works closely with TNB and other industry players.

3. Green Public Procurement (2021)

Green public procurement is where the Penang State Government leads by example by purchasing goods and services with green credentials. Given the size of public procurement, the emphasis on green goods and services will create or expand the existing market for green products. It will help increase public awareness of the viability of green lifestyle as well as help local businesses to cash in on the new trend. Although it may increase the public procurement cost in the short term, the Government will benefit from a more dynamic and environmentally friendly market and society in the long term. Green public procurement can start in areas where green products or services are readily available and relatively less costly, but ultimately it should apply to all forms of purchases by all Government agencies. This can also help accelerate the certification of green products and services in Penang, making it easier for other consumers to opt for a green lifestyle. Green public procurement is seen as having a huge impact in developing a green economy in Penang.

4. Penang Green or Sustainable Tourism (2020)

The tourism sector not only will continue to be a main contributor to Penang's economic growth but also a leading sector in the development of a green economy in Penang. Penang needs a clear long-term vision or plan to ensure it remains a key tourist attraction, including protecting its natural and cultural beauty. In addition, Penang should also consider creating a Penang Green or Sustainable Tourism brand to attract new and young tourist groups who are environmentally conscious.

Local businesses in Penang (including restaurateurs, hoteliers, shops etc) are already subjected to some of the toughest environmental policies in Malaysia (and the region) such as the no plastic bag initiative and waste segregation, Penang can easily build on that to differentiate itself from the other tourist attractions in the region including even Singapore and Thailand. With the move towards a green economy and sustainable development Penang can and should cash in on the momentum in order to attract tourists who are willing to pay a premium for a "green or sustainable tourism" experience. Focusing solely on increasing the number of tourists will eventually negatively affect the quality of Penang's environment and infrastructure. It will take a few years to

establish Penang Green or Sustainable Tourism but, once it is established, it will have a positive knock-on effect on other sectors of the economy. Penang Tourism Master Plan (currently being drafted) should identify the main elements of a green tourism economy and the roadmap to achieve it.

5. Green Economy Policy for Industry (2020)

Manufacturing is and will be the key contributor to Penang's growth in the foreseeable future. As such, it needs to play a leading role in greening the trajectory of Penang's economic growth. Penang needs a Green Economy Policy for Industry to help facilitate a systemic and comprehensive transition for the industry sector. The Policy needs to identify both opportunities and challenges for the industrial green transition, including the fact that the many multinational corporations (MNCs) in Penang should be able to spearhead the move away from business-as-usual. The main challenges will be in persuading and facilitating the transformation of small and medium-sized enterprises (SMEs) that may lack the will, knowledge and financial resources to change. The Policy can encompass a range of mechanisms or instruments to promote a 'green' industry in Penang, including capacity-building for SMEs (a one-stop centre, for example), an information platform for financing and technology, incentive schemes, eco-enterprise parks, micro-financing schemes for entrepreneurs and so on. The Penang State Government should also develop a comprehensive "sustainability criteria'' – containing high standards of environmental and social safeguards – which all current and future investors will be required to meet.

6. Public-Transit Oriented Transportation (2030)

As one of the major components of Penang's economy, it is essential that Penang's transportation be green. Transportation needs to be public-transit oriented and the number of cars needs to be reduced. Numbers of users of public transport should reach at least the target of 40% set by the Federal Government. Given the low number of public transport users (3%) currently, there is a lot the Penang State Government could be doing. The Penang Transport Master Plan does contain quite a few plans for public transportation (e.g. LRT, BRT) but it also provides for the building of new roads and highways. In order to achieve the 40% target, the Penang State Government should take decisive, instead of incremental, steps to ramp up the public transport network and discourage the use of private vehicles. It will take a while to make the transition but the Government needs to start taking action now if it is to achieve its target.