

GREEN TECHNOLOGY POLICY AS A DRIVER FOR SUSTAINABILITY DEVELOPMENT: A CASE STUDY IN MALACCA

Nor Azilah Ahmad¹, Ahmad Fariz Mohamed², Nor Fazilah Abdul Hamid³

¹²Institut Alam Sekitar dan Pembangunan (LESTARI)

Universiti Kebangsaan Malaysia, Selangor, Malaysia

³Universiti Teknikal Malaysia Melaka, Malaysia

E-mail: azilahahmad@utem.edu.my

ABSTRACT

Melaka is known as the most historic state and is also a popular tourist destination in Malaysia. With the legacy of old buildings by past occupiers such as A Famosa, Christ Church, St. Paul's Building and others recognize Melaka being one of the World Heritage States. Along time ago, the title of "Sleeping Hollow" state have been called for the slow economic situation and development conditions. Year 2000 to 2010 has shown a lot of environmental development and progress has been made, making Malacca eligible to be developed as a developed state in 2010. Next, Melaka continues to drive development opportunities to achieve green state urban status. The great expectation of the success of the mission is based on the needs of development in line with the will of the state government as well as the whole society. Researchers use qualitative methods where research on the documentation of official government materials as well as the search of information sources from journal articles, books and online data as the main reference. The findings have shown that the mission and strategy of development implementation are indispensable to continue to drive the state's development for the sake of sustainability of the development itself. This study is also expected to contribute to clarifying the importance of green technology in driving the development of Melaka state now and beyond.

Keywords: *Green technology, policy guideline and future development*

1.0 INTRODUCTION

Green technology is an application of environmental science to conserve resources and nature to address the negative impact of human activity. Green technology is a low carbon technology and more environmentally friendly compared to existing technology. When we use green technology, we use resources such as energy, water, and so on to produce a product. The product will be safe to use and provide a healthy and better environment for all living things. It also saves energy and resources and promotes renewable resources.

The objectives include reducing the rate of consumption of energy while increasing economic development. Additionally, green technology ensures sustainable development and conserve the environment for future generations as well as enhances public education and awareness of green technology and widespread green technology. Green technology is also capable of reducing the release of carbon gases into the air which causes the phenomenon of global climate change.

2.0 LITERATURE REVIEW

In applying green technology, the state government of Malacca acknowledges that with the development of green technology the greatest benefits will be enjoyed especially in terms of improving the quality of life of the people. Through the development of green technology, it can also guarantee the environment and the quality of the environment to be more sustainable. (Kementerian Tenaga, Teknologi Hijau dan Air, 2012).

Malacca has also set a goal to create a sustainable and resilient state. Its main focus is to reduce carbon emission rates, conserve the environment and use energy efficiently, save energy and try to increase renewable energy use (Dasar Teknologi Hijau, UPEN, 2012). This mission is for the development of the community and its progress. Therefore understanding of the community is essential to realizing this mission. Based on studies up to 2012 on green practices that are still poorly received, they are still poorly understood and it is not common practice for people to adopt green culture and practices. (Blueprint, 2012). Both technology and industry initially thought that nature had its own ability to neutralize the rest of the industry (Azizan Ramli, 2010). This conflict has finally led to an awareness of changing dimensions to balance the demands of modernity and the environment. The answer to this conflict is through the elements of green technology development.

The intention of the Malacca state government to implement development policies based on green technology elements is accurate. (Melaka Green City Action Plan (2014). There are a several factors that have been identified to influence this action, namely tourism factors, direct foreign investment, Green City branding for a balance of development and environmental protection (B.C.Chew et al, 2016) especially in terms of the implementation of the

organizational system, the desire for cultural change and community practice expected by the Malacca state government to realize this great mission. Even more so after the success of the state of Malacca achieved the mission of Melaka developed in 2010. The vision and mission continued to achieve a future dream of a green technology state.

3.0 METHODOLOGY

This conceptual paper is based on qualitative descriptive research. Where this method is selected to describe a phenomenon that is taking place while understanding and exploring the factors to be identified (Othman, 1999). All data and information are collected from the library and online system. The collection of data and information of this study involves primary and secondary data. Information is reviewed and analyzed particularly in analyzing information either written or publications such as policies, procedures, regulations, bulletins, statistics, government publications, published or unpublished information that can be obtained from libraries, the internet, archives and other (Sekaran, 2003). In addition, information is also taken from the writing of journals, reports, books, articles and theses.

4.0 FINDING AND DISCUSSION

4.1 Green Technology criteria & its impact on Development

Green Technology refers to products, equipment, or systems that meet the following criteria that it can minimize environmental quality degradation, it has a low or zero Greenhouse Gas emission, it is also safe to use and provides a healthy and better environment for all living things. By use this technology we can save energy and natural resources and also promoting renewable resources. All of these criteria will ensure the sustainability of development and at the same it's can minimize the negative impact of human activities.

4.2 The Importance of Green Technology in the Development Perspective

Green Technology is a low carbon technology and more environmentally friendly than existing technology. When we use green technology, we use resources such as energy, water and so on minimally in daily life. The use of Green Technology is also in line with the concept of sustainable development

where the development is to meet the current needs without affecting the needs of future generations. Green Technology is seen as one of the triggers of economic development. In the meantime, we are all responsible for ensuring that future generations can at least enjoy the quality of life we have now or a better quality of life.

4.3 The Benefits of Green Technology

We are now aware of the impact of global warming. We are still not too late and can still change the situation so much to do planning or program implementation to drive the development of green technology. Examples of such advantages of using green energy sources are that the energy is said to be clean from pollution, thus reducing the minimum impact on the environment. In fact, the energy is also renewable, meaning we will never run out of such resources as oil is expected to dry in a decade or so. It is also said that the facilities offered by green technology development are expensive in all aspects of its development, but it is worthwhile for the next operating practices and processes.

There are many amazing insight in slightly mad vision; his scheme for a totally full life would converse resources, reduce pollution, and to provide facilitate the utmost in conviviality. The imaginary planning in the green technology development has been a potent image for the planners and policy makers in the country. This situation will bring economic benefits to the country and its entire community. The country will be cleaner and less polluted making it one of the great tourist destinations in the world. This study will also discuss the benefits of green technology to the environment. The benefits of green technology to the environment are:-

a) Environmental Aspects

When a country grows rapidly, its population levels are also increasing. This leads to a high demand for demand. The human lifestyle that wants a better life like home, electricity and water, cars and others causes demand for natural resources to grow. Unmanaged natural resource management such as uncontrolled logging, extensive land exploration, carbon dioxide emissions into the atmosphere, solid waste disposal and so on will cause environmental pollution. If environmental conditions cannot be preserved and sustainably developed, it will cause destruction to the environment itself. In fact, if natural

resource management is not well managed, it will definitely affect the quality of human life and the environment. Hence, the world community is facing major challenges, including pollution issues, climate change issues and energy issues. These issues need to be handled collectively and effectively. A critical approach is important. The answer to all these issues is through approach towards the practice and implementation of green technology-based development. Green technology has a far more strategic role than far reaching energy autonomy and tackling weather changes. Green technology also helps the development of knowledgeable communities pushing for the practice of sustainable energy and better way of life. We can live more sustainable if we become more environmentally-literate, learn from nature, live more modestly and become an active citizen in developing the environment.

Green technology is the development and application of products, tools and systems to conserve the environment and natural resources, and minimize the negative effects of human activities. Green technology refers to products, equipment or systems that meet criteria such as minimizing environmental quality degradation, having low or zero greenhouse gas emissions, safe to use and providing a healthy and better environment for all living, energy-saving and natural resources and promoting resources renewable. It is a low carbon technology and is more environmentally friendly than the existing technology. When we apply and adopt green technology in life, especially to interact with nature, the negative effects on nature can be minimized. Even the environment can be well preserved and conserved, Soon nature may be able to last as long as people are aware and know about the importance of nature care and realize it through the safest interaction for the purpose of environmental development itself.

b) Social Aspects

In applying green technology, the biggest benefit is the social aspect, especially in terms of improving people's quality of life and a more sustainable environmental quality assurance. Air pollution, water, noise and so on will affect the quality of life of the people if the problem is left over. When we use green technology, negative effects on the environment can be reduced. Even the quality of the environment can also be recovered slowly. If once in a while nature is able to absorb all the waste naturally, but now the situation has begun to change. This situation occurs as a result of the various development

activities undertaken by the human person without considering the adverse effects that will occur in nature and life. The aspirations of environmentalists, technologists, scientists and the community as a whole to enable applications to Green Technology are capable and have great potential in driving the country's development without endangering life. Applying this technology will also be able to provide new job opportunities for the local community. The community can also explore the opportunities of exporting 'green' products that they have created and produced. The government can also encourage people to apply or apply green technology either in implementing work processes or daily life practices. Today's society has to be disclosed in practicing green as much as possible. People also need to be in the direction of starting with the simple things they can do. For example, bring drinking water in containers without buying bottles of water. If they buy food to bring home, it's best to use their own food containers instead of using a non-environmentally friendly styrofoam or plastic container. With the implementation of technology development and green practices in life is expected to lead to a better quality social environment to society. People will feel comfortable with the quality of the environment and feel safe if they really understand the benefits they can get through such a technology application.

c) Economic Aspects

Green Economy means sustainable economic activity with good environmental preservation and engagement of all parties. The Green Economy touches almost every aspect of human life and involves development around us. Important elements in the Green Economy should be practiced such as reducing carbon emissions and emissions, increasing resource and energy efficiency and preventing biodiversity losses and ecosystems. What is Green Economy? Basically the green economy refers to economic activities (UNEP-Green Economic Report 2011):

- a). Use of low pollution technology
- b). Efficient use of natural resources Examples of green economy activities in Malaysia are recycling industries such as Syarikat Indah Water Consortium (IWK), where wastewater from home and industry is treated before partially discharged back to the environment.

Some of these treated water will be reused by the industry. Green Economy Measurements Global attention to green economy requires equal measurement standards among countries. These measurements can compare how far a country's competitiveness is using natural resources and reducing pollution. The United Nations (UN) with the cooperation of the European Union, the International Monetary Fund and the World Bank have introduced a system that measures the growth of the economic sector and its relationship with the level of reducing natural resources and environmental degradation. This system is known as an integrated environmental and economic accounting system (Integrated System of Environmental and Economic Accounting (SEEA)).

The green economy not only ensures the sustainable use of natural resources but also drives GDP growth. The use of green production technology in the energy, manufacturing, transport, construction, recycling, agriculture, fishery, water and forestry sectors has the potential to reduce energy consumption from 40% of fossil resources. Growth in green economy activities will generate an increase in GDP, thereby creating more job opportunities. Green economy activity is expected to reduce greenhouse gas at high rates:

- World energy consumption is reduced by 36% in 2030
- Carbon pollution is reduced by 450 ppm by 2050 Green economy preserves its balance

d) Green Technology Policy to Drive the Sustainability of the Development of Malacca State

i. National Green Technology Policy (NGTP 2009)

NGTP was launched in 2009 as a sign of the government's commitment to develop green technology as a driver of economic growth towards a sustainable development. NGTP defines green technology as a product, equipment or system that meets the criteria of minimizing environmental quality degradation, having a low or zero Greenhouse gas emission (GHGs), Safe for use and provide a healthy and better environment for all living, save energy and resources natural and promoting renewable resources.

Objectivity of NGTP is to reduce the rate of increase in employment and at the same time improve economic development, assist growth in the Green

Technology industry and increase its contribution to the national economy; enhancing the capacity for innovation in Green Technology development and enhancing competitiveness in Green Technology in international markets; ensure sustainable development and conserve the environment for future generations; enhancing education and public awareness on Green Technology and promoting widespread use of Green Technology (KETTTHA 2010).

The green technology policy to provide direction and motivation to continuously enjoy good quality and a healthy environment should be based on four pillars: ↯ Energy: Seek to attain energy independence and promote efficient utilization. ↯ Environment: Conserve and minimize the impact on the environment. ↯ Economy: Enhance the national economic development through the use of technology. ↯ Social: Improve the quality of life for all.

ii. Malacca Green Technology Blueprint (2010)

Based on Melaka Blueprint 2011-2020 document research, Malacca has been declared a developed country in 2010. This is based on the achievement of 11 years earlier from 2000 to 2010 which has successfully implemented 10 of its responsibilities to the people based on the following socioeconomic outcomes:

1. Security and safety;
2. Unity and racial harmony;
3. Freedom of speech;
4. The rapid economic growth;
5. Great job opportunities / low unemployment rate;
6. Increased household growth / prosperity;
7. The poverty rate decreases;
8. Income gap narrowed;
9. Inflation rate is moderate;
10. Sustainability State.

In the course of the 11-year period, the state government has not only succeeded in developing the state but has also received numerous recognition from within and outside the country. Among them, Melaka Berjaya has been recognized as the World Heritage City by Unisco, Mapan City, The Cleanest State in Malaysia and the state with the prettiest landscape in Malaysia.

Furthermore, in 2010 the idea to declare Melaka as the Green Technology State has been implemented. Targeting of objective setting until 2020 has been made to achieve: -

- 1) Improve the achievement of developed countries;
- 2) Strengthen the status of the city state and;
- 3) Raise the state of the Sustainability through the use of green technology and practices (Green Technology State). For this study, the researcher only analyzes the target of achieving the objectives in relation to Malacca's desire to improve the status of the established state through the use of green technology and practice.

Seen in the sense of the Green City concept, Green Town is a city that maintains sustainability, a growing economy, preserves social justice and preserves the natural system of the earth. The Green City concept also needs to nurture the right of every educator to the clean, healthy and safe environment (Source: United Nations Green Urban Declaration of Urban Environment Accord (UN-UAE))

Whereas, the strategy to ensure the State of Melaka to enhance the status of the Sustainable State is through the use of green technology and green technology according to the following seven core thrusts;

1. The use of environmentally friendly and prudent energy;
2. Solid waste management based on recycling practices;
3. Eco-friendly urban design;
4. Conservation and conservation of urban environment;
5. Efficient transport system;
6. Environmental health care
7. Water management and use of the camp.

However, in the new framework that has been formulated based on the original framework of the Melaka Maju, MURNI net and the United Nation Urban Environmental Accord (UN-UEA) towards the implementation mission of the State of Green Technology of Malacca, the new Green Technology State framework has been emphasized to 8 sectors key and 185 indicators. The mission towards successful implementation of green technology development

in Malacca is based on a combination of original and new green technology cities in Malacca focused on the following sectors:

1. Nature
2. Demographics
3. Urban economy
4. Management and Finance
5. Transport and Accessibility
6. Community and Recreational Facilities
7. Sociology and social impact
8. Utility and infrastructure.

All of the above sub-sectors are further refined to ensure the achievement of the Green Technology State which can lead to the achievement of the National Sustainable Development Goals.

iii. Melaka Green City Action Plan (2014)

The green city approach promotes a paradigm shift where, cities make a concerted effort to pursue integrated urban development and environmental planning in response to rapid urbanization and associated challenges. With regards to environment, the focus is on managing land, water and air in an efficient manner to maintain the long term sustainability of these natural resources, pursuing low carbon technologies and practices to reduce greenhouse gas emissions, and reducing vulnerabilities to natural hazards and climate change impacts by enhancing resilience and managing disaster risks. To achieve economic competitiveness, cities seek to expand municipal infrastructure, improve efficiency of service delivery, and ensure that operations and maintenance are carried out effectively.

To do so, cities consider innovative financing mechanisms, through engaging with the private sector and seeking new opportunities for revenue generation. Cities also promote entrepreneurship and jobs, with particular focus on green industries. To ensure equitable outcomes, cities partner with civil society, residents, private sector, institutions of learning, and other stakeholders to identify and implement solutions aimed at improving livability for all residents.

Melaka is well recognized as a world heritage city that receives millions of visitors annually. With such popularity, and with the mission towards the state of Green Technology of Malacca, has gained worldwide attention. The Green City Action Plan 2014 is a next step towards helping Melaka reaching its vision. It is based on the underlying premise that integrated and comprehensive approaches will lead to a greener Melaka. Other than that the GCAP 2014 was planned provides a set of recommendations for helping Malacca to straight forward and also are to aimed at maintaining Melaka's competitiveness as a popular tourist and investment destination, keeping environmental challenges to a minimum, and establishing the state as a role model for livability in the region.

5.0 CONCLUSION

The selection of this policy is the most appropriate development policy especially for the socioeconomic situation of Melaka which has no major source as any other state in Malaysia. The Green Technology-based Development element is very important in helping the community determine the future of sustainable development. In other words, Green technology has a beneficial effect on income distribution, human development and the quality of the environment as a whole. Green technology has been chosen as an agenda to address the environmental problems that arise, and it is an alternative to improving the state's economy without disrupting the existing ecosystem. Moreover, Malacca is known as a historical state and is recognized as one of the world's heritage.

This policy will continue to be the guide or driver of Malacca's success as a state of Green Technology. In fact, this policy is intended to be the key to realizing the success of government machinery and at the same time transforming society into a sustainable society based on the needs of the world of advanced technology.

ACKNOWLEDGMENT

The writer would like to thank to the Universiti Teknikal Malaysia Melaka (SICCOM-CTED) and Lestari, Universiti Kebangsaan Malaysia for their support in all research related to green technology area.

REFERENCES

- Andrew S. Winston " Green Recovery Get Lean, Get Smart, and Emerge from the Downturn on Top", Harvard Business Press, 2009 pp. 165.
- Azizan Ramli, 2010. *Membudayakan Budaya Minda Lestari Dalam Pengurusan Alam Sekitar*. Pahang: Penerbit Universiti Malaysia Pahang.
- BLUEPRINT MELAKA 2010.
- Chew, B.C1, Hamid, S.R2, Sukri. 2016. Branding Melaka as a complete green city for state image enhancement. *Journal of Advanced Manufacturing Technology* (Volume 12, No. 1(1), Special Issue iDECON 2016, 2018, Pages 143 to 158.
- Dasar Teknologi Hijau, UPEN, 2012.
- .GCAP Malacca 2014.
- Jamaluddin Md Jahi, Abd Samad Hadi, Ahmad Fariz Mohamed dan Kadaruddin Ayub "Transformasi dan Dayahuni Habitat Manusia".
- Joan Roelofs "Greening Cities Building Just and Sustainable Communities",The Bootstrap Press, 1996 pp. 218.
- KETTHA 2010.
- Korten, D., 1990. *Getting to the 21st Century: Voluntary Action and the Global Agenda*. Hartford, CT: Kumarian Press.
- Mazlin Mokhtar & Sarah Aziz "Sustainable Development, Sustainability and Indicators: Model and Measures", Institut Alam sekitar & Pembangunan (LESTARI) UKM, 2012 pp. 7.
- National Green Technology Policy 2009.
- Sumber: Kementerian Tenaga, Teknologi Hijau dan Air) <http://pmr.penerangan.gov.my> 2012.
- The Melaka Green Book. First Edition 2018.
- Tenth Malaysia Plan (2011-2015).