



Green Future Solutions

SUGGESTIONS FOR SUSTAINABLE SINGAPORE

**SUBMITTED TO: IMCSD SECRETARIAT, MINISTRY OF THE
ENVIRONMENT AND WATER RESOURCES**

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Reduce Energy and Carbon Emissions

1. Promote SEE Energy Management for the Industry and Building Sector

About 70% of the energy generated in Singapore is consumed by the Industry and Building sectors. More effort should be placed on these sectors to reduce their energy consumption, especially on promoting SEE energy management – Sufficiency, Effectiveness and Efficiency (in order of sequence).

Sufficiency is considering whether energy is actually needed in the first place, using sufficient energy and cutting down unnecessary use of energy for an activity. Effectiveness is choosing the correct and best way to use energy for an activity through design, orientation, automation and controls. Efficiency is using the least amount of energy for an activity through energy efficient lightings, appliances and equipment. Energy sufficiency should always be considered first before energy efficiency.

For example, in the case of lighting for activities in a room, the following questions can be asked:

- Sufficiency: Are there unnecessary lighting in the room? Can some lights be removed without affecting the activities? Can the lights be changed to those with lower wattage?
- Effectiveness: Can natural daylight be used for the room? Are there switches for lighting different areas in the room? Are ceiling lights or table lamps more effective for the activities? Can the lights be turned off automatically when no one is in the room?
- Efficiency: Are the lights energy efficient? Are the lights fitted with electronic ballasts? Can efficient LED lights be used?

2. Encourage Building Owners to Reduce Lightings at Night

Buildings are lit up at night with façade lighting and outdoor advertising, which is excessive and unnecessary. There is nobody to see and enjoy the lightings in the middle of the night. To reduce unnecessary night lightings, building owners should be encouraged to reduce their building lightings from 1am onwards.

The encouragement could involve push and pull methods such as creating peer pressure through a “brightest” building ranking system, providing incentives for switching from outdoor advertising to online advertising, providing free publicity for participating building owners, and working with ESCOs on a building package to reduce lighting and energy.

3. Work Towards a Four National Switches Energy Strategy

Singapore has diversified her water sources and has the Four National Taps: local catchment water, imported water, NEWater and desalinated water. Similarly, there should be a Four National Switches energy strategy to diversify our energy sources and achieve greater energy security. The four energy sources could include fuel oil, natural gas and two other renewable energy sources (solar, wind, biomass, tidal, etc).

Renewable energy targets and timeline should be set for the strategy. The intention is not to completely replace fossil fuel but to reduce our dependence on their import. The cost of alternative renewable energy might be higher now but we should also take into account the future price of oil given the security and climate change concerns.

4. Set Mandatory Energy Efficiency and Renewable Portfolio Standards

A mandatory Energy Efficiency Portfolio Standard (EEPS) requires electricity providers to implement energy efficiency programmes to offset a portion of the increase in customer electricity demand. The cost of implementing the energy efficiency programmes would be offset by the operational savings from reduced peak demand, thus ensuring that the costs would not be passed on to the customers. The EEPS would help to reduce the load growth, achieve energy savings, lower customer utility bills, and increase jobs for those providing energy efficiency services.

A mandatory Renewable Portfolio Standard (RPS) requires electricity providers to include renewable energy sources in their fuel portfolio for electricity generation. The RPS helps to diversify our energy sources, reduce carbon emissions and strengthen the clean energy industry. In addition, the electricity providers might be required to disclose their renewable energy portfolio and carbon footprint (amount of carbon dioxide emitted for a unit of electricity generated) under the new Electricity Vending System. The electricity providers would no longer compete on price alone but also on their environmental performance.

The EEPS and RPS are policies adopted by the US Department of Energy.

Redesign, Reduce, Reuse and Recycle Waste

5. Encourage Educational and Practical Opportunities on Redesign

Tertiary institutions with courses on product and building design should be encouraged to include the concept of Redesign in their syllabus. Redesign involves looking at design from an ecological and environmental perspective, instead of only focusing on aesthetic or functional values.

Students should be exposed to green design concepts such as Cradle to Cradle, Biomimicry, The Natural Step, and Design for the Environment. In addition, students should have opportunities to work with product manufacturers to redesign their products as part of the students' industrial attachment programme.

6. Set Targets for Reducing Packaging

Excessive packaging results in the disposal of the packaging waste. Plastic packaging is usually disposed of and plastics are among the top three waste types disposed of, in terms of weight. Therefore, more effort should be placed on reducing plastic packaging.

Voluntary reduction of packaging by manufacturers and demand from consumers for products with less packaging would take a long time and much effort to be achieved. Instead, targets should be set for manufacturers and retailers to reduce their product packaging, especially for plastic packaging. Packaging should be kept to a minimum and recyclable, or include recycled material.

7. Introduce an Incentive Scheme for BYOB

To encourage more consumers to bring their own bags, a gift incentive scheme can be introduced. This scheme could be extended to every day instead of only on Wednesdays. This incentive scheme could use a small booklet that is acceptable by all retailers and supermarkets.

When customers bring their own bags, they would receive a stamped chop on their booklets. After accumulating a number of chops, they can redeem their gifts from the participating retailers. The gifts could include daily food items or green products such as energy efficient lightbulbs, environmentally friendly detergents and recycled paper.

8. Introduce a National Waste Reuse Database

Introduce a national waste reuse database where companies, organisations and individuals can give their waste material and used items to those who want them. The waste material could include offcuts and used material (such as paper, plastics, wood and cloth), non-toxic used chemicals, used furniture or other used electronic items such as computers and appliances.

The material and items can be searched online in the database, and could be given to the needy and charitable homes, schools and people who use them for handicrafts and projects. This would ensure that more material and items are reused instead of being disposed of.

9. Provide a National Food Matching Service

Expired food products are disposed of and this results in the waste of food. For companies with food products that are expiring soon or with unsold food products, they

can donate the products to the needy and charitable homes. However, the companies might not be aware of who would need their products.

A national food matching service could be set up where companies can announce the food products that they are donating, and the needy can search for food products and contact the companies. This would ensure that food that is still edible would not be wasted and disposed of. Food waste that have expired and need to be disposed should be sent to anaerobic digestion plants for producing energy.

10. Set up Community Recycling Centers with Comprehensive Waste Collection

Each community would have a Community Recycling Center (CRC) to complement the National Recycling Programme. The CRC serves the following purposes:

- Collection of recyclables such as paper, plastics, metals, glass, clothing, electrical and electronic items (to be sold to recycling companies)
- Collection of used furniture for repairing and refurbishing onsite (refurbished furniture are sold to residents)
- Collection of food waste (to be sent to anaerobic digestion plants for producing energy)
- Collection of used cooking oil (to be sent to plants for producing biodiesel)
- Educational center for teaching residents and students about waste minimisation and recycling

The CRC could be operated as a social enterprise to provide jobs for needy residents in the community. Revenue would come from the sale of recyclables and refurbished furniture. Extra revenue could also come from providing advertising space to companies at the CRC.

To attract residents to bring down their recyclables to the CRC, residents would be given credits for their recyclables and these credits could be exchanged for food and products. The food and products could be sponsored by companies and the programme could be operated as part of a company's corporate social responsibility activities.

In addition, the CRC could be designed as a green center with the following features:

- Use of natural and recycled building material
- Use of natural daylight and natural ventilation
- Generating energy from solar panels
- Use of energy efficient lights and appliances
- Rainwater harvesting for non-potable usage
- Educational material to introduce green design, building and technologies

Reduce Water Demand and Pollution

11. Encourage Rainwater Harvesting for Non-Potable Usage

Residents and organisations should not be using potable water for activities such as watering plants, washing vehicles and other processes that do not require potable drinking water. Instead, they can collect rainwater, store and use it for the activities. This helps to reduce the consumption and demand of potable water and also reduces the energy needed for water management, such as water distribution and water treatment.

Proper techniques of collecting and storing rainwater could be taught to residents and organisations. There should also be clear guidelines allowing rainwater harvesting and providing the relevant water tank dimensions and requirements.

12. Introduce Data Collection for Marine Waste

The annual coastal cleanup by the RMBR serves as a gauge on the marine waste and litter problem at our coasts and beaches. Other NGOs such as the Waterways Watch has been active in educational and cleanup programmes. However, there is no proper data collection and assessment of the marine waste and litter problem by the authorities. More frequent waste data collection should be done to monitor the marine waste collected at the beaches and coasts to assess whether the amount of waste is increasing or decreasing.

Data collection is an important component in tackling the marine waste and litter problem. With increased knowledge of the amount and type of waste, the waste source could be better located: whether it is generated from park users, fishermen, campers, ships, from drains or from overseas. Specific programmes can then be implemented to reduce the waste generation.

Sustainable Transportation

13. Include Carsharing and Bikesharing in the Public Transportation System

Allow public transport operators to implement carsharing and bikesharing schemes. Under the scheme, cars and bicycles are parked at convenient locations, and users can register to use them and only pay for their use. The carsharing and bikesharing schemes should be easy to use and have sufficient number of cars and bicycles to cater to the users' needs.

14. Set Clear Guidelines to Promote Cleaner Cars

There should be clear guidelines to promote cleaner cars such as hybrid cars, Euro IV diesel vehicles, electric cars and CNG cars. These guidelines could include the setting up of infrastructure for cleaner cars (such as fuelling stations and repair workshops), the extension or abolishment of the special tax, and the extension of the Green Vehicle Rebate. Having clear guidelines would give car owners a clear signal that the government supports cleaner cars and would help them make the shift towards owning cleaner cars.

Sustainable Food, Materials and Products

15. Encourage Urban Agriculture

Allocate land near housing estates or unused spaces such as rooftops and carpark roofs for the growing of vegetables that can be grown on soil or using hydroponics. Residents can grow their own vegetables or buy local vegetables grown near their homes. This would help to achieve greater food sufficiency, add more greenery, foster community bonding, and reduce the use of resources for food import and transportation.

16. Promote Local or Ecolabelled Food, Materials and Products

Support and encourage consumers to buy food that are grown locally and products that are made locally. Increase consumer awareness about these local products and where to find them. There should also be efforts to educate consumers about ecolabels for food, materials and products. Local ecolabels include Green Label, Energy Label, Fuel Economy Label and Water Efficiency Label. Global eco-labels include Forest Stewardship Council labels, Marine Stewardship Council labels, USDA Organic, Soil Association Organic Standard, EU Ecolabel, etc.

There could a directory of ecolabels recognised by the authorities so that consumers can make the right choice to buy green. In addition, the authorities could come up with a standardised ecolabel for all food, materials and products. This ecolabel could follow the Health Promotion Board's Healthier Choice Symbol on food products, which helps consumer make healthier food choices. Similarly, there could be a Greener Choice Symbol on all materials and products to help consumers make informed green choices.

Protecting Natural Habitats and Biodiversity

17. Establish Mandatory Environmental Impact Assessments and Environmental Reviews

To protect our natural habitats and wildlife, it should be mandatory for developers to conduct environmental impact assessments or environmental reviews for their projects before starting development activities. Environmental Impact Assessments (EIAs) should be conducted for large-scale projects of a larger size and involving sensitive natural habitats. Environmental Reviews are scaled-down versions of EIAs and should be conducted for smaller projects that could have environmental impacts on the surroundings.

18. Strengthen the Protection of Marine Habitats and Biodiversity

Our marine habitats contain a multitude of biodiversity that should be protected and studied but there are no clear guidelines or laws to protect the marine habitats and biodiversity. Marine habitats are increasingly threatened by shipping activities, land reclamation, dredging and development projects.

There should be a comprehensive study of the various marine habitats and build upon the excellent work currently done by groups (such as wildsingapore), NGOs and research institutes. Based on the study, relevant programmes and laws to protect the marine habitats can be developed. There should also be plans for some of the marine habitats to be gazetted as marine reserves.

Greener Companies and Businesses

19. Introduce Green Certification for SMEs

For companies who wish to show that they are concerned about the environment and are implementing environmental practices, they usually try to obtain certification for ISO 14001 Environmental Management System. However, implementing the ISO 14001 standard and achieving certification usually involves a substantial amount of cost and time, especially for SMEs. As a result, SMEs might not be too willing to implement the standard.

To make it easier for SMEs to implement green practices, a green certification scheme could be introduced. The green certification scheme is a scaled-down version of the ISO 14001 standard, involving less paperwork and time, and is easier and cheaper to implement. This scheme would enable SMEs to implement simple green practices and obtain a green certification. SMEs with this green certification would be recognised by the government and consumers as being environmentally conscious. The green certification would also serve as a stepping stone if SMEs wish to go further for ISO 14001 certification.

This green certification for SMEs could model those of other countries such as the Eco-Lighthouse Program in Norway, the Kyoto Environmental Management System and the Eco Action 21 in Japan.

20. Develop More Green Resources for Companies

Develop more resources to help companies reduce their environmental impacts. This could be done by the authorities or with the help of external consultants. The resources could include guidebooks, case studies and best practices on how to reduce energy,

water, carbon emissions and packaging, and how to implement environmental management system and life cycle analysis. Some good examples of resources can be found from:

- Carbon Trust (<http://www.carbontrust.co.uk/>)
- Energy Star (<http://www.energystar.gov/>)
- Envirowise (<http://www.envirowise.gov.uk/>)
- GreenBiz (<http://www.greenbiz.com/>)
- Waste and Resources Action Programme (<http://www.wrap.org.uk/>)

Green Future Solutions



Green Future Solutions provides environmental consultancy services to help small and medium enterprises (SMEs) go green. We also manage the Green Business Times – an online resource to help businesses go green and reduce their impact on the environment. Our aim is to provide environmental news, green resources and sustainable practices for companies and business professionals in Singapore. Visit Green Business Times at <http://www.greenbusinesstimes.com/>. For enquiries, please contact Mr Eugene Tay at eugene@greenbusinesstimes.com.