

TREELODGE @
PUNGGOL

Green Home
Healthy Living

An Eco-Lifestyle Experience

TREELODGE @

PUNGGOL

A HOME OF DISTINCTION, AN ECO-FRIENDLY LIFESTYLE

Welcome to Treelodge@Punggol, HDB's first demo eco-friendly precinct. This is your Green Home, where you can live in an environmentally friendly environment. Check out your precinct and home, and discover the various green features that have been included here.

Treelodge@Punggol introduces environmental features that embrace Singapore's tropical climatic conditions. It employs both passive design strategies and green building technologies to achieve efficient energy, water and waste management

You can also contribute by adopting eco-friendly choices. Let's all do our part for the environment.



ENHANCED

ENERGY

WATER AND WASTE

GREEN

CONTENTS

SITE ECOLOGY

- 6 PASSIVE DESIGN STRATEGY
- 8 PODIUM CARPARK / ECO-DECK
- 10 GREEN SPACES
- 12 COMMUNITY GARDEN
- 13 SKYRISE GREENERY
- 14 ENHANCED GREENERY
- 16 GREEN COMMUTE

MANAGEMENT

- 20 EFFICIENT ENERGY MANAGEMENT
- 21 RENEWABLE ENERGY SOLUTIONS
- 22 GREEN FEATURES WITHIN HOME

MANAGEMENT

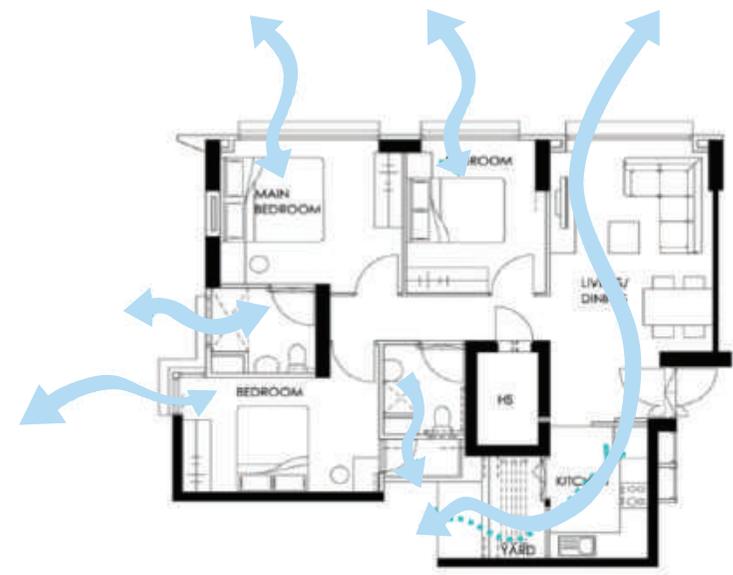
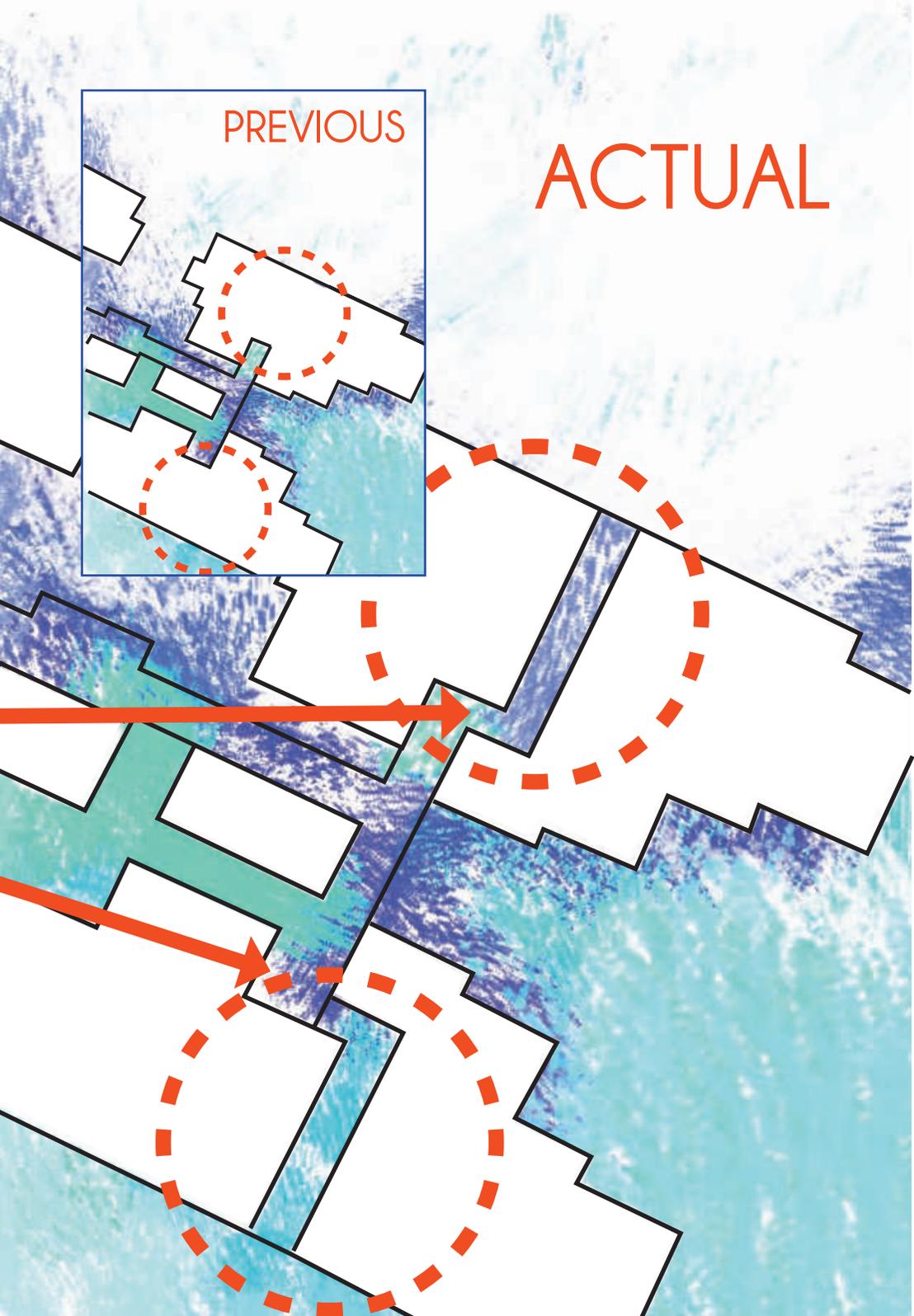
- 26 ALTERNATIVE WATER SOLUTIONS
- 27 EFFICIENT WATER MANAGEMENT
- 28 RENEWABLE RESOURCE SOLUTIONS
- 30 RESOURCE EFFICIENCY
- 31 GREEN MATERIALS

LIVING LIFESTYLE

- 34 LIVING WITH THE ENVIRONMENT
- 35 MAKE THE RIGHT CHOICE / COOL MOVES
- 36 BRIGHT IDEAS
- 37 MONITORING YOUR ENERGY CONSUMPTION







Wind Flow within 4 Room Unit

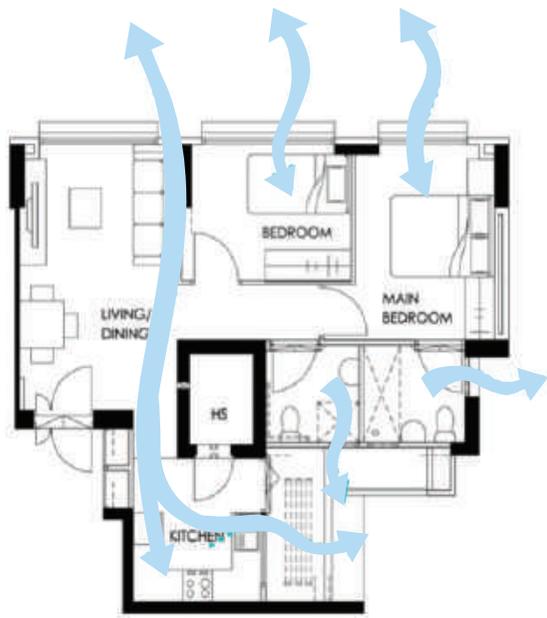
PASSIVE DESIGN STRATEGY

PREVAILING WIND, NATURAL CROSS VENTILATION

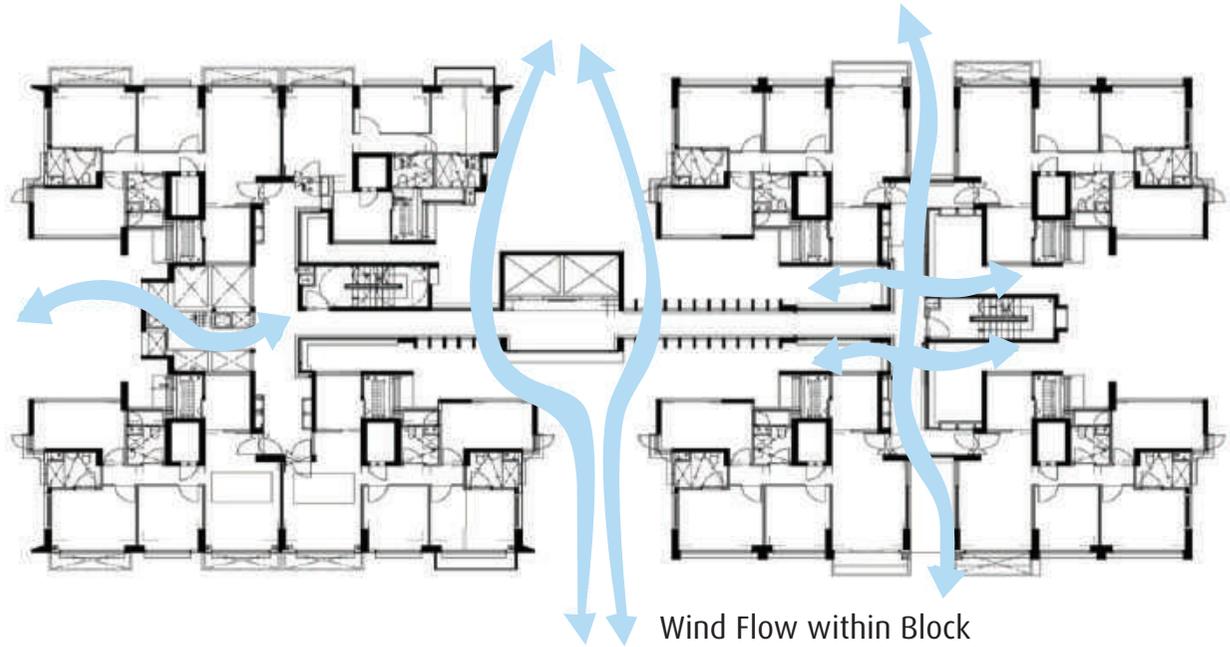
Treelodge@Punggol faces north-east and south-west wind direction. All residential blocks are strategically orientated to face the prevailing winds, to maximize natural cross-ventilation. Windows are designed to maximize natural lighting and minimize solar radiation from the sun into the units from the east-west direction.

COMPUTATIONAL FLUID DYNAMICS (CFD)

The orientation of the buildings and the openness of the landscape Eco-Deck create a wind tunnel through the central spine of the Eco-Deck. Studies have been carried out to capitalize on the wind tunnel effects to cool the development at precinct, block and unit levels.

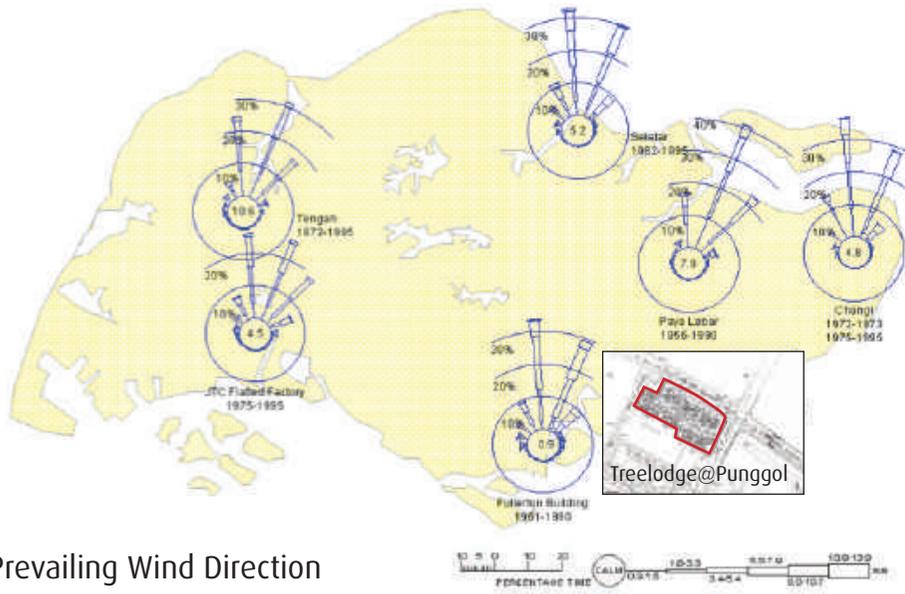


Wind Flow within 3 Room Unit

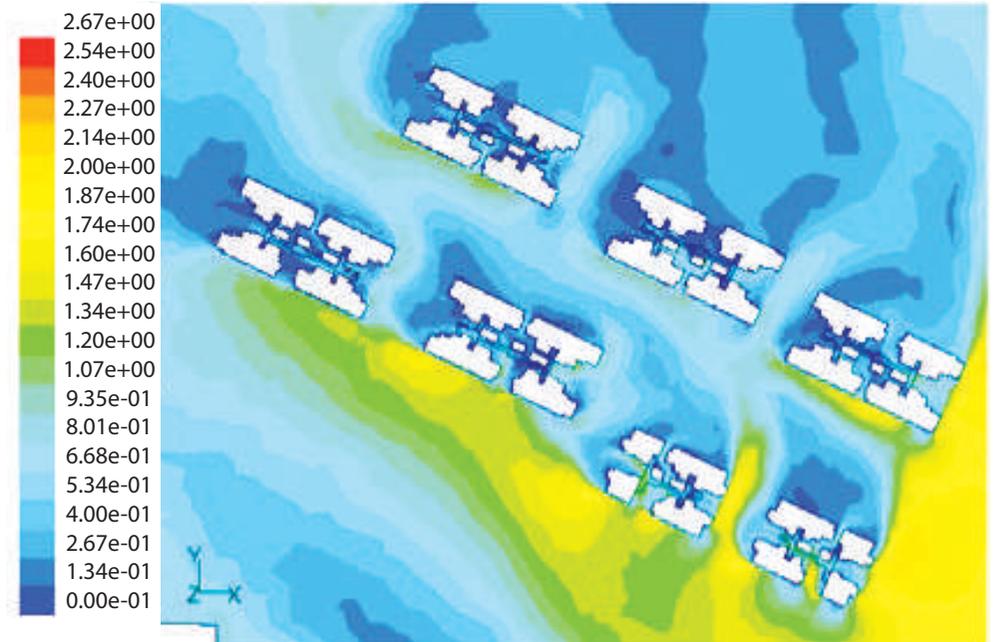


Wind Flow within Block

WIND ROSE



Prevailing Wind Direction



CFD Simulation



PODIUM CARPARK AND ECO-DECK

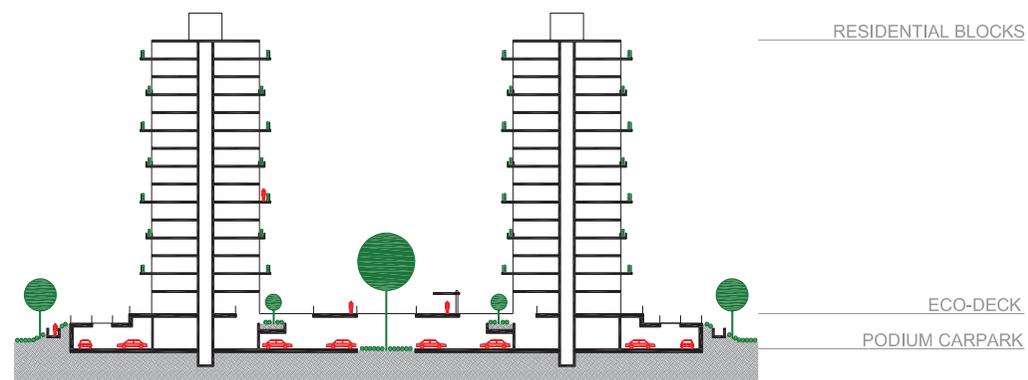
Treelodge@Punggol adopts a podium carpark design concept, with the residential blocks sitting on a single storey carpark extended across the entire 1st storey of this precinct.

PODIUM CARPARK

The podium carpark allows residential blocks to be spaced further apart for better cross-ventilation within the precinct. Direct carparking provides convenience to the residents.

ECO-DECK

The roof of the carpark, the Eco-Deck, is a landscaped activity centre, with the Green Spine linking all precinct amenities together. The Eco-Deck consists of precinct amenities such as double-deck precinct pavilion, playground, fitness corner and a dedicated spot for community gardening.







GREEN SPACES

GREEN SPINE

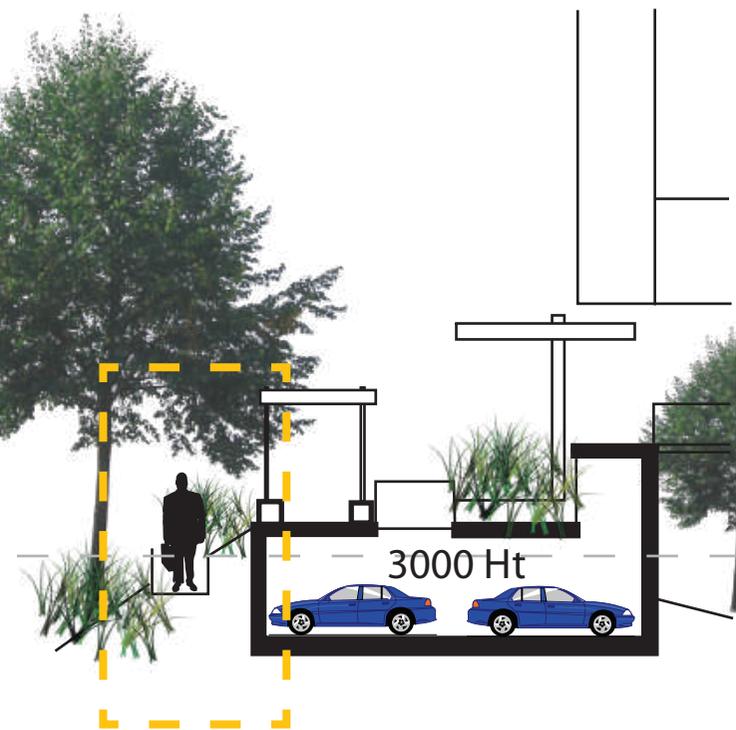
Along the Green Spine, trellises run through the precinct and connect the various precinct amenities. Enhanced greenery along the Green Spine not only reduces heat built-up in the precinct, but also minimizes glare and provide better and greener visual relief for the units above.

GREEN PATH

This Green Path runs around the peripheral of Treelodge@Punggol. It is approximately 650m long. Trellises are provided at strategic locations to further provide shade for recreational activities such as jogging or taking leisure walks.

GREEN CONNECTOR

Treelodge@Punggol is located at a strategic position adjacent to a common green and in close proximity to the Town Park and My Waterway@Punggol. This allow a green connector that runs through the precinct to be created, which not only enhance the greenery within the living environment but also co-relate Treelodge@Punggol with the surrounding green areas and attractions.







COMMUNITY GARDEN

The Eco-Deck incorporates a community garden to facilitate communal gardening activities for the residents. Residents of Treelodge@Punggol can participate in gardening and consume its produce. This helps promote community cohesiveness amongst the residents.





SKYRISE GREENERY

GREEN BALCONIES AND PLANTER BOXES

Some of the units in Treelodge@Punggol come with green balconies and planter boxes to promote house gardening. Residents can play their part to green up the building façades and the living environment.

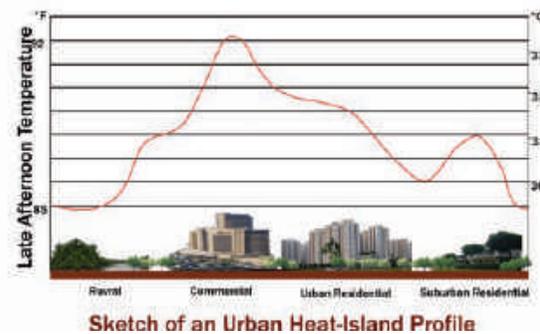




ENHANCED GREENERY

REDUCED URBAN HEAT ISLAND EFFECT

The provision of greenery in Treelodge@Punggol not only relieves the Urban Heat Island Effect, but also enhances the aesthetics within the precinct, creating a conducive living environment. With the podium carpark design concept and the Eco-Deck, there are more opportunities to green up the precinct. To maximize the green footprint, greenery is also introduced to selected columns and all rooftops within Treelodge@Punggol .



$$GnP = \frac{\text{GREEN AREA}}{\text{SITE AREA}}$$

GREENERY PROVISION

Green Plot Ratio (GnP) is a planning and design tool to quantify the provision of greenery in developments. It includes the green provided at the ground level, building façades, as well as on the roof. For Treelodge@Punggol , the GnP is higher than typical HDB projects.

LANDSCAPED COURTYARD

To further enhance the green experience, the lift lobbies at carpark level are landscaped to create thematic courtyards. The plants introduced are carefully selected and require little sunlight and maintenance.





GREEN ROOF (PEG TRAYS)

Provision of green roofs in eco-precinct reduces heat absorption on roof surfaces that enhances the comfort of residents living in the units at the topmost storey. This is achieved with the use of HDB's Prefabricated Extensive Green (PEG) Roof system which has proven to perform well in Singapore's tropical climate. It is also a cost effective system which requires very low maintenance.

HYBRID PLANTING

Enhanced greenery on the Eco-Deck is made possible with the adoption of a "hybrid green roof system". This system reduces the depth of the soil bases required for planting, consequentially reducing the size of the deck structure. Larger trees are grown at the carpark level and allowed to 'emerge' out through air-wells to provide greater variety in greenery for the Eco-Deck.

Landscaping on the Eco-Deck are also maximized to create an environment conducive for residents to rest and relax. The enhanced greenery also helps to absorb environmental noise, as opposed to bare concrete surfaces which tend to reflect noise, thereby further enhancing the living experience in the precinct – creating a cool and quiet environment.



VERTICAL GREENING

Besides the Eco-Deck and rooftops, facade greening or vertical greening is also introduced at selected columns of the residential blocks along the green connector.





GREEN COMMUTE

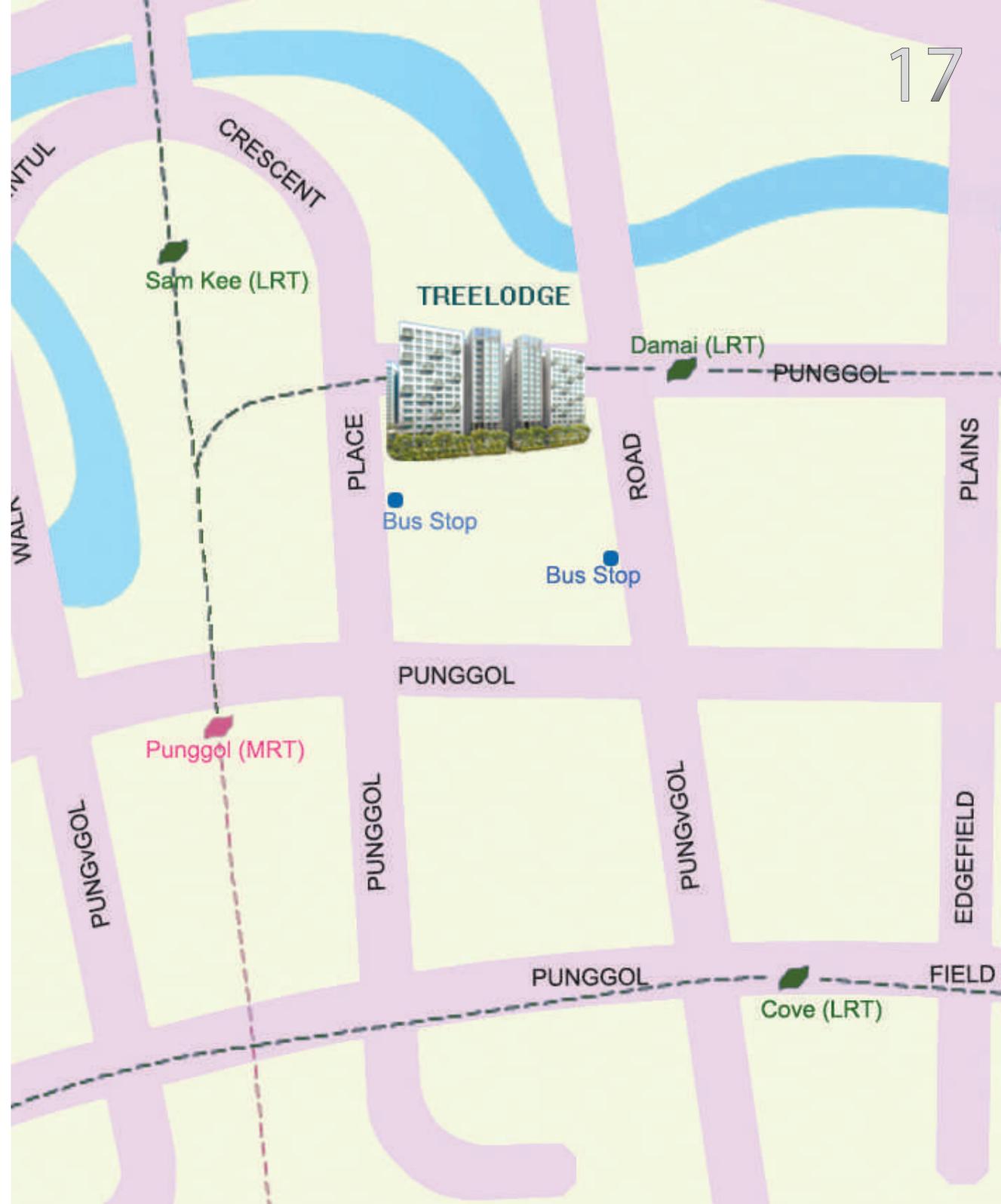
PUBLIC TRANSPORT

Treelodge@Punggol is close to the existing Punggol MRT and Damai LRT stations. With such convenience and accessibility to public transport nodes, and coupled with a car sharing scheme, there is little need to own and drive cars.

CYCLING

Bicycle parking is provided at the 1st storey of every block in Treelodge@Punggol to promote cycling around Punggol Town. Cycling does not contribute to carbon dioxide emission and promotes a healthy living lifestyle.







ENERGY MANAGEMENT

Treelodge@Punggol adopts energy efficient technologies to help optimize energy usage and reduce maintenance cost in the estate. Besides optimizing energy usage and exploring the use of clean and renewable energy sources, it also reduces the reliance on fossil fuels to achieve environmental sustainability.



MOTION SENSOR

EFFICIENT ENERGY MANAGEMENT

ENERGY EFFICIENT LIGHTINGS, MOTION SENSORS

Energy saving light fittings are used along common corridors and podium carpark. This not only reduces energy consumption but also optimizes maintenance as they have longer life spans. Motion sensors are also introduced at the staircases to provide on-demand lighting. This reduces electricity consumption.



ENERGY EFFICIENT LIGHTING

ENERGY EFFICIENT LIFTS WITH REGENERATIVE FEATURES

All lifts in Treelodge@Punggol are Machine-Roomless Lifts (MRL) which use 10% less energy than conventional lifts through incorporation of a highly efficient motor system. These lifts do not require a machine room, thus requiring less construction materials. Regenerative features integrated also help to supply energy back to the power network during the braking phase. This results in lower net electricity usage.



RENEWABLE ENERGY SOLUTIONS

SOLAR PHOTOVOLTAICS

Solar panels are installed on the roof at Treelodge@Punggol. These panels will generate energy to meet the demand of common area services such as lifts and lighting in the corridors and Eco-Deck.





GREEN FEATURES WITHIN HOME

MAXIMISING NATURAL DAYLIGHTING

All dwelling units in Treelodge@Punggol are orientated to reduce direct solar irradiance into the interior, whilst allowing natural light. In addition, 3-quarter height windows are provided, allowing more light through, thus keeping the interior bright and airy.

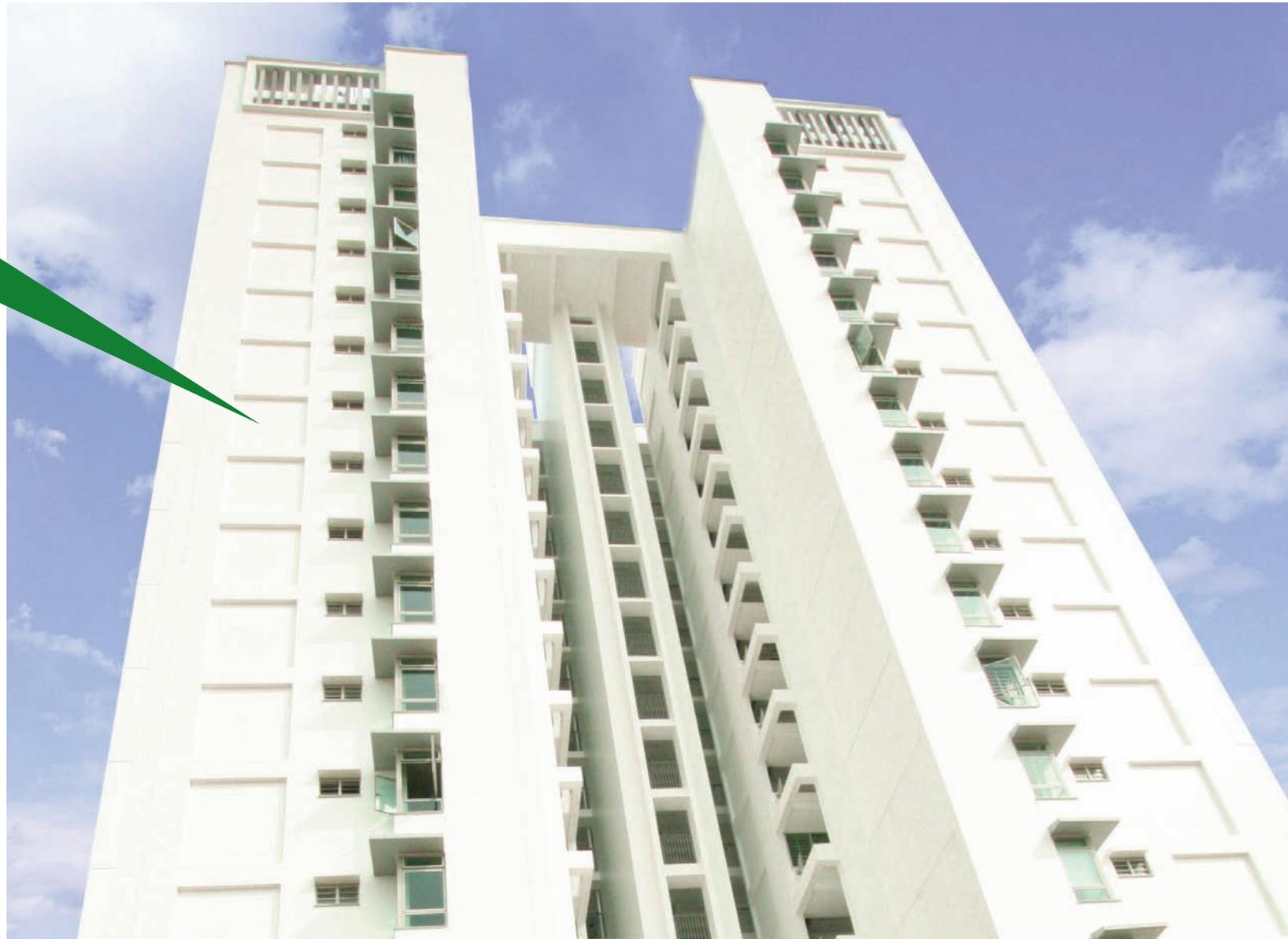
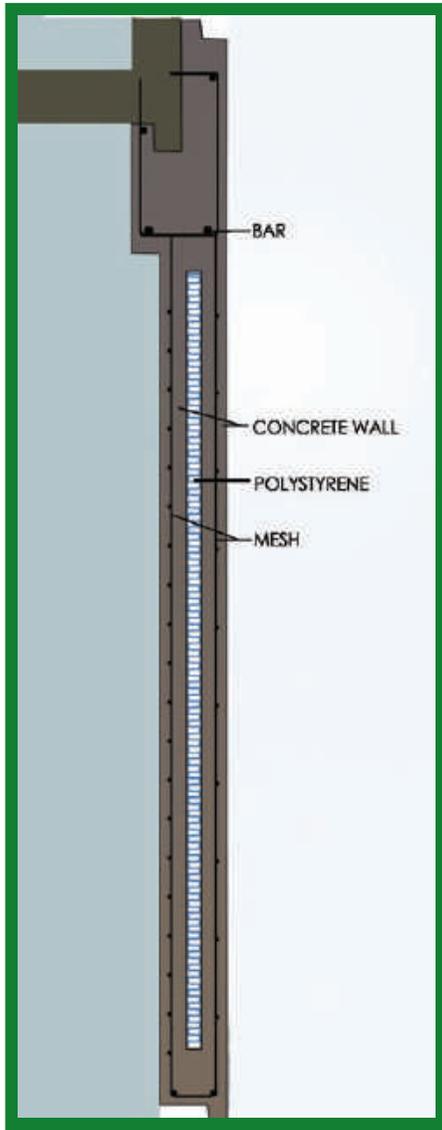
CLOTHES DRYING RACK

External clothes drying racks are provided at Treelodge@Punggol for residents to hang their clothes for drying. Although this feature is not new in HDB's context, it reduces the need for clothes to be dried through mechanical methods which is energy intensive.



COOL WALL

“Cool Walls”, with enhanced thermal insulation, are incorporated to units with walls facing east or west direction to cut down heat radiation, improving the thermal comfort within the units.





METAL



GLASS



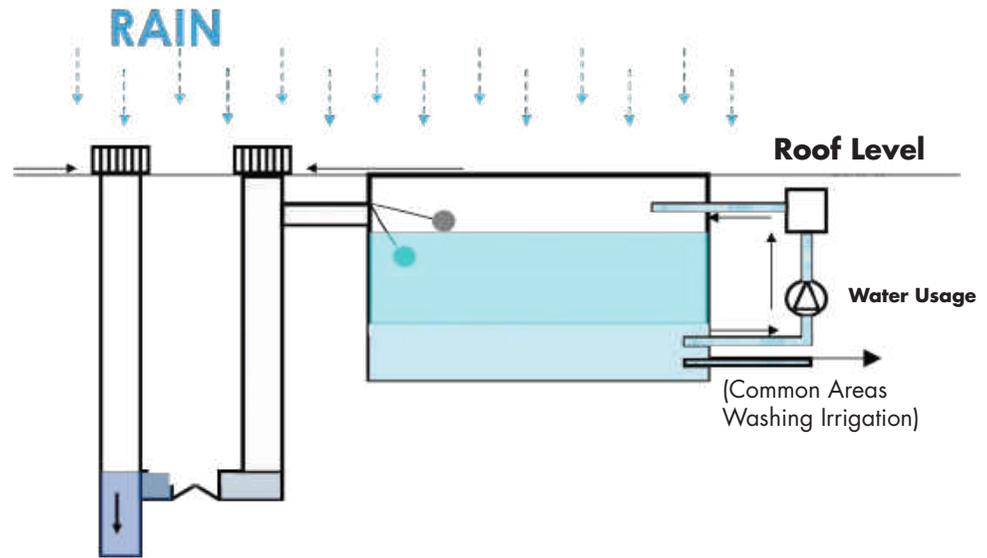
PLASTIC



WATER AND WASTE MANAGEMENT

Efficient water and waste management is also key towards creating a sustainable living environment. At Treelodge@Punggol, green building technologies are introduced to conserve and optimize resource usage through water conservation features and promote recycling efforts.

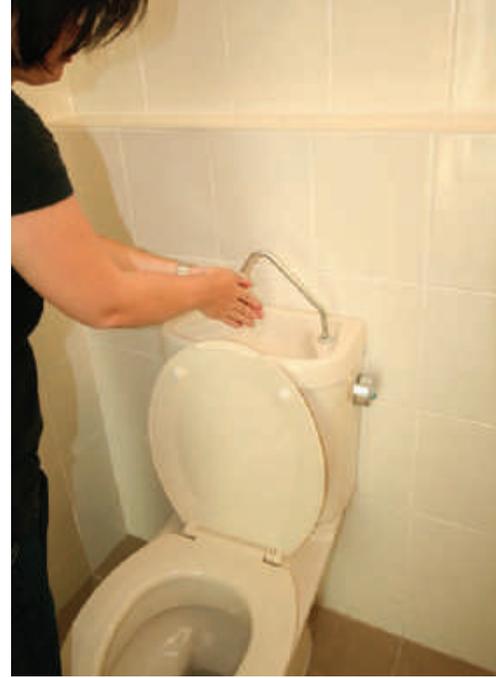




RENEWABLE WATER SOLUTIONS

RAINWATER HARVESTING

Treelodge@Punggol incorporates a rainwater collection system to collect and store rainwater for common corridor washing and irrigation. The system is designed to capitalize on gravitational force for the supply of water, thus negating the need to use energy for any pumping works.



EFFICIENT WATER MANAGEMENT

WATER-SAVING DEVICES

To help residents conserve water, several water-saving features are introduced at Treelodge@Punggol. All taps installed are rated “very Good” in PUB’s Water Efficient Labeling Scheme (WELS). This is to optimize water usage within the flats.

INTEGRATED WASH BASIN – TOILET PEDESTALS

An innovative integrated wash basin-toilet pedestal system is introduced to all bathrooms in Treelodge@Punggol. This system allows residents to use the water for hand-washing before they are re-directed to the pedestal cistern for the next toilet flushing. In addition, a dual flush feature is also incorporated to enable the user to vary the amount of water for flushing depending on usage, thus achieving further water conservation. This helps residents to save water used for flushing the toilets by as much as 20%.



Water Efficiency Labelling Scheme

| Fitting | Wels |
|-----------------|-------|
| Toilet Pedestal | ● ● ◐ |
| Taps | ● ● ◐ |
| Shower Heads | ● ● ◐ |
| Bib Taps | ● ● ◐ |

RENEWABLE RESOURCE SOLUTIONS

CENTRALISED RECYCLABLE REFUSE CHUTE

To promote recycling in Treelodge@Punggol, an additional Centralized Refuse Chute dedicated for recyclable wastes is introduced to all residential blocks. The system, with recycling points at every level, provides convenience for residents to dispose recyclables, contributing towards recycling and also enhancing collection efficiency for waste collectors.



RECYCLABLE WASTE

Drink cartons Clothes Plastics

Cardboards Newspapers Glass Cans

PLEASE DO NOT THROW NON-RECYCLABLE ITEMS INTO THIS CHUTE.



CAUTION

NON-POTABLE WATER NOT FOR DRINKING



RESOURCE EFFICIENCY

RESOURCE EFFICIENT CONSTRUCTION METHODS

Sustainable construction is a key emphasis when constructing your home at Treelodge@Punggol. Using precast technology ensures minimal wastage of materials and maximizing of quality production. Most of the precast components are also fabricated off-site. This generates less heat and noise on site as compared to conventional construction, and also reduces heat built-up and noise disturbance to neighbouring sites and environment.

RECYCLED PLAYGROUND MATERIALS

At Treelodge@Punggol, recycled construction materials are used to achieve sustainable construction. Even the playground equipment are made using recycled materials such as plastics, steel and aluminum.



**Made with
recycled materials**



**Product can
be recycled**



GREEN MATERIALS

LOW-VOC PAINT

For the interior, paint with low Volatile Organic Compounds (VOC) are used. Besides reducing paint odour, these paints are also more environmentally friendly.

SELF-CLEANSING PAINT

At Treelodge@Punggol, the paint used are carefully selected to be environmentally friendly and minimizes maintenance. The exterior are painted using self-cleansing paint. This minimizes maintenance as the paint can repel water and washes away surface dirt following a rain. The white colour scheme also helps to reduce heat absorption into the interior.







GREEN LIVING LIFESTYLE

Treelodge@Punggol, your Green home where you can experience a distinctive Eco-Lifestyle, one that aims to promote a green and healthy living. With increased consciousness of the environment, let's bring about greater conservation efforts for a more sustainable living environment in future.

LIVING WITH THE ENVIRONMENT

HARNESSING NATURE'S FORCES FOR CLEAN AND GREEN ENERGY

HDB flats have been designed to facilitate natural lighting and ventilation to help reduce energy consumption.



GREEN POCKETS

Have green plants in your home to enhance and cool the environment.



NATURAL LIGHTING

Larger windows allows more lighting and ventilation, they reduce electricity usage and enhance the natural lighting in your home.



NATURAL COOL

Open your windows and enjoy the breeze from the natural surroundings and greenery around your flat.



DRYING RACKS

External clothes drying racks allow you to dry your clothes naturally.

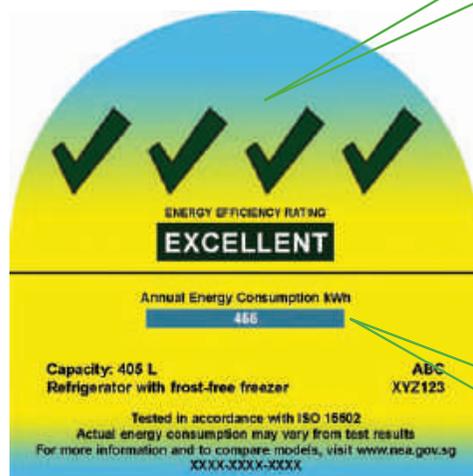
DO YOU KNOW?

- Green plants cool the environment around you!

MAKE THE RIGHT CHOICE!

BUY ENERGY EFFICIENT APPLIANCES

Look at the Mandatory Energy Labeling Scheme (WELS) ticks when buying Air-Conditioners, Refrigerators and Clothes Dryers. Generally, more ticks means greater energy-savings for you!



Energy Efficiency Rating

| Green Ticks | Energy Efficiency Rating |
|-------------|--------------------------|
| 0 | Low |
| 1 | Fair |
| 2 | Good |
| 3 | Very Good |
| 4 | Excellent |

Annual Energy Consumption (kWh)

The lower the value, the more you will save on your electricity bill.

DO YOU KNOW?

- The energy consumption of 3 fans is only about a quarter of that used by an air-conditioner!
- Over-crowding your refrigerator will increase energy consumption.

COOL MOVES

In Singapore's climate, cooling represents the largest part of household electricity usage. Take the following steps to increase the efficiency of your home cooling systems.

Save about S\$380 a year by having a air-conditioner of 1-tick to a 4 -tick model:-

- Set the temperature to 25 degrees Celsius.
- Close the windows and doors in your room when using your air conditioner.
- Clean your air-conditioner filter regularly.
- Keep your house cool by using curtains, blinds and solar reflecting film on the windows.

Air-Conditioner



Save about S\$310*

a year by replacing your air-conditioner from a 1-tick to a 4-tick model.

Save about S\$110 a year by replacing your refrigerator from a 1-tick to a 4 -tick model:-

Refrigerator



Save about S\$90*

a year by replacing your refrigerator from a 1-tick to a 4-tick model.

- Choose the smallest refrigerator size that meets the whole family's needs as generally, larger models use more energy to operate.
- Keep the back of the refrigerator well-ventilated.
- Allow hot food to cool before placing it in the refrigerator.
- Test the door seal occasionally by closing the door on a thin piece of paper. If it does not stay in place, the seal should be replaced.

Non-energy Efficient Lighting

Incandescent Bulb



Halogen Spotlight



Energy Efficient Lighting

CFL



T5 Circular Light



BRIGHT IDEAS

CHOOSE THE RIGHT LIGHTING

Save about \$520 per bulb per year by replacing a 40W incandescent bulb with a 7W compact fluorescent lamp (CFL).

One of the fastest and easiest ways to cut down on your energy bill is to switch to energy efficient lighting.

Electronic ballasts have fast become the standard in the industry as a replacement to electromagnetic ballasts. The below are 5 reasons why you should switch to one:

- Greater efficiency
- Generates less heat
- Better light quality
- Minimal flickering effect
- Minimal noise during operation

Inefficient Ballasts

Electromagnetic ballast



Efficient Ballasts

Electronic ballast



DO YOU KNOW?

- Notebooks use about 60% less electricity than desktop computers.

MONITORING YOUR ENERGY CONSUMPTION

BE CONSCIOUS OF YOUR ENERGY USAGE. CHECK YOUR UTILITY BILLS MONTHLY!

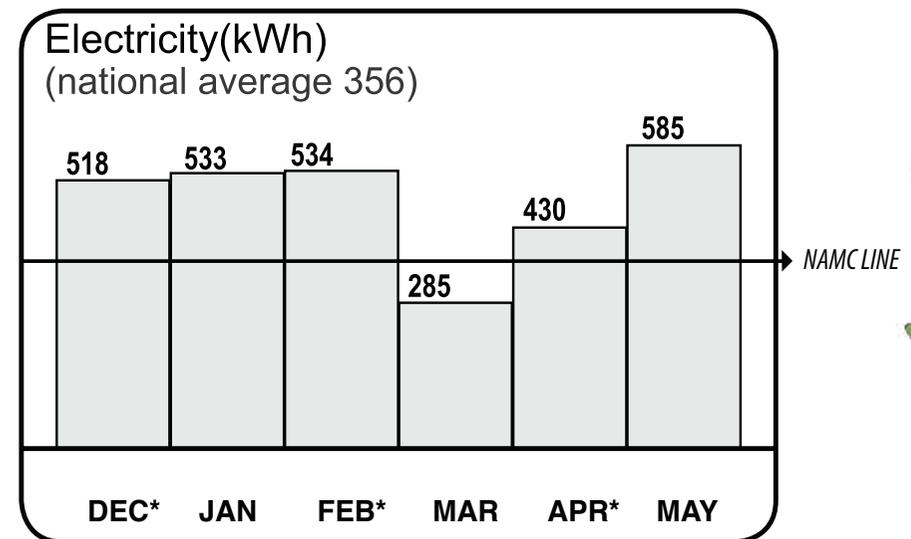
There is a bar graph in your utility bill which shows your previous months' electricity consumption. The horizontal line in the graph shows the National Average Monthly Consumption (NAMC) for the type of housing you are staying in. The shaded bars show your monthly electricity consumption.

If the bar is higher than the NAMC line, it shows that you are using more electricity than those living in the same housing type. You can start saving on your electricity bill by practising good energy conservation habits.

If the bar column is lower than the NAMC line, it shows that you are using less electricity than those living in the same housing.

| CURRENT MONTH CHARGES | | | | |
|-------------------------------------|---------|-----------|-------------|------------|
| | Usage | Rate (\$) | Amount (\$) | Total (\$) |
| Electricity Services | | | | |
| Reading taken on 04-05-2009 : 69042 | | | | |
| Electricity | 70 kWh | 0.2293 | 16.05 | |
| | 516 kWh | 0.1803 | 92.85 | 108.91 |

Bar Graph for Past Consumption



*Consumption based on estimated reading
- National average consumption for your house type

DO YOU KNOW?

- Standby power accounts for up to 10% of your home electricity. Switch off your appliances at the power sockets!





Loving Nature
Living Better

