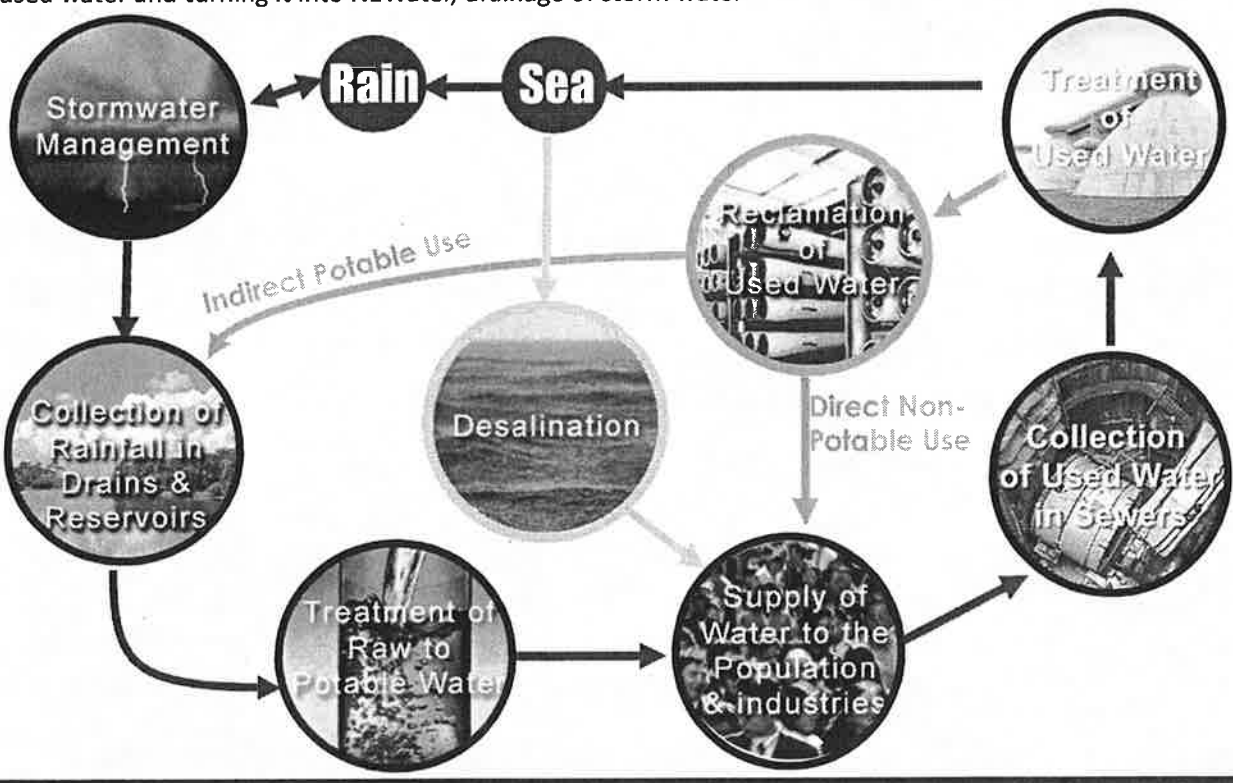
Water for All
Conserve, Value, Enjoy
PUB



Water Efficiency in the Non-Domestic Sector

PUB Manages the Complete Water Cycle

From sourcing, collection, purification and supply of drinking water, to treatment of used water and turning it into NEWater, drainage of storm water



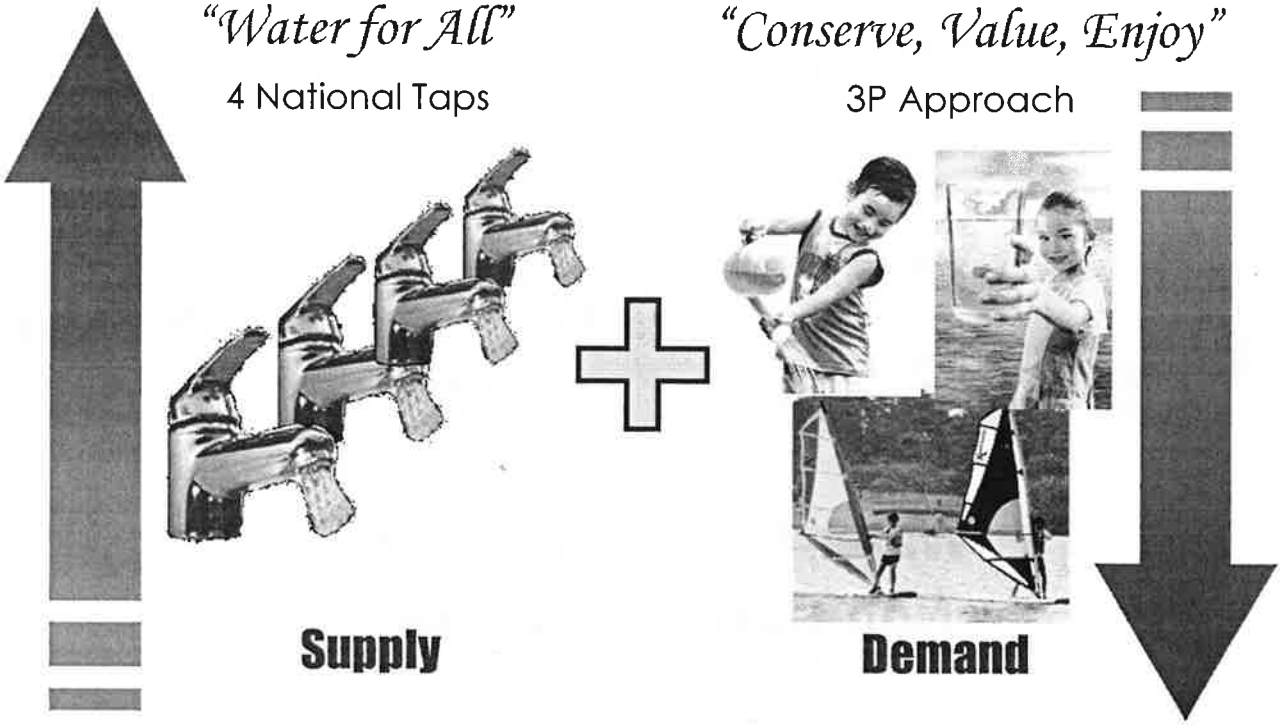
Sustainable Water Management

"Water for All"

4 National Taps

"Conserve, Value, Enjoy"

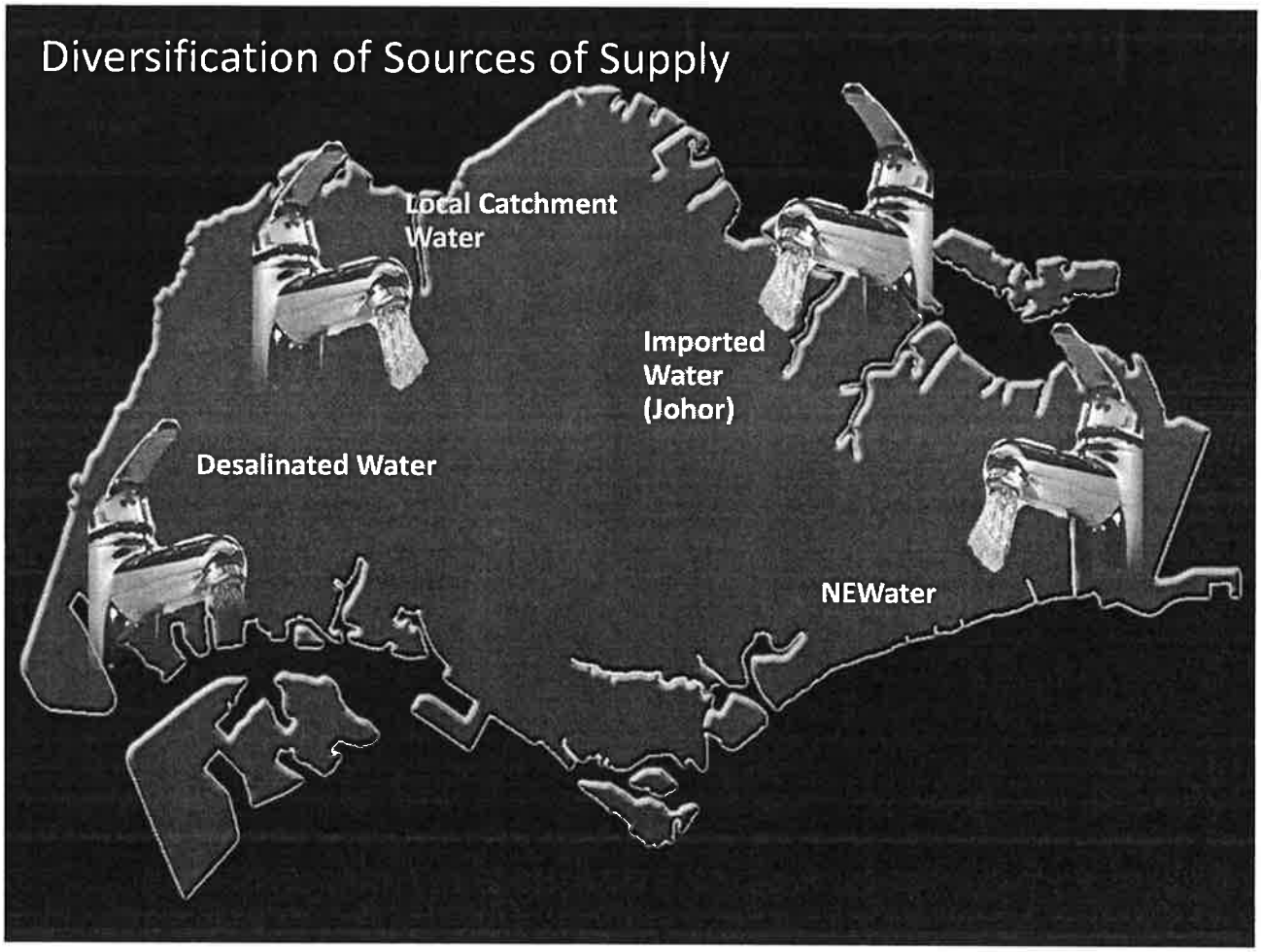
3P Approach



Supply

Demand

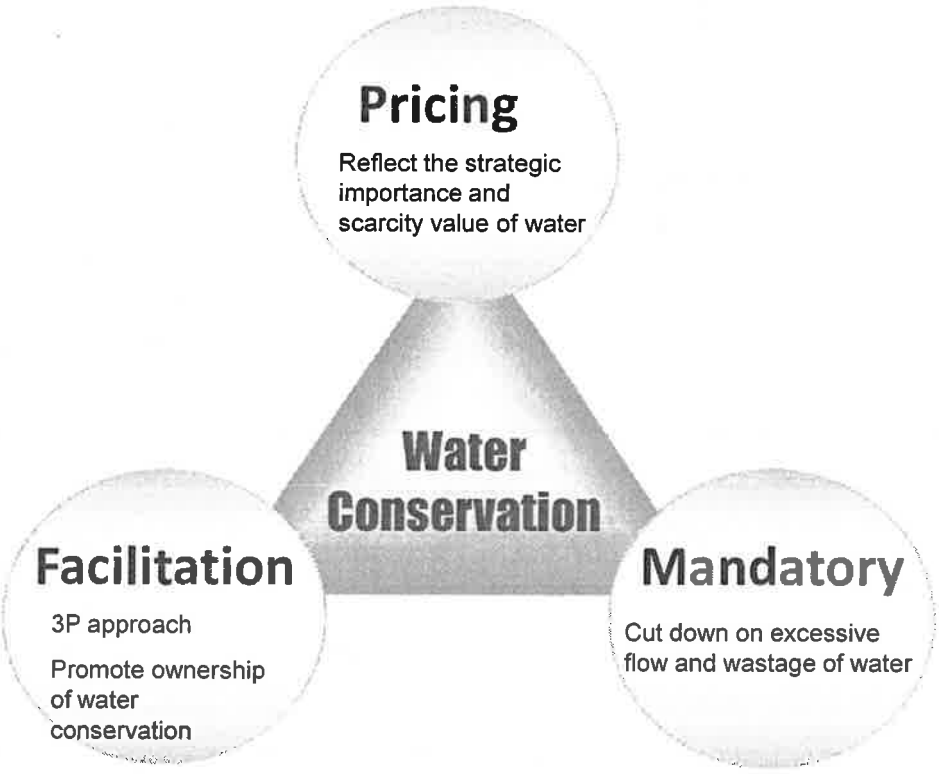
Water for All: Conserve, Value, Enjoy PUB



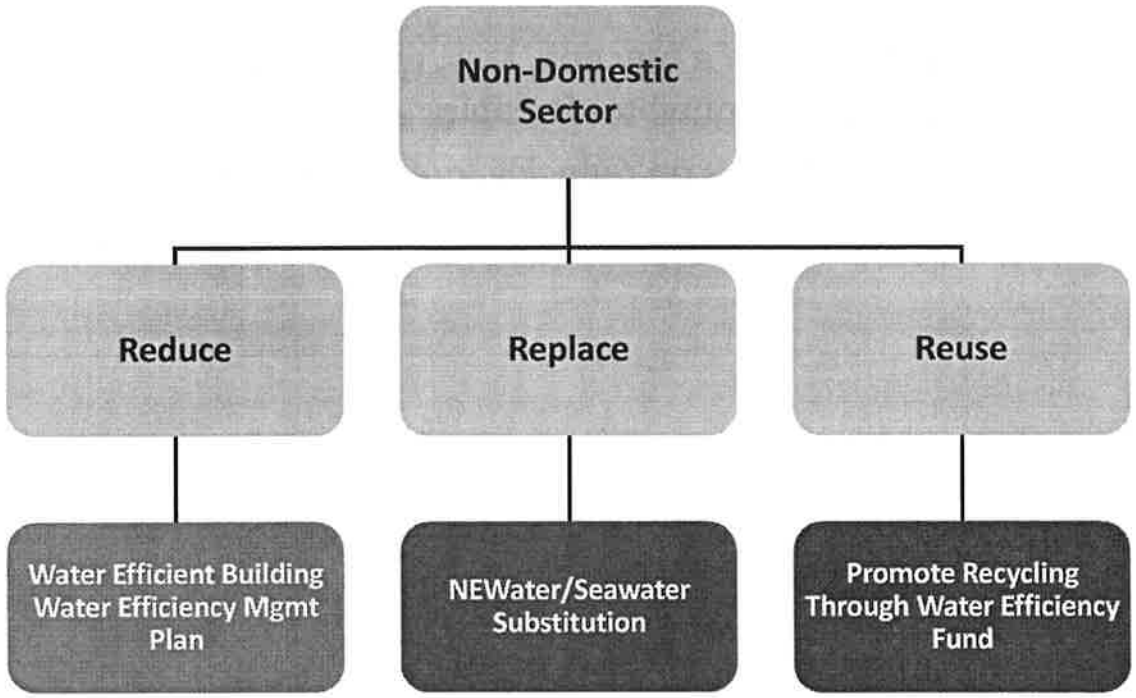
Definition of Water Efficiency (Wikipedia)

- The accomplishment of a function, task, process or result with **minimal amount of water feasible**
- Water efficiency focuses on reducing, not restricting use.

3-Prong Water Conservation Strategy



Non-Domestic – Water Efficient Strategy (3Rs)



Pricing – Water Tariff Structure

Tariff Category	Consumption Block (m3 per month)	With Effect from 1 July 2000	
		Tariff (cents per m3)	Water Conservation Tax or WCT (%)
Domestic	1 to 40	117	30
	Above 40	140	45
Non-Domestic	All Units	117	30

WCT : Water Conservation Tax - Broad-based Tax levied by the Government

Regulatory Requirements

Code of Practice for Water Services – SS CP 48 : 2005 Water Conservation Measures (Cl 7.2)

- Install Self-Closing Delayed-Action Taps (Since 1983)
  - All wash basins, shower points
- *In all non-domestic premises (including common amenities of condominiums)





Manually-operated



Sensor-operated

Self-Closing-Delayed-Action Tap

Regulatory Requirements

Code of Practice for Water Services – SS CP 48 : 2005 Water Conservation Measures (Cl 7.2)



9 litre flushing cistern



1997



Single Flush Low capacity flushing cistern (4.5 litres)

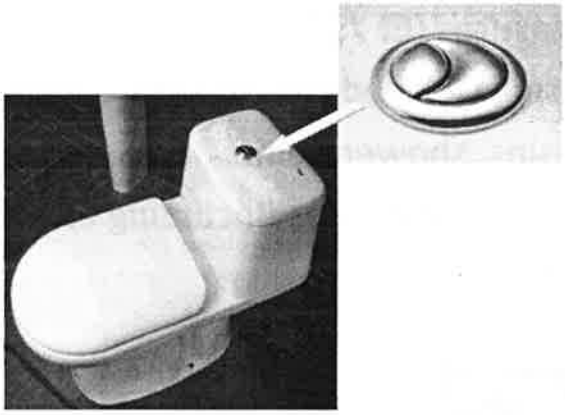
From July 2009



Dual flush Low Capacity Flushing Cistern

- Install dual flush low capacity flushing cisterns in new developments and existing domestic premises undergoing renovation which involve the
  - replacement of water closets
  - applicable for non-domestic premises if flushing cisterns are to be used
  - applicable to all domestic premises

Dual Flush Low Capacity Flushing Cisterns (LCFCs)

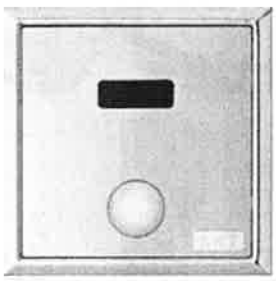


Dual flush LCFC

- Full flush not more than 4.5 litres
- Reduced flush not more than 3.0 litres
- Allow user to choose reduced flush for flushing liquid wastes
- Can save approximately 1.5 litres per flush

(Public toilets to be fitted with sensor operated flush valves as required by NEA)

Flush Valves



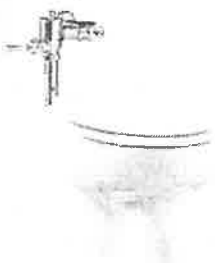
Sensor-operated
Flush Valve
With Sensor Faceplate



Manually-operated
Flush Valve
With Manual Button
Faceplate



Exposed Manually-operated
Urinal Flush Valve
With Manual Button



Exposed Manually-operated
Flush Valve

NEW BUILDINGS

BCA GREEN MARK

- 2 different categories for new buildings
  - Non residential buildings (ver 4.1)
  - Residential buildings (ver 4.1)

- Water efficiency – 17 points out of 190 (non residential)
  - 14 points out of 155 (residential)

GREEN MARK ASSESSMENT CRITERIA

Water Efficiency – New Buildings

BCA Green Mark Version NRB/4.1 Non-Residential Building Criteria

Part 2 – Water Efficiency	Green Mark Points
NRB 2-2 Water Usage and Leak Detection Promote the use of sub-metering and leak detection system for better control and monitoring.	
(a) Provision of private meters to monitor the major water usage such as irrigation, cooling tower and tenants' usage.	1 point
(b) Linking all private meters to the Building Management System (BMS) for leak detection	1 point

Regulatory Requirements

Code of Practice for Water Services –SS CP 48 : 2005
Amendment (Jun 2009)

Water Conservation measures (Cl 7.2 i)

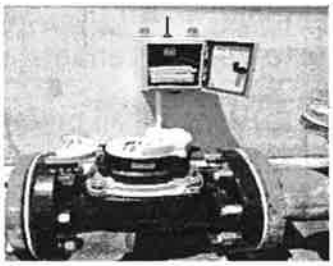
• Other areas in domestic (where applicable) and non- domestic premises as follows:-

- Install private water meters to measure water consumption at various areas such as cooling towers, swimming pools, kitchens, guestrooms, gardens, landscaped areas, toilets, boilers, etc and to monitor and track the water consumption at these areas for water usage and leakage control management.

Installation of Private Water Meters & Regular Monitoring

- Objectives:
  - Understand water usage within your premises
  - Identify leak areas quickly
- To install at key water usage areas
- Meters are to be labelled "private meters" and indicate water usage areas monitored
- Regular monitoring is required – daily, weekly, monthly
  - Manual recording
  - Remote metering





Remote Metering

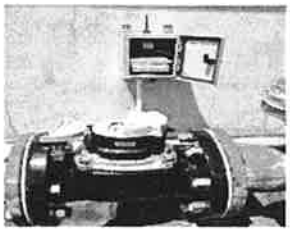
- Link the private water meters via:
  - Building Management System (BMS)
  - Automatic Meter Reading System (AMR)



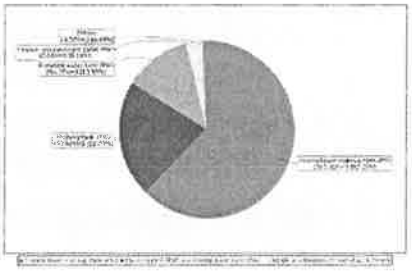


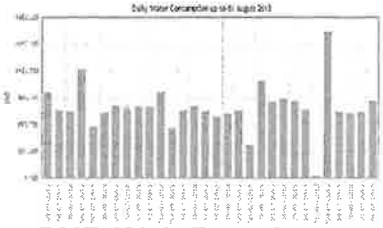


Building Management System



Automatic Meter Reading System





PUB Web Portal
- AMR
- WEMP

Water for All : Conserve, Value, Enjoy PUB

GREEN MARK ASSESSMENT CRITERIA

Water Efficiency – New Buildings

BCA Green Mark Version NRB/4.1 Non-Residential Building Criteria

Part 2 – Water Efficiency	Green Mark Points		
NRB 2-1 Water Efficient Fittings Encourage the use of water efficient fittings covered under the Water Efficiency Labelling Scheme (WELS). (a)Basin taps and mixers (b)Flushing cistern (c)Shower taps, mixers or showerheads (d)Sink/Bib taps and mixers (e)Urinals and urinal flush valve	***Rating based on Water Efficiency Labelling Scheme (WELS)**		Points scored based on the number and water efficiency rating of the fitting type used (Up to 10 points)
	Very Good	Excellent	
	Weightage		
	8	10	

Water for All : Conserve, Value, Enjoy PUB

Water Efficiency Labelling Scheme (WELS)

- Voluntary Water Efficiency Labelling Scheme (WELS) – launched 31 Oct 06
- Objective:
  - To help consumers make well-informed purchasing decisions & reduce their water consumption by providing info on the water efficiency of products
- WELS rate products in terms of water efficiency
  - 1 tick – Good
  - 2 ticks – Very Good
  - 3 ticks – Excellent
- Voluntary WELS remains limited in its effectiveness in helping consumers make more informed choices



Mandatory Water Efficiency Labelling Scheme

- To enhance the scheme, PUB mandated it through Mandatory WELS (MWELS)
- Types of water fittings under MWELS



Basin taps and mixers



Shower taps and mixers



Sink/Bib taps and mixers



Low capacity flushing cisterns



Urinals and urinal flush valves



Washing machines



Type of water fittings under Voluntary WELS

- Showerheads remains under Voluntary WELS



Showerheads



Criteria for WELS

FITTINGS	MAXIMUM ALLOWABLE	✓ GOOD RATING	✓✓ VERY GOOD RATING	✓✓✓ EXCELLENT RATING (**)
Shower Taps, Mixers & Showerheads (L/min)	9	>7 to 9	>5 to 7	5 or less
Basin Taps & Mixers (L/min)	6	>4 to 6	>2 to 4	2 or less
Sink/Bib Taps (L/min)	8	>6 to 8	>4 to 6	4 or less
Flushing Cisterns – Dual Flush Type (L/flush)	4.5 (full flush) 3.0 (low flush)	> 4.0 - 4.5 (full flush) > 2.5 -3.0 (low flush)	>3.5 to 4.0 (full flush) > 2.5 – 3.0 (low flush)	3.5 or less (1) (full flush) 2.5 or less (low flush)
Urinals & Urinal Flush Valve (L/flush)	1.5	> 1.0 to 1.5	> 0.5 to 1.0	0.5 or less or (2) waterless urinals
Washing Machine (L/Kg)	15	> 12 -15	> 9 -12	9 or less

(1)To pass laboratory simulation test on waste transportation efficiency in pipes
(2)To pass dilution test
(3)** The Excellent rated fittings shall also meet the minimum acceptable flow rates specified for the different fittings above.

Code of Practice for Water Services – SS CP 48 : 2005

Max allowable flow rates (Cl 4.1) & Public Utilities Water Supply Regulations (Cl 40)

From 1 July 2009

- All taps, urinals and flushing cisterns to display MWELS labels prominently at point of sale and packaging
- For all new developments and existing developments undergoing renovations, only water fittings/products that are labelled with at least 1-tick water efficiency rating and above under MWELS shall be installed and used.

From 1 April 2014

- Clothes washing machine models that do not meet minimum 1 tick water efficiency rating under MWELS shall no longer be allowed for sale, supply, display or advertisement.

From 1 Oct 2015

- Clothes washing machine models that do not meet minimum **2 ticks** water efficiency rating under MWELS shall no longer be allowed for sale, supply, display or advertisement.

Code of Practice for Water Services – SS CP 48 : 2005

Max allowable flow rates (Cl 4.1 Table 1 / Cl 4.2 Table 2)

Area of Usage	Maximum Allowable Flow Rate (litres/min)	WELS Flow Rating for 1 Tick Label (July 2009)	Best Water Efficient Flow Rate (litres/min)	Remarks
Basin Tap & Self Closing Delayed Action Basin Tap	6 2 (for Basin Taps in all public toilets and outside toilet facilities in food retail outlets)	> 4 to 6	2 (toilets) 4 (others)	For *self closing delayed action basin taps, timing shall remain at between 2 and 3 sec
Sink / Kitchen Tap and Wash Area	8	> 6 to 8	4	
Shower Tap & Self-Closing Delayed Action Shower Tap	9 12 (hotels)	> 7 to 9	5	For self closing delayed action shower tap, timing shall remain at between 13 and 15 sec
Other Areas	8	> 6 to 8	4	

* Sensor self-closing delayed action basin taps with a flow rate of 2 *litres/minute* are allowed a maximum preset timing of not more than 60 seconds provided water supply from the tap is automatically cut off when the hand is moved away from beneath the tap.

Water for All : Conserve, Value, Enjoy PUB

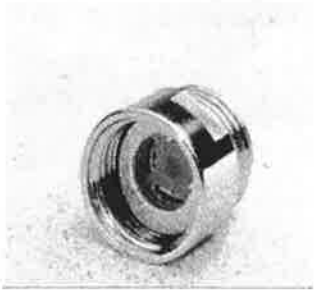
Flow Regulators

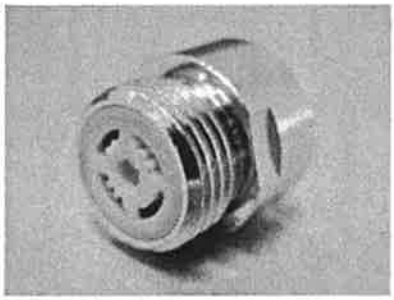
Terminal Constant flow regulator





In line Constant flow regulator





10% Challenge

- To challenge the non-domestic sector, particularly the hotels, schools, commercial buildings, government office buildings, etc, to work towards becoming a WEB and save 10% of their monthly water consumption
- To help non-domestic customers better manage and improve their efficiency in water consumption and help them reduce costs.

10 percent challenge

- 10% Challenge Website portal
- Water Efficiency Manager Course
- Water Efficient Building Design Guide
- Water Efficiency Management Plan

10% Challenge Website

http://tenpercent.com.sg/

- Water Efficiency Index (WEI) Calculator
- Water Efficient Practices
- 10 % Registration
- Water Audit Checklist
- Electronic Feedback Form
- Success stories
- Download WEB Design Guide
- Book & publicity materials



Water for All: Conserve, Value, Enjoy PUB

Water Efficiency Manager Course

SINGAPORE POLYTECHNIC
Opening Minds Shaping Lives

- **Objective:** To equip facilities managers with the knowledge and skills to:
  - conduct water audits
  - apply water efficiency measures to reduce water consumption in commercial/residential buildings.



- **Target Audience**
  - Facilities & Estates Managers
  - Building Owners
  - Engineers & Architects
- **Award**
  - Pass MCQ test, achieved minimum 75 % attendance and must submit the Water Efficiency Management Plan
  - Certificate of proficiency upon completion of the course.
- **Duration** : 3 days
- **Course Fees** : S$481.50 (with GST) per participant
- **Eligible for SDF Claims and PDU points**

Water for All: Conserve, Value, Enjoy PUB

Water Efficiency Manager Course

SINGAPORE POLYTECHNIC
Opening Minds Shaping Lives

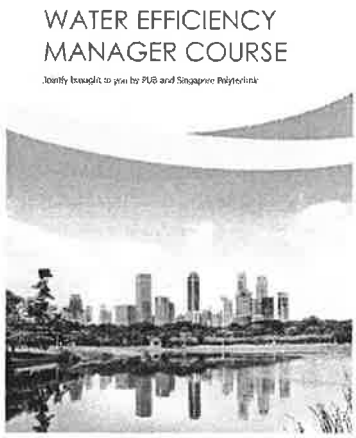
Course Content

- Regulatory requirements, Incentive, Water Efficiency Planning
- Cooling Tower Water Management
- Water Efficient Irrigation & Landscape
- Swimming Pool
- Audit Methodology & Tools
- Industrial Water Solutions
- Site visits

http://www.sp.edu.sg/

Public Run Dates

- 2015
  - 21, 28 and 29 Jan
  - 11, 18 and 19 Mar
  - 13, 20 and 21 May
  - 22, 29 and 30 Jul
  - 4, 11 and 12 Nov



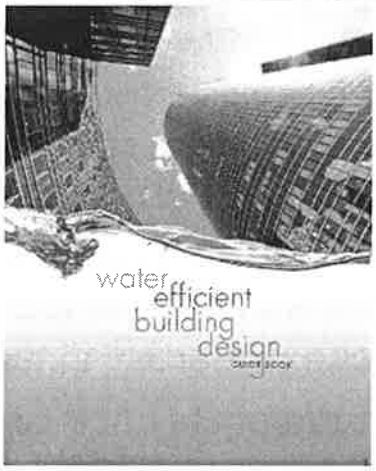
Water for All: Conserve, Value, Enjoy PUB

Water Efficient Building Design Guide Book

Download from

http://tenpercent.com.sg/docs/WEBDgb%20web.pdf

Acknowledgments
Foreword
Introduction
Mandatory Requirements
WATER EFFICIENT STRATEGIES – THE 3RS
DESIGNING A WATER EFFICIENT BUILDING
Include a Water Recycling System during Construction
Adopt a Low Pressure Water System
Employ Water Efficient Fittings/Products
Choose a Water Efficient Cooling System
Plan a Water Efficient Irrigation System
Design a Water Efficient Swimming Pool
Prevent Leakages in Plumbing System
ENSURING SUSTAINABILITY IN WATER EFFICIENCY MANAGEMENT
Corporate Culture & Management Commitment
Water Conservation Plan
Conducting Water Audit
Monitoring Water Consumption – Metering
Identifying & Repairing Leakage
Reference

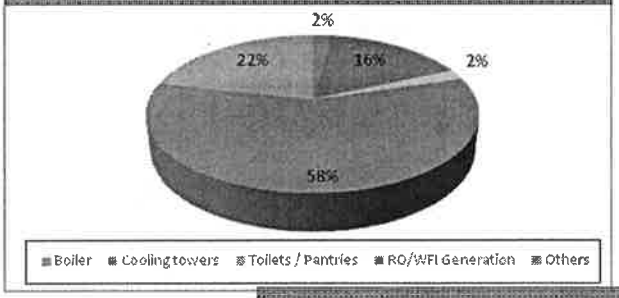


Water for All: Conserve, Value, Enjoy PUB

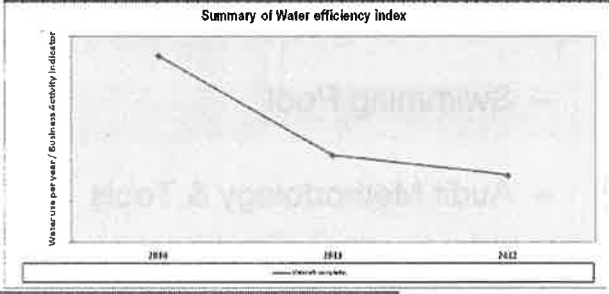
Reduce: *Water Efficiency Management Plan (WEMP)*

- The WEMP includes:
  - ✓ analysis of current water use
  - ✓ identification of potential water saving measures
  - ✓ action plan and implementation timelines
- Apply Water Efficiency Fund to implement measures

Breakdown of Water Usage



Trending of annual Water Efficiency Index / recycling rates



Action Plan

Action	Description of project	Due date for implementation	Water savings m^3/y	Comments
1	Divert RO Reject to Cooling Tower	01-Feb-12	111,953	If 100% goes to Cooling Tower

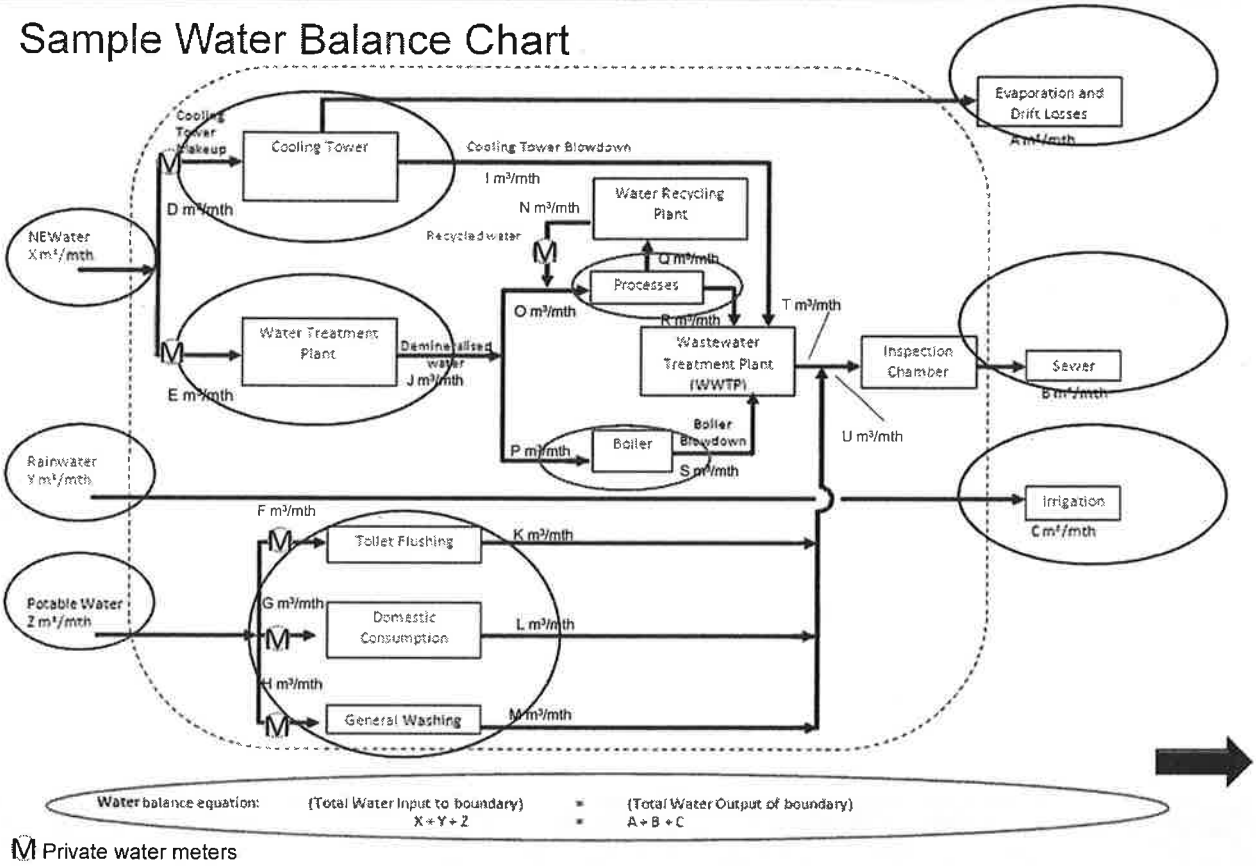
Reduce: *Water Efficiency Management Plan (WEMP)*

- From 2015, mandatory for all large water users (≥ 60,000 cu m in the preceding year)
  - To submit WEMPs to PUB by 30 Jun **annually**
  - To submit for at least 3 consecutive years
  - To submit through same portal as NEA's EDMA (where applicable)
  - To submit via PUB's portal otherwise
- To install private meters for measurement and monitoring of water consumption to account for the breakdown of the various water end use areas in the premises
- Submit Water Balance Chart indicating water usage and private meter positions
- *Consider tapping onto PUB's Water Efficiency Fund to comply to requirements, and for other water efficiency projects*

Water for All: Conserve, Value, Enjoy PUB

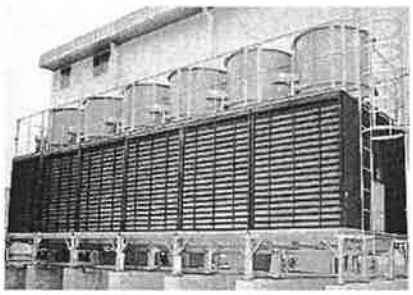
Water Efficiency Management Plan (WEMP)

Sample Water Balance Chart

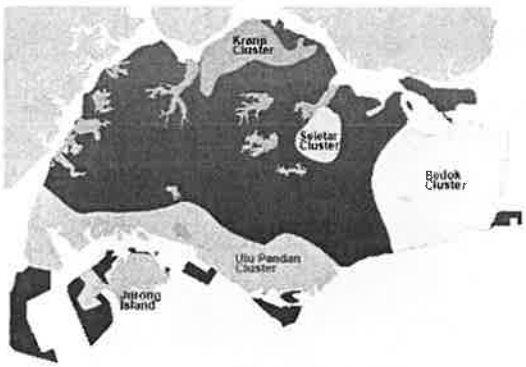


Water Conservation –
Replace: **Substitution with other sources of water**

- PUB encourages substitution of potable water with **NEWater, rainwater** and **sea water**



- NEWater :
  - Frees up potable water for other uses
  - Quality suitable for process use (UPW), boilers, laundry, air-con cooling towers, toilet flushing, general washing
  - Lower price - ($1.22 compared to $1.52)



- Rainwater Harvesting allowed
  - To consult PUB for any rainwater collection system
  - To comply with NEA's requirements on mosquito prevention

GREEN MARK ASSESSMENT CRITERIA

Water Efficiency – New Buildings

BCA Green Mark Version NRB/4.1 Non-Residential Building Criteria

Part 2 – Water Efficiency	Green Mark Points
NRB 2-3 Irrigation System and Landscaping	
Provision of suitable systems that utilize rainwater or recycled water and use of plants that require minimal irrigation to reduce potable water consumption.	
(a)Use of non potable water including rainwater for landscape irrigation.	1 point
(b)Use of automatic water efficient irrigation system with rain sensor.	Extent of Coverage : At least 50% of the landscape areas are served by the system 1 point
(c)Use of drought tolerant plants that require minimal irrigation.	Extent of Coverage : At least 80% of the landscape areas 1 point

Water Efficient Landscaping

➢ **Water Efficient Plants**

- Use drought resistant plants or plants that fit naturally into the existing climatic conditions
- Limit amount of turf area , turf grasses need a lot of water and require continual upkeep
- Group plants by their water needs such as plants that need high, moderate or little to no irrigation.



Drought resistant plants



Limit turf Area

• Water Efficient Plants



Phyllanthus myrtifolius



Osmoxylon lineare



Sansevieria

Ixora compacta 'Orange'





Bougainvillea 'Mrs Eva'



Licuala grandis



Plumeria spp.

Water Efficient Irrigation Systems

•Drip irrigation uses 30% to 50% less water than sprinkler irrigation
•Drip irrigation applies water slowly and directly to the roots of plants. Hence, evaporation and runoff is minimized
•Adopt flexible irrigation schedule to save water by adjusting to changing weather conditions
•Recycled water should be used
•Potable water is only permitted for system to be turned on manually and turned off automatically
•Rain sensors, moisture sensor, Roots watering system



GREEN MARK ASSESSMENT CRITERIA

Water Efficiency – New Buildings

BCA Green Mark Version NRB/4.1 Non-Residential Building Criteria

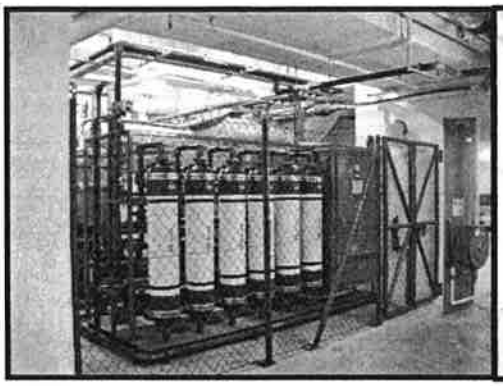
Part 2 – Water Efficiency	Green Mark Points
NRB 2-4 Water Consumption of Cooling Tower Reduce potable water use for cooling purpose. (a) Use of cooling tower water treatment system which can achieve 7 or better cycles of concentration at acceptable water quality. (b) Use of NEWater or on-site recycled water from approved sources	 1 point 1 point
PART 2 – WATER EFFICIENCY CATEGORY SCORE :	Sum of Green Mark Points obtained from NRB 2-1 to 2-4

Recycle: Encourage recycling for reuse

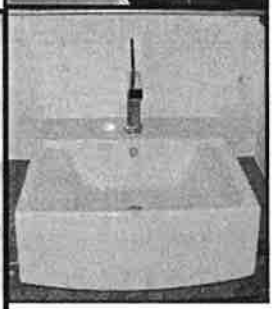
PUB encourages recycling of the following streams for reuse for non-potable purposes:

- Process water
- Greywater









GREEN MARK ASSESSMENT CRITERIA

Water Efficiency – New Buildings

BCA Green Mark Version NRB/4.1 Non-Residential Building Criteria

Part 5 – Other Green Features	Green Mark Points
NRB 5-1 Green Features and Innovations Encourage the use of other green features that are innovative and/or have positive environmental impact. Examples : ▪ Pneumatic waste collection system ▪ Carbon footprint of development ▪ Calculation of Concrete Usage Index (CUI) ▪ Dual chute system ▪ Self cleaning façade system ▪ Conservation of existing building structure	2 points for high impact item 1 point for medium impact item 0.5 point for low impact item (Up to 7 points)

WEB(GOLD) to be recognized as a medium impact item - under the Innovation category

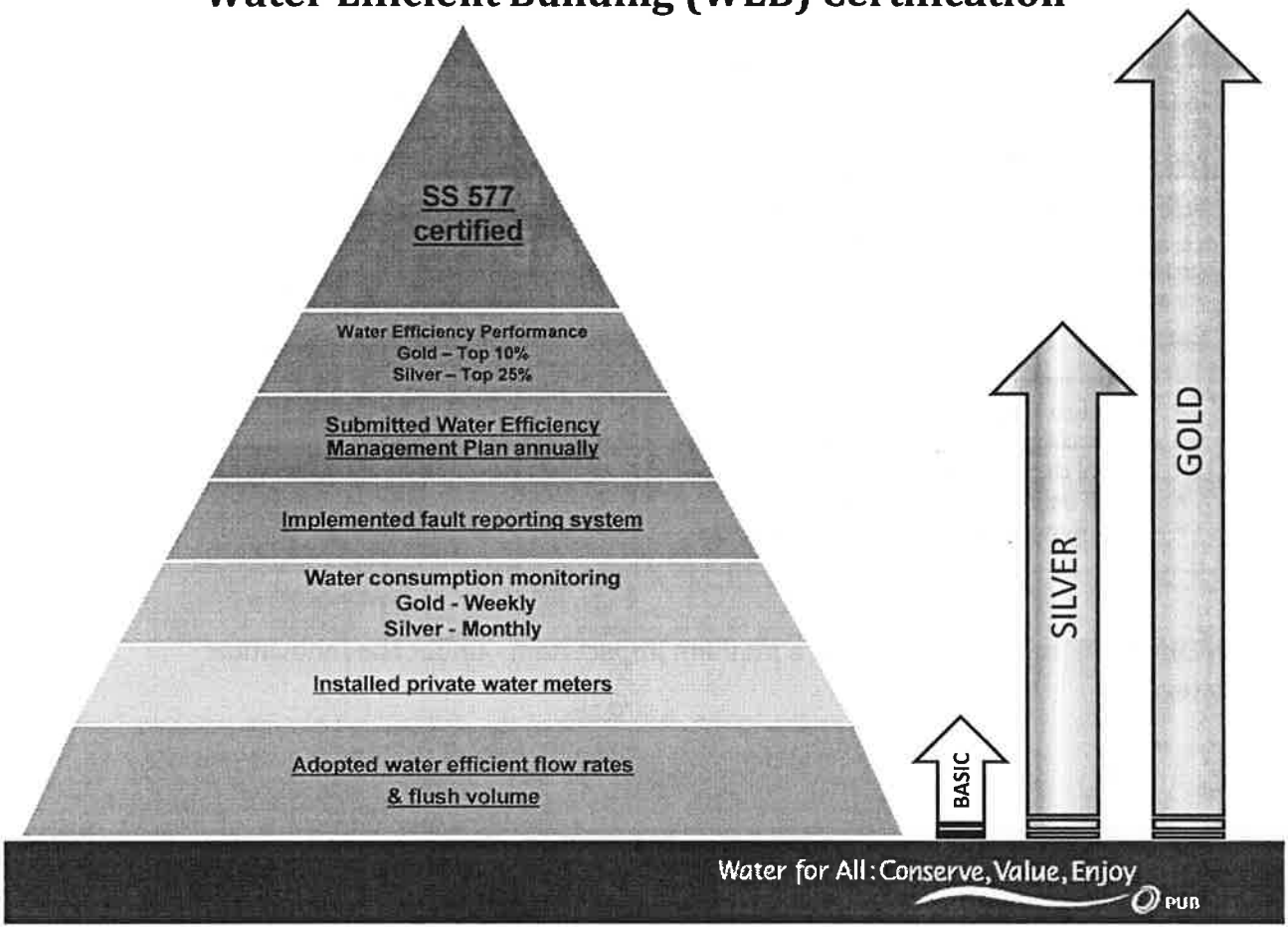
GREEN MARK ASSESSMENT CRITERIA

Water Efficiency – New Buildings

Green Mark Ver 4.1 Residential

Part 2 – Water Efficiency	Green Mark Points		
RB 2-1 Water Efficient Fittings Encourage the use of water efficient fittings that are certified under the Water Efficiency Labelling Scheme (WELS) (a) Basin Taps and Mixers (b) Flushing Cistern (c) Shower taps, mixers or showerheads (d) Sink/Bib Taps and Mixers (e) All other water fittings	**Rating based on Water Efficiency Labelling Scheme (WELS)**		Points scored based on the number and water efficiency rating of the fitting type used (Up to 10 points)
	Very Good	Excellent	
	Weightage		
	8	10	
RB 2-2 Water Usage Provision of private meters to monitor the major water usage such as irrigation, swimming pools and other water features.	1 point		
RB 2-3 Irrigation System Provision of suitable systems that utilize rainwater or recycled water for landscape irrigation and use of plants that require minimal irrigation to reduce potable water consumption. (a) Use of non potable water including rainwater for landscape irrigation (b)Use of automatic water efficient irrigation system with rain sensor. (c)Use of drought tolerant plants that require minimal irrigation.	1 point Extent of Coverage : At least 50% of the landscape areas are served by the system 1 point Extent of Coverage : At least 50% of the landscape areas are served by the system 1 point		
PART 2 – WATER EFFICIENCY	Sum of Green Mark Points obtained from RB 2-1 to 2-3		

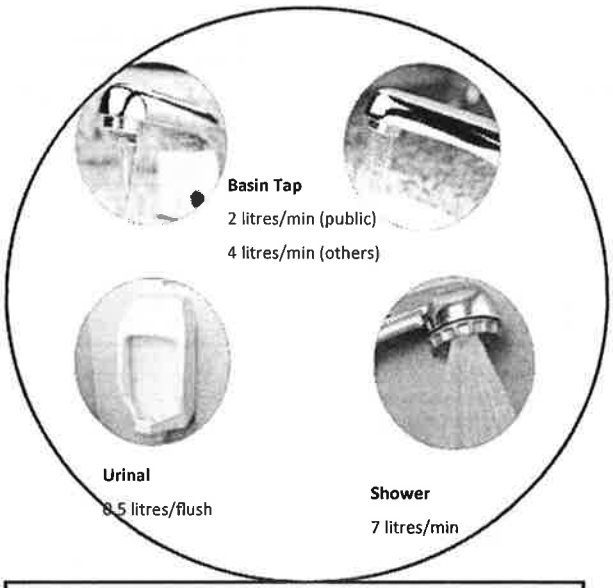
Water Efficient Building (WEB) Certification



Water Efficient Building (Basic)



Install meters and take meter readings regularly





Avoid water wastage. Repair leak fittings promptly.



Check flowrate using a beaker and watch



Use high water efficient labelled products

To-date, more than 2,600 buildings/premises are certified as Water Efficient Buildings (Basic)

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Implement Fault Reporting System

- Leaks / faults can be reported promptly
- Minimise water wastages







Reduce: *SS 577: 2012 Water Efficiency Management Systems*

- Launched in Mar 2013



- **Objective:** To enable an organisation to take a systematic approach to achieve continual improvement of water efficiency and to develop and implement water saving measures

- Specifies requirements that contribute to water efficiency:
  - Leadership & commitment, water usage, monitoring, measurement, documentation and reporting, design and procurement practices for equipment, systems, processes and personnel
- Facilitate organisations to prepare their WEMP





In 2013 - 4 organisations certified
In 2014 - **14** organisations certified

Water Efficient Building (WEB) Certification
Application Process

1) WEB (Basic) Certification:

- Contact PUB at pub_conserve@pub.gov.sg when your premises is ready for certification

2) WEB (Gold/Silver) Certification:

- Submit a copy of the completed application form, together with all relevant supporting documents either by
  - post to PUB, or
  - electronic mail to pub_conserve@pub.gov.sg
- Certification period : Every 3 years

Dates	Application Stage
Sep 14 – Mar 15	Consultation period
Jan 15 – end Mar 15	Application for Certification & Site Verification
Apr 15 – May 15	Evaluation & confirmation of recipients
Jun 15 – Sep 15	Certificate Presentation Ceremony



Water Efficiency Fund

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Water Efficiency Fund

Objective

- To encourage companies to look into efficient way of managing their water demand through various water conservation projects.

- Aims at getting companies to look into efficient way of managing their water demand, which includes PW, NW and IW, through recycling, use of alternate sources of water supply as well as initiative to promote water conservation in the community.

Water Efficiency Fund

Eligibility Criteria

The eligibility criteria for applicants of the fund is as follows :

- Companies with monthly water consumption > 1000m3. Individual companies with monthly consumption < 1000m3 can choose to apply for this fund collectively Project should yield at least 10% reduction of water consumption (PW, NW and/or IW)

- In addition to criteria 1, for industries in which recycling is already a norm e.g. wafer fabs, WEF will only be given to the company if it puts in place a system that conserves water at a rate higher (at least 10% higher) than the norm in its industry.

- Organisation which intend to organise community-wide campaigns to promote water conservation can also apply for WEF.

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Note:

- Criteria 1 and 2 above do not apply to the following:
  - Water Audit Projects;
  - Certification to SS 577:2012 Water Efficiency Management Systems under Feasibility Study Projects; and
  - Community-Wide Water Conservation Campaigns and Programmes.

- For applicants applying for funding for certification to SS 577:2012 Water Efficiency Management Systems under Feasibility Study Project, the following eligibility criteria and requirements shall apply:
  - Obtained at least Water Efficient Building (Basic) Certificate from PUB; and
  - Submitted "Water Efficiency Management Plan" to PUB, based on the actual metered water consumption over a minimum period of 3 months (with private meters installed at the key water usage areas).

- SMEs who wish to apply for funding for certification to SS 577:2012 Water Efficiency Management Systems shall be referred to SPRING Singapore for the Capability Development Grant.

Water Efficiency Fund



Feasibility Study Project# — **Co-fund 50%, capped at $50,000**

Includes certification to SS 577:2012 Water Efficiency Management Systems



Water Audit Project^ — **Co-fund 90%, capped at $30,000**

^ Includes the installation/procurement of water meters and the upgrading/installation of remote metering system



Recycling Efforts / Use of Alternative Source of Water — **Based on water savings or capital cost (capped at $1 mil)**



Community-wide Water Conservation Campaigns — **Co-fund 50%, capped between $200 - $5,000**

Funding Schemes for Certification

SPRING Singapore's Capability Development Grant - SMEs	PUB's Water Efficiency Fund (Feasibility Study) – Other Customers
Grant of 70% of the total cost^	Grant of 50% of the total costs+, cap at $10,000*

^ Manpower, Consultancy and 1st year Certification audit cost

+Consultancy and 1st year Certification audit cost

For premises with monthly water consumption ≤ 1,000 m^3/mth, the funding cap is **$5,000.*

Other Feasibility Study Projects

Other types of feasibility studies
Grant of 50% of total cost, cap at $50,000 upon full scale implementation of project#

 # If the project is not implemented at full scale, a grant of 10% of total cost is offered, cap at $10,000

Water Audit Project

Water Audit [+]	Remote Metering
Co-fund 90% of water audit cost, cap at $15,000*	Additional grant of 90% of the upgrading or installation costs, cap at $15,000*

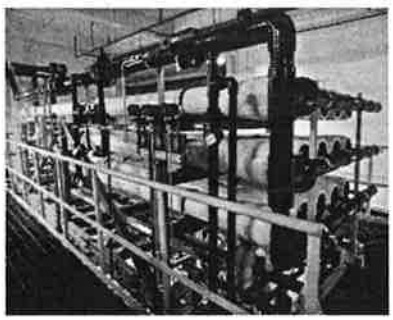
[+] *Includes cost of procuring and installation of water meters. Water meters shall be procured from PUB subject to availability.*

For premises with monthly water consumption of 1,000 cu m or less, the funding cap will be **$5,000. For customers with monthly water consumption ≤ 3,000 m^3/mth, the funding cap is **$10,000**.*

Recycling Efforts/ Use of Alternate Sources of Water

- Incentives revised with effect from 1 Apr 2014
- Funding is offered based on: water savings of potable water (PW)/NEWater (NW)/industrial water (IW) or capital cost of the facilities, whichever is lower, cap at $1,000,000

Water Savings*	Capital Cost
$0.60 / m^3 of PW saved **$0.30 /** m^3 of NW saved **$0.10 /** m^3 of IW saved	50% of the capital cost of the facilities



** Over the economic life of the facilities or 7 years, whichever is earlier.*

Water Efficiency Fund

Community-wide Water Conservation Campaigns and Programmes

Grant of 50% of the costs of organising the programme, cap at $200 - $5,000 (depending on type of programme)

Water Efficiency Fund

Projects Not Eligible for Funding

The following projects are not eligible for funding :

- Rainwater harvesting projects.
- Initiatives that are put in place to comply with regulatory requirements eg. save water devices such as water efficient taps and flushing cisterns, trade effluent discharge limits or earth control requirements.
- Not applicable to premises that purchase water efficient devices like low flow taps/ showerheads, low capacity flushing cisterns/ urinals, water urinals.
- Use of NW/IW to replace potable water.

PUB Watermark Award

- Recognises advocates for their outstanding contributions and commitment towards protecting and raising awareness of Singapore's precious water resources



- Nominations were open to all individuals and organisations from **Jul to end Aug** 2014.

- To be considered for the award, nominees must have:
  - made significant contributions towards protecting and raising awareness of Singapore's water resources consistently over the past one year; and
  - contributed beyond core work scope, direct economic interest and regulatory requirements.

Attaining Water Efficient Building (Gold) is one of the key criteria

For more information, please visit: www.pub.gov.sg/watermarkaward
For enquiries about Watermark Award, email : pub_watermark_award@pub.gov.sg

Water for All: Conserve, Value, Enjoy PUB

Dry Spell (Jan-Mar 2014)



Water for All: Conserve, Value, Enjoy PUB

What Can You Do...

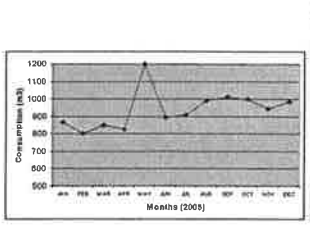
We urge Community and Businesses

- **CONSERVE** water
- Play our part to stretch our water resources
- Reduce your consumption now
  - ➢ Adopt Water Conservation Measures
- Reduce 10% during dry spell
  - ➢ Adopt further measures

10 Simple Ways to Reduce Water Usage

#1 - Monitor Water Usage

Take water meter readings regularly (daily/weekly/fortnightly)





#2 - Check for Leaks

- Watch water meter during off peak period where there is no consumption/negligible consumption
- Display the maintenance office telephone number(s) so that users can report leaks Promptly



#3 – Adopt water efficient measures flowrates & flush volume for water fittings



- Install constant flow regulators / use high water-efficient labeled products

#4 – Adopt water efficient practices during irrigation

- Use drip irrigation system / water-efficient irrigation system / drought-tolerant plants that require minimal irrigation
- Irrigate plants only when necessary and between 4-7 am or 6-9 pm to minimise evaporation losses
- Use non-potable water for irrigation

10 Simple Ways to Reduce Water Usage

#5 - Adopt water efficient practices when carrying out washing activities/ water tanks

•Carry out washing activities only when necessary and supervise closely to ensure no wastage

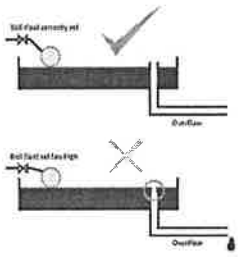
•Use water in water tank to around 150-200 mm above bottom of tank before isolating for cleaning & use water from draining of tank for non-potable uses e.g. irrigation

#6 - Adopt water efficient practices for cooling tower operation

•Check cooling towers regularly to prevent overflow and splashing. Avoid operating water cooled air-conditioning systems at temperatures below 24 °C.

•Achieve 7 or better COC

•Use variable speed drive circulation pumps



#7 – Adopt water efficient practices for swimming pool operation

•Inspect water storage tanks especially the Swimming Pool's Balancing Tank regularly to ensure that the float switch mechanisms function properly to prevent overflow.





10 Simple Ways to Reduce Water Usage

#8 – Reuse for non-potable use



- Reuse AHU condensate for non-potable use such as cooling towers make-up.

#9 – Senior management & staff participation

•Senior management to encourage water efficiency practices

•Monitor work of Managing Agents, contractors, cleaners to reduce water usage & prevent wastage

•Display water conservation messages around premises to regularly employees to practise water conservation



#10 – Develop your Water Efficiency Management Plan

•To analyse water use, identify potential water-saving measures, and come up with action plan & implementation timelines

More info available at :

http://www.pub.gov.sg/conserve/WaterReductionMeasures/Pages/default.aspx

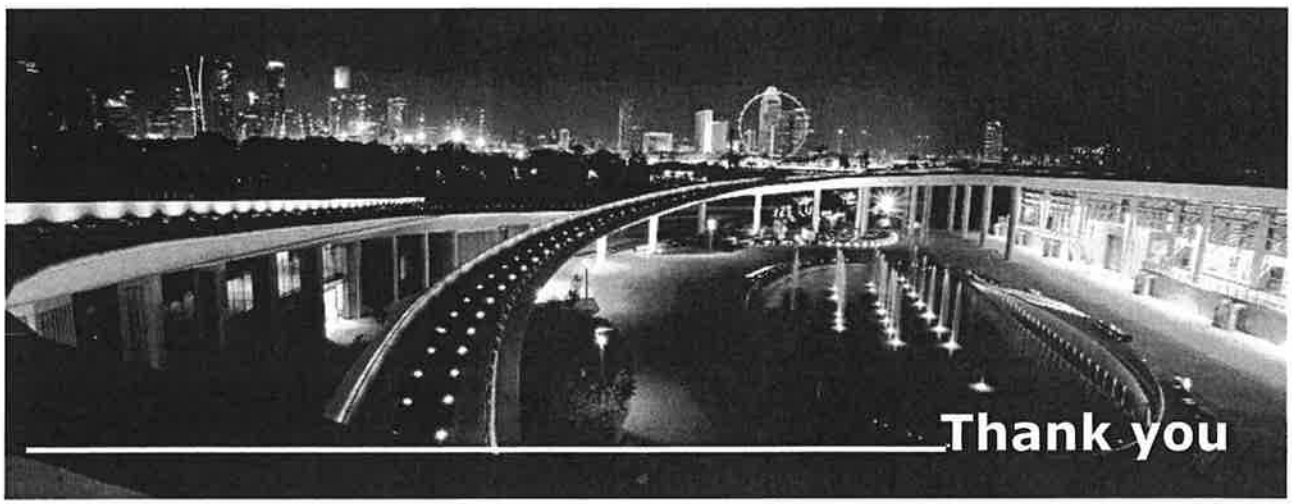
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Further Measures During Dry Spell



Dry Spell Water Reduction Plan

- STOP leaks promptly
- STOP vehicle washing
- STOP running water features, fountains, water play areas & cascades
- STOP unnecessary watering of plants& turf
- STOP use of high pressure jets & hoses for washing activities
- Convert urinals to waterless type
- Reduce operating hours of water cooled air con systems
- Provide hand sanitizers to minimise hand washing





Water for All: Conserve, Value, Enjoy PUB