



2nd Jurong Island Industrial Water Solutions Forum

18 Sept 2015

Goh Chee Kiong, Executive Director, Cleantech,
and Cities, Infrastructure & Industrial Solutions,
Economic Development Board (EDB)

1 Singapore Water Ecosystem

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Singapore Water Ecosystem



Vibrant Ecosystem

About 180 water companies and 26 R&D centres in one location



Thought leader in R&D and Innovation

NUS & NTU ranked top 2 in world for water research



Diverse range of technical & business talent

Supporting Commercialization

Singapore as Living Lab

Public private partnerships create opportunities for companies to test innovative water technologies.



Separation Technologies Innovation Cluster (STIC)

National centre to help industry translate and commercialise intellectual property from Singapore in separation technologies



Singapore as Global Hydrohub

Singapore Water Ecosystem

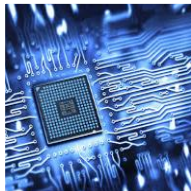
Manufacturing accounts for 20-25% of Singapore's economy...

WATER INTENSIVE INDUSTRIES



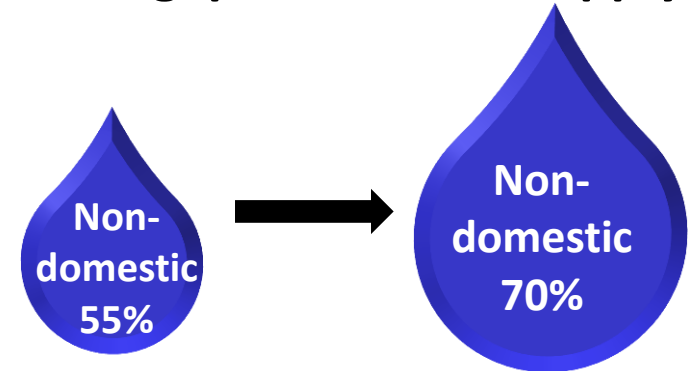
Chemicals

**Biomedical
Sciences**



Electronics

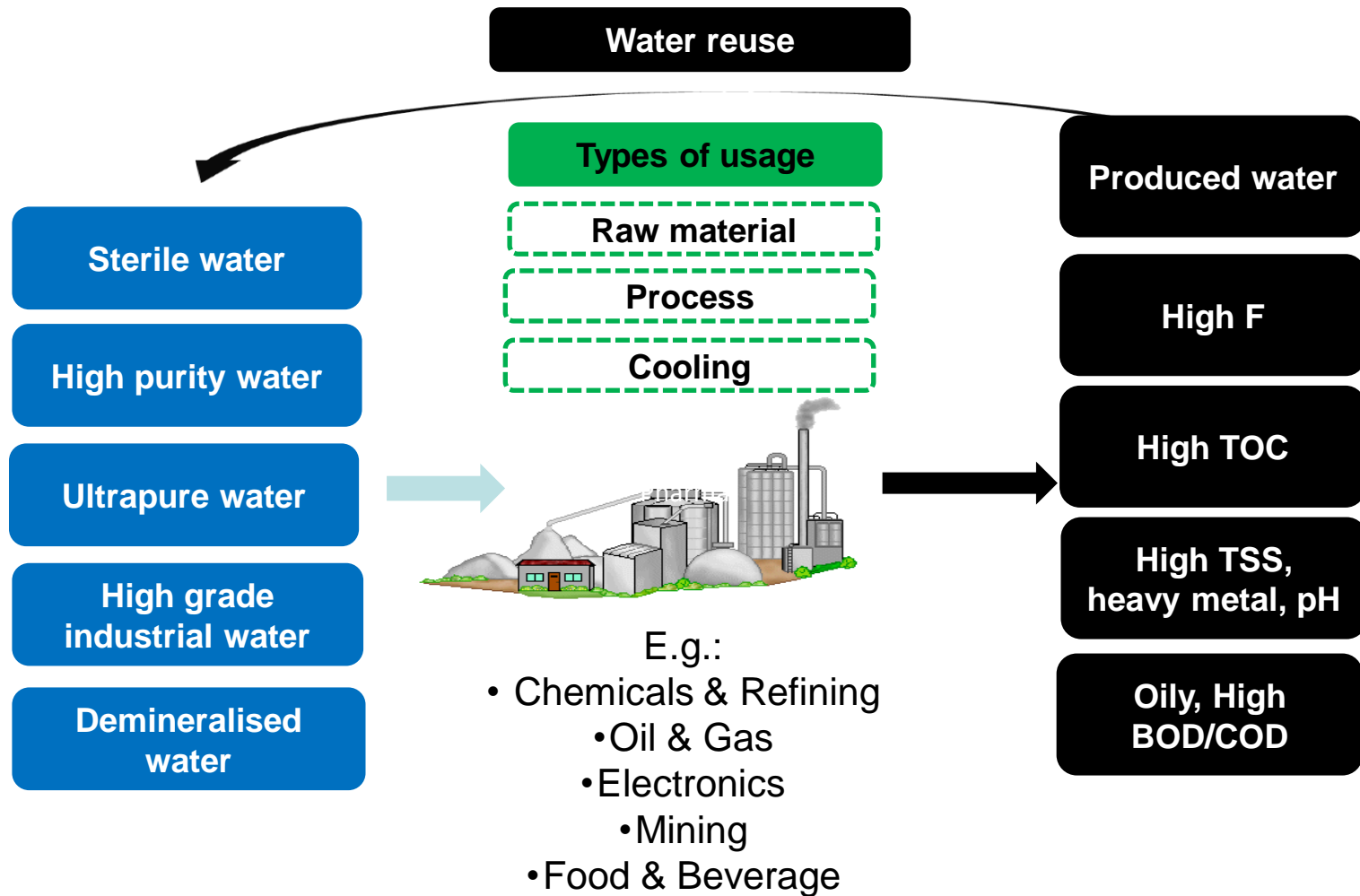
... and consumes more than half Singapore's water supply



	2013	2060
Total water demand (mgd)	400 → 800	
Non-domestic demand (mgd)	220 → 560	

Industrial water solutions (IWS) as a key focus

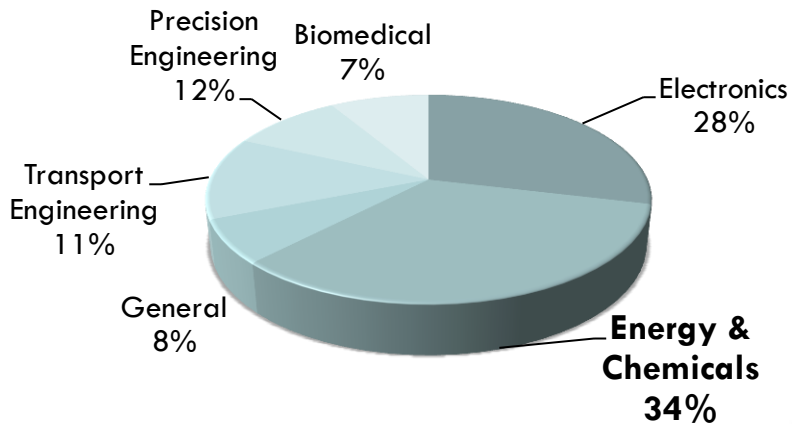
Singapore Water Ecosystem



Customized IWS needed for each industrial sector

Jurong Island

Manufacturing Output 2014: S\$304 b (US\$240 b)



Singapore is

- ✓ Asia's leading oil hub (3rd largest trading hub globally)
- ✓ Top 5 export refining hub at a single location
- ✓ Top 10 global chemicals hub



Jurong Island: Unique location with one of most diverse ecosystem of 100 companies

- 900Ha → ~ 3,000 Ha
- >26,000 employees
- Over S\$40 b investment (US\$30 b)

Energy & Chemicals remains a major focus for Singapore's economy

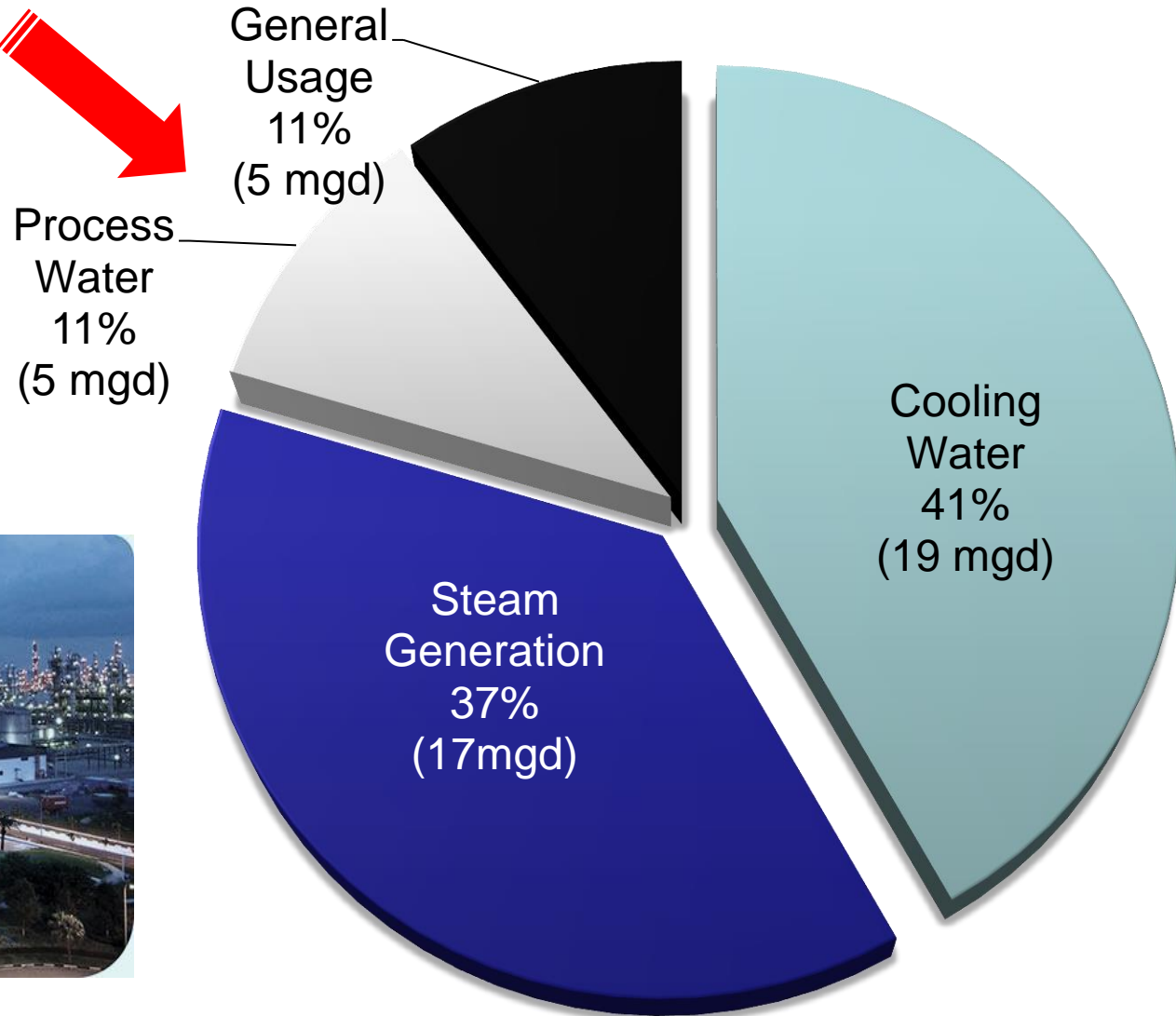
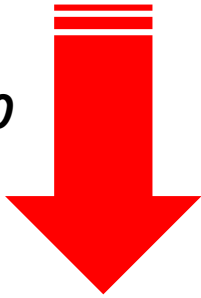
Jlv2.0 Master Plan to address global competition and local sustainability challenges



Jurong Island



By 2060



Jurong Island to account for more than 20% of national water usage

Industrial Water Solutions on Jurong Island



Industrial Water Solutions on Jurong Island

Sembcorp Industrial Living Lab



Joint Partnership between EDB and Sembcorp Industries

Utilities facilities on Jurong Island provide test-bed opportunities for technology suppliers

Plug & Play Test-Bed Facilities

WATER: Wastewater Treatment & NEWater Plants

Examples of focus areas:

- SMART system for wastewater treatment
- Cost-effective biological treatment processes
- Recalcitrant wastewater treatment
- Zero liquid discharge tech



ENVIRONMENT: Waste to Energy Plants

Examples of focus areas:

- Efficiency improvement
- Corrosion monitoring and control
- Predictive maintenance



Process Monitoring, Predictive Maintenance & Asset Optimisation

Industrial Water Solutions on Jurong Island

Seawater Cooling on Jurong Island



Adoption of seawater cooling by companies:

- Companies with large cooling load and located near the seafront are encouraged to adopt seawater cooling
- Ongoing consultancy study by PUB/JTC/EDB to look at feasibility of centralised seawater cooling system in different parts of the island

Industrial Water Solutions on Jurong Island

R&D

**Test-Bedding and
Early Adoption**

Lead demand

Incentive for Research & Innovation Scheme (IRIS)

A competitive scheme for funding R&D projects conducted by public sector entities, academia and private companies

TechPioneer Grant

Accelerating the commercialisation of innovative water technologies by encouraging early adoption of new technologies

PUB Water Efficiency Fund

Encourage water user to reduce water consumption or to explore alternative water sources by supports feasibility studies, water audits and capital expenditures



- SRC's refinery
- Water & energy audit
- Water recycling technology demonstration
- Funded by IRIS



- Ceramic membranes to treat and reclaim industrial wastewater
- Pilot plant at Jurong Water Reclamation plant funded by TechPioneer
- Another plant at SRC

Industrial Water Solutions @ SIWW 2016

Technical Solutions

Water Convention



Business Solutions

Industrial Water Solutions Forum



Industrial Solutions Showcase

Water EXPO



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Summary

- Singapore is a Global Hydrohub with IWS as a key focus area
- Energy & Chemicals remains a key economic pillar but is a large water user
- Presents opportunities for companies to co-innovate on IWS
- Strong support from PUB, EDB and JTC

Thank You

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