

Water for All
Conserve, Value, Enjoy



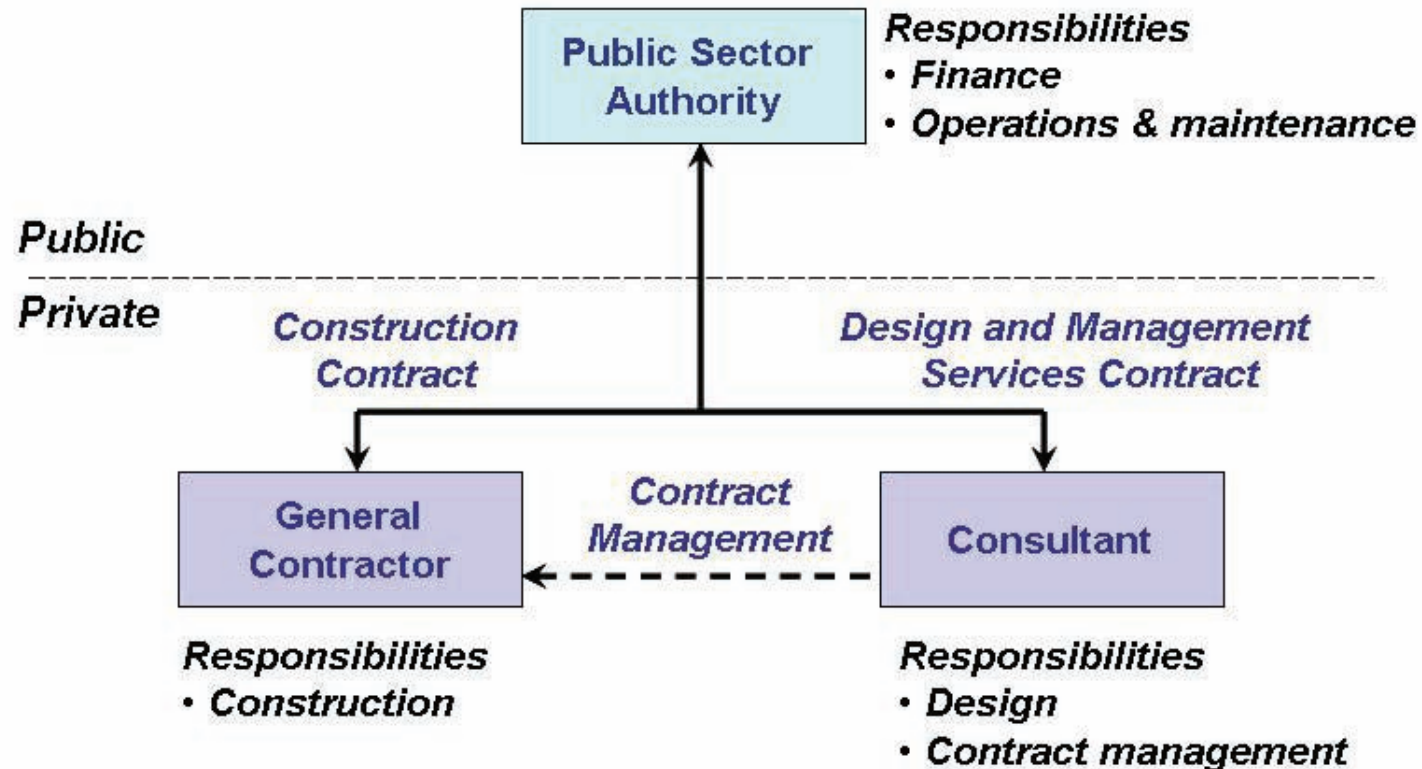
Partnering in Action

Moh Wung Hee
Director (Best Sourcing), PUB Singapore
FIDIC 2007 Workshop 1

Outline of Presentation

- Procurement Models in PUB
- Barriers to a effective partnership and strategies to overcome them
- Our Projects – How PUB maintains Successful Relationship with our Partners

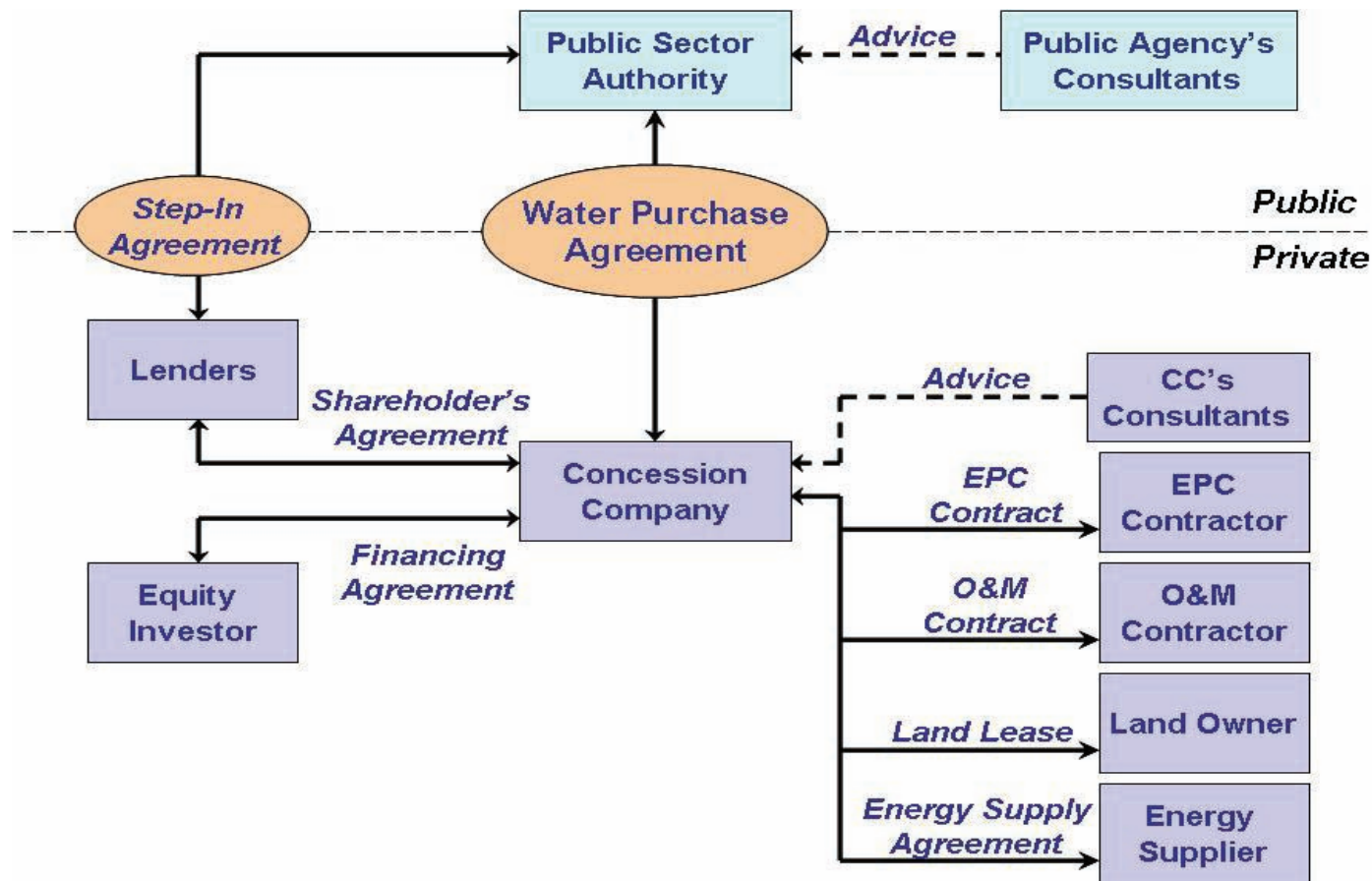
Procurement Models in PUB



Design-Bid-Build (DBB)

- *Deep Tunnel Sewerage System (DTSS) – Scheduled for completion in 2008*
- *Marina Barrage – Scheduled for completion in Dec 2007*

Procurement Models in PUB



Design-Build-Own Operate (DBOO)

- *Tuas Desalination Plant (30mgd) – Commissioned in 2005*
- *Ulu Pandan NEWater Plant (32mgd) – Commissioned in Mar 07*
- *Changi NEWater Plant (50mgd) – Currently in tender phase, from 31 Aug 07 to 22 Nov 07*

Successful Partnership?



Successful Partnership?

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<ul style="list-style-type: none">• Lack of trust between partners	Understand and trust our partners.

DTSS

Changi Water Reclamation Plant

Overview of Changi Water Reclamation Plant

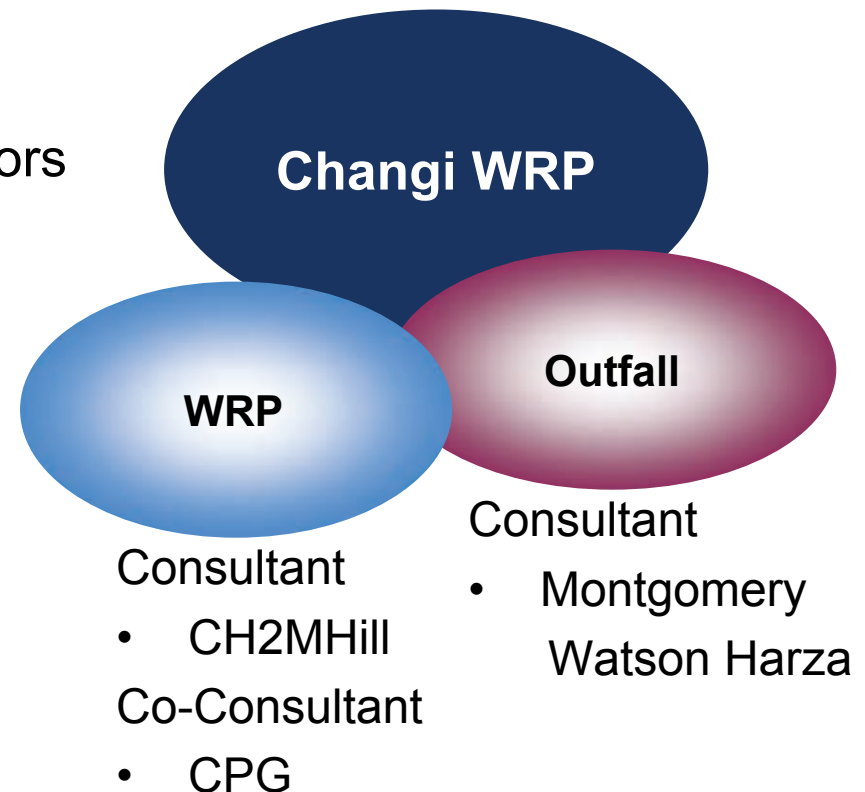
- Phase 1 capacity : 176 MGD (800,000 m³/day)
- Construction period: 2001 to 2008
- Estimated cost : S\$2.2 Billion
- Ultimate capacity : 528 MGD (2,400,000 m³/day)



Strong Partnerships in the DTSS Changi WRP

Contractors

- Koh Brothers Bldg & Civil Engineering
- Econ Resources
- Lum Chang Building Contractors
- Sembawang Engineers & Constructors
- United Engineers
- Keppel Seghers Engineering
- Singapore Piling & Civil Engineering
- CNA Group
- Dayen Environmental
- Mitsubishi Corporation
- Metax Engineering Corp
- Boskalis International BV



20 main contractors, with over 400 project partners, including sub-contractors, manufacturers, suppliers etc.

DTSS Changi WRP

Proper Risk Allocation - With 20 main contractors in one worksite, disputes could inevitably arise as to who takes responsibility for common areas. PUB proactively took on the appropriate responsibilities.



Opting to use a single contract to provide site infrastructure, including excavation, foundations, construction infrastructure and water control

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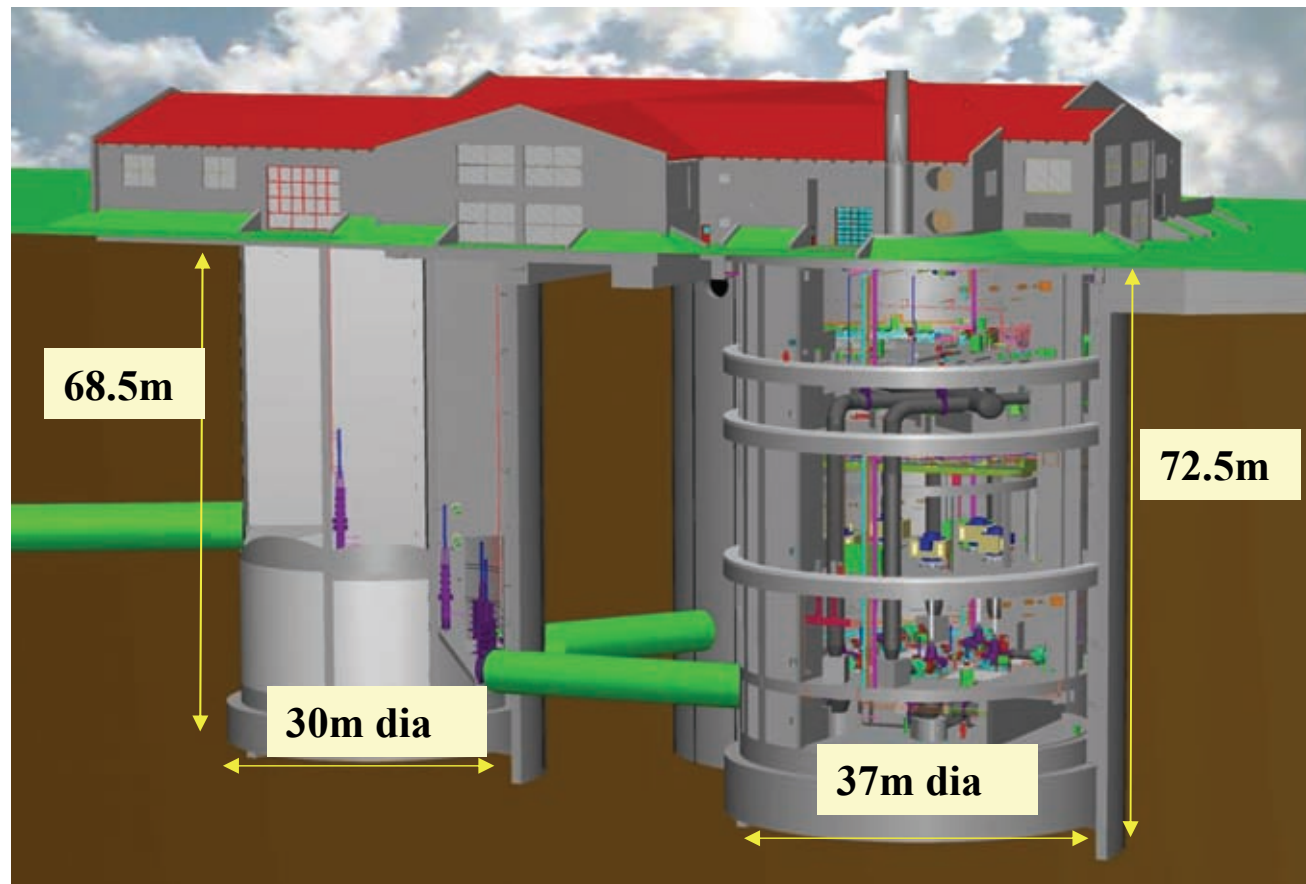
DTSS Changi WRP



Use of a ground water cut-off wall to prevent infiltration of ground water

DTSS Changi WRP

Proper Risk Allocation – PUB shares the risk with the contractor by specifying design for the temporary works C2B shaft.



DTSS Changi WRP



The diaphragm wall is incorporated as part of the shafts' substructure wall for the excavation of the 70m deep Influent Pumping Station Shafts.

DTSS Changi WRP

A Proactive PUB – Communication is the key



DTSS Changi WRP

Trust and Understand our Partners



Performance Monitoring of Deep Excavation at Changi Water Reclamation Plant Project, Singapore

“... a valuable contribution to geotechnical engineering...”

“... demonstrates benefits of the extra effort put into a high quality geotechnical investigation and test program...”

“... a strong selling point to owners, convincing them of the rewards achievable by putting more money into ground upfront, instead of potentially much more later on...”

Comments by reviewers of the 7th International Symposium On Field Measurements in Geomechanics (FMGM 2007), Boston, USA

Marina Barrage

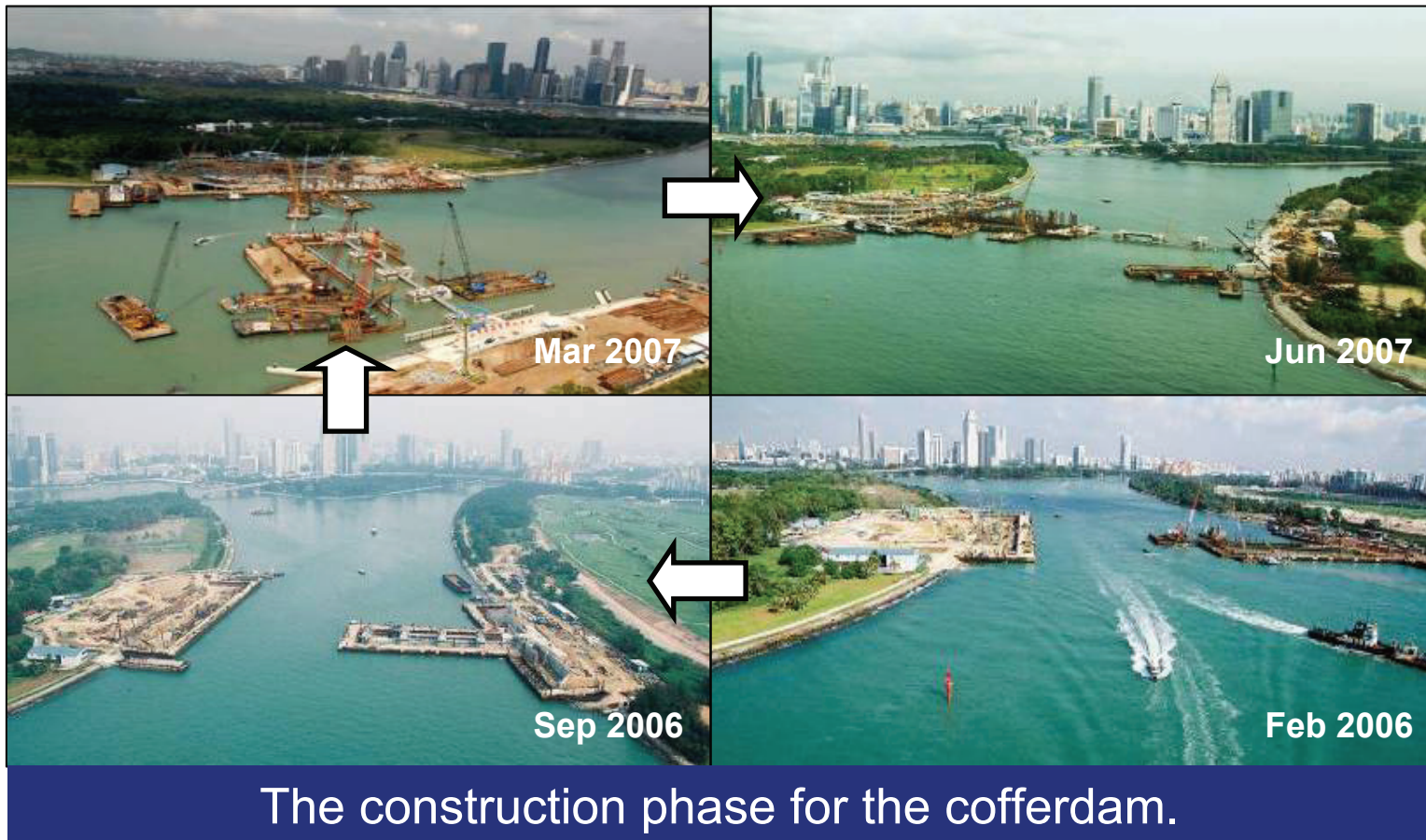
Overview of the Marina Barrage

- Contract sum : S\$ 226 M
- Scheduled for operation by Dec 2007



Marina Barrage

Risk Allocation – PUB shares risk with the main contractor by specifying the design for the construction of the cofferdam.



Marina Barrage



Aerial View of Marina Barrage

Strong Project Partnerships Achieve Marina Barrage Engineering Excellence

Key Suppliers

- Kurimoto, Japan
- TCT, Taiwan
- Bosch Rexroth, Germany
- Rexroth Hydraudyne, Netherlands
- Bosch Rexroth, S'pore
- Sojitz, S'pore
- APECO, S'pore

Pontoon -
Bellingham,
Australia

Crest Gate System

Overhead Crane
Morris, UK

Low level sluices
Tyco,
Netherlands

Drainage Pumping System

- Nijhuis, Netherlands
- Breman, Netherlands
- Flender, Germany
- Pleissner, Germany
- ABB, Finland
- Torsco, Malaysia
- Metax, S'pore

Screens
Hulbert Stavoren,
Netherlands

Consultants

- CDM
- Black & Veatch
- ACLA
- AT3
- SKM
- Fabulax
- Crib Point Engrg, Australia
- Loyang Marine, S'pore

Boat Hoist

Engine Generator System

- Caterpillar, USA
- ABB, Finland
- TSL, S'pore

PUB

**Koh Brothers,
S'pore**

Electrical, Instrumentation & Control System

- Siemens, Germany
- GE, USA
- Schneider, Italy
- Wallingford, UK
- Barco, Belgium
- Reyrolle, New Zealand
- Yokogawa, Japan
- Pirelli, Malaysia
- ABB, S'pore
- GSM, S'pore
- CISCO, S'pore
- Cegelec, S'pore

C&S Contractors

More than 80 project partners

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Public-Private-Partnership (DBOO Projects)

Tuas Desalination Plant

- Date of Agreement : April 2003
- Concession Company : SingSpring (Pte) Ltd
- Contract Term : 2005 – 2025
- Plant Capacity : 30 mgd (136,000 m³/day)



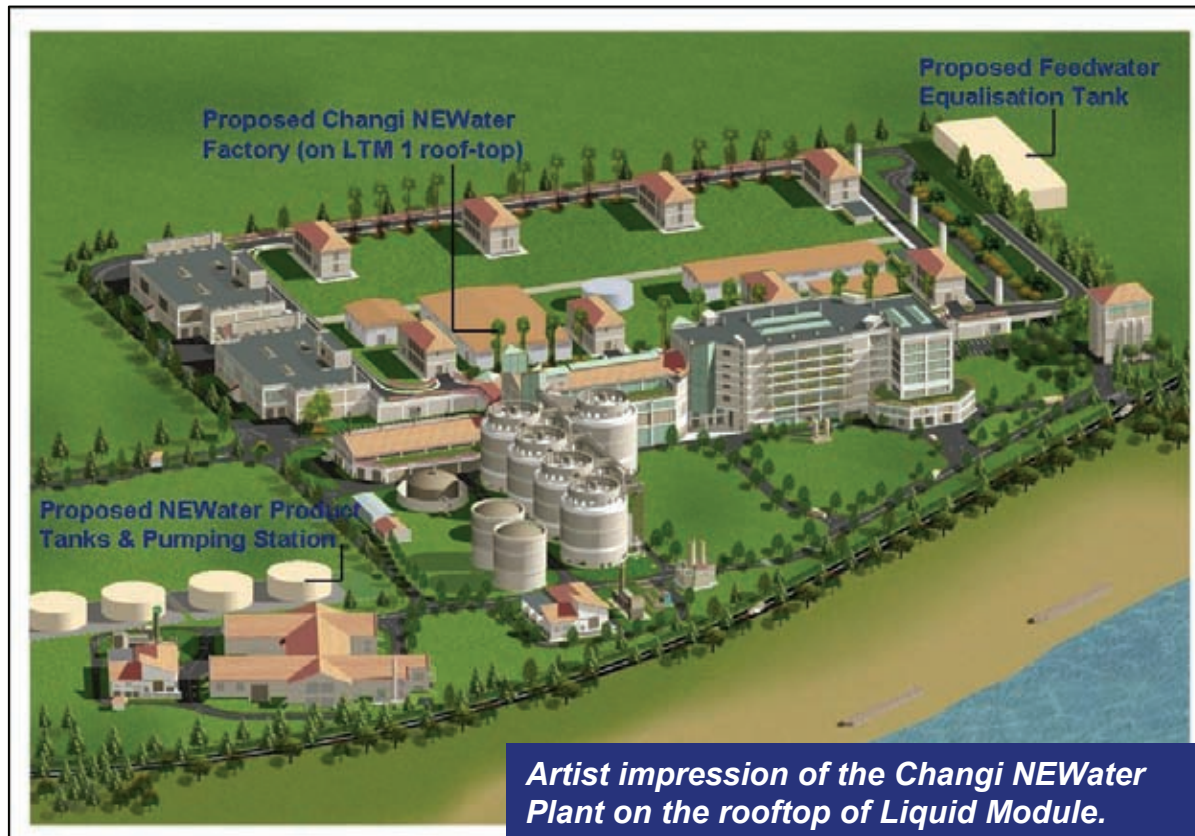
Ulu Pandan NEWater Plant

- Date of Agreement : January 2005
- Concession Company : Keppel Seghers NEWater Dev (Pte) Ltd
- Contract Term : 2007 – 2027
- Plant Capacity : 32 mgd (148,000 m³/day)

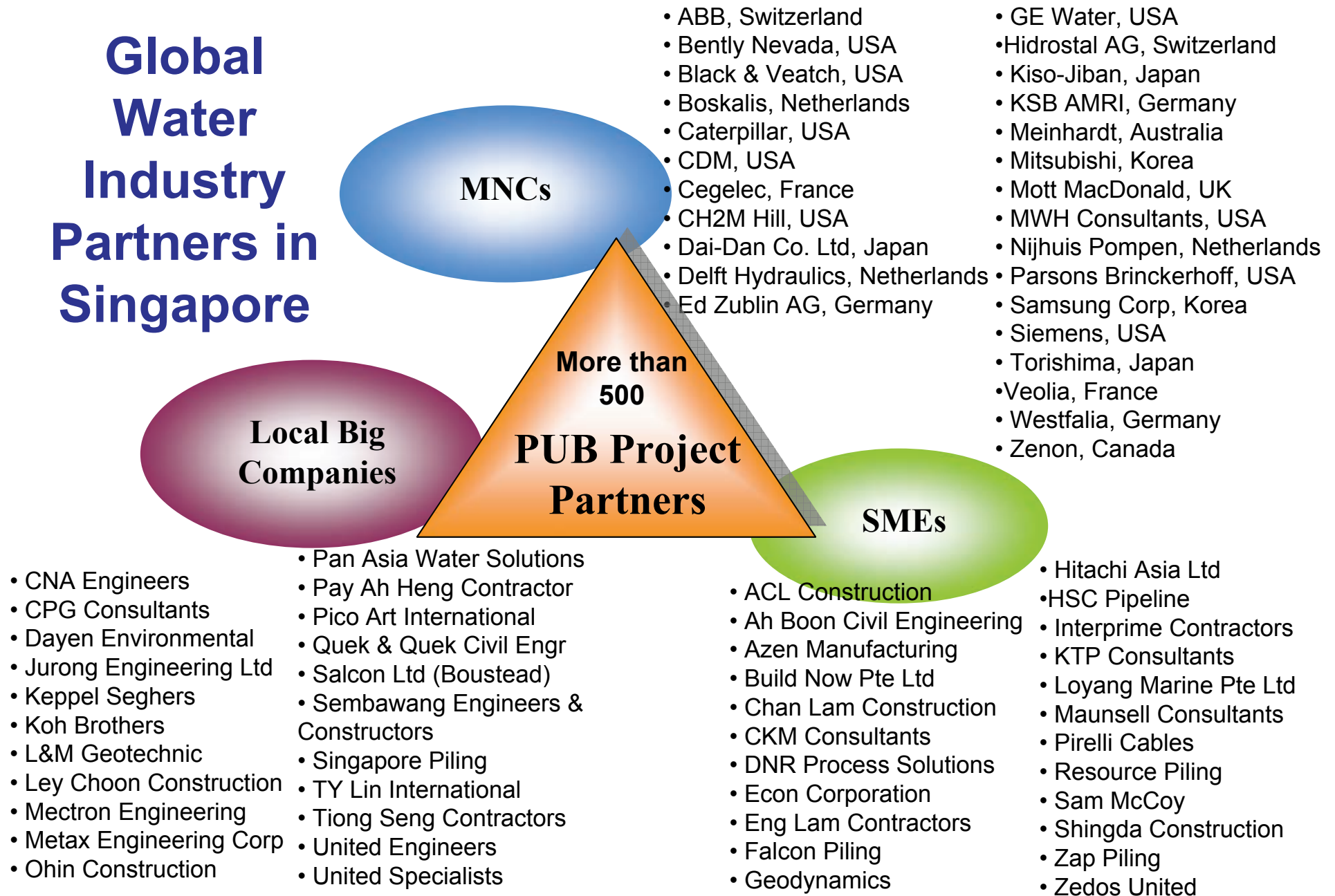


Changi NEWater Plant

- 1st Phase Capacity: 15 mgd (to be completed by May 09)
- Total Capacity: 50mgd (to be completed by mid 2010)
- Tender Phase : 31 Aug 07 – 22 Nov 07



Global Water Industry Partners in Singapore



Water for All : Conserve, Value, Enjoy



Final Thoughts

“Key Factors to an EFFECTIVE PARTNERSHIP”

- Trust
- Shared Objective
- Cooperation & Collaboration

Provocative Questions

A Proactive Client?

- We have looked at the advantages of a proactive client. Could there be any disadvantages?
- If the client has taken/ share some risks of the consultant/ contractor which is originally not his, should he bear the liability as well?
- Is there any possibility of conflict of interest arising?

Provocative Questions

Certainty vs. Flexibility?

- If there is a clear and precise legislative framework, flexibility would be compromised. If the contract specifications are too stringent and provides no recourse for amendments, the contractor could see himself holding unmanageable risk.
- How can we maintain certainty in the contract, yet keeping flexibility?

Provocative Questions

The Clients' Role?

- To cope with the times of change, the role of the client is shifting from a passive to a proactive position; globalization, combining resources with the private sector, hands-on involvement in projects.
- What will be the role of the public sector be in the future?
- How will consultants/ contractors/ private sector expect the role of the public sector to be in the future?

Thank You