MINISTRY OF ENERGY,
GREEN TECHNOLOGY AND WATER (KeTTHA)

Stockholm International Water Week

Water & Waste: Reduce & Reuse

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Secretary General, KeTTHA Malaysia

- Holistic perspectives
- First thing first
- Sustaining the sustainability

UNITED NATIONS
SUSTAINABLE DEVELOPMENT SUMMIT 2015
25 - 27 SEPTEMBER

Environmental Sustainability

The currency is **Carbon** (C)

Approach?

- Reduce C emission
- Increase C sink

Methodology (e.g.)?

- Green technology
- Green cover

System?

- Green lifestyle
- Circular economy

TN50: Feedback on Energy, GreenTech & Water

	2017	2030*	2050
RE in Energy Mix	18.4%	25%	
EEV (energy efficient vehicle)	32.6%	-	
EEV + EV (electric vehicle)	-	100%	
CO Emission (metric tons/capita/year)	8	6	
Energy Efficiency	<2%	15%	
Treated Wastewater Recycling	**<1%**	**35%**	
Freshwater extraction rate	**2%**	**15%**	
% Green Manufacturing SME	10%	50%	
Green Building	244	1750	
Sanitary Landfill/Non-Sanitary Landfill	14/147	50%	
Solid Waste Recycling Rate	17.5%	50%	

* Targets in Green Tech Master Plan 2017-2030

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Challenges of Malaysia Water Sector

Financial for infrastructure :

- Urban
- Islands and rural areas
- Coastal settlements

Institutional issues :

- Water and sewerage
- Regulatory and tariff setting
- Business models

Sustainability of water industry :

- Subsidy
- Full cost recovery

500	Number of water treatment facilities
23	Number of water operators
95.5 %	Percentage of population served with treated water
6,625	Number of public sewage treatment facilities
37.3 %	Percentage of population served with connected public sewerage services (Peninsular (75.9%) + Sabah (30%) + Sarawak (6%)

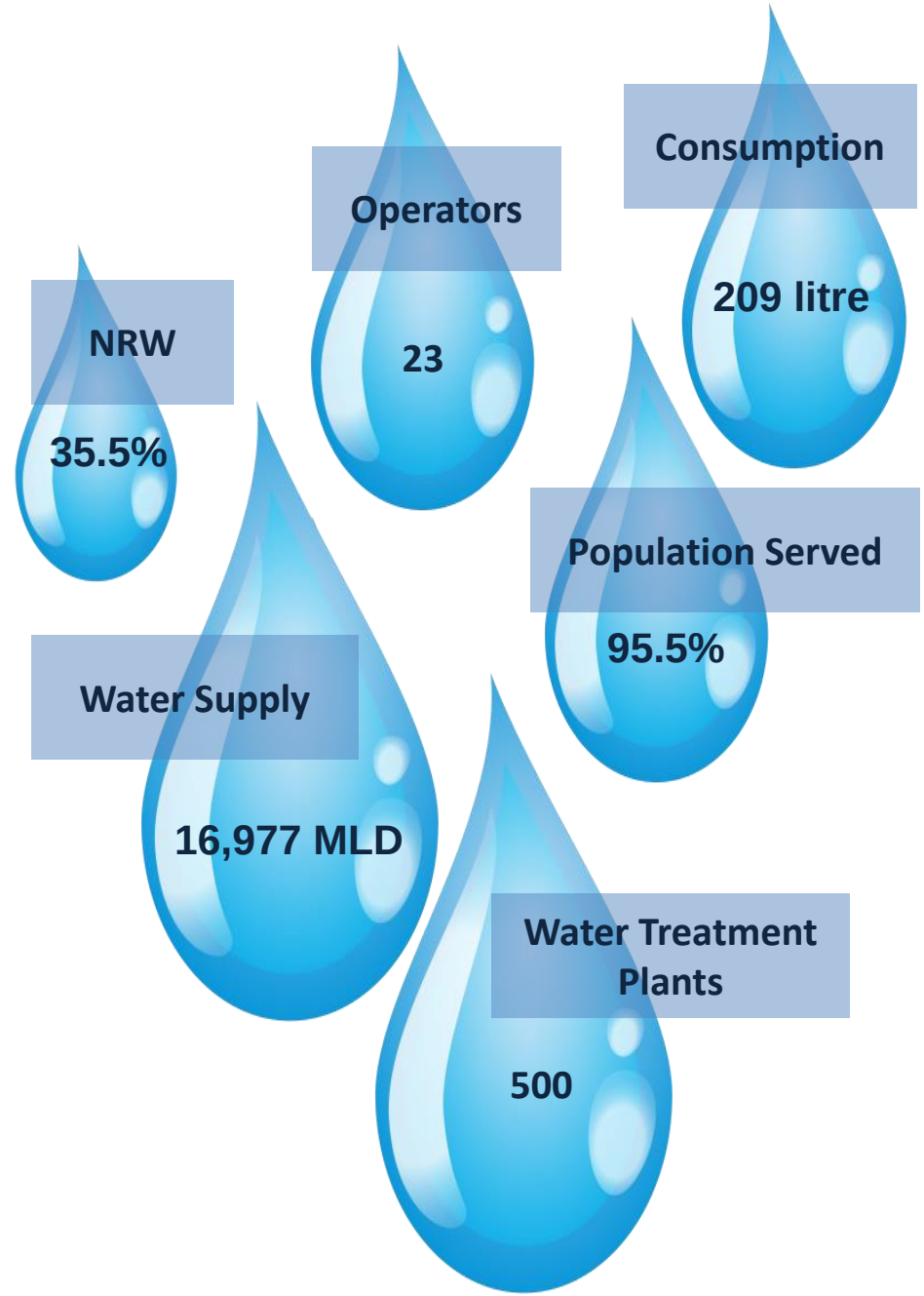
Future Opportunities

Water and sewerage

Goal	Gaps and opportunities
Quality access	▪ **Complete new sewerage industry master plan** (property connection, industrial connection)
Supply security	▪ **Better water resource management solutions incl. optimized use of existing resources** (e.g. alternative water sources)
Financial sustainability	▪ **Sustainable sector economics with tariff setting mechanism to achieve full cost recovery** ▪ **Complete cycle of value chain** (bioeffluent and biosolids reuse) ▪ **Opportunity for capex development** (by private investor) ▪ **Subsidy rationalization** (targeted)
Cost competitiveness	▪ **Better integration between energy and water sectors** (e.g. Pantai 2 STP)
Environmental Sustainability	▪ **Promote advanced treatment of wastewater** (e.g. recycling, currently only 23% treated to advanced level, lower than developed peers) ▪ **Increase awareness and clarity on policies and subsidies**

SOURCE: Global Water Intelligence; FAO; World Bank; Information on Malaysian´s water tariffs taken from Syarikat Bekalan Air Selangor Sdn Bhd for Kuala Lumpur, SAJ Holdings for Johor Baru, and Perbadanan Bekalar Air Pulau Pinang Sdn Bhd for George Town (Penang). Information on Malaysian´s wastewater tariffs taken from IWK.

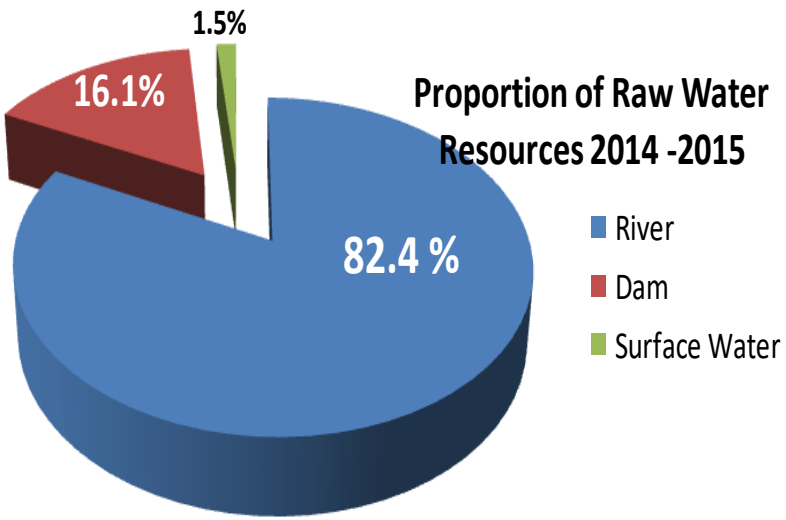
Quick Facts



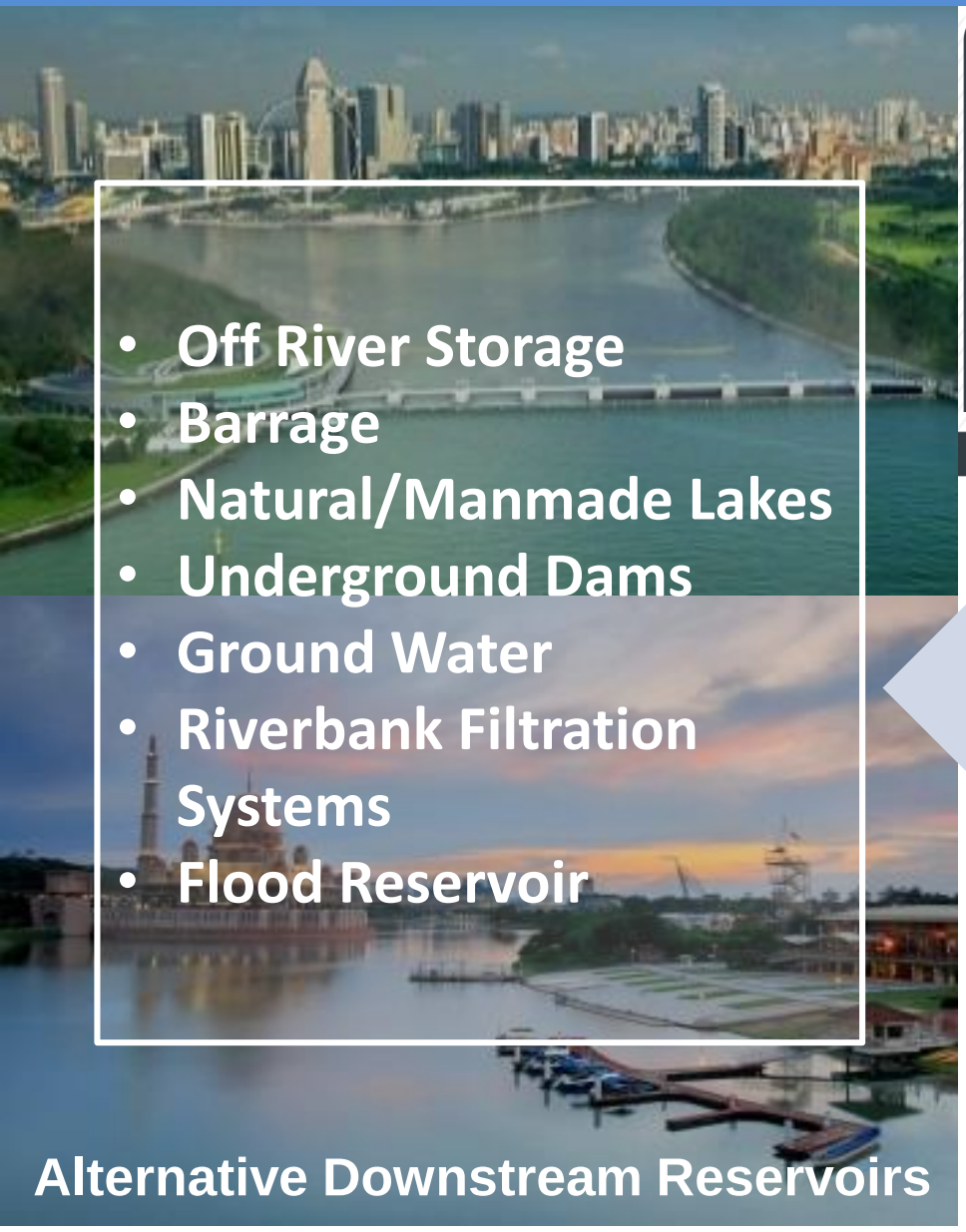
Demand Trends

Year	Quantity (MLD)
2010	8,948
2015	10,445
2020	18,619
2050	25,455

Sources



Initiatives



- Off River Storage
- Barrage
- Natural/Manmade Lakes
- Underground Dams
- Ground Water
- Riverbank Filtration Systems
- Flood Reservoir

Alternative Downstream Reservoirs

1/3 treated effluent to be recycled by 2030 (Water Reclamation Plants)

NRW Reduction (to 15%)

Water Utilisation Technology (WEPLS, TSM, R&D&C, Promotion)

Lowering Per Capita Consumption (to 170 l/c)

Managing Demands

Total Volume and Proportion of Water Consumption 2016

State	2016				
	Domestic		Non-Domestic		TOTAL
	MLD	%	MLD	%	MLD
Johor	773	60.1	513	39.9	1,286
Kedah	525	72.4	200	27.6	725
Kelantan	163	68.3	76	31.7	238
Labuan	17	34.1	33	65.9	50
Melaka	206	50.8	199	49.2	405
N. Sembilan	287	55.2	233	44.8	520
Pulau Pinang	492	59.5	335	40.5	827
Pahang	342	59.0	238	41.0	579
Perak	655	71.4	262	28.6	916
Perlis	82	85.4	14	14.6	96
Sabah	335	57.1	252	42.9	586
Sarawak	474	55.7	376	44.3	850
Selangor, KL & Putrajaya	1,883	58.5	1,336	41.5	3,219
Terengganu	264	60.0	176	40.0	440
MALAYSIA	**6,495**	**60.5**	**4,242**	**39.5**	**10,737**

Total Volume and Proportion of Water Consumption 2016

State	2016				
	Domestic		Non-Domestic		TOTAL
	MLD	%	MLD	%	MLD
Selangor, W.P. Kuala Lumpur & Putrajaya	1,883	58.5	1,336	41.5	3,219

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Challenges of Malaysia Water Sector

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Water & Wastewater

	Access	Efficiency	Sustainability
2016 POSITION	**96.2%** Population served with clean water[1] **23.6m PE** Sewage connected[3]	**36%** Non-revenue water[1] **211 litre** Water consumption per capita per day[1]	**2%** Annual freshwater withdrawals of total[2] **19,397 m³** Renewable internal freshwater resources, per capita[2]
GLOBAL PEERS			
UK	99% 135m PE	25% 260 litres	7% 2,244 m³
Japan	97% 210m PE	7% 170 litres	19% 3,382 m³
Singapore	100% 12m PE	5% 160 litres	32% 110 m³

1 Suruhanjaya Perkhidmatan Air Negara; GWI Global Water Market 2017
2 WorldBank, FAO and AquaSTAT. Data for 2015
3 Eleventh Malaysia Plan 2015-2020. Includes population covered by grids and septic tanks, value from 2015; GWI Global Water Market 2017

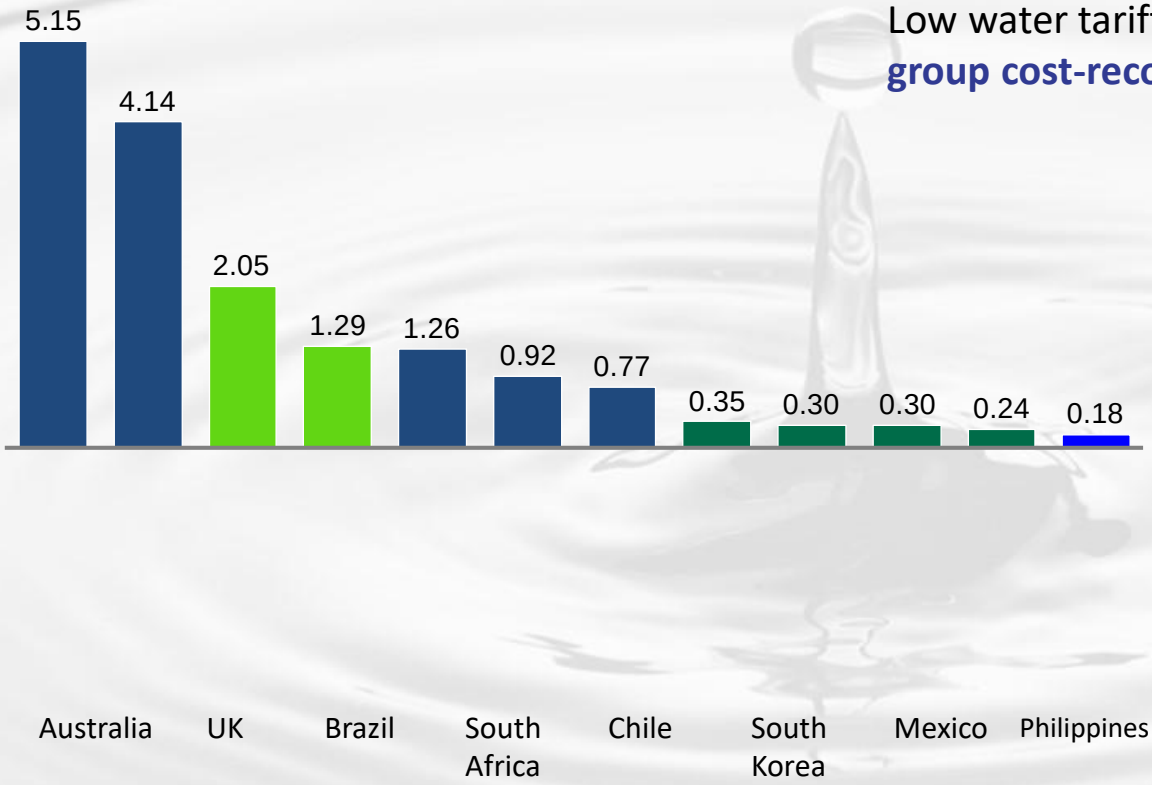
Benchmarking: Malaysia lags peer countries in the

OECD
Similar development
ASEAN

Financial sustainability

Water tariffs[1]

USD/m^3



Low water tariffs have led to **lower than peer-group cost-recovery**

1 Average price per cubic meter of cities surveyed in each country equivalent to a consumption of 16m3

SOURCE: Information on Malaysian´s water tariffs taken from Syarikat Bekalan Air Selangor Sdn Bhd for Kuala Lumpur, SAJ Holdings for Johor Baru, and Perbadanan Bekalar Air Pulau Pinang Sdn Bhd for George Town (Penang). Information on Malaysian´s wastewater tariffs taken from IWK.

FRAGMENTED INDUSTRY

	POLICY	FUNDING	OPERATORS
Water Resources	NRE KeTTHA	NRE KeTTHA PAAB	Water companies / concessionnaires
Water Supply	KeTTHA KKLW SPAN	KeTTHA KKLW MOH PAAB	Water companies / concessionnaires
Sewerage	KeTTHA SPAN	KeTTHA KKLW MOF	Water companies / concessionnaires
Stormwater & Sullage	NRE KPKT LAs	NRE KPKT	Water companies / concessionnaires

Findings from research...

Malaysia Water Sector Reform

Prior to 2007 **ACT 655 WATER SERVICES INDUSTRY** **Post 2007**

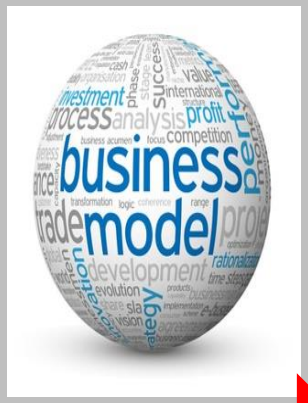
- Financial constraints for OPEX & CAPEX
- Low tariffs
- High NRW
- Ineffective regulations
- Not sustainable industrial structure

Issue/Problem

Water Services Industry Reform

- PAAB undertakes CAPEX
- Water operators focus on services
- Regulated by SPAN through license
- Competitive tariff structure

Transformation



Before

Water Services Act 2006

Loans owed by the States to Federal Government shall be novated to PAAB (for the transfer of water assets)

Federal Govt. Loan

Commercial Loan

Water Asset

Transfer

After

Lease arrangement

PAAB

Operator

Focus on O&M

Bond/Capital Market

Source for competitive funding

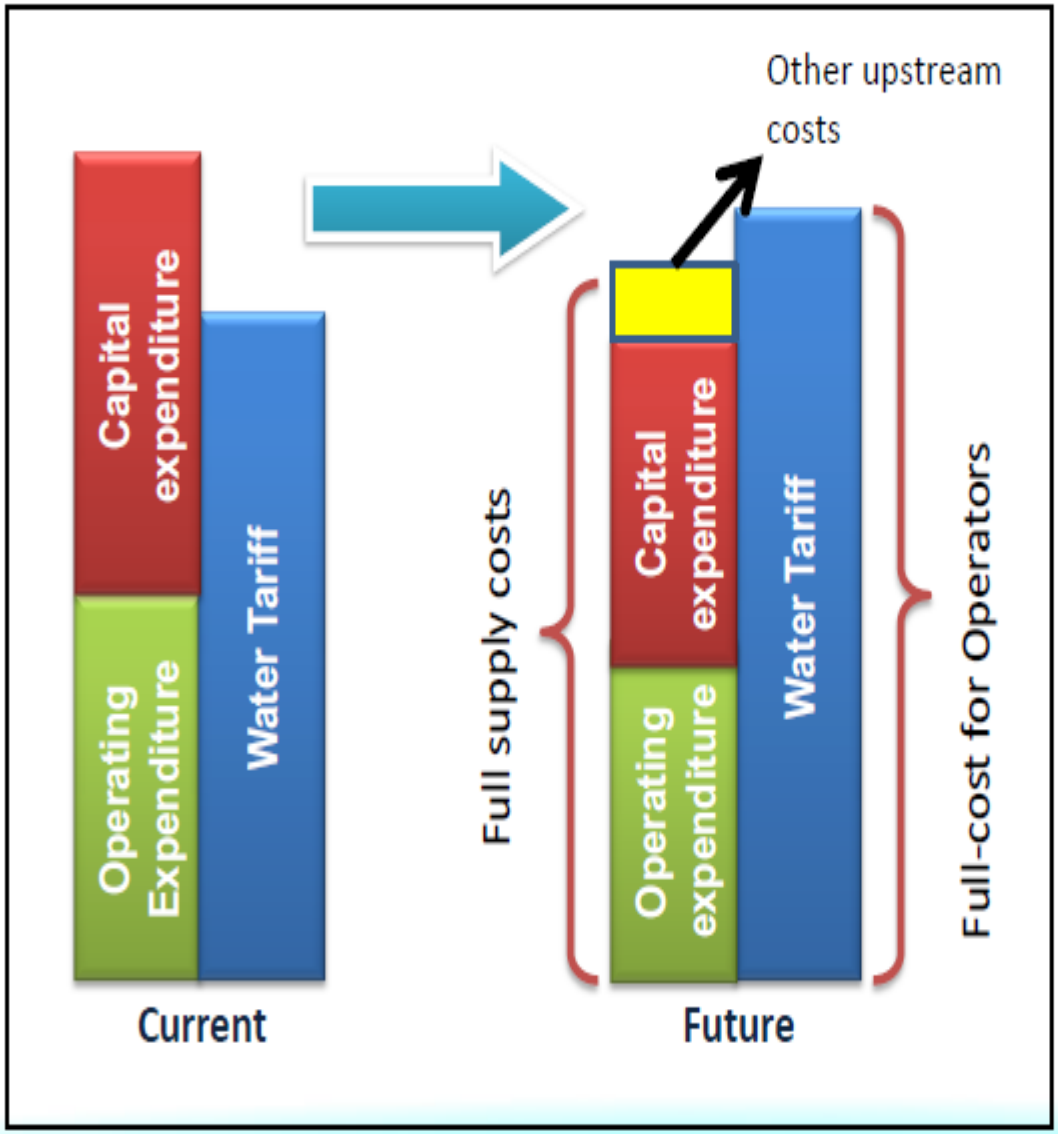
Lease payment

New Asset

Lease

Tariff Setting Mechanism

.....balancing affordability and sustainability



- Full Cost Recovery cannot be achieved with a one-time huge tariff increase
- Phased tariff increases to recover costs
- Short – Mid Term (Year 1-10 years) : full supply cost
- Long Term (Year 11-30) : full cost

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Way Forward in Malaysia Water Sector

- Investments by private sectors through PPP
- Exploring potential solutions to address water and wastewater infrastructure to cater for geographical challenges
- PAAB role in capex development

- Migration from state owned to public owned companies
- Governance migration
- Mechanism for tariff setting

- Subsidy rationalization (targeted)
- Aiming for full cost recovery
- Information dissemination

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