

SEMINAR ASEANSAI ON NON REVENUE WATER MANAGEMENT IN MALAYSIA



NATIONAL POLICY ON NON REVENUE WATER (NRW)

Water Regulatory Department

31 October 2012

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Introduction

1. Quick facts about the water services industry in Malaysia
2. Water services industry reform
3. Achievements
4. Issues & Challenges
5. Way Forward

Non-Revenue Water

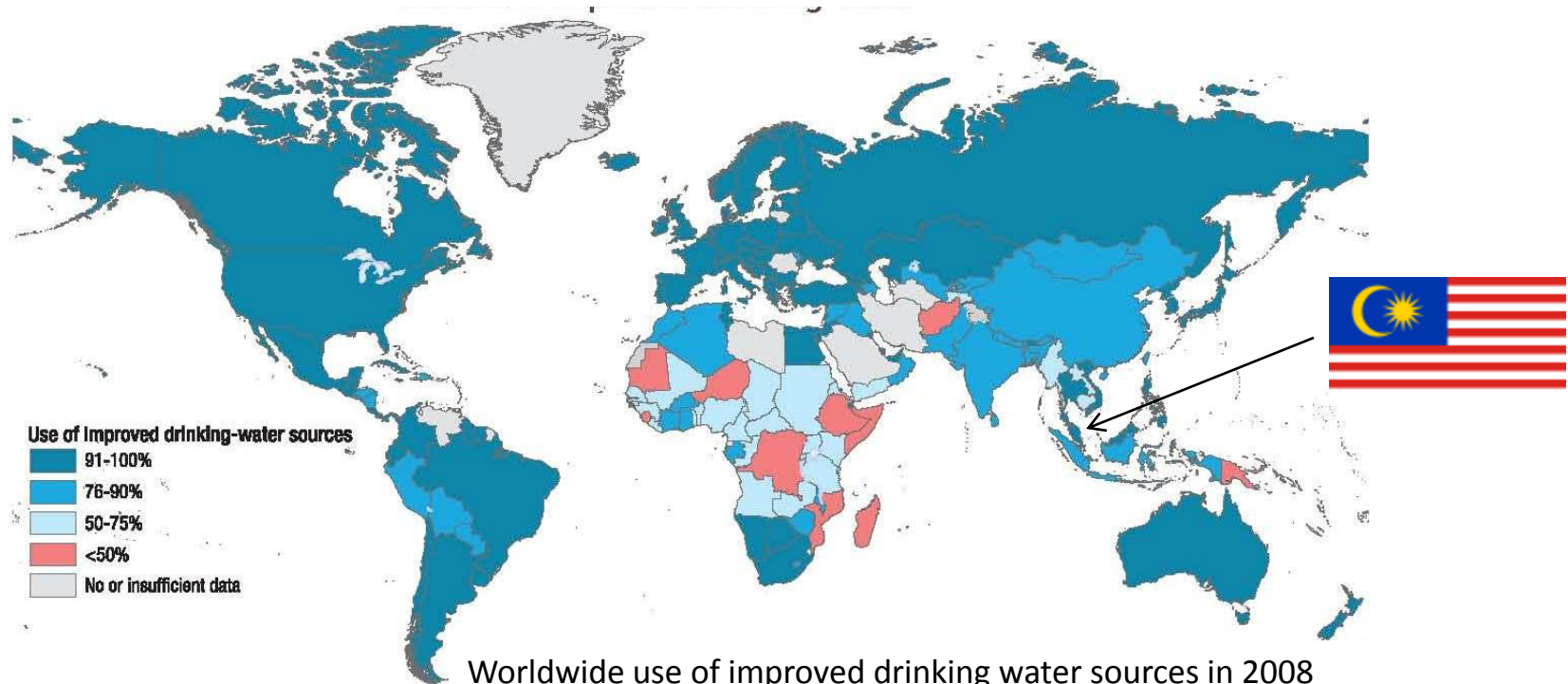
1. Introduction
2. NRW Policy
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QUICK FACTS ON THE WATER SERVICES IN MALAYSIA

Progress of Drinking Water

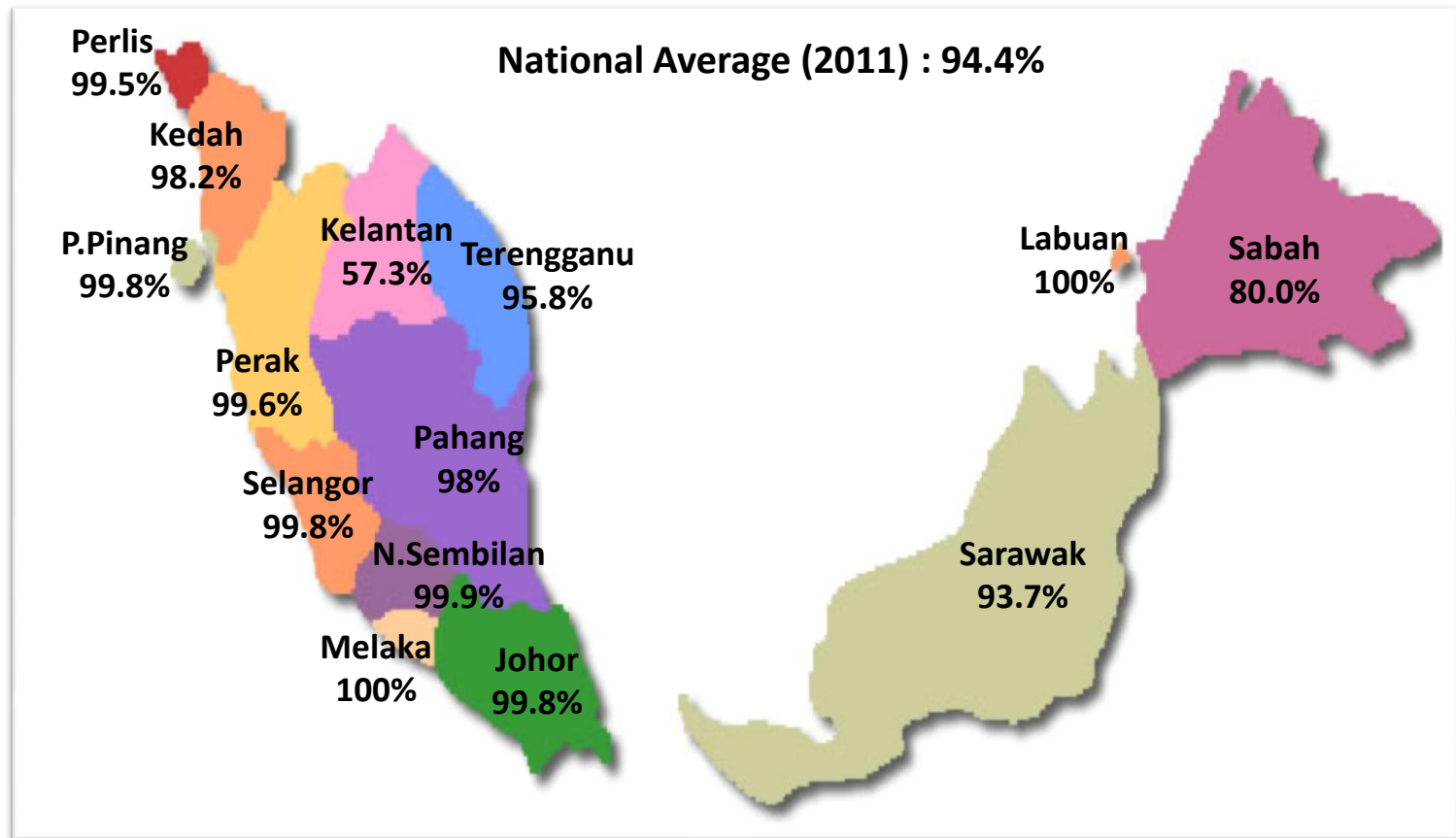


Worldwide use of improved drinking water sources in 2008
(Source: Progress Report on Sanitation and Drinking Water, 2010 Update, WHO & UNICEF)

- Population in Malaysia having access to safe drinking water in 2008
 - Urban: 100%, Rural : 99%, Total : 100% (Source: WHO)
- Population in Malaysia having access to piped water in 2011
 - Urban: 96.8%, Rural : 90.1%, Total : 94.4% (Source: MWIG)

QUICK FACTS ON THE WATER SERVICES IN MALAYSIA

Percentage of Population Served with 24 / 7 Piped Supply

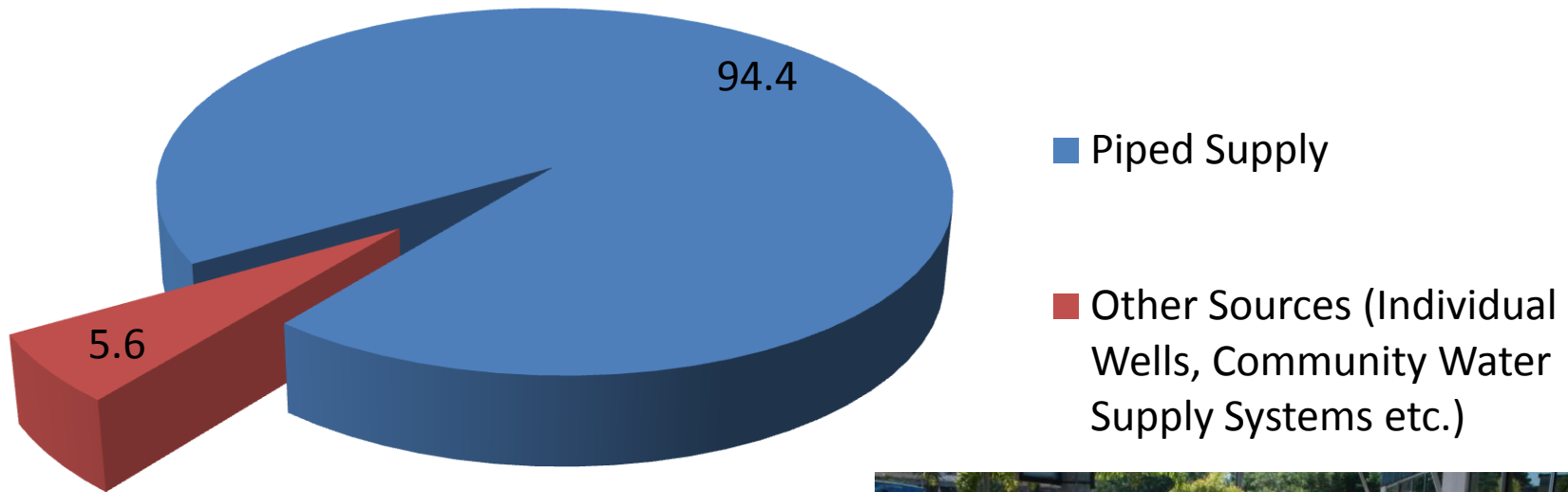


Population: 28.816 mil (2011)

Area: 330,252 sq km

QUICK FACTS ON THE WATER SERVICES IN MALAYSIA

% Population with access to safe drinking water



SPAN Small community water supply system developed by Ministry of Rural Development



Wells are preferred despite availability of piped supply

QUICK FACTS ON THE WATER SERVICES IN MALAYSIA

STATE	WATER OPERATORS		
	DISTRIBUTION & TREATMENT (16)	TREATMENT ONLY (9)	DISTRIBUTION ONLY (1)
JOHOR	SAJH	SWC	
MELAKA	SAMB		
N.SEMBILAN	SAINS		
SELANGOR		PNSB SPLASH ABASS KASB	SYABAS
PERAK	LAP	MUC AUSB	
PULAU PINANG	PBAPP		
KEDAH	SADA	Taliworks AUI	
PERLIS	JKR Perlis		
PAHANG	PAIP		
TERENGGANU	SATU		
SABAH	JBA Sabah		
SARAWAK	JKR Sarawak LAKU Sibu Kuching		
LABUAN	JBA Labuan		
KELANTAN	AKSB		

QUICK FACTS

Domestic Consumption Per Capita Per Day

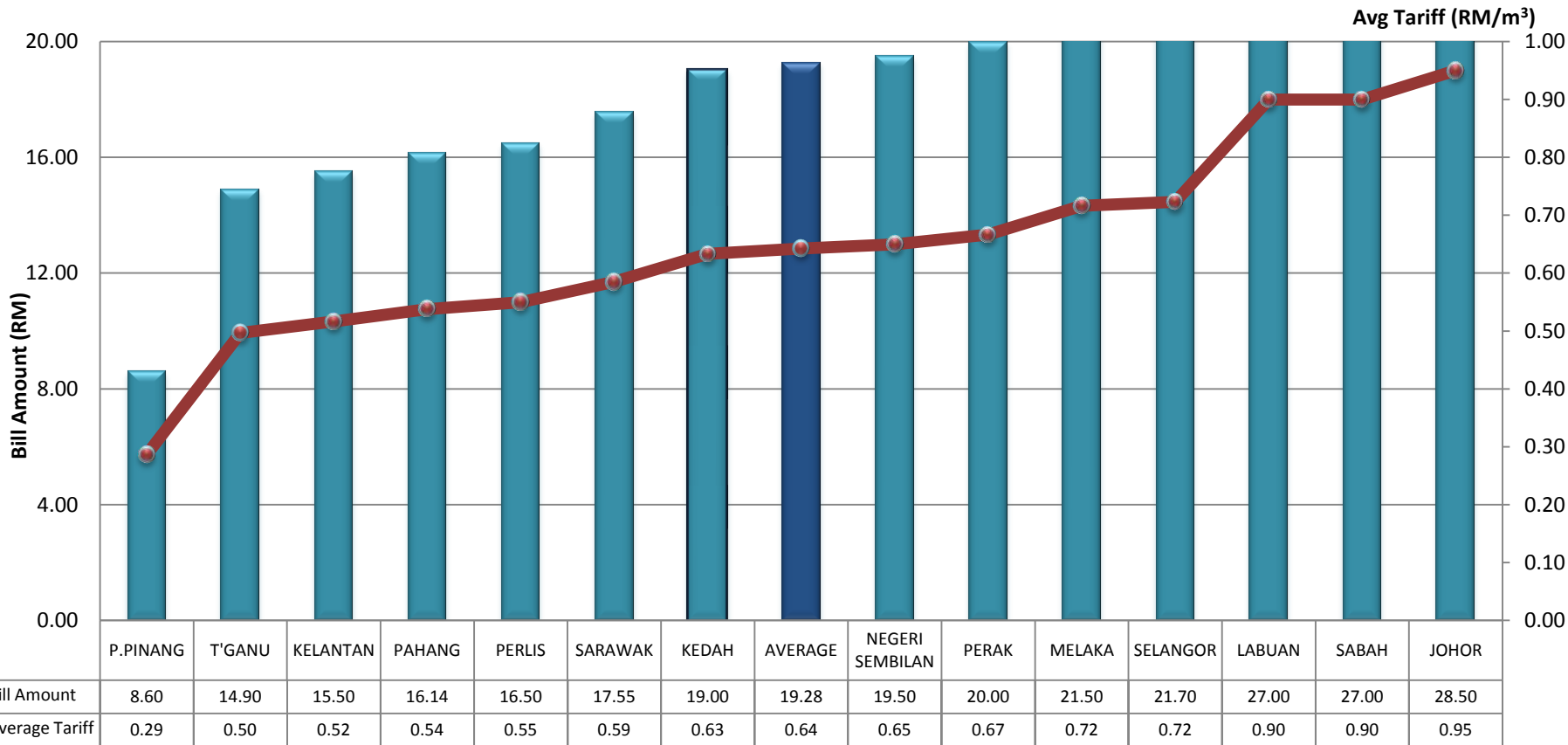
Water Supply Entities	Consumption Per Capita Per Day	
	l / cap / d	
	2010	2011
Johor	218	216
Kedah	222	226
Kelantan	145	137
Labuan	207	219
Melaka	231	233
N.Sembilan	223	227
Pulau Pinang	291	285
Pahang	175	186
Perak	228	230
Perlis	257	247
Selangor	239	230
Terengganu	212	207
Pen. Malaysia & FT Labuan	227	224
Sabah	85	107
Sarawak	188	188
MALAYSIA	209	210

* Singapore 155 lcd
Hong Kong 187 lcd

Domestic Consumption per capita : 210 l/cap/d
Average no. of people per domestic account : 4.7 people/account
Average consumption per domestic connection/month : 30 m³

QUICK FACTS

Average Domestic Tariff By State for First 30m³/month - 2011

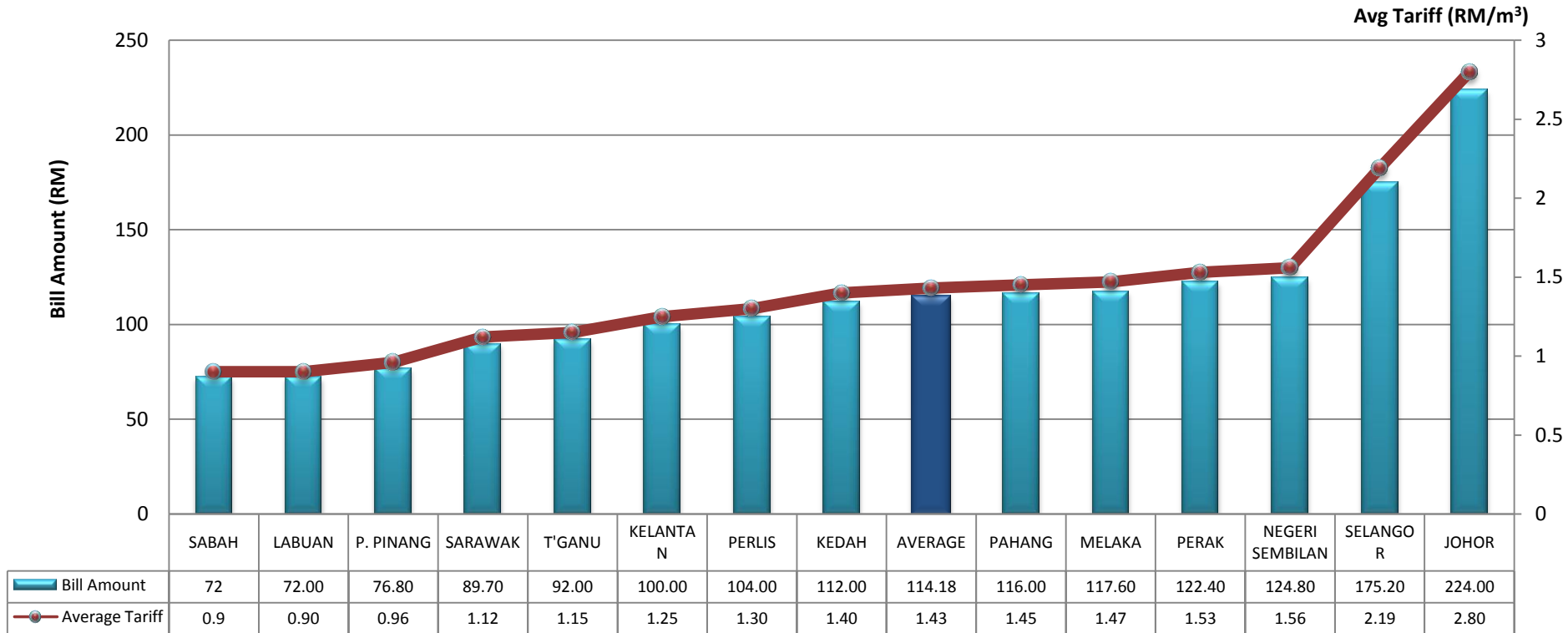


Average Amount of Bill per month: RM19.28

Average Tariff: RM0.64/m³

QUICK FACTS

Average Industry Tariff By State for First 80m³ - 2011

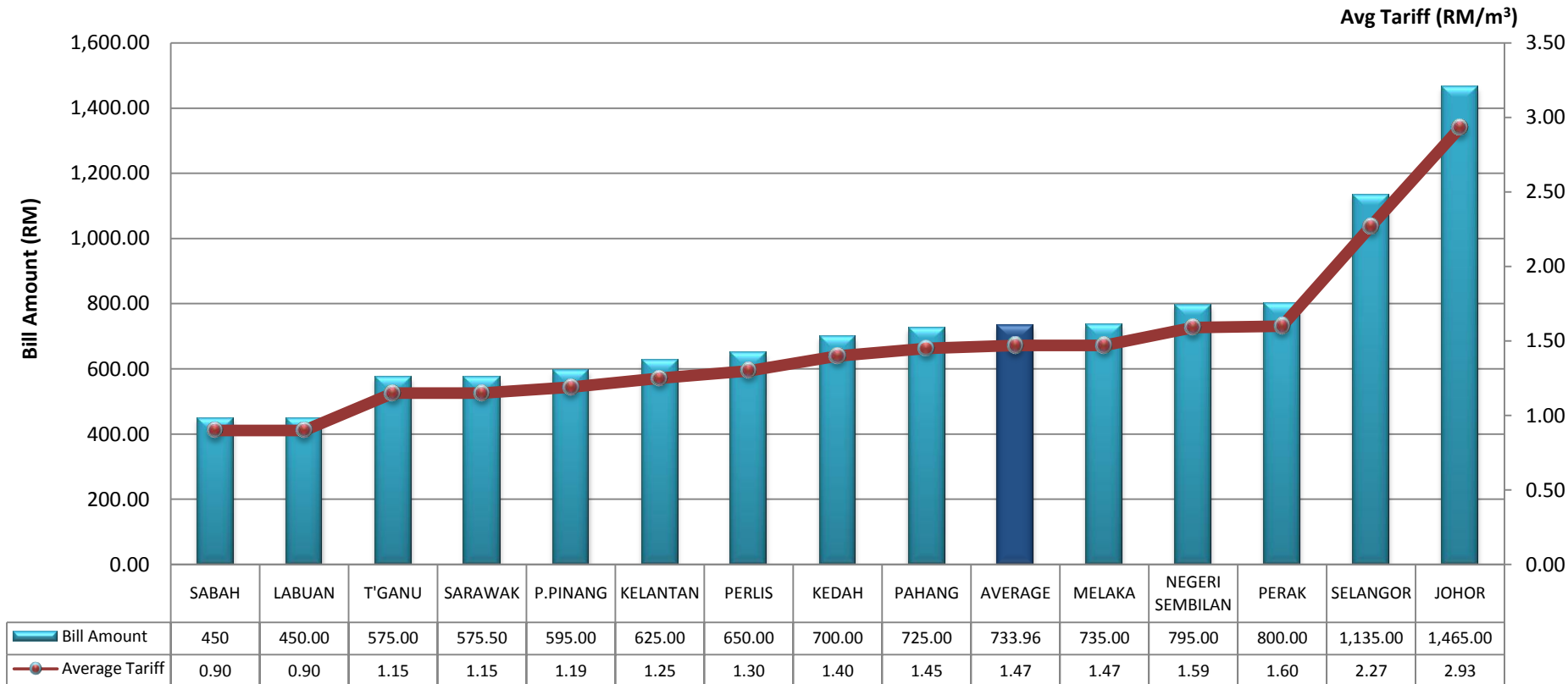


Average Amount of Bill per month : RM 114.18

Average Tariff : RM1.43/m³

QUICK FACTS

Average Industry Tariff By State for First 500m³- 2011



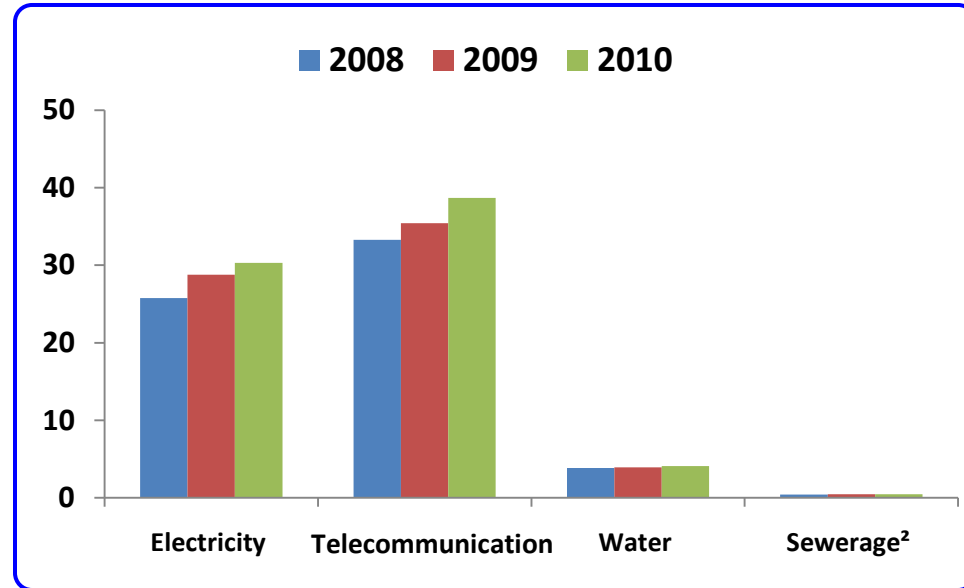
Average Amount of Bill per month : RM 733.96

Average Tariff : RM1.47/m³

QUICK FACTS

Utilities Sector Revenue (RM bil)

Year	Utility Sector				Highway ³ (RM bil)
	Electricity (RM bil)	Telecommunication ¹ (RM bil)	Water (RM bil)	Sewerage ² (RM bil)	
2008	25.75	33.29	3.83	0.41	3.26
2009	28.78	35.44	3.93	0.47	3.47
2010	30.32	38.69	4.09	0.47	3.66



RM billion

1. Telecommunication Companies - TM, Axiata, Maxis and Digi.
2. IWK and Majaari (Kelantan)
3. Highway Concession Company - PLUS dan Litrak Berhad

Source:

- 2007-2010 Annual Report (TNB, Axiata, Maxis dan Digi)
- Highway Concession Company Financial Statement 2007-2010
- Malaysia Water Industry Guide 2011
- 2010 Water Operator Data

QUICK FACTS

Non Revenue Water

State	2011			
	System Input Volume	Metered Billed Consumption	NRW	NRW (%)
	(m³ '000)			
Johor	546,682	387,178	159,504	29.2
Kedah	447,444	233,764	213,680	47.8
Kelantan	147,048	65,213	81,835	55.6
Labuan	19,308	15,068	4,240	21.9
Melaka	166,037	124,426	41,611	25.1
N. Sembilan	270,731	150,107	120,623	44.6
Pulau Pinang	347,123	283,159	63,964	18.4
Pahang	393,938	172,587	221,351	56.2
Perak	404,759	281,734	123,025	30.4
Perlis	66,041	26,538	39,502	59.8
Sabah	361,000	177,173	183,827	50.9
Sarawak	395,324	274,604	120,720	30.5
Selangor	1,503,629	1,017,749	485,880	32.3
Terengganu	215,172	135,508	79,665	37.0
MALAYSIA	5,284,235	3,344,808	1,939,427	36.7

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- 2. Water services industry reform**
3. Achievements
4. Issues & Challenges
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WATER SERVICES REFORM - WHY?



**Water industry is
not sustainable
without
transformation**

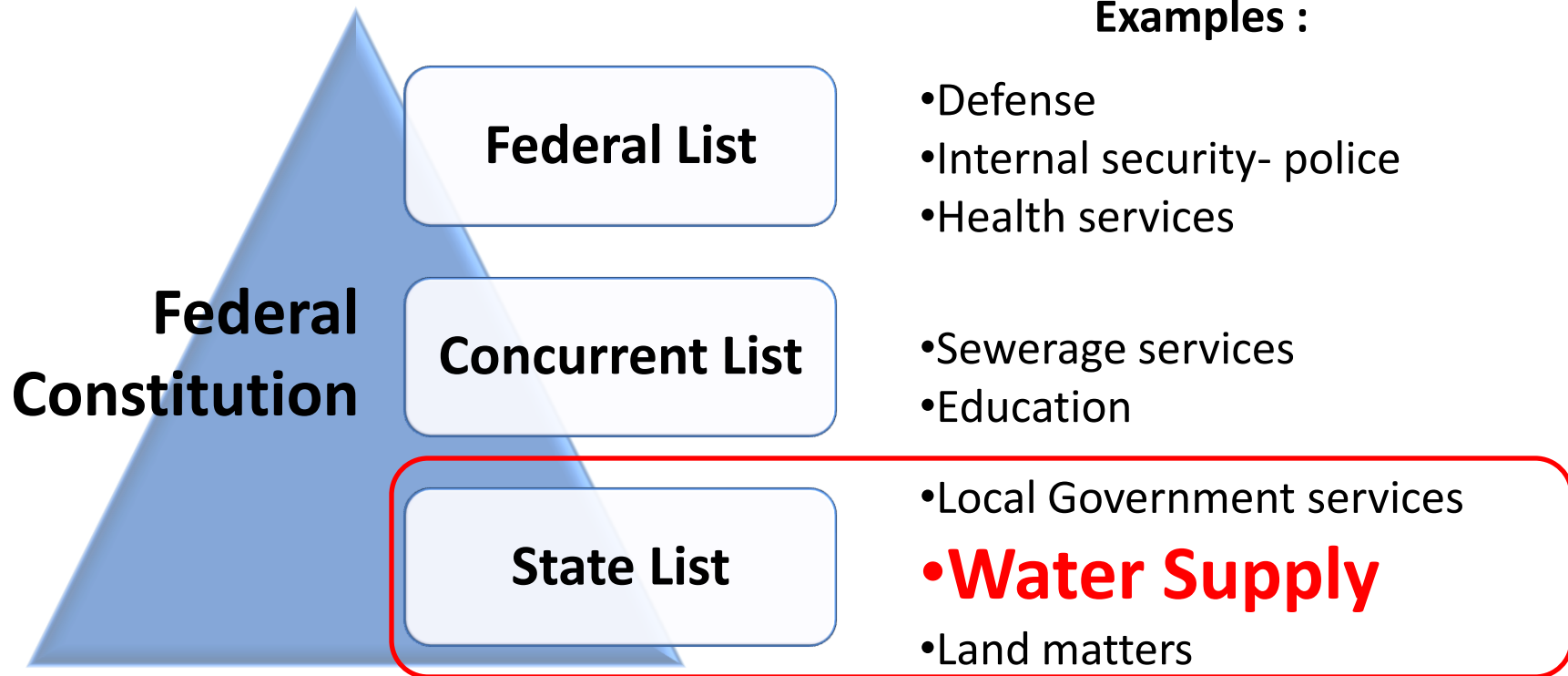
- ✓ Put in place a **clear policy** and **legal framework** for the water services industry
- ✓ Provide development of **capital works** to meet demand requirements
- ✓ Increase **efficiency** and **effectiveness** in service provisions by licensees
- ✓ Promote **transparency** and effective **participation** from stakeholders

WATER INDUSTRY BEFORE REFORM

Amendment to Federal Constitution (Feb 2005) to enable the Federal Government to regulate the water services

- ✓ Water services and supplies are transferred from State List to Concurrent List
- ✓ Water source remains with State Government

Examples :



AFTER REFORM - LAWS GOVERNING THE INDUSTRY

FEDERAL CONSTITUTION (amended and gazetted on 10 Feb 2005)

- Water Services Industry Act (WSIA)
- National Water Services Commission (SPAN)

Governing water
industry services

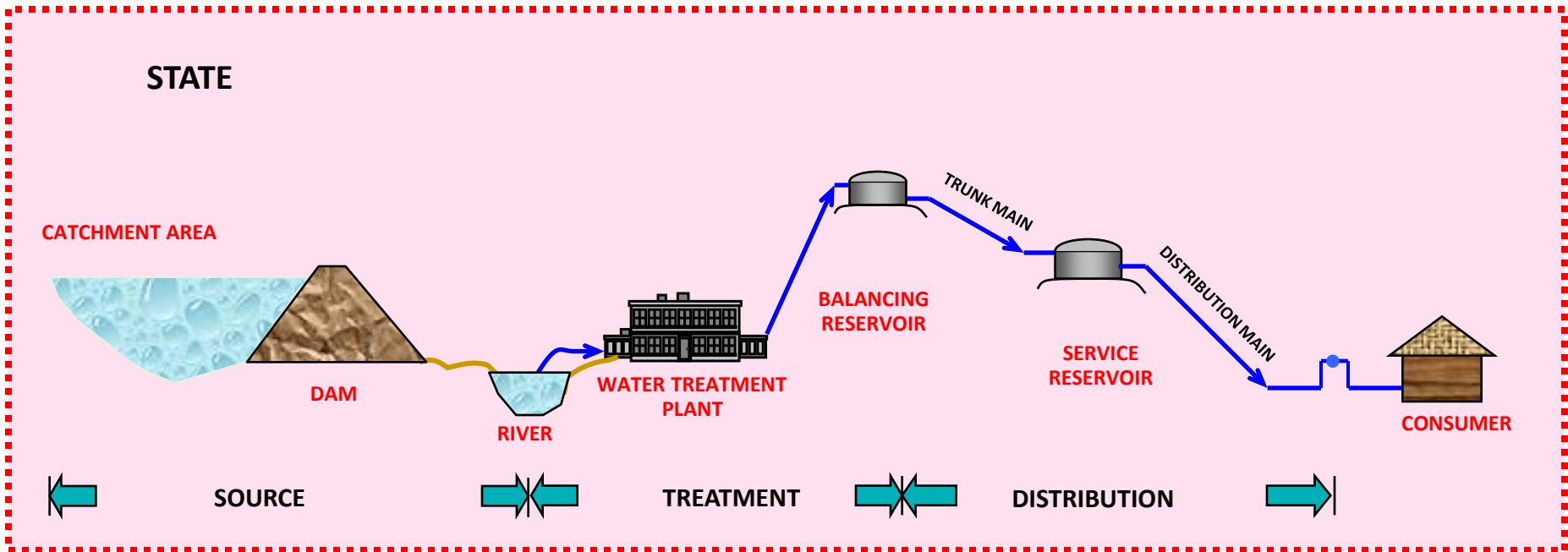
- Federal Laws On Environment, Building, Health etc
- Federal Departments

Governing
environmental,
building, health

- State Water Enactment (raw water)
- State Water Department

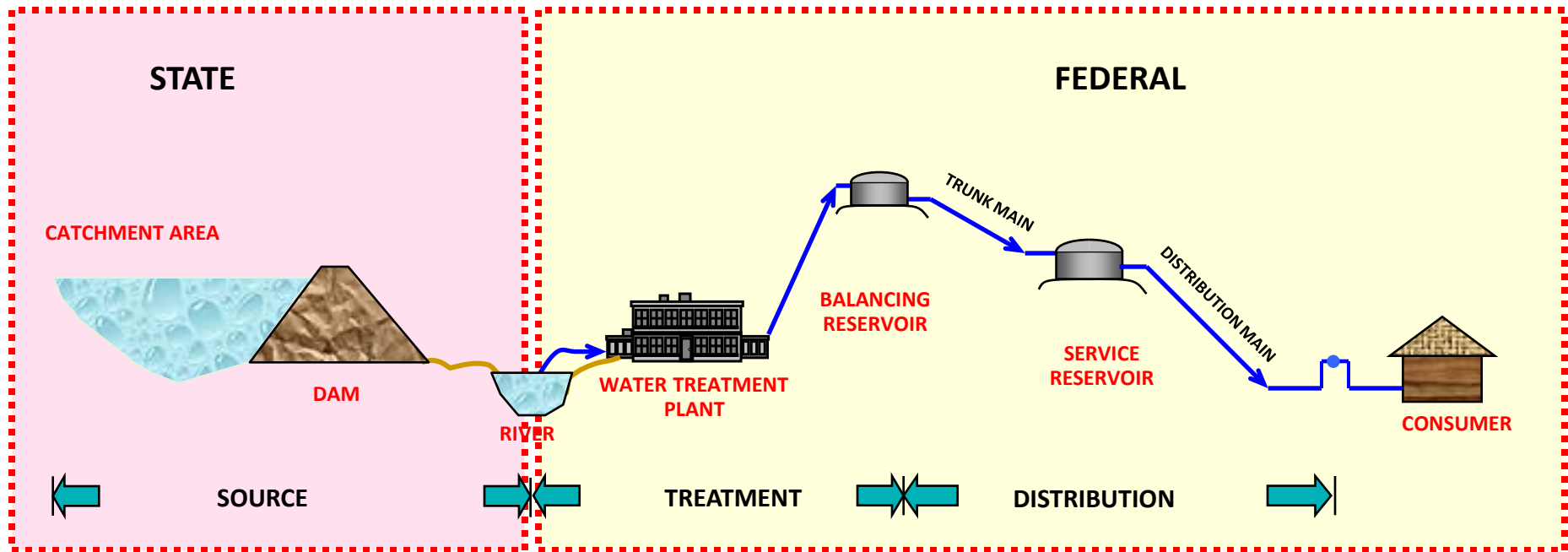
Governing water
basin, extraction and
conservation of raw
water supply

WATER SUPPLY SYSTEM



Before Federal Constitution Amendment

WATER SUPPLY SYSTEM



After Federal Constitution Amendment

AFTER REFORM – POLICY & INSTITUTIONAL FRAMEWORK

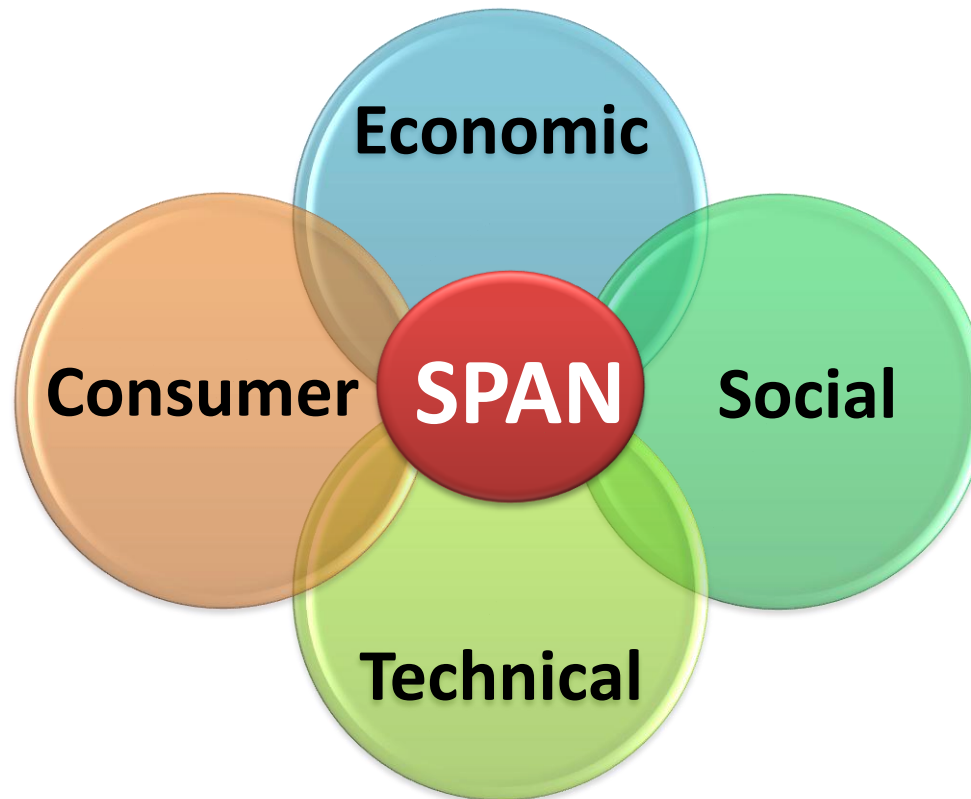
BODY	AREA OF RESPONSIBILITY	DESCRIPTION
Federal Government (Ministry of Energy, Green Technology and Water)	Policy matters	Development of a holistic water policy for the country by setting policy directions.
State Governments	Raw water matters	Regulate raw water abstraction and catchment management
National Water Resources Council (NWRC) – chaired by Prime Minister	Water resources matters – cross boundaries/inter state/issues of national interest	Ensures coordination between various State Governments in the management of river basins.
National Water Services Commission (SPAN)	Regulatory matters	Regulate water services industry (water and sewerage services) in <u>Peninsular Malaysia and Federal Territory of Labuan</u>

WHAT ARE THE REFORMS THAT HAVE TAKEN PLACE?

- ✓ Coming into effect the 2 Acts i.e
 - Water Services Industry Act 2006 (WSIA 2006) - to **govern the water services industry** from treatment of raw water to discharge of waste water
 - National Water Services Industry Act 2006 (SPAN Act)- to **establish a national regulator** for the water services industry
- ✓ Establishment of Water Reform Business Model
- ✓ Enhancement of Regulatory Framework

NEW REGULATORY REGIME (1)

- SPAN as the **ONE** regulatory body



VISION

Towards a Sustainable, Reliable and Affordable Water Services for All

MISSION

To Regulate the Water Services Industry Through Fair, Effective and Transparent Implementation of WSIA

NEW REGULATORY REGIME (2)

- Uniform **legislation**
- Uniform **regulation and rules** – to give better clarity
- Uniform **tariff-setting mechanism**
 - ✓ A robust, stable and transparent framework for periodic tariff reviews
 - ✓ The process is **Transparent, Consultative, Participatory** where customer's views are considered and well planned and comprehensive
 - ✓ Regulatory accounting framework (RAF) to allow benchmarking to incentivized operators
 - ✓ Tariff structure is based on
 - Affordability
 - Punitive rate - to prevent excessive consumption and encourage water conservation

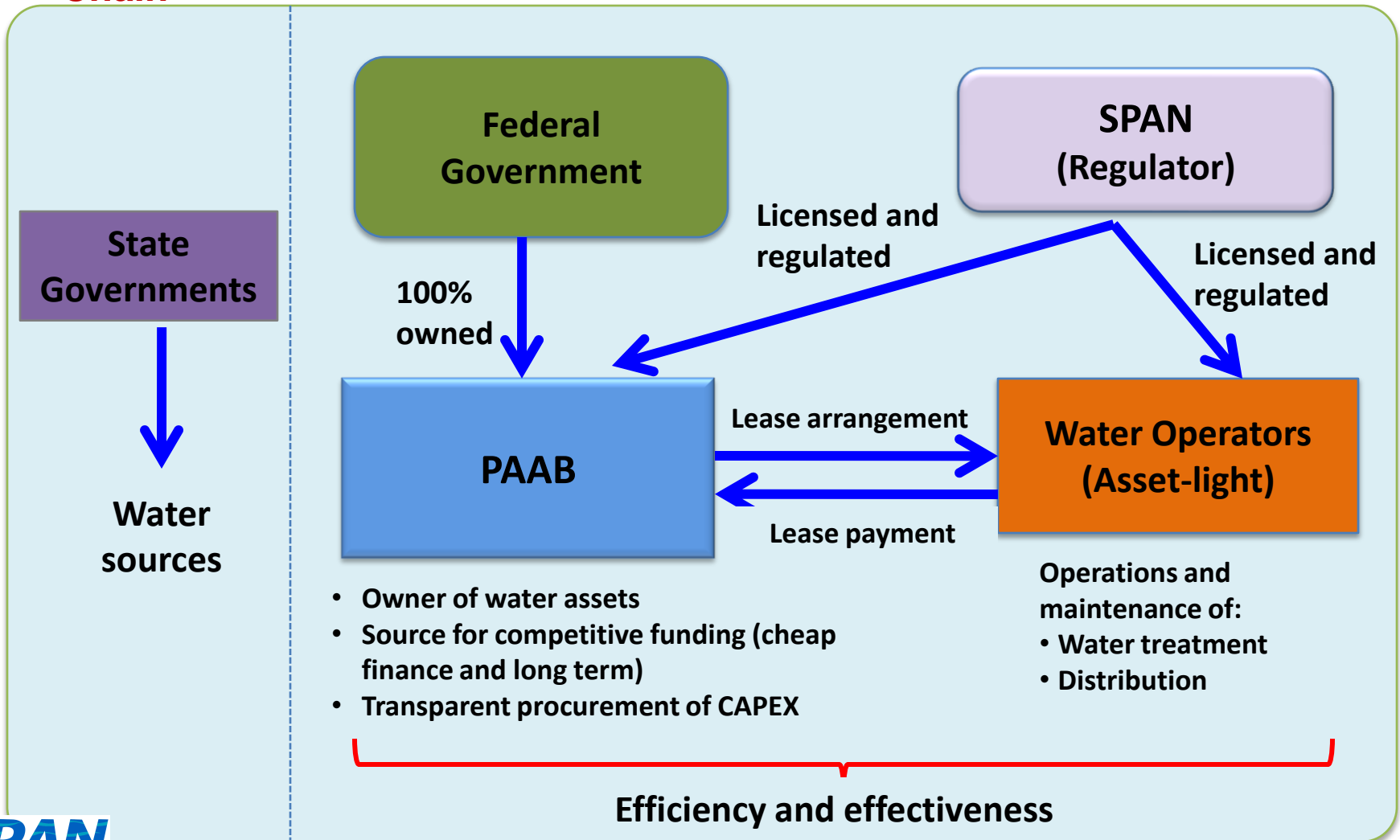
NEW REGULATORY REGIME (3)

- Licensing of water and sewerage operators with **key performance indicators (KPIs)**
 - ✓ Set up national performance standards, timeliness and monitoring and reporting requirements
- Standard **operating procedures**
 - ✓ Set up regulatory framework which brings together costs, performance, scope for **efficiency improvements** and **consumer protection (enforcement activities)**
 - ✓ Review existing specs and practices in design, construction and operation of water supply and sewerage system
- Standard **product certification procedures**
 - ✓ Suppliers to be held accountable for non-conformity of standard and quality

WATER REFORM BUSINESS MODEL

Water Services under Federal Government

Creating A Sustainable Long Term Business Model & Holistic Value Chain



DEVELOPING A SUSTAINABLE WATER SERVICES INDUSTRY

**continuous
access to
safe water
at
affordable
rate**

*Sustainable water
services industry*

✓ **Completed**

**Independent
National
Regulator**

✓ **Completed**

**Creative
Innovative
Financing**

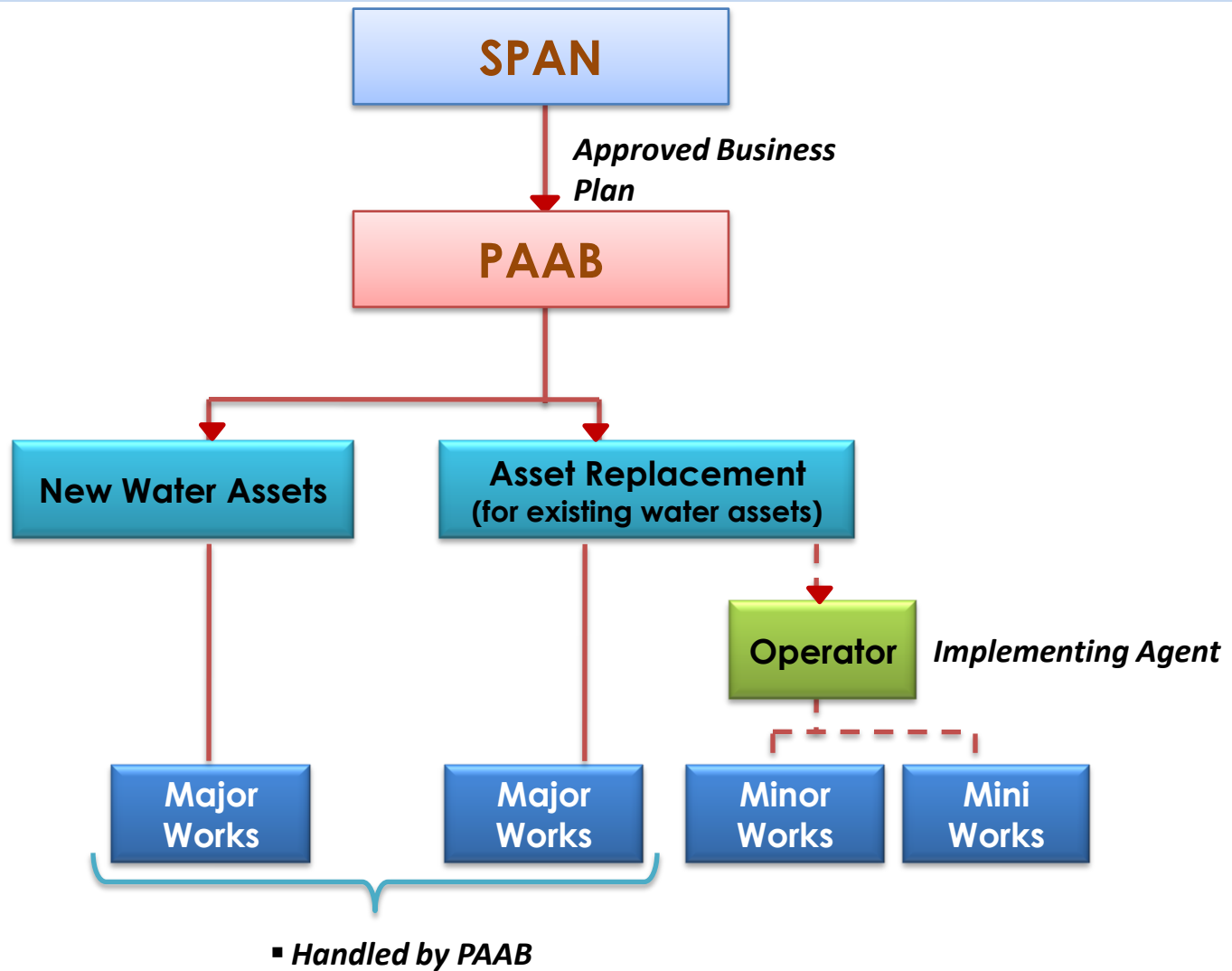
On-going

**Transparent Tariff
Setting
Mechanism**

Continuous

**Effective and
Efficient Service
Delivery**

CAPEX WORKS IMPLEMENTATION BY PAAB



ROLES & STRATEGIES

ROLES / STRATEGIES	SPAN
Promoting effective competition and economic efficiency	✓
Protecting the interest of consumer	✓
Protecting the financial viability of efficient suppliers	✓
Enhancing public knowledge, awareness and understanding of the regulated sectors	✓
Promoting the availability of regulated services to all consumers: low income, rural and disadvantaged consumers	✓
Approves business plans of utilities	✓
Issues operational licences to utilities	✓
Approves service tariffs	✓
Publish technical guidelines and standards	✓
Monitors water quality and performance of utilities	✓
Collect & publishes comparative performance data	✓

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ISSUES & CHALLENGES (2)

- **Addressing sustainability issues**

- ✓ Aging infrastructure that needs to be refurbished, upgraded or replaced
- ✓ Funding - matching ability to pay and requirements

- **Migration/Restructuring Issues**

- ✓ Basis of valuation of assets to be transferred to PAAB
- ✓ Negotiations between Federal and State Government require careful and cautious approach
- ✓ Perception that Federal Government is taking over the states' assets
- ✓ Restructuring model adopted must be able to balance and satisfy the needs of all stakeholders
- ✓ Tariff review implementation

ISSUES & CHALLENGES (3)

- **Handing over of projects that do not comply with specifications**
 - ✓ Failure of developers to hand over water supply and sewerage system which requires SPAN's intervention
- **Declining Quantity/Quality of Water Resources**
- **Increasing consumer expectations for higher level of service and transparency**
 - ✓ Consumer codes
 - ✓ Consumer participation – through Water Forum
 - ✓ Management of consumer complaints

PRIVATE WATER SUPPLY

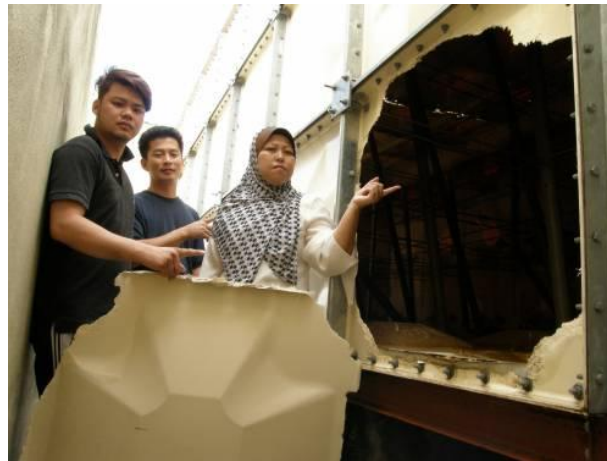


A private (estate) water supply system

FAILURE OF WATER PRODUCTS



Gombang, Johor

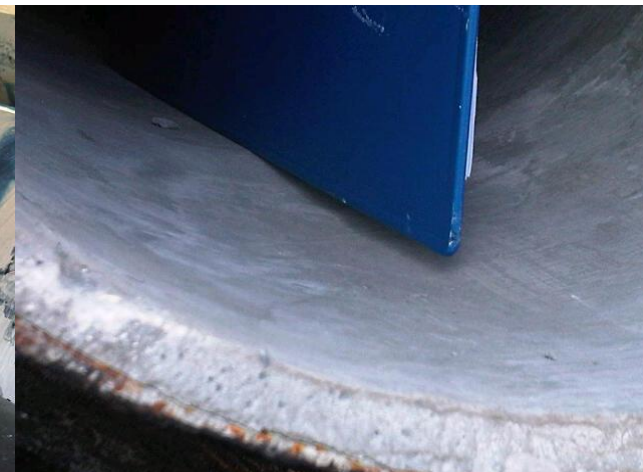


Sri Kembangan, Selangor



Larkin, Johor

FRP Tanks



Mild Steel Concrete Lining Pipes

SOME CASES OF COMPLAINT RESOLVED BY SPAN

Low water pressure at Raja Perempuan Zainab II Hospital, Kota Bharu, Kelantan.

BEFORE



Pressure gauge showing low water pressure

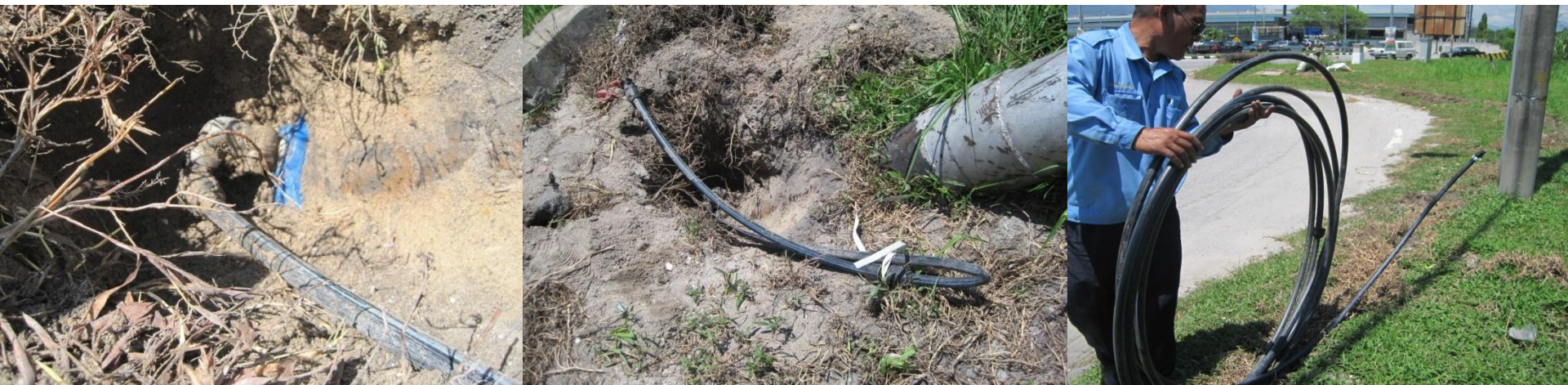
AFTER



Improved incoming flow indicating increase in water pressure



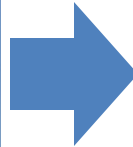
Fruit Orchard in Sungai Petani, Kedah



Illegal tapping to Food Stall and Motor Workshop in Lahat, Perak

ISSUES ON HANDING OVER OF PUBLIC WATER

Water supply issues resolved at Bukit Beruntung & Bukit Sentosa



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WAY FORWARD

- Improving water service infrastructure
 - ✓ supply coverage to increase from 93% of population in 2009 to 97% by 2015
- Integrating water and sewerage services and tariffs
- Implement Regulatory Accounting Framework(RAF) and move towards full cost recovery

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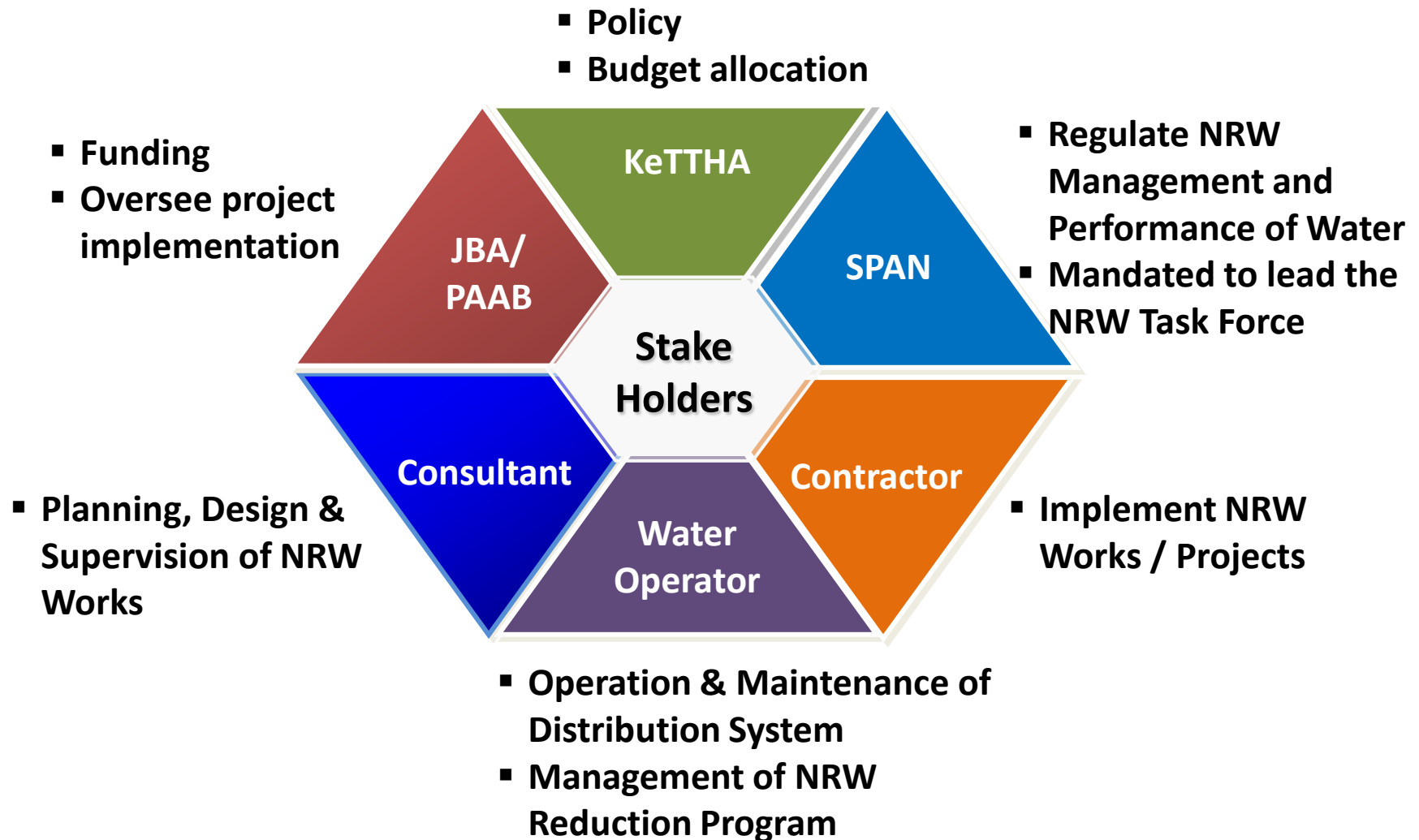
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3. Monitoring of NRW
4. National Target Achievements
5. NRW Key Performance Indicator
6. Capital Expenditure
7. Common Audit Findings

INTRODUCTION

- Non Revenue Water (NRW) is a matter of grave concern for any country and reducing NRW has become a pressing issue in Malaysia
- Past efforts to improve the situation have been limited due, in part, to underestimating the technical difficulties and complexity of NRW management
- Through the regulatory framework under SPAN, NRW will be given top priority attention to move the NRW plans forward and make NRW reduction programme work
- A special Task Force has been set to recommend an implementation strategy to drive the process for NRW reduction in Malaysia

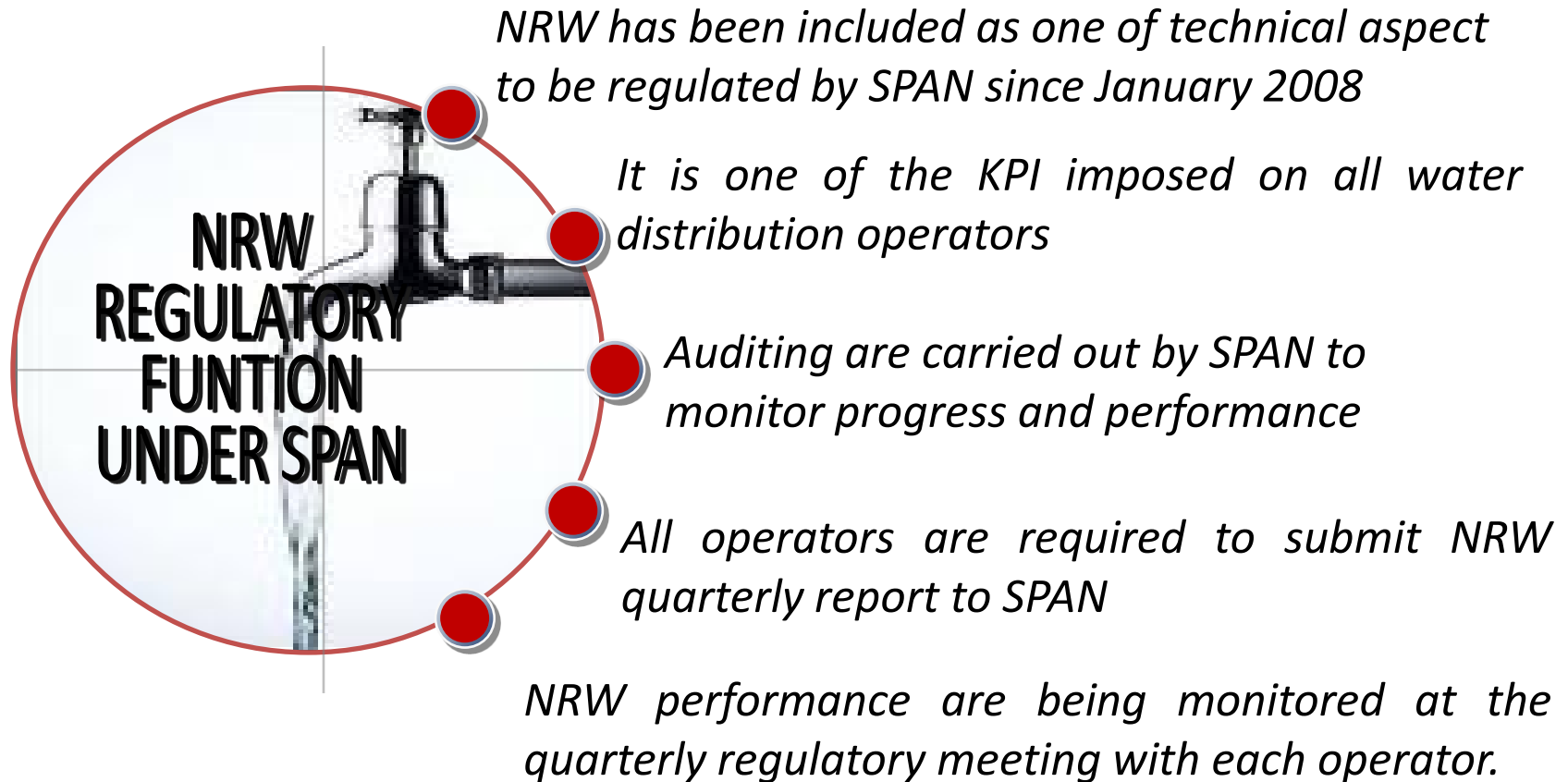
INTRODUCTION

NRW MANAGEMENT IN MALAYSIA – THE KEY ROLE PLAYERS



INTRODUCTION

NRW MANAGEMENT IN MALAYSIA – THE KEY ROLE PLAYERS



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NRW MANAGEMENT POLICY

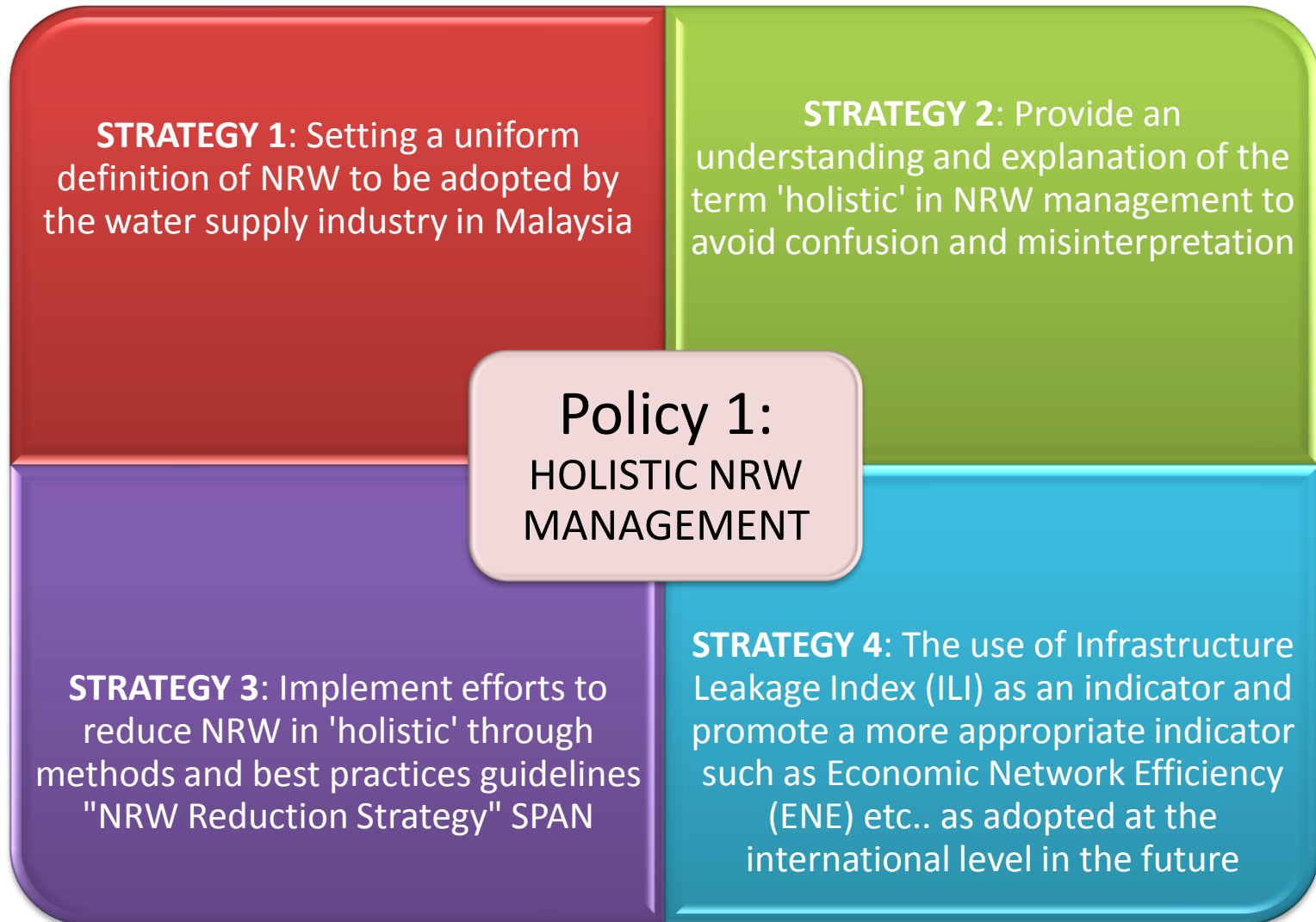
To reduce national Non-Revenue Water – (NRW) average level to 25% by 2020 via:



25 % NRW
(Year 2020)



POLICY 1 : HOLISTIC NRW MANAGEMENT



POLICY 1 : HOLISTIC NRW MANAGEMENT

WATER BALANCE

System Input Volume	Authorized Consumption	Billed Authorized Consumption	Billed Metered Consumption	Revenue Water
			Billed Unmetered Consumption	
		Unbilled Authorized Consumption	Unbilled Metered Consumption	Non-Revenue Water (NRW)
			Unbilled Unmetered Consumption	
	Water Losses	Commercial (Apparent) Losses	Unauthorized Consumption	
			Customer Metering Inaccuracies and Data Handling Errors	
		Physical (Real) Losses	Leakage on Transmission and / or Distribution Mains	
			Leakage and Overflows at Utility's Storage Tanks	
			Leakage on Service Connections up to Point of Customer Use	

POLICY 1 : HOLISTIC NRW MANAGEMENT

SPECIFIC NRW COMPONENTS (MALAYSIAN SCENARIO)

System Input Volume (Part A)	Authorised Consumption	Billed Authorised Consumption	Billed Metered Consumption	<ul style="list-style-type: none"> Water that is billed to all types of users 	Revenue Water
			Billed Unmetered Consumption	Estimated water use which is calculated and billed as: <ul style="list-style-type: none"> Water sold to private tankers Water sold to contractors for reservoir / tank testing Estimated and billed usage as a result of the damage meter for a specified period 	
		Unbilled Authorized Consumption	Unbilled Metered Consumption	<ul style="list-style-type: none"> Water supplied to certain institutions for free Water supplied for free through tankers during the disruption of water supply (some states) 	Non-Revenue Water (Part A)
			Unbilled Unmetered Consumption	<ul style="list-style-type: none"> Water from fire hydrants for fire fighting Water used for mutual cooperation activities Water supplied for free through tankers during the disruption of water supply (some states) Water used for cleaning pipes (Scouring and flushing) 	

POLICY 1 : HOLISTIC NRW MANAGEMENT

SPECIFIC NRW COMPONENTS (MALAYSIAN SCENARIO)

System Input Volume (Part B)	Water Losses	Commercial (Apparent) Losses	Unauthorised Consumption	<ul style="list-style-type: none"> • Water stolen or through illegal connections • Water used from a fire hydrant which is not for fire fighting purposes unless approved by the appropriate authority • Water used from a tempered meter 	Non-Revenue Water (Part B)
			Customer Metering Inaccuracies and Data Handling Errors	<ul style="list-style-type: none"> • Water loss due to meter inaccuracies • Water loss due to data handling errors from billing management 	
		Physical (Real) Losses	Leakage on Transmission and/or Distribution Mains	<ul style="list-style-type: none"> • Reported or unreported leaks / burst occurring in the supply and distribution pipes maintained by the distribution licensee 	
			Leakage and Overflows at Reservoirs	<ul style="list-style-type: none"> • Water leaks and overflows in Reservoirs & Tanks due to operating problems or technical difficulties 	
			Leakage on Service Connections up to customer metering point	<ul style="list-style-type: none"> • Leakage from Communication Pipe, between the tapping point up to customer meter on a landed property • Leakage from Communication Pipe, between the tapping point up to the bulk meter on high rise residential and gated community 	



UNBILLED AUTHORISED CONSUMPTION (UAC)





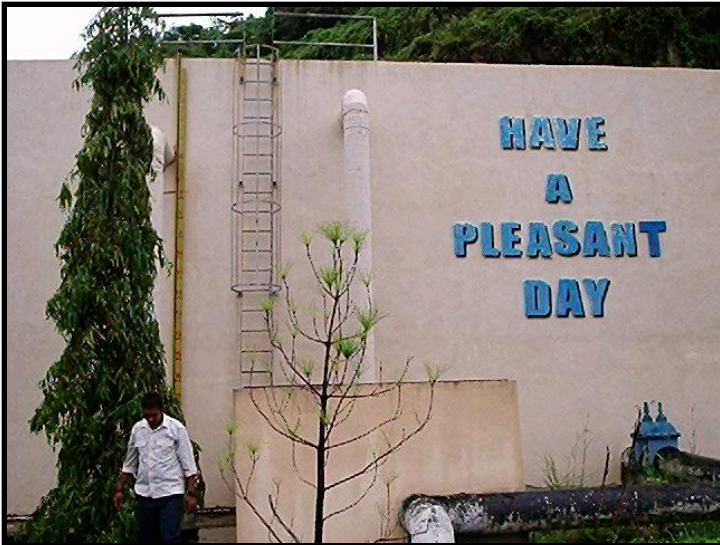
COMMERCIAL(APPARENT) LOSSES

- ❖ UNAUTHORISED
CONSUMPTION



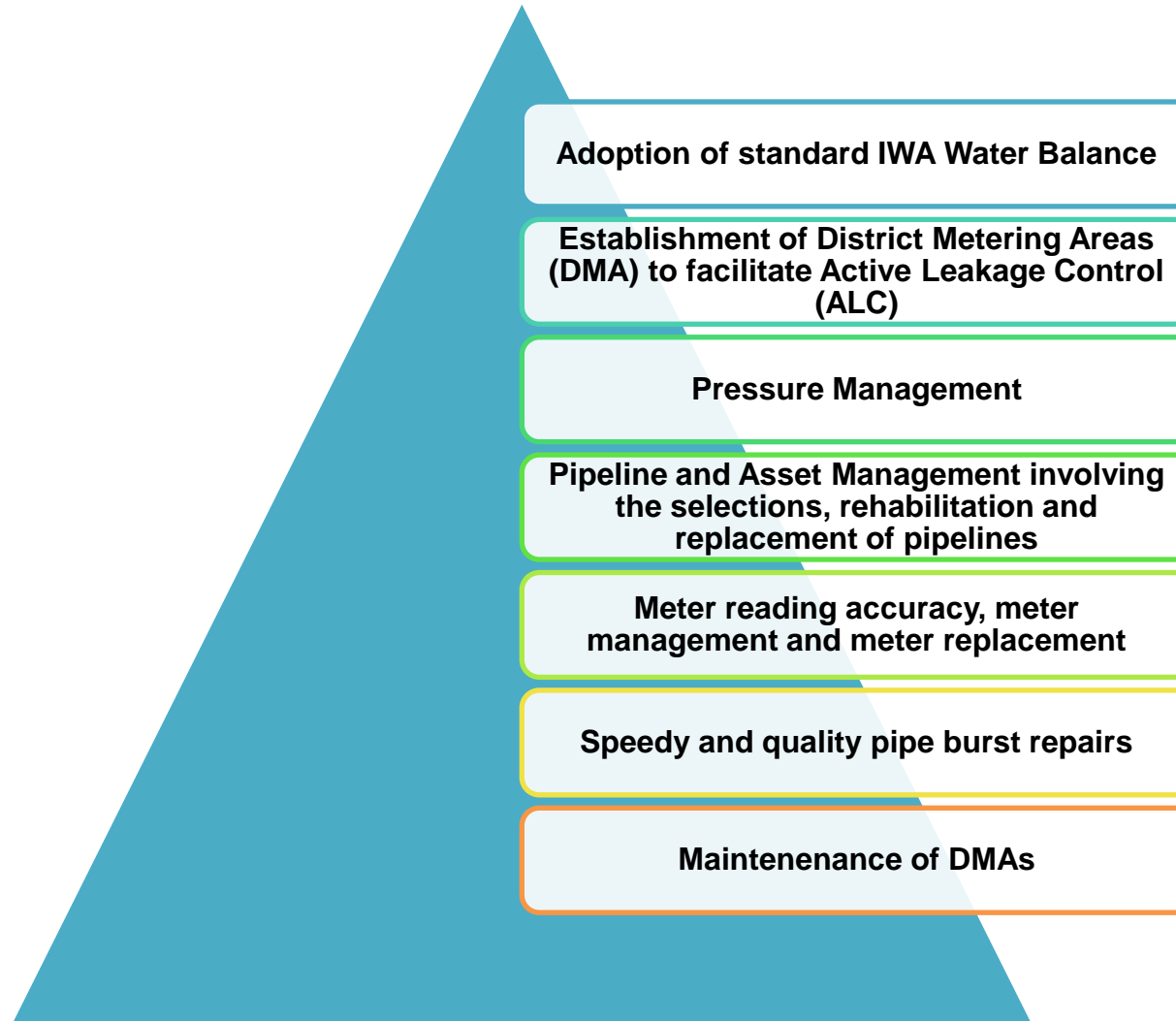


PHYSICAL (REAL) LOSSES

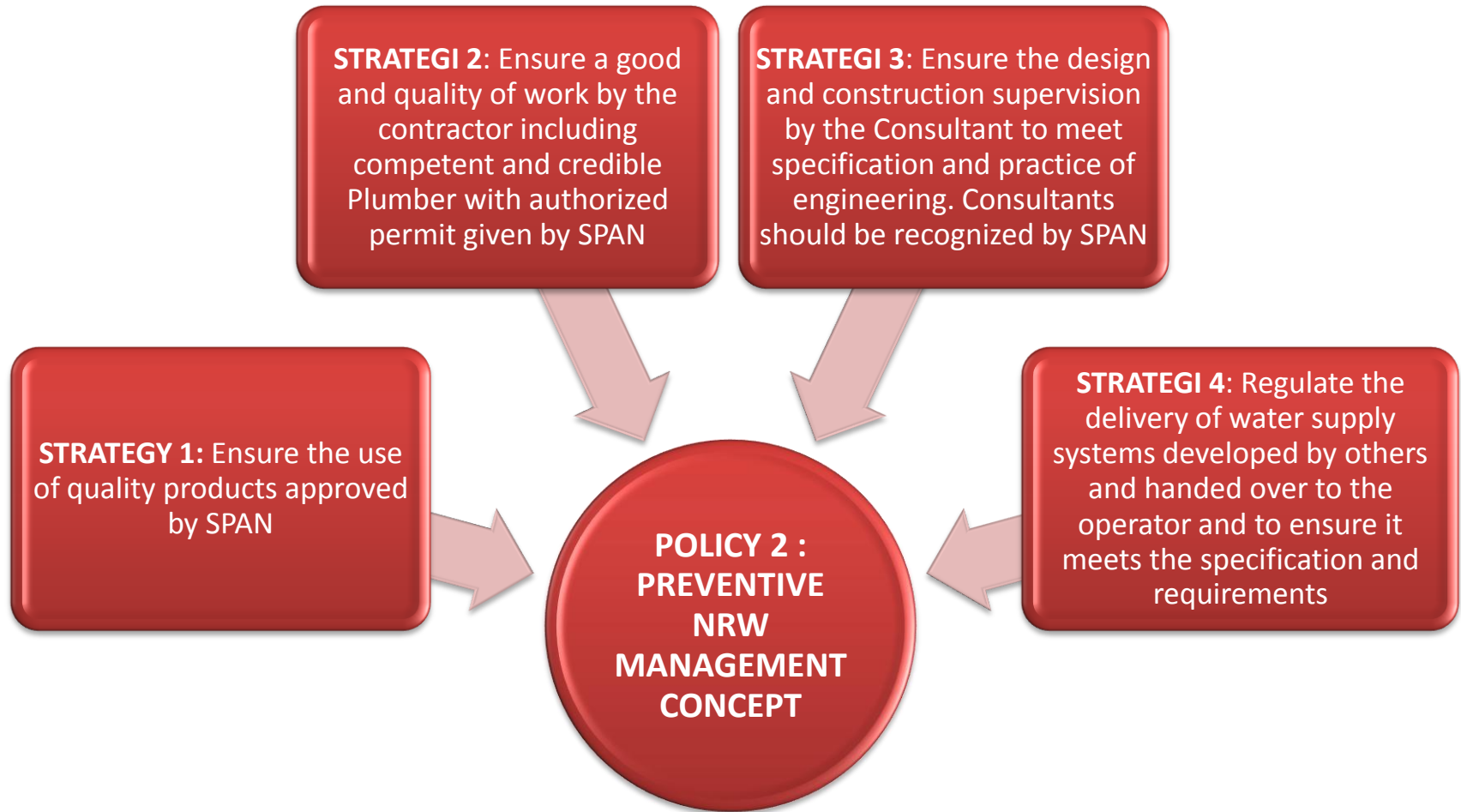


POLICY 1 : HOLISTIC NRW MANAGEMENT

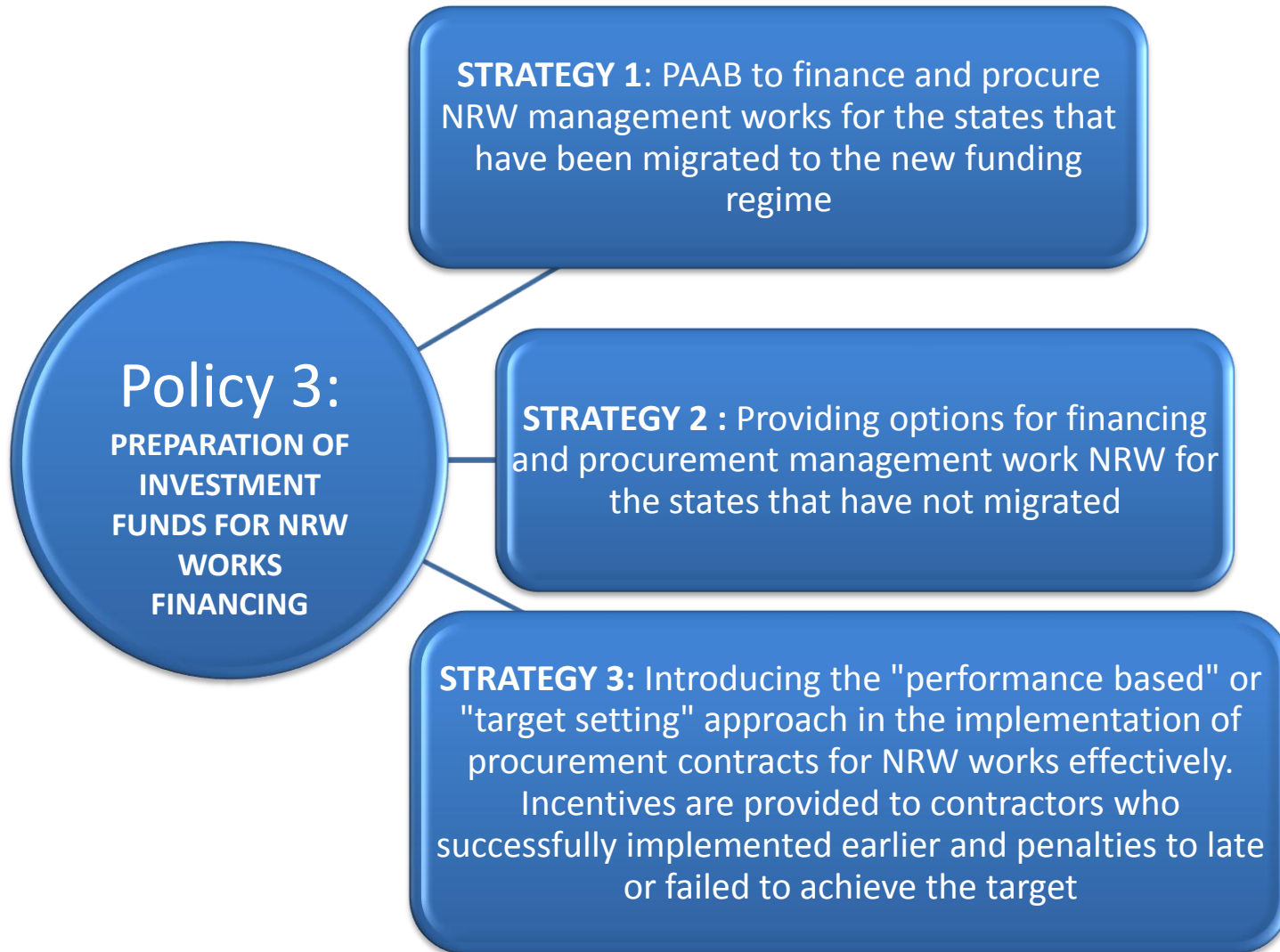
HOLISTIC NRW ACTIVITIES



POLICY 2 : PREVENTIVE NRW MANAGEMENT CONCEPT



POLICY 3 : PREPARATION OF INVESTMENT FUNDS FOR NRW WORKS FINANCING



POLICY 4 : EFFECTIVE NRW MONITORING MECHANISM



POLICY 4 : EFFECTIVE NRW MONITORING MECHANISM

EVALUATION CRITERIA ON WATER OPERATORS NRW MANAGEMENT EFFORTS

- SPAN evaluates the water operator NRW management efforts based on the following criteria;
 - DMA establishment
 - Pressure management
 - Active leakage control
 - Leak repair
 - Asset management
 - Meter management
 - Enforcement

POLICY 4 : EFFECTIVE NRW MONITORING MECHANISM

EVALUATION ON WATER OPERATORS NRW MANAGEMENT PERFORMANCE

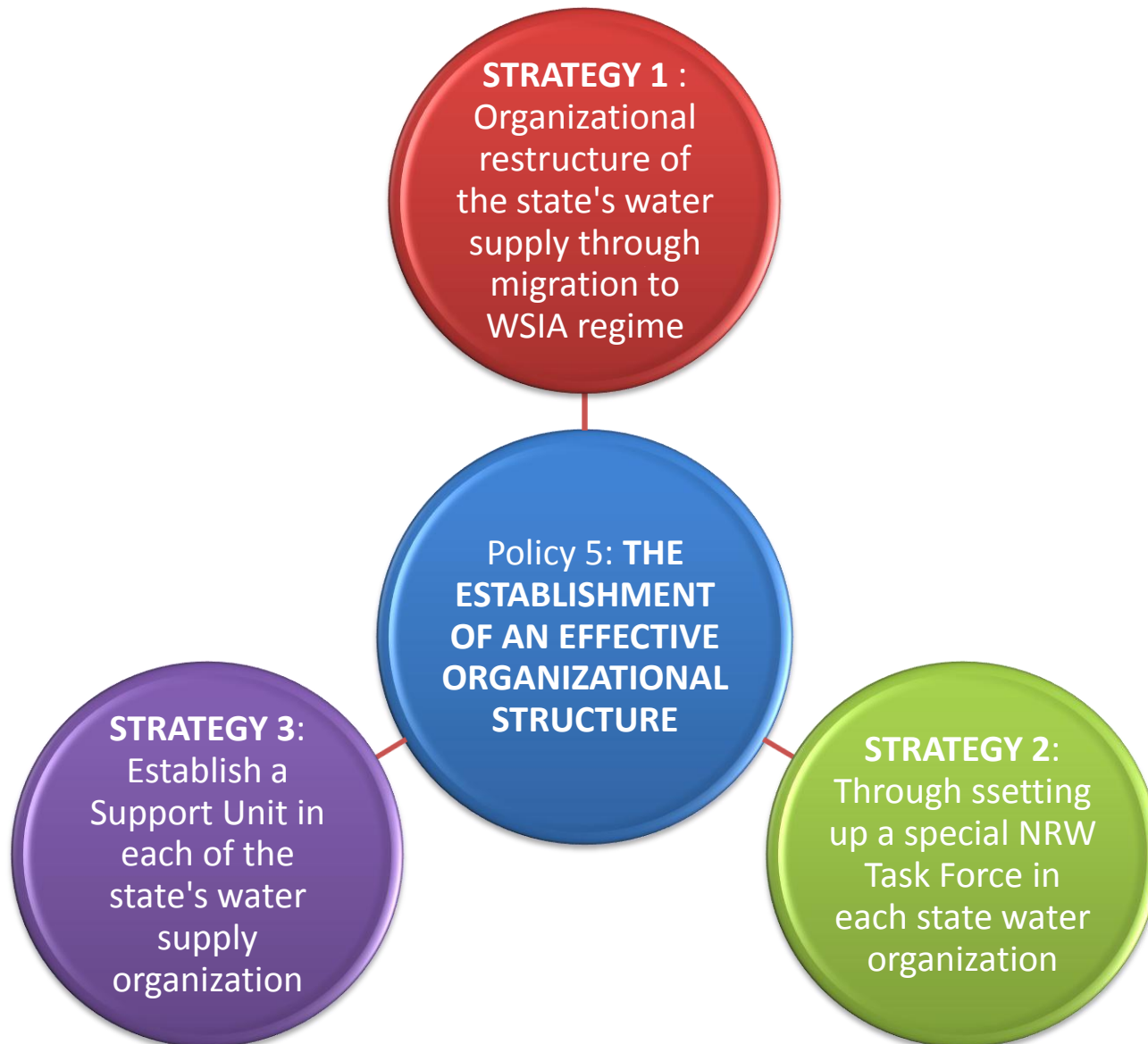
	STATES	NRW %			EVALUATION ON HOLISTIC NRW MANAGEMENT PERFORMANCE						
		2009	2010		DMA Establishment	Pressure Management	Active Leakage Control	Leak Repair	Asset Management	Meter Management	Enforcement
1	Pulau Pinang	19.08	18.22	↓							
2	Labuan	25.85	24.91	↓							
3	Melaka	29.71	26.02	↓							
4	Perak	30.68	29.55	↓							
5	Johor	31.95	29.85	↓							
6	Selangor	32.49	32.45	↓							
7	Terengganu	37.85	40.20	↑							
8	Kedah	44.97	42.99	↓							
9	N.Sembilan	49.16	43.41	↓							
10	Perlis	44.67	51.30	↑							
11	Kelantan	48.32	52.41	↑							
12	Pahang	59.90	55.29	↓							

POLICY 4 : EFFECTIVE NRW MONITORING MECHANISM

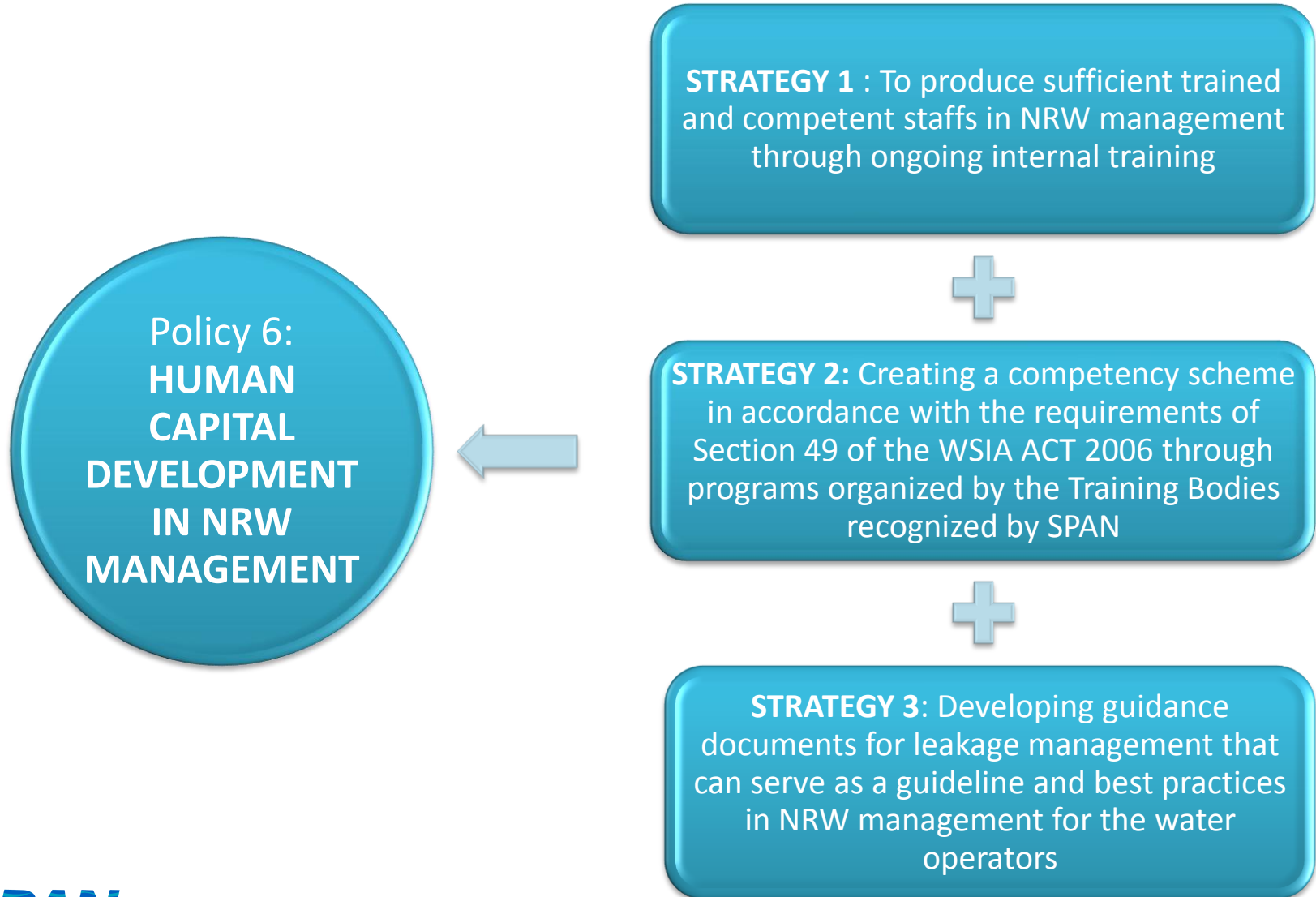
GRADING ON WATER OPERATORS BASED ON NRW MANAGEMENT PERFORMANCE

	STATES	NRW %			EVALUATION ON HOLISTIC NRW MANAGEMENT PERFORMANCE							Total
		2009	2010		DMA Establishment	Pressure Management	Active Leakage Control	Leak Repair	Asset Management	Meter Management	Enforcement	
1	Pulau Pinang	19.08	18.22	↓	3	3	3	3	3	3	2	20/21
2	Melaka	29.71	26.02	↓	3	3	3	3	3	3	2	20/21
3	Perak	30.68	29.55	↓	3	3	3	3	3	3	2	20/21
4	Johor	31.95	29.85	↓	3	3	3	3	3	3	2	20/21
5	N.Sembilan	49.16	43.41	↓	3	3	2	3	3	3	3	20/21
6	Selangor	32.49	32.45	↓	3	3	2	3	2	3	3	18/21
7	Labuan	25.85	24.91	↓	3	3	3	3	3	3	1	18/21
8	Terengganu	37.85	40.20	↑	2	2	2	3	3	3	1	16/21
9	Kedah	44.97	42.99	↓	2	2	2	3	2	3	1	15/21
10	Perlis	44.67	51.30	↑	1	1	1	1	1	1	1	7/21
11	Kelantan	48.32	52.41	↑	1	1	1	1	1	1	1	7/21
12	Pahang	59.90	55.29	↓	1	1	1	1	1	1	1	7/21

POLICY 5 : THE ESTABLISHMENT OF AN EFFECTIVE ORGANIZATIONAL STRUCTURE



POLICY 6 : HUMAN CAPITAL DEVELOPMENT IN NRW MANAGEMENT



POLICY 7 : RESEARCH, DEVELOPMENT AND INNOVATION IN NRW MANAGEMENT

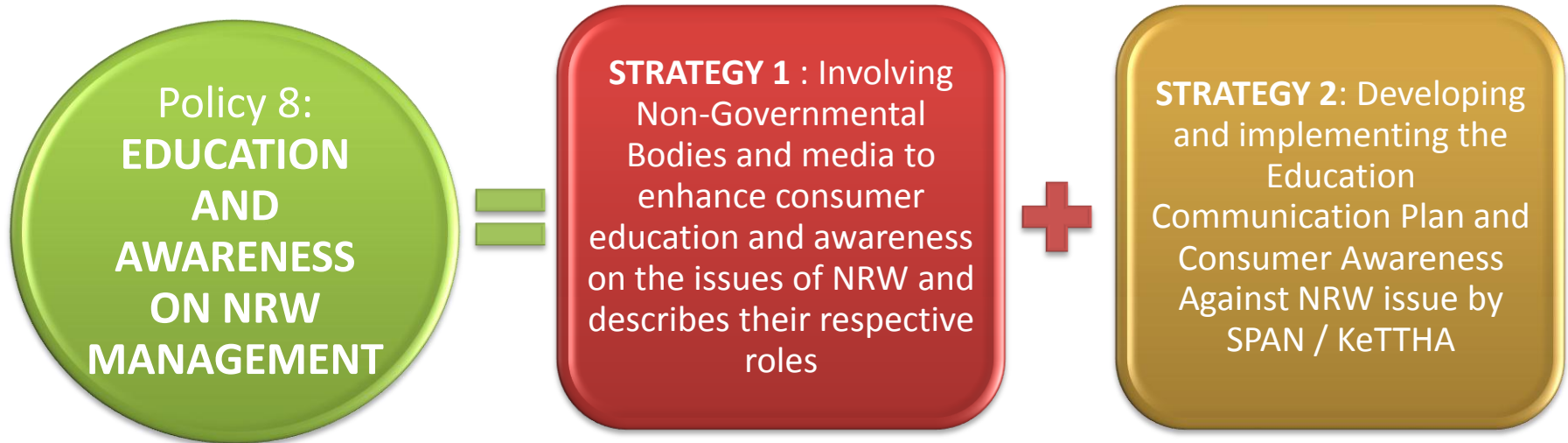
Policy 7: RESEARCH, DEVELOPMENT AND INNOVATION IN NRW MANAGEMENT

STRATEGY 1 :
Implementing NRW Management Pilot Project in one location as a 'showcase' for assessing the effectiveness of NRW works and reference survey

STRATEGY2 :
Report NRW levels in major cities to focus on the work of NRW and comparison at the national and international level

STRATEGY 3:
Collaborate with Research Bodies such as Non-Governmental Organizations (MWA, the Water Forum, AWER) and Institutions of Higher Education to increase the understanding and development of NRW management activities in Malaysia

POLICY 8 : EDUCATION AND AWARENESS ON NRW MANAGEMENT



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NRW MONITORING

NRW LEVEL BY PERCENTAGE (%)

	STATES	NRW %				
		2008	2009	2010	2011	2012
1	Johor	31.30	31.95	29.85	29.2	28.2
2	Kedah	44.99	44.97	42.99	47.8	47.5
3	Kelantan	49.39	48.32	52.41	55.6	54.2
4	Labuan	33.19	25.85	24.91	21.9	24.5
5	Melaka	30.09	29.71	26.02	25.1	24.7
6	N.Sembilan	50.51	49.16	43.41	44.6	40.8
7	Pulau Pinang	16.90	19.08	18.22	18.4	17.2
8	Pahang	52.86	59.90	55.29	56.2	56.0
9	Perak	31.39	30.68	29.44	30.4	30.7
10	Perlis	41.66	44.67	51.30	59.8	64.2
11	Sabah*	55.73	49.41	57.35	50.9	N/A
12	Sarawak*	29.38	29.52	31.38	30.5	N/A
13	Selangor	33.95	32.49	32.45	32.3	32.9
14	Terengganu	38.01	37.85	39.39	37.0	38.4
Purata Seluruh Negara		36.93	36.63	36.37	36.11	N/A
Purata Semenanjung Malaysia dan Labuan		36.21	36.29	36.35	36.7	35.8

NRW MONITORING

WATER LOSSES LEVEL BY INFRASTRUCTURE LEAKAGE INDEX (ILI)

States	2011				
	NRW	Infrastructure Leakage Index		Commercial Loss	Physical Loss
	(%)	ILI	Band	lit/conn/day	lit/conn/day
Pulau Pinang	18.4	8.02	C	58	277
Melaka	25.1	10.04	C	167	288
Johor	29.2	10.3	C	59	381
Perak	30.4	13.93	C	91	380
Labuan	21.9	18.03	C	235	511
Selangor	32.3	18.65	D	183	554
N.Sembilan	44.6	20.42	D	174	751
Terengganu	37.0	29.51	D	77	749
Kedah	47.8	34.87	D	149	980
Pahang	56.2	47.33	D	362	1259
Kelantan	55.6	54.01	D	105	1028
Perlis	59.8	N/A	N/A	N/A	N/A

NRW MONITORING

WATER LOSSES LEVEL BY INFRASTRUCTURE LEAKAGE INDEX (ILI)

Technical Performance Category		ILI	Litres/connection/day (when the system is pressurised) at an average pressure of:				
			10 m	20 m	30 m	40 m	50 m
Developed Countries	A	1 - 2		< 50	< 75	< 100	< 125
	B	2 - 4		50-100	75-150	100-200	125-250
	C	4 - 8		100-200	150-300	200-400	250-500
	D	> 8		> 200	> 300	> 400	> 500
Developing Countries	A	1 – 4	< 50	< 100	< 150	< 200	< 250
	B	4 – 8	50-100	100-200	150-300	200-400	250-500
	C	8 - 16	100-200	200-400	300-600	400-800	500-1000
	D	> 16	> 200	> 400	> 600	> 800	> 1000

A = Excellent – no specific intervention required.

B = Good – no urgent action required although should be monitored carefully.

C = Poor – requires attention.

D = Very Bad – requires immediate water loss reduction interventions.

NRW MONITORING

NRW COMPONENT RATIO

States	2011			
	NRW	Unbilled Authorised Consumption	Commercial Loss	Physical Loss
	(%)	(%)	(%)	(%)
Pulau Pinang	18.4	0.1	3.2	15.2
Labuan	21.9	0.5	6.8	14.6
Melaka	25.1	0.2	9.1	15.8
Johor	29.2	0.7	3.8	24.7
Perak	30.4	1.5	5.6	23.3
Selangor	32.3	0.5	7.9	23.9
Terengganu	37.0	2.8	3.2	31.0
N.Sembilan	44.6	0.1	8.4	36.1
Kedah	47.8	0.0	6.3	41.4
Kelantan	55.6	0.4	5.1	50.1
Pahang	56.2	3.5	11.8	40.9
Perlis	59.8	N/A	N/A	N/A

NRW MONITORING

NRW IMPRESSION LEVEL

States	2011			
	NRW	Infrastructure Leakage Index (ILI)	Commercial Loss	Physical Loss
	Impression Level			
Pulau Pinang	Low	Relatively High	Low	Relatively High
Labuan	Medium	Relatively High	Medium	Relatively High
Melaka	Medium	Relatively High	High	Relatively High
Johor	Relatively High	Relatively High	Low	Relatively High
Perak	Relatively High	Relatively High	Medium	Relatively High
Selangor	Relatively High	High	Medium	High
Terengganu	Relatively High	High	Low	High
N.Sembilan	High	High	High	High
Kedah	High	High	High	High
Kelantan	High	High	High	High
Pahang	High	High	High	High
Perlis	High	N/A	N/A	N/A

NRW MONITORING

DATA COLLECTION SUBMISSION STATUS

States	2011			
	NRW	Infrastructure Leakage Index (ILI)	SIV Information	DMA Inventory
	(%)			
Johor	29.2	√	√	√
Kedah	47.8	√	Incomplete	Incomplete
Kelantan	55.6	√	√	√
Labuan	21.9	√	√	√
Melaka	25.1	√	√	√
N.Sembilan	44.6	√	√	Incomplete
Pulau Pinang	18.4	√	√	√
Pahang	56.2	TBP	TBP	TBP
Perak	30.4	√	√	Incomplete
Perlis	59.8	N/A	√	N/A
Selangor	32.3	√	√	√
Terengganu	37.0	√	√	Incomplete

NRW MONITORING

NRW AUDITS

REGION	NRW AUDITS	NON-CONFORMANCE		OBSERVATIONS	POSITIVE FINDINGS
		MAJOR	MINOR		
CENTRAL	-	-	-	-	-
SOUTHERN	3	-	17	15	3
EASTERN	1	-	-	10	7
NORTHERN	3	-	-	19	9
TOTAL	7	-	17	44	19

NRW MONITORING

DATA & INFORMATION

- Other related NRW data monitored by SPAN on a quarterly and annually basis such as;
 - Length of pipes (km)
 - Numbers of connections
 - Meter age
- These data are published annually in the Malaysia Water Industry Guide (MWIG)

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NATIONAL TARGET ACHIEVEMENTS

NRW reduction works is focused on the 5 highlighted states which has the highest production and consumption of water

States	Projections									
	Year									
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
	NRW (%)	NRW (%)	NRW (%)	NRW (%)	NRW (%)	NRW (%)	NRW (%)	NRW (%)	NRW (%)	NRW (%)
Johor	29.2%	29.04%	28.89%	28.74%	28.59%	28.44%	28.29%	28.14%	27.99%	26.90%
Kedah	47.8%	46.15%	44.13%	42.12%	40.10%	38.08%	36.06%	34.04%	32.03%	30.01%
Kelantan	55.6%	49.18%	43.02%	36.87%	30.71%	24.56%	18.40%	18.40%	18.40%	18.40%
Labuan	21.9%	20.50%	20.40%	20.30%	20.20%	20.10%	20.00%	19.90%	19.80%	19.70%
Melaka	25.1%	24.44%	23.63%	22.83%	22.02%	21.22%	20.42%	19.61%	18.81%	18.00%
N.Sembilan*	44.6%	38.00%	36.00%	34.00%	32.00%	31.00%	29.00%	28.00%	26.00%	25.00%
Pulau Pinang*	18.4%	17.64%	17.24%	16.83%	16.43%	16.03%	15.63%	15.23%	14.82%	14.42%
Pahang	56.2%	51.57%	48.25%	44.93%	41.61%	38.29%	34.96%	31.64%	28.32%	25.00%
Perak*	30.4%	29.20%	28.05%	26.90%	25.75%	24.60%	23.45%	22.30%	21.15%	20.00%
Perlis	59.8%	57.57%	54.57%	51.57%	48.57%	45.57%	42.57%	39.57%	36.57%	33.57%
Selangor*	32.3%	32.30%	31.10%	29.50%	28.10%	25.90%	24.20%	22.60%	21.70%	20.80%
Terengganu*	37.0%	34.50%	33.00%	31.50%	30.00%	28.50%	27.50%	26.50%	25.50%	24.50%
Sabah	50.9%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Sarawak	30.5%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SPAN	35.8%	35.84%	34.02%	32.17%	30.34%	28.52%	26.71%	25.49%	24.26%	23.03%

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NRW KEY PERFORMANCE INDICATOR

- SPAN carried out its regulatory function by imposing and monitoring Key Performance Indicator (KPI) to all its licensed and authorized water operators.
- NRW is one of the KPI continuously monitored which has three detailed components;
 - NRW % from System Input Volume (SIV)
 - Physical Loss (liters)/connection/day
 - Infrastructure Leakage Index (ILI)

NRW KEY PERFORMANCE INDICATOR

- However, consideration on various KPI's is ongoing to ensure more meaningful are imposed to the water operators such as;
 - Physical Loss/connection/day/meter pressure
 - Economic Network Efficiency (ENE) etc..

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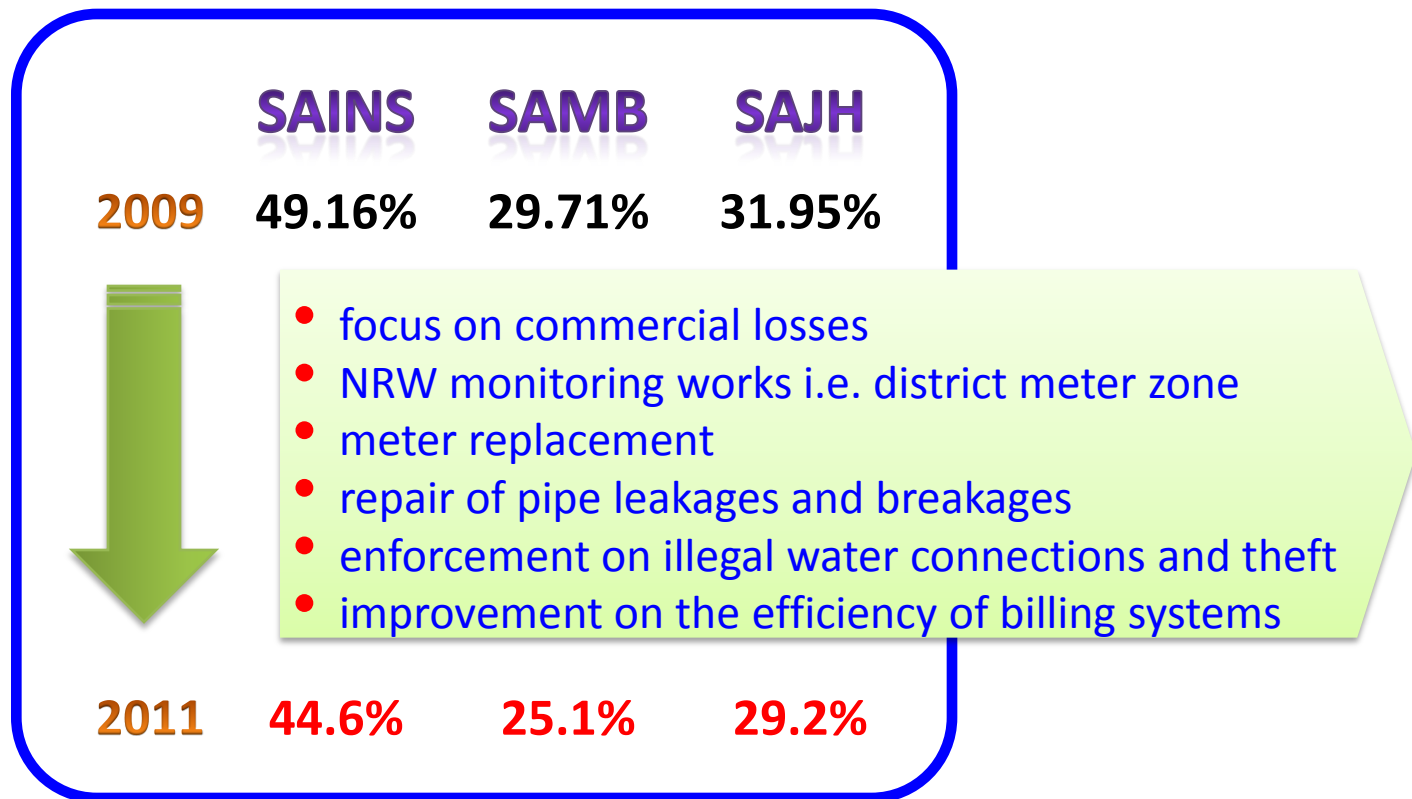
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CAPITAL EXPENDITURE

- The Federal Government has spent about RM 1 billion under the 9th Malaysia Plan (2005-2009) to reduce NRW level.
- A total RM 720 million has been allocated for NRW works under the 10th Malaysia Plan (2010-2015).
- Under the new licensing regime, 3 migrated states that has benefited from the new CAPEX funding model has shown improvement in their NRW level.

CAPITAL EXPENDITURE

- A total of RM 400 million has been allocated and spent on the migrated states in a more detailed, selective and holistic manner.



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COMMON AUDIT FINDINGS

- Lack of NRW knowledgeable and competent staff
- Incomplete information in Geographical Information System (GIS)
- Malfunction System Input Volume (SIV) meter
- Improper documentation practice
- Unable to establish a District Metering Area (DMA) due to technical problem and site condition obstruction
- Permit issues with local authority
- Lack of cooperation from other unit/department
- Lack of focused and support from management
- Lack of fund



THANK YOU



If we want our children to have the best in life... if we want future generations to have enough water... let's start by not wasting the water we have today. Because every drop used, is a drop less for tomorrow.

Every drop used is a drop taken from our children



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