

# Strengthening infrastructure to support economic expansion

## Overview

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### Looking back Tenth Malaysia Plan, 2011-2015: Progress

Upgrading physical infrastructure to enhance access and connectivity

Developing a people-centric public transport system

Growing logistics and trade facilitation

Increasing broadband coverage and initiating migration to Digital Terrestrial Television

Continuing efforts to restructure the water services industry

Ensuring effective sourcing and delivery of energy

### Summary of focus areas Eleventh Malaysia Plan, 2016-2020

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Focus area A: Building an integrated need-based transport system

Focus area B: Unleashing growth of logistics and enhancing trade facilitation

Focus area C: Improving coverage, quality, and affordability of digital infrastructure

Focus area D: Continuing the transition to a new water services industry framework

Focus area E: Encouraging sustainable energy use to support growth

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## Overview

Infrastructure investments lay the foundation for long-term economic growth and quality of life improvements of citizens. Malaysia has historically invested significantly in infrastructure, and therefore today a majority of the *rakyat* have access to essential amenities and services such as transport, communications, electricity, and clean water. Developments in these assets – including roads, rail, logistics, ports and airports, digital infrastructure such as high-speed broadband, connected water services, and electricity supply have helped establish physical and virtual connectivity within the nation, allowing development to flow to all regions, and improving standards of living and productivity nationally. As Malaysia moves closer to its vision of becoming an advanced economy and inclusive nation by 2020, the focus will not only be on further expanding the physical reach of these networks to all communities, but to improve the efficiency, productivity, and affordability of these services, and enhancing user experience. The Government will address issues of streamlining licences and regulations, and strengthen institutional frameworks to improve integrated planning and regulatory oversight of the industry. These efforts will lay the right “software” for infrastructure as new significant investments – from mass rapid transit system, high-speed broadband, expanded sewerage networks to new oil refining capacity – are rolled out in the next five years.

**During the Tenth Malaysia Plan, 2011-2015,** the Government made large investments in transport, digital, and energy infrastructure, in line with rising demand for such assets. Malaysia’s road network grew 68% between 2010 and 2015, plugging more communities into Malaysia’s growth. Two major national ports - Port of Tanjung Pelepas and Port Klang - were in the World’s Top 20 Container

Ports as cargo and container volume in the country grew 23% since 2010. Expansion works were undertaken in these ports to meet this soaring demand. A new runway and terminal were opened in Kuala Lumpur International Airport (KLIA) and passengers grew 46% between 2010 and 2014. Under the National Broadband Initiative, 55,801 km of fibre was rolled out, increasing the broadband penetration to 70.2% of Malaysia's households. Construction of the strategic Pengerang Integrated Petroleum Complex (PIPC) started in 2012 on approximately 9,100 hectares of land, improving energy security for Malaysians.

**In the Eleventh Malaysia Plan, 2016-2020**, the transport and logistics sector will continue to remain a crucial driver of growth – leveraging new investments in road, rail and air services to boost regional development. Expansion of these networks will create new corridors of economic activity. Better integration of these different transport modes will also create seamless connectivity for people and goods. The Government will work with the private sector to create an integrated logistics, which coupled with an efficient trade facilitation will further boost Malaysia's trade. Digital connectivity will also be expanded through broadband infrastructure roll-out in non-urban areas, bringing connectivity and choice to even more regions and households. In water and sewerage, Malaysia will continue to invest in new networks and treatment plant capacity. Focus will also be given to a holistic non-revenue water reduction programme and improving the performance of the sewerage system. Efforts to expedite migration towards a new licensing regime under the Water Services Industry Act, 2006 (WSIA), will also be undertaken to ensure the sustainability of the water services industry. Energy underpins all these initiatives, and efforts to further strengthen the security of Malaysia's fuel and electricity supplies will be undertaken.

## Highlights

### Tenth Malaysia Plan, 2011-2015: Achievements

**93,100**  
KM

New roads added, increasing total network by 68% between 2010 and 2015<sup>e</sup>

**2.29**

National Road Development Index in 2015 from 1.42 in 2010

**TOP**  
**20**

Two ports in World's Top 20 Container Port rankings - Port Klang, Selangor(#13); Port of Tanjung Pelepas, Johor (#19)

**39%**

Increase in passengers handled at airports from 2010 to 2014<sup>1</sup>



KLIA2 opened in 2014 and 3rd runway operationalised at KLIA

**32%**

Increase in urban rail ridership from 2010 to 2014

**25**

World Bank Logistics Performance Index ranking rose from 29 in 2013 to 25 in 2014

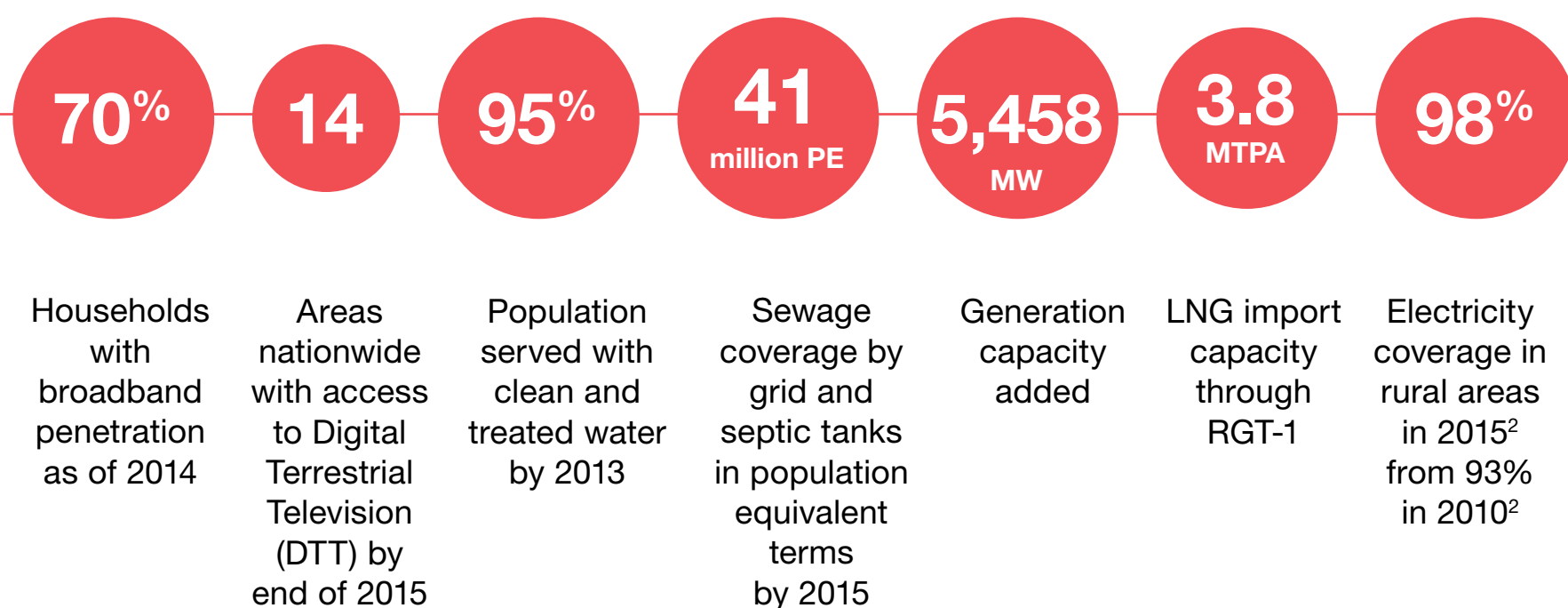
**Upgrading physical infrastructure to enhance access and connectivity**

**People-centric public transport system**

**Growing logistics and trade facilitation**

<sup>e</sup> Estimate

<sup>1</sup> Not including transit passengers



**Increasing broadband coverage and initiating DTT migration**

**Efforts to restructure the water services industry**

**Effective sourcing and delivery of energy**

<sup>2</sup> Actual figure for 2010 is 92.5% and for 2015 is 98.2%.

## Looking back Tenth Malaysia Plan, 2011-2015: Progress

Network expansion of essential infrastructure was undertaken to reach more households and meet increasing demand for services such as transport, broadband, water services, and energy.

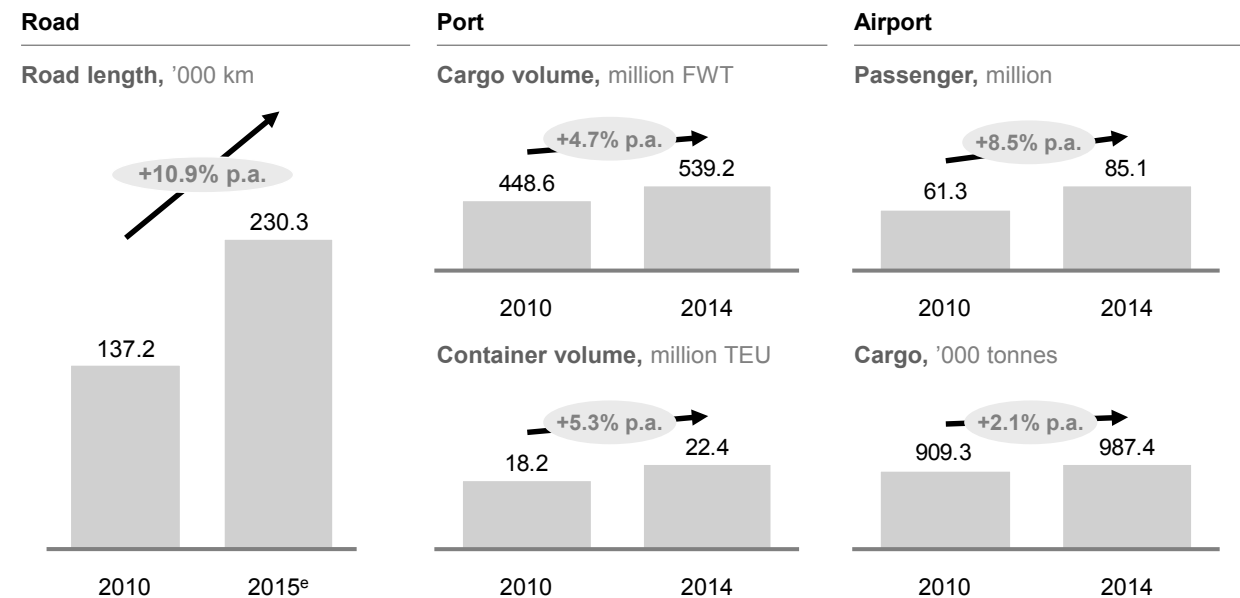
In the Tenth Malaysia Plan, network expansion of essential infrastructure such as roads, rail, water, and electricity, was undertaken to reach more households and improve standards of living. Concurrently, initiatives to develop new infrastructure such as mass rapid transit (MRT), broadband and fibre-optic internet, digital terrestrial television, and renewable energy were started. In addition, institutional framework and regulations were streamlined and strengthened to address sectoral challenges and improve delivery of services.

### Upgrading physical infrastructure to enhance access and connectivity

Road length rose 68% from 137,200 kilometres (km) in 2010 to an estimated 230,300 km in 2015. This resulted in a rise in the National Road Development Index from 1.42 in 2010 to an expected 2.29 in 2015. A total of 4,500 km of rural roads were built under the National Key Result Area (NKRA) programme. During this period, road development focused on improving nationwide linkages for better connectivity. Road maintenance programmes were continuously undertaken with

Exhibit 7-1

### Highlights of road, port, and airport growth



Source: Economic Planning Unit and Ministry of Transport

a greater focus on corrective maintenance. Accident-prone spots were improved and pedestrian bridges constructed to improve safety. Details on expanded road infrastructure are included in Exhibit 7-1.

Two Malaysian ports featured in the International Association of Ports and Harbours World's Top 20 Container Ports report in 2013 – Port Klang, Selangor at 13th with 10.4 million twenty-footer equivalent unit (TEUs) and Port of Tanjung Pelepas (PTP) at 19th with 7.6 million TEUs. Between 2010 and 2014, total cargo volume grew 20.2% reaching 540 million freight weight tonnes (FWT) and container volume grew 21% reaching 22 million TEUs. Major projects were undertaken to expand port capacity with addition of new container wharfs at Northport and Westport of Port Klang, PTP, Penang Port, and Kuantan Port. Details on cargo and container volume are included in Exhibit 7-1.

During the Tenth Plan, airports recorded an average annual growth rate of 8.5% for passengers handled, and an increase of 39% in total volume between 2010 and 2014 to 85 million passengers in 2014. In May 2014, KLIA2 was opened as a new low-cost carrier terminal at the Kuala Lumpur International Airport (KLIA) and an additional third runway was

operationalised at KLIA, to facilitate higher aircraft movement. These investments were in line with projected increases in demand, as the Government had ratified the ASEAN Open Skies Agreement in 2013 and also improved connectivity domestically to rural areas. Exhibit 7-1 shows the evolution of passenger and cargo volume in Malaysian airports.

## Developing a people-centric public transport system

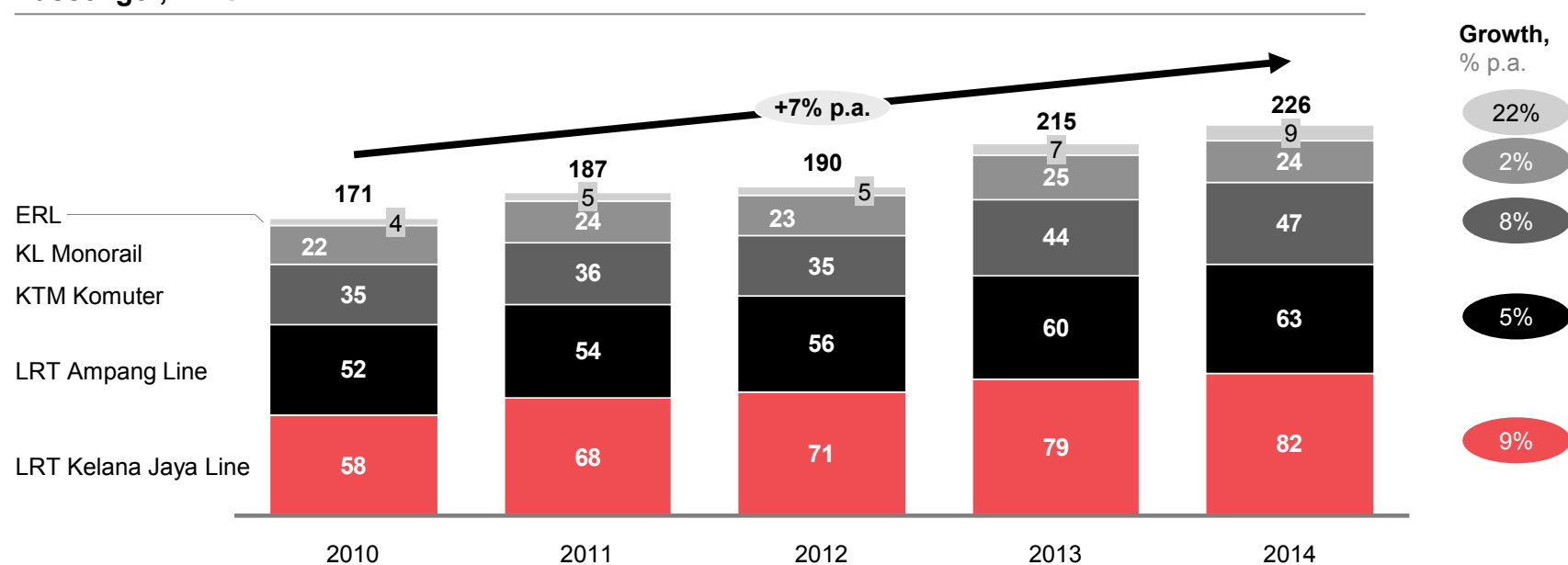
A people-centric public transport system was the main focus of development efforts. Four strategies were implemented - strengthening the regulatory framework, increasing transport capacity, promoting seamless connectivity, and establishing a robust monitoring and enforcement mechanism. The National Land Public Transport Master Plan 2012-2030, was formulated to set the direction for public transport development to achieve a 40% public transport modal share for urban areas by 2030.

Initiatives under the Tenth Plan enabled a 31.7% increase in the annual ridership of urban rail in Greater Kuala Lumpur / Klang Valley (GKL/ KV) - from 171 million in 2010 to 226 million in 2014. These initiatives

Exhibit 7-2

### Greater Kuala Lumpur / Klang Valley rail ridership

Passenger, million



included comprehensive investments in rail transport, which included upgrading and rehabilitation of existing infrastructure, constructing new rail lines, extending existing lines, and procuring new rolling stocks. New routes added include the Express Rail Link (ERL) extension from KLIA's main terminal to KLIA2 and light rail transit (LRT) extension from Kelana Jaya to Putra Heights and Sri Petaling to Putra Heights. The Klang Valley Mass Rapid Transit (KVMRT) Line 1 from Sungai Buloh to Kajang started in 2012. The KVMRT Line 1 is expected to operationalise in 2017 and will bring greater convenience and connectivity to residents in the Klang Valley. Outside the GKL/KV area, the electrified double-track railway from Padang Besar, Perlis to Gemas, Negeri Sembilan was also completed during this period. Exhibit 7-2 details increased ridership in urban rail in GKL/KV.

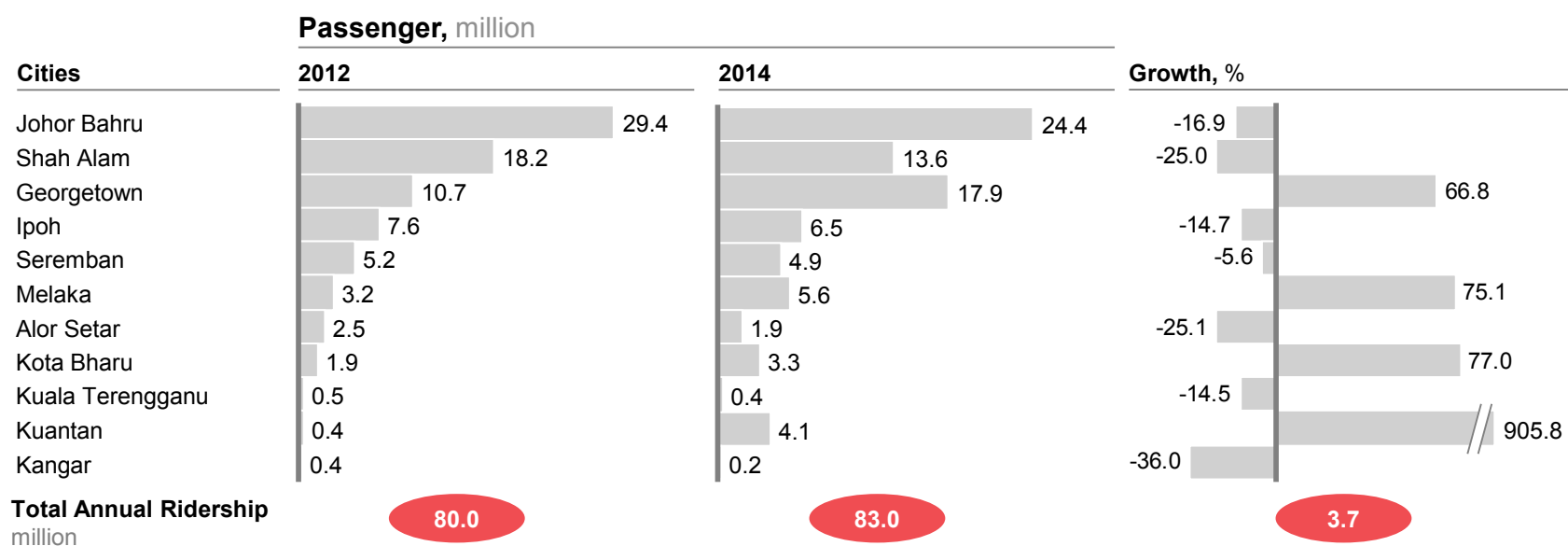
An additional 470 new buses were provided for Rapid KL, Rapid Kuantan, and Rapid Penang, leading to significant increases in passenger ridership. In Georgetown, stage bus ridership increased from 10.7 million in 2012 to 17.9 million in 2014, an increase of 67%, whereas in Kuantan it

rose from 0.4 million to 4.1 million in the same period, a 10-fold rise. The Go-KL free bus service was introduced in 2013 to ease road congestion during peak hours in the Kuala Lumpur central business district. Overall, stage bus annual ridership showed a mixed performance with an increase in four capital cities and a decrease in seven other cities from 2012 to 2014, as shown in Exhibit 7-3.

Integration between transport modes was enhanced by providing first- and last-mile connectivity including extending pedestrian walkways, building parking facilities at terminals, and revitalising inter-urban terminal hubs. The opening of the Terminal Bersepadu Selatan and Pudu Sentral in Federal Territory (FT) Kuala Lumpur improved connectivity between different modes. In the GKL/KV region, the public transport modal share improved from 16.9% in 2010 to 17.1% in 2014, while the morning peak hour ridership increased from 314,965 to 747,859. Network coverage, measured by population living within 400 metres of public transport nodes, improved from 63% in 2010 to 72% in 2014.

Exhibit 7-3

### Stage bus ridership in selected capital cities





## Growing logistics and trade facilitation

Improvements in transport infrastructure and measures to facilitate online trading contributed to increased trade activities, improving Malaysia's ranking in the World Bank Logistics Performance Index from 29 out of 160 countries in 2013 to 25 in 2014. Total freight volume grew 20.7% from 453.7 million tonnes in 2010 to 548 million tonnes in 2014 and total trade increased 23.9%, from RM1.17 trillion in 2010 to RM1.45 trillion in 2014. During the same period, rail freight contributed the highest annual growth rate of 6.3% followed by sea freight at 5.5%. Air freight showed a slight decrease of 0.8% per annum due to limited connectivity, frequency of cargo flights, and low air cargo volume.

## Increasing broadband coverage and initiating migration to Digital Terrestrial Television (DTT)

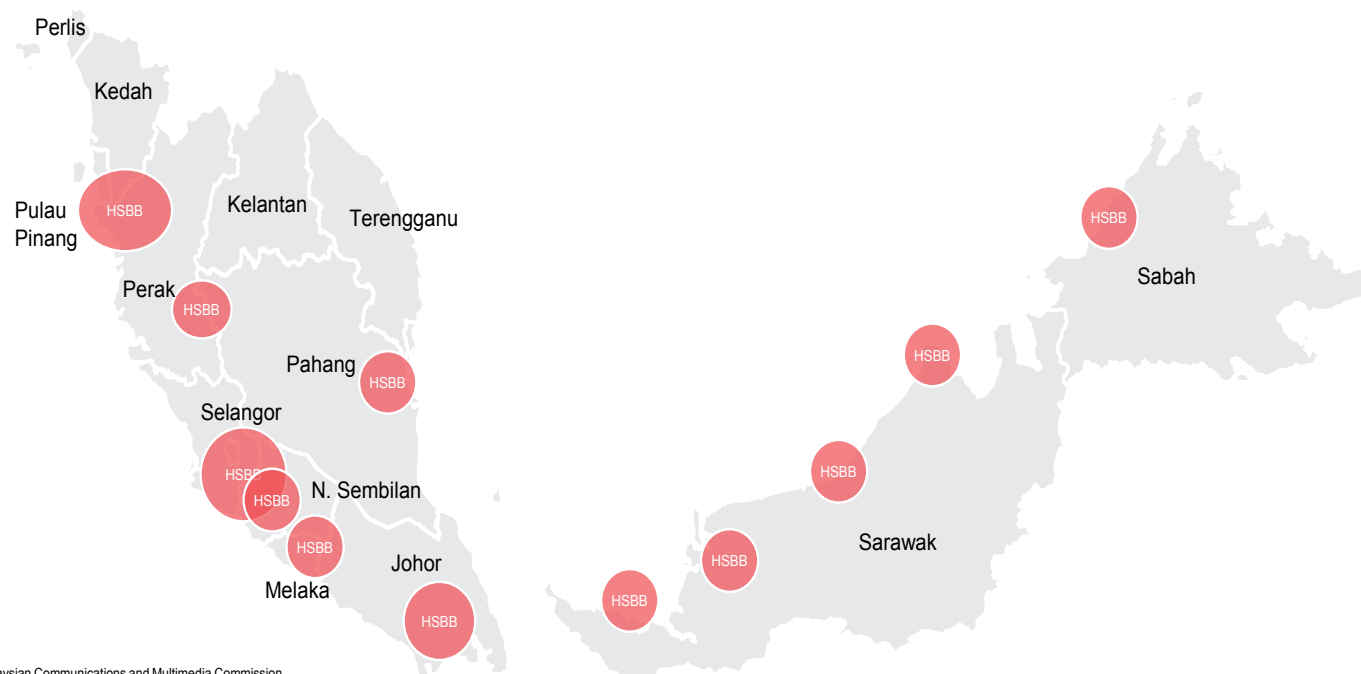
High-speed broadband is critical for economic growth. According to an International Telecommunication Union (ITU) 2012 report, a 10% increase in broadband penetration will contribute 0.7 percentage

points increase in Malaysia's GDP. Under the Tenth Plan, High Speed Broadband (HSBB) and Broadband for General Population (BBGP) were rolled out in several states, raising national broadband penetration from 55.6% in 2010 to 70.2% in 2014. Cities within the HSBB roll-out include Bintulu, Kuching and Miri in Sarawak, and Kota Kinabalu and Menggatal in Sabah. This contributed to an increase in broadband penetration in these states from 40.2% and 25.6% respectively in 2010 to around 67% in 2014. States such as Kuala Lumpur, Melaka, Perak, Selangor, Pahang, and Johor achieved more than 70% household broadband penetration. Exhibit 7-4 shows the areas covered by HSBB 1 during the Tenth Plan.

ICT infrastructure in the public sector, previously managed by individual ministries, was consolidated into 1Gov\*Net in 2012, a centrally managed dedicated network connecting 10,552 out of 11,268, nearly 94%, of all Federal Government buildings. Under the 1BestariNet programme, efforts were made to provide connectivity to schools to support teaching and learning. A total of 10,132 schools were connected through fibre (nine schools), WiMAX (6,628 schools),

Exhibit 7-4

### Areas covered by HSBB I



Source: Malaysian Communications and Multimedia Commission

Asymmetric Digital Subscriber Line (ADSL, 1,086 schools), Very Small Aperture Terminal (VSAT, 2,129 schools), and wireless (280 schools).

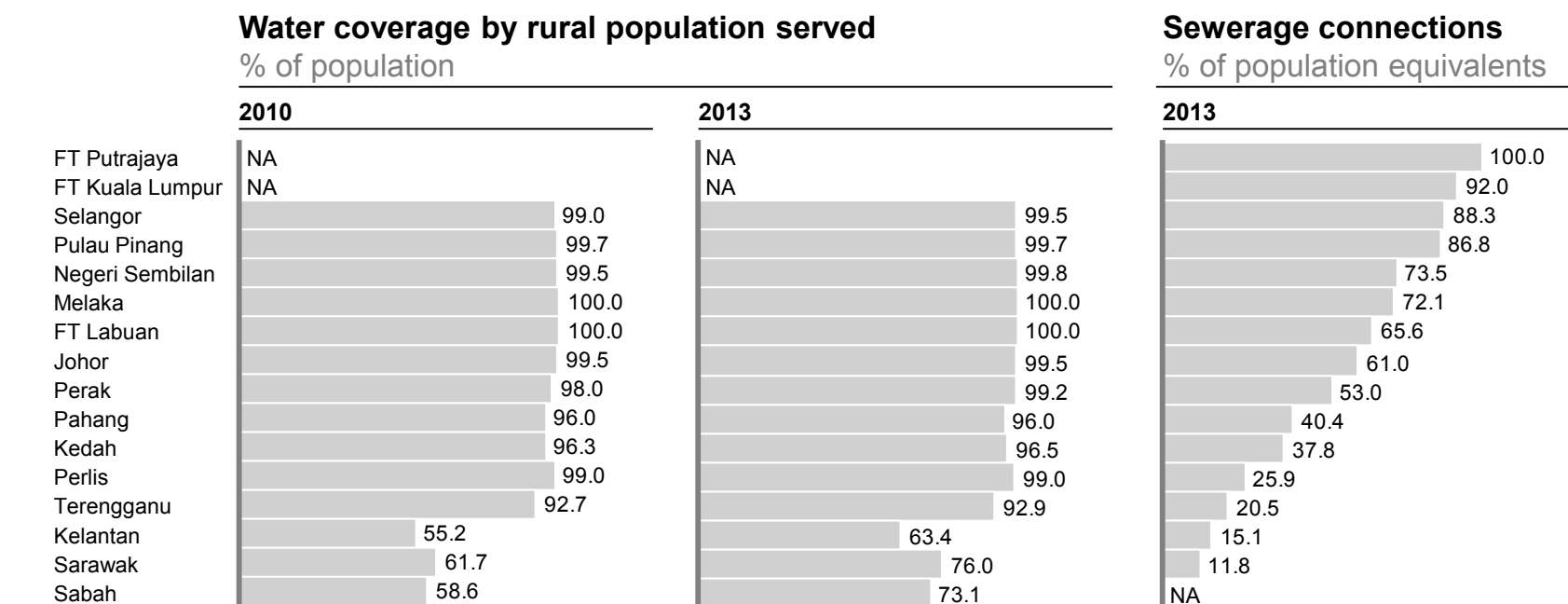
In keeping pace with technological development, Free-to-Air Digital Terrestrial Television (DTT), offering digital television and radio services is scheduled to be launched by end of 2015. The first phase is expected to be rolled out in 14 areas nationwide including four areas in Sabah and Sarawak. Other services will be made available after the Analogue Switch Off (ASO) scheduled to start in 2016.

## Continuing efforts to restructure the water services industry

The water services industry comprises both water and sewerage services. As of April 2015, six states have migrated to the new licensing regime in line with the WSIA. The remaining five states namely Kedah, Kelantan, Pahang, Selangor, and Terengganu are expected to migrate during the Eleventh Plan. Sewerage services, which are part of the WSIA, are yet to be integrated.

*Exhibit 7-5*

### Water and sewerage services coverage



## Connecting communities to water supply

At the end of the Tenth Plan, Malaysia enjoyed a high level of connectivity to treated water. As of 2014, 95.1% of the population was served with clean and treated water supply, rising from 94.2% in 2010. Most states recorded more than 99% coverage in urban areas – the only exception being Kelantan at 59.5%. Rural coverage for Kelantan, Sabah and Sarawak remained below 80%, as seen in Exhibit 7-5.

Despite efforts to improve management of water supply and its distribution, the rate of non-revenue water (NRW) increased from 36.3% in 2010 to 36.6% in 2013. This is due to the lack of enforcement, limited district metering zones to monitor water pressure and detect burst pipes as well as slow replacement of pipes and meters. NRW rate was highest in Perlis at 62.4% and Sabah at 53.2%. While water and sewerage services are well developed in urban areas, these services could be further strengthened for rural areas.

24 new water treatment plants were completed and commissioned while 38 treatment plants were upgraded, increasing production

capacity to 18,421 million litres per day. In addition, upgrading of the Mengkuang Dam in Pulau Pinang and distribution networks in the Federal Land Development Authority (FELDA) settlement areas in Pahang commenced. The National Key Results Area (NKRA) programme provided clean and treated water networks to 320,000 rural households. These initiatives expanded coverage of clean and treated water networks and ensured security of supply.

### Extending sewerage coverage

The capacity of sewerage services by grid and septic tanks is expected to increase from 36.2 million population equivalent (PE)<sup>3</sup> in 2010 to 40.7 million PE by end of the Tenth Plan. Connected sewerage services will increase to 3.4 million accounts by 2015 with a handling capacity of 26.1 million PE. Sewage volume for connected services increased from 22.4 million PE in 2010 to 24.6 million PE in 2013, representing 63% of total PE volume. In addition, construction of seven regional and centralised treatment plants including the Pantai 2 Sewage Treatment Plant (STP) in FT Kuala Lumpur and Langat STP in Selangor commenced.

### Ensuring effective sourcing and delivery of energy

The security of energy supply improved to meet increased energy demand. Efforts were undertaken to ensure the long-term sustainability of the energy sector through resource diversification, continuous investments in new infrastructure, and technology enhancement. In addition, the improvement in productivity and efficiency as well as the implementation of efficient resource utilisation measures were also undertaken.

### Oil and gas

Petroleum reserves stood at 22.6 billion barrels of oil equivalent (boe) comprising 5.8 billion boe of crude oil and 16.8 billion boe of natural gas in 2014. Average production of domestic crude oil and condensate decreased from 667,000 barrels per day (bpd) in 2006 to 576,000 bpd in 2013. At 2013 production level, domestic crude oil including condensate would have a reserve life of 28 years. An average Overall Resource Replenishment Ratio (ORRR)<sup>4</sup> of 1.94 from 2011 to 2013 was

achieved, and attributed to continuous investments by PETRONAS in the upstream exploration and production. For the downstream subsector, the total refining capacity has remained at 635,000 bpd since 1998, fulfilling most domestic demand. Exhibit 7-6 shows trends in Malaysia's oil and gas production since 2000.

The production of natural gas increased at a compound annual growth rate of 6%, as seen in Exhibit 7-6. The discovery of new gas fields grew reserves from 90 trillion cubic feet (tcf) in 2011 to 98.3 tcf in 2012. The Regasification Terminal 1 (RGT-1) in Sungai Udang, Melaka, with a capacity of 3.8 million tonnes per annum (mtpa) began operations in 2013. The increase in supply capacity enabled the demand of 2,419 million standard cubic feet per day (mmscfd) of gas in Peninsular Malaysia to be met. Construction of RGT-2 in Pengerang, Johor commenced in 2015 and when completed in 2017, will increase the supply level to 2,900 mmscfd.

During the Tenth Plan, several projects in the downstream oil and gas subsector were initiated to ensure the security and sustainability of energy supply. Development of the Pengerang Integrated Petroleum Complex (PIPC) on approximately 9,100 hectares of land, which includes the PETRONAS Pengerang Integrated Complex and DIALOG-Vopak Deepwater Petroleum Terminal, started in 2012. The deep water petroleum terminal, which started operations in April 2014, has a storage capacity of 1.3 million cubic metres for both crude oil and petroleum products. In addition, expansion of the liquefied natural gas (LNG) plant in Bintulu, Sarawak, which began in 2013, is expected to add 3.6 mtpa of LNG production.

### Electricity

To ensure the reliability of electricity supply, a total of 5,458 megawatts (MW) of capacity was added into the system, with the commissioning of 10 power plants. Among these were the Bakun Hydroelectric in Sarawak as well as Kimanis and SPR gas-fired power plants in Sabah with a total capacity of 2,785 MW. In terms of fuel mix, the share of coal in the total generation mix is expected to increase from 41.6% in 2010 to 43.0% in 2015, while natural gas is expected to decline from 51.5% to 40.1%.

<sup>3</sup> PE is an estimate unit of usage made of sewage facilities. For residential areas PE is calculated as five per household.

<sup>4</sup> ORRR is an indicator to measure discovered reserves versus production where a ratio of 1.0 and above is healthy.

Transmission and distribution systems were further expanded to improve the quality of services and meet growing demand. The transmission projects linked generation plants to the main grid, providing connections to industrial and commercial areas. These included the Air Tawar-Bukit Merah in Perak, Bukit Kapar-Meru in Selangor, Kimanis-Lok Kawi in Sabah, and Bakun-Similajau in Sarawak. The distribution network was also expanded to provide access to new development areas and to extend electricity supply to rural areas such as distribution substations in Indahpura (Johor), Enoe (FT Labuan), and Labuk (Sabah).

Improvements were recorded in the productivity and efficiency of electricity supply services. Tenaga Nasional Berhad (TNB), Sabah Electricity Sdn. Bhd. (SESB), and Sarawak Energy Berhad (SEB) registered improved performance in reducing the number of interruption incidences based on the System Average Interruption Duration Index (SAIDI) as shown in Exhibit 7-7. The supply of electricity to rural areas increased from 92.5% in 2010 to 98.2% in 2015. The implementation of rural electrification projects, mostly through grid connection, benefited

115,153 houses, mainly in Sabah and Sarawak. Alternative systems such as mini hydro, solar hybrid, and biomass were utilised in remote areas.

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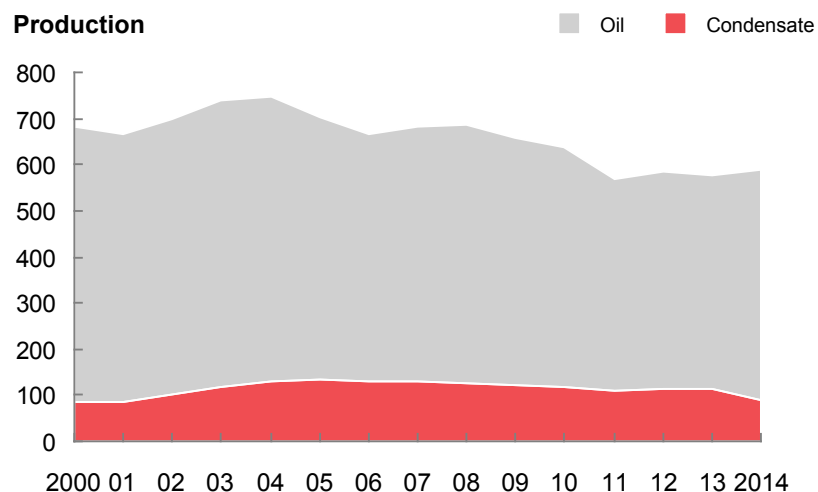
Despite the progress achieved in the Tenth Plan, provision of reliable transport, logistics, digital infrastructure, utilities, and energy supply will become more challenging to ensure sustained robust economic growth. The key challenges in the transport sector include road congestion in urban areas, inadequate public transport, capacity constraints in ports, institutional limitations in civil aviation, and bottlenecks in logistics. Digital infrastructure roll-out in rural areas still faces cost and coverage challenges due to the high cost of broadband deployment and low return on investment. With respect to water supply, the key issues are the high NRW rate, low coverage in rural areas, high operational cost, and lack of financial sustainability of the water service operators. In the energy sector, the issues include fragmented governance, security and reliability of supply, market distortion, lack of regulatory framework, and overdependence on fossil fuels.

Exhibit 7-6

## Oil and gas production from 2000 to 2014

### Crude oil and condensate production

'000 bpd



Source: Petroleum Nasional Berhad

### Gas production

mmscfd

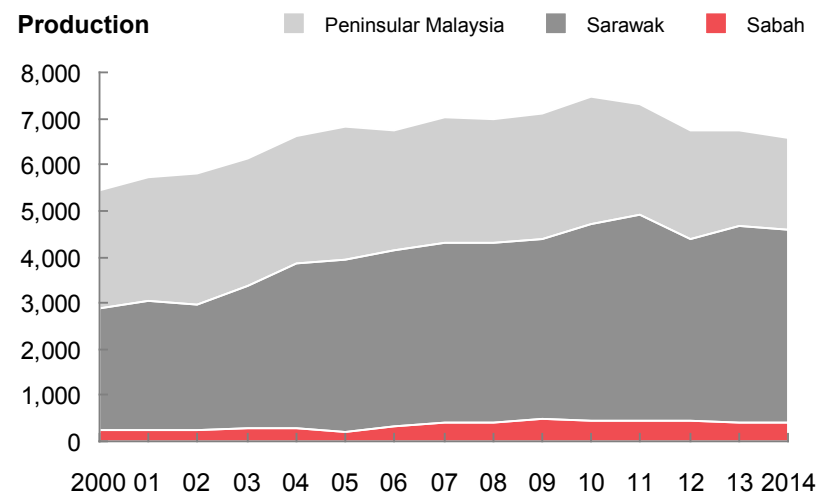
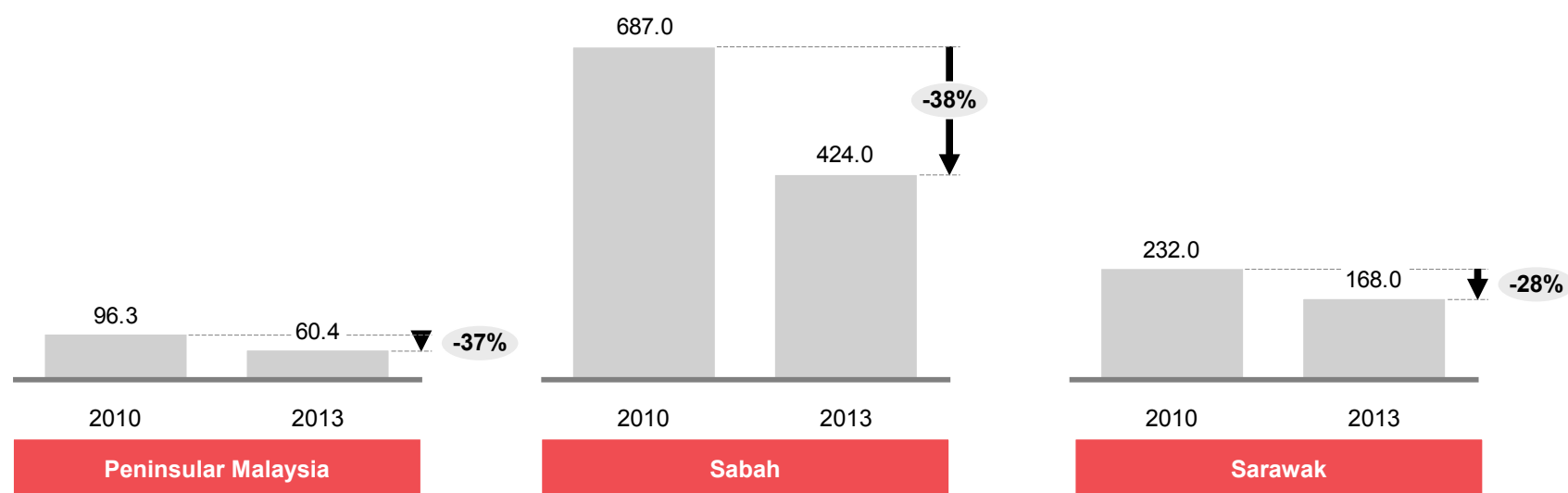


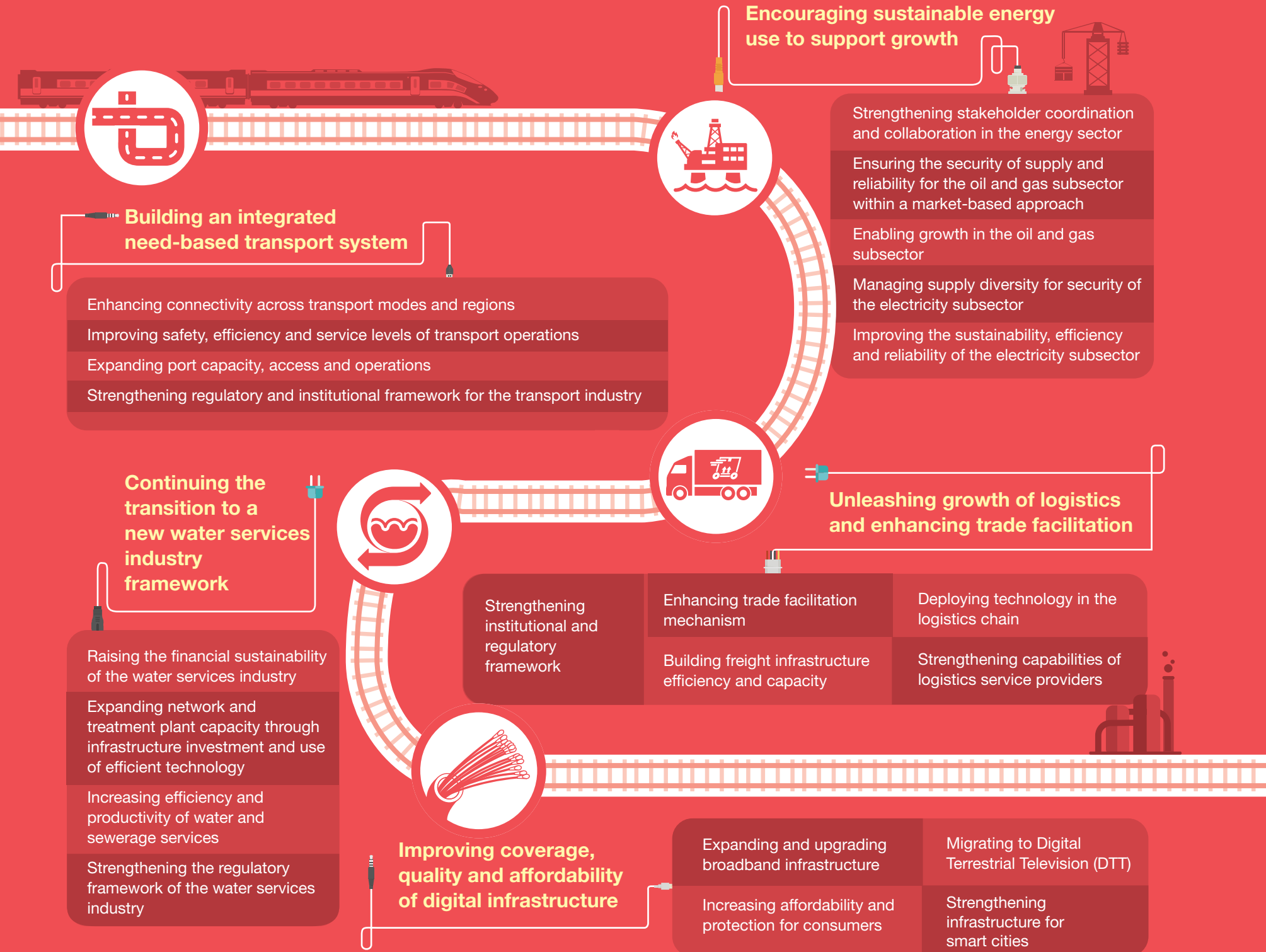
Exhibit 7-7

**Reliability of electricity supply from 2010 to 2013****System Average Interruption Duration Index, minutes per customer**

Source: Ministry of Energy, Green Technology and Water, Energy Commission, and Sarawak Energy Berhad

# Summary of focus areas

## Eleventh Malaysia Plan, 2016-2020



# SELECTED OUTCOMES



## Moving forward Eleventh Malaysia Plan, 2016-2020

In the Eleventh Plan, focus will not only be on expanding the physical capacity and reach of infrastructure networks, but improving their performance, productivity, and affordability. The aim is to not only bring such amenities to all households, urban or rural, but make these services befitting of an advanced economy and inclusive nation by 2020.

The Eleventh Malaysia Plan will strengthen the foundation of economic expansion and provide an enabling environment to support growth. Initiatives will be undertaken to provide a seamless transportation system and enhance mobility of people, targeting a 40% public transport modal share in the GKL/KV region and 20% in other state capitals. Rural, rural-urban and inter-city connectivity will also be strengthened through enhanced bus, rail and air services. Movement of goods will also become increasingly important as trade plays a significant role in Malaysia's economic growth. The logistics industry will therefore be strengthened. By 2020, Malaysia is targeting an 8.5% annual growth rate of the transport and storage subsector, along with a place in the top 10 of the World Bank Logistics Performance Index.

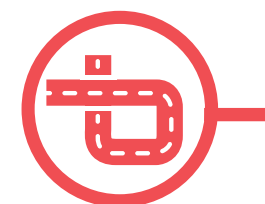
Beyond physical connectivity, digital infrastructure will not only be vital in bringing people together through communication channels, but lay the foundation of economic development through knowledge-intensive industries. To achieve this, the reach of broadband infrastructure to 95% of populated areas is targeted, along with its affordability - targeting 1% of gross national income (GNI) per capita for fixed broadband cost. Key infrastructure roll-out initiatives such as High-Speed Broadband 2 (HSBB 2), Sub-Urban Broadband (SUBB), and Digital Terrestrial Television (DTT) will be undertaken during this period, along with policies to improve access pricing and consumer protection frameworks.

Essential amenities like water services and energy continue to remain critical in directly impacting the quality of life of citizens. In these sectors, expanding network reach especially in rural areas, improving the reliability and efficiency of services, and enhancing the financial sustainability of the sector, are main areas of focus. By 2020, the Government aims to provide 99% of the population with clean and treated water, 80% with connected sewerage services and reduce non-revenue water to 25%. In energy sector, 7,626 MW new generation capacity will be installed in Peninsular Malaysia, along with 300,000 bpd refining capacity at PIPC, providing security to Malaysia's energy needs.

The focus areas are summarised as follows:

- Focus area A: Building an integrated need-based transport system
- Focus area B: Unleashing growth of logistics and enhancing trade facilitation
- Focus area C: Improving coverage, quality, and affordability of digital infrastructure
- Focus area D: Continuing the transition to a new water services industry framework
- Focus area E: Encouraging sustainable energy use to support growth





## Focus area A

# Building an integrated need-based transport system

Transportation is a vital lifeline for both urban and rural communities in Malaysia. It ensures that people from all walks of life are able to access and broaden their activities in pursuit of jobs, recreation, and daily necessities. Under the Eleventh Plan, the Government aims to continue to provide sufficient and affordable access to transportation to allow for a safe, efficient, and fast flow of people and goods within Malaysia – especially across rural and urban areas – and internationally. These aspirations will be achieved through four strategies:

- **Strategy A1: Enhancing connectivity across transport modes and regions** through greater connectivity across regions and modes, promoting public transport in both rural and urban areas, and optimising transport planning;
- **Strategy A2: Improving safety, efficiency, and service levels of transport operations** by shifting to preventive maintenance, improving road and rail safety, and upgrading air navigation and airport infrastructure;
- **Strategy A3: Expanding port capacity, access, and operations** through the National Port Policy, a port community system, and improving port accessibility and capacity; and
- **Strategy A4: Strengthening regulatory and institutional frameworks for the transport industry** through introducing a national transport model and establishing the Malaysian Aviation Commission.

## Strategy A1

### Enhancing connectivity across transport modes and regions

Comprehensive and efficient public transport connectivity is an enabler for sustained economic prosperity. To elevate public transport as the preferred mode of commute, it has to be made available and must prove to be reliable and convenient for users. Investments will therefore be made in rural, rural-urban, urban, and intercity transport modes. These efforts will reduce dependency on private vehicles, traffic congestion and air pollution.

### Prioritising regional connectivity for new highways

To achieve a balanced economic development, highway development will be focused outside the Klang Valley and other urban areas. The Eleventh Plan will therefore focus on rural and rural-urban connectivity. The Pan Borneo Highway will promote better connectivity in Sabah and Sarawak. Further development of the Central Spine Road, Kota Bharu-Kuala Krai Highway, and the Lebuhraya Pantai Timur will improve connectivity in Peninsular Malaysia and catalyse growth in the east coast region. The completion of the West Coast Expressway in 2019 will also provide better access to the west coast of Perak and Selangor. A comprehensive needs analysis will be adopted in road planning to ensure effective decision-making on whether to upgrade existing roads or construct new ones.

## Box 7-1

**Klang Valley Mass Rapid Transit (KVMRT)****Line 1: Sungai Buloh to Kajang**

- 51 km MRT system
- 31 stations with expected ridership of 400,000 people per day
- 3.5 minutes service intervals
- Construction started in 2012
- Phase 1: Sungai Buloh to Semantan, expected operations in 2016
- Phase 2: Semantan to Kajang, expected operations in 2017

**Line 2: Sungai Buloh to Serdang to Putrajaya**

- 52.2 km MRT system
- 2016 construction expected to start, with completion in 2022



Source : MRT Corporation

**Increasing public transport modal share in cities**

Improving urban public transport remains critical for Malaysia as 75% of its population will be living in cities by 2020. Public transport modal share in GKL/KV was 17.1% in 2014. The Government aims to raise this to 40% by 2020, and 20% in other capital cities. To increase public transport modal share by commuters, investments in new infrastructure, along with greater intermodal integration will be undertaken to ensure seamless travel. Suitable public transport modes will be developed based on travel demand.

The Klang Valley Mass Rapid Transit (KVMRT) system will become operational during the Eleventh Plan. The KVMRT Line 1 will traverse 51 km between Sungai Buloh and Kajang, through 31 stations serving about 1.2 million people with a daily expected ridership of 400,000 as shown in Box 7-1. Construction on KVMRT Line 2 will also start in 2016 and is estimated to become operational by 2022. Additionally, construction on a Light Rail Transit (LRT) Line 3 connecting Bandar Utama to Klang, running over 36 km and serving 25 stations will start in 2016 with expected completion in 2020.

KTMB is the sole operator of intercity rail services and offers public transport options. KTMB will continue its transformation exercise to improve overall operations, including organisation structure, route rationalisation, and review of fare and freight charges, to provide a better service to the public. Service reliability and operational performance will be improved by addressing engineering issues, rolling stock management, and infrastructure maintenance.

**Deploying roads and public transport to increase rural and rural-urban connectivity**

Rural roads linking the main road networks will continue to be given focus. These roads provide access to basic social amenities such as health, education, and other public services. Rural roads will also create economic opportunities for the residents and further alleviate poverty among the rural households. Bus networks will complement rail networks to provide efficient last-mile connectivity. Express bus services will be rationalised to make it efficient, safe, and sustainable. Its network will be restructured to provide more regular and frequent services, taking into account low demand areas.

Beyond roads, an efficient public transport service is important to facilitate mobility within, and to urban centres. This improves accessibility to social amenities and promotes economic activities. In this regard, the Stage Bus Services Transformation (SBST) Programme will be extended to rural areas and provide greater coverage. Alternative community-based public transport service

such as minivans, and the use of private vehicles, will be considered for remote areas. Box 7-2 provides details on the SBST Programme.

The Government will continue to enhance connectivity and safety of rural air services (RAS) by improving short take-off and landing airstrips (STOLports). The construction of a new airport in Mukah will be completed in 2018 and the relocation of Lawas STOLport in Sarawak to a suitable site will be carried out. MASwings, the designated community airline for Sabah and Sarawak, will utilise the new ATR 72

and Viking aircrafts to improve its efficiency. Currently there are 49 RAS routes which serve communities across Sabah and Sarawak as shown in Exhibit 7-8. These routes will be rationalised to ensure that support on rural air services is targeted towards the right areas.

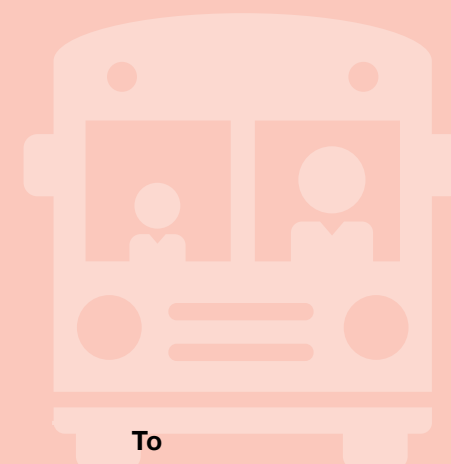
### Optimising transport planning

The transit-oriented development (TOD) concept will be promoted to optimise land use and public transport infrastructure planning. TOD concepts will be expanded in urban areas to maximise access

#### Box 7-2

### Stage Bus Services Transformation Programme

The SBST Programme is an ambitious effort to completely transform the stage bus business model towards financial self-sustainability and increased levels of service for commuters. The SBST will be rolled out in phases starting in 2015 across Seremban, Kuching, Kangar, Ipoh, and Kuala Terengganu and extending to other cities and rural areas during the Eleventh Plan. Major shifts under the SBST Programme include:



	From	To
<b>SUSTAINABILITY</b>	Bus operators dependent on fare box collection only	Gross cost service delivery contract model where operators are paid per kilometre of service provided
<b>ACCESSIBILITY</b>	Areas without sufficient ridership are underserved in terms of availability of service and frequencies of service	Minimum level of accessibility provided based on network and service levels determined by the regulator
<b>SERVICE QUALITY</b>	Large variance in quality of service across various operators, and across regions	Stringent performance monitoring through global positioning system (GPS) and geo-fencing data to track reliability, on-time performance, safety and other key indicators

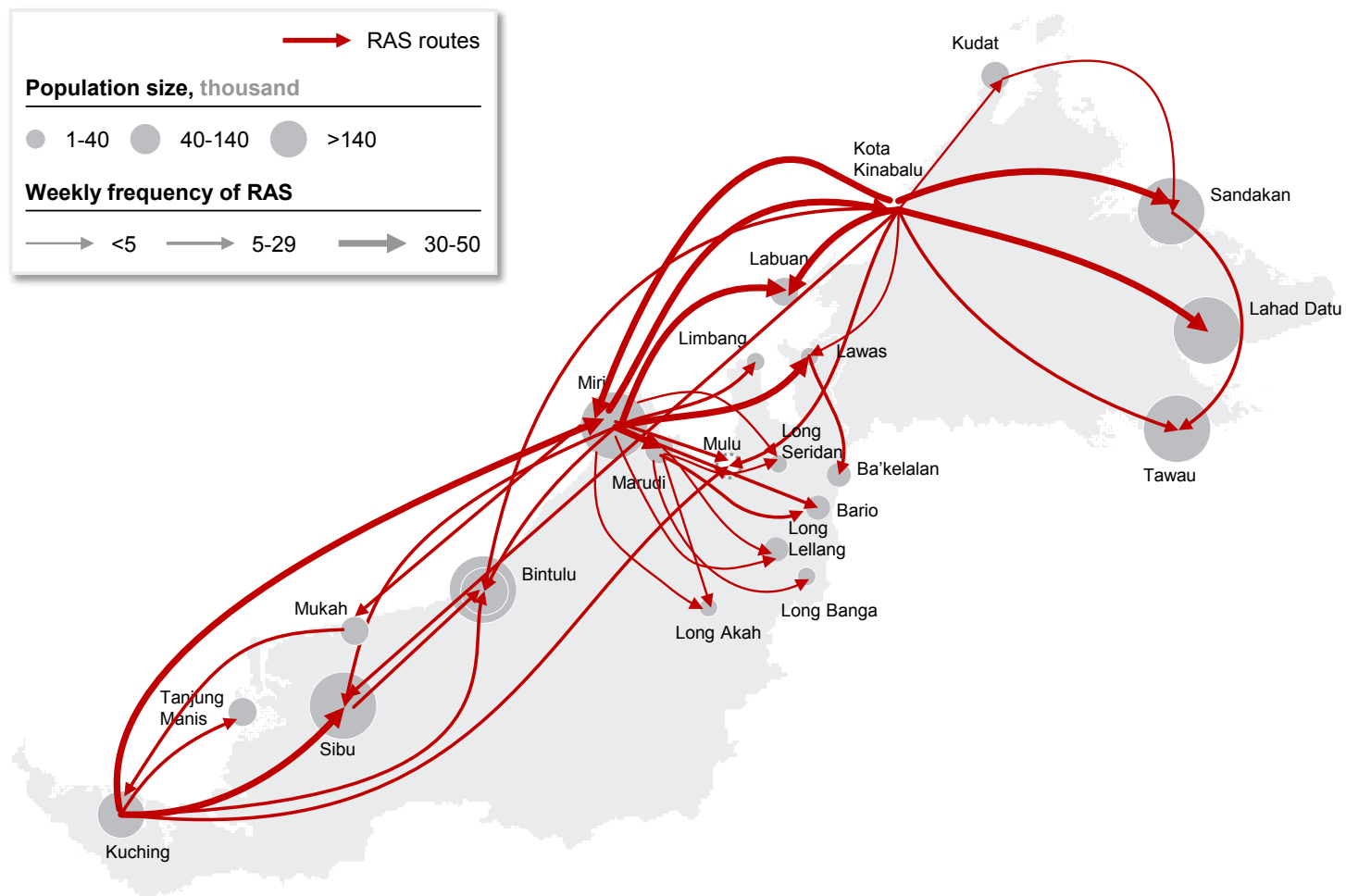
to quality public transport and to attract private investments for commercial and residential purposes. This will help reduce traffic congestion and improve air quality, making cities more liveable.

Planning for development of road and rail networks will be integrated, to promote a multimodal transport system. Mechanisms for regular

engagement between stakeholders and transport planners will be established to avoid fragmented planning. Efforts will be undertaken to promote the modal shift from road to rail in transporting cargo between hinterland and ports.

Exhibit 7-8

### Rural air services routes



Source: Ministry of Transport

## Strategy A2 Improving safety, efficiency, and service levels of transport operations

Strategies to expand Malaysia's transport network and enhance intermodal integration must be further complemented by efforts to improve the system's safety and efficiency as well as user's level of comfort. This approach will encourage commuters to trust and use the public transport options available to them, move away from private transport, and create a more equitable and environmentally sustainable transport system.

### Shifting towards preventive maintenance

Maintaining assets in good condition is crucial to ensure the road and rail network continues to be effective, and functions to required standards throughout its lifespan. Road maintenance programmes will focus on preventive maintenance by adopting a life-cycle costing approach. Utilisation of advanced materials and innovative technology in road construction and maintenance will be intensified to ensure durability of road infrastructure. Maintenance of rail assets will focus on refurbishment of rolling stocks and replacement of tracks and sleepers.

### Improving road and rail safety

Road and rail safety will be improved during the Eleventh Plan. Blackspot Mitigation Programme and Road Safety Audit will be intensified to reduce road accidents and fatalities. This will reduce road fatalities by 50% by 2020 as per the recommendations of the United Nations Decade of Action for Road Safety 2011-2020. Response time to address road hazards, including landslides and potholes, will be shortened. Rail safety for heavy rail will be enhanced through track upgrading, electrification, signalling and communication system improvement, as well as rolling stocks replacement.

### Upgrading air navigation system and airport infrastructure

A new Kuala Lumpur Air Traffic Control Centre will be built at KLIA to replace the National Control Centre at Subang, Selangor to improve aircraft movement capacity. In addition, the Communication, Navigation and Surveillance as well as the Air Traffic Management systems will

be upgraded to improve efficiency of air navigation services. This will increase aircraft movements from 68 movements per hour to 108 movements to strengthen KLIA as the main gateway. The Langkawi International Airport, Kedah and the Sultan Ismail Petra Airport, Kelantan will be upgraded to cater for the expected increase in passengers.

## Strategy A3 Expanding port capacity, access, and operations

As Malaysia integrates further into the ASEAN Economic Community and the global economy on the whole, economic growth through trade and exports will necessitate greater capacity and efficiency of its port infrastructure. To address this, attention will be given to expanding capacity of ports and address issues in congestion.

### Implementing the National Port Policy

The National Port Policy will be implemented to foster systematic development and growth of ports and jetties by introducing comprehensive strategy and policy measures. The policy will provide a regulatory framework for further developments in capacity, and will improve efficiency by streamlining the functions of all ports and jetties. Major hub ports will be strengthened by networks of secondary ports to improve competitiveness of the national logistics chain. In addition, port development will take into account land use planning to ensure the sustainable growth of major ports.

### Creating a port community system

A single communications platform will promote information sharing among ports and private stakeholders such as logistics firms and customs agents. All port authorities will be required to establish their port community system (PCS), an open electronic system that enables intelligent and secure information exchange between public and private stakeholders. PCS optimises, manages, and automates port and logistics processes through a single window for interaction. This will improve the efficiency of port operations and competitiveness while strengthening strategic alliances among stakeholders.

### **Improving port accessibility and capacity**

Accessibility to major ports will be improved to cater for bigger vessels through channel deepening works. In addition, port operators will undertake capacity expansion, which includes building additional berths and wharfs. These improvements will attract more international liners and mega vessels with capacity of 18,000 TEUs to call at these ports.

## **Strategy A4 Strengthening regulatory and institutional framework for the transport industry**

Greater attention will be given to strengthen the institutional and regulatory framework for public transport, port, and civil aviation. This will ensure that development in these sectors is planned, structured, and systematic to remain competitive and sustainable.

### **Introducing a national transport model**

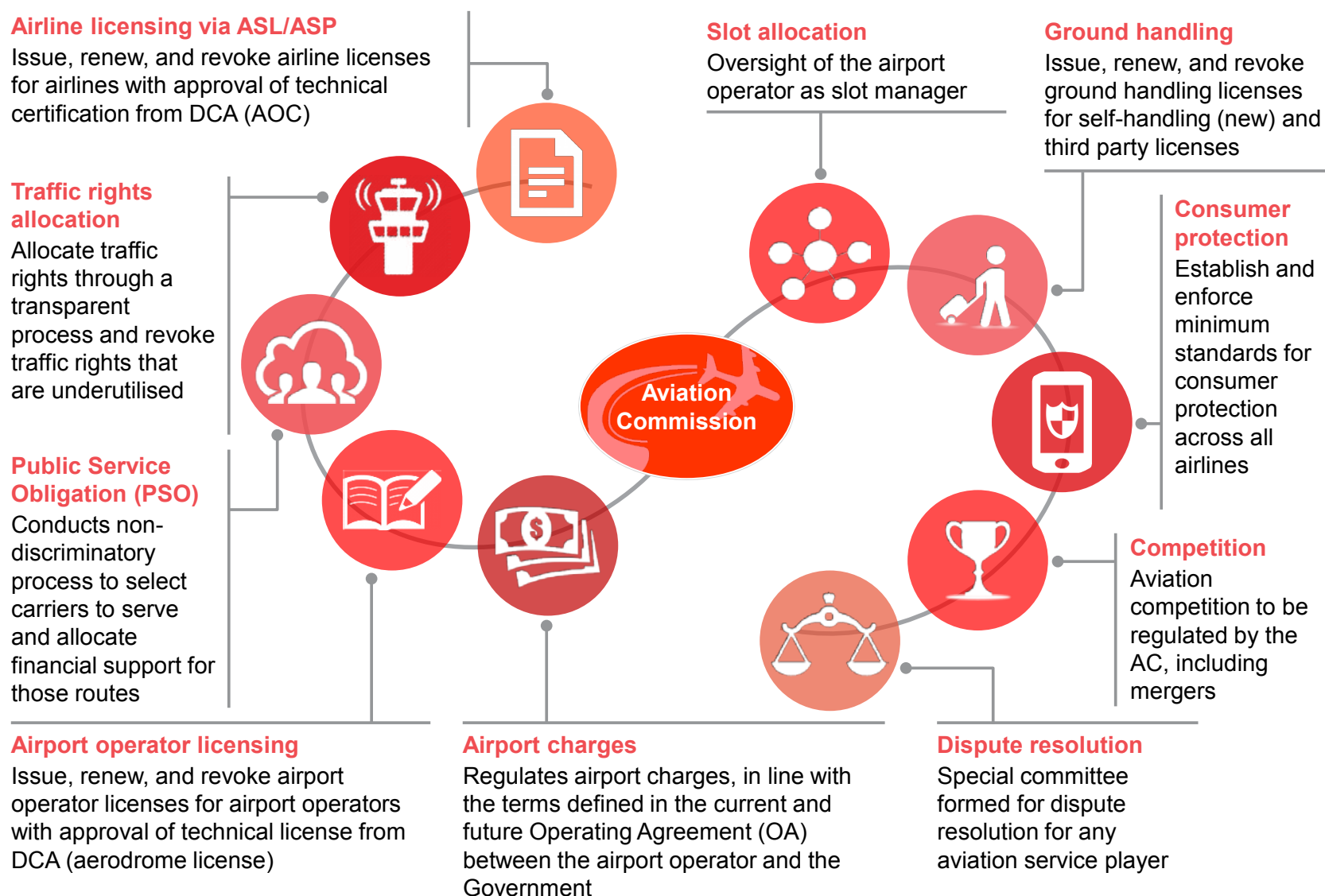
A national transport model will be introduced to strengthen inter-agency collaboration in formulating integrated transport policies. This will facilitate demand and capacity assessments of new transport infrastructure based on current and future development needs.

### **Establishing the Malaysian Aviation Commission**

The incorporation of the Malaysian Aviation Commission in July 2015, an independent regulatory body, will enable a more structured and systematic aviation industry. The responsibilities of the commission include economic regulation and consumer protection as shown in Exhibit 7-9. It will also undertake policy and planning functions to manage capacity and competition via licensing, route allocation, and streamlining airports according to its hierarchy. The Department of Civil Aviation (DCA) will continue to serve as the technical, safety, and security authority. The possibility of corporatising DCA will be assessed during the Eleventh Plan.

Exhibit 7-9

## Roles of the Malaysian Aviation Commission



Source: Malaysian Aviation Commission Bill, 2015



## Focus area B

# Unleashing growth of logistics and enhancing trade facilitation

Efficient and high-performing logistics and trade facilitation are important determinants of a country's competitiveness, as well as an important source of employment. Malaysia has a high aspiration to become the preferred logistics gateway to Asia, and improve its ranking in the World Bank Logistics Performance Index from top 25 in 2014 to be among the top ten by 2020. Exhibit 7-10 shows Malaysia's current performance compared to selected regional peers. By 2020, Malaysia aims to achieve an annual growth of 8.5% for the transport and storage subsector, creating an additional 146,000 jobs, mostly high-skilled. These aims will be met through the following strategies:

- **Strategy B1: Strengthening the institutional and regulatory framework** through the National Logistics Task Force (NLTF) and regulating other functions such as off-dock depots, warehousing activities, and commercial vehicle registrations;
- **Strategy B2: Enhancing trade facilitation mechanisms** through collaboration to reduce cargo clearance time and greater paperless trading;
- **Strategy B3: Building freight infrastructure efficiency and capacity** by improving last-mile connectivity at Port Klang and expanding air and rail freight infrastructure;
- **Strategy B4: Deploying technology in the logistics chain** through development of virtual selling platforms and supporting logistics infrastructure for e-commerce; and
- **Strategy B5: Strengthening the capabilities of logistics service providers** through training and accreditation programmes.

## Strategy B1

### Strengthening institutional and regulatory framework

#### Formation of the National Logistics Task Force

The Ministry of Transport (MOT) will champion the development of the logistics sector through the NLTF. Chaired by the Minister of Transport, the NLTF will implement the National Logistics and Trade Facilitation Master Plan, providing strategic direction for the development of the logistics industry and further improving its productivity and competitiveness. Five cluster groups have been established, responsible to drive specific action plans proposed in the Master Plan, monitored by the NLTF. In addition, the Special Committee for Services Sector, chaired by the Prime Minister, will provide oversight to resolve cross-cutting issues.

#### Regulating off-dock depots

The Land Public Transport Commission (SPAD) will be given the mandate and capacity to ensure the orderly development of off-dock depots. These depots will be regulated through operating licences and standard guidelines. An organised off-dock depot management system will decongest ports and deliver efficient cargo operations at competitive cost.

#### Planning and development of warehousing activities

The planning and development of warehousing activities will be placed under the purview of MOT. The ministry will collaborate with the Ministry of Urban Wellbeing, Housing and Local Government (KPKT) to develop standards and specifications for warehouses, identify suitable locations, and improve approval processes. In addition, both ministries will develop a national warehouse inventory website to manage information on the warehousing segment.








### Simplifying and streamlining regulations

Efforts will be focused on simplifying the commercial vehicle registration process. In addition, processing time for application of landing permits for non-scheduled flights will be shortened. To enable these improvements, complex and ineffective regulations will be

simplified and streamlined to improve efficiency and reduce costs. In order to optimise vehicle utilisation and enhance road freight efficiency, the axle load for heavy vehicles and the interchangeability of prime movers for different trailers will be reviewed.

Exhibit 7-10

### Comparison of logistics sector performance in 2013

		Malaysia	Indonesia	Thailand	Singapore	Hong Kong
						
Air	<b>Air Transport</b> (million tonne-km)	1,990.9	959.1	2,644.4	6,512.2	9,439.9
	<b>Air Freight Volume</b> (million tonne)	0.9	1.5	1.6	1.8	4.1
Sea	<b>Container Traffic</b> (million tonne)	20.8	10.1	7.9	32.6	22.4
	<b>Sea Freight Volume</b> (million tonne)	506.2	1,470.5	198.5	560.9	276.1
Land	<b>Trade Costs</b> (US\$ per container)					
	<b>Import</b>	485.0	660.0	760.0	440.0	595.0
	<b>Export</b>	450.0	615.0	595.0	460.0	590.0
Warehouse	<b>Building a warehouse</b>					
	<b>Procedures</b> (no.)	13.0	17.0	7.0	10.0	5.0
	<b>Time</b> (days)	74.0	211.0	113.0	26.0	66.0
Trade Facilitation	<b>Time Requirement</b> (Days)					
	<b>Import</b>	8.0	23.0	13.0	4.0	5.0
	<b>Export</b>	11.0	17.0	14.0	6.0	6.0

Higher performance  
Lower performance

Source: World Bank

## **Strategy B2**

### **Enhancing trade facilitation mechanism**

#### **Collaboration to reduce cargo clearance time**

Collaboration between the Royal Department of Customs and permit issuing agencies will be strengthened to shorten cargo clearance processing time without compromising security. The Special Task Force to Facilitate Business (PEMUDAH) will lead this initiative with the Malaysian Productivity Corporation as secretariat.

#### **Moving to paperless trading**

Paperless trading will be driven through u-Customs to encourage industry players and permit issuing agencies to gradually reduce the usage of hardcopy documents. The security of the trade documents will be enhanced with better features and standards to ensure only genuine documents are used.

## **Strategy B3**

### **Building freight infrastructure efficiency and capacity**

#### **Strengthening last-mile connectivity to Port Klang**

The last-mile connectivity to Port Klang, Selangor via road and rail will be improved to cope with the rise in container volume. Priority will be given to upgrading the rail link between Westports and Northport to reduce congestion and encourage rail freight. Critical stretches along Jalan Pelabuhan Utara and Pulau Indah Highway will be upgraded to ease congestion and enable the seamless movement of goods. In addition, the usage of traffic information systems will be promoted for better traffic management within Port Klang.

#### **Expanding capacity for rail and air freight**

The Padang Besar Terminal in Perlis will be upgraded to capture the potential growth in cargo volume, anticipated to reach 245,000 TEUs by 2020 from 120,000 TEUs in 2014. Among the measures to be undertaken include expanding the yard to create an extra container stacking area, providing extra load-on/load-off spaces, and increasing the number of train services.

The cargo handling facilities and freighter service at Kota Kinabalu International Airport will be upgraded based on demand to support the export of agricultural produce, particularly aquacultural products. In addition, the need for cargo facilities such as cool ports and staging areas to consolidate and facilitate cargo movement at KLIA will be reviewed. In addition, the former low-cost carrier terminal will be transformed into a regional cargo hub.

## **Strategy B4**

### **Deploying technology in the logistics chain**

#### **Promoting the development of virtual selling platforms**

Virtual selling platforms will be promoted to match logistics supply and demand. The private sector, through freight associations, will take the lead in establishing platforms, driven through the NLTF. This initiative will enable the logistics service providers to connect with freight forwarders and publish rates and availability of services to users, particularly the small and medium enterprises (SMEs).

#### **Strengthening logistics facilities for e-commerce**

Supporting logistics facilities for e-commerce featuring fulfilment centres will be developed at strategic locations to increase the efficiency and productivity of online retailers. Fulfilment centres which offer warehousing, order processing and delivery activities provide the platform for online retailers to outsource services. This will reduce operating costs and enhance customer satisfaction. In addition, SMEs will be encouraged to go online and gain access to a wider market through fulfilment centres.

The development of urban logistics services will be given priority to encourage efficient distribution of goods purchased online in the urban areas. Emphasis will be given to improve fleet management, setting up hub and spoke distribution facilities, and night logistics services. NLTF will drive the urban logistics initiative under the Eleventh Plan.

## **Strategy B5**

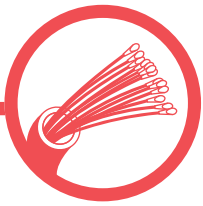
### **Strengthening capabilities of logistics service providers**

#### **Investing in training and human capital development**

Skills of professionals in the logistics industry will be enhanced through on-the-job training programmes. In addition, universities and training institutes will be encouraged to offer logistics-related short-term courses or certification programmes to improve competency. Efforts will be undertaken to enhance industry-led training through greater collaboration between training institutions and industry experts.

#### **Introducing accreditation for logistics service providers**

An accreditation system for logistics service providers will be introduced to certify companies that comply with regulations and adopt best practices such as green logistics and information, communications and technology (ICT) applications. Accreditation will be made a prerequisite for companies to obtain incentives. This initiative will enable local logistics service providers to move up the value chain and offer higher value-added services, leading to increased service exports.



## Focus area C

# Improving coverage, quality and affordability of digital infrastructure

Digital infrastructure plays a critical role in connecting businesses and individuals to the global marketplace, allowing people to communicate in ways never possible before due to rapid technological advances. Malaysia aspires to ensure that its citizens and economy keep pace with the digital global economy by expanding the successful roll-out of digital technologies such as the High-Speed Broadband (HSBB) and Digital Terrestrial Television (DTT). This, coupled with efforts to increase the affordability of such services, and enhanced consumer protection standards, will pave the way for the ubiquity of fibre connectivity, ensuring that Malaysians have access to affordable, high-quality digital infrastructure on par with the world's developed economies. These aspirations will be achieved through four strategies:

- **Strategy C1: Expanding and upgrading broadband infrastructure** through deploying broadband as an essential service, improving connectivity from international to last-mile connections, and integrating digital infrastructure planning;
- **Strategy C2: Increasing affordability and protection for consumers** through an improved Access Pricing Framework (APF) and setting standards for consumer protection;
- **Strategy C3: Migrating to DTT** by implementing the second phase of DTT and introducing value-added services; and
- **Strategy C4: Strengthening infrastructure for smart cities** through better connectivity and seamless integration of urban services.

### Strategy C1

## Expanding and upgrading broadband infrastructure

Policy measures to encourage investments in digital infrastructure will be undertaken by improving connectivity from international to last-mile connections to households. Greater coordination between relevant government agencies will ensure these measures are integrated and coherent.

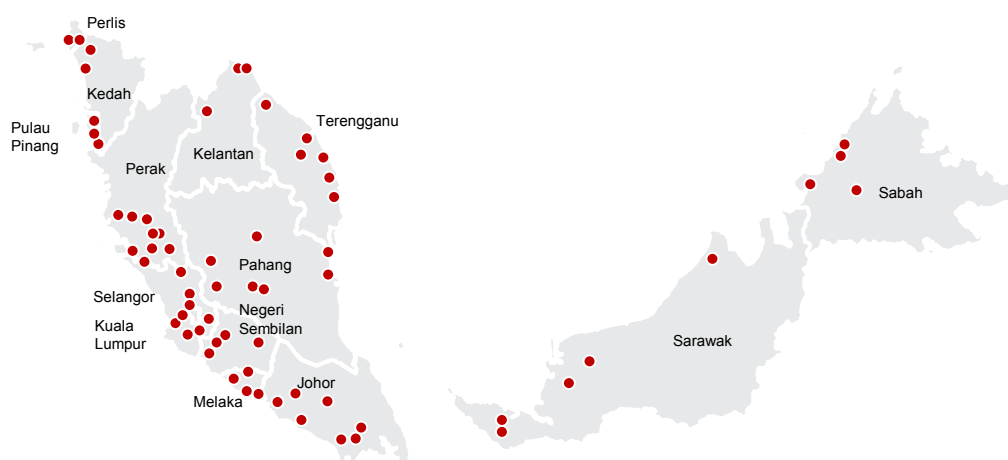
### Deploying broadband as essential service through Uniform Building By-Laws

An amendment in 2011 to the Uniform Building By-Laws (UBBL), 1984 stipulates that communication installations is one of the essential services similar to water and electricity under the certification for completion and compliance of buildings. This requires developers to provide ready-to-use communication infrastructure for new housing and commercial developments. The eight states, namely Johor, Kelantan, Melaka, Pahang, Perak, Perlis, Selangor, and Terengganu, which have gazetted the new UBBL requirements will be fibre-ready by 2018. The remaining states will be encouraged to comply with the UBBL requirements.

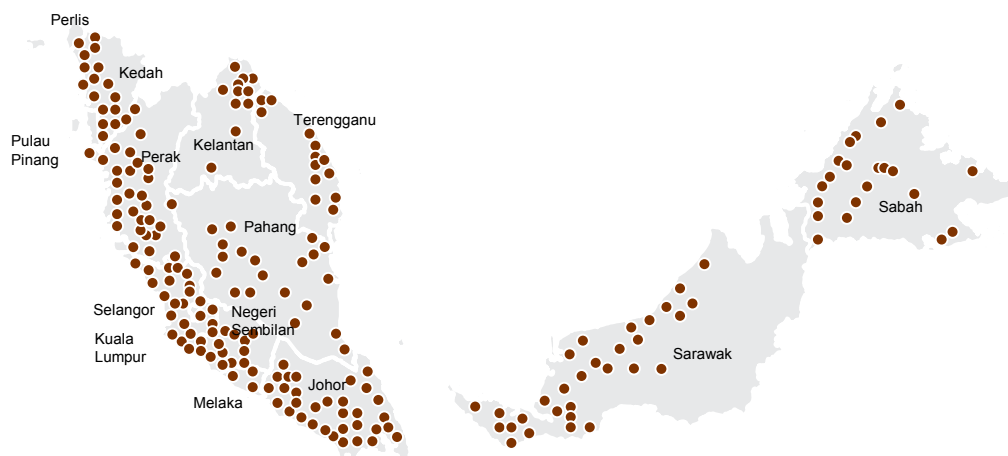
### Improving connectivity from international to last-mile connections

Measures will be undertaken to improve the international to last-mile bandwidth capacity to meet the expected demand of 41 terabytes per second (Tbps) during the Eleventh Plan. Efforts will also be undertaken to enhance connectivity through deployment of the High-Speed Broadband 2 (HSBB 2) and Suburban Broadband (SUBB) for a more holistic coverage in all state capitals and selected high-impact growth areas as shown in Exhibit 7-11.

Exhibit 7-11

**HSBB 2 and SUBB proposed coverage****High-Speed Broadband 2**

- Covers all state capitals and selected high-impact growth areas
- 250,000 ports to be installed by end of 2016, passing through 410,000 premises
- 100 Megabits per second (Mbps) broadband made available to all households in state capitals and high-impact growth areas by 2020

**Suburban Broadband**

- Covers suburban and rural areas
- Additional 420,000 ports through 750,000 premises to be installed within 5 years of project start
- 20 Megabits per second (Mbps) broadband made available to 50% of households in suburban and rural areas by 2020

Source: Malaysian Communications and Multimedia Commission

A review of the regulatory framework for international connectivity and promotion of a conducive environment to encourage international submarine cables to land in Malaysia will be undertaken.

### Integrating digital infrastructure planning

Collaboration amongst the Ministry of Communications and Multimedia, Malaysian Communications and Multimedia Commission (MCMC), state governments, and local authorities will be strengthened on the planning and deployment of digital infrastructure. Sharing of infrastructure and smooth deployment of broadband at standard and reduced cost will be the focus. The collaboration will ensure that broadband supply meets both federal and state requirements.

## Strategy C2

### Increasing affordability and protection for consumers

#### Improving the Access Pricing Framework for providers

The APF will be improved to facilitate competition and infrastructure sharing among service providers. This is expected to reduce the fixed broadband cost from 2.42% of GNI per capita in 2013 to 1% in 2020, in line with the national target. This will increase affordability and improve broadband outreach to the underserved. The APF will be reviewed in 2015 and the next review is scheduled in 2017 after the revision of the access list. The decision on specific service pricing will be determined as a result of the review and public inquiry. Exhibit 7-12 shows Malaysia's fixed broadband prices versus other countries in the region.

Exhibit 7-12

### Comparison of fixed broadband prices between Malaysia and other countries

Fixed broadband price, % GNI per capita 2013



Source: International Telecommunication Union and World Bank

### Setting standards and guidelines for better consumer protection

The self-regulatory framework under the Communications and Multimedia Act 1998 will be strengthened to enhance consumer protection. These improvements will provide consumers with clear and specific criteria to measure the Quality of Service (QoS) of service providers, as well as protect their rights in cases where minimal acceptable standards are not met. Services such as public cellular service, dial-up internet access, content applications, public payphone, digital leased line service, and broadband access will be included. In addition, the monitoring and compliance framework will also be strengthened to impose stiffer penalties on service providers for non-compliance.

In addition, a Star Rating System for telcos will be introduced to assist consumers in making informed choices about service providers. This will be based on MCMC's Extensive End-Point Service Availability Testing, a mobile network quality measurement which is conducted twice a year to benchmark the QoS for mobile services. This effort is to keep consumers informed and encourage mobile operators to improve their networks and services.

The General Consumer Code (GCC) will be reviewed to provide model procedures for service providers on reasonably meeting consumer requirements, handling consumer complaints, protecting consumer information and promoting a high level of consumer confidence in service delivery from the industry.

### Strategy C3

## Migrating to Digital Terrestrial Television (DTT)

DTT is a technological advancement in television that allows broadcasting of high quality video over digitised land-based signals. DTT therefore has lower operating costs than satellite television, but offers a higher quality of broadcast than analogue. DTT allows higher levels of video compression than analogue, leading to a more efficient use of spectrum, thus releasing spectrum for wireless communication and other uses. For broadcasters and consumers, this means better affordability and better quality viewing on regular television, without the need for satellite antennas.

### Implementing second phase of DTT

The second phase of the Digital Terrestrial Television (DTT) service will be implemented in 2016-2017, covering 46 areas nationwide including 24 areas in Sabah and Sarawak. The second phase roll-out will give more households the option to choose between DTT and satellite televisions, increasing consumer choice.

### Introducing value-added services through DTT

In addition to providing TV and radio services, DTT opens the room for new value added services through televisions, as well as spurs the development of content and applications, which contributes to the growth of the content and software solutions industry. Service options include connected services such as Catch-Up TV, video- and application-on-demand; potential for TV-based commerce including e-shopping, transaction and payment gateways, and delivery tracking; and other services such as social media TV, ratings research and analytics, and e-learning. These services will be made available after the completion of the Analogue Switch Off (ASO), which will commence by regions in 2016, to be completed in 2017. Examples of potential value-added services are shown in Exhibit 7-13.

## Strategy C4 Strengthening infrastructure for smart cities

As more Malaysians live in urban areas, cities are starting to face pain points such as congestion, pollution, and inefficient deployment of urban services. Smart Cities is a next generation approach to urban management with solutions that address these issues and improve the quality of life of urban dwellers as shown in Exhibit 7-14.

Efforts will be undertaken by the Ministry of Communications and Multimedia to ensure smart living in cities. In this regard, emphasis

will be placed on addressing major pain points related to urban services such as providing better transportation as well as utilities and waste management through the adoption of digital infrastructure and applications. To enable connectivity and seamless integration of services, focus will be on developing pervasive broadband, sensor networks and applications. Data will also be made available on an open basis to support analytics and planning as well as create opportunities for open innovation by businesses and individuals.

During the Eleventh Plan, a framework will be developed to prioritise areas of focus in the development of smart cities. A fundamental initiative to realise the migration to smart cities will be the development of smart communities.

*Exhibit 7-13*

### Examples of value-added services through DTT



#### Connected Services

- Catch-Up TV
- Video-on-Demand
- Application-on-Demand
- Online Games
- Web TV
- Multi-Screen Video
- Video Contribution Network
- Electronic Programme Guides Schedule Data Enhanced
- On-Screen Chat



#### T-Commerce & Applications Services

- E-Shopping
- Ordering Services
- Transaction & Payment Gateway
- Third Party Integration Management
- Delivery Tracking



#### Soft Services

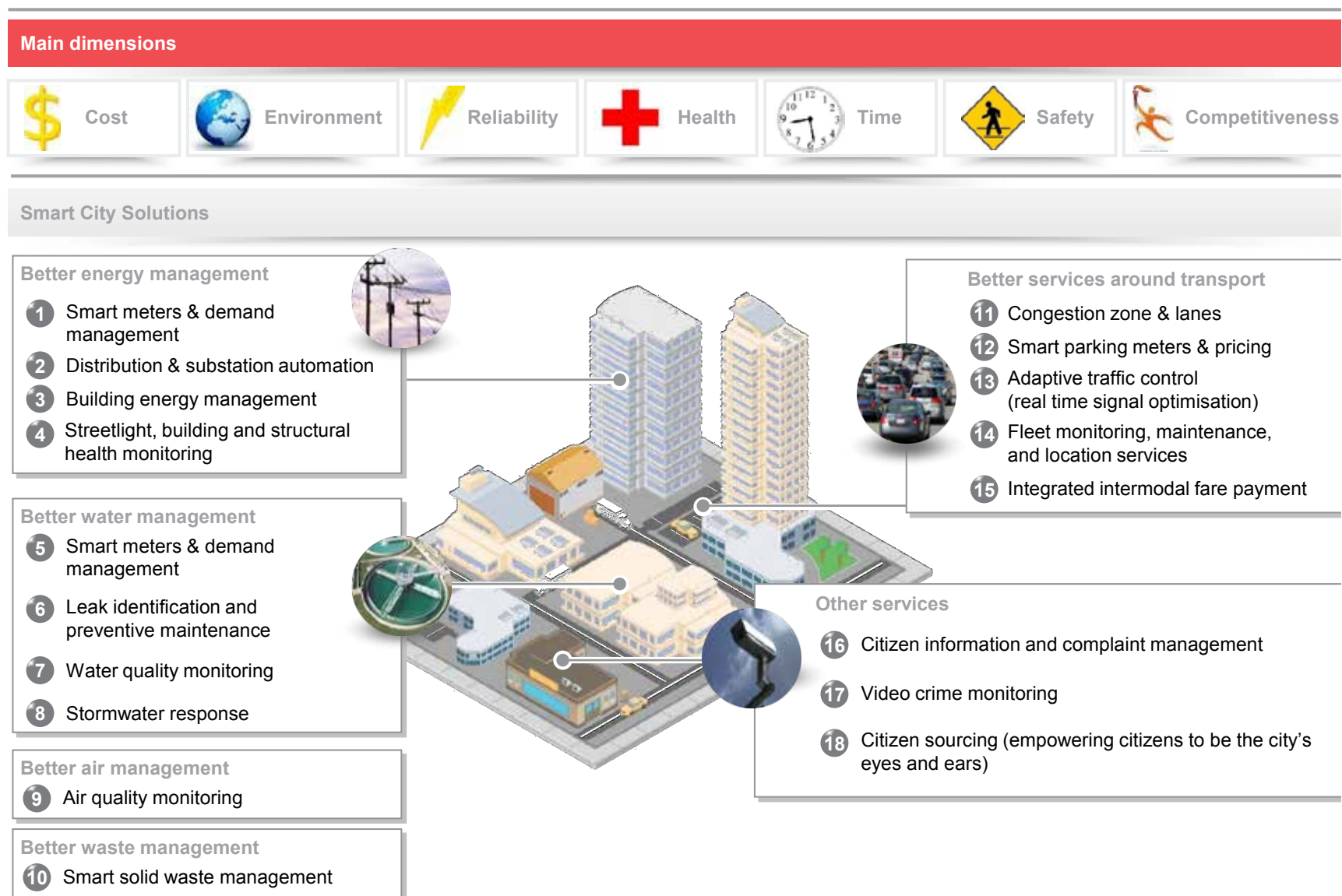
- Hot Line
- Ratings Research & Analytical Customer Relationship Management
- E-Learning Application
- Social Media TV
- Voting
- Subscriber Management System
- Playout

Source: Malaysian Communications and Multimedia Commission



Exhibit 7-14

## Overview of smart city initiatives



Source: Based on "How to make a city great", McKinsey & Company Cities Special Initiative, 2013



## Focus area D

# Continuing the transition to a new water services industry framework

Access to clean water and sewerage represents one of the most basic foundations of life. Malaysia today has already achieved impressive outcomes with close to 95.1% of its population having access to clean and treated water. The Government remains committed to expanding coverage and improving the quality of the water services industry nationwide. To achieve these objectives, the Water Services Industry Act (WSIA) was introduced in 2006. The Act aims to protect long-term financial sustainability and enable continuous improvement of the industry. In addition, the Government remains committed to tackling the long-standing issue of non-revenue water, currently at a national average of 36.6%. The following strategies will be pursued during the Eleventh Plan:

- **Strategy D1: Raising the financial sustainability of the water services industry** by strengthening the tariff system and implementing joint billing for water and sewerage;
- **Strategy D2: Expanding network and treatment plant capacity through infrastructure investment and use of efficient technology**, through developing new treatment plants, increasing clean and treated water coverage and expanding connected water and sewerage services in rural areas;
- **Strategy D3: Increasing efficiency and productivity of water and sewerage services** through implementation of the Non-Revenue Water Reduction Programme and by rationalising and upgrading sewage treatment plants; and
- **Strategy D4: Strengthening the regulatory framework of the water services industry** with the National Sewerage Master Plan, a water demand management master plan and promotion of waste to wealth initiatives.

### Strategy D1

## Raising the financial sustainability of the water services industry

### Strengthening the tariff setting mechanism

Capital expenditure for water treatment and distribution will be financed through the Perbadanan Aset Air Berhad (PAAB) to reduce the amount of financial support required from the Government. The viability of this arrangement will need to be tied to a new tariff setting mechanism that promotes full cost recovery. This will ultimately ensure that water services operators are financially sustainable.

A new tariff setting mechanism will also be implemented for sewerage service to cover operational cost. This will ensure that service operators are able to carry out scheduled maintenance, minimising incidences of non-compliance and safeguarding the environment.

### Implementing joint billing for water and sewerage services

WSIA aims to integrate both water and sewerage services as a single industry. To this end, a joint billing exercise between water and sewerage services will be implemented based on a volumetric formula for sewerage tariffs. This is expected to increase collection rates by 20% to 30% for sewerage services, allowing operators to be financially sustainable.

## Strategy D2

### Expanding network and treatment plant capacity through infrastructure investment and use of efficient technology

#### Developing new treatment plants

The Government will ensure water supply sustainability, especially in stressed areas, by constructing new treatment plants or upgrading existing ones. Focus will be given to states which have water supply reserve margins of less than 10% such as Kedah (0%), Selangor (4.5%), and Negeri Sembilan (7.5%). With the completion of the Langat 2 Water Treatment Plant (WTP), the water supply reserve margin for Selangor will reach 14%. Similarly, the upgrading of Kulim High Tech WTP and Batu Kitang WTP will increase reserve margins for the Kulim High Tech Industrial Park in Kedah to 10% and for Kuching in Sarawak to 13%.

#### Increasing clean and treated water coverage

The Government aims to have 99% of the population served by clean and treated water by 2020. Alternative water supply systems such as rain water harvesting, tube wells, and gravity feed systems will be expanded in rural areas - particularly in Kelantan, Pahang, Sabah, and Sarawak. Efforts to expand connected water supply coverage in these states will continue, supplemented by these alternative systems. These systems will be tailored to local requirements, geographical considerations, and cost effectiveness considerations. Rain water harvesting systems will be adopted in remote areas with high rainfall while gravity feed systems will be adopted in highland areas with limited access.

#### Expanding connected sewerage services in rural areas

Connected sewerage services will be extended to rural areas through solutions tailored for population agglomerations of less than 5,000 people. This will reduce the use of individual septic tanks and pour flush, which are both major threats to the environment and public health, and result in a two million population-equivalent reduction. Priority will be given to areas bordering water sources and polluted rivers.

## Strategy D3

### Increasing efficiency and productivity of water and sewerage services

#### Implementing a holistic non-revenue water (NRW) reduction programme

During the Eleventh Plan, NRW will be reduced from 36.6% in 2013 to 25%, as shown in Exhibit 7-15, with the implementation of a holistic NRW reduction programme. The reduction of 11% in NRW will result in an additional revenue of up to RM410 million annually. One of the initiatives is to develop comprehensive district metering zones, which also include meter and pipe replacement programmes, and pressure control management. Enforcement on illegal tapping will also be given priority. Regulations to require contractors to only use trained workers in pipe works will be enforced.

#### Rationalising and upgrading sewage treatment plants

In the Eleventh Plan, 3,000 small and inefficient sewage treatment plants will be rationalised through the construction of regional and centralised plants with larger capacities and efficient technologies. These plants will be considered for areas that have sufficient demand. In areas where such plants are not feasible, existing treatment plants will be upgraded with new mechanical and electrical components to ensure effluent levels are compliant with standards. This rationalisation is expected to reduce the cost of electricity bills and manpower by 50%. Alternative financing methods based on privatisation concepts will be further promoted as a new source of capital.

## Strategy D4

### Strengthening the regulatory framework of the water services industry

A comprehensive policy will be prepared for implementing agencies, industry players, and relevant stakeholders to guide the water services industry towards sustainability. This is to promote better and more

coordinated planning through an enhanced understanding of the supply and demand chain from all sources.

### Developing the National Sewerage Master Plan

The National Water Services Commission (SPAN) will develop the National Sewerage Master Plan to provide integrated and holistic long-term policy directions and strategic shifts for the sewerage services industry. The master plan will include strategic plans on identification of catchment areas, rationalisation of treatment plants, and funding mechanisms. It will also provide appropriate strategies to encourage migration from individual septic tanks and pour flush to standardised treatment systems to minimise pollution.

### Promoting waste to wealth for sewerage

Waste to wealth initiatives will be actively promoted for sewerage service operators. These operators will be encouraged to tap sewage

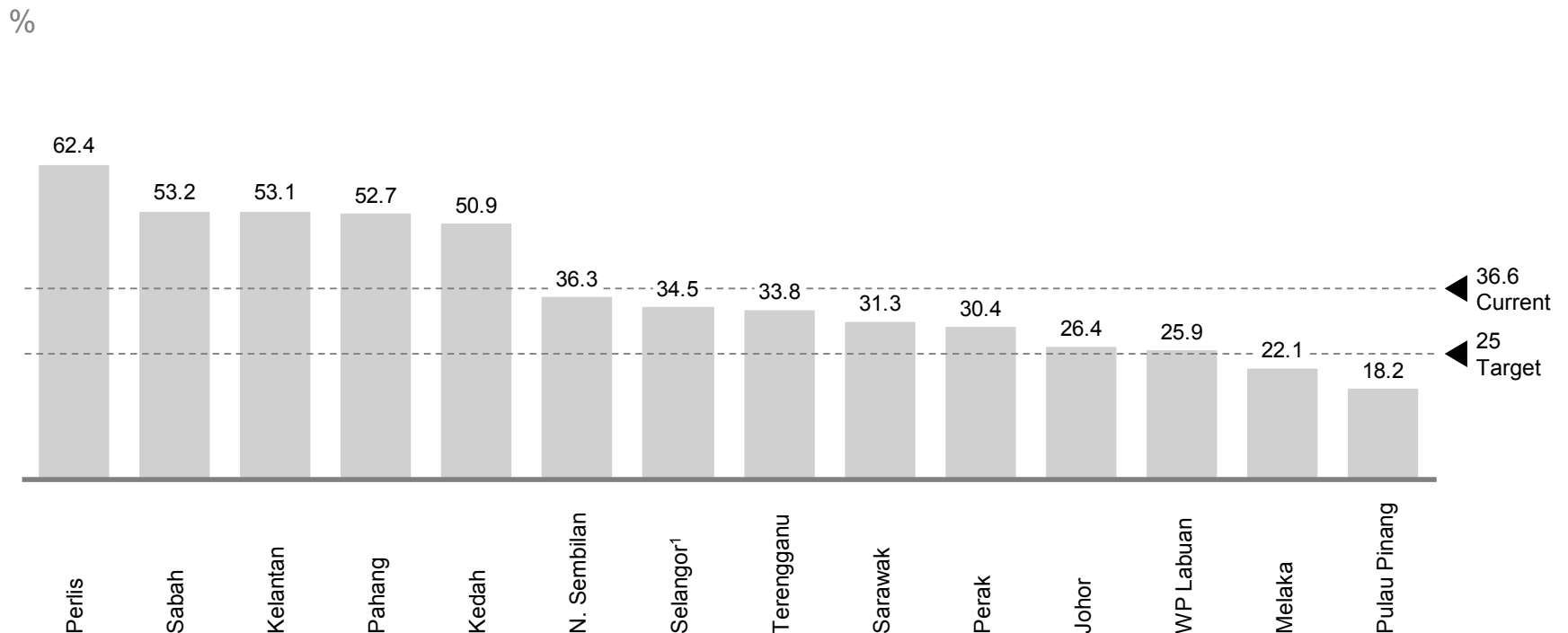
by-products. Guidelines will be introduced under the National Sewerage Master Plan to lay necessary requirements to support these initiatives. In addition, service operators will be encouraged to strengthen their standard operating procedures.

### Establishing a water demand management master plan

The Ministry of Energy, Green Technology and Water (KeTTHA) will develop a master plan on water demand management, which will enable better demand management and provide tools to forecast water demand. Priority will be given to reduce the use of treated water for non-potable uses by using alternative water sources such as rain water harvesting, storm water, and treated waste water. The revision of tariffs will also be used as a water demand management tool. In addition, communications, awareness and education programmes will be intensified to promote the efficient and prudent use of water.

Exhibit 7-15

### Non-revenue water by states in 2013



<sup>1</sup> Selangor includes FT Kuala Lumpur and FT Putrajaya  
Source: Suruhanjaya Perkhidmatan Air Negara



## Focus area E

# Encouraging sustainable energy use to support growth

The security of energy supply is of paramount importance as energy is the primary driver of the nation's growth – affecting not only the quality of life for all Malaysians but also enabling the continued growth of the economy. Malaysia is committed to ensuring energy security for the nation while improving infrastructure and service delivery for the oil, gas and electricity subsectors. Underpinning these efforts are continuing policies to rationalise energy subsidies and move towards a market-based energy pricing so that energy resources are utilised optimally. These aims will be achieved through five strategies:

- **Strategy E1: Strengthening stakeholder coordination and collaboration in the energy sector** through greater institutional collaboration on energy planning and engaging end-users on efficient energy consumption;
- **Strategy E2: Ensuring the security and reliability of supply for the oil and gas subsector within a market-based approach** and reducing market distortions;
- **Strategy E3: Enabling growth in the oil and gas subsector** in downstream oil and gas refining, introducing third party access regulation to allow new entrants into the gas business and implementing clean fuels in the transport sector;
- **Strategy E4: Managing supply diversity for security of the electricity subsector** through better management of resources, enhancing alternative energy sources, and augmenting rural electrification; and
- **Strategy E5: Improving the sustainability, efficiency, and reliability of the electricity subsector** with a sustainable tariff framework and initiatives to improve efficiency and reliability of electricity supply.

### Strategy E1

## Strengthening stakeholder coordination and collaboration in the energy sector

### Fostering greater institutional collaboration on energy planning

A comprehensive governance, that allows for more structured inter-agency collaboration in the area of planning and management for the energy sector, will be instituted. A high-level focal point in the Government will be established to oversee and streamline all energy related policy decisions and execution. In this regard, National Petroleum Advisory Council will oversee comprehensive planning and management of the energy sector and streamline the interests of all parties.

### Engaging end-users on efficient energy consumption

A comprehensive and effective communication plan on the sustainable use of energy resources is required to improve public awareness and understanding, and to manage public perception of the subsidy rationalisation programme. This includes communications and public awareness programmes to build buy-in for the development of coal and nuclear power plants required for security of supply, and for consumers to use energy efficiently in homes, schools, and at workplaces. A task force comprising of representatives of the Government, the private sector, and non-government organisations (NGOs) will be formed to ensure coordinated implementation of the plan.

## **Strategy E2**

### **Ensuring the security and reliability of supply for the oil and gas subsector within a market-based approach**

#### **Ensuring security of supply for gas**

Gas supply security would be ensured through the construction of pipelines from the Malaysia-Thailand Joint Development Area to Kerteh, Terengganu; construction of the RGT-2 in Pengerang, Johor; and the commissioning of two floating LNG units offshore Sabah and Sarawak with a capacity of 2.7 mtpa. In addition, to ensure undisrupted supply during emergencies, a swing field offshore east of Peninsular Malaysia will provide an additional 100-200 mmscfd of natural gas. These additional volumes, together with a 15% buffer of storage capacity from RGT-1 in Sungai Udang, Melaka, will cater for gas demand in Peninsular Malaysia.

Reliability of gas supply in Sabah will be improved with additional pipeline connections from offshore fields to demand centres in FT Labuan, as well as Kota Kinabalu and Kimanis in Sabah. Platforms will be connected through multiple links to provide alternative bypass options and provide capacity to users in the event of platform shutdowns. Improved connectivity for FT Labuan will be realised through the establishment of a pipeline connection between the Sabah-Sarawak Gas Pipeline and FT Labuan. In addition, advanced technology will be deployed in mature and marginal fields to monetise stranded gas.

Distribution of natural gas to scattered and uneconomic demand areas in Peninsular Malaysia and Sabah will be served through virtual pipelines, which is a method of distributing natural gas from city gate to consumers using trucks. This will reduce the cost of production for industries. Safe and economic alternative distribution methods for natural gas will also be explored.

#### **Reducing market distortion**

Sustained efforts to institute market-based energy pricing will be carried out to reduce the amount of energy subsidies. Initiatives to

review the pricing structure for gas supply will be continued during the Eleventh Plan to gradually align current piped gas prices towards market prices. In addition, Incentive Based Regulation (IBR) for gas will be introduced to ensure efficient resource allocation, usage and sustainable financial performance. The price for RON 95 petrol, RON 97 petrol and diesel will continue to be regulated using the managed float system to stem leakages. Compressed natural gas (CNG) prices will also be reviewed accordingly to gradually remove subsidies and encourage expansion of CNG retail infrastructure.

## **Strategy E3**

### **Enabling growth in the oil and gas subsector**

#### **Supporting the development of Pengerang Integrated Petroleum Complex**

The Refinery and Petrochemical Integrated Development (RAPID) within PIPC is a major development that will add 300,000 bpd of oil refining capacity in Malaysia during the Eleventh Plan. The facility will be able to produce EURO 4M and EURO 5 grade petrol, in addition to 7.7 mtpa of various grades of specialised products such as synthetic rubber and high grade polymer by 2020. In addition, the complex will have a 1,220 MW co-generation power plant of which 620 MW will be utilised by RAPID and the remaining 600 MW exported to the grid. The Government will provide support to construct essential infrastructure such as roads, drainage, and utilities for this development. Another investment in PIPC will be secured by the Johor Petroleum Development Corporation during the Eleventh Plan to complement existing investments by DIALOG-Vopak and PETRONAS.

#### **Moving towards third party access for gas supply to allow new entrants**

Third party gas players will be able to utilise gas supply infrastructure through the enforcement of the amended Gas Supply Act, 1993 (Act 501) in 2016. This will create a level playing field for new entrants to the domestic gas supply market complementing PETRONAS, which is currently the sole player.

In addition, fair competition will be encouraged and a vibrant gas supply market will be created while local industries will be weaned off subsidies. The expected future gas industry growth is estimated to be worth RM2.86 billion.

### Implementation of clean fuel in the transport sector

The utilisation of environmentally friendly fuel will be implemented when RON 95 petrol with EURO 4M, and diesel with EURO 5 standards are introduced during the Eleventh Plan. This is in line with Environmental Quality (Control of Petrol and Diesel Properties) (Amendment) Regulations 2013. In addition, the current B7 programme will be further increased to the B15 programme (blending of 15% palm-based methyl ester with 85% petroleum diesel) in all sectors by 2020. The bio-diesel programme, which will be implemented by the Ministry of Plantation Industries and Commodities, offers the energy sector a sustainable, renewable, and environmentally friendly source of energy, as well as reduces the nation's dependency on imported diesel fuel.

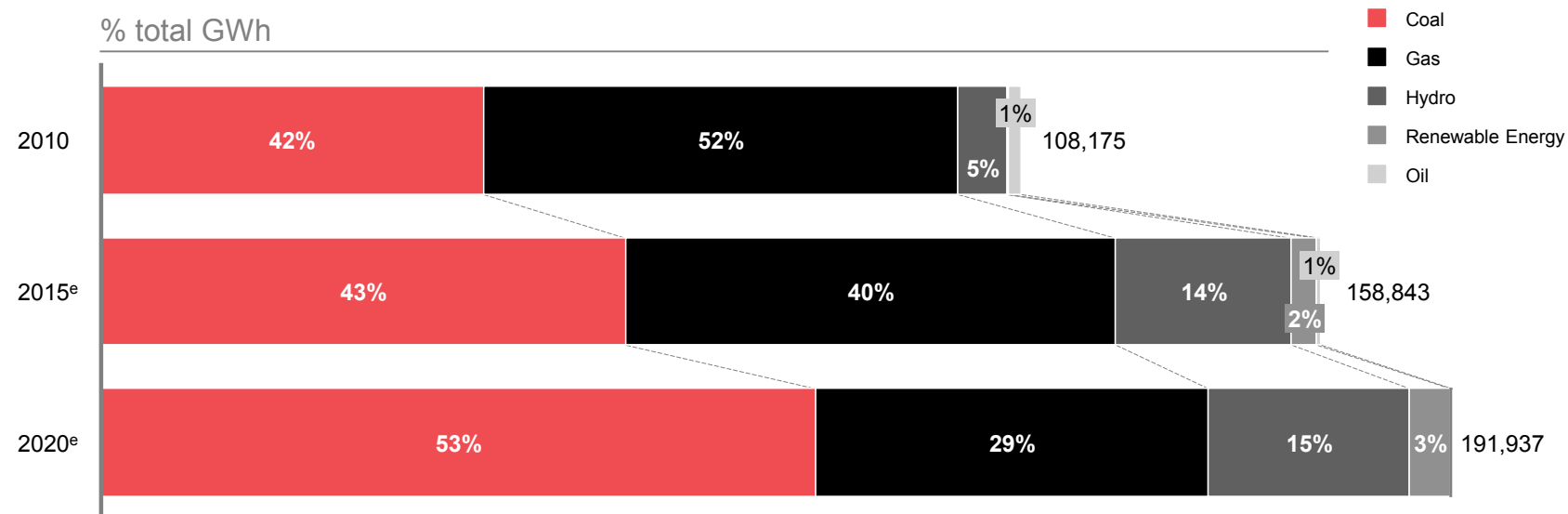
## Strategy E4 Managing supply diversity for security of the electricity subsector

### Ensuring electricity supply security through better management of resources

The electricity subsector will maintain an optimum generation mix, which takes into account economic, social, and environmental factors. This will be guided by the Hirschmann-Herfindahl Index or HHI<sup>5</sup>, a fuel diversity index which will be adopted for efficient management of resources. During the Eleventh Plan, the optimisation of fuel mix and exploration of alternative fuels will be given priority to reduce the nation's dependency on fossil fuels for electricity generation. The expected electricity generation mix is shown in Exhibit 7-16.

Exhibit 7-16

### Generation mix in Malaysia



<sup>e</sup> Estimated  
Source: Energy Commission

<sup>5</sup> The HHI target is set at below 0.5 in 2020. A HHI of 0.5 indicates there will be no dependence on any particular fuel while a HHI exceeding 0.5 reflects overdependence on certain fuel resources. The HHI for 2014 is 0.45, which indicates a healthy index.

The Government will ensure that future power planting up must incorporate more stringent emission control technologies to ensure a progressive reduction of the energy industry's carbon footprint. Usage of clean and green energy sources in power generation will be made a priority and is expected to be increased substantially in the generation mix. Malaysia needs the right balance between economic, environmental, technology adaptation, and social considerations to ensure all aspects are considered before installing new capacity.

### Enhancing alternative energy sources

The Government will study new potential RE sources to enhance the generation mix. During the Eleventh Plan, biomass and biogas power plants will be pursued because of the large potential of these sources. In addition, other RE sources such as wind, geothermal, and ocean, as well as off-grid RE facilities, will be explored and promoted. Off-grid electricity supply using RE sources in relevant local areas will be provided in a cost-efficient manner, as successfully implemented in other countries. Electricity generation capacity through renewable sources including biomass, biogas, solar PV, and mini hydro are targeted to reach 7.8% of total installed capacity in Peninsular Malaysia and Sabah by 2020, or about 2,080 MW<sup>6</sup>.

The usage of nuclear power as an alternative energy resource will be explored further. In this regard, an independent atomic energy regulatory commission will be established based on a new comprehensive nuclear law for electricity generation.

The implementation of net energy metering (NEM), especially for solar-generated electricity, will provide savings on electricity bills to consumers. NEM allows RE generators to use the electricity first and feed surplus electricity to the grid. This instrument will enable consumers to use their own generating facilities to offset their consumption of electricity over a billing period.

### Augmenting rural electrification

Rural electrification programmes, especially in Sabah and Sarawak, will be enhanced to improve national coverage to 99% by 2020, as shown in Exhibit 7-17. Electricity supply would be provided through off-grid generation for areas which are too far from the grid. The development of alternative systems such as solar hybrid, mini and pico hydro will be supported by off-grid networks to ensure wider coverage. A pico hydro is a small-scale system with a generation capacity between 0.1 kW and 1 kW which uses flowing water to rotate electrical generator turbines. This system is suitable for rural areas as it does not require construction of dams and has no impact on the environment.

Community involvement in providing rural electrification will be promoted. The Government will explore collaborations with relevant communities to ensure sustainability of rural electrification systems. Partnerships with NGOs will be formed to provide electricity supply for the rural communities using micro hybrid and RE sources. The community's involvement from an early stage is important to reduce the cost of development and maintenance of the electrification system.

### Strategy E5

## Improving the sustainability, efficiency, and reliability of the electricity subsector

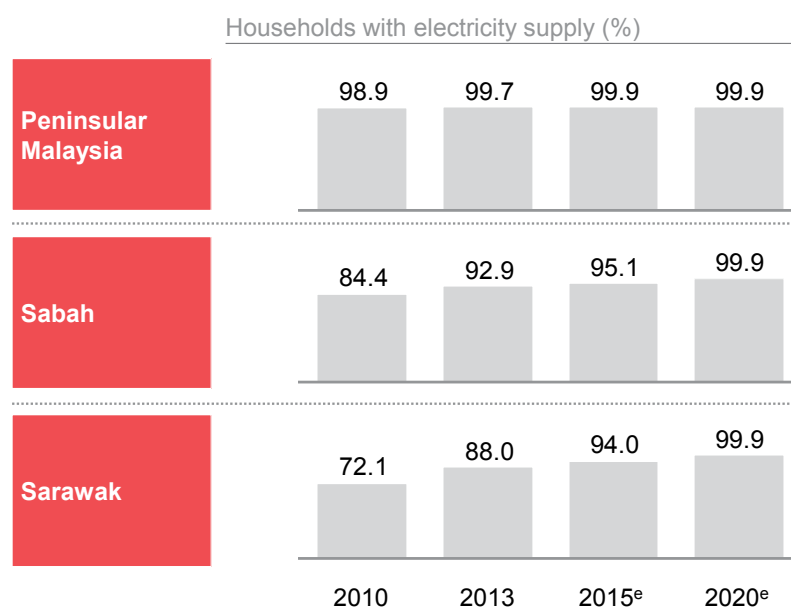
### Creating a sustainable tariff frameworks

In line with the Government's policy to gradually remove energy subsidies, subsidy rationalisation for electricity tariffs will continue to be implemented. Fuel cost is the single largest component of the electricity tariff. Therefore, to ensure that electricity tariffs are affordable for consumers, the generation fuel mix needs to be balanced to optimise the cost of supply. The Special Industrial Tariff will be abolished by 2020. In addition, future tariff increases will take into consideration the availability of safety nets for low-income households.

<sup>6</sup> Excludes large hydro projects

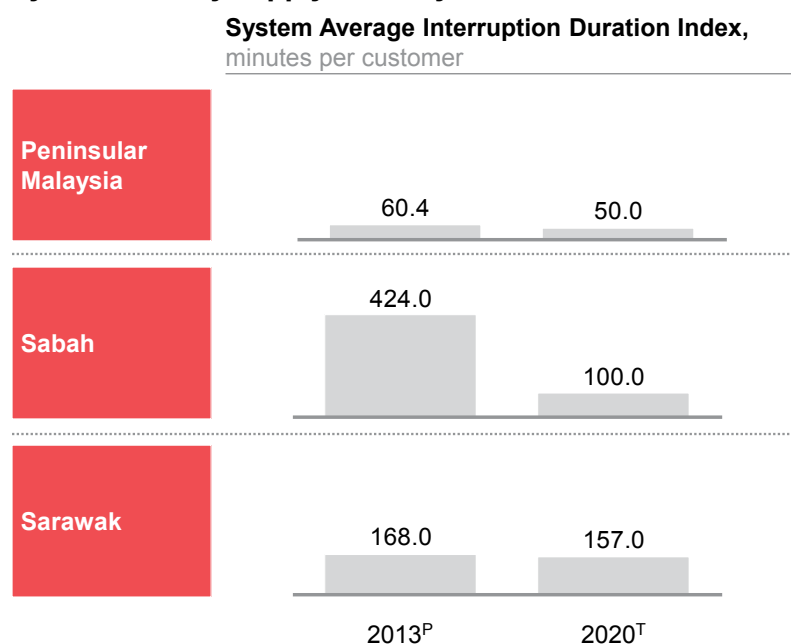


Exhibit 7-17

**Rural electrification in Malaysia**<sup>e</sup> Estimated

Source: Ministry of Rural and Regional Development

Exhibit 7-18

**Reliability of electricity supply in Malaysia**<sup>P</sup> Progress<sup>T</sup> Target

Source: Ministry of Energy, Green Technology and Water, Energy Commission, and Sarawak Energy Berhad

The implementation of IBR will be continued to ensure utility companies provide efficient services. The IBR framework is designed to incentivise utility companies to reduce costs and improve service levels. The separation of generation, transmission, and distribution tariffs with automatic adjustments to take into account changes in fuel prices will increase transparency and efficiency of electricity supply as illustrated in Box 7-3. New additions of power plants and extensions of existing power plants will continue to be selected through competitive bidding for greater transparency. This also creates healthy competition among industry players which will result in more competitive tariffs, and in turn benefits end-consumers.

**Improving efficiency and reliability of electricity supply**

The efficiency and reliability of electricity supply will be further improved through continued investment in generation, transmission, and distribution projects by utility providers. New investment in generation capacity and reinforcement of transmission, and distribution networks will continue in the Eleventh Plan. Construction of new power plants to produce 7,626 MW will be initiated to replace retiring plants and meet the growing peak demand. A number of 500 kV and 275 kV transmission projects to reinforce the grid systems will be completed to enhance the security of supply to major load demand centres. The additional generation capacity coupled with expanded transmission and distribution networks will improve the SAIDI for Peninsular Malaysia, Sabah, and Sarawak as shown in Exhibit 7-18.

## Box 7-3

## Incentive Based Regulation for the electricity subsector

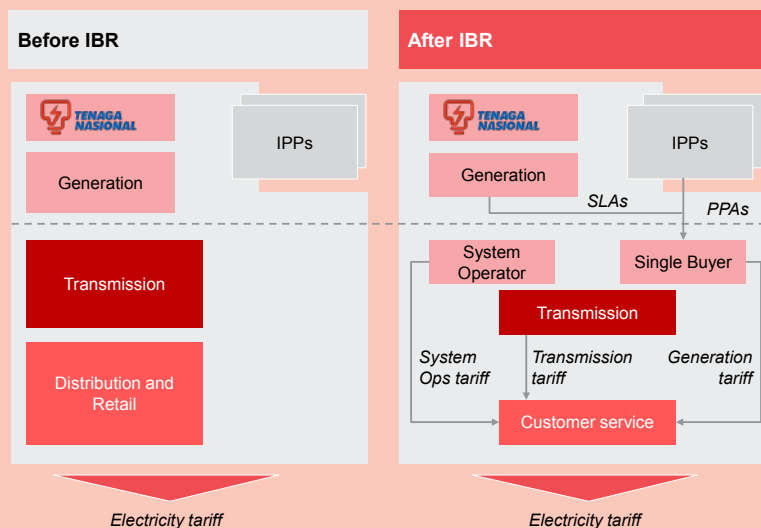
### What is Incentive Based Regulation?

Incentive Based Regulation (IBR) is a core part of the Malaysia Electricity Supply Industry (MESI) restructuring exercise which began in 2009. The first regulatory period of the IBR was launched in January 2014.

It marks a significant structural shift away from the original model towards one of greater transparency as each business

unit of Generation, Transmission, Distribution, Single Buyer and System Operator is unbundled from an accounting standpoint. Under this new model, the Energy Commission, approves the electricity tariff based on a 3-year operations and investment plan submitted by the power utility company. The IBR model further incentivises efficiency gains by the utility, the benefits of which can be passed through to the consumer.

### Incentive Based Regulation concept



### Benefits of the IBR

- **Efficient.** Incorporates mechanisms to incentivise cost efficiencies over every regulatory period and allows the efficiency gains to be passed through to end-users;
- **Transparent.** Allows the regulator greater transparency over the operational and financial performance of every business unit including Generation, Transmission, Distribution, Single Buyer, and System Operator;
- **Financially Sustainable.** Enables periodic pass-through of fuel-related and other generation specific costs through the Imbalance Cost Pass-Through mechanism, while providing a fair return to the utility; and
- **Enables Growth.** Allows for recovery of future investments, provided they are done in a cost-efficient manner, and therefore ensures security of electricity supply to the nation.

## Conclusion

Good infrastructure is a fundamental enabler of economic expansion, social inclusion and growth. In the Tenth Plan, network expansion of infrastructure such as road, rail, water, digital infrastructure, gas and electricity were undertaken to improve accessibility and standards of living. In the Eleventh Plan, investment in roads, rail, ports, and air services will be balanced with efforts to improve productivity, efficiency, and service level of such infrastructure. To enhance national competitiveness and lower the cost of doing business, the logistics services will be improved and trade facilitation mechanisms will be strengthened. The capacity and coverage of water services and digital infrastructure will be expanded with greater emphasis on efficiency and affordability. The security and reliability of the energy supply will be strengthened by addressing both supply-side and demand-side measures. The successful implementation of the strategies outlined will enable Malaysia to achieve its vision of becoming an advanced economy and inclusive nation by 2020.