

Annex 2:

Individual Economy Reports



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AEPR 2018: Structural Reform and Infrastructure

Individual Economy Report Questionnaire

This year's AEPR is on the topic of structural reform and infrastructure, with a focus on how structural policies for infrastructure can improve the efficiency of infrastructure provision and management, support inclusive growth and promote economic and environmental resilience. Challenges in the provision and management of digital infrastructure and supporting connectivity between economies will be cross-cutting themes throughout the report, given the importance of digital technology and connectivity to economic growth going forward. Economies are encouraged to include learnings on these themes.

As an important aspect of the AEPR, the Individual Economy Reports (IERs) provide an opportunity for economies to identify ways forward for structural reform to improve infrastructure provision and management, support inclusive growth and improve resilience. The IERs will be incorporated into the report, and will contribute to developing a broader picture of the lessons, gaps, challenges, and opportunities in implementing structural reform for infrastructure. The IERs will also contribute to identifying avenues for regional cooperation and capacity building.

For the purposes of this questionnaire, we define structural reforms for infrastructure as including reforms relating to: public sector governance and management, competition policy, ease of doing business, standards and international norms relating to infrastructure¹, the regulation of or legal framework for infrastructure, or for markets that support infrastructure (such as funding markets/related service markets), among others. Policies are included if their ultimate aim is to: improve the efficiency of infrastructure provision and management; improve the operation of markets relating to infrastructure; support broad access to infrastructure across the population in order to ensure the benefits of infrastructure investment are widely shared; or support the resilience of infrastructure and related markets.

For the purpose of this report infrastructure systems that are resilient are systems that can withstand disruption, absorb disturbances and recognise changing conditions over time, and in particular are robust to emergent and shock events from new technology, temperature extremes and weather events. Furthermore, we define inclusive growth as a pattern of economic growth that provides greater opportunities for economic participation and employment among underprivileged segments of society, or segments of society that are underserved in terms of infrastructure, such as remote regions, the poor, indigenous peoples, minorities, women or youth and people living with disabilities.

Where an economy has provided a case study that it wishes to use in this IER, the economy may cross refer to that case study. Economies should provide the following information to the extent available for their economy:

¹ Examples of standards and international norms include G7 Ise-Shima Principles for Promoting Quality Infrastructure Investment and the WTO's Agreement on Government Procurement.

Questionnaire

Please limit responses to a maximum of four pages in total.

Capabilities: what significant policy or institutional structures (e.g. top 2) support your economy in meeting the following objectives. Economies could discuss whole of Government policies or policies that apply at a sector specific level:

- **Cost effectiveness:** Providing for the efficient provision and management of infrastructure and the efficient operation of infrastructure markets, including providing for cost-based access;
- **Resilience:** Enhancing adaptability and ensuring the infrastructure system is robust to disruptions and shocks;
- **Inclusion:** Ensuring broad access (e.g. across regions, genders, underserved or minority groups and indigenous people) to infrastructure, including digital infrastructure, to support inclusive growth?

Gaps: What are the highest priority structural or institutional reforms you have identified to meet these objectives?

Barriers and challenges: What are the key barriers and challenges to implementing structural reforms for infrastructure in your economy and has your economy identified any solutions to overcome those barriers or challenges?

Needs and financing requirements: What are your economy's main (e.g. top 2-3) identified physical and digital infrastructure needs over the medium-long term? Please describe the required financing and expected impact of these infrastructures.

Future needs: What are the main factors (e.g. population increase, technology, climate change or variability, ageing capital stock) that will influence your economy's future physical and digital infrastructure needs?

Leading practices: Among your economy's structural reforms relating to infrastructure in the past 5 years (2013-2018), which two do you think have been implemented most effectively? Please identify the main reasons for the effectiveness of this structural reform that could be relevant for other economies.

Regional cooperation: What role can regional cooperation and regional bodies such as APEC play? You may like to consider the role of cooperation in addressing the challenges and policy gaps previously identified, in enhancing the investment environment, in making more possible cross-border/regional connectivity projects and in promoting co-ordination of development funding.

How can we ensure that Asia Pacific has top-quality physical and digital infrastructure to ensure maximum connectivity? What would be the benefits to your economy from improved connectivity?

AUSTRALIA

Capabilities: what significant policy or institutional structures (e.g. top 2) support your economy in meeting the following objectives. Economies could discuss whole of Government policies or policies that apply at a sector specific level:

- **Cost effectiveness:** Providing for the efficient provision and management of infrastructure and the efficient operation of infrastructure markets, including providing for cost-based access;
- **Resilience:** Enhancing adaptability and ensuring the infrastructure system is robust to disruptions and shocks;
- **Inclusion:** Ensuring broad access (e.g. across regions, genders, underserved or minority groups and indigenous people) to infrastructure, including digital infrastructure, to support inclusive growth?

Gaps: What are the highest priority structural or institutional reforms you have identified to meet these objectives?

Barriers and challenges: What are the key barriers and challenges to implementing structural reforms for infrastructure in your economy and has your economy identified any solutions to overcome those barriers or challenges?

In Australia, responsibility for the provision of most economic and social infrastructure lies with the state, territory and local governments. In some States, core utilities (electricity and telecommunications) are provided by both private and public entities. However, in others, major utilities service providers are owned by the State. The other tiers of government are primarily responsible for planning and providing public services (such as schools, hospitals, roads, water and sewerage).

The states, territories and local governments raise revenues from taxes and charges to fund the delivery of these and other services they provide. To supplement this, the central government provides additional funding support to the other tiers of government through general-purpose financial assistance grants and grants for individual transport infrastructure projects. Each government is responsible for planning, delivery and operation of their services, which is done through departments and with ministers accountable for this to their communities. In many States, this is supported by independent infrastructure planning and advisory bodies, who provide written advice to the government on specific infrastructure matters. This includes assessment of government or private sector proposals, government infrastructure plans and intergovernmental submissions.

In 2008, the Australian Government established Infrastructure Australia (IA) to advise on Federal financial support for transport and other infrastructure. IA provides independent research and advice to all levels of government as well as investors and owners of infrastructure on projects and reforms Australia needs in order to fill the infrastructure gap. Australia released its first Infrastructure Plan, which sets out the infrastructure challenges, and opportunities Australia faces over the next 15 years.

In March 2018, IA released an update to the Infrastructure Priority List. The **Priority List** is a critical reference point for the most important investments needed to address critical infrastructure gaps. The Priority List is updated regularly to reflect emerging infrastructure priorities across Australia and provides independent, evidence-based advice to governments and industry on the projects that will most benefit our growing communities. The latest Priority List identifies over \$A55 billion worth of economy-shaping projects. Of the five highest priority projects, four relates to addressing urban road congestion and one relates to economy-wide connectivity and boosting Australia's aviation capacity.

These arrangements at the economy-wide and state/territory/local level are intended to provide the institutional structures to support sound decisions on economic and social infrastructure. They are also intended to facilitate good outcomes but decisions are ultimately made by governments taking advice into account which are accountable to the community.

Australia has a long history of structural reform in infrastructure. Over the 1980s and 1990s, the Australian Government partially deregulated and restructured airlines, coastal shipping, telecommunications and wharves/ports. In addition, across-the-board commercialisation, corporatization and privatization initiatives for government business enterprises were progressively implemented around the same time.

The Australian Government is committed to continued improvement of its infrastructure delivery in the water, telecommunications, transport and energy infrastructure markets. Key barriers and challenges to implementing structural reform for infrastructure are emerging technologies (including rapid speed of change) and barriers to entry for mobile network providers in regional Australia.

The Australian Government recognises that new, flexible approaches to regulation will enable technological benefits to be realised, reducing barriers to competition in infrastructure services and delivering efficiency gains to consumers and businesses. The Government considers, and seeks to reduce the regulatory burden on businesses, individuals and community organisations, through its Regulatory Reform Agenda, under which it made decisions to reduce red tape by a net \$4.8 billion between September 2013 and December 2015. In November 2015, the Government announced it would strengthen the Regulatory Reform Agenda to focus on changes enhancing innovation, competition and productivity.

The construction and completion of the National Broadband Network (NBN) will improve telecommunications in Australia, including in regional areas. The Government expects NBN Co Limited to make the NBN fixed wireless towers open to co-location from mobile network operators. As a result, mobile network operators have begun co-locating equipment on a number of NBN fixed wireless towers. NBN Co Limited has developed a Cell Site Access Product, which will enable it to leverage the Government's investment to deliver additional telecommunication service improvements in regional areas. In addition, the Government's Mobile Black Spot Program (rounds 1 and 2) encourages the sharing of mobile base stations and associated infrastructure by mobile network operators.

Needs and financing requirements: What are your economy’s main (e.g. top 2-3) identified physical and digital infrastructure needs over the medium-long term? Please describe the required financing and expected impact of these infrastructures.

Future needs: What are the main factors (e.g. population increase, technology, climate change or variability, ageing capital stock) that will influence your economy’s future physical and digital infrastructure needs?

Australia’s three main identified physical infrastructure medium-long term needs are:

- **Sydney Metro:** Increasing the City and Southwest rail network capacity (see pg 20 of **priority list**)
 - Funded jointly by the Australian Government, the State Government and the Private Sector
 - The project’s major benefits will be for public transport users through travel time savings and reliability improvements. The proponents stated benefit-cost ratio for conventional benefits is 1.3.
- **Western Sydney Airport:** Boosting domestic connectivity (see pg 21 of **priority list**)
 - Funded jointly by the Australian Government and the Private Sector
 - Addressing the identified capacity constraint would improve productivity and facilitate broader economic impacts such as increased trade, tourism and foreign direct investment, and wider economic benefits such as agglomeration benefits derived from improved connectivity between businesses (including the clustering of airport businesses). The proponents stated benefit-cost ratio is 1.9 (7% real discount rate), not including wider economic benefits.
- **Southern Sydney to CBD public transport enhancement:** connection between inner south urban area and Sydney CBD (see pg 41 of **priority list**)
 - Funding, options development and benefits to be determined.

The major digital infrastructure requirement is ensuring access to reliable broadband internet. The Australian Government is delivering an economy-wide broadband optical fibre network which is being undertaken by a government owned company and funded by equity and debt provided by the Australian Government. The NBN Co charges wholesale rates to internet service providers that provide end users with services at retail rates. The NBN is underpinned by a purpose to connect Australia and bridge the digital divide. NBN’s key objective is to ensure all Australians have access to fast broadband as soon as possible (2020), at affordable prices, and at least cost.

Australia’s historically has high current levels of population growth and expected aging are significant challenges in the medium to long term. The arrangements noted above (in the previous question) are intended to deal with this challenge by providing the planning and delivery structures to support appropriate infrastructure decisions.

Leading practices: Among your economy’s structural reforms relating to infrastructure in the past 5 years (2013-2018), which two do you think have been implemented most effectively? Please identify the main reasons for the effectiveness of this structural reform that could be relevant for other economies.

The establishment of independent infrastructure planning arrangements by the national and lower tiers of government provides a strong platform for sound funding decisions to be made.

A continued focus towards adopting market-based arrangements for infrastructure delivery has provided a good platform for increased efficiency and effectiveness of infrastructure services. This improves the quality of resource allocation decisions and increases productivity throughout the economy. Much of the structural reform initiative were undertaken prior to this period but it remains a core policy achievement and an ongoing priority.

Regional cooperation: What role can regional cooperation and regional bodies such as APEC play? You may like to consider the role of cooperation in addressing the challenges and policy gaps previously identified, in enhancing the investment environment, in making more possible cross-border/regional connectivity projects and in promoting co-ordination of development funding.

How can we ensure that Asia Pacific has top-quality physical and digital infrastructure to ensure maximum connectivity? What would be the benefits to your economy from improved connectivity?

APEC is the premier forum for facilitating economic growth, cooperation, trade and investment in the Asia-Pacific region. APEC operates on the basis of non-binding commitments, open dialogue and equal respect for the views of all participants. Unlike the WTO or other multilateral trade bodies, APEC has no treaty obligations required of its participants. Decisions made within APEC are reached by consensus and commitments are undertaken on a voluntary basis. APEC's non-binding, consensus approach creates an environment to incubate ideas.

APEC has established a strong work plan on procuring infrastructure. This includes enhancing the government's ability to plan infrastructure projects considering lifecycle cost, environment, safety, quality. The APEC Guidebook on Quality of Infrastructure and Development and Investment is an example of shared best practices for government officials and other stakeholders to detail common recognitions for infrastructure development and investment. In addition, APEC has played a role towards bridging the infrastructure-funding gap in the region.

Australia stands to gain from improved regional infrastructure services through trade and the experience and skills it can offer regional economies.

BRUNEI DARUSSALAM

Capabilities: what significant policy or institutional structures (e.g. top 2) support your economy in meeting the following objectives. Economies could discuss whole of Government policies or policies that apply at a sector specific level:

- **Cost effectiveness:** Providing for the efficient provision and management of infrastructure and the efficient operation of infrastructure markets, including providing for cost-based access;
- **Resilience:** Enhancing adaptability and ensuring the infrastructure system is robust to disruptions and shocks;
- **Inclusion:** Ensuring broad access (e.g. across regions, genders, underserved or minority groups and indigenous people) to infrastructure, including digital infrastructure, to support inclusive growth?

Gaps: What are the highest priority structural or institutional reforms you have identified to meet these objectives?

Barriers and challenges: What are the key barriers and challenges to implementing structural reforms for infrastructure in your economy and has your economy identified any solutions to overcome those barriers or challenges?

In Brunei Darussalam, to determine if an infrastructure procurement is cost effective, the Ministry and its Department estimates the cost of the project based on the market value of its goods, materials and services. They will also need to make sure that the estimation is not over the budget allocated for the project.

For the purpose of this report, Brunei Darussalam will be looking into its Infrastructure Development Strategy. The Infrastructure Development Strategy under the stewardship of the Ministry of Development, working with various government agencies including the Ministry of Communications, Ministry of Health, and the Ministry of Education. The domestic objective is to promote economic prosperity, growth and contribute towards a high quality of life by providing adequate social and economic development such as public housing, communication, health care and education.

One of the pillars for the Infrastructure Development Strategy is to ensure continued government investment by leveraging on public-private sector partnership in developing and maintaining infrastructure. Under this strategy, the Government focuses on the following policies in the Infrastructure Development Strategy:

1. Cost effectiveness

The Ministry of Development continues to improve the quality of infrastructure as well as the sustainability of infrastructure funding through the following key initiatives: -

- a. Reviewing the Government's infrastructure procedures such as reviewing contracts that are awarded and managed in order to ensure that any infrastructure projects are implemented on time and cost-effectively;
- b. Leveraging on Public-Private-Partnerships (PPP) for economically viable projects by adopting appropriate legal and regulatory frameworks to promote

- investment in social and industrial infrastructure, including privatization and public-private partnerships (PPP) in line with international best practice; and
- c. Alternative financing and procurement in the form of involving private developers or investors in Design-Build-Operate-Transfer procurement.

2. Resilience

The Ministry of Development's priority is to ensure well-planned and optimized future investments for integrated and resilient assets. On disaster mitigation infrastructure, the Ministry has successfully built infrastructure, particularly on water, sanitation and drainage to alleviate some of the regular incidences of flash floods in Brunei Darussalam. Our economy does not experience any occurrences of major disruptions and shocks.

3. Inclusion

The Ministry of Development has always been committed towards providing the highest level of its provisions and services to the people regardless of their social status. The Ministry's main priority is enabling affordable infrastructure and services as a means for inclusive development and economy building. For example:

- Road Connectivity

Roads are the main mode of connectivity in Brunei Darussalam for the movement of people as well as goods and services.

- To date, Brunei Darussalam's road-related assets includes approximately 3,100 kilometers of roads, 279 bridges, 20 flyovers, 19 pedestrian bridges, 30 major roundabouts and 1 underpass.
- Currently, road connectivity is at 97%.

- Rural-Urban Development

Disparity in rural-urban development is being monitored closely by the Ministry of Development to strike a balanced rural-urban development and promote inclusivity. To this end, all major development projects are planned. Our physical planners are guided by the National Land Use Master Plan 2006-2025 (NLUMP 2006-25), which has 26 key Planning Policy Areas.

Gaps and priority reforms:

- Focusing and ensuring the completion of high impact projects can be achieved by consistent monitoring and reviewing of the development plan.
- Alternative financing methods have been identified to encourage public private partnerships (PPP) to raise additional financing. The Ministry is currently reviewing the legal and regulatory framework conditions as well as other institutional arrangements to allow financing flexibility. This may lead to more effective and efficient financing and/or delivery of infrastructure;
- Emphasis on land optimization strategy to provide continued and improved benefits to society, and to cater to the current and future needs of Brunei Darussalam.

Barriers and Challenges

- Aging infrastructure assets are costly to upgrade and/or maintain. In Brunei Darussalam, this maintenance cost is incurred by the Government.

Possible Solutions:

- Public Private Partnerships
- To create effective mechanisms for cost recovery for the maintenance of the infrastructure built
- Value engineering to evaluate cost effectiveness of projects.

- The need to bring in new methodology (i.e. best practices or technology) in construction to reduce cost on any infrastructure sector over the long run.

Possible Solutions:

- Capacity building for technical professionals in the area of innovative construction methodologies as well as in the area of project management and implementation
- Adoption of new construction technologies that can assist in efficient and effective construction practices.
- Shortage of data hinders the process of prioritizing projects.

Possible Solution: To integrate the data from all relevant sectors into one platform through cross-sectoral mechanism.

Needs and financing requirements: What are your economy's main (e.g. top 2-3) identified physical and digital infrastructure needs over the medium-long term? Please describe the required financing and expected impact of these infrastructures.

Future needs: What are the main factors (e.g. population increase, technology, climate change or variability, ageing capital stock) that will influence your economy's future physical and digital infrastructure needs?

Needs and financing requirements

- The immediate priority for physical infrastructure is the provision of adequate quality housing to cater towards the increasingly high demand for public housing and to expedite construction and delivery time, sustainability, as well as enhance affordability of home ownership.

Future needs

The main factors that will influence Brunei Darussalam's future infrastructure needs are the economy's ageing capital stock and economic diversification. Brunei Darussalam's ageing capital stock continues to make it a priority for significant investments, in order to modernise the economy. This will ensure optimal performance thereby reducing long-term costs.

Infrastructure improvements are also needed to support Government's economic diversification goals. It can contribute towards economic diversification through various avenues such as reducing transaction costs, cultivating increased foreign direct investment, and enhancing productivity.

Growing demand for housing and other social infrastructure will inevitably exert pressure on the available land and natural resources and hence the Ministry of Development will have to manage the competing needs for social and economic growth on limited developable land uses.

Balanced development and sustainability of the environment is another critical priority for infrastructure development so as not to compromise the environment for our future generations.

Leading practices: Among your economy's structural reforms relating to infrastructure in the past 5 years (2013-2018), which two do you think have been

implemented most effectively? Please identify the main reasons for the effectiveness of this structural reform that could be relevant for other economies.

Leading Practices

1. As part of the improvement for Registering Properties, one area that will have a positive impact on Brunei Darussalam's real estate sector is the recent implementation of the new Land Code (Amendments) 2016. This will allow foreigners and permanent residents to acquire land ownership under the Strata Title for an extended lease term of between 60 to 99 years. With this change in place, the growth of strata property market in the future looks very promising and this will definitely boost the attractiveness of FDI in the real estate sector for Brunei Darussalam.
2. Another structural reform undertaken by the Ministry of Development is the review and streamlining of construction approval processes that now only takes 7 days for developers and companies to obtain 'Planning Permission' from the Ministry of Development. The Construction Permit processes - obtaining planning permission, granting development approval and occupational permit - have been consolidated, which has resulted in the reduction in number of steps to only six steps.
3. The introduction and use of online portals have also accelerated the application processes. For example, OneBiz of Negara Brunei Darussalam is a one stop online portal to ease the starting up of businesses in Brunei Darussalam and its use has improved the submission processes across all agencies involved. Another online portal, the Planning Permission Electronic System, also known as e-KP, accelerates the planning permission application process.

Regional cooperation: What role can regional cooperation and regional bodies such as APEC play? You may like to consider the role of cooperation in addressing the challenges and policy gaps previously identified, in enhancing the investment environment, in making more possible cross-border/regional connectivity projects and in promoting co-ordination of development funding.

Regional Cooperation

- Through the sharing of knowledge, experience and best practices as well as success stories among Asia Pacific economies, particularly on planning and execution of policy implementation, it can serve as a guide for Brunei Darussalam to design policies specific to the economy's needs.
- Sharing data and key resources, such as the exchange of professionals among Asia-Pacific economies, through capacity building, training and workshops.
- Match-making key industry players, through conducting public-private sector dialogues and academic experts, to assist in narrowing some of the key common gaps identified by Asia-Pacific economies in the region.

How can we ensure that Asia Pacific has top-quality physical and digital infrastructure to ensure maximum connectivity? What would be the benefits to your economy from improved connectivity?

- Closer collaboration and to conduct high impact physical infrastructure projects regionally with APEC economies through joint-funding mechanisms.

CANADA

Capabilities: what significant policy or institutional structures (e.g. top 2) support your economy in meeting the following objectives. Economies could discuss whole of Government policies or policies that apply at a sector specific level:

- **Cost effectiveness:** Providing for the efficient provision and management of infrastructure and the efficient operation of infrastructure markets, including providing for cost-based access;
- **Resilience:** Enhancing adaptability and ensuring the infrastructure system is robust to disruptions and shocks;
- **Inclusion:** Ensuring broad access (e.g. across regions, genders, underserved or minority groups and indigenous people) to infrastructure, including digital infrastructure, to support inclusive growth?

The ‘Investing in Canada’ plan is the Government of Canada’s comprehensive, long-term plan towards building a prosperous and inclusive economy through historic infrastructure investments. Over the 12 years of the plan, starting in 2016, the Government will invest over \$180 billion in infrastructure—more than doubling existing federal funding—to achieve long-term economic growth, improve the resilience of communities and social inclusion and socioeconomic outcomes for all Canadians.

Cost Effectiveness: Canada will make significant investments over the long-term in five priority investment streams: public transit (\$28.7 billion), green infrastructure (\$26.9 billion), social infrastructure (\$25.3 billion), infrastructure for rural and northern communities (\$2 billion) and trade and transportation infrastructure (\$10.1 billion). In addition, the Plan includes permanent funding such as the Gas Tax Fund and funding committed prior to 2016 such as the New Building Canada Fund. These targeted investments will ensure that federal dollars are used to address key infrastructure priorities across the economy. As part of the long-term infrastructure plan, \$33 billion will be delivered over 10 years through integrated bilateral agreements (IBAs) between the federal government and each of the provinces and territories. We have worked with other levels of government to ensure that this spending will be effective and, provide flexibility within an outcomes-based framework. This is significant change from the way infrastructure funding in Canada was allocated in the past.

Resilience: To ensure that Canada’s communities are healthy and are productive places to live, now and in the future, Canada is investing in sustainable solutions. Green infrastructure investments have the potential to help achieve GHG reductions across various sectors and can drive innovation and growth by increasing technology development and adoption. Disasters related to climate change are increasing in scale and severity. Investments in infrastructure specifically designed for climate impacts, including innovative nature-based solutions, enhance the resilience of Canadian communities while continuing to safely provide essential services. By accounting for the effects of climate change in infrastructure development, communities will be better prepared to respond and recover from severe weather events.

Inclusion: Canada’s investments in infrastructure will seek to leverage infrastructure investments to address socio-economic inequality, by understanding that certain populations and groups face disadvantages and have unique needs. Under the ‘Investing in Canada’ plan, funding

will be targeted towards communities in which investments are needed the most. For example, the Government uses the Gender-Based Analysis + (GBA+), an analytical tool that measures the impact of legislation, policies and programs on diverse groups of Canadian women and men, as part of its policy development and project review processes.

The Government has also integrated a Community Employment Benefits (CEB) initiative in its long-term infrastructure plan. The CEB will focus on providing employment and/or procurement opportunities for apprentices, Indigenous peoples, women, persons with disabilities, veterans, youth, newcomers to Canada, small and medium-sized enterprises and social enterprises.

Gaps: What are the highest priority structural or institutional reforms you have identified to meet these objectives?

Cost Effectiveness: The ‘Investing in Canada’ plan is an evolution on how the federal government delivers infrastructure funding. It moves towards an approach that promotes partnerships with other orders of government to align priorities and programs. This is an important shift in approach, as these partnerships allow the federal government to leverage and thus significantly increase the reach of funding from the Plan. Bilateral agreements with provinces and territories in particular represent a key delivery mechanism for the Plan.

The Government also understands the need to innovate and try new approaches to fund infrastructure in Canada. The Canada Infrastructure Bank (CIB) is an additional tool available to provinces, territories, municipalities and Indigenous communities to leverage public funds to attract private sector and institutional investment for new, revenue-generating infrastructure projects in the public interest. The CIB will invest \$35 billion over 11 years, using loans, equity investments and other innovative financial tools.

In addition, the Government launched the Smart Cities Challenge, a Canada-wide competition open to communities of all sizes, including municipalities, regional governments and Indigenous communities. The Challenge encourages communities to improve the lives of their residents by using data and connected technology in innovative ways. The Challenge will deliver \$300 million in prizes over 10 years through a total of three competitions

Resilience: One of the main objectives of the ‘Investing in Canada’ plan is to improve the resilience of communities and transition towards a clean growth economy. The Plan will address persistent challenges to air, water and soil quality and make Canadian communities more resilient to climate change, natural disasters and extreme weather events. Infrastructure that reduces greenhouse gas emissions through cleaner electricity grids, energy efficient buildings and transportation systems sets us on a path towards a low-carbon future. Other investments in green infrastructure are building Canada’s resilience to the risks we face from the impacts of climate change.

Inclusion: The Plan will contribute towards building communities where all Canadians have the opportunity to succeed. It will do this by improving access to quality affordable housing, shelters, early learning and child care, cultural, sport and recreation infrastructure and reliable public transit. The Plan also addresses pressing needs within Indigenous communities. Investments will also improve physical accessibility and safety for persons with disabilities.

Barriers and challenges: What are the key barriers and challenges to implementing structural reforms for infrastructure in your economy and has your economy identified any solutions to overcome those barriers or challenges?

A key challenge to implementing structural reforms for infrastructure in Canada is the **need for better infrastructure data**. Canada lacks information and data on infrastructure investments, but also on existing capital assets across the economy. The lack of information on existing infrastructure assets can be a serious barrier towards implementing meaningful structural reforms and investments in infrastructure in Canada. It is important to note that provinces, territories and municipalities own close to 98% of the net stock of core public infrastructure in Canada (Statistics Canada: 2016). Municipalities that do not possess asset management strategies can be limited in their ability to develop and implement medium to long-term investment strategies in infrastructure.

The Government of Canada launched Canada’s Core Public Infrastructure (CCPI) survey in July 2017 to improve the knowledge and understanding of Canada’s core public infrastructure assets across the economy. In Fall 2018, a summary of the 2017 key findings will be available online. Key elements of the CCPI survey will be repeated every two years, and over time it will give decision makers from all orders of government a clear view of trends on the state and performance of core public assets. The government is also providing financial support to Canadian municipalities to develop sound asset management practices.

Needs and financing requirements: What are your economy’s main (e.g. top 2-3) identified physical and digital infrastructure needs over the medium-long term? Please describe the required financing and expected impact of these infrastructures.

Over the next 10 years, the Government of Canada, through the ‘Investing in Canada’ plan, will invest over \$180 billion in infrastructure in the areas of public transit, green, social and rural and northern infrastructure. In addition to federal investments, provinces, territories and municipalities will make significant investments over the same period of time, in areas such as health, education, transportation, digital connectivity, culture and municipal infrastructure.

Subnational jurisdictions in Canada face different infrastructure challenges based on their respective demographics, socioeconomic context, climate and geographic location. However, certain needs and challenges appear to be shared across jurisdictions, such as easing road congestion in large urban centres, lack of telecommunications infrastructure in rural and northern communities, and enhancement of trade corridors to ensure that Canadian goods and resources are moved to domestic and international markets as efficiently as possible.

According to the Advisory Council on Economic Growth, which was established by the Government of Canada in 2016, estimates of the infrastructure gap in Canada ranges from \$150 billion to \$1 trillion. Although the federal, provincial and territorial governments are making significant long-term investments in infrastructure, there is a need for other sources of financing to bridge the infrastructure gap in Canada. The Advisory Council on Economic Growth suggests that the participation of financial institutions such as banks, pension funds, sovereign wealth funds and other long-term investors can help further leverage and amplify public dollars spent on infrastructure.

That is also why the Government of Canada established the CIB in 2017. The CIB will make investments in revenue-generating infrastructure projects that are in the public interest, and seek

to attract investment from private sector and institutional investors for those projects. This is an innovative partnership model between all orders of government, across all regions of Canada, leveraging the expertise of the private sector.

Infrastructure investments can lead to economic growth and productivity. According to the Advisory Council on Economic Growth, infrastructure drives economic productivity year after year to the tune of 20 to 50 cents on every dollar invested over the longer term. In addition to strong economic growth, infrastructure investments can improve the resilience of communities as well as social inclusion and socioeconomic outcomes for citizens.

Future needs: What are the main factors (e.g. population increase, technology, climate change or variability, ageing capital stock) that will influence your economy's future physical and digital infrastructure needs?

Physical and digital infrastructures contributes directly towards Canada's economic growth. Both of these sub infrastructure sectors are influenced by various social, structural, environmental and technical factors. Canada has identified four main factors affecting its economy future physical and digital infrastructure needs namely ageing population, ageing capital stock, climate change, and disruptive technology.

Ageing population: Canada's population is in the midst of a fundamental shift. In 2016, approximately 16.9 per cent of Canadians were 65 years old and over; by 2030, that number will jump to nearly 25 per cent. This demographic change presents new challenges as well as new opportunities for Canadian society. Immigration policies are used by the Canadian government to increase the number of labour force participants. The concept of Universal Design is being gradually integrated into Canadian infrastructure projects and local urban plans which increases accessibility and supports longer civic participation of seniors.

Ageing capital stock: The 2016 Canadian Infrastructure Report Card reported that one-third of Canadian municipal infrastructure, which accounts for just under 60% of total infrastructure in Canada, was in fair, poor or very poor condition. Survey results demonstrated that roads, municipal buildings, sport and recreation facilities and public transit are the asset classes most in need of attention. Increasing reinvestment rates has been identified as a way to stop the deterioration of infrastructure.

The federal government is partnering with the Federation of Canadian Municipalities to implement and deliver the Municipal Asset Management Program which helps Canadian cities and communities make informed decisions about infrastructure investments in a context of constrained financial resources. The program will help harmonize asset management standards at an economy-wide level.

Climate Change: Canada's climate is changing. Temperatures in Canada have been increasing at roughly double the global average; in Canada's North, they are rising at roughly three times the global average. Increased temperatures have brought with them longer heat waves; more intense, frequent and extreme storms; permafrost degradation; diminishing sea ice and snow cover; and rising sea levels.

Climate change and extreme weather events threaten infrastructure across the economy, impacting its effectiveness, lifespan, cost, maintenance, rehabilitation and renewal. For example,

some older water systems cannot process an increase in precipitation, which increases the risk of flooding.

The ‘Investing in Canada’ plan makes it clear that federal infrastructure investments should reduce or minimize GHG emissions and also enhance resilience to the impacts of climate change. Infrastructure Canada has developed a climate lens ensuring that project proponents consider and evaluate GHG emissions reduction and climate resiliency when they seek funding through the ‘Investing in Canada’ Infrastructure Program

The climate lens will provide insight into the climate impacts associated with individual projects, and encourage project planners to make choices consistent with shared federal, provincial and territorial objectives articulated in the Pan-Canadian Framework for Clean Growth and Climate Change—including a commitment to reduce Canada’s GHG emissions by 30% below 2005 levels by 2030.

Disruptive technologies: We know the world is changing. Every day it becomes more digital; international trade grows; and the ways we work, move and communicate are evolving. International experience shows that investments in technologies to make better use of infrastructure can significantly increase productivity.

Canada launched the Smart Cities Challenge to encourage communities to improve the lives of their residents by using data and connected technology in innovative ways. The Challenge is a pan-Canadian competition open to communities of all sizes, including municipalities, regional governments and Indigenous communities. The Challenge will empower partners to take risks and think outside the box. It will fund projects that are ambitious yet achievable, as well as innovative, transferable, replicable and scalable.

Leading practices: Among your economy’s structural reforms relating to infrastructure in the past 5 years (2013-2018), which two do you think have been implemented most effectively? Please identify the main reasons for the effectiveness of this structural reform that could be relevant for other economies.

Public-Private Partnerships: The Canadian model of Public-Private Partnerships (often called P3s) is considered as one of the most successful models in the world. There have been major political commitments towards P3s across Canada, and among governments at the federal, provincial and municipal level. Over 200 infrastructure projects have been delivered in the last 20 years, representing over C\$70 billion of capital investment.

The Canadian case suggests that, while political will is of paramount importance in a P3 programme’s success, local and regional actors can themselves drive the emergence of viable markets.

Key determinants of P3 success in Canada have been: a steady pipeline of well-structured economic and social infrastructure projects; standardized procurement processes, including consistent project agreements and payment mechanisms, evaluation methodologies, and financing requirements; a collegial approach both among and within the provinces, including the sharing of lessons learned and new approaches; and a framework of mutual trust between the public and private sectors that has helped to elicit and sustain the development of a diverse and competitive supply market.

Lessons learned: At the individual project level too, trust and working partnerships are fundamental towards securing the risk-sharing and good, balanced, contractual relations that are at the heart of good project delivery. To generate this, it is essential that the contracting parties have access to clear, transparent and objective information about the level of performance under the contract.

Regional cooperation: What role can regional cooperation and regional bodies such as APEC play? You may like to consider the role of cooperation in addressing the challenges and policy gaps previously identified, in enhancing the investment environment, in making more possible cross-border/regional connectivity projects and in promoting co-ordination of development funding.

Regional cooperation fosters sharing best practices to address common challenges and policy gaps, identifying barriers in the investment environment, promoting cross-border/regional connectivity projects, and coordinating development funding.

How can we ensure that Asia Pacific has top-quality physical and digital infrastructure to ensure maximum connectivity? What would be the benefits to your economy from improved connectivity?

To ensure Asia Pacific has top-quality physical and digital infrastructure, Canada supports domestic policies, action plans and strategies that provide stable and predictable funding over time (medium and long term). In addition, Canada fosters innovative governance and financing options for infrastructure projects.

Canada could benefit from improved connectivity in Asia Pacific through increased business/trade opportunities that would improve the mobility of goods and people. Outcomes of trade agreements like the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) could be leveraged by improved physical and digital infrastructure.

CHINA

Capabilities: what significant policy or institutional structures (e.g. top 2) support your economy in meeting the following objectives. Economies could discuss whole of Government policies or policies that apply at a sector specific level:

- **Cost effectiveness: Providing for the efficient provision and management of infrastructure and the efficient operation of infrastructure markets, including providing for cost-based access;**
- **Resilience: Enhancing adaptability and ensuring the infrastructure system is robust to disruptions and shocks;**
- **Inclusion: Ensuring broad access (e.g. across regions, genders, underserved or minority groups and indigenous people) to infrastructure, including digital infrastructure, to support inclusive growth?**

- Cost effectiveness: providing for the efficient provision and management of infrastructure and the efficient operation of infrastructure markets, including providing for efficient access;
- Resilience: enhancing adaptability and ensuring the infrastructure system is robust to disruptions and shocks;
- Inclusion: ensuring broad access (e.g. across regions, genders, underserved or minority groups and indigenous people) to infrastructure, including digital infrastructure, to support inclusive growth?

Over the last 40 years, since initial reform and opening up for 40 years, China has made outstanding progress within infrastructure development, which has vigorously boosted economic and social development. On one hand, the transport infrastructure construction has been rapidly advanced, with road, railway, port, airport and urban rail transit networks having taken shape gradually. A comprehensive transport channel featuring “ten in the lengthwise and ten in the transverse” has been basically established, which has not only allowed people to travel in a convenient way, but also played a guiding and supporting role in serving the domestic strategy, connecting economic zones, facilitating the development along the routes, and strengthening interconnection and intercommunication. A study indicates that the contribution rate of transportation to the domestic economy rose from 3.5% in 2012 to 4.3% in 2016. On the other hand, the information infrastructure construction and upgrading have continuously accelerated with China’s Internet penetration rate having increased as a result of broadband access at home, speed lift and fees reduction. Notably, the Internet penetration rate has exceeded 30% in rural areas. By the end of 2016, 89.9% of the villages had achieved access to the Internet, and 25.1% are equipped with e-commerce delivery sites.

The above achievements are closely intertwined with measures such as the reform of the investment and financing system in transport infrastructure sector and the advancement of Internet popularity in information infrastructure sector. To address the fund shortage issue at the early stage of reform and opening up in the transport infrastructure sector, China has expanded the sources of funds for road construction through various channels, including work relief, raising the road toll standard, imposing surcharges on vehicle purchases, fund-

raising or bank loans, developing government loan roads as well as operating toll roads (e.g. in railway construction field, China has actively explored a new model of “ministerial-provincial cooperation” to advance the construction). In terms of ports, China has gradually delegated powers to regions, encouraged owner units to build dedicated wharfs on their own, and continuously stepped up the building of ports through measures such as imposing port construction fees. With regard to airports, China has strengthened the central support, arranged civil aviation development funds and investment within the central budget to accelerate the airport construction, and actively attracted private investment. In the information infrastructure sector, China has redoubled its efforts to lift network speeds and cut fees, and vigorously implemented the project of “boosting network coverage in every village” in rural areas, which has improved infrastructure inclusiveness. For example, China’s three telecom operators, namely China Telecom, China Mobile and China Unicom, have launched a few rounds of speed lift and fees cut measures since 2015, which have led to a reduction of fixed broadband charges by 86% and mobile broadband charges by 65% within two years. Other examples are that some regions have effectively integrated various types of agriculture-related information resources to build the modern rural comprehensive information service network featuring “multiple channels, multiple terminals, diversification and different levels”; developed a new model boasting “guidance by the government, co-building and sharing, and operation by enterprises”; and explored a new path on sustainable growth of rural information construction.

Gaps: What are the highest priority structural or institutional reforms you have identified to meet these objectives?

To achieve the above objectives, the reform of the infrastructure investment and financing system has always been one of the most important and urgent reforms. Currently, China remains the world’s largest developing economy, and is still facing many deficiencies in the field of infrastructure construction. For instance, infrastructure is still scarce in some remote areas; there are big gaps in infrastructure levels between different regions, the contradiction between the demand for infrastructure construction and the financial capacity of local governments becomes very conspicuous. Key measures to solve the insufficiency and imbalance issues of infrastructure construction are to push forward the reform of the infrastructure construction investment and financing system, continuously introduce diversified investment and financing subjects, optimize development models, and improve the investment and financing efficiency.

Barriers and challenges: What are the key barriers and challenges to implementing structural reforms for infrastructure in your economy and has your economy identified any solutions to overcome those barriers or challenges?

During the reform of the transport infrastructure investment and financing system, some issues have arisen, such as complicated approval procedures, failure to further identify the investment subject position of enterprises, the impulse for blind expansion of transport infrastructure in some regions, imperfect return on investment and exit mechanisms and outstanding problems during the transformation of regional transport investment and financing platforms. Targeting these issues, China urgently needs to further deepen the reform of its investment and financing system within the transport infrastructure sector,

identify the investment subject position of enterprises, clarify the investment boundary of the government, loosen and motivate social investment, and inspire private investment potential and innovation vitality. China will provide vigorous support for the sustainable and healthy development of transport infrastructures by clarifying the investment and financing relationship as well as improving the investment and financing efficiency.

Connectivity needs and financing requirements: what are the main (e.g. top 3) identified physical and digital infrastructure needs for your economy over the next 30 years?

Please describe the required financing and expected impact of these infrastructures.

Looking into the future, China urgently needs to build digital infrastructures and raise the intelligence levels of its infrastructures. Digital infrastructures not only include infrastructures related to information and communication technologies, but also involve digital transformation and upgrading of infrastructures. For example, the accelerated construction of vehicle-road collaborative technology systems and relevant infrastructures will create conditions for the building of intelligent transport and smart cities. The construction of smart ports will boost the shift from information, digital and intelligent ports to smart ports; and the construction of infrastructures related to smart rail transits will further bring more convenience for urban mobility and improve urban congestion.

To speed up the construction and upgrading of digital infrastructures, China needs to establish effective investment & financing, return on investment and exit mechanisms by introducing diversified investment subjects, adopting comprehensive, three-dimensional development pattern and taking innovative business models. Improving the smart levels of infrastructures will effectively increase the convenience within transportation, lower transportation costs, and further expand the role of infrastructures in the domestic economy.

Future needs: What are the main factors (e.g. population increase, technology, climate change or variability, ageing capital stock) that will influence your economy's future physical and digital infrastructure needs?

China's process of urbanization and development of the digital economy have a significant influence on infrastructure construction. On one hand, there is still a wide gap between the urbanization level in China and those of developed economies as well as with the different regions in China which remain unbalanced. With the increase in urbanization levels and the implementation of the rural revitalization strategy, China still has a strong demand for the construction of infrastructures such as comprehensive underground pipe galleries, smart urban transport and intercity rail transit systems. On the other hand, the digital economy has maintained a robust double-digit growth rate in recent years, and the in-depth application of digital technology in industry, agriculture and other fields will raise requirements for connectivity and transmission, leading to new rounds of transformation and upgrading within the information infrastructure sector.

Leading practices: Among your economy's structural reforms relating to infrastructure in the past 5 years (2013-2018), which two do you think have been

implemented most effectively? Please identify the main reasons for the effectiveness of this structural reform that could be relevant for other economies.

Over the past five years, China has continuously advanced the reform of the transport infrastructure investment and financing system. Practices in two aspects have been constantly promoted and active achievements have been made, as a result of the close cooperation between central and regional governments and a broad consensus on playing the decisive role of the market in resource allocation.

The first practice is the central-regional government cooperation, which has stepped up the infrastructure construction by means of diversified fund-raising modes. For example, the co-financing model between the central and regional governments has been adopted during the railway construction. The main sources of funds for railway construction include investment within the central budget, railway construction funds, railway construction bonds and dedicated construction funds, as well as financing from banks, investment of local governments and part of social funds. Diversified fund-raising modes has allowed China to make remarkable achievements in the construction of railways, particularly high-speed railways, in the past few years.

The second practice is the introduction of social funds to the infrastructure construction sector to achieve the diversification of investment and financing subjects. For example, related social funds have been introduced to participate in the construction and development of some urban rail transits, which has not only lowered the financing cost and played the leverage role of government funds, but also brought in excellent governance structures and advanced operation experience. Comprehensive development models, such as “rail + property management,” “rail + community” and “rail + town,” as well as diversified fund-raising models, such as the PPP model and bond issuance, have taken shape in some regions, and appropriate ways of development have been used to facilitate the rail transit construction. Another example is that economic organizations at home and abroad are allowed to set up operating toll road companies by investing in road construction or accepting the transfer of the toll right of government loan roads. The establishment of the toll road system has not only brought roads to the market, but also realized the diversification of investment subjects, making bank loans and equity investment new extra sources of funds for road construction.

Regional cooperation: What role can regional cooperation and regional bodies such as APEC play? You may like to consider the role of cooperation in addressing the challenges and policy gaps previously identified, in enhancing the investment environment, in making more possible cross-border/regional connectivity projects and in promoting co-ordination of development funding.

How can we ensure that Asia Pacific has top-quality physical and digital infrastructure to ensure maximum connectivity? What would be the benefits to your economy from improved connectivity?

APEC can play a bigger role in promoting the transportation convenience in the Asia-Pacific region. It is suggested more attention should be paid to solve issues such as the difference of specific standards in the planning, layout and construction of inter-state transport

infrastructures, and coordinate with related economies so as to further improve the transportation convenience level.

China firmly supports globalization and trade liberalization, as higher interconnection and intercommunication levels in Asia Pacific will benefit the economic and trade cooperation between China and other economies in the region. China also has the willingness, ability and experience to make bigger contributions to the infrastructure construction in Asia Pacific and to the promotion of interconnection and intercommunication in the region.

HONG KONG, CHINA

Capabilities: what significant policy or institutional structures (e.g. top 2) support your economy in meeting the following objectives. Economies could discuss whole of Government policies or policies that apply at a sector specific level:

- **Cost effectiveness:** Providing for the efficient provision and management of infrastructure and the efficient operation of infrastructure markets, including providing for cost-based access;
- **Resilience:** Enhancing adaptability and ensuring the infrastructure system is robust to disruptions and shocks;
- **Inclusion:** Ensuring broad access (e.g. across regions, genders, underserved or minority groups and indigenous people) to infrastructure, including digital infrastructure, to support inclusive growth?

Gaps: What are the highest priority structural or institutional reforms you have identified to meet these objectives?

Barriers and challenges: What are the key barriers and challenges to implementing structural reforms for infrastructure in your economy and has your economy identified any solutions to overcome those barriers or challenges?

Capabilities

There is a need for the Hong Kong, China (HKC) Government to strengthen cost management for public works projects. The Development Bureau (DEVB) established the Project Cost Management Office (PCMO) in June 2016 to take forward various cost management initiatives for public works projects and promote cost management in the private construction sector. In assuming the overall cost management role, the PCMO also oversees the implementation of the Capital Works Programme which comprises the whole of the public works projects covering both basic and social infrastructures including transportation, environment, health, education, water supply and drainage systems for the economic development of Hong Kong, China and enhancement of the quality of living of our community.

Gaps

Hong Kong, China has been beset by the challenge of high construction costs in recent years. An international report has ranked Hong Kong, China as the 3rd highest construction cost city in 2018. Despite tender prices having stabilised since 2016, noting the predicted keen demand on construction services, HKC needs to adopt proactive and structured approaches to tackle the issues of high construction cost. If the challenges of high construction cost are not properly tackled, it will adversely affect the implementation of capital works projects and may eventually undermine Hong Kong, China's competitiveness.

Barriers and challenges

The construction industry in Hong Kong, China has been facing challenges of high construction cost, shortage in skilled labour and declining productivity. DEVB established the PCMO in June 2016 with the objective of strengthening cost management of construction projects. This cost management policy drive will also bring forward reform in the construction industry by instilling the culture of treating cost as a major driver of construction projects. The establishment of PCMO to promote cost management is one of the most important Government policy initiatives for the construction industry undertaken in recent years.

HKC is striving to adopt innovation and advanced technology in public works projects to reduce manpower requirements and enhance productivity for achieving better cost-effectiveness. HKC promotes and leads the adoption of Modular Integrated Construction (MiC) in the construction industry. By adopting the concept of “factory assembly followed by on-site installation” and the mode of manufacturing, labour intensive processes can be accomplished in off-site prefabrication yard with a view to enhancing productivity and cost-effectiveness. Furthermore, HKC is actively seeking to promote the use of the Building Information Modelling (BIM) technology in Hong Kong, China. The construction industry as a whole will benefit from the adoption of BIM by enhancing visibility and reducing project risks, multiple handling, abortive work, etc. To lead by example, the HKC Government requires consultants and contractors to adopt BIM when undertaking major Government capital works projects starting from 2018.

HKC has been promoting buildability in capital works projects in recent years. Buildable designs can lower construction cost through comprehensive appraisal of the construction methods and ensuring their practicality and effectiveness well in advance in the design stage. HKC aims to pilot the use of buildability evaluation system in Government building projects in 2018.

With Government support, the Construction Innovation and Technology Application Centre of the Construction Industry Council was in operation in 2017 to provide the latest information on the local and overseas construction technologies with a view to supporting small and medium enterprises for adoption. The centre aims at establishing a global research network to promote interdisciplinary research and application on enhancement of productivity and safety performance in the long run.

In 2018 Budget, the Financial Secretary committed to set up a \$1 billion Construction Innovation and Technology Fund to boost the capacities of enterprises and practitioners in the construction industry to adopt new technology, and support the industry to harness innovative technology. Eligible contractors, registered sub-contractors and consultants can apply for financial support from the Fund to acquire the software and hardware as well as to nurture the expertise required for using local and overseas innovative construction technologies, such as BIM, steel reinforcing bar products produced in local prefabrication yards and MiC when carrying out construction projects. The Fund will also support students and practitioners of the construction industry to receive training on innovative construction technologies.

Needs and financing requirements: What are your economy’s main (e.g. top 2-3) identified physical and digital infrastructure needs over the medium-long term? Please describe the required financing and expected impact of these infrastructures.

Future needs: What are the main factors (e.g. population increase, technology, climate change or variability, ageing capital stock) that will influence your economy’s future physical and digital infrastructure needs?

Needs and financing requirements

Looking ahead, HKC will need to sustain capital works investment to meet the needs in various fronts, such as land and housing supply in the medium to longer time horizon; the 10-year Hospital Development Plan to look after the ageing population; various initiatives to improve people’s livelihood and district environment; enhancement of transportation networks to boost connectivity etc. Based on the planned infrastructure programme, the HKC Government anticipates that the annual capital works expenditure in the coming years will exceed \$100 billion. Some main identified physical infrastructure will include:

1. Three-Runway System (3RS) project at the Hong Kong International Airport (HKIA): the Airport Authority Hong Kong (AAHK) commenced construction of the 3RS on 1 August 2016. The construction works will take eight years to complete. The commissioning of the new runway is scheduled for 2022, after which the existing north runway will be closed for reconfiguration, and the full commissioning of the 3RS is targeted in 2024. The 3RS will be crucial for maintaining Hong Kong, China’s competitiveness as an international and regional aviation hub

Expected Impact: With the 3RS, the capacity of HKIA will be substantially enhanced. HKIA will be able to handle air traffic demand at least up to 2030, by which time the annual passenger and cargo volumes are expected to increase to around 100 million and 9 million tonnes respectively. Expanding the HKIA into a 3RS will not only strengthen Hong Kong, China’s status as an international and regional aviation hub, but also benefit a wide range of industries, in particular the aviation industry. According to AAHK, the whole 3RS project is estimated to generate additional economic benefits of HK \$455 billion (in 2012 dollars) over a 50-year period and create more jobs opportunities in Hong Kong, China. AAHK anticipated that the 3RS would create direct employment of around 123,000 jobs as well as indirect and induced employment of 165,000 jobs, much higher than that of the two-runway system comparable of 89,000 and 119,000 jobs.

2. Hong Kong – Zhuhai – Macao Bridge (HZMB): The Hong Kong - Zhuhai - Macao Bridge, a direct land transport infrastructure, will link Hong Kong, China directly with Zhuhai and Macao. The project is jointly taken forward by the Guangdong; Hong Kong, China; and Macao Governments. The Main Bridge will become the longest bridge-cum-tunnel sea crossing in the world, totalling 29.6 km in length (including 6.7 km of underwater tunnel). As a major strategic cross-boundary project, the HZMB is unprecedented in terms of scope, scale and complexity.

Expected Impact: The HZMB is strategically important. It will facilitate the further economic development of Hong Kong, China; Macao; and Western Pearl River Delta, and will significantly reduce transportation costs and time for travellers and goods on roads of Hong Kong, China. Its commissioning will benefit various sectors

in Hong Kong, China such as tourism, finance and commerce. Upon completion of the HZMB, the journey time between the Kwai Chung Container Terminal and Zhuhai will be reduced from currently 3.5 hours or so to about 75 minutes, whilst the journey time between the Hong Kong International Airport and Zhuhai will be reduced from currently 4 hours or so to about 45 minutes.

Future needs

The Government has all along been adopting long-term and visionary planning for infrastructure projects and will continue to invest in worthwhile infrastructure projects in a timely manner to meet social needs and maintain Hong Kong, China's competitiveness. It is imperative for Hong Kong, China to expand land resources on an on-going basis. This includes the provision of land and space for economic activities to accommodate commercial facilities and industrial developments with a view to maintaining economic development and creating job opportunities. HKC will continue to invest in world-class infrastructure to support sustainable economic growth and sharpen our competitive edge.

Leading practices: Among your economy's structural reforms relating to infrastructure in the past 5 years (2013-2018), which two do you think have been implemented most effectively? Please identify the main reasons for the effectiveness of this structural reform that could be relevant for other economies.

1. Establishment of PCMO

DEVB established the PCMO in 2016 with the objective of strengthening cost management of construction projects. This cost management policy drive will also bring forward reform in the construction industry by instilling the culture of treating cost as a major driver of construction projects. The establishment of PCMO to promote cost management is one of the most important Government policy initiatives for the construction industry undertaken in recent years.

Under the guiding principles of not compromising functionality, quality and safety of works, the PCMO has adopted a three-prong approach to take forward the relevant initiatives for capital works projects, namely: (a) reviewing requirements and devising works policies; (b) project-by-project scrutiny; and (c) enhancing project management. Since 2016, the PCMO has reviewed some 130 projects at a total estimated cost of over \$250 billion. HKC Government managed to achieve cost saving of some 10% of the total project cost.

2. Hong Kong Construction 2.0

Construction is a pillar industry supporting the development of Hong Kong, China. Facing the multifaceted challenges nowadays including high construction cost, shortage of skilled labour and declining productivity, HKC Government's leadership is instrumental to championing the upgrading of the industry for meeting the rising aspiration of the community and maintaining the sustainability of the industry. In 2018, DEVB launched a new initiative namely, "Hong Kong Construction 2.0" to transform the construction industry to a new generation. Innovation, Professionalisation and Revitalisation are the three pillars under the "Hong Kong Construction 2.0". This new initiative will instigate an institutional reform and drive the cultural change of Hong Kong, China's construction industry for strengthening our delivery capability to tackle the challenges ahead.

Regional cooperation: What role can regional cooperation and regional bodies such as APEC play? You may like to consider the role of cooperation in addressing the challenges and policy gaps previously identified, in enhancing the investment environment, in making more possible cross-border/regional connectivity projects and in promoting co-ordination of development funding.

How can we ensure that Asia Pacific has top-quality physical and digital infrastructure to ensure maximum connectivity? What would be the benefits to your economy from improved connectivity?

Regional cooperation and initiatives by international organisations such as APEC can share the knowledge and best practice regarding infrastructure, and help economies learn from the experiences of each other and devise measures to overcome the challenges in their respective contexts. These efforts also provide valuable fora for economies to discuss and pursue cross-border and regional connectivity projects. HKC, as an international logistics and trade centre, would benefit from the connectivity enabled by an advanced IT and communications infrastructure and a global network of shipping and aviation services. Further improvement in connectivity of the region would enhance the role of HKC as a transport hub and expand the capacities for economic development.

INDONESIA

Capabilities: what significant policy or institutional structures (e.g. top 2) support your economy in meeting the following objectives. Economies could discuss whole of Government policies or policies that apply at a sector specific level:

- **Cost effectiveness:** Providing for the efficient provision and management of infrastructure and the efficient operation of infrastructure markets, including providing for cost-based access;
- **Resilience:** Enhancing adaptability and ensuring the infrastructure system is robust to disruptions and shocks;
- **Inclusion:** Ensuring broad access (e.g. across regions, genders, underserved or minority groups and indigenous people) to infrastructure, including digital infrastructure, to support inclusive growth?

Regarding fiscal management, in the last ten years, Indonesia has greatly enhanced its policies on infrastructure provision and management in terms of quantity and quality to support fair and strong growth. In 2018, Indonesia has more than doubled its infrastructure budget allocation since 2014 (IDR 177.9 trillion to IDR 410 trillion), mainly for connectivity and energy infrastructure development. Since 2008, significant efforts and results has been made in infrastructure provision through the public private partnership (PPP) scheme.

Cost effectiveness, resilience and inclusion:

The Government of Indonesia (GoI) has issued several laws and regulations as part of its structural reform to increase capabilities in infrastructure, including promoting the PPP scheme to enhance the cost effectiveness, resilience and inclusion.

- Presidential Regulation Number 38/ 2015: to activate the PPP scheme, certain studies are required, such as Value for Money Analysis and Environmental Study.
- Ministry of Communication and Informatics Regulation Number 25/2015: this regulation was issued to ensure the quality of infrastructure services by the private party are maintained properly based on PPP contracts and that service coverage for marginal groups and remote area are provided for.
- The GoI also provides supporting facilities to accelerate infrastructure market development, such as through Viability Gap Fund (VGF), Government Guarantees, and Infrastructure Financing Fund, of which are parts of structural reform.

Gaps: What are the highest priority structural or institutional reforms you have identified to meet these objectives?

Indonesia's highest priority is to reform its infrastructure provision policy to acquire the investment needed to develop strategic and important infrastructure. Thus, Indonesia has established the National Strategic Projects (President Regulation No 58/2017), supported by a number of regulations to improve financing and investment for infrastructure provision in supporting fair growth and welfare, especially financing through PPP.

Barriers and challenges: What are the key barriers and challenges to implementing structural reforms for infrastructure in your economy and has your economy identified any solutions to overcome those barriers or challenges?

Apart from the shortage of funds, there are other issues that challenge the acceleration of infrastructure development in Indonesia.

- Issue of land acquisition

Regarding this matter, GoI has published Law Number 2/2012 on land acquisition and has established the Public Services Agency (State Assets Management Institutions or Lembaga Manajemen Aset Negara (LMAN)) to fund the land acquisition in order to have well-coordinated, fast and efficient processes.

- Project planning and preparation to ensure a good quality of infrastructure and to attract investor (especially on infrastructure provision through PPPs)

On this matter, the government have established regulations on project planning and preparation (see Box 1 in the attachment). For example, in terms of project preparation, the GoI through the Ministry of Finance provides facilities (Project Development Fund) to help Government Contracting Agencies (GCA) in project preparation and transaction to ensure preparation runs well and the transaction process is fair, transparent and competitive.

In case of funding through the government budget, other efforts undertaken include increasing government revenues through taxes (structural reform efforts in tax system itself, part of it is Tax Amnesty Program and other program) and encouraging management improvement in infrastructure provision under the universal/public services obligation to finance infrastructure development.

Needs and financing requirements: What are your economy's main (e.g. top 2-3) identified physical and digital infrastructure needs over the medium-long term? Please describe the required financing and expected impact of these infrastructures.

Though Indonesian Government infrastructure spending has increased significantly in the last five years (Table 1), approximately 87% financing gap still exists within infrastructure development. Indonesia's needs within infrastructure financing for the National Strategic Project is estimated at IDR 4,796 trillion and are planned to be sourced from the government budget (41%), state owned enterprises (SOEs) (22%) and the private sector (37%). GoI has a limited financing capacity for connectivity and telecommunication infrastructure (Table 2 in attachment).

Future needs: What are the main factors (e.g. population increase, technology, climate change or variability, ageing capital stock) that will influence your economy's future physical and digital infrastructure needs?

As outlined within our development goals, through creative industries, Indonesia's demographic bonus holds the potential to advance Indonesia's development and growth to a higher level. Indonesia's pivotal role in the trans-regional value chain and connectivity combined with its productive population as well as efficient and productive labor force has become increasingly essential to support growth. Furthermore, as an economy with a huge market potential with high penetration and ramification from information and technology development (e.g digital transaction, education, and other), e-commerce has become one of Indonesia's priority areas to develop.

Based on the issues highlighted above, refocusing fiscal policy or structural reforms in budget allocation and spending quality are essential. Strengthening fiscal capacity,

efficiency, effectivity and productivity, particularly in infrastructure provision (physical and digital), has become Indonesia's top development priority.

Leading practices: Among your economy's structural reforms relating to infrastructure in the past 5 years (2013-2018), which two do you think have been implemented most effectively? Please identify the main reasons for the effectiveness of this structural reform that could be relevant for other economies.

Within the fiscal management framework, structural reforms in infrastructure provision has been effectively implemented. Leading practices can be seen in the National Strategic Project development (consist of 245 projects and 2 programs) increasing the proportion of infrastructure budget allocated and the development of the PPP scheme as a source of financing and other supporting policies. Especially for PPPs, Indonesia has set out regulations in order to support their use, especially for financing and accelerating infrastructure development (see Box 1). The Ministry of Finance (MOF) has assisted in a number of PPP projects agreement. Indonesia has 17 PPP (project) contracts signed, where 13 projects are in the construction stage (Table 3 below).

Structural reforms to support growth are also a continuous effort within the telecommunication infrastructure sector. Policies have been made regarding infrastructure provision involving Public Services Agency that serve Universal Services Obligation (public service on telecommunication, including infrastructure provision). Policies made also highlight on inclusivity, where the Ministry of Communication and Informatics Regulation Number 25/2015 stipulates that the service provision coverage includes remote area and marginal groups.

Regional cooperation: What role can regional cooperation and regional bodies such as APEC play? You may like to consider the role of cooperation in addressing the challenges and policy gaps previously identified, in enhancing the investment environment, in making more possible cross-border/regional connectivity projects and in promoting co-ordination of development funding.

As a trans-regional forum, APEC can support trans-regional cooperation in developing a set of standards needed for quality infrastructure services in Asia Pacific based on development and needs of economies. In addition, APEC can conduct a review to economies' best practices in infrastructure provision that is best suited for its economies, have a significant impact in lowering business and other cost, and can be replicated for other economies. Knowledge sharing can be another way or method in disseminating experience knowledge (from economies to economies) to address issues within infrastructure provision, such as financing and investment.

Overall, APEC has the potential to improve the quality of physical and digital infrastructure to ensure maximum connectivity through trans-regional cooperation by having business hub or space that accommodates the interests of private sector in infrastructure development. Those interests, thus, act as modalities to identify the array of infrastructure development policies.

How can we ensure that Asia Pacific has top-quality physical and digital infrastructure to ensure maximum connectivity? What would be the benefits to your economy from improved connectivity?

By engaging close cooperation in implementing Infrastructure Development Framework as instructed by Leaders in 2013. The inter-connected and well-developed infrastructure in the region is the backbone for the freer flow of trade and investment in the Asia Pacific. It will eliminate barriers to trade, accelerate regional economic integration, improve and sustain growth, reduce inequality and contribute towards Asia Pacific's economic resilience (APEC 2013 Annex B Leaders Declaration). The benefit of enhanced connectivity in the Asia Pacific will not only benefit Indonesia but all economies in the region.

ATTACHMENT

Table 1. Infrastructure Budget Allocation

		Year					
		2013	2014	2015	2016	2017	2018
1	Infrastructure Budget (in IDR trillion)	155.9	177.9	290.3	313.5	346.6	410.4
2	Percentage of GDP (current price)	2.30	1.68	2.51	2.52	2.55	-

Table 2. Budget Allocation for Connectivity and Telecommunication Infrastructure

Infrastructure		Year (in IDR trillion)					
		2013	2014	2015	2016	2017	2018
1	Bridges and Roads	32.59	33.41	48.66	34.22	35.97	33.02
2	Transportation Terminals	5.68	5.11	7.69	5.75	5.16	4.87
3	Telecommunication*	-	-	-	-	-	0.8

*There is budget allocation for telecommunication infrastructure as much as IDR 4 trillion through PPP scheme in 2018.

Table 3. List of PPP Projects Awarded the Private Proponent and Signed The PPP Agreement

No.	Project Name	Project Cost (IDR Trillion)	Financial Facility From MOF	Status
1.	Central Java Power Plant Project	40 T	Guarantee (MOF and IIGF)	Construction process (targeted COD 2019)
2.	Umbulan Water Project	2.1 T	PDF, VGF and IIGF Guarantee	Construction process (targeted COD 2019)
3.	Palapa Ring Project – West Package	1.28 T	PDF, IIGF Guarantee and AP	Construction process (targeted COD 2018)
4.	Palapa Ring Project – Central Package	1.38 T	PDF, IIGF Guarantee and AP	Construction process (targeted COD 2018)
5.	Palapa Ring Project – East Package	5.13 T	PDF, IIGF Guarantee and AP	Construction process (targeted COD 2018)
6.	Batang – Semarang Toll Road Project	11 T	IIGF Guarantee	Construction process (targeted COD 2019)
7.	Manado – Bitung Toll Road Project	5.1 T	IIGF Guarantee	Construction process (targeted COD 2019)
8.	Balikpapan – Samarinda Toll Road Project	9.9 T	IIGF Guarantee	Construction process (targeted COD 2019)
9.	Pandaan – Malang Toll Road Project	5.9 T	IIGF Guarantee	Construction process (targeted COD 2019)
10.	Serpong—Balaraja Toll Road Project	6T	IIGF Guarantee	Construction process (targeted COD 2019)
11.	Jakarta-Cikampek Toll Road Project	16 T	Co guarantee (IIGF and MoF)	Construction process
12.	Krian-Legundi-Bunder-Manyar Toll Road Project	12.2 T	Co guarantee (IIGF and MoF)	Construction process
13.	Serang-Panimbang Toll Road	5.33 T	Co guarantee (IIGF and MoF)	Construction process
14.	Cileunyi Sumedang-Dawuan Toll Road	8.21 T	Co guarantee (IIGF and MoF)	Land Acquisition
15	Probolinggo-Banyuwangi Toll Road	21 T	Co guarantee (IIGF and MoF)	PPP Agreement Signed
16	Jakarta-Cikampek II South Toll Road	13,38 T	Co guarantee (IIGF and MoF)	PPP Agreement Signed
17	Bandar Lampung Water Project	1,1 T	PDF, VGF and IIGF Guarantee	PPP Agreement Signed

Box 1. List of regulations regarding Acceleration of Infrastructure Development

- **Presidential Regulation No. 75/2014** regarding Acceleration of Providing Priority Infrastructure
- **Presidential Regulation No. 38/2015** concerning Partnership of Government and Business Entity in Infrastructure Provision.

(This regulation replaces Presidential Regulation Number 67/2005 that has been modified several times)
- **Presidential Regulation No. 3/2016** regarding Acceleration of Implementation in National Strategic Projects
- **Minister of National Development Planning Regulation No. 4/2015** concerning Implementation Guideline in Cooperation Projects between the Government and Business Entity in Providing Infrastructure
- **Coordinating Minister for The Economy Regulation No.12/2015** concerning Acceleration of Preparation for Priority Infrastructure
- **Chair of National Public Procurement Agency Regulation No. 19/2015** regarding Implementation Guideline in Providing Business Entity for Cooperation Projects between the Government and Business Entity in Providing Infrastructure
- Minister of Finance Regulation No. 260/2010 regarding Implementation Guideline on Infrastructure Guarantee in Cooperation Project Between the Government and Business Entity.
- Minister of Finance Regulation Number 223/2012 concerning Construction Cost Contribution for PPP Project.
- Minister of Finance Regulation Number 265/2015 concerning Facility for Preparation and Transaction of Cooperation Between Government and Business Entities in Infrastructure Provision
- Minister of Finance Regulation No. 8/2016 concerning Adendum on MoF Regulation No. 260/2010 regarding Implementation Guideline on Infrastructure Guarantee in Cooperation Project Between the Government and Business Entity.
- Minister of Finance Regulation No. 260/2016 concerning Availability Payment.

JAPAN

Capabilities: what significant policy or institutional structures (e.g. top 2) support your economy in meeting the following objectives. Economies could discuss whole of Government policies or policies that apply at a sector specific level:

- **Cost effectiveness:** Providing for the efficient provision and management of infrastructure and the efficient operation of infrastructure markets, including providing for cost-based access;
- **Resilience:** Enhancing adaptability and ensuring the infrastructure system is robust to disruptions and shocks;
- **Inclusion:** Ensuring broad access (e.g. across regions, genders, underserved or minority groups and indigenous people) to infrastructure, including digital infrastructure, to support inclusive growth?

Gaps: What are the highest priority structural or institutional reforms you have identified to meet these objectives?

Barriers and challenges: What are the key barriers and challenges to implementing structural reforms for infrastructure in your economy and has your economy identified any solutions to overcome those barriers or challenges?

Japan considers that (1) building a safe and comfortable society contributes to both resilience and inclusion, and (2) utilizing ICT and promoting technology research and development supports cost effectiveness and resilience.

The key challenges to realize those objectives are:

i. Realizing Accessibility through a Universal Design Concept

The “Act on Promotion of Smooth Transportation, etc. of Elderly Persons, Disabled Persons, etc.” embodies the universal design concept of “freedom and convenience for anywhere and anyone”, making it mandatory to comply with “Accessibility Standards” for newly establishing various facilities (passenger facilities, various vehicles, roads, off-street parking facilities, city parks, buildings, etc.), as well as mandatory best effort for existing facilities and defining a development target for the end of FY2020 under the “Basic Policy on Accessibility” to promote accessibility.

ii. Shifting to a Society with Higher Disaster Prevention Awareness

In light of the lessons from the many disasters that occurred in 2016, we are undertaking a general mobilization of structural measures with major impacts and non-structural measures from the perspective of residents. It is a shift towards society to raise disaster prevention awareness and ensure all actors, including government, residents, and companies, are sharing knowledge and perspectives on disaster risks as well as preparing for all kinds of disasters, including–flooding, earthquakes, and sediment-related disasters.

iii. Shaping domestic land that is safe and resilient to disasters as well as enhancing and strengthening the Framework of Preparedness for Crisis Management

In order to mitigate and reduce damage caused by flood disasters which occurs frequently and seriously, structural measures such as preventative flood control measures and measures to prevent re-occurrence. Non-structural measures such as strengthening of the flood defense system and provision of river information are being promoted in a comprehensive manner taking into account the influence of climate change.

In order to prevent and mitigate the damages by sediment-related disasters, a combination of non-structural and structural measures, such as the construction of sediment-related disaster prevention facilities and improvement and enhancement of early warning and evacuation systems are being promoted.

In preparation for the volcanic mudflow caused by volcanic eruptions and the debris flow caused by rainfall, sediment control dams, training dikes among others are being constructed to prevent or reduce damages.

To protect human lives and assets from storm surges and high waves caused by frequently occurring storm surges, a combination of structural and non-structural measures are being promoted. Examples include the development of coastal levees and the issuing of flood prevention warnings.

Since a variety of factors contribute to coastal erosion across the economy, the administrators of rivers, coasts, shipping ports, and fishing ports have coordinated to implement measures such as sand bypasses and sand recycling.

For the tsunami measures for coasts, structural measures are taken to develop coastal levees and so on necessary for resisting tsunamis with relatively high frequency of occurrence, take earthquake and liquefaction measures, enable automatic/remote operation of floodgates, and develop coastal levees and seawalls with a tenacious structure that includes various structures, such as green coastal levees. These are in addition to non-structural measures taken to assist creation of tsunami and storm surges hazard maps and manage and operate floodgates and others effectively.

The key challenges towards encouraging the utilization of ICT and promoting technology research and development are:

i. Sophisticated Water Management and Water Disaster Prevention Utilizing ICT

In light of the new developments in information technology of recent years, new technology is being applied in the field to further improve the sophistication of water management and water disaster prevention.

ii. Improving Costing Technology for Public Works

For the purpose of ensuring transparency of public works, various price data standards are being made public. In FY2015, i-Construction, a method of improving productivity by incorporating ICT into studies, surveys, design functions, construction work, inspections, maintenance functions, and updating processes, was promoted and new estimation standards for ICT construction were enacted.

iii. CIM and BIM Initiatives

Construction Information Modeling/Management (CIM) endeavors to seamlessly connect processes at all stages by linking and developing three-dimensional models from the survey, planning, and design stages to the construction and maintenance management stages and promoting the sharing of information among concerned parties involved in the entire project.

Since FY2010, the adoption of Building Information Modeling (BIM) to help visualize design content and integrate and consolidate building information has been subject to trial operations to verify the effect of the adoption of BIM and any issues that might consequently arise.

Needs and financing requirements: What are your economy's main (e.g. top 2-3) identified physical and digital infrastructure needs over the medium-long term? Please describe the required financing and expected impact of these infrastructures.

Future needs: What are the main factors (e.g. population increase, technology, climate change or variability, ageing capital stock) that will influence your economy's future physical and digital infrastructure needs?

Infrastructure needs over the medium-long term and for the future in Japan are addressing: (1) rapid aging of infrastructure, (2) vulnerability of land (pressing issues for massive earthquakes and severe weather disasters), and (3) intensified international economic competition.

First, realizing advancement of the functions while promoting rationalization of the scale, through the construction of maintenance cycles and steady execution will ensure safety and security, along with reduction and equalization of total costs by construction of maintenance cycles. Promoting the recruitment and training of engineers involved in maintenance as well as the development and introduction of new technology will improve maintenance technology, and enhance competitiveness of the maintenance industry.

Second, focused preparation for Nankai Trough earthquake and an inland earthquake directly under Tokyo Metropolitan area, etc. will reduce risks of imminent massive earthquakes, tsunami, and large-scale eruptions. Enhancing measures against frequent and intense flood as well as sediment disaster will reduce risks for intense meteorological disasters. Promoting enrichment and enhancement of TEC-FORCE, and the introduction of a time line(*) will enhance risk management measures to reduce risks when a disaster occurs.

Finally, forming global level urban environments and enhancing functions of international airports and ports will enhance global competitiveness in metropolitan areas. Priority development of infrastructures, such as enhancement of traffic networks which contribute to the inducement of private investment including regional relocation of corporations, will promote urban and regional development inducing industry and tourism investment in regional areas. Promotion of overseas expansion of infrastructure systems related to transportation and urban development by partnership between the government and private sector will support Overseas expansion of quality infrastructure systems of Japan.

Leading practices: Among your economy’s structural reforms relating to infrastructure in the past 5 years (2013-2018), which two do you think have been implemented most effectively? Please identify the main reasons for the effectiveness of this structural reform that could be relevant for other economies.

Regional cooperation: What role can regional cooperation and regional bodies such as APEC play? You may like to consider the role of cooperation in addressing the challenges and policy gaps previously identified, in enhancing the investment environment, in making more possible cross-border/regional connectivity projects and in promoting co-ordination of development funding.

How can we ensure that Asia Pacific has top-quality physical and digital infrastructure to ensure maximum connectivity? What would be the benefits to your economy from improved connectivity?

One of the most important roles of APEC is providing its economies with the opportunity to exchange information such as the “High Level Meeting on Quality Infrastructure” that was held in Tokyo, Japan in October 2017. In the Meeting, participants shared good practices on Quality Infrastructure Investment (QII), and discussed challenges and elements that are conducive to QII. It was also agreed to issue the “Report on the Outcomes” which suggests necessity of “continuing efforts” in order to promote the QII in the Asia-Pacific region.

REPUBLIC OF KOREA

Capabilities: what significant policy or institutional structures (e.g. top 2) support your economy in meeting the following objectives. Economies could discuss whole of Government policies or policies that apply at a sector specific level:

- **Cost effectiveness:** Providing for the efficient provision and management of infrastructure and the efficient operation of infrastructure markets, including providing for cost-based access;
- **Resilience:** Enhancing adaptability and ensuring the infrastructure system is robust to disruptions and shocks;
- **Inclusion:** Ensuring broad access (e.g. across regions, genders, underserved or minority groups and indigenous people) to infrastructure, including digital infrastructure, to support inclusive growth?

Gaps: What are the highest priority structural or institutional reforms you have identified to meet these objectives?

Barriers and challenges: What are the key barriers and challenges to implementing structural reforms for infrastructure in your economy and has your economy identified any solutions to overcome those barriers or challenges?

Capabilities:

The Korean government is making continued efforts to enhance Internet access and improve the quality of Internet services in order to reduce the digital divide, achieve balanced digital development across the economy and encourage digital-based innovation. As the rapid advancement of ICT has a significant impact on human life, disparities in the access to and usage of those technologies have become a major barrier towards inclusive growth. In response to this challenge, Korea has expanded the coverage of the gigabit Internet service (i.e. digital infrastructure offering 1Gbps Internet connection) and developed new innovative application services such as ones based-on 5G networks. Specifically, the Korean government adopted the Giga Internet Plan, a road map for equipment development and verification, and carried out two follow-up projects to implement the plan: pilot programs on virtual reality and smart homes in 2015 and designating test districts for the new gigabit Internet service in 2016. At the end of 2016, Korea's gigabit Internet service coverage reached 91.82% in urban areas, and the number of subscribers reached 4.4 million.

Korea is also focusing on improving its social infrastructure, especially for the employment of women, with a view to further developing human resources and achieve inclusive long-term growth. To prepare for the demographical cliff influenced by the decreasing fertility rate in Korea, there is an urgent need to put in place well-designed infrastructure to increase the female workforce. The heavy burden of childbirth and childcare on Korean women has led to serious career interruptions as seen by Korea's female employment rate of 56.2% in 2016, which is significantly lower than the OECD average of 59.4%. To tackle this problem, the Korean government established the Women's Re-

employment Centre, a one-stop institution for career counselling, vocational training, and job referrals, in 2009.

Gaps:

Timely policy responses to facilitate continued investment in digital infrastructure, such as the next generation 10Gbps Internet service, intelligent IT and the Internet of Things, are highly required. The demands for network connection and mobile traffic are expected to increase exponentially, five times higher in 2021 compared with 2016. Catching up with the fast changing technologies, exploding demands and acquiring the capability to process the accompanying data flows effectively are prerequisites for building an innovative business environment and improving the quality of life. These are closely linked to achieving efficient, resilient and quality growth of the economy.

Strengthening support for women in their 30s is also high up on the priority list as they are the most vulnerable group representing 51% of women experiencing career discontinuity. The prevalent career interruption among this age group undermines the long-term base for labour supply and decreases overall productivity, which in turn, has a negative impact on business activities and the economy.

Barriers and challenges:

A large amount of initial fixed-cost investment is necessary to provide and manage network infrastructure, given the significance of economies of scale in this field. Also, rising competition among telecommunication companies may lead to duplicate investments. Taking account of these factors, the Korean government plans to implement various measures that will serve as incentives for the private sector to make cost-efficient engagements. The measures include finalizing 5G frequency allocation by 2019, improving regulations on advanced communication networks, and promoting joint constructions of infrastructure and facility sharing in rural areas.

There are structural vulnerabilities in terms of wage, job stability, and skill level that hinder women's active economic participation. The wage gap between genders remains large, and women are more likely to work for part-time positions with less legal protection against unfair treatment. Due to career interruptions, building an advanced skillset is often harder for females. One solution for this is to provide a customized platform based on diversified re-education programs and partnerships with local businesses.

Needs and financing requirements: What are your economy's main (e.g. top 2-3) identified physical and digital infrastructure needs over the medium-long term? Please describe the required financing and expected impact of these infrastructures.

Future needs: What are the main factors (e.g. population increase, technology, climate change or variability, ageing capital stock) that will influence your economy's future physical and digital infrastructure needs?

Needs and financing requirements:

Korea needs to build a digital ecosystem that is able to utilize newly created technologies with minimum costs and expand the Internet service coverage to vulnerable groups such as those in rural areas, low-income families and the old. Digital infrastructure could also contribute towards creating decent jobs, which plays a pivotal role in achieving sustainable growth. To achieve this, it is essential that the government and businesses join hands. In particular, the government needs to provide comprehensive policy support to the private sector in order to diversify the funding sources for digital infrastructure and achieve efficient operation of the infrastructure market and risk management.

Investment in intangible infrastructure, such as changing the gender-biased employment culture and promoting work-life balance, is also required as this will increase the efficiency and competitiveness of the labour input in a wide range of industries. As government initiatives are important in motivating employers to modify their corporate culture in accordance with the changing social demand, the Korean government is carrying out pilot programs at 15 local offices of the Women's Re-employment Centre and is seeking to expand the number gradually.

Future needs:

The advancements in technology and their unforeseen impacts are the most influential factors in shaping Korea's future digital infrastructure needs. In the era of the fourth industrial revolution, digital technology has the biggest potential to profoundly transform economic and social structures. Commercialized intelligent IT, convergence among different telecommunications and broadcasting services, and the spread of the Internet of Things networks are examples of future changes in technology.

Rapid demographical change is another concern. Korea has seen its lowest birth rate of 1.17 in 2016 and is moving towards becoming an aged society at a fast pace. As a result, it is forecasted that Korea's working population will shrink after 2018. Therefore, more emphasis should be placed on investing in infrastructure that maximizes the utilization of existing human resources.

Leading practices: Among your economy's structural reforms relating to infrastructure in the past 5 years (2013-2018), which two do you think have been implemented most effectively? Please identify the main reasons for the effectiveness of this structural reform that could be relevant for other economies.

Leading practices:

The Korean government is focusing on narrowing or eliminating the digital divide between urban and rural areas. To this end, it has joined hands with private telecommunication companies to build the Broadband convergence Network (BcN) in rural areas since 2010. The Korean government's strategy for building rural BcN is based on the following three

objectives: constructing physical subscription networks; developing services using the constructed networks; and stimulating the utilization of the networks and services with support plans. To ensure access to communication services in rural areas, the Korean government carried out the Subscription Networks for Rural BcN project and built the BcN in rural villages with fewer than 50 households. The Korean government, municipal governments, and private communication operators provided 25%, 25% and 50% of the funding needed to carry out this project, respectively. The project was completed in 2017. The most notable outcomes of this project are that the average annual household income in rural areas increased by 980 thousand won and that lower service fees and information gathering via web was brought about by cost-reduction effects. It also contributed towards improving the well-being of those living within rural areas.

To provide more support for women who want to restart their careers after a career interruption and increase their access to such support, the Korean government more than doubled the number of the regional offices of the Women’s Re-employment Centre between 2009 and 2015. Since 2015, the Korean government has categorized the Centre’s regional offices into “general,” “career-developing” and “rural” branches to meet the needs of various targets, including highly educated women in their 30s and women in rural areas. In addition, to encourage women to restart their careers after a career interruption, the Centre provides job training programs in value-added sectors, such as 3D printing, big data and drones.

Regional cooperation: What role can regional cooperation and regional bodies such as APEC play? You may like to consider the role of cooperation in addressing the challenges and policy gaps previously identified, in enhancing the investment environment, in making more possible cross-border/regional connectivity projects and in promoting co-ordination of development funding.

How can we ensure that Asia Pacific has top-quality physical and digital infrastructure to ensure maximum connectivity? What would be the benefits to your economy from improved connectivity?

Regional cooperation:

APEC can serve as a venue for member economies and relevant external institutions to share their experiences, knowledge, and best practices within the APEC context. For example, Korea could provide practical advice to interested economies in areas where Korea has a comparative advantage such as developing ICT-based digital infrastructure or constructing highway, high-speed train, and subway systems.

Also, economies can consider strengthening the conformity of technologies and adopting a standard technology in the field of ICT to improve connectivity and interoperability in the region. Mutually compatible technologies can promote digital trade and e-commerce, which contributes towards increasing the mobility of products and people and achieving future growth.

MALAYSIA

Capabilities: what significant policy or institutional structures (e.g. top 2) support your economy in meeting the following objectives. Economies could discuss whole of Government policies or policies that apply at a sector specific level:

- **Cost effectiveness:** Providing for the efficient provision and management of infrastructure and the efficient operation of infrastructure markets, including providing for cost-based access;
- **Resilience:** Enhancing adaptability and ensuring the infrastructure system is robust to disruptions and shocks;
- **Inclusion:** Ensuring broad access (e.g. across regions, genders, underserved or minority groups and indigenous people) to infrastructure, including digital infrastructure, to support inclusive growth?

Gaps: What are the highest priority structural or institutional reforms you have identified to meet these objectives?

Barriers and challenges: What are the key barriers and challenges to implementing structural reforms for infrastructure in your economy and has your economy identified any solutions to overcome those barriers or challenges?

For this survey, Malaysia would like to highlight its achievement in Structural Reforms and Infrastructure in the areas of:

- A. Improving coverage, quality and affordability of digital infrastructure; *and*
- B. Building an integrated need-based transport system.

A. Improving Coverage, Quality and Affordability of Digital Infrastructure

- Digital infrastructure plays a critical role in connecting businesses and individuals to the global marketplace, and due to rapid technological advances, it allows people to communicate in ways unthinkable before. Malaysia aspires to ensure that its citizens gain benefits from digital economy by expanding the 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 fiber connectivity, ensuring that Malaysians have access to affordable, high-quality digital infrastructure on par with developed economies. These aspirations will be achieved through **four (4) strategies:**

I. Expanding and upgrading broadband infrastructure

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 11th Malaysia 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.

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. The collaboration will ensure that broadband supply meets both federal and state requirements.

2. Increasing affordability and protection for consumers through an improved Access Pricing Framework (APF)

Improving the Access Pricing Framework for providers

- The APF will be improved to facilitate competition and infrastructure sharing among service providers which is expected to reduce the fixed broadband cost from 2.42% of Gross National Income (GNI) per capita in 2013 to 1% in 2020, in line with the domestic target. This will increase affordability and improve broadband outreach to the underserved.

3. Migrating to Digital Terrestrial Television (DTT) and introducing value-added services

Migrating to Digital Terrestrial Television (DTT)

- DTT is a technological advancement in television that allows the broadcast of high quality video over digitized land-based signals. DTT has lower operating costs than satellite television, but offers a higher quality of broadcast than analogue. For broadcasters and consumers, this would mean better affordability and improved quality of viewing on regular television, without the need for satellite antennas.

Implementing second phase of DTT

- The second phase of the DTT service will be implemented in 2016-2017, covering 46 areas economy-wide 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.

4. Strengthening infrastructure for smart cities through better connectivity

- 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. During the 11th Malaysia Plan, a framework will be developed to prioritize areas of focus in the development of smart cities. A fundamental initiative to realize the migration to smart cities will be the development of smart communities.

B. Building and Integrated need-based transport system

- The Government of Malaysia is committed towards developing an effective and sustainable transport system that can cope with the rising demand of personal mobility and the pressing need to bring down the cost of doing business. In the 10th Malaysia Plan,

network expansion of essential infrastructure such as roads, rail was undertaken to reach more households and improve standards of living.

- Improvements in transport infrastructure and measures to facilitate online trading contributed to increased trade activities, improving Malaysia's ranking in the World Bank Logistic Performance Index from 29 out of 160 economies in 2013 to 25 in 2014. **Four (4) strategies** towards achieving an integrated need-based transport systems:

1. Enhancing connectivity across transport modes and regions

- Comprehensive and efficient public transport connectivity is an enabler for sustained economic prosperity. To increase public transport utilization, public transport facilities will be made available, reliable and convenient for users.
- To achieve a balanced and inclusive growth, highway development will be focused towards rural and remote areas. A comprehensive needs analysis will be undertaken in road planning to ensure effective decision making on whether to upgrade existing road or construct new ones.

2. Expanding port capacity, access and operations

- As Malaysia integrates into the ASEAN Economic Community and the global economy, economic growth through trade and exports will necessitate greater capacity and efficiency of its infrastructure.

3. Strengthening regulatory and institutional framework for the transport industry

- Greater attention will be given towards strengthening 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 in order to remain competitive and sustainable.

4. Improving safety, efficiency and service levels of transport operations

- Strategies to expand Malaysia's transport network and enhance intermodal integration must be complemented by efforts to improve the systems' safety. Road and rail safety will be improved through initiatives such as Blackspot Mitigation Programme and Road Safety Audit to reduce accidents and fatalities. In addition to that, utilization of advanced materials and innovative technology in road construction and maintenance will be intensified to ensure durability of road infrastructure.

Highlights of the achievements (2011-2015):

- Road length rose 68% from 137,200 km in 2010 to an estimated 230,000 km in 2015. This resulted in a rise in the National Road Development Index from 1.42 in 2010 to 2.29 in 2015. During this period, road development focused on improving economy-wide linkages for better connectivity. Road maintenance programmes were continuously undertaken with greater focus on corrective maintenance.
- Two Malaysian ports were featured in the International Association of Ports and Harbours World's Top 20 Container Ports report in 2013. Port Klang, Selangor was ranked at 13th place with 10.4 million twenty-footer equivalent unit (TEU) and Port of Tanjung Pelepas was at 19th spot with 7.6 million TEUs. Between 2010 and 2014, total cargo volume grew 20.2% reaching 540 million freight weight tonnes. Major projects were

undertaken to expand port capacity with the addition of new container wharfs at Northport and Westport of Port Klang, Penang Port and Kuantan Port.

- Airports recorded an average annual growth rate of 8.5% for passengers handled. There was an increase of 39% in total volume between 2010 and 2014 (85 million passengers in 2014). In May 2014, Kuala Lumpur International Airport 2 (KLIA 2) was launched as a new low-cost carrier terminal and a third runway was operationalized at KLIA, to facilitate greater number of aircraft movement.
- The bottlenecks at key ports and airports are being addressed to capture existing and future demand. This is vital to ensure that the ports and airports remain competitive at the regional and global level.

Needs and financing requirements: What are your economy's main (e.g. top 2-3) identified physical and digital infrastructure needs over the medium-long term? Please describe the required financing and expected impact of these infrastructures.

Future needs: What are the main factors (e.g. population increase, technology, climate change or variability, ageing capital stock) that will influence your economy's future physical and digital infrastructure needs?

A. Among future Digital Infrastructure plans under the 11th Malaysia Plan are:

1. Fixed line broadband expansion
 - High Speed Broadband Phase 2 infrastructure expansion with speeds of 100 Mbps in state capital
 - Sub-urban broadband infrastructure with speeds up to 20 Mbps
 - The widening of broadband infrastructure with speeds up to 20 Mbps in rural areas
2. Mobile broadband coverage expansion
 - Construction of 800 towers that will improve 3G/4G mobile broadband services
 - 1500 existing towers upgraded to 4G mobile broadband
3. Submarine cable systems
 - A new submarine cable system is part of the government's initiatives to increase the capacity of high-speed broadband and data traffic between Peninsular Malaysia and Sabah and Sarawak.
 - The new submarine cable system which spans over 3,800 km lands at six landings in Kuantan, Mersing, Kuching, Bintulu, Miri and Kota Kinabalu. It will adopt state-of-the-art 100 Gbps technology, with a capacity of 4 Terabit per second (Tbps), enabling access to higher quality services to all Malaysians.

Malaysia's broadband penetration rate has reached 84.5% in 2017.

B. Key Physical Infrastructure plans under the 11th Malaysia Plan:

Pan Borneo Highway, Sabah and Sarawak

Pan Borneo Highway which spans over 2,325 km across the states of Sabah and Sarawak will play a major role in opening up economic corridors and opportunities to the areas connected by and along the highway. The completion of the Pan Borneo Highway Sabah and

Sarawak by the year of 2022 will certainly contribute towards the overall increase in productivity and revenue of the states.

Leading practices: Among your economy’s structural reform relating to infrastructure in the past 5 years (2013-2018), which two do you think have been implemented most effectively? Please identify the main reasons for the effectiveness of this structural reform that could be relevant for other economies.

Improving coverage, quality and affordability of digital infrastructure.

Among the key reasons were:

1. Domestic agenda to transform Malaysia to a modern state and adoption of knowledge based economy;
2. To keep pace with the development of digital economy;
3. Digital infrastructure development was implemented in stages since 1996, with the formalization of Multimedia Super Corridor (MSC); *and*
4. Excellent cooperation and coordination between government, private sector and public at large.

Regional cooperation: What role can regional cooperation and regional bodies such as APEC play? You may like to consider the role of cooperation in addressing the challenges and policy gaps previously identified, in enhancing the investment environment, in making more possible cross-border/regional connectivity projects and in promoting co-ordination of development funding.

How can we ensure that Asia Pacific has top-quality physical and digital infrastructure to ensure maximum connectivity? What would be the benefits to your economy from improved connectivity?

It is proposed that APEC continues to play a role in driving Regional Economic Cooperation by:

1. establishing platforms for knowledge sharing and technology exchange on Physical/Digital Infrastructure management and maintenance;
2. organising workshops to discuss future developments and challenges of Sustainable Physical/Digital Infrastructure; *and*
3. Capacity building programmes for SMEs to learn from Successful Physical/Digital Infrastructure Industry Players.

MEXICO

Capabilities: what significant policy or institutional structures (e.g. top 2) support your economy in meeting the following objectives. Economies could discuss whole of Government policies or policies that apply at a sector specific level:

- **Cost effectiveness:** Providing for the efficient provision and management of infrastructure and the efficient operation of infrastructure markets, including providing for cost-based access;
- **Resilience:** Enhancing adaptability and ensuring the infrastructure system is robust to disruptions and shocks;
- **Inclusion:** Ensuring broad access (e.g. across regions, genders, underserved or minority groups and indigenous people) to infrastructure, including digital infrastructure, to support inclusive growth?

Gaps: What are the highest priority structural or institutional reforms you have identified to meet these objectives?

Barriers and challenges: What are the key barriers and challenges to implementing structural reforms for infrastructure in your economy and has your economy identified any solutions to overcome those barriers or challenges?

Capabilities:

- Access to high-quality telecommunication and broadcasting services.
- **Cost effectiveness:** (2012)- Mexico promoted Structural Reforms to boost economic growth and development: These Reforms trigger investments, promote productivity, and generate a more flexible economic structure to face internal and external challenges. (2017)- the Ministry of Finance announced the strategy to promote Investment Programs and Projects under the Public Private Partnerships (PPP). Mexico’s private sector helps to reduce the need of public resources for infrastructure development.
- **Resilience:** An important part of the infrastructure development in Mexico is related to insurance schemes to protect the resources invested, ensuring its reconstruction in case of natural disasters. The PPP and concession schemes contemplate, in many cases, the construction risk transfer to the private enterprise in charge. The Mexican Government is reviewing the technical criteria of infrastructure projects to enhance resilience capacity.
- **Inclusion:** Telecommunications reform seeks to develop inclusion within Mexican society and to ensure that Mexico can provide broad access and democratize digital services to the citizens. In two projects: i) Shared Network (“Red Compartida”): a carrier that provides prime economy-wide telecommunication infrastructure equally available to all participants in the market; ii) Backbone Network (“Red Troncal”): to build a robust backbone network for access to a fixed broadband and facilitate telecommunication services through Federal Electricity Commission (CFE) infrastructure.

Gaps:

- With the telecommunications reform, the access to information and communication technologies, as well as the telecommunications and broadcasting services, including the broadband and Internet are considered to be human rights and the Mexican State shall guarantee that these services are provided in conditions of competition, quality, plurality, universal coverage, interconnection, convergence, continuity, free access and without arbitrary interference.
- One of the highest priorities of the telecommunications reform was to strengthen the legal and regulatory framework to improve the economic competition of this sector. **For this reason**, the reform introduced asymmetric regulation for the preponderant economic agents and allowed the Foreign Direct Investments (FDI) in all telecommunication and satellite communication services up to one hundred percent.
- Strengthen the legal and regulatory framework with a clear division between public policy and regulation, the creation of two autonomous bodies with ample powers: the IFT and the Federal Economic Competition Commission (COFECE). The IFT as a self-governing regulator has a transparent procedure for nominating and appointing the IFT's commissioners that involves the participation of different public powers and the IFT decisions cannot be suspended during judicial review. Also the reform created special courts to the telecommunication and broadcasting sectors for indirect appeal (“amparo”), convergent licenses to provide all services, an authority to grant and revoke licenses and exclusive powers to the IFT regarding antitrust for media and telecom.
- Mexico has set a legal framework to increase private sector participation:
 - Energy reform: boost productivity and investment.
 - Tax reform: changes to the tax system to increase tax collection.
 - Telecommunications reform: strengthens competition and investment.
 - Financial reform: promotes competition and access to better financing conditions.
 - Anti-trust reform: bolsters competition and investment.
 These reforms, as a key component of a new set of institutional arrangements, will facilitate and accelerate private investment in strategic infrastructure sectors.

Barriers and challenges:

The lack of project preparation implies incomplete and non-bankable projects, unaligned regulation, and unattractive risks; therefore, the government shall take actions aimed at:

- Strengthening public capacity to create greater impacts on institutional coordination, data collection for planning and project management.
- Reviewing and improving local regulation, especially for greater transparency and accountability for project development and financing.
- Understanding risk management to reduce inefficiencies, cost, and delivery time.

Needs and financing requirements: What are your economy's main (e.g. top 2-3) identified physical and digital infrastructure needs over the medium-long term? Please describe the required financing and expected impact of these infrastructures.

Future needs: What are the main factors (e.g. population increase, technology, climate change or variability, ageing capital stock) that will influence your economy's future physical and digital infrastructure needs?

Needs and financing requirements:

The Mexican Government recently created an infrastructure promotion area allocated in BANOBAS, a Mexican development bank. Its main objective is to contribute towards

increasing the supply of well-structured PPP projects and to link these projects with local and international investors. Within this area, the online platform called “Proyectos Mexico” or “Mexican Project Hub” is a bilingual website with more than 450 opportunities in different infrastructure and energy sectors that require private funding (equity or financing).

Future needs:

- According to the OECD Telecommunication and Broadcasting Review of Mexico 2017, the main objective of the reform was to increase access to high-quality telecommunication and broadcasting services for Mexico to create a vibrant digital economy. To maintain the momentum and move further towards promoting competition, improve market conditions, such as encouraging further investment, improving spectrum management, eliminating the tax on telecommunication services and ensuring that market expansion benefits all stakeholders while reducing barriers. To most, effectively meet the targets of the reform updating the National Digital Strategy in ways that harness the benefits brought by the development of the digital economy and society.
- In the short term, Mexico will face technological change, climate change, structural change (ageing), demographic increase, as well as a more urbanized society. In general, the future Mexican society will demand more and better public and private services. In this sense, Mexico urges the expansion of coverage for public and private services by modernizing its infrastructure.

Leading practices: Among your economy’s structural reforms relating to infrastructure in the past 5 years (2013-2018), which two do you think have been implemented most effectively? Please identify the main reasons for the effectiveness of this structural reform that could be relevant for other economies.

Leading practices:

- As a consequence of regulatory reform, the relevant markets in the telecommunication industry have developed positively: increased penetration levels can be observed in broadband markets, new players have entered the mobile market and the quality of service (QoS) has improved (the latter, particularly with respect to broadband speeds and data volumes, where investment in higher capacity mobile technologies and further availability of spectrum for mobile telecommunication services, including via the digital switchover, has led to an acceleration of gains). In the domestic economic context, between 2012 and 2016, prices for telecommunication services significantly decreased, leading to an important increase in subscriptions, especially in mobile markets: over 50 million new mobile subscriptions to the mobile Internet and, from a small base, the number of people using the Internet for online transactions has multiplied by a factor of four. In addition, foreign investment increased and the telecommunication and broadcasting sectors grew faster than the overall Mexican economy. A third domestic Free-to-air television network has been introduced and plans have been announced for a fourth set of licenses to be made available and awarded on a regional basis.

Energy reform:

- The modernization and consolidation of “Petróleos Mexicanos” (PEMEX) and “Comisión Federal de Electricidad” (CFE) as state owned productive companies.
- Attract investment to increase the availability of oil and natural gas.

- Improve the quality of public electricity, with broader coverage and more competitive prices.

Telecommunications reform:

- Attract investment towards satellite and broadcasting communications, thus stimulating telecommunications development throughout the economy.
- Opening DFI: up to 100% in telecommunications and up to 49% in broadcasting.
- Increase options for end consumers at affordable prices for cable television, fixed-line, and mobile telephony, and high speed internet.

Regional cooperation: What role can regional cooperation and regional bodies such as APEC play? You may like to consider the role of cooperation in addressing the challenges and policy gaps previously identified, in enhancing the investment environment, in making more possible cross-border/regional connectivity projects and in promoting co-ordination of development funding.

How can we ensure that Asia Pacific has top-quality physical and digital infrastructure to ensure maximum connectivity? What would be the benefits to your economy from improved connectivity?

Regional cooperation:

- The role of these regional bodies should be to continue the focus on promoting investment, accelerating regional economic integration, encouraging economic and technical cooperation, enhancing human security, facilitating a favorable and sustainable business environment in order to reach a sustainable and inclusive economic growth.
- The implementation of the Connectivity Plan (2018-2025), the exchange of knowledge and the creation of capacities, will allow APEC economies to have physical and high quality digital infrastructure to ensure maximum connectivity. Mexico is better prepared to face and adverse external environment:
 - Has achieved a sustained growth in the last 32 quarters, and in the last ten years recorded an average annual growth of 2.2%.
 - Implemented in the last several years 13 structural reforms with outstanding results:
 - 3.35 million jobs created in the period 2012 – 2017.
 - Committed investments by the private sector without precedent in the energy sector of over USD 200 billion.
 - Has proven prudent management of public finances that enabled a primary balance surplus of 1.4% of GDP in 2017.
 - Reversed the upward trend of public debt.
 - Has a solid legal framework that fosters the development of infrastructure through public-private partnerships.
 - Is committed to address climate change as demonstrated by the actions undertaken over the last few years.

NEW ZEALAND

Capabilities: what significant policy or institutional structures (e.g. top 2) support your economy in meeting the following objectives. Economies could discuss whole of Government policies or policies that apply at a sector specific level:

- **Cost effectiveness:** Providing for the efficient provision and management of infrastructure and the efficient operation of infrastructure markets, including providing for cost-based access;
- **Resilience:** Enhancing adaptability and ensuring the infrastructure system is robust to disruptions and shocks;
- **Inclusion:** Ensuring broad access (e.g. across regions, genders, underserved or minority groups and indigenous people) to infrastructure, including digital infrastructure, to support inclusive growth?

Cost-effectiveness: the Investment Management System

The investment management system encompasses the processes, rules, capabilities, information and behaviours that together shape the way investments are managed throughout their lifecycles. The system as a whole enables the New Zealand government to invest more effectively to maximize public value and improve the wellbeing of New Zealanders. The main goals of the system are:

- To enable investments to achieve their intended investment objectives,
- To optimise the value generated from existing assets and new investments,
- To increase the efficiency and effectiveness of the system over time.

Achieving these goals takes a concerted effort, because the system is complex and made up of many different agents (such as Ministers, boards, and agencies) with a range of roles and responsibilities. This organisational diversity exists in part because New Zealand, as a small economy of 4.7 million people, performs many government functions at a economy-wide level which are performed at regional or local levels in other jurisdictions.

The system is led and coordinated by the Treasury's Investment Management and Asset Performance (IMAP) team, in cooperation with other senior government officials at the centre of the New Zealand government. Together these "stewards" of the investment management system set rules and standards, run processes, and build capabilities to ensure investment across government is well developed and managed². For example, when agencies develop new government investments of significance, the IMAP team (on behalf of the system) sets standards and expectations for business cases (outlined in the Better Business Case framework), provides business case clinics (if needed) to assist agencies developing investments, collects data periodically on the investment to track development, and (if needed) monitors progress from investment development through to delivery. Additional processes and supporting functions are also performed by the system stewards to assist agencies as investments are developed and delivered.

² The scope of the investment management system and the rules, processes and expectations which guide and support government investments, are articulated primarily in Cabinet Circular CO 15 (05).

A Principles-Based Approach

The complexity of the system requires a flexible, principles based approach to investment management. The system is underpinned by an Investment Strategy³, which contains the following 11 principles to guide investment management:

Table 1: Principles of the Government Investment Strategy

Principle	Description
Considered and active stewardship	Take considered and active stewardship of taxpayer and Crown resources over a long-term investment horizon.
Continuous assessment	Continually assess whether existing investments and assets align with the Government's objectives and exit from assets, commitments or projects in development if it no longer makes sense to continue.
Balanced investment	Balance investment across the Government's interests and accountabilities when considering the make-up of the Government investment portfolio.
Informed decisions	Inform decision-making processes with information and evidence as well as analyses of the impacts of investing, not investing or divesting in public services.
Consideration of relative value	Consider the relative value of investment proposals against other proposals, existing investments, other options and forecast future proposals, in order to make decisions that make the best use of the precious resources in our care.
Alignment to Government priorities	Give preference to initiatives aligned with the priorities of the Government. Collective and all-of government approaches will be looked on favourably but must be able to demonstrate long-term value and show they have strong stakeholder support and commitment.
Optimal resource allocation	Move resources (including funding, assets and capability) to where they have the greatest overall effect, within the constraints of delegations and existing levers.
Appropriate risk management	Accept a level of risk in order to obtain the benefits from investments, but the risks need to be clearly identified and managed. Each decision carries risk, as does doing nothing. The Government is comfortable with a level of managed risk in its portfolio.
Good financial management	Expect agencies, in the first instance, to provide for current and future needs from within their existing baselines, and to understand: the costs of delivering their services; their medium to long-term planning; the impact of moving resources; and the performance of investments under their responsibility.
Alignment to fiscal strategy and balance	Inform and constrain (e.g., timing and maximums) its investment decision-making and management, at an all-of-government level, through the Government's fiscal strategy and balance sheet targets.

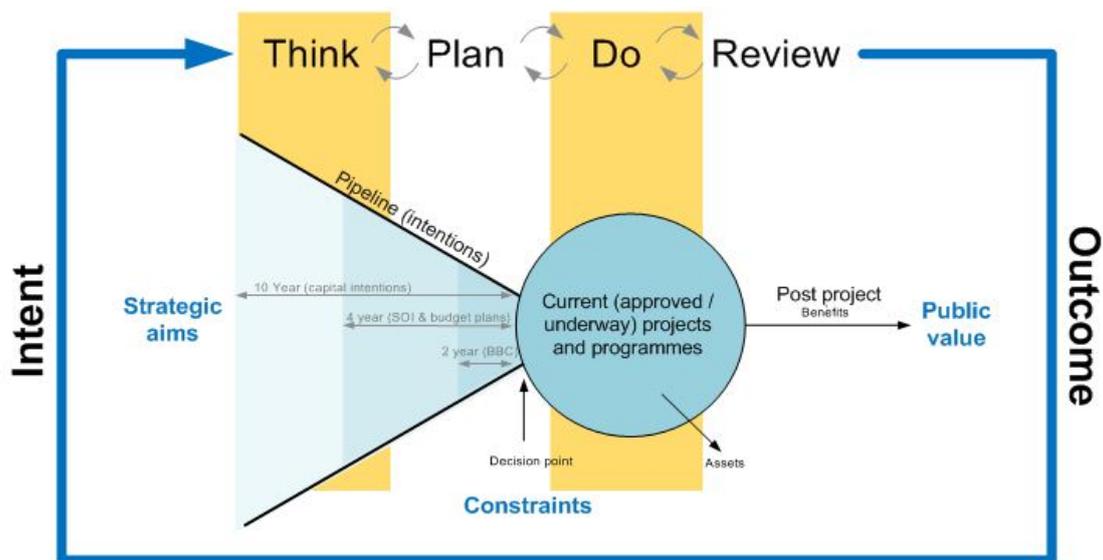
³ Given the recent change of government, the investment strategy represented here is currently being reconsidered and revised by the new government, however it will likely be similar in intent and wording.

sheet targets	
Regular reporting	Review, and periodically report on, the performance of the Government’s investment portfolio against the outcomes it wants to achieve, to ensure transparency.

Investment Lifecycle Phases

Conceptually the investment management system is organised into four investment lifecycle phases: think, plan, do and review. Throughout these phases, agencies manage their own investments, but with additional support and monitoring from the centre of Government to ensure success. Each phase has different implications for agencies and decision-makers. Figure 1 describes these investment lifecycle phases.

Figure 1: Phases of the Investment Lifecycle



Resilience

Given New Zealand’s exposure to natural hazards, and the range of other factors that may disrupt the flow of services derived from infrastructures assets, ensuring that critical infrastructure systems can effectively respond to shocks is important. Under best practice resilience considerations would be incorporated into decision-making as ‘business as usual’, for example it should be a routine consideration alongside other considerations when developing business cases for new or existing infrastructure assets that get considered through the domestic budget, local government investments or Government-owned company board decisions.

Resilience should also be considered broadly (see figure 2), not just with a narrow focus on shock events such as earthquakes, or infrastructure failure. For example, consideration should be given to all potential hazards to a system including those that occur over a long period of time such as the impacts of climate change, thinking about interdependencies within and between systems and the impact of events on the level of service. Increasing

resilience is not just about building things stronger; the role of operational changes and community preparedness in mitigating the costs of hazards also needs to be considered.

Incorporating resilience considerations into strategic thinking, planning and funding therefore requires a level of capability across central and local government in understanding resilience. Below we discuss two initiatives that have been undertaken in New Zealand, the Lifelines Council and incorporation of consideration of resilience into planning for transport infrastructure.

Figure 2: Resilience attributes



Lifelines Council

In order to build cross agency capability in regards to resilience, the New Zealand Lifelines Council (NZLC)⁴ was established in 1999 with the objective of "Enhancing the connectivity of lifeline utility organisations across agency and sector boundaries in order to improve infrastructure resilience". Members of the council include providers of critical infrastructure (e.g. providers of telecommunications, electricity and gas, water and road) and Government agencies with a relevant interest. The NZLC seeks to promote arrangements to improve infrastructure resilience, and has adopted three themes to frame work in this respect. These are the need for:

- Robust assets, or satisfactory alternative service continuity arrangements;
- Effective coordination, pre and post-event, at an economy-wide and local level;
- Realistic end-user expectations, so that users are risk-aware and better able to consider options.

The principal functions of the NZLC are:

⁴ Ministry of Civil Defence and Emergency Management. (n.d.). New Zealand Lifelines Council. Retrieved from <https://www.civildefence.govt.nz/cdem-sector/lifeline-utilities/new-zealand-lifelines-council/>

- Advising community-based Lifelines Groups on best practices across a range of activities, including encouraging new projects and supporting them by offering information on methodology and other learnings from projects in other regions;
- Providing a link between Lifelines activities and government – relevant government programmes include Lifelines work within the Ministry for Civil Defence and Emergency Management and economy-wide infrastructure planning within Treasury;
- Promoting and promulgating resilience-related research;
- Organising the annual National Lifelines Forum. The Forum updates representatives from Lifeline Groups and domestic utilities on latest developments, and provides an opportunity to develop positions on common resilience-related issues.

Transport

The ability of our transport system to function effectively during a range of adverse conditions, and then to recover quickly to acceptable levels of service, is fundamental to the longer-term well-being of communities, and New Zealand's economic productivity. Aside from facilitating normal activity (including economic activity), the transport system is also a vital lifeline during an emergency response, and is critical for evacuations and supplying essential goods and services. Given transport's crucial role, improving transport *system* resilience has been identified as a key priority for the transport sector. In this regard the Ministry of Transport plays a key role in providing cross sector leadership in improving the resilience of the system as a whole and to:

- Plan, prepare, and respond to hazardous events impacting on the transport system;
- Build a longer-term strategy to improve transport system resilience, including a clear vision and outcomes framework and a cross-modal action plan;
- Encourage engagement and collaboration across the transport sector on transport system resilience;
- Provide clear advice on the appropriate role government should play to achieve a resilient transport system.

One key lever that central Government has to influence the resilience of the transport sector is through its funding choices. Funding choices for land transport are guided by the Government Policy Statement on land transport (GPS). This is issued by the Minister of Transport and outlines the Government's strategy to guide land transport investment over the next 10 years. The GPS guides decisions on how money from the National Land Transport Fund (NLTF) is to be invested over the next decade (currently approximately \$4 billion each year) and guides the decisions of other entities that makes decisions on the funding of land transport (such as local government). One of the national land transport system objectives in the 2018 GPS is for a land transport system that is resilient, including a focus on resilience to climate change impacts, ensuring that this consideration is a factor in funding decisions.

Inclusion

One key element of inclusion in New Zealand is ensuring the economic prosperity of regional New Zealand. The New Zealand Government has recently undertaken an initiative to lift the productivity potential of regions that are seen to have fallen behind on a number of key economic indicators, such as employment and household income. The Tuawhenua Provincial Growth Fund (PGF), launched in February 2018, aims to lift productivity in the regions. Its priorities are to enhance regional economic development opportunities, create sustainable jobs, enable Maori to reach their full potential, boost social inclusion and

participation, build resilient communities, and help meet New Zealand's climate change targets. This reflects a commitment to ensure that regional New Zealand can thrive through productive, sustainable and inclusive economic growth, and also reduce social and infrastructural deficits that are said to have emerged.

The PGF fund will allocate NZD\$3 billion over 3 years towards regionally-based projects. One arm of the PGF is focused on investing in regional infrastructure projects that will lift productivity and grow jobs. The PGF will allow additional funding for regional infrastructure projects, such as land transport, that support the goals of the fund.

Gaps, barriers, challenges and future needs: What are the highest priority structural or institutional reforms you have identified to meet these objectives? What are the key barriers and challenges to implementing structural reforms for infrastructure in your economy and has your economy identified any solutions to overcome those barriers or challenges?

Our economy faces significant challenges over the next 30 years. This includes the need to balance fiscal resilience (by returning government debt to a 20 percent ratio of core Crown debt to GDP) against the need to invest to support the resilience of physical assets. Additionally, fiscal pressures resulting from the need to replace ageing assets (many of which were constructed post-war), as well as population and demand shifts will need to be addressed. Also, to keep our economy growing, our infrastructure needs to support increased productivity. At the same time, technology is transforming the way infrastructure providers deliver services. Finally, our climate is changing, and our natural resources are under pressure, which will create new challenges for infrastructure planning.

To respond to these challenges, we need a more sophisticated approach to planning, developing and managing our infrastructure. This includes having an overriding focus on the outcomes we want to achieve, rather than the assets used to deliver them. This can be achieved by infrastructure providers in central government, local government and the private sector:

- Increasing understanding of levels of service and future drivers of demand over the long term;
- Strengthening asset management practices and using data more effectively; and
- Optimising decision making, which includes having the right governance and management structures and regulatory regimes in place.

Specific examples of particular areas for improvement are below:

Three waters (drinking, storm- and wastewater)

A series of recent events have indicated the need for improvement in the management of three waters (drinking, storm and wastewater). This is illustrated by the following:

- The Auditor-General and the Productivity Commission have raised concerns about investment and regulation of three waters infrastructure;
- There was a widespread outbreak of gastroenteritis in Havelock North in August 2016, with more than 5000 people falling ill from contamination of the drinking water supply;
- It could take up to 120 days to restore water services to Wellington in the event of a major earthquake;

- There have been some examples of cost overruns/quality problems in water systems delivered by local Government, namely:
 - In Kaipara District Council, a wastewater scheme intended to cost the community \$18.5 million actually cost \$63.3 million, and required the Crown to appoint Commissioners to replace the elected council.
 - In Whanganui District Council, a wastewater scheme costing \$27 million failed to meet intended performance levels and a new scheme costing approximately \$41.2 million is proposed.

Resource management planning

The existing resource and land use regime could be reformed to better enable central and local government to more easily respond to demand for infrastructure. Challenges include a lack of alignment across legislative roles and responsibilities, particularly with regard to urban issues such as housing and infrastructure. Improvement to the planning system may mean more certainty that the right levels of infrastructure are planned, funded and delivered over the long term.

Leading practices: Among your economy’s structural reforms relating to infrastructure in the past 5 years (2013-2018), which two do you think have been implemented most effectively? Please identify the main reasons for the effectiveness of this structural reform that could be relevant for other economies.

See case studies.

Regional cooperation: What role can regional cooperation and regional bodies such as APEC play? You may like to consider the role of cooperation in addressing the challenges and policy gaps previously identified, in enhancing the investment environment, in making more possible cross-border/regional connectivity projects and in promoting co-ordination of development funding.

How can we ensure that Asia Pacific has top-quality physical and digital infrastructure to ensure maximum connectivity? What would be the benefits to your economy from improved connectivity?

- Cooperation through regional bodies such as APEC provides the opportunity to share experiences on the lessons learned in improving structural policies for infrastructure provision and management. Economies can learn from others’ reforms and outcomes. They can share the range of their experiences and challenges through policy dialogues, workshops and capacity building exercises, allowing other economies in similar positions to learn from their situations.
- This sharing allows economies to identify opportunities for joint projects and areas for coordination or parallel development. The more coordinated regional infrastructure development is, the more valuable this development to the Asia Pacific region as a whole.
- A regional discussion of infrastructure challenges and plans could also pave the way for constructive discussions with the market. For example, a regional articulation of future government infrastructure needs could attract suppliers to the region, or encourage them to increase capacity or capability to meet the regions’ public sector infrastructure forecast needs.

- New Zealand is highly reliant on robust, good quality physical and digital infrastructure for its development and long term prosperity.
- The digital economy is becoming an increasingly important driver of economic growth and well-being. Encouraging development and alignment of digital infrastructure, in particular, is likely to generate significant benefits. The goal should be to achieve high standards of digital infrastructure and support connectivity between APEC economies, where businesses, people and government are all using digital technology to drive innovation, improve productivity and enhance the quality of life.

PAPUA NEW GUINEA

Capabilities: what significant policy or institutional structures (e.g. top 2) support your economy in meeting the following objectives. Economies could discuss whole of Government policies or policies that apply at a sector specific level:

- **Cost effectiveness:** Providing for the efficient provision and management of infrastructure and the efficient operation of infrastructure markets, including providing for cost-based access;
- **Resilience:** Enhancing adaptability and ensuring the infrastructure system is robust to disruptions and shocks;
- **Inclusion:** Ensuring broad access (e.g. across regions, genders, underserved or minority groups and indigenous people) to infrastructure, including digital infrastructure, to support inclusive growth?

There are various policy reforms being implemented by the Government to encourage cost-efficiency, sustainability and inclusive growth in the economy.

The Government has recently undertaken the Kumul Reform Agenda to improve governance in the management of SOEs and enhance efficiency in service delivery.

This is complemented by other various policies such as the Community Service Obligation (CSO) Policy and the On-Lending Policy. These policies are being implemented to address challenges that the SOEs face, to improve their investment performance and allow for efficient infrastructure service delivery.

SOEs contribute significantly to the economy not only in terms of providing basic essential infrastructure services such as power and water but SOE dividends contribute to the PNG domestic budget. Hence, the Government requires that SOEs maintain a good performance.

However, SOEs are frequently faced with the challenge of generating a comparable level of profit to private sector companies while providing goods or services to the community at a cost that renders those activities unprofitable. The CSO policy promotes both competition and transparency in the provision of goods and services by SOEs.

The CSO policy requires that all CSOs are fully costed and defined in a contract. This will ensure CSOs are delivered in a manner that is transparent, brings greater accountability and improves SOE performance. This will further enable the government to better monitor the performance of the SOEs and their delivery of CSOs.

Removing the need for SOEs to cross subsidize CSO activities from the profitable arms of their operation also enables the Government to understand the true cost of delivering CSOs, thus placing the Government in a better position to assess the scope for private sector involvement.

The CSO policy is currently being piloted with an SOE. Lessons from the pilot program will enable the broader roll-out of this policy onwards.

Gaps: What are the highest priority structural or institutional reforms you have identified to meet these objectives?

PPP - Infrastructure initiative.

The government remains committed to promoting reforms to encourage efficiency and enhance infrastructure service delivery. One such reform initiative is the Public Private Partnership (PPP). The Government passed the PPP Policy and legislation in 2014.

The recent gazettal of the PPP Act beginning 2018, will now enforce the implementation of the PPP legislation. The PPP law creates three PPP institutions namely; PPP Centre, PPP Forum and PPP Steering Committee.

The PPP modal will be used in the delivery of infrastructure service, assist in prioritising projects and ensure they are of the best outcomes and value for money. Supporting the government in identifying a streamline of bankable projects going forward. The government is in support of the PPP framework as it recognises that private sector participation in infrastructure and service delivery will lead to greater efficiencies.

The Government will utilize private sector capital, management, innovation and technology to realise these efficiencies. The greater use of PPP arrangements can also help to improve SOE efficiency and profitability as well.

There are existing PPP arrangements operating/implemented effectively outside of any formal PPP framework. The PPP legislation will bring all potential PPP arrangement project under one framework.

Barriers and challenges: What are the key barriers and challenges to implementing structural reforms for infrastructure in your economy and has your economy identified any solutions to overcome those barriers or challenges?

CHALLENGES**CONNECTIVITY**

- **REMOTE GEOGRAPHICAL TERRAIN.**
- **DIFFICULTY IN ACCESS TO MARKETS**
- **SCATTERED POPULATION**

PNG (New Guinea) is one the largest island economies in the Pacific with a population of 8 million people, and an average growth rate of 2%. It has a population density of 18 people per square kilometer, which is relatively low in comparison to other pacific island economies. It is considered to be one of the most diverse and geographically complex places, given the wild terrain and large mountainous rainforests that is vastly un-inhabited.

People live widely scattered areas along the mountains and valley terrains, some in remote isolation accessible by walking. This makes it difficult in terms of accessing services and markets.

Many Papua New Guineans still live in very remote and isolated areas especially in the inland Highlands rural areas. Only an estimated 4% dwell in the urban towns. Hence service delivery and infrastructure is vital to connect them with the rest of the economy.

The Government sees Connectivity as critical to achieve a more productive and integrated robust economy. Better connectivity translates to lower trade costs, access to markets, create business opportunities among others.

- Connectivity could be Physical in term of road infrastructure, interconnection within the economy. Creating access for connecting people to services.
- Connectivity could be Institutional in terms interagency, Central Government to the Provincial government to the Local Level Government. Building capacity within the institutions to provide efficient and effective infrastructure services.

The Government has public systems and (decentralize) mechanisms in place to assist in identifying and allocating resources to the different communities in the economy.

Government is promoting policies that would better enhance service delivery and provide basic infrastructure to the people. The CSO and PPP Policy frameworks.

COMPETITIVE ENVIRONMENT - COST OF DOING BUSINESS

Affordable Utility Services – Providing quality and affordable electricity, water, telecommunication services to the people in the economy is a priority.

PNG's growing urban population demands for quality and affordable utility services. The Government is looking at alternative options that could improve the provision of all Utility Services.

Electricity

Currently only 13% of the population have access to electricity, the Government through its Medium Term Development Plan would like to see improvement such that more than 55% of households having access to electricity by 2025 and the overall economy access to 70% by 2050.

To achieve this goal, PNG needs sustainable domestic power solutions that could deliver quality and affordable electricity to the People and the economy as a whole. Hydro Power Projects coming on-line such as the Ramu 2 and Naoro Brown would contribute to enhancing infrastructure development in the medium term.

Telecommunication

Competition in the Telecommunications Sector has brought significant benefits to the PNG economy.

Reportedly, the telecommunications mobile phone sector reform and growth have made a strong contribution to PNG's GDP. Following the entry of Digicel in 2007, the contribution of the transport, storage and communication sector to total and non-mining GDP almost doubled – from 2.7% and 3% respectively in 2006 to 5.1% and 5.7% respectively in 2008. The sector contributed just over 20% of total GDP growth for 2008. With total GDP growth estimated at 7.16%, this means that the sector contributed approximately 1.4 percentage points to GDP growth in 2008.

Further reforms are being discussed in this Sector going forward to enhance efficiency and effective service delivery.

Water

There is currently two SOEs engaged in this sector in PNG namely Eda Ranu and Water PNG. There are discussion to merge the two entities to improve the efficiency of delivery of water and sanitation services to the people.

SOCIAL – LAND ISSUES: LAND TENURE

In PNG almost 80% of the land is Customary owned. The Government is always tasked to provide an economically beneficial solution to both PNG customary landowners and investors in terms of dealing with investments.

Also finding the right Policy framework that would give equal and fair treatment to all stakeholders when dealing with Customary Land issues is important.

NATURAL DISASTERS – MANY PACIFIC ISLAND ECONOMIES EXPERIENCING CLIMATE CHANGE.

Natural Disasters such as landslides, weather effects on the road conditions do affect productivity output and service delivery in PNG. Also PNG is an island economy that is experiencing issues in respect to climate change.

PNG , the reported changes in respect to Climate Change are ; (PNG Weather Service report on Climate Change, 2011 - 2012)

- Rising Sea Level. Many Communities in the coastal areas are experiencing issues with the sea coming in and washing away the villages and the taking the land. (eg. Wewak).
- Increased Temperature – with very hot days occurring more in the future (Hot Days - recording really high temperatures unlike before).
- This is also creating an issue for 85% of PNG’s population who live a subsistence lifestyle and are dependent on the weather to harvest food and cash crops.
- Ocean Pollution and acidification. This is creating issues for PNG’s diverse bio marine environment and the Government is looking for appropriate solutions for this.

The Government has to effectively manage these different priorities and needs as well as maintain a consistency in service delivery to the people.

The main objective for the Government is in identifying the right measures to deal with the challenges identified. Formulating strategic plans and appropriate reforms to addressing this issues/challenges going forward is very important.

GOING FORWARD

Getting Value for Money on Public Expenditure is Important

The Public Expenditure through government intervention programmes stimulate economic activity and contribute to developments in the economy. The government public expenditure to key areas such as health, education and infrastructure have been maintained continuously through the annual budgets, as it is part of the Medium Term Development Plan (MTDP) enablers towards improving PNG's social indicators for development.

However; translating the resources being given to tangible development outcomes in the economy is still to be realised.

Continue Public Investment

Sustainable Public Expenditure/Investment - Inclusive Green growth objectives (StaRS)

The PNG government is focusing its efforts on Inclusive Green growth investments, this means intervention programmes being implemented by the government are based on a having sustainable approach to development.

The Government direction is on the renewable sectors, such as re-invigorating growth through Small Medium Enterprises (SMEs) and the tourism and agriculture sectors that will underpin broad based and inclusive economic growth structures. This also means providing financing to enable development in these sectors.

In 2018 the PNG government allocated K100 million to the Agriculture Commercialisation Fund (ACEF) to boost economic activities in this sector. As well as allocating a K100 million aimed at SME development to commercial banks for concessional lending.

The PNG government is also undertaking other broader reforms such as the Public Expenditure and Financial Accountability (PEFA) assessment which is targeted towards improving the Public financial management system to enable greater transparency and accountability in the government system. Effective monitoring and disbursement of funds to the priority areas will contribute effectively to promote infrastructure and service delivery to the people.

PERU

Capabilities: what significant policy or institutional structures (e.g. top 2) support your economy in meeting the following objectives. Economies could discuss whole of Government policies or policies that apply at a sector specific level:

- **Cost effectiveness:** Providing for the efficient provision and management of infrastructure and the efficient operation of infrastructure markets, including providing for cost-based access;
- **Resilience:** Enhancing adaptability and ensuring the infrastructure system is robust to disruptions and shocks;
- **Inclusion:** Ensuring broad access (e.g. across regions, genders, underserved or minority groups and indigenous people) to infrastructure, including digital infrastructure, to support inclusive growth?

The Legislative Decree 1224 is the legal framework for Public Private Partnerships (PPP) in Peru, a modality that has been actively used during the last decade (the first PPP law was enacted in 2008):

- Institutional framework: Clearer roles were set, better defining responsibilities with the Central Government, as well as Sub-National authorities. The Domestic System for the Promotion of Private Investment has been created, with the Ministry of Economy and Finance's PPP control unit being the guiding entity of the System. Moreover, the domestic PPP unit called "Proinversión", which is a cross-sector agency focused on promoting private investment, especially PPPs, has been empowered.
- Policy: The Business Case methodology has also been strengthened: this part of reform was introduced to tackle one of Peru's main problems with PPPs, which is project readiness and preparation, focusing on the suitability of PPP procurement as well as the investment decision per se. There is an on-going effort to heighten risk analysis and mitigation throughout project preparation. The recent changes to the PPP law have also improved the payment mechanisms: trying to reduce tax money away from an overly guaranteed PPP model, aiming to strengthen the concepts of functionality and availability.

On the other hand, the Legislative Decree 1252 is the legal framework for the new National System for Public Investment, called National System for the Multiannual Programming and Management of Investments (Invierte.pe), which replaced the previous platform called SNIP:

- Institutional framework: All public bodies (as ministries, regional governments, municipalities or state-owned enterprises wishing) must apply to the Invierte.pe for funding in order to undertake an investment project. Depending on the type of project, an evaluation consists of either a cost-benefit analysis or a cost-effectiveness analysis.
- Policy: The new system provides a coherent framework for selecting, identifying, coordinating, evaluating and implementing public investments. Also, it improves resource allocation through an appropriate multi-year programme as a way to link project appraisal with economy's development priorities and to narrow "infrastructure investment gap". Moreover, the appraisal methodology that each project must undergo depend on its technical complexity, size and cost: for smaller projects or repeated investments (such as schools, police stations and rural roads), a positive evaluation (template) is sufficient for start-up.

Gaps: What are the highest priority structural or institutional reforms you have identified to meet these objectives?

Among the pending reforms to be implemented are:

- Publication of a guideline for the elaboration of a PPP standard contract, which would help reduce transaction costs for the development of a PPP project.
- Publication of a National Infrastructure Plan, where the Peruvian government will emphasize concepts like sustainability, resilience to climate change and natural disasters as well as cost effectiveness (better value for money).
- Ongoing capacity building efforts, especially at the regional and local government levels.

Barriers and challenges: What are the key barriers and challenges to implementing structural reforms for infrastructure in your economy and has your economy identified any solutions to overcome those barriers or challenges?

On the PPP side, one of the main challenges is getting the land. Informality and lack of an updated baseline for property owners throughout the economy are in dire need of reform. Solutions have been identified through the creation of a delivery unit for PPP, called APIP, within Proinversión. APIP, which stands for ‘Access to Property for Prioritized Investment Projects’, will be in charge of establishing ad hoc procedures to obtain the land, remove utilities and transfer property among public entities for a list of prioritized investment projects, including PPPs.

On the public investment side:

- Lack of effective implementation of investments and limited resources: It requires moving away from a strict project-based approach to a more strategic portfolio of projects approach, based on “closing infrastructure gaps” and government priorities. The new public investment system, Invierte.pe, seeks to prioritise projects according to this criteria in order to allocate resources.
- Assessment of functioning of investments: Public assets tend to be forgotten after projects have been completed and attention shifts to seek funding for new projects. To tackle this barrier, the new public investment system, Invierte.pe, keeps records of the existing assets and their current value, in order to allocate resources for the operation and maintenance of these assets.

Needs and financing requirements: What are your economy’s main (e.g. top 2-3) identified physical and digital infrastructure needs over the medium-long term? Please describe the required financing and expected impact of these infrastructures.

On an economy-wide level, although there are no official estimates for the infrastructure gap, several studies commissioned or prepared by public and private entities have estimated the infrastructure gap in different sectors. For example, the Association for the Promotion of National Infrastructure (*Asociación para el Fomento de la Infraestructura Nacional - AFIN*) estimated the domestic infrastructure gap to be about US\$ 159 billion for the period 2016–25. However, the study seems to underestimate needs in social sectors such as education, health, water and sanitation, and energy. Another study estimates an infrastructure gap of US\$ 200 billion until 2062. However, methodologies are not consistent across studies, so these estimations should not be taken at face value. An official baseline study is needed.

Future needs: What are the main factors (e.g. population increase, technology, climate change or variability, ageing capital stock) that will influence your economy’s future physical and digital infrastructure needs?

- A combination of increasing population and demand for better services (due to a growing middle class), especially in education and health.
- Climate change and pollution are becoming more important, regarding that Peru is highly vulnerable to these impacts. In line with Paris Agreement, Peru has committed to reduce its greenhouse gas emission in 30% by 2030, as well as reinforce its climate-change adaptation policies. Therefore, notions such as resilience, preparedness and sustainable development need to be integrated into infrastructure planning and assessment.

Leading practices: Among your economy’s structural reforms relating to infrastructure in the past 5 years (2013-2018), which two do you think have been implemented most effectively? Please identify the main reasons for the effectiveness of this structural reform that could be relevant for other economies.

The enactment of Legislative Decree 1224, our existing PPP law, allowed the following improvements:

- Establishing five clear phases for the development of PPP: Planning and Programming, Formulation, Structuring, Transaction and Contract Execution.
- Creation of the National System for the Promotion of Private Investment, with the Ministry of Economy and Finance’s PPP control unit being the guiding entity of the System. Before the creation of the System, each public entity involved in PPP (regulator, granting entities, National Audit Office, among others) had a different interpretation of the law.
- Creation of the Committees for the Promotion of Private Investment within the Ministries and subnational governments. Acting as project owners.
- Preparation of Evaluation Reports as business case documents, which include a qualitative value for money assessment. Allows a more thorough evaluation of the project, including economic, financial, technical, social and environmental aspects. Setting a target and roadmap for land acquisition is a must.

Preparation of the Multiannual PPP Investment Report by the Ministries and subnational governments, which is the main document of the Planning and Programming phase. Projects need to be aligned with strategic planning.

On the public investment side, the new National System for the Multiannual Programming and Management of Investments (Invierte.pe), allowed the following improvements:

- The new system covers the phases of the investment cycle in a more complete manner than the predecessor system (called SNIP) and the system of any other economy in the region. The new phase added is called “Multiannual Programming of Investments”, whose main result is a portfolio of projects based on “closing infrastructure gaps” and aligned with strategic objectives.
- Appraisal methodologies may be differentiated according to the size of project or its complexity. This would mean less rigorous assessments for smaller projects and more rigorous ones for larger or riskier projects.
- Clearer roles were set, better defining responsibilities of the bodies part of the System.

Regional cooperation: What role can regional cooperation and regional bodies such as APEC play? You may like to consider the role of cooperation in addressing the challenges and policy gaps previously identified, in enhancing the investment

environment, in making more possible cross-border/regional connectivity projects and in promoting co-ordination of development funding.

How can we ensure that Asia Pacific has top-quality physical and digital infrastructure to ensure maximum connectivity? What would be the benefits to your economy from improved connectivity?

Initiatives such as the Global Infrastructure Hub (<https://www.gihub.org/>) and SOURCE (<https://public.sif-source.org/>) provide valuable databases and information on infrastructure projects that promote best practices among public officers as well as the private sector.

In order to ensure maximum connectivity among APEC economies, especially considering the sharp geographic differences (i.e. some member economies are located in Asia while others are located in America), a baseline study would have to be elaborated first to identify the common infrastructure needs and possibilities. Second, some proper planning would be required to develop cross-border investments. Finally, aspects such as financing and funding are key to determine which economy or group of economies will have to pay for the needed infrastructure.

With regard to the benefits of top-quality physical and digital infrastructure, a significant amount of research shows the positive relationship between an economy's stock of infrastructure and its economic and social performance. Infrastructure has a positive effect not only on economic growth, but also on development in terms of poverty alleviation and income distribution. According to APEC itself, well-designed, sustainable, and resilient infrastructure enhances economic growth, boosts productivity, and promotes job creation. Regional infrastructure also facilitates the smooth flow of goods, services, and people across borders, improves regional connectivity, and promotes sustainable development.

PHILIPPINES

Capabilities: what significant policy or institutional structures (e.g. top 2) support your economy in meeting the following objectives. Economies could discuss whole of Government policies or policies that apply at a sector specific level:

- **Cost effectiveness:** Providing for the efficient provision and management of infrastructure and the efficient operation of infrastructure markets, including providing for cost-based access;
- **Resilience:** Enhancing adaptability and ensuring the infrastructure system is robust to disruptions and shocks;
- **Inclusion:** Ensuring broad access (e.g. across regions, genders, underserved or minority groups and indigenous people) to infrastructure, including digital infrastructure, to support inclusive growth?

Gaps: What are the highest priority structural or institutional reforms you have identified to meet these objectives?

Barriers and challenges: What are the key barriers and challenges to implementing structural reforms for infrastructure in your economy and has your economy identified any solutions to overcome those barriers or challenges?

Capabilities

Recognizing the information and communications technology (ICT) sector's indispensable role in catalyzing economic growth and development in the economy, the Philippine Government formulated the National Broadband Plan (NBP) which will set the policy direction for the sector and blueprint to accelerate the development of broadband access in the economy.

The NBP is envisioned to provide a "resilient, comfortable and vibrant life for all, enabled by open, pervasive, inclusive, affordable and trusted broadband internet access" with the following four key outcome areas: (a) accelerated investment; (b) mobilized and engaged public and private sectors; (c) more places connected; and (d) increased usage/take-up rate.

To realize its vision and attain the four key outcome areas, the NBP will focus on three broad strategies as follows:

- Institute policy and regulatory reforms;
- Provide government investment in broadband infrastructure through the establishment of the Philippine Integrated Infostructure (PhII) and harmonization of existing government assets to reduce the deployment costs; and
- Support the stimulation of broadband demand through local content creation, among others.

The Philippine Government is currently in the conceptualization/development phase of various infrastructure projects to support the NBP implementation such as the following:

- Component 1: National Fiber Backbone;
- Component 2: International Cable Landing Stations;
- Component 3: Accelerated Tower Build (Access);
- Component 4: Accelerated Fiber Build (Access); and

- Component 5: Satellite Overlay (Access).

The full implementation of projects that will support the NBP may have implementation delays due to, among others, lack of forward planning which will affect the absorptive capacities of key implementing agencies (IAs), right-of-way (ROW) and resettlement issues, inadequate project preparation, poor quality-at-entry and poor project executive. These aspects may significantly reduce the project's value and hamper the attainment of the overall objectives of the NBP.

Thus, the Philippine Government has initiated/facilitated the following to ensure quality-at-entry of infrastructure projects and improve capacities of the concerned government agencies:

- Project Development and Other Related Studies (PDRS) Fund amounting to PhP1.5 95 billion to be administered by NEDA for 2018;
- Infrastructure Preparation and Innovation Facility (IPIF) amounting to PhP7.92 billion to be financed through Official Development Assistance (ODA) to be facilitated by the Department of Finance (DOF) from 2018 to 2021;
- Institutionalization of the Infrastructure Cluster (IC)⁵ which is aimed at improving the quality and reliability of public infrastructure, public investment efficiency and enhancing the delivery of public infrastructure
- Facilitation of the Project Development and Monitoring Facility (PDMF), a revolving fund intended for the preparation of pre-investment studies of public-private partnership (PPP) projects, among others.

Moreover, the Philippine Government recognized the need to improve the management of existing and proposed infrastructure assets to ensure the sustainability of operations and resilience and maximize the functionality and project life.

In August 2017, Republic Act (RA) 10929 or the Free Internet Access in Public Places Act has been signed by the President to make broadband services more accessible to the public. This Act aims to provide internet access in 13,024 public places.⁶

Gaps, barriers and challenges

To further improve the ICT sector in the economy, the Philippine government has identified amendments to the Public Telecommunications Policy to consider changes in the market landscape and advancements in telecommunications and technology as well as to enhance competition in the playing field through the DICT and National Telecommunications Commission (NTC).⁷ Other policies and regulatory issuances that restrict developments in ICT are the Public Service Act, Radio Control Law, Article XII of the 1987 Constitution,

⁵ Executive Order (EO) No. 24, s. 2017: Reorganizing the Cabinet Clusters System by Integrating Good Governance and Anti-Corruption in the Policy Frameworks of All the Clusters and Creating the Infrastructure Cluster and Participatory Governance Source: <http://www.officialgazette.gov.ph/downloads/2017/05may/20170516-E0-24-RRapdf>

⁶ Renewed APEC Agenda for Structural Reform Individual Action Plan Mid-Term Review

⁷ Chapter 19, Philippine Development Plan 2017-2022

and the Guidelines on the Procurement of Orbital Slots and Frequency Registration of Philippine Satellites.⁸

Aside from amending the existing policies and regulatory issuances, the NBP also includes policies that the government may pursue to improve the industry. This includes, among others, the Open Access and Peering Policy and Dig Once Policy. Furthermore, there is a need to streamline and standardize permits and processes across local government units to fast track the deployment of Info structure.

Other challenges associated with broadband rollout is the high construction costs. To minimize costs, the government will enable Info structure sharing and make government-owned facilities available to telecommunication entities.⁵

Needs and financing requirements: What are your economy's main (e.g. top 2-3) identified physical and digital infrastructure needs over the medium-long term? Please describe the required financing and expected impact of these infrastructures.

Future needs: What are the main factors (e.g. population increase, technology, climate change or variability, ageing capital stock) that will influence your economy's future physical and digital infrastructure needs?

Noting the recent institutionalization of the DICT through RA 10844 in May 2016, the Philippine Government is currently undertaking assessment and preparatory activities and studies which may be implemented to accelerate the development in the sector.

Based on the Public Investment Program (PIP) 2017-2022, the Department of Information and Communications Technology (DICT) shall implement the NBP from 2019 to 2022 with an estimated total cost of PhP39,501.03 million.⁹

Leading practices: Among your economy's structural reforms relating to infrastructure in the past 5 years (2013-2018), which two do you think have been implemented most effectively? Please identify the main reasons for the effectiveness of this structural reform that could be relevant for other economies.

With regards to digital connectivity, no structural reforms have been made yet. The NBP has only been launched last year and is still for implementation. The Philippine Government is currently in the conceptualization/development phase of various infrastructure projects to support the NBP implementation.

Regional cooperation: What role can regional cooperation and regional bodies such as APEC play? You may like to consider the role of cooperation in addressing the challenges and policy gaps previously identified, in enhancing the investment environment, in making more possible cross-border/regional connectivity projects and in promoting co-ordination of development funding.

⁸ Department of Information and Communications Technology. 2017. National Broadband Plan.

⁹ Chapter 19, Socioeconomic Report 2017. Retrieved from http://www.neda.gov.ph/wp-content/uploads/2018/03/SER-Chap-19_as-of-March-28-1.pdf

How can we ensure that Asia Pacific has top-quality physical and digital infrastructure to ensure maximum connectivity? What would be the benefits to your economy from improved connectivity?

The implementation of regional connectivity projects may be hampered by numerous issues such as the following, among others:

- a. Unattractive investment climate for regional connectivity projects;
- b. Unsound and incomplete institutional set-up at the regional and economy-wide levels;
and
- c. Implementation barriers such as technical and/or financial capability of the member economies to implement connectivity initiatives is affected by uneven levels of development.

Thus, it is imperative for regional bodies to ensure that the proposed regional connectivity development projects will cut across the different sectors of development and may support and expand different economic activities. Moreover, there is a need to ensure coherence of regional initiatives into the domestic development agenda of the respective member economies in order to ensure ownership of the projects and optimize resources.

In addition, the regional bodies, such as APEC, may further strengthen cooperation and competencies of member economies through capacity building initiatives and sharing of best practices concerning project preparation and execution of regional connectivity projects of member economies with advanced digital infrastructure and connectivity setup.

THE RUSSIAN FEDERATION

Capabilities: what significant policy or institutional structures (e.g. top 2) support your economy in meeting the following objectives. Economies could discuss whole of Government policies or policies that apply at a sector specific level:

- **Cost effectiveness:** Providing for the efficient provision and management of infrastructure and the efficient operation of infrastructure markets, including providing for cost-based access;
- **Resilience:** Enhancing adaptability and ensuring the infrastructure system is robust to disruptions and shocks;
- **Inclusion:** Ensuring broad access (e.g. across regions, genders, underserved or minority groups and indigenous people) to infrastructure, including digital infrastructure, to support inclusive growth?

Gaps: What are the highest priority structural or institutional reforms you have identified to meet these objectives?

Barriers and challenges: What are the key barriers and challenges to implementing structural reforms for infrastructure in your economy and has your economy identified any solutions to overcome those barriers or challenges?

Efficient operation of infrastructure markets. Roadmaps on public-private partnership (infrastructure mortgage) was adopted on 12th March, 2018. It contains measures aimed at developing PPP financing mechanisms, including: establishment of an open unified register of projects for the construction and reconstruction of infrastructure in key sectors, compilation of a list of PPP pilot projects and concessions whose socioeconomic efficiency has been confirmed, creation of ready forms, models and algorithms for investor and public party actions, and risk matrices and standard projects for different sectors.

Cost effectiveness. Russia ensures that public audit is conducted for most projects with government participation. In 2017, an audit was conducted for of all the projects with total value of 3 billion rubles or higher, in 2018 cutoff is expected to amount to 1.5 billion rubles. This measure is aimed at enhancing the efficiency of public investment, including the investment of the natural monopolies, through obligatory public technical and price audit of all large-scale projects even partially financed by the government.

Inclusion: Ensuring broad access to digital infrastructure. The program aimed at eliminating digital inequality involves the construction of the needed telecommunications network, the creation of access points to it and connecting small settlements to it with fiber optic lines. It started in 2014 and will last until 2024. During the project implementation, data services with a minimum speed of 10 Mbit/s will be provided to over 13 thousand settlements of between 250 and 500 people. As per March 2018, access points were established in 5 656 communities. Total investment are expected to amount to 67 bln Rubles (about 1.2 bln. USD).

Needs and financing requirements: What are your economy's main (e.g. top 2-3) identified physical and digital infrastructure needs over the medium-long term? Please describe the required financing and expected impact of these infrastructures.

Future needs: What are the main factors (e.g. population increase, technology, climate change or variability, ageing capital stock) that will influence your economy’s future physical and digital infrastructure needs?

Physical infrastructure. “Expansion and modernization of the Trans-Siberian and Baikal-Amur railways” is an example of large project aimed at developing physical infrastructure in Russia. The main objective of the project is improvement of capacity and eliminating bottlenecks on the Trans-Siberian and Baikal-Amur mainlines. Total project costs amount to 562 bln. rubles (9.8 bln. USD). By the end of 2017 173 bln. rubles (3 bln USD) have already been invested. The project will increase additional cargo volume of up to 66 mln tons a year (current volume is about 126 mln tons per year), which will contribute to the development of industrial enterprises in the region, create new jobs, and the necessary economic conditions for effective and sustainable development of Siberia and the Far East. Moreover, it is expected that the Russian budget will receive 8.2 bln. USD from the added infrastructure during 30 years. The project is also expected to create about additional 40 thousand jobs.

Digital infrastructure. Main measures in the field of digital infrastructure are covered by the Program “Digital Economy of Russia”, in particular, by the action plan “Information infrastructure”. Action plan on “Information infrastructure” was adopted in December 2017 and contains measures aimed at establishing data centers in Russia, expansion of broadband internet access, development of roadmap of 5G network creation.

Implementation of the Action plan requires total investment of 436.5 bln Rubles (7.6 bln USD). According to the plan, the share of households with broadband access is expected to reach 50% by 2020 and 97% by 2025. Also it is expected to get 5G coverage in cities with a population of 1 million people or more and achieve average speed of 100 Mbit/s throughout the economy.

Leading practices: Among your economy’s structural reforms relating to infrastructure in the past 5 years (2013-2018), which two do you think have been implemented most effectively? Please identify the main reasons for the effectiveness of this structural reform that could be relevant for other economies.

PPP law. The law on public-private partnerships (PPPs) and municipal-private partnerships (MPPs) in the Russian Federation and the introduction of amendments to certain legislative acts of the Russian Federation were adopted in July 2015 and entered into force on 1 January 2016. The Law, among other things, has introduced the concept of a PPP agreement, a new private initiative procedure and additional guarantees for private investors. In 2016, when the Law entered into force, the number of PPP projects in Russia surged from 873 (2015) to 2183. Private investments in PPP projects also increased from 408 bln. Rubles in 2015 to 1.3 trln. Rubles in 2016.

Regional cooperation: What role can regional cooperation and regional bodies such as APEC play? You may like to consider the role of cooperation in addressing the challenges and policy gaps previously identified, in enhancing the investment environment, in making more possible cross-border/regional connectivity projects and in promoting co-ordination of development funding.

How can we ensure that Asia Pacific has top-quality physical and digital infrastructure to ensure maximum connectivity? What would be the benefits to your economy from improved connectivity?

APEC may play an important role in sharing best practices and good examples of realizing domestic policies within infrastructure development.

CHINESE TAIPEI

Capabilities: what significant policy or institutional structures (e.g. top 2) support your economy in meeting the following objectives. Economies could discuss whole of Government policies or policies that apply at a sector specific level:

- **Cost effectiveness:** Providing for the efficient provision and management of infrastructure and the efficient operation of infrastructure markets, including providing for cost-based access;
- **Resilience:** Enhancing adaptability and ensuring the infrastructure system is robust to disruptions and shocks;
- **Inclusion:** Ensuring broad access (e.g. across regions, genders, underserved or minority groups and indigenous people) to infrastructure, including digital infrastructure, to support inclusive growth?

Gaps: What are the highest priority structural or institutional reforms you have identified to meet these objectives?

Barriers and challenges: What are the key barriers and challenges to implementing structural reforms for infrastructure in your economy and has your economy identified any solutions to overcome those barriers or challenges?

Chinese Taipei has adopted the practices of Life-Cycle Assessment of Public Construction so as to achieve the goals of cost effectiveness, resilience and inclusion of infrastructures. The budget reasonability, technical feasibility and cost effectiveness will be taken into consideration in the evaluation process of public construction projects. At the planning and design stage, the design shall include the purposes of saving energy, emission reduction of greenhouse gases, environmental protection, resource conservation, economic viability, and also take into account the aspects of the landscape, local ecology, and life aesthetics, as well as a friendly environment for users of different genders, ages, social groups and the disabled.

With the restriction of natural environment and vulnerability to natural disaster, the infrastructure is designed to prevent and mitigate the potential impacts. For example:

1. Water supply has been a challenge for Chinese Taipei due to the uneven temporal and spatial distribution of rainfall, global climate change and growing water demand of economic development. Chinese Taipei has set the strategies for providing stable water supply, which include developing multiple water resources based on the local characteristics and potential, saving water by enhancing the reduction of tap water leakage and the reuse of recycled water, better water allocation by giving priority to the usage of local water, and preparing the backup system in response to the abnormal rainfall distribution of the climate change effects.
2. In terms of traffic infrastructure, Chinese Taipei has initiated various action plans to adapt to climate change according to the goals stipulated within the National Climate Change Adjustment Policy Program and referred to in the risk concepts suggested by the Intergovernmental Panel on Climate Change (IPCC) of the United Nations. It has implemented the disaster-preventive plans for railroads and driveways as well as improvement measures such as the real-time monitoring of high-risk roads impacted by

disasters, enhancing the shock-proof capability of bridges and tunnels, reinforcement projects and the alert mechanism for disaster prevention. The disaster resistance and resilience of railroads and driveways are expected to be improved. Meanwhile, reducing the barriers for physically and mentally challenged citizens as well as satisfying the basic civil transportation demands for remote areas have also been incorporated into infrastructure projects. As for the cost-efficiency of traffic infrastructures, the interim, end-of-term and operating evaluations are also required so as to fully grasp the status of execution and goal-achievement in major projects, and thus the efficacy of the investment in traffic infrastructure projects can be ensured.

Needs and financing requirements: What are your economy's main (e.g. top 2-3) identified physical and digital infrastructure needs over the medium-long term? Please describe the required financing and expected impact of these infrastructures.

Future needs: What are the main factors (e.g. population increase, technology, climate change or variability, ageing capital stock) that will influence your economy's future physical and digital infrastructure needs?

Chinese Taipei is promoting the Forward-looking Infrastructure Development Program to build a new generation of infrastructure for the future. This program includes funding for eight categories:

1. railway projects to provide safe and fast transportation;
2. water environments to build resilience against climate change;
3. green energy infrastructure to ensure environmental sustainability;
4. digital infrastructure to create a smart and connected economy;
5. urban and rural projects to balance regional development;
6. child care facilities to reverse the declining birth rate trend;
7. infrastructure to ensure food safety;
8. human resources infrastructure to nurture talent and boost employment.

The Forward-looking Infrastructure Development Program is funded by a special budget which is completely financed through debt. However, we will adhere to our strict fiscal discipline. In accordance with the Public Debt Act and Special Act for Forward-Looking Infrastructure, the government's total amount of debt issued under the general and special budgets for the period of 2017-2020 is not to exceed 15 % of total budget and must comply with the debt level limit provided in the paragraph 1, Article 5 of Public Debt Act (40.6% of the average nominal GDP for the previous 3 years) so as to achieve financial stability and economic development. If any major public infrastructure projects in the future are approved, the financial resources will be raised to meet the overall planning policy.

Leading practices: Among your economy’s structural reforms relating to infrastructure in the past 5 years (2013-2018), which two do you think have been implemented most effectively? Please identify the main reasons for the effectiveness of this structural reform that could be relevant for other economies.

1. Promotion of utilizing recycled aggregates in public works

For the purpose of facilitating industrial development, reducing natural resource consumptions, and implementing the circular economy policy, we set out an inter-agency task force, consisting of representatives from related industries, to promote utilization of recycled aggregates, such as steel slag and incinerated bottom ash in public works. Strategically, the competent authorities monitor the quality control and flow management of recycled aggregates. Meanwhile, government agencies take the lead in utilizing recycled aggregates in public works, for the purpose of developing a more environmental-friendly and prosperous economy.

2. Financial Improvement of Taiwan High Speed Rail (THSR)

- (1) THSR Project is a leading BOT (Build-Operate-Transfer) project by Chinese Taipei. Ministry of Transportation and Communications (MOTC) of Chinese Taipei granted the concession to Taiwan High Speed Rail Corporation (THSRC) in 1998. The Company has outstanding operational performance and excellent services since 2007. However, bad financial structure and under-expectation of revenue income resulted in its financial crisis.
- (2) The MOTC negotiated and cooperated with THSRC to draw up solutions which include reversing stock split, extending concession period, capital injection and terminating station development concessionaire. After discussing with related government agencies, via law amendment, communicating with the Legislature and the public, the solution program finally was executed in 2015 and resolved THSRC’s dilemma. Hopefully, the THSRC would operate sustainably and reach a win-win-win situation for the people, the government and the THSRC.
- (3) MOTC helps THSRC to carry on the financial improvement program successfully. The most effective reasons are:
 - i. Clarifying the issues and formulating solutions to propose the best program under the consideration of maintaining the maximum public interest and minimizing the overall cost of processing.
 - ii. Well inter-ministerial coordination to confirm that the program was acceptable and feasible by all contractual stakeholders.
 - iii. Collecting external questions and concerns, opening and explaining information to general public, also actively communicating with the Legislature, and seeking supports from all fields.

In addition to the above two practices, Chinese Taipei has launched a wide range of structural reforms such as the mitigation of the accumulated sediments in reservoirs to extend the

lifespan of the reservoirs, sewage systems, and expanding the capacity of the harbors through land reclamation and new berths to build advanced facilities for the future development.

Regional cooperation: What role can regional cooperation and regional bodies such as APEC play? You may like to consider the role of cooperation in addressing the challenges and policy gaps previously identified, in enhancing the investment environment, in making more possible cross-border/regional connectivity projects and in promoting co-ordination of development funding.

How can we ensure that Asia Pacific has top-quality physical and digital infrastructure to ensure maximum connectivity? What would be the benefits to your economy from improved connectivity?

To address domestic challenges and promote regional cooperation and connectivity, APEC member economies could share best practices and experiences through capacity-building activities, as well as launching regulatory harmonization and standardized measures. Also, APEC Business Advisory Council (ABAC) and APEC's policy partnerships and industry dialogues can contribute significantly by providing private sector feedback or insight on market needs, trends and expectations for APEC member economies' consideration. Chinese Taipei looks forward to cooperating with APEC member economies to improve the quality of infrastructure through initiatives under the "APEC Connectivity Blueprint for 2015-2025" and tackling possible challenges occurred during the execution of structural or institutional readjustment with the aim to make further contribution to the enhancement of APEC connectivity.

THAILAND

Capabilities: what significant policy or institutional structures (e.g. top 2) support your economy in meeting the following objectives. Economies could discuss whole of Government policies or policies that apply at a sector specific level:

- **Cost effectiveness:** Providing for the efficient provision and management of infrastructure and the efficient operation of infrastructure markets, including providing for cost-based access;
- **Resilience:** Enhancing adaptability and ensuring the infrastructure system is robust to disruptions and shocks;
- **Inclusion:** Ensuring broad access (e.g. across regions, genders, underserved or minority groups and indigenous people) to infrastructure, including digital infrastructure, to support inclusive growth?

According to the 7th Strategy (Infrastructure and Logistics Development) in the 12th National Economic and Social Development Plan (NESDP), Thailand puts particular emphasis on increasing its competitiveness, improving service quality to accommodate the expansion of cities and the main economic areas, and ensuring inclusive access to the public services and infrastructure in order to raise the quality of life among all social groups

In transport sector, Public Private Partnership (PPP) has been encouraged to engage private sector in transport infrastructure development, operation and maintenance, and service quality improvement. The employment of PPPs will ease a number of constraints such as limited government budget in transport infrastructure investment, expertise in transport infrastructure development, project management and advanced technology and knowledge. The Private Investment in State Undertaking Act B.E. 2556 (2013) (PISU Act), has recently been enacted in Thailand to promote private participation and attract private investment by ensuring transparent, traceable, streamlined accountable procedures regarding PPPs to be taken into consideration in any risk-benefit analyses. State Enterprise Policy Office (SEPO), Ministry of Finance, has also requested all infrastructure projects invested by State-Owned Enterprises (SOE) to apply Risk Management Plan. The Plan helps them identify and manage potential risks of doing such projects. Moreover, the impact of climate change is also required to be embedded in infrastructure planning processes.

To ensure broad access to infrastructure, the Ministry of Transport (MOT) is conducting a study on the universal design for vehicles and transport facilities to accommodate all groups of people including children, the elderly, and the disabled.

As for the digital infrastructure, Thailand aims to expand the economy-wide high speed internet network through encouraging new digital entrepreneurs and developing international standard cyber security. Digital Economy and Society Development Plan has been implemented to promote sustainable development through digital technology. The plan highlights digital infrastructure development; economic-driven digital technology; creating inclusive quality society by using digital technology; digital government transformation; workforce preparation for digital era; and confidential building on using digital technology.

Gaps: What are the highest priority structural or institutional reforms you have identified to meet these objectives?

- Structural reform has been undertaken in transport sector management through establishing a clear separation of function between policy maker, regulatory unit and the operators. For example, in air transport sector, the Civil Aviation Authority of Thailand (CAAT) has been established to regulate, promote, and ensure that the development of civil aviation is legal and high standard. The CAAT's role is also to oversee the airport operator, Department of Airports (DoA), and to ensure that the quality of air transport services, especially safety regulations meet the international standards as well as cost efficient. As for the rail transport, State Railway of Thailand (SRT) is a service operator, while the Department of Rail Transport is a regulator.

- Digital Development for Economy and Society Act B.E. 2560 (2017) has been enacted to shift institutional structure to promote digital economy and society. Under the Act, the National Digital Economy and Society Committee, chaired by the Prime Minister, is established to set out guidelines and policy under the digital economy framework, aiming mainly at maximizing the benefits of digital technologies, developing infrastructure for digital technology, raising the economy's competitiveness with digital innovation, creating equal opportunities with information and digital services, developing human capital for the digital era, creating public confidence in the use of digital technology and implementing digital technology to enhance Thailand's economy and society.

Barriers and challenges: What are the key barriers and challenges to implementing structural reforms for infrastructure in your economy and has your economy identified any solutions to overcome those barriers or challenges?

One key challenge to implementing structural reforms for infrastructure in Thailand is the fragmented management of public sector. The lack of interagency coordination among several public institutions responsible for infrastructure development leads to conflicting goals and priorities. Moreover, structural reforms tend to create winners and losers, and since the priorities of various agencies are different, the reforms may fail to engage relevant parties and hence are not successfully implemented. Thus, consultation and coordination with relevant stakeholders is important to the effective implementation of structural reforms. Infrastructure oversight body which oversees the economy-wide infrastructure projects as well as at the local level could also be established to ensure that all ministries understand and realise the same infrastructure priorities. Moreover, this oversight body could help setting the economy's strategic plan and framework as well as identifying policy sequencing to implement structural reforms for infrastructure. A holistic infrastructure development strategy should be developed as well, to determine a complete picture of transport and economic corridor. A group of projects shall be identified to include specific highways, railway corridors, and power generation and transmission lines that are needed to develop or expand in the short and long run.

Another challenge is the lack of expertise in the public sector to understand the technical intricacies associated with the implementation of structural reforms. For example, the lack of experts in digital technology, as well as inadequate rules and regulations regarding digital technology could be seen as an obstacle to implementing structural reforms for digital infrastructure in Thailand. Therefore, it is important to have international cooperation like APEC as a platform to share experiences and learn from best practices when designing practical solutions adapted to domestic challenges.

Needs and financing requirements: What are your economy’s main (e.g. top 2-3) identified physical and digital infrastructure needs over the medium-long term? Please describe the required financing and expected impact of these infrastructures.

Future needs: What are the main factors (e.g. population increase, technology, climate change or variability, ageing capital stock) that will influence your economy’s future physical and digital infrastructure needs?

According to ADB’s report, Meeting Asia’s Infrastructure Needs, infrastructure investment in Thailand (including climate-adjusted estimate) is expected to account for 3.2 percent of GDP, or approximately \$ 268 billion during 2016-2030.

The Ministry of Transport has launched Thailand’s Transport Infrastructure Development Strategy 2015-2022 as a framework for transport infrastructure development in Thailand. This strategy aligns with the 7th Strategy (Infrastructure and Logistics Development) in the 12th NESDP, as it aims to increase the proportion of freight transportation that uses the railways and waterways; to raise the proportion of passengers using public transportation systems in urban areas; and to expand the capacity of the Bangkok airports and of regional airports to meet increasing demand from passengers. The investment in rail network including passenger and freight transport, as well as mass rapid transit in Bangkok and major regional cities, accounts for approximately 76 percent of the overall transport infrastructure investment. The development in these infrastructure projects is expected to enhance time- and cost-effectiveness, as well as alleviate pollution problems from transport sector. However, transport infrastructure requires high capital investment and substantial time for development. The sources of funding for transport infrastructure are largely from loans (52%), government budget (28%), PPPs (16%) as well as state owned enterprises and other sources of funding (4%).

Another top priority of the government is to transform Thailand into a “Digital Economy” in order to enhance the economic and social prosperity. Since 2016, the Ministry of Digital Economy and Society (MDES) has been established to plan, promote, develop and implement activities related to a digital society and economy. Developing a hard digital infrastructure across the economy is one of the key strategies of the Digital Development Plan. The government is also accelerating the launch of a public broadband project. The TOT Public Company Limited, Thai state-owned telecommunications company, is assigned by the government to lay down the broadband internet for 24,700 villages, while the office of the National Broadcasting and Telecommunications Commission will handle the installation for the remaining 15,732 villages. The objective is to provide local people with greater access to digital technology.

Financing sources for physical and digital infrastructure in Thailand are largely from government budget. Debt consolidation or borrowing is primarily used for the development of infrastructure with a commercial return. Private sector is also encouraged to participate in PPP especially in operation and maintenance. Infrastructure Fund has become increasingly important as it is considered as a new source of funding for infrastructure development in Thailand.

Future needs: What are the main factors (e.g. population increase, technology, climate change or variability, ageing capital stock) that will influence your economy’s future physical and digital infrastructure needs?

- Aging population will influence specific requirement for transport demand with accessibility and universal design that can accommodate people of various groups and needs especially the elderly.
- Urbanization will require expansion of mass rapid transit network and public transport services. The efficient public transport system will help the economy to reduce time, energy consumption, and pollution.
- Climate resilient infrastructure will need to be taken into account to promote sustainable infrastructure development. In the future, infrastructure must be constructed in such a way that can withstand disruption, absorb disturbance and recognize changing conditions/climate over time.
- Disruptive Technology, for example, more environment- friendly, autonomous vehicles or AI will be used in transport system and this could lead to increased transport efficiency. Congestion will be relieved, as energy demand and emissions could be greatly reduced. Moreover, hyper digital connectivity, as well as expansion of internet access in remote areas, artificial intelligence, and the Internet of Things could all shape the future needs for digital infrastructure development.

Leading practices: Among your economy’s structural reforms relating to infrastructure in the past 5 years (2013-2018), which two do you think have been implemented most effectively? Please identify the main reasons for the effectiveness of this structural reform that could be relevant for other economies.

1. Ever since the enactment of the Private Investment in State Undertaking Act 2013 (PISU Act), the involvement of private sector in transport infrastructure development in the form of Public Private Partnership has become more prominent. Furthermore, the implementation of the PPP Fast Track programme under the PISU Act, the red tape and bottlenecks regarding the approval and development of infrastructure projects have been reduced. The project preparation is reduced to 3.5 months. Project proposal takes 4 months while private selection requires six weeks and after 9 months the project is ready for bidding. This has helped to shorten the time required for approvals and development of the projects from 25 to 9 months.

2. In early 2015, the International Civil Aviation Organisation's (ICAO) gave Thailand a red flag status as a number of significant safety concerns were raised regarding the economy's oversight of carriers, particularly its processes around awarding new air operator certificates. Thus, to solve this problem, the Civil Aviation Authority of Thailand (CAAT) has been established by the Ministry of Transport as a regulator, to ensure that aviation safety standard is uplifted to meet internationally acceptable level. This reform has led to a full commitment and collaboration between several public sector agencies, airlines and foreign experts which ultimately resulted in the removal of Thailand’s “red-flag” status from ICAO in October 2017.

Regional cooperation: What role can regional cooperation and regional bodies such as APEC play? You may like to consider the role of cooperation in addressing the challenges and policy gaps previously identified, in enhancing the investment environment, in making more possible cross-border/regional connectivity projects and in promoting co-ordination of development funding.

How can we ensure that Asia Pacific has top-quality physical and digital infrastructure to ensure maximum connectivity? What would be the benefits to your economy from improved connectivity?

Regional cooperation and regional bodies play an important role in strengthening regional connectivity and facilitating infrastructure investment environment. Take ASEAN for example, in spite of the rapid economic growth, ASEAN still has a huge infrastructure gap. Therefore, to support continued infrastructure investment in ASEAN, ASEAN Infrastructure Fund (AIF) has been recently established and co-financed by the Asian Development Bank (ADB), as a source of fund for the region's infrastructure projects.

The Asia-Pacific region is facing a growing demand for infrastructure investment as well. Thus, it is imperative to find an appropriate way to invest in infrastructure with an aim to facilitating sustainable and quality development and growth and to achieve shared benefits among economies within the APEC region. APEC economies have discussed these issues for years, and this has resulted in two important documents. The first one is the "APEC Multi Year Plan on Infrastructure Development and Investment", which was adopted in 2013 at the leader level of APEC economies. The second one is "APEC Connectivity Blueprint for 2015-2025", adopted during the APEC Leaders' Meeting in 2014. The Blueprint aims to improve the connectivity within the APEC region as well as the institutional arrangement and facilitation of people to people exchange in terms of the three pillar, namely, "Physical Connectivity", "Institutional Connectivity" and "People-to-people Connectivity". It is clear that on the one hand good physical infrastructure is necessary, but on the other hand rules and regulations of cross-border and regional transport facilitation are also needed.

APEC has played a huge role in addressing challenges in reform in infrastructure development through providing assistance that could help developing economies to enhance its investment capacity as well as accelerate innovation for infrastructure. Its engagement with international organizations, for example, Organization for Economic Cooperation and Development (OECD), and World Bank could help providing technical support to developing economies to attract foreign direct investment for infrastructure development. Through capacity building and training programs organized by various working groups and committees under APEC, member economies could learn from each other's experiences which in turn give them the opportunity to apply best practices to their reform process in order to achieve the most concrete and effective infrastructure development. Ultimately, seamless and better infrastructure will help our region unleash the region's economic potential and alleviate poverty.

UNITED STATES OF AMERICA

Capabilities: what significant policy or institutional structures (e.g. top 2) support your economy in meeting the following objectives. Economies could discuss whole of Government policies or policies that apply at a sector specific level:

- **Cost effectiveness:** Providing for the efficient provision and management of infrastructure and the efficient operation of infrastructure markets, including providing for cost-based access;
- **Resilience:** Enhancing adaptability and ensuring the infrastructure system is robust to disruptions and shocks;
- **Inclusion:** Ensuring broad access (e.g. across regions, genders, underserved or minority groups and indigenous people) to infrastructure, including digital infrastructure, to support inclusive growth?

The Transportation Infrastructure Finance and Innovation Act (TIFIA) helps finance surface transportation projects through direct loans, loan guarantees, and lines of credit. One dollar of TIFIA subsidy leverages roughly \$40 in project value. The program's fundamental goal is to leverage Federal funds by attracting substantial private and other non-Federal co-investment in critical improvements to the U.S. surface transportation system. TIFIA credit assistance is often available on more advantageous terms than in the financial market, making it possible to obtain financing for needed projects when it might not otherwise be possible.

The Private Activity Bonds (PABs) program allows the Department of Transportation to allocate authority to issue tax-exempt bonds on behalf of private entities constructing highway and freight transfer facilities. PABs have been used to finance many Public Private Partnerships (PPPs) projects.

The Federal Communications Commission (FCC) is pursuing a number of policies to improve U.S. broadband communications infrastructure, which is critical to bettering the lives of the American people and to boosting our economy's efficiency, competitiveness, and innovativeness. For example, to promote digital inclusion, the FCC's primary tool is the universal service programs, which provide direct support to spur the construction of wired and wireless networks in areas of the United States where the incentive for private investment does not exist. These public-private partnerships have been reinvigorated, with a focus on ensuring fiscal responsibility and guaranteeing that they leverage, rather than displace, private capital. To achieve these goals, the FCC will hold two multi-billion dollar reverse auctions to help connect rural America efficiently.

Gaps: What are the highest priority structural or institutional reforms you have identified to meet these objectives?

The United States is considering reforms on how infrastructure projects are regulated, funded, delivered, and maintained. The 2019 Budget provides \$200 billion over 10 years for the Infrastructure Initiative. The main goal of this program is to encourage state and local

entities to raise new revenues or set aside additional funding dedicated for infrastructure investments and future operations and maintenance. The Infrastructure Initiative includes:

- **Infrastructure Incentives**—\$100 billion is provided to encourage increased State, local, and private infrastructure investment by awarding incentives to project sponsors for demonstrating innovative approaches that would generate new revenue streams, prioritize maintenance, modernize procurement practices, and generate a social and economic return on investment. Incentives would be provided in the form of competitive grants.
- **Rural Formula Funds**—\$50 billion is provided to address the significant need for investment in rural infrastructure, including broadband internet service.
- **Transformative Projects**—\$20 billion is provided to support bold, innovative, and transformative infrastructure projects that can significantly improve existing infrastructure conditions and services.
- **Infrastructure Credit Programs**—\$14 billion is provided in additional subsidies for key Federal credit programs providing financing to infrastructure projects via the Department of Transportation’s Transportation Infrastructure Finance and Innovation Act (TIFIA) and Railroad Rehabilitation and Improvement Financing programs, the Environmental Protection Agency’s Water Infrastructure Finance and Innovation Act program, and the Department of Agriculture’s Rural Utilities Service program.
- **Private Activity Bonds (PABs)**—The initiative would expand flexibility and broaden eligibility for private activity bonds, which play an important part in delivering many large, regionally- and U.S.-wide-significant projects. The Budget includes \$6 billion in costs related to this expansion.
- **Federal Capital Revolving Fund** — \$10 billion is provided to establish a mandatory revolving fund to finance purchases, construction, or renovation of Federally-owned civilian real property
- **Environmental review and Permitting Process Enhancements** - In addition, implementing a more efficient and streamlined regulatory and environmental review process can speed up the benefits of that improved infrastructure in terms of time savings, health benefits, and business activity. The Infrastructure Initiative includes several proposals to streamline permitting decisions to accelerate project delivery while maintaining environmental safeguards, including:
 - o **Improving Environmental performance** by considering pilot programs to better protect and enhance the environment.
 - o **One Federal Decision** - The Federal Government can designate a single entity with responsibility for shepherding each project through the review and permitting process.
 - o **Unnecessary Approvals** - The United States supports putting infrastructure permitting into the hands of responsible State and local officials where appropriate.

Barriers and challenges: What are the key barriers and challenges to implementing structural reforms for infrastructure in your economy and has your economy identified any solutions to overcome those barriers or challenges?

The flexibility to use Federal dollars to pay for essentially local infrastructure projects has created a dynamic in which State and local governments delay projects in the hope of receiving Federal funds. Overreliance on Federal grants and other Federal funding can create a strong disincentive for non-Federal revenue generation and investment.

The FCC has taken steps to review regulatory barriers to wireless network infrastructure deployment and examine how it could act to remove or reduce these barriers. In the next few years, wireless providers will need to deploy large numbers of cell sites to densify their networks, roll out 5G technology, and meet the United States' wireless broadband service needs. The FCC recently adopted new rules to streamline and expedite the environmental and historic-preservation procedures for reviewing proposed wireless infrastructure deployments. These steps are intended to reduce regulatory impediments to wireless network infrastructure investment and deployment and should promote more rapid introduction of 5G technologies, in turn expanding connectivity.

The FCC has also reduced regulatory barriers and promoted both wired and wireless infrastructure investment and innovation through its *Restoring Internet Freedom* order. By eliminating heavy-handed utility-style regulation of broadband Internet access service and returning to a light-touch regulatory framework, the FCC restored a favorable climate for network investment, key to closing the digital divide.

Needs and financing requirements: What are your economy's main (e.g. top 2-3) identified physical and digital infrastructure needs over the medium-long term? Please describe the required financing and expected impact of these infrastructures.

According to the American Society of Civil Engineers, the largest needs in physical infrastructure over the near and medium term are in surface transportation and electric generation, transmission and distribution.

Future needs: What are the main factors (e.g. population increase, technology, climate change or variability, ageing capital stock) that will influence your economy's future physical and digital infrastructure needs?

The main factors that will influence our economy's future physical and digital infrastructure needs is the sustained growth in the demand for infrastructure services and, with respect to physical infrastructure, the age of critical assets.

Leading practices: Among your economy's structural reforms relating to infrastructure in the past 5 years (2013-2018), which two do you think have been implemented most effectively? Please identify the main reasons for the effectiveness of this structural reform that could be relevant for other economies.

Transportation Performance Management - The Moving Ahead for Progress in the 21st Century Act of 2012 (MAP-21) transformed the Federal-aid highway program by establishing new requirements for performance management to ensure the most efficient

investment of Federal transportation funds. Performance management increases the accountability and transparency of the Federal-aid highway program and provides a framework to support improved investment decision-making through a focus on performance outcomes for key federal transportation goals. As part of performance management, recipients of Federal-aid highway funds will make transportation investments to achieve performance targets in the areas of safety, infrastructure condition, congestion reduction, system reliability, freight movement and economic vitality, environmental sustainability and reduced project delivery delays. Prior to MAP-21, there were no explicit requirements for State DOTs to demonstrate how their transportation program supported federal performance outcomes.

Multi-modal freight networks - The Fixing America’s Surface Transportation Act of 2015 includes numerous provisions to improve the efficiency of the United States’ multi-modal freight networks. The Act required the development of a National Freight Strategic Plan to address the conditions and performance of the multimodal freight system, identify strategies and best practices to improve intermodal connectivity and performance of the U.S. freight system, and mitigate the impacts of freight movement on communities. The Act also created a new freight-focused \$4.5 billion grant program to improve safety, eliminate freight bottlenecks, and improve critical freight movements, and invests an additional \$6.3 billion in freight projects on the National Highway Freight Network. The Act includes provisions to reduce the time it takes to break ground on new freight transportation projects, including by promoting best contracting practices and innovating financing and funding opportunities and by reducing uncertainty and delays with respect to environmental reviews and permitting.

Regional cooperation: What role can regional cooperation and regional bodies such as APEC play? You may like to consider the role of cooperation in addressing the challenges and policy gaps previously identified, in enhancing the investment environment, in making more possible cross-border/regional connectivity projects and in promoting co-ordination of development funding.

How can we ensure that Asia Pacific has top-quality physical and digital infrastructure to ensure maximum connectivity? What would be the benefits to your economy from improved connectivity?

Infrastructure projects should provide mutual economic and social benefits and job creation while allowing APEC economies maximum freedom to choose among alternatives to meet their infrastructure investment needs. APEC can help to achieve that by promulgating rules, norms, and standards that support high-quality, sustainable, and transparent infrastructure that meets stakeholder needs. Core project selection criteria should include life cycle costs; financial, environmental, regulatory, and market risks; and community impact. Insofar as energy infrastructure projects are concerned, APEC should insist on projects that contribute to more open, efficient, and liquid markets, such as for natural gas. Doing so will enhance regional energy security and bolster economic growth.

The benefits to United States are twofold: improved regional energy security, meaning access to reliable, diversified, and affordable energy resources, all of which increase regional stability; and economic opportunity, as fellow APEC economies can benefit from U.S. energy resources, technologies, and services.