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# Public-Private Partnership for Cross-border Infrastructure Development

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# Public-Private Partnership for Cross-border Infrastructure Development<sup>+</sup>

by

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May 2018

## Abstract

Cross-border infrastructure networks are critical for improving regional connectivity, their financing has however been challenging. This paper examines whether Public-Private Partnerships (PPP) may contribute to their development and reviews experience with this type of financing arrangements in the energy, transport and telecommunication sectors. By involving several countries, cross-border projects face specific challenges as these projects are by nature more complex, face augmented political risks and necessitate higher level of coordination. To support countries in financing cross-border projects, the paper studies these challenges in detail. It also highlights the policy actions required to achieve enhanced regional connectivity. It stresses, for instance, the importance of supporting intergovernmental platforms where international networks can be planned, regulatory hurdles tackled and financing arrangements structured. Developing guidelines for cross-border projects would also help countries in their efforts to enhance regional connectivity. The paper concludes by recognizing the potential of PPP for these projects, though it acknowledges that supportive policy actions from participating governments will be required for their success as well as a strong high-level political backing.

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***Keywords:*** public-private partnership (PPP), infrastructure development, regional connectivity, Asia and the Pacific.

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## Background

Strengthening regional integration has become a priority of many countries in Asia and the Pacific seeking new drivers of economic growth. In that context, improving connectivity plays a key role as it can further enhance the potential of interlinked production networks and facilitate international trade while allowing investments and ideas to travel across countries. Recognizing these benefits, Governments have integrated the development of transborder infrastructure into the 2030 agenda for Sustainable Development.<sup>1</sup>

To achieve greater connectivity, developing physical connectivity between countries is a prerequisite. This can be done, for example, through pipelines, transmission lines, roads, railways and fiber cables crossing borders (i.e. cross-border infrastructure projects).

Unfortunately, for several reasons such as constrained public budgets, legal and regulatory obstacles and insufficient regional cooperation, these linkages have not been developed to the level required. Countries in Asia and the Pacific have thus to find options to overcome these issues and bridge the infrastructure bottlenecks, particularly in the energy, transport and telecommunication networks.

Among the possible options, mobilizing private finance, through Public-Private Partnerships (PPPs), is being considered by policy makers as a promising avenue. Nonetheless, little is known about how the PPP mechanism could be effectively used for transboundary projects despite a reasonably well-established track record at the national level in several economies. To address this information gap, the paper is structured around three main questions:

- What has been the experience so far with PPP based cross-border projects?
- What challenges emerge from examining these projects?
- What conclusions can be drawn for future policy actions?

## Experience

Asian countries have a large track record regarding the use of PPP for developing national infrastructure. In the region developing countries, private companies have invested around \$650 billion over the last 15 years for energy (54 %), transport (33%), telecommunication (10%) and water (3%) infrastructure.<sup>2</sup> This represents approximately 6.5 per cent of their GDP over the period, yet this ratio varies considerably with PPP investments accounting for more than 15 per cent in only ten countries (i.e. more than 1 per cent of GDP on average per year).

Whereas PPPs cannot fill all infrastructure gaps, experiences at the national level show that this mechanism may contribute to a significant share of infrastructure investments in some sectors. For example, available data suggest that the private sector has financed roughly 50 per cent of

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<sup>1</sup> Sustainable Development Goal 9 – Target 9.1 stipulates “*Develop quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all*”.

<sup>2</sup> <https://ppi.worldbank.org/> (accessed 20 October 2016) – The following countries were included: Afghanistan, Armenia, Azerbaijan, Bangladesh, Bhutan, Cambodia, China, Fiji, Georgia, India, Indonesia, Islamic Republic of Iran, Kazakhstan, Democratic People’s Republic of Korea, Kyrgyzstan, Lao People’s Democratic Republic, Malaysia, Maldives, Mongolia, Myanmar, Nepal, Pakistan, Papua New Guinea, Philippines, Russian Federation, Sri Lanka, Tajikistan, Thailand, Tonga, Turkey, Turkmenistan, Uzbekistan and Vanuatu.

investments in power generation assets in South-East Asia over the period 2000-2013.<sup>3</sup> Likewise, in transport, the private sector contribution reached an impressive 34 per cent of total investment in roads and highways in India in the 11th Plan (2007-2012).<sup>4</sup>

Despite this extensive track record, the World Bank's PPI Database only reports 20 projects classified as cross-border, with six of them in the ESCAP region. This seems to indicate that multi-country PPP projects are relatively uncommon (though the PPI database does not capture all the existing projects).

To gain a better understanding of the potential of PPP for cross-border projects, it is necessary to identify specific examples and study them in detail. As such, lessons can be learned for designing future policies to promote the PPP mechanism for regional infrastructure development. In addition, in-depth analyses are needed to shed light on the prospects and specificities of private investments in each sub-sector, which are reviewed in turn below.

## **I. Energy**

The energy sector is a good candidate for cross-border PPP projects. On one hand, private companies have invested heavily in energy-related infrastructure development and have acquired a large experience with this sort of projects. On the other hand, there is a clear economic case for regional energy markets as they can reduce the gap in supply and demand by transferring power from energy-rich countries to energy-deficient countries. Indeed, more than half of the countries in Asia and the Pacific are not energy self-sufficient and depend on imports to meet domestic demand.<sup>5</sup> In addition, transnational networks can reduce reserve capacity needs for peak demand periods by linking countries with different seasonal consumption patterns. However, regional markets only work provided that cross-border connections are developed. The following sections assess whether these connections may be built through private resources.

### **A. Power generation and transmission**

Investments in the power sector have been closely linked to the development of Independent Power Producers (IPP) whereby governments delegate the responsibility of generating electricity to private companies. In this model, public authorities typically sign a long-term Power Purchase Agreement (PPA) with private investors, thereby guaranteeing the project's future cash flows. Cross-border projects occur then when a power plant is located in a different country than the one where the electricity is sold. This has happened in the hydro-power sector on several occasions as illustrated by the three cases presented in Box 1. Although these hydro projects are transboundary, the private consortium had mainly to comply with the regulatory system of the country where the asset is located. This has most likely facilitated their realization.

Other renewable energy sources, such as solar and wind, may trigger similar projects as long as they offer a cost-effective solution. For instance, it could be that the solar and wind conditions are

<sup>3</sup> Information on historical investment data are available in Annex of [www.iea.org/publications/freepublications/publication/WEIO2014.pdf](http://www.iea.org/publications/freepublications/publication/WEIO2014.pdf) and information on private investment are available at <https://ppi.worldbank.org/> (accessed 20 October 2016).

<sup>4</sup> PwC (2011). The road ahead: Highways PPP in India.

<sup>5</sup> [www.unescap.org/sites/default/files/Did\\_you\\_know\\_SYB2015.pdf](http://www.unescap.org/sites/default/files/Did_you_know_SYB2015.pdf) (accessed 20 October 2016).

so much better in one country thereby generating sufficient savings to justify the import of electricity for another country. For instance, Far East Russia's hydropower together with wind and solar from the Gobi desert could be exported to neighbouring countries. Regional power trade implies though sufficient transmission capacity and grid interconnections among the countries involved. Developing these linkages should be a priority for further regional integration. An example of this kind of regional initiative is the "Asian Energy Super Ring" proposal connecting Russia, Mongolia, Japan, China and the Republic of Korea, which has been put forward by a consortium of private sector companies from the participating countries. Another example is the \$1.17 billion CASA-1000 project, which is publicly funded through loans and grants from development partners. The project aims at facilitating the export of available surplus electricity in the summer months from Kyrgyzstan and Tajikistan to Afghanistan and Pakistan by strengthening transmission capacity between those countries.<sup>6</sup> Private investors can also contribute to strengthen grid interconnections. For instance, the operator of the largest copper-gold mine in Mongolia (i.e. "Oyu Togli LLC") developed a 96-km of transmission line to the Mongolia-China border in 2011 to allow the import of electricity from China.<sup>7</sup>

Modern transmission technologies, such as ultra-high-voltage direct current (UHVDC) transmission, also create new prospects for regional power exchanges as they allow large volumes of electricity to be transmitted over long distances. This is particularly important for unlocking renewable energy production, for which ideal sites are often located far from consumption centers. The use of UHVDC began in China in 2010 with the completion of line connecting a hydro-power plant in Yunnan province to Shanghai but more lines have been constructed since then. State Grid, China's state-owned electricity utility, wants 23 UHVDC lines in operation by 2030 and has a plan to spend \$88 billion on these lines between 2009 and 2020.<sup>8</sup> India also plans 2 UHVDC lines.

- ***126 MW Dagachhu Hydropower Plant (Bhutan/India):***

The \$200 million Dagachhu project is the first hydro PPP project in Bhutan. The shareholders are Druk Green (59%), Tata Power Company (26%), and the National Pension and Provident Fund of Bhutan (15%). The project was successfully commissioned in March 2015. Besides the royalty energy (i.e. the free energy made available to the Government under the project), all the power from the project is transferred to India through a 25-year PPA with Tata Power Trading Company Limited.<sup>a</sup>

- ***1075 MW Nam Theun 2 (NT2) Hydropower project (Lao PDR/Thailand):***

NT2 is one of the largest hydro projects in the region whereby electricity produced in Lao People's Democratic Republic is exported to Thailand. The project construction started in 2005 and it has been operational since 2010. Through this project, 1000 MW are allocated to the Thai market through a PPA signed with Electricity Generating Authority of Thailand (EGAT) and 75 MW are supplied for domestic use. The project, worth \$1.45 billion, is implemented by a consortium of local and foreign companies through a 30-year concession agreement (5-year construction and 25-year operation period). The project also includes the development of a 138-km long transmission line to the border with Thailand. The Lao

<sup>6</sup> [www.worldbank.org/en/news/speech/2016/05/10/central-asia-south-asia-electricity-transmission-and-trade-project-casa-1000#](http://www.worldbank.org/en/news/speech/2016/05/10/central-asia-south-asia-electricity-transmission-and-trade-project-casa-1000#) and [www.worldbank.org/projects/P145054/?lang=en&tab=details](http://www.worldbank.org/projects/P145054/?lang=en&tab=details) (accessed 20 October 2016).

<sup>7</sup> <http://ot.mn/news-20151019-en/> (accessed 20 October 2016).

<sup>8</sup> [www.economist.com/news/leaders/21714350-case-high-voltage-direct-current-connectors-chinas-embrace-new](http://www.economist.com/news/leaders/21714350-case-high-voltage-direct-current-connectors-chinas-embrace-new).

government was in charge of all the resettlement and social activities. Guarantees were provided by multilaterals to cover the political risks linked to government performance.<sup>b</sup> For example, MIGA provided a guarantee against the risks of expropriation, breach of contract, war and civil disturbances and currency inconvertibility, which was a pre-requisite to secure the support of lenders. Other similar projects include the 126-MW Houay Ho Hydro Power project and the 210-MW Theun-Hinboun project, respectively completed in 1999 and 1998.

- **87 MW Paravani Hydro Power Plant Project (Georgia/Turkey):**

This hydro project is located on the Paravani river in Georgia close to the Turkish border and had a cost estimate of around \$150 million, of which 70 per cent is financed through debt facilities and the remaining through equity via the project sponsor, a Turkish conglomerate. The project was completed in 2014 and most of the electricity produced is expected to be sent to Turkey. The project includes a 32-km transmission line to connect the facility to the Turkish grid.

*Source:* G. Lazriev (2011), Paravani Hydro Power Plant in Georgia, Ministry of Environment Protection of Georgia. Available from [www.iges.or.jp/en/archive/cdm/pdf/regional/20110906/Session4\\_G2\\_2b\\_GLazriev.pdf](http://www.iges.or.jp/en/archive/cdm/pdf/regional/20110906/Session4_G2_2b_GLazriev.pdf) (accessed 20 October 2016).

<sup>a</sup> [www.drukgreen.bt/index.php/44-subsiary-company/dhpc/289-background-of-the-project](http://www.drukgreen.bt/index.php/44-subsiary-company/dhpc/289-background-of-the-project) (accessed 20 October 2016).

<sup>b</sup> M. Gray, (2012), Nam Theun 2 Multipurpose Development Project. Available from <http://documents.worldbank.org/curated/en/571631468047363599/pdf/715390WP0P07640ing0Paper0July02012.pdf> (accessed 20 October 2016).

## B. Gas and oil pipelines

Besides electricity trade, the rapid rise of demand for oil and gas in Asia and the Pacific has created the need for more imports and consequently for pipeline investments. The World Energy Investment Outlook 2014 from the International Energy Agency projects at approximately \$1.1 trillion the cumulative investment requirements for oil and gas transport infrastructure in Asia/Eurasia during the period 2014-2035 (including domestic and international pipelines). Based on world averages, it is estimated that roughly 50 per cent of this amount will be for gas pipelines, 20 per cent for oil pipelines and 30 per cent for investments in oil and gas shipping-related assets (e.g. tankers and Liquefied Natural Gas (LNG) facilities).

Since oil and gas is traditionally a profitable business, external investments in pipelines should be possible through large multinationals and state-owned enterprises (SOEs), which are largely dominating the market in the region.<sup>9</sup> Debt and equity (i.e. “project finance” type of structure) are typically used to finance pipelines and refining assets whereas most other capital expenditures in

<sup>9</sup> It is estimated that governments own 86% and 53% of respectively the world’s oil and gas reserves – Major private companies include: ExxonMobil, Chevron, BP, Shell, Eni, Total, etc. Available from [www.chathamhouse.org/sites/files/chathamhouse/public/Research/Energy,%20Environment%20and%20Development/1012pr\\_oilgas.pdf](http://www.chathamhouse.org/sites/files/chathamhouse/public/Research/Energy,%20Environment%20and%20Development/1012pr_oilgas.pdf) (accessed 20 October 2016).

the oil and gas industry are realized from retained earnings.<sup>10</sup>

International pipeline projects present a high-risk profile for investors and lenders given their complexity and long-term horizon. Political risks are heightened with several countries involved and geopolitical considerations often interfere. In addition, environmental and social risks are considerable as pipelines usually cover a long distance and cross a range of land uses. Such issues may generate significant delays. Likewise the distance covered by these pipelines creates challenges in term of maintenance and security (especially in oil-related cases). This high level of risk may hold back investments. Pipelines also face the competition of shipping as an alternative means of transport (for example LNG can be more cost efficient when natural gas has to be moved over long distances) and demand for fossil fuels might become more uncertain with the growing importance of renewable sources of energy.

Many international pipeline projects have nonetheless materialized and are in operation today. For landlocked reserves, pipelines are the only option for transporting gas to their market. Similar to the power sector, the presence of a strong off-taker (i.e. the party buying the output produced) appears to be instrumental in the success of these projects, which usually includes “Take or Pay” provisions (i.e. the off-taker pays the pipeline operator for reserving a minimum capacity even if it decides not to utilize such capacity). In these projects, the sponsors (i.e. the equity investors and owners of the project company) are typically involved in buying and/or selling the oil and gas transported. Such consortium approach helps to distribute the risks and ensure that the interests of different stakeholders are represented (see box 2 for project examples).

From a contractual point of view, this kind of projects necessitate different agreements, including: a transportation agreement ensuring that the project company is paid as long as the pipeline is operational, an Inter-Governmental Agreement (“IGA”) among the involved governments to set the rights and privileges required for building and operating the pipeline and an Host Government Agreement (“HGA”) to be signed by the project company with each host country (see Figure 1). To facilitate these contractual arrangements, the Energy Charter, an intergovernmental process on energy cooperation in Eurasia, has developed models for the IGA and HGA agreements.<sup>11</sup>

Here are some examples of cross-border pipelines involving project finance structure:

• ***Yadana and Yetagun Gas Pipeline (Myanmar/Thailand)***

These are two cross-border pipelines transporting gas from Myanmar to Thailand financed through private consortia in partnership with the state-owned Myanma Oil and Gas Enterprise. The 412-km Yadana pipeline completed in 1999 had a total cost of \$1.2 billion (operated by France’s TOTAL) while the 277-km Yetagun pipeline was completed in 2000 for about \$830 million (operated by Malaysia’s Petronas). The gas is exported to Thailand under a long-term contract with the state-owned Petroleum Authority of Thailand (PTT). In these projects, the private consortium is operating both the gas field and pipeline.<sup>a</sup>

• ***Baku–Tbilisi–Ceyhan (BTC) Oil pipeline (Azerbaijan / Georgia / Turkey)***

The 1,768-km oil pipeline from Baku, Azerbaijan through Georgia to Ceyhan, Turkey links

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<sup>10</sup> International Energy Agency (IEA), *World Energy Investment Outlook* (2014, figure 2.3, pp. 55). Available from [www.iea.org/publications/freepublications/publication/WEIO2014.pdf](http://www.iea.org/publications/freepublications/publication/WEIO2014.pdf) (accessed 20 October 2016).

<sup>11</sup> More information on the Energy Charter. Available from [www.energycharter.org/process/frequently-asked-questions/](http://www.energycharter.org/process/frequently-asked-questions/) (accessed 20 October 2016).

the Caspian to the Mediterranean sea and has a capacity of 1.2 million barrels per day since 2009. It was the first major pipeline in central Asia funded on a limited recourse basis<sup>b</sup> for a total cost of \$3.6 billion (co-financed by EBRD and IFC) with insurance policies provided by Export Credit Agencies (ECAs). The pipeline became operational in June 2006 and was built by the Baku-Tbilisi-Ceyhan pipeline company (BTC Co). The operation of it is carried out by BP (the major shareholder in the consortium).<sup>c</sup>

- ***Central Asia-China gas pipeline (Turkmenistan / Uzbekistan / Kazakhstan / China)***

This 1,873-km gas pipeline consists of three parallel lines that connect Turkmenistan to China via Uzbekistan and Kazakhstan. The line A of this pipeline became operational in 2009 while the other two parallel lines (B and C) started their operation in 2010 and 2014 respectively. The state-owned China National Petroleum Corporation (CNPC) initially owns 50% of the pipelines through separate joint venture deals with the three transit countries.<sup>d</sup> The financial viability of the pipeline is assured through a gas sales & purchase agreement signed by CNPC that envisages annual delivery of 30 billion cubic meters of gas from Turkmenistan to China for 30 years.<sup>e</sup> For the section Kazakhstan-China of the Line C, it has been reported that the China Development Bank provided a \$4.7 billion project loan.<sup>f</sup> The pipeline has a capacity approximately equivalent to 20% of China's annual natural gas consumption and was the first to connect China with Turkmenistan.

- ***Turkmenistan-Afghanistan-Pakistan-India gas pipeline (TAPI)***

In 2010, an intergovernmental agreement was signed between the participating countries to build to the build the TAPI pipeline. The about 1,700-km pipeline, estimated to cost around \$10 billion, is planned to carry 33 billion cubic meters of gas annually from gas-rich Turkmenistan to Pakistan and India while Afghanistan should receive transit fees. The state-owned companies from the four partner states established a special purpose consortium company (SPCC) that will build, own and operate the pipeline. The consortium will be led by "Turkmengas", which would provide 85% of the equity while the other TAPI members take each 5% of equity.<sup>g</sup> ADB has acted as the Secretariat for the TAPI pipeline project since 2003 and numerous meetings at technical and ministerial levels have been organized since then. However, progress has been slow given the project complexity, which is amplified by the security concerns in Afghanistan. Several milestones have nevertheless been reached such at the Gas Sale and Purchase Agreement (GSPA) (2012-2013), Operations Agreement (2014), Transit Fee Arrangement (2012) and Shareholders Agreement (2015). A groundbreaking ceremony was held in December 2015 and detailed engineering and route surveys as well environmental and social safeguard studies are underway. ADB and the Islamic Development Bank (IDB) have expressed interest in financing part of the project while supplier credits are also expected to contribute to the financing.

<sup>a</sup> Prabir De, M. Samudram and S. Moholkar, *Trends in National and Regional* (2010). Investors Financing Cross border Infrastructure Projects in Asia. ADBI Working Paper Series No. 245. Japan: Asian Development Bank Institute. Available from [www.adb.org/sites/default/files/publication/156100/adbi-wp245.pdf](http://www.adb.org/sites/default/files/publication/156100/adbi-wp245.pdf) (accessed 20 October 2016).

<sup>b</sup> Limited recourse means that the lenders only rely on the project company's assets in case of default not on the assets of the shareholder companies.

<sup>c</sup> Presentation by A. Chavarot on "Financing Large Scale Pipeline Projects In and Out of Russia – Past Experience and Challenges for the Future" are available at <http://www.eng.rpi-inc.ru/materials/1/Doklad/PrChavarotEn.pdf>; and Presentation by N. L. Khodadad on "Financing Cross-Border Pipelines". Available from [www.energycharter.org/fileadmin/DocumentsMedia/Events/IME\\_Ashgabat\\_2014\\_S3\\_Khodadad.pdf](http://www.energycharter.org/fileadmin/DocumentsMedia/Events/IME_Ashgabat_2014_S3_Khodadad.pdf) (accessed

20 October 2016).

<sup>d</sup> <http://interfaxenergy.com/gasdaily/article/21221/china-continues-to-hold-sway-in-central-asia> (accessed 20 October 2016).

<sup>e</sup> [www.cnpc.com.cn/en/FlowofnaturalgasfromCentralAsia/FlowofnaturalgasfromCentralAsia2.shtml](http://www.cnpc.com.cn/en/FlowofnaturalgasfromCentralAsia/FlowofnaturalgasfromCentralAsia2.shtml) (accessed 20 October 2016).

<sup>f</sup> [www.cliffordchance.com/people\\_and\\_places/people/partners/cn/maggie\\_lo.html](http://www.cliffordchance.com/people_and_places/people/partners/cn/maggie_lo.html) and <http://kazenergy.com/en/press-center/2011-04-21-10-24-20/9456-> (accessed 20 October 2016).

<sup>g</sup> [www.isgs.pk/projects/turkmenistan-afghanistan-pakistan-india-gas-pipeline-tapi-4](http://www.isgs.pk/projects/turkmenistan-afghanistan-pakistan-india-gas-pipeline-tapi-4).

## I. Transport

Similar to energy, the transport sector in many economies has also benefited from significant private investments. The question is then whether the private sector could also contribute to bridge cross-border infrastructure gaps. This is critical as improved transport connectivity has the potential to contribute to further economic integration, more optimal resource allocations and increased trade prospects. However, infrastructure bottlenecks, particularly at border areas, still prevent transport networks from delivering their full potential.

### F. Road

Roads have the largest PPP track record in the transport sector, with more than five hundred projects in the Asia-Pacific region since 1995. Cross-border projects are, however, extremely rare due to the nature of road projects, which are typically considered as domestic assets and financed on a standalone basis. Stretches of regional networks have nevertheless been developed through PPP arrangements (for example, the Thai government is considering a PPP structure for developing a motorway connecting Kanchanaburi with the Thai-Myanmar border with the objective of improving the connectivity to the future Dawei deep-sea port).<sup>12</sup> Yet, the following African project demonstrates that transboundary road PPP projects are possible.

- ***N4 Toll Road from South Africa to Mozambique:***

In 1997, a Build-Operate-Transfer (BOT) contract was signed for a 30-year concession in order to upgrade and rehabilitate 390 km of an existing road connecting South Africa and Mozambique for a total cost of around \$660 million. A one-stop border facility was also developed as part of the project. To make the project viable, the governments authorized the private operator to collect tolls and jointly guaranteed its debt (and to some extent its equity investment). Regarding the contracting structure, only one concession contract was signed including the road authorities of the two countries.<sup>13</sup>

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<sup>12</sup> ASEAN (2016). Projected Briefs for Selected PPP Projects. Available from <http://asean.org/storage/2016/07/Project-Briefs-for-Selected-PPP-Projects-Final-21Jun2016.pdf> (accessed 20 October 2016).

<sup>13</sup> PPIAF (2009). Toolkit for PPP on Roads and Highways. Available from [www.ppiaf.org/sites/ppiaf.org/files/documents/toolkits/highwaystoolkit/6/pdf-version/safricamazambique.pdf](http://www.ppiaf.org/sites/ppiaf.org/files/documents/toolkits/highwaystoolkit/6/pdf-version/safricamazambique.pdf) (accessed 20 October 2016).

## G. Border-crossing facilities

Transport infrastructure networks also rely on border-crossing facilities to operate efficiently and PPP mechanisms have been used for upgrading these facilities as illustrated by the Turkish example (see Box 3).

- *Modernization of Border Crossing Points in Turkey:*

In Turkey, six border gates have been modernized through a BOT agreement whereby the private company makes all the capital expenditures (initially \$190 million) and then operates only the commercial facilities built (the public authorities remain responsible of the custom-related ones). At the end of the contract, the facilities are transferred free of charge to the public authorities. The private company established in 2005 for this project is owned by the Turkish Chambers and their federation, which have an interest in having modern border crossing facilities.<sup>14</sup>

PPP schemes can also be envisaged to develop Special-Economic Zones (SEZ) at borders. For instance, it was reported that the Industrial Zone in Myawaddy, a border town between Myanmar and Thailand, could be developed through a PPP arrangement.<sup>15</sup>

## H. Bridge & tunnel

Through PPP contracts, the private sector can also finance the development of bridges and tunnels, which are necessary to span physical obstacles and connect the transport networks of different countries. However, only few cases can be identified, such as:

- *Second border crossing bridge (Malaysia / Singapore)*

An intergovernmental agreement was signed in March 1994 between Malaysia and Singapore to define the respective responsibilities of the two governments with regard to the design, construction, operation and maintenance of the project whereby each government was in charge of the construction of its portion of the bridge.<sup>16</sup> A joint committee with representatives from both governments was established to supervise the project implementation. For the Malaysian part, a 30-year BOT contract was awarded to a private concessionaire. Besides the bridge, the project includes 44 km of expressway as well as customs and ancillary facilities. The project suffered, however, from lower than forecasted initial traffic (initially about 1/3 of estimates) resulting in difficulties for the private consortium to service its debt. As a result, the government of Malaysia had to envisage compensation mechanisms, such as a prolonged concession period, in order to avoid the project failure.<sup>17</sup>

<sup>14</sup> Presentation by Ahmet Gürlek on "Modernization of Border Crossing Points in Turkey" is available from [www.unece.org/fileadmin/DAM/trans/doc/2009/wp5/ECE-TRANS-WP5-GE2-03-pres18e.pdf](http://www.unece.org/fileadmin/DAM/trans/doc/2009/wp5/ECE-TRANS-WP5-GE2-03-pres18e.pdf) (accessed 20 October 2016).

<sup>15</sup> [www.meti.go.jp/meti\\_lib/report/2014fy/E003820.pdf](http://www.meti.go.jp/meti_lib/report/2014fy/E003820.pdf) (accessed 20 October 2016).

<sup>16</sup> ASEAN (2014). Public-Private Partnership (PPP) Guidelines. Economic Research Institute for ASEAN and East Asia (ERIA).

<sup>17</sup> Prabir De, M. Samudram and S. Moholkar (2010). Trends in National and Regional Investors Financing Cross border Infrastructure Projects in Asia. ADBI Working Paper Series No. 245. Japan: Asian Development Bank Institute. Available from [www.adb.org/sites/default/files/publication/156100/adbi-wp245.pdf](http://www.adb.org/sites/default/files/publication/156100/adbi-wp245.pdf) (accessed 20 October 2016).

## I. Rail

In Asia, missing links in international networks need to be extended and existing lines upgraded to reap the full potential of railways.<sup>18</sup> This necessitates huge investments. For example, building the missing links in the Trans-Asian Railway network, which comprises 117,500 km of railway lines serving 28 countries, has been estimated to around \$60 billion. Unfortunately, past experience with cross-border railway lines developed through PPP is limited and results are mixed for the existing projects. These issues are due in part to the lack of interoperability between railway networks in the region but also to the low financial viability of railway projects and over-optimism of private companies in bidding for contracts, the latter leading to lower than expected revenues.

Here is an example of a planned project between Malaysia and Singapore:

- ***High-Speed Railway Line (Malaysia / Singapore)***<sup>19</sup>

The plan to develop a 350-km high-speed railway line between Kuala Lumpur and Singapore, which should reduce travel time to 90 minutes from 4 hours currently by bus, was formally announced in 2013. A joint ministerial committee was set up to discuss its implementation and a bilateral agreement is expected to be signed to define the technical, commercial and governance frameworks. The cost is estimated at around \$11 billion, which could be partly financed through a combination of private resources and government funding (discussions are ongoing). For instance, the project could be structured in such a way that the civil works is financed through the public purse and the train services through a PPP arrangement.

In Europe, cross-border rail projects have also been developed through PPP yet the ones identified have experienced financial difficulties such as the Eurotunnel, connecting the United-Kingdom to France, which cost twice its original budget and has not met its traffic targets. Another example is the Perpignan-Figueiras Rail Concession described below:

- ***Perpignan-Figueiras Rail Concession***<sup>20</sup>

This 44-km line between France and Spain, including several bridges and tunnels, was developed under a 50-year concession arrangement for a total budget of around \$1 billion. The project aims at relieving a major transport bottleneck cutting travel time by 2 hours for passengers and 10 hours for freight while connecting Spain to the European network and addressing the break-of-gauge issue<sup>21</sup> between the two countries. The project was granted in 2004 through a bi-national tender process to a consortium of French and Spanish infrastructure companies. It benefited from large state subsidies from both governments involved as well as the European Union (i.e. €540 million or 57% of Capex). The concessionaire revenue flow depends on tolls levied on train operating companies (SNCF, RENFE and others). While the construction ended in 2009, the line was fully operational only a few years later and traffic

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<sup>18</sup> For example, upgrading networks could mean increasing the maximum axle load of railway tracks so train can transport higher freight volume per journey.

<sup>19</sup> Information on Kuala Lumpur – Singapore High Speed Rail Project August 2015. Available from hoganlovells.com (accessed 20 October 2016).

<sup>20</sup> Presentation by Thomas Vieillescazes on “PPPs and EU Funds, Cross-Border Projects: The case of the Rail Sector PPPs” is available from [www.lemonde.fr/economie/article/2015/07/20/le-concessionnaire-de-la-ligne-tgv-barcelone-paris-depose-le-bilan\\_4690502\\_3234.html](http://www.lemonde.fr/economie/article/2015/07/20/le-concessionnaire-de-la-ligne-tgv-barcelone-paris-depose-le-bilan_4690502_3234.html) (accessed 20 October 2016).

<sup>21</sup> A break-of-gauge occurs when the railways of neighbouring countries have different track gauges as, for example, between China and Kazakhstan, or the Islamic Republic of Iran and Turkmenistan.

levels have since been much lower than anticipated (partly as a result of the growing competition from low cost airlines). This has obviously created financial difficulties for the private concessionaire, which entered into liquidation in 2016 after failing to renegotiate its debts with its creditors.

A more positive example of multinational cooperation in the European train services is the Thalys company, which operates the high-speed services linking France, Belgium, the Netherlands and Germany. The company was set up as a commercial entity in 1996 and became in 2015 fully independent from its shareholders, the national train operating companies. Since its establishment, the number of passengers has increased by almost 10% per year on average to around 7 million passengers in 2015. The quality of service, measured in terms of punctuality and customer satisfaction levels, is also rated high (around 90 per cent for both indicators). This project was made possible notably because of the increasing technical compatibility in the trans-European rail system and demonstrates that cross-border train services are possible. Moreover, it has been estimated that the lines operated by Thalys generate around 140 million euros (approx. \$155 million) of indirect savings per year through lower carbon emissions, avoided car accidents and reduced road congestion.<sup>22</sup>

## **J. Port and airport**

Although ports and airports are national infrastructure, they have a clear cross-border nature as they link countries together. For instance, they are the only way to connect island countries to the rest of the world and therefore are critical for improving basic connectivity.

PPPs have a good track record in these sub-sectors, with the implementation of around 250 port and 90 airport projects in the region since 1990. A reason for this success is that such infrastructure projects do not require large amount of land, which is often one of the most challenging issues with these projects.

Regarding port operations, the private partner typically leases a port terminal and is responsible for both operations and related investments (examples are wharf expansion, cranes and office buildings). However, the public authority remains usually in charge of common facilities, such as breakwaters, entrance channels, utilities and road and rail access to the port.<sup>23</sup> The objective is to build on the private sector's capacity to improve the efficiency and quality of port services.<sup>24</sup>

Similar to maritime ports, airports are also well suited to the PPP model, especially as the business of operating an airport terminal matches the private sector's strengths. For example, the private sector is able to identify and develop other sources of revenue, such as shops, hotels and car parks, which can partly fund the infrastructure investment. Foreign exchange risks are also low for this type of asset because airports generate substantial revenues in hard currency, which increases their attractiveness for international investors.

<sup>22</sup> <http://pro.visitparisregion.com/content/download/11302/255276/version/1/file/Pr%C3%A9sentation-Thalys.pdf> and [https://www.thalys.com/img/pdf/presse/release/en/1435929252\\_15.07.03.\\_Carbone\\_4.pdf](https://www.thalys.com/img/pdf/presse/release/en/1435929252_15.07.03._Carbone_4.pdf) (accessed 7 November 2016).

<sup>23</sup> Public-Private Partnership in Infrastructure Resource Center. World Bank Group. Available from <http://ppp.worldbank.org/public-private-partnership/sector/transportation/ports> (accessed 20 October 2016).

<sup>24</sup> J. Tongzon and W. Heng (2005). Port privatization, efficiency and competitiveness: Some empirical evidence from container ports. *Transportation Research Part A: Policy and Practice*, vol. 39, no.5, pp. 405-424.

## II. Information and Communications Technologies (ICT)

With the economy becoming ever more digitalized, the demand for high-bandwidth content and applications is growing rapidly and so is the demand for capacity on international fibre-optic cable networks. Unfortunately, the Asia-Pacific region is still very much divided regarding access to these international networks. For instance, Myanmar is reported to have 900 times less internet bandwidth per capita than Singapore. Weak international internet bandwidth connectivity also impacts consumer pricing with less connected countries suffering from relatively higher prices, which is a major deterrent for fixed broadband adoption.<sup>25</sup> Expanding fiber cable networks can improve broadband access on a regional basis and reduce these inequalities while providing cost-effective solutions to more people. This could have a significant impact as ICT increasingly plays a key role in terms of productivity gains and public services modernization.

To finance these international networks, telecom operators from different countries have traditionally partnered in consortium, the objective for each operator being to secure an allocation of bandwidth capacity (proportional to its investment) to serve its home market. This “consortium” approach also enables risk and cost sharing.

Another model involves projects led by non-telecom companies where private investors build cables with the objective of selling access to third parties. This is a more speculative model as it relies on strong future demand. If the demand is overestimated, oversupply capacity is created. This is what occurred in the early 2000s when the industry crashed following the dot-com bubble burst.<sup>26</sup>

From a banker’s point of view, the revenue uncertainty in such a fast-evolving industry makes ICT projects challenging to finance. In addition, current cable systems might become obsolete more rapidly than expected due to technological progress. The lack of collaterals, beyond the shares of the project company, is another issue for lenders (for example, cables lying in international waters cannot be pledged as a security for the loans).<sup>27</sup>

### A. Submarine cables

Most of the international connections are made through submarine cables, which is a cheaper option than terrestrial networks and avoid hurdles related to border crossing. Fiber cables are also more competitive than the satellite alternative since cables have a higher bandwidth capacity and lower latency than satellite systems. However, the drawback is that underwater cables are not easy to repair, especially for cables located in deep waters.

In the period 2008-2014, approximately \$4.5 billion were invested in submarine cables in the ESCAP region (around 38 per cent of the world total). The majority of these investments have been made by telecom carrier-led consortium (83 per cent of worldwide investments in recent years) while the rest was financed by governments and multilateral development banks (MDB) (9

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<sup>25</sup> [www.unescap.org/sites/default/files/20160401%20Bangkok%20ESCAP%20-%20Terabit%20Consulting%20Presentation.pdf](http://www.unescap.org/sites/default/files/20160401%20Bangkok%20ESCAP%20-%20Terabit%20Consulting%20Presentation.pdf) (accessed 20 October 2016).

<sup>26</sup> [www.milbank.com/images/content/2/3/23470/PFI-570-54-56.pdf](http://www.milbank.com/images/content/2/3/23470/PFI-570-54-56.pdf) (accessed 20 October 2016).

<sup>27</sup> [www.milbank.com/images/content/1/0/1096/Subtelforum-Issue-2037-Glenn-Gerstel.pdf](http://www.milbank.com/images/content/1/0/1096/Subtelforum-Issue-2037-Glenn-Gerstel.pdf) (accessed 20 October 2016).

per cent) and private investors (7 per cent).<sup>28</sup>

Recent examples in box 4 illustrate how private resources are mobilized for such type of project.

- ***The Bay of Bengal Gateway<sup>a</sup>***

The Bay of Bengal Gateway (BGG) is a submarine fibre-optic cable project providing a connection between the Sultanate of Oman and Penang in Malaysia, with branches to the United Arab Emirates, Sri Lanka and India (Mumbai and Chennai) as well as Singapore. The 8,100km submarine cable provides diversity to existing South East Asia – India – Middle East – Europe routes and promises enhanced reliability as it avoids the Malacca Strait and other cable-cut prone areas. The cable started to carry commercial traffic in March 2016. The project is financed through a consortium of private companies consisting of Vodafone (United Kingdom), Omantel (Sultanate of Oman), Etisalat (United Arab Emirates), Reliance Jio Infocomm (India), Dialog Axiata (Sri Lanka) and Telekom Malaysia (Malaysia).

- ***The Tasman Global Access (TGA)***

The Tasman Global Access (TGA) is a 2,300-km submarine fibre-optic cable connecting New Zealand and Australia. The new cable will provide an alternative route to the existing cables and increase redundancy and resilience of the network. The project is being realized by a consortium consisting of telecommunications companies Spark, Vodafone and Telstra, which invested approximately \$70 million. The submarine cable is expected to be ready for service by the end of 2016.

<sup>a</sup> [www.bayofbengalgateway.com/](http://www.bayofbengalgateway.com/) and [www.telegeography.com/products/commsupdate/articles/2016/04/18/bbg-consortium-launches-submarine-cable-linking-india-se-asia-me/](http://www.telegeography.com/products/commsupdate/articles/2016/04/18/bbg-consortium-launches-submarine-cable-linking-india-se-asia-me/) (accessed 20 October 2016).

Relying fully on market forces to ensure network development might, however, not always be possible as serving less-developed markets or remote countries tends to be unviable on pure commercial terms. Therefore, these frontier markets need support from development partners and MDBs. For example, connecting pacific islands countries has required public support as illustrated in the Fiji-Samoa example below:

- ***The Samoa Submarine Cable Project***

The 1,300-km cable will connect Samoa to the Southern Cross Cable in Suva, Fiji and improve connectivity for the small island states. The project worth \$57 million is carried out as a PPP, with grants from the Asian Development Bank (\$25 million), the World Bank (\$16 million) and the Australia's Department of Foreign Affairs and Trade (\$1.5 million). These grants will be lent by the Government to the recently established Samoa Submarine Cable Company (SSCC), which is in charge of procuring, owning and operating the submarine cable system. The rest of the financing will be provided by the Government of Samoa (\$6.7 million covering taxes and duties) and the local private sector through equity (\$8.2 million). The SSCC local shareholder comprises existing ICT providers and state-owned enterprises (investment vehicles and insurance companies). The cable is expected to be operational around the second

<sup>28</sup> [www.terabitconsulting.com/downloads/2014-submarine-cable-market-industry-report.pdf](http://www.terabitconsulting.com/downloads/2014-submarine-cable-market-industry-report.pdf) (accessed 20 October 2016).

half of 2017.<sup>29</sup>

## **B. Terrestrial networks**

Although terrestrial networks are more expensive to build, they are a valuable complement to undersea cables. For instance, they provide back-ups to the overall system and protect networks in case of outages in submarine cables, which may result from natural disasters, ships' anchors or equipment failure. This is critical because Asia-Pacific countries depend largely on a limited number of underwater cables. Terrestrial networks also offer lower latency on some routes, which might be important for time-sensitive services such as financial transactions. For landlocked countries, land-based networks are also the only option available.

The *Diverse Route for European & Asian Markets (DREAM)* is an example of such project, which connects Europe and Asia through 8,700km high-speed fibre optic link crossing five countries. The project was implemented by MegaFon, a large Russian telecom carrier, in cooperation with Kazakhtelecom and Interoute, and started its operation in 2013.<sup>30</sup>

A common factor between sea- and land-based networks is that the project company (i.e. the special purpose vehicle or SPV) usually gathers telecom companies from the involved countries. This partnership is not only useful to secure demand for the created capacity but also to gain political support. For example, implementing fiber cable projects require access to land for installing and maintaining cables (for example at landing stations for submarine cables) thus necessitate obtaining land rights and regulatory approvals. Political support can be useful to obtain and accelerate these approvals. Leveraging existing infrastructure, such as highways and railways, can also facilitate access to right-of-way and streamline the procurement process while reducing development costs.<sup>31</sup>

Public authorities have also an important role to play in terms of regulation to avoid monopolistic behaviors. Ideally, purchasers of capacity should be able to access international networks on an equal, non-discriminatory basis. Recognizing the importance of liberalized international gateways (i.e. the links between the domestic network and international cable systems), the authorities in Singapore regulated prices, terms and conditions for accessing the dominant licensee's submarine cable landing station in early 2000s. It also required the dominant carrier to lease space to competitors at its station; thereby allowing operators to have direct access to submarines cables.<sup>32</sup>

## **III. Typical allocation of responsibilities**

From the case studies presented, the following patterns can be observed in terms of project structure. These elements will be further studied in the following sections together with possible policy actions.

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<sup>29</sup> [www.worldbank.org/en/news/press-release/2015/06/19/underwater-cable-to-bring-high-speed-internet-to-samoa](http://www.worldbank.org/en/news/press-release/2015/06/19/underwater-cable-to-bring-high-speed-internet-to-samoa) (accessed 20 October 2016).

<sup>30</sup> [www.interoute.com/russian-telco-links-europe-asia-high-speed-fibre-0](http://www.interoute.com/russian-telco-links-europe-asia-high-speed-fibre-0) (accessed 20 October 2016).

<sup>31</sup> [www.unescap.org/sites/default/files/20160401%20Bangkok%20ESCAP%20-%20Terabit%20Consulting%20Presentation.pdf](http://www.unescap.org/sites/default/files/20160401%20Bangkok%20ESCAP%20-%20Terabit%20Consulting%20Presentation.pdf) (accessed 20 October 2016).

<sup>32</sup> [www.itu.int/itu-news/manager/display.asp?lang=en&year=2009&issue=01&ipage=26](http://www.itu.int/itu-news/manager/display.asp?lang=en&year=2009&issue=01&ipage=26) (accessed 20 October 2016).

	Energy	Transport	ICT
<b>Planning</b>	<b>Public</b>		
	Governments are typically involved in the planning of regional infrastructure networks and need to set-up institutional platforms to agree on project structures. Nonetheless the private sector might also identify commercial opportunities and initiate cross-border projects.		
<b>Construction &amp; operation risk</b>	<b>Private</b>		
	The project consortium typically supports the construction and operation risks for the entire contract duration, which means that any cost overruns shall be borne by it.		
<b>Land</b>	<b>Public</b>		
	Governments usually provide the right-of-way and/or land for the project site.		
<b>Finance</b>	<b>Private</b>		
	The project company is typically in charge of securing the financing (debt and equity).		
<b>Demand risk</b>	<b>Public</b>	<b>Private / Public</b>	<b>Private</b>
	The project revenue stream is usually guaranteed through a long-term purchase agreement signed by the SOE of the importing country.	While user fees can generate project incomes, governments often have to intervene to make projects financially viable.	In most cases, the project revenues are sufficient to cover the costs although some projects are not viable on pure commercial terms.
<b>Political risk</b>	<b>Public</b>		
	Political risks are acute in cross-border projects and project consortia generally try to protect their interests through contractual provision, public guarantee and political risk insurance. The involvement as shareholders of companies from the participating countries also contributes to mitigate political risks and align incentives.		
<b>Regulation</b>	<b>Public</b>		
	Governments have to grant the necessary regulatory approvals and set-up international arrangements in order to make cross-border projects doable while promoting an enabling investment climate.		

## **V. Challenges & policy actions**

The projects reviewed above reveal that implementing PPP projects at a multi-country level is complex endeavor. By having more than one country involved, cross-border projects face specific challenges such as: complex intergovernmental arrangements; limited competition; augmented political risks; disparate policy and regulatory environments; intricate procurement process; and unbalanced cost and benefit allocation. These challenges are detailed below together with policy actions that governments could consider for supporting cross-border infrastructure development. These challenges are not all PPP specific but impact the chances of mobilizing private investments for cross-border.

### **A. Complex intergovernmental arrangements**

Regional connectivity depends on the capacity of countries to plan cross-border projects and agree on their characteristics (e.g. the project scope, border arrangements and tariff setting mechanisms). Without these elements, it is not possible to present a clear business case to potential investors in the private sector.

- ***Creating institutional bridge***

To provide such clarity, an intergovernmental agreement is typically required as well as a formal institutional arrangement to coordinate the project implementation and make decisions. Regarding such arrangement, a two-tier structure is often set-up with a high-level Ministerial body making key decisions and a working-level committee in charge of supervising and managing the project (as illustrated in the second border crossing bridge project between Malaysia and Singapore and the CASA 1000 project). Effective institutional arrangements are critical in order to establish mutually acceptable processes among numerous stakeholders with sometimes conflicting objectives.

- ***Supporting regional platforms***

Regional cooperation platforms can facilitate the identification of cross-border projects. For example, ESCAP has been contributing to the formulation of regional networks in the field of transport (for example, the Asian Highway and Trans-Asian Railway networks). This has supported countries in prioritizing and planning regional projects. These efforts are commendable and need to be pursued in other infrastructure sectors as they help investors in better understanding governments' future plans. Also, regional platforms are needed to disseminate information on PPPs and provide advisory services on this mechanism, for instance through an Asia-Pacific network of PPP units and programmes. In addition, industry dialogues have to be encouraged at a regional level as cross-border projects might also be initiated by private consortium as shown in the ICT sector.

- ***Addressing bottlenecks at borders***

Private investors are unlikely to finance transboundary infrastructure projects unless administrative hurdles at borders are minimized. For example, by streamlining customs procedures, governments have the ability to improve cross-border project viability while stimulating the demand for international services. Recognizing the importance of this issue, countries in the region have taken measures to address bottlenecks at borders for instance

through regional agreements (e.g. the Motor Vehicles Agreement signed in 2015 between Bangladesh, Bhutan, India and Nepal should facilitate the seamless movement of vehicles across these countries). In the same way, the development of international services can be supported with the harmonization of technical standards, such as those related to rolling stock and signalling systems in the rail sector, and frequencies and voltage in the power sector. The continuation of these efforts, through intergovernmental platforms, is crucial for triggering more cross-border projects as well as private investments.

## **B. Limited competition**

Cross-border projects tend to be large and only a limited pool of companies have the financial, technical and human resources to build these infrastructure projects and operate them on a long-term basis. This obviously limits the competitive pressure when tendering these projects and often results in bilateral negotiations.

The market structure of each sector also influences the feasibility of procuring these projects through competitive bidding. For example, oil and gas pipelines traditionally involve companies active in the upstream activities (i.e. exploration and production) and there is little alternative than involving these companies together with the SOEs of the traversed countries. Nonetheless, competitive procurement is easier in other sub-sectors such as power generation and transport.

In the ICT sector, investments are also not primarily initiated by the public sector but rather directly by private entities identifying a commercial potential. Indeed, international fiber cables have been mainly developed by national telecom operators partnering with each other since they are the ones having the necessary customer base to make these projects viable. In such environment, the role of the public sector is more limited and tends to focus on fostering competition and tackling monopolistic behaviours.

- ***Leveraging SOE's appetite for internationalization***

In some cases, pure private investment is not possible due to lack of competition or because the sector is dominated by SOEs. Countries may nevertheless benefit from external investments to develop their regional networks by involving foreign SOEs keen to invest abroad. For instance, the Chinese SOEs have recently demonstrated a strong appetite for financing infrastructure networks (see box 5). Governments need to further understand the benefits and risks associated with these opportunities in order to identify the required actions for making the most of them.

- ***Creating industry benchmarks***

In the absence of sufficient competition, the challenge is to ensure that governments achieve value for money. Industry benchmarks could be useful in that context to support countries in assessing whether resources are properly spent (for example to estimate what can be fairly charged by a transit country in an energy project). The lack of detailed information regarding transnational deals, however, makes the establishment of these benchmarks problematic. Promoting further transparency in these deals and collecting data can contribute to address this challenge.

- ***Moderating risk transfer***

Investors are reluctant to take on risks they cannot manage and predict. This means that

governments should make contingencies related to infrastructure project as clear and predictable as possible to attract private investments. For example, governments may support PPP projects by bearing the demand risk. Indeed, one of the success factors in the energy sector has been the presence of creditworthy off-takers ready to purchase the outputs produced on a long-term basis thus limiting the private sector's risks to the construction and operation of the infrastructure asset. Likewise, availability payment-based structures have been used in transport to reassure private investors unwilling to rely exclusively on toll collection.<sup>33</sup>

- ***Boosting domestic markets***

Cross-border projects do not operate in silos and respond to changes in national markets. For instance, the level of competition for domestic broadband services will impact the demand for cross-border connections. Public authorities can positively influence the business case for international projects by supporting internal market development, for example through authorizing private ownership of key telecommunication sectors, including international gateway.

#### **Box 5. Chinese SOEs investment abroad**

The Chinese SOEs are among those companies capable of embarking on large-scale transboundary projects. They have access to relative cheap financing thanks to their strong ratings and backing of the State. They can also tap international capital markets through equity and bonds issuances, and may benefit from concessional lending via state-backed lenders as well as from political insurance, which are critical in these types of projects (the international loan portfolio of the two China's state development banks, China Development Bank and Export-Import Bank of China, is larger than the one of six major MDBs).<sup>a, b</sup>

The expansion of Chinese SOEs abroad has, however, not been trouble-free as illustrated by the difficulties faced in several flagship projects. For example, the \$1.4 billion Colombo port city project supported by the state-owned China Communications Construction Company (CCCC) was suspended in March 2015 after a change in the Sri Lankan government.<sup>c</sup> Likewise, the \$3.6 billion Myitsone dam project in Myanmar has been stalled since 2011 following opposition from local communities (the original plan foresees that 90% of electricity produced will be exported to China).<sup>d</sup> However, there are more encouraging examples such as the concession contract signed for the Gwadar port in Pakistan or the recently signed contract by the China Railway Construction Corporation (CRCC) for the construction of a railway line on the Bangladesh's largest Padma Bridge (around \$4 billion). The latter would be financed through China's government soft loan as well as the government's own funds.<sup>e</sup>

These projects illustrate the two typical models of Chinese investments abroad. The Colombo port is a form of PPP arrangement where the project is fully financed by the SOE, which expects to recoup its investment throughout the project lifetime. In the second model, a Government receives a concessional loan from a Chinese state-backed finance institution and contracts the construction of the infrastructure project with a Chinese state-owned construction company. The operation of

<sup>33</sup> With availability type of PPP structure, the governments commit to pay the private concessionaire on a regular basis provided that the performance standards indicated in the contract are met. Therefore, the private sector's revenue stream does not depend on future traffic levels, which have proven to be difficult to forecast and largely inaccurate.

the infrastructure is then the responsibility of the local government. These two models are presented in the following simplified figures.

<sup>a</sup> [www.bu.edu/pardeeschool/files/2016/05/Fueling-Growth.FINAL\\_.version.pdf](http://www.bu.edu/pardeeschool/files/2016/05/Fueling-Growth.FINAL_.version.pdf) (accessed 20 October 2016).

<sup>b</sup> Political insurances are typically provided by Export Credit Agencies (ECA) and EXIM (Export-Import) banks.

<sup>c</sup> Reuters, China, Sri Lanka keen to push Colombo port project: Chinese diplomat, Thursday, April 7, 2016. Available from [www.reuters.com/article/us-china-sri-lanka-idUSKCN0X41SH](http://www.reuters.com/article/us-china-sri-lanka-idUSKCN0X41SH) (accessed 20 October 2016).

<sup>d</sup> Reuters, Myanmar's Suu Kyi assures China of solution to stalled dam, Thursday, 18 August 2016. Available from [www.reuters.com/article/us-china-myanmar-idUSKCN10TOLK](http://www.reuters.com/article/us-china-myanmar-idUSKCN10TOLK) (accessed 20 October 2016).

<sup>e</sup> [www.railjournal.com/index.php/asia/bangladesh-awards-padma-bridge-rail-link-contract.html](http://www.railjournal.com/index.php/asia/bangladesh-awards-padma-bridge-rail-link-contract.html) (accessed 20 October 2016).

### C. Augmented political risk

The political risk includes issues such as adverse and abrupt regulatory changes, breach of contract and default on sovereign obligations. With more than one country involved, these risks are multiplied and new ones emerge, such as the possible disagreement among the public authorities of different countries. Such type of risks is a major deterrent for private investors, which want to be reassured that their rights are protected and contracts enforced.

- *Securing up-front political support*

Cross-border projects are challenging and require a strong political commitment from the participating countries at the highest possible level. Without such high-level support, these projects are unlikely to succeed. Likewise, the stability of the country will be an important factor considered by the private sector before deciding on any investment.

- *Strengthening risk coverage instruments*

Political risk insurances are particularly important in this context as illustrated in the case of the hydro project in Lao People's Democratic Republic. Their availability might however be an issue. Despite the instruments made available by multilateral development banks (e.g. the World Bank Group's Multilateral Investment Guarantee Agency (MIGA)), the political risks continue to be perceived as top constraints for private infrastructure investments.<sup>34</sup> Therefore policymakers should consider how to improve the effectiveness of existing instruments and develop additional ones where required.

- *Reinforcing governance*

By the same token, it is important that good governance principles are applied to provide assurance that the public interest is protected. These principles include the fight against corruption and the need for transparency and publicly available information. Alternatively, public opposition may easily derail projects and force governments to renege on their previous commitments thereby harming investors' confidence.

<sup>34</sup> Organization for Economic Cooperation and Development (OECD) (2015). Project Risks and Mitigation in ASEAN. Available from [www.unescap.org/sites/default/files/7a%20-%20OECD%20-%20Risk%20Mitigation%20Instruments.pdf](http://www.unescap.org/sites/default/files/7a%20-%20OECD%20-%20Risk%20Mitigation%20Instruments.pdf) (accessed October 2016).

- ***Selecting sound projects***

Cross-border projects often raise geopolitical issues and have been used to promote foreign policy goals. These projects are, however, more likely to be successful if also driven by sound economic factors. In this respect, developing adequate mechanisms to perform economic analysis of project in a multi-country framework is necessary to assess whether the benefits justify the costs over the life of the project. Projects with clear benefits are also expected to obtain the public support crucial to their implementation.

#### **D. Acute land, environmental and social challenges**

Large infrastructure projects usually cross over different land uses and can easily become a political issue among domestic constituencies. In addition, procedures for construction permits, environmental clearances and land acquisition widely vary among countries. It is also important that environmental and social considerations are integrated into infrastructure development in order to contribute to sustainable development.

- ***Managing environmental and social impacts***

Countries should implement strong environmental and social safeguards so as to limit the potential controversy surrounding these projects. This means that impacts should be carefully assessed at the planning stage through sufficient stakeholder engagements (in particular the affected population) and compensation for negative externalities should be built into the contractual arrangement with the private counterpart. The responsibility for monitoring the implementation of remedial actions should also be clearly allocated especially in a transboundary project where the line of responsibility might be blurrier. In addition, raising environmental and social standards is also important to access international resources. Indeed, through the Equator Principles, 84 financial institutions require infrastructure projects to meet minimum standards to be eligible for financing.

- ***Acquiring land***

Cross-border projects require a large amount of land. Normally the public partner is in the best position to handle the risk of land acquisition, as legal procedures are usually required. Whenever possible, it is recommended that land is secured as early as possible in the project cycle, due to the potential impact of land acquisition factors on project delivery.

#### **E. Disparate policy and regulatory environment**

In a multi-country project, the private sector has to deal with different legal and regulatory environments. For instance, the level of protection for private investments differs across countries. These discrepancies not only increase the project complexity but also mean that the overall project risk is considerably determined by the country with the least favorable environment (for example, the country where securing a license is particularly uncertain). Also, transnational projects require for much more coordination and approvals because of the lack of a single jurisdiction.

- ***Enhancing national PPP frameworks***

Countries in Asia and the Pacific do not have the same level of readiness with regard to private sector involvement in infrastructure development. Some countries in the region have acquired considerable experience and developed a strong track record of PPP projects, while others are

still at an early stage. By enhancing the PPP enabling environment across the region, more PPP cross-border projects could be realized. This can be done by enacting PPP laws, developing related policies and strengthening institutional frameworks. For example, around 20 countries in the region have established or are establishing dedicated national units to support their PPP programmes, which have generally been successful in playing a ‘catalytic’ role in promoting and developing PPP solutions.

- ***Establishing regional regulatory mechanisms***

The transboundary nature of cross-border projects creates additional regulatory issues. For instance, international train services have to take into account immigration rules and may require a new regulatory body to oversee the international services provided. Likewise, electricity trade requires specific regulatory arrangements to allow access to transmission networks, harmonize technical standards and address system imbalances.<sup>35</sup> Supporting the development of these regional mechanisms should ease the implementation of cross-border projects. International transit agreements can also go a long way towards facilitating transboundary projects by addressing regulatory obstacles and avoiding case-by-case negotiations.

## **F. Intricate procurement process**

When competition is possible, the tendering process remains complicated. These projects usually involve several grantors though there are cross-border projects tendered by a single government (see the hydro-power projects presented in Box 1). This leads to practical difficulties leaving governments with two main options: either procure the project through one comprehensive contract awarded by two or more governments or via several interlinked sub-projects tendered separately. The latter has the advantage of being simpler to administer but creates interface issues between the different sub-projects. Having a single contract circumvents these issues and allows for a single consortium to build, operate and maintain the whole infrastructure but this option is not easy to implement. In addition, participating governments might have conflicting interests regarding the consortium to be selected or disagree on the procurement procedures to be followed.

- ***Developing guidelines for cross-border procurement***

Since countries in the region have limited experience with this type of procurement, there is scope for further exploring how these issues can best be addressed. For example, developing guidelines for transacting cross-border projects might provide useful support for Asia-Pacific countries. Moreover, creating model contracts for transboundary projects, where feasible, could make projects easier to study and negotiate.

## **G. Unbalanced cost and benefit**

In a cross-border project, the costs and benefits may be unequally distributed (or at least perceived so) among the countries concerned, making the financial arrangements tricky to negotiate. Furthermore, PPP projects are not always financially sustainable on their own (especially in the transport sector) and often necessitate government support. The challenge is thus to find an

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<sup>35</sup> Anoop S., P. Wijayatunga, and P. N. Fernando (2016). Improving Regulatory Environment for a Regional Power Market in South Asia. ADB South Asia Working Paper Series No. 45. Philippines: Asian Development Bank Institute. Available from [www.adb.org/sites/default/files/publication/190221/sawp-045.pdf](http://www.adb.org/sites/default/files/publication/190221/sawp-045.pdf) (accessed 20 October 2016).

agreement on how to share the costs and benefits between the participating countries and make the project financially viable for private investment.

- ***Aligning interests***

The success of a cross-border project depends on the continued support from all stakeholders. One way of securing such support is to ensure that countries have a direct financial stake in the project, typically through a minority equity participation in the SPV set up for the project. Another possibility is to agree on clear cost and revenue sharing formula. For example, this formula could be the bidding parameter for a project thereby selecting the private consortium offering the highest percentage of revenue sharing or requesting the lowest amount of subsidy as in the case of Viability Gap Funding schemes.<sup>36</sup>

- ***Promoting dedicated financial instruments:***

Cross-border projects are by nature more complex than national ones and consequently often receive lower priority. Also, transnational projects cannot easily benefit from financial support mechanisms created to stimulate national projects. Therefore, it might be necessary to develop dedicated regional instruments to give more prominence to regional infrastructure networks. To this end, a dedicated technical assistance facility could be established to support the preparation of cross-border projects, which typically face high transaction costs. Also, a loan-grant blending facility might be designed to incentivize this kind of projects. In this respect, the multilateral banks have an important role to play as well as the main donor countries. Guarantee facilities have also the potential to improve the viability of projects and their attractiveness for private investors whilst helping private consortia to secure loans from commercial banks. With this objective in mind, a Loan Guarantee Instrument for Trans-European Transport Network Projects (LGTT) was developed in the European Union in order to facilitate a larger participation of the private sector in the financing of Trans-European Transport Network infrastructure (“TEN-T”).<sup>37</sup> Such public guarantees come, however, with fiscal risks that need to be managed to preserve the sustainability of public finances.

## **VI. Conclusions & way forward**

The highlighted challenges explain why only a limited number of cross-border projects have been realized through PPP. By definition, the PPP method is more complex than traditional procurement as PPP contracts have to incorporate both the construction and operation phases of an infrastructure project. The multi-country element adds another layer of complexity.

The review presented in this paper shows, nevertheless, that PPPs are a powerful mechanism for developing cross-border infrastructure when the right conditions are in place, notably when projects demonstrate a strong business case and generate sufficient cash flows to pay back the initial investments. Unlike governments, the private sector cannot factor in the wider-economic

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<sup>36</sup> A Viability Gap Funding (VGF) is a grant provided to support infrastructure projects that are economically justified but fall short of financial viability.

<sup>37</sup> European Investment Bank (EIB). Fact Sheet on The Loan Guarantee Instrument For Trans-European Transport Network Projects. Available from [www.eib.org/attachments/press/2008-005-fact\\_sheet\\_en.pdf](http://www.eib.org/attachments/press/2008-005-fact_sheet_en.pdf) (accessed 20 October 2016).

benefits resulting from infrastructure projects and has to rely exclusively on the project revenues.

To make PPP cross-border projects feasible, a strong political will is necessary and a range of policy options are available through which they can positively influence the development of these projects (as presented in the previous section). Governments need to consider how to implement them and should mobilize assistance from development partners, such as ESCAP (see Box 6).

To conclude, with a world awash with liquidity and record low interest rates, regional infrastructure development should benefit from private investors seeking higher returns than government bonds. PPP is a way to channel these resources to the infrastructure needed to better connect countries in Asia and the Pacific. It is also important to bear in mind that regional networks rely, beyond border zones, on national infrastructure. Financing these national projects is thus critical for improving connectivity in the region and PPP solutions have proven to be a valuable mechanism for this purpose.

#### **Box 6. ESCAP long-lasting policy and technical support to PPP**

Countries in the Asia-Pacific region can count on development partners such as ESCAP to make the most of the PPP mechanisms. In particular, ESCAP has assisted countries by:

***Disseminating best practices*** - The ESCAP secretariat has promoted PPP best practices and developed for this purpose several knowledge materials such as a PPP country readiness diagnostic tool, a series of case studies and a project screening toolkit. ESCAP will continue disseminating these materials through regional and national workshops in order to ease the effective use of the PPP mechanism, including for the development of cross-border infrastructure projects.

***Building governments' capacity*** - The lack of capacity has been identified as a major obstacle of PPP programmes in the Asia-Pacific region not only for cross-border projects but also for national ones. Stepping-up capacity building efforts is required to tackle this issue and reduce the expertise asymmetry that exists between the private and public sectors when PPP contracts are negotiated. In the area of capacity building, the ESCAP secretariat has developed recognized expertise (e.g. its online PPP training programme has been accessed approximately 30,000 times over the last year).

***Providing policy advocacy*** - The ESCAP secretariat has supported several least developed countries with the establishment of effective PPP policy frameworks. As a result, these countries have further developed their PPP national policies, legislations and regulations. Such support is instrumental in improving countries' readiness for private sector involvement in infrastructure development.

***Promoting regional collaboration*** - Regional collaboration is fundamental for cross-border project development. As an intergovernmental platform, ESCAP is well-positioned to facilitate such cooperation for instance with regard to infrastructure planning and PPP experience sharing.

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