

Roundtable on Financing Water

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5th meeting, 26-27 November 2019, ADB HQ Manila

**Session 2. Financing the water value chain without a sovereign guarantee:
Case studies of private sector participation in water distribution and wastewater treatment in
China**

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BACKGROUND PAPER

Rationale

According to the latest available ADB estimates, current investment in infrastructure across 25 DMCs is approximately US\$880 billion, with the People's Republic of China (PRC) representing around 75% of this total¹. The public sector accounts for the overwhelming majority of this investment, and this is especially true for water and wastewater infrastructure. The PRC is at present the only DMC where ADB currently lends without a sovereign guarantee. It is widely recognised that an acceleration in investment is necessary to ensure that infrastructure supports sustainable development in the DMCs and is resilient to the effects of greater climate variability². The estimated gap between current investment levels and what is required to ensure infrastructure is fit more purpose, is nearly US\$500 billion *per annum* between 2016 and 2030, across the 25 DMCs analysed by ADB. Expanding private sector operations is a pre-requisite for closing the infrastructure investment gap³, and is a core objective of ADB's Strategy 2030⁴.

The aim of the Roundtable session is to identify, through the discussion of case studies from the PRC, the enabling conditions that support increased private sector participation in water and wastewater infrastructure investment. The session convenes an interdisciplinary group of key stakeholders operating in the PRC, including the top management of several private sector utilities, along with senior legal and financial practitioners.

Context

While the PRC represents 75% of total current infrastructure spending as described above, it accounts for a much smaller share of the US\$500 billion p.a. investment gap, at around 30% of the total¹. In part, this reflects the PRC's success in developing public-private-partnership (PPP) projects. The ADB has been supporting PPP projects in priority infrastructure areas in the PRC for the past 20 years. This experience has generated several key learnings⁵ regarding the conditions that have generally prevailed where a PPP project has been successful in the PRC. They are summarised below:

Decentralised model. The PRC's decentralized model in the municipal infrastructure has been crucial for the development of a PPP market. One of the key success factors of the decentralised model is a concise concession template which enabled the replication and dissemination of a functional PPP model to smaller municipalities. The template allows for the standardisation of basic contractual terms, while enabling specific, local issues to be discretionally tailored to each municipality's needs.

Decoupling revenue streams. Municipal government creditworthiness and the ability of end users to pay for services are important considerations for private sector financiers, invariably making larger cities in the PRC a more attractive investment proposition than

¹ ADB (2017) [Meeting Asia's Infrastructure Needs](#)

² See e.g. McKinsey Global Institute (2016) [Bridging Global Infrastructure Gaps](#)

³ Vandenberg, P. et al. (2016) [SMEs in Developing Asia: New Approaches to Overcoming Market Failures](#)

⁴ ADB (2018) [Strategy 2030: Achieving a Prosperous, Inclusive, Resilient, and Sustainable Asia and the Pacific](#)

⁵ ADB (2013) [Public-Private Partnerships – Lessons from ADB's support for PPPs](#)

smaller towns. An innovative approach taken to address this was to decouple creditworthiness and ability to pay by ringfencing users' payments for water, wastewater and waste treatment from the local government's budgets. This reduced the credit risk faced by private financiers and has made PPP viable even in the PRC's smaller cities.

High quality project developers. Identifying the appropriate sectors and projects to prioritise and select for a PPP arrangement requires skill and experience. Competent sponsors, or project developers, are crucial to successful project implementation as they bring the necessary technical, financial and managerial capabilities to bear. This capacity is available for a growing range of projects in the PRC, where many developers have well-established and successful relationships with third-party financiers such as insurance companies. It has also facilitated the development of innovative approaches and 'asset light' strategies, which have supported the adoption of PPP modalities internationally, as Chinese project developers have engaged in programmes outside the PRC.

Tailored sector-specific regulations. Many concessional contracts or regulatory arrangements which appear superficially attractive to the private sector often fail to attract the anticipated interest due to contextual nuances or issues that were not apparent in the first instance. The PRC has built on project experience to develop sector-specific regulations such as higher environmental standards in water and wastewater treatment, which has encouraged the private sector to engage with PPP projects. Networks operate across the water value chain, involving a coalition of partners from local government, project developers and third-party financiers to fund interlocking facilities and services including water remediation, flood control, and pollution prevention projects.

Adherence to contractual obligations. PPPs are typically a form of outsourcing to the private sector, operational responsibility of what is often perceived to be public infrastructure. This presents important political considerations, not just when PPP contracts are awarded, but also for the sustainability of private operations over the entire lifecycle of the project. Adherence to contractual obligations such as tariff levels and payments during the implementation phases have been key to establishing credibility with the private sector participants in projects in the PRC.

Project preparation. One of the principal reasons why PPP projects become delayed or eventually fail is because of inadequate preparation. It is the responsibility of public authorities to adequately prepare the project to a standard (technical, legal and financial) that is sufficient for acceptance by the credit committees of lending institutions. The PRC has significantly developed its preparation capabilities over the course of many projects and has been supported in this process by experienced and competent advisers.

Bankability. Commercial banks face evolving technologies and emerging contractual structures (such as shorter operations and maintenance (O&M) contracts, limited warranties, the absence of turn-key engineering, procurement and construction (EPC) agreements, limited security over assets, and the timing of off-take agreements) that test the tolerance of their credit committees. Collectively these present a challenge to the bankability of projects. The PRC has recognised the benefits of good financial advice to help identify the optimal structure to package contractual agreements and ensure bankability. This approach reflects the recognition that financial markets are segmented, and a range of solutions may need to be considered.

Case Study Approach

Water is a locally managed asset. As such water infrastructure is often perceived differently to other sectors such as electricity, and there may be specific political considerations to account for when involving private finance. For example, local public authorities may be unwilling to allow water assets to be used as collateral or loan security. Also, local tariffs and charges presented to end-users for water and wastewater services may not always reflect full economic cost recovery, making it more challenging to structure PPP arrangements. Identifying effective and workable solutions that facilitate private sector involvement in water infrastructure therefore requires a particularly deep understanding of local context and the political economy. Case studies are therefore a valuable medium for knowledge production, and for the development of flexible, scalable PPP arrangements.

Closing the infrastructure finance gap via the involvement of the private sector in DMCs outside the PRC remains a significant challenge and is an important focus area for ADB's Strategy 2030. Successful water utility operators in the PRC are able to take the experience they have gained from projects in China and applying this knowledge to address opportunities that exist in other DMCs. Moreover, many of these operators have gained experience from running projects outside the region. They are using this knowledge to apply new and innovative practices on projects across brownfield sites in second and third tier cities in the PRC, and increasingly are engaging with potential opportunities in DMCs outside the PRC. The process of socialising best practice and sharing innovation across different regulatory and political structures is often most effective through a case study approach.

The PPP model in China

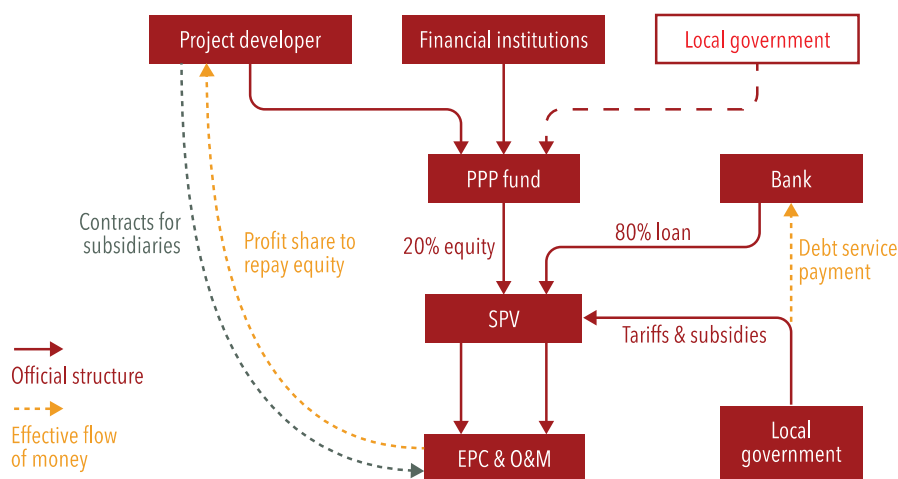
Traditionally, PPP projects in the water and wastewater sector are narrowly characterised by the Build-Operate-Transfer (BOT) model, or variants thereof. However, in the PRC the concept of PPPs is broader, and typically encompasses the long-term alliances between local governments, private developers and third-party financiers to fund water remediation, flood control, and pollution prevention projects. Project sponsors in the PRC are commonly state-owned enterprises and given the historical context of excessive debt build-up, there has been a strong push to develop projects using limited recourse, off balance sheet financing.

An example of PPP innovation in the PRC is a model that features 'preferential' and 'intermediate' limited partners committing equity capital to create a fund together. When approval on a specific project is obtained, financing may be provided solely by the preferential partner – typically a third-party financial institution, such as an insurance company. The intermediate partner – the project sponsor – is still under obligation to provide financing though its commitment to the fund, but this is only exercised if the fund needs additional cash, for example because off-taker payments have been delayed, or there is some contingency issue. To the extent that these risks are well managed, the sponsor may need to lock up very little capital; meanwhile the fund can leverage its equity, typically on an 80:20 basis. This model allows the project developer to compete for and win large concession projects, with the financial benefits

of operating at scale, while only contributing a relatively small amount of investment. Moreover, by issuing limited recourse financing, such as off balance sheet notes backed by cashflows from operational assets, utilities can avoid adding to their indebtedness (and even start to deleverage), improving their creditworthiness and catalysing a virtuous cycle of improved operational and financial performance.

Of course, the challenge of low tariffs discussed previously, does not disappear in this scenario. But as Figure 1 illustrates, tariffs and subsidies are not the sole, or even the primary source of revenue for the project developer. Rather, cash flows are generated from O&M and EPC subcontracts associated with the PPP project and these activities are executed by subsidiary entities of the developer. This allows the sponsor to more quickly recover its equity capital commitment made to the PPP fund, as EPC work is typically conducted upfront, while tariffs and subsidy payments are phased through the life of the project.

Figure 1. The PPP Model in China



Source: Global Water Intelligence

Where this model is sustainable, it is obviously attractive to project developers, and there has been steady growth in the number and size of PPP arrangements structured around these lines. An active participant is Beijing Enterprises Water Group (BEWG) who launched seven bonds with a total face value of RMB 15 billion (US\$2.2 billion) in the space of just one year, including their first Sukuk bond to fund a wastewater treatment plant in Malaysia. The company's construction business has experienced commensurately strong growth.

In summary, the PPP model has been adapted in the PRC, reflecting the importance of local context, as highlighted earlier in the paper. It demonstrates that private finance can be attracted to the water and wastewater sector, and that PPP can stimulate a virtuous cycle of growth and improved creditworthiness for utilities. But as this section demonstrates, the overriding factor of success is having the appropriate enabling conditions. For similar growth to take place in other DMCs, it seems likely that bespoke and local variants of the traditional PPP model will need to mature.

ADB's experience with water PPPs

The scale of water infrastructure investments that have been required in the PRC are without parallel. By 2025, an estimated 1 billion people will be living in its cities⁶, mainly due to migration in recent years that has put intense pressure on existing infrastructure. The responsibility for provision rested with municipality-owned utilities, which have historically faced the familiar problem of chronic financial distress due to weak management, poor budgetary discipline, artificially low water tariffs, and losses to non-revenue water. This unprepossessing background was an important factor in the PRC government's decision to develop the enabling conditions that would encourage private participation in upgrading water infrastructure.

Since making its first PPP investment in the PRC's water sector in 1997, the ADB has contributed to the financing of projects accounting for over US\$2 billion of A-loan (i.e. ADB financed) and B-loan (i.e. commercial co-financed) investment. In 2017 ADB led a US\$200 million loan to China Water Affairs Group (CWA) for an integrated concession comprising water treatment, distribution wastewater treatment, sewage and drainage pipelines in second third-tier cities in the PRC. This followed an earlier loan to CWA in 2011, also for US\$200 million and in partnership with 12 international banks. CWA worked with local regulators to conduct cost-of-living surveys and consulted consumer advocacy groups while developing subsidised tariffs for vulnerable customers. Investments to tackle non-revenue water included plant rehabilitation, capacity building through staff training, leakage reduction initiatives and the installation of meters. Customer service improvements were also rolled out, including hotlines and flexible payment schemes.

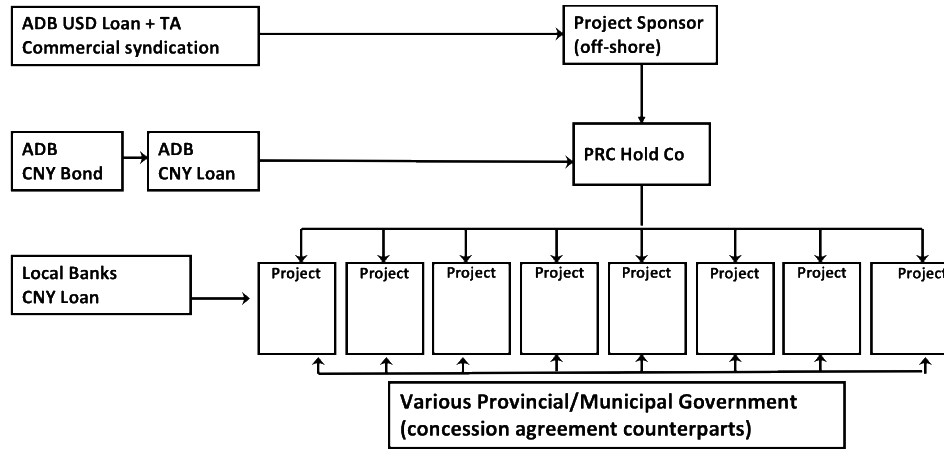
ADB's Private Sector Operations Department (PSOD) in the PRC has progressed beyond financing urban water supply and wastewater treatment projects by working closely with sponsors to develop progressively more sophisticated arrangements including the prevention and rehabilitation of pollution in water bodies. An example of this increasing level of sophistication is the \$250 million loan made in 2016 to China Water Environment Group (CWE), which included \$100 million of syndicated bank funding in addition to ADB's investment. The project involved integrated wastewater management, with a single concessionaire implementing multiple interlocking environmental facilities and services for lake and river pollution prevention in Central and Western China. These latter services would ordinarily be non-bankable on a standalone basis, but by decoupling revenue streams as described previously, income was generated from both end-user tariffs as well as annuity payments from local government.

Further evidence of innovation in private partnership arrangements for financing water infrastructure in the PRC comes from PSOD's Integrated Water Management Project, a key activity for the 2019-20 period. The programme is a comprehensive lake and river pollution prevention and rehabilitation initiative that involves multiple environmental interlocking facilities (wastewater and sludge treatment plants, sewage collection systems) and services (riverbank reinforcement, wetland development). By integrating infrastructure systems, the total project cost will be reduced, driven by improvements in operational efficiency. Importantly this programme will deliver investment in

⁶ Woetzel, J. et al (2009) [Preparing for China's urban billion](#). MGI

environmental services projects that, of themselves would have been unlikely to attract private financing.

Figure 2. PRC Integrated Wastewater Management Project – Non-sovereign PSOD



Source: PSOD, ADB

The key innovation of this programme is that it is the first ADB private sector intervention to support an emerging public-private partnership model for integrated wastewater management. The total loan value is to be US\$450 million, comprising US\$150 million from ADB’s participation (A-loan) to catalyse US\$300 million of commercial co-finance (B-loan). In addition, a small amount (US\$215k) of technical assistance was provided to CWE to (i) enhance wastewater treatment and sludge management and (ii) improve energy efficiency in wastewater treatment process. The A-loan was approved in 2016 and committed, along with the technical assistance, in 2017. The B-loan is to be committed in 2020.

This programme is significant for several reasons. First, the US\$450 million investment represents a substantial increase in the quantum of ADB-led non sovereign financing on water infrastructure in the PRC. Second, the size of the proposed B-loan, at three times the value of the A-loan, indicates the scope for catalysing private sector participation in well prepared, bankable projects, and is consistent with the objectives of ADB’s Strategy 2030. Third, the complexity of the programme - involving multiple environmental interlocking facilities and services, is indicative of the scope for engaging private sector finance across a range of projects.

Ultimately, programmes such as these provide tangible evidence of the significant potential for private sector financing of water infrastructure within DMCs. However, it is equally clear that for these investments to occur, the environment needs to be suitably enabling, and that projects are appropriately structured. The consistent requirement is for progressive, forward-looking public authorities; skilled and competent project sponsors; and advisors with the technical, financial, legal and managerial skills to put help together structured arrangements that are optimized for complex and segmented capital markets. The ADB has played an integral part in the development of the PPP market in the PRC, and this Roundtable offers an opportunity to socialise learnings from its experience, with a view to replication and scale-up across other DMCs.