

# InfraRead

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THE ASIAN INFRASTRUCTURE INVESTMENT BANK:

## What next?

BY ANNA HERMELIN AND DANIEL JARRETT

Latin America opportunities and challenges:  
Trends in Colombia, Mexico and Peru

BY VINCENT CASEY AND MANUEL ZAPATA

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The Fourth Railway Package: All change?

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BY MICHAEL HARRISON, RICHARD GUIT AND NICK STALBOW

Mark Elsey writes: There is no such thing as a free bridge...

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# An overview of this issue

I am delighted to introduce this ninth issue of **InfraRead**, our biannual publication covering a range of legal and transactional issues relevant to the global transport and infrastructure space.



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### **Latin America opportunities and challenges: Trends in Colombia, Mexico and Peru** p9

Latin America has a serious infrastructure deficit which, it has been estimated, would cost some US\$300 billion per year to remedy. This has triggered an infrastructure boom in the region which is reliant on private investment. **Vincent Casey** and **Manuel Zapata** provide further details.

### **The changing face of Middle Eastern social infrastructure projects: The post-oil-boom economy** p14

Over the past two years, there has been an unprecedented slump in the price of oil. Particularly for those countries in the Middle East whose main source of revenue has come from oil sales, this slump has required a complete reappraisal of their public spending strategies. **Yvonne Cross** and **Sophie Kapoor** explore the impact which this decline in oil price has had on the region’s social infrastructure investment plans, including a look at the new financing models and sources of funding which these countries are now needing to adopt.

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THE ASIAN INFRASTRUCTURE INVESTMENT BANK:

# What next?

by Anna Hermelin and Daniel Jarrett



**T**he Asian Infrastructure Investment Bank (AIIB) was established on 24 October 2014, pursuant to the “Memorandum of Understanding of Establishing AIIB”, signed by 22 prospective founding members. By April 2015, the number of prospective founding members had increased to 57 and by December 2015 its Articles of Agreement (Articles) had come into force.

At the time of its foundation, few details were known about the intended focus and policies of the AIIB and there was much speculation, particularly as to its governance structure, its level of co-operation with other funding institutions in the region and its approach to environmental concerns. Two years on from its official launch, we consider the policies that have been adopted to date and AIIB’s likely focus in the future.

## **Purpose**

As set out in its Articles, the purpose of the AIIB is to “(i) foster sustainable economic development, create wealth and

*improve infrastructure connectivity in Asia by investing in infrastructure and other productive sectors; and (ii) promote regional cooperation and partnership in addressing development challenges by working in close collaboration with other multilateral and bilateral development institutions”.*

The AIIB’s mandate is therefore to focus on infrastructure financing rather than on poverty reduction, which differentiates it from other multilaterals such as the Asian Development Bank (ADB) and the International Finance Corporation (IFC). AIIB’s standpoint is that poverty reduction is a natural consequence of infrastructure development and will therefore still be a

key benefit of its operations. AIIB has also emphasised that it intends to combine the best features of private companies with those of multilateral development banks, and that one of its core functions will be to encourage private investment in projects which contribute to economic development in the region, as well as to provide financing where private investment is not available. The Articles permit the AIIB to fulfil its mandated purpose and function in financing specific projects or investment programmes, by making equity investments and by providing technical assistance, which is in line with other multilateral development banks.

## AIIB timeline: selected highlights

- **December 2015:** Articles of Agreement enter into force, with an authorised capital of US\$100 billion.
- **January 2016:** AIIB declared open for business; Mr Jin Liqun elected as first President.
- **June 2016:** First Annual Meeting held in Beijing. On the eve of the meeting, AIIB's board approves a total of US\$509 million in loans for the first four confirmed projects.
- **September 2016:** Two further projects announced, as AIIB's board approves loans to finance energy projects in Pakistan and Myanmar.
- **October 2016:** First meeting of the AIIB's International Advisory Panel. The Panel comprises international leaders and experts who provide independent advice to the AIIB.
- **December 2016:** Three additional projects announced, as AIIB's board approves loans to finance infrastructure projects in Oman and a natural gas pipeline project running from Azerbaijan to Turkey.

## Governance

The AIIB's governance structure is three-tiered, with a board of governors, a board of directors and an executive management function.

Each member country is represented on the **Board of Governors**, which is required to meet on at least an annual basis, with the voting power of each member proportionate to its subscription amount. This means that China has the greatest voting power, at over 28 per cent, with India (over 8 per cent) and Russia (over 6 per cent) next in line, and a group of countries including the UK, Germany, Korea, Indonesia and Australia each with voting power of between 3 to 4 per cent each. The USA and Japan have not joined the ranks of members and therefore have no influence on its decision-making. While the Board of Governors is generally entitled to delegate its powers to the Board of Directors, it retains control of, among other matters, the admission of new members, any increase in the authorised capital of the AIIB, any amendments to the Articles and the election of the President.

The **Board of Directors** is composed of representatives of 12 members, 9 of whom are elected by the Board of Governors from Asia-based members and 3 of whom are elected by the Board of Governors from non-Asia-based members. The current Board of Directors consists of representatives from Australia, China, Egypt, Germany, India, Indonesia, Korea, Russia, Thailand, Turkey, Saudi Arabia and the UK. The Board of Directors is responsible for the direction of the general operations of the AIIB and is

therefore mandated to establish the policies of the AIIB, to supervise the management and operation of the AIIB and to approve the strategy, annual plan and budget of the AIIB.

The **executive management function** of the AIIB is led by its President, Mr Jin Liqun, who was elected in January 2016 for an initial period of five years. Mr Jin Liqun's previous roles have included serving as Chairman of China International Capital Corporation Limited, as Vice-President of the ADB in charge of programmes for South, Central and West Asia and private sector operations, and as Alternative Executive Director for China at the World Bank. He therefore brings with him valuable experience of the operations of other multilateral development banks.

In the initial months following its foundation a number of concerns were raised about the ability of the AIIB to remain independent of its largest contributing member, China. Subsequent appointees of Vice-Presidents may have helped to address this concern, with appointees being drawn from former members of the UK Government (Sir Danny Alexander, the former Chief Secretary to the UK Treasury), and the Indian and Indonesian Governments, in addition to ADB and the World Bank. The international credentials of the AIIB have been further boosted by the establishment of an International Advisory Panel, with members drawn from Africa, Hong Kong, Japan, Korea, Malaysia, Pakistan, Sweden, the US and the UK, whose role is to assist the President and executive management on strategy, policy and operational matters.

The AIIB promotes itself as “lean, clean and green: lean, with a small efficient management team and highly skilled staff; clean, an ethical organization with zero tolerance for corruption and green, an institution built on respect for the environment”. We will discuss the environmental limb of its modus operandi below. Recently, it announced a lean management team, and the number of staff is still limited as it focuses on the recruitment of strategic staff. However, with reports of a large purpose-built headquarters planned to accommodate up to 6,000 staff it is not clear how long it will maintain its “lean” operations. Its focus on remaining “clean” has included early adoption of governance policies, rules and procedures, and later in 2017 it has plans to put in place a mechanism for the independent investigation of complaints relating to non-compliance with policies, and institutional arrangements to give effect to its policy on prohibited practices. These actions, together with the recruitment of an experienced executive management team and further collaboration with other multilateral development banks, will help to allay any concerns about whether governance standards will suffer in the push to meet its strategic goals quickly.

## Competition or collaboration?

One question which was being asked two years ago was whether the AIIB would act in collaboration, co-existence or competition with other multilaterals, export credit agencies, commercial banks and other infrastructure investors.

The hallmark of the first two years has been collaboration. The Articles refer to infrastructure development in Asia being met more adequately “by a partnership among existing multilateral development banks” and, as noted above, to the AIIB “working in close collaboration with other multilateral and bilateral development institutions”. In the past year alone, we have seen a co-financing framework agreement signed with the World Bank (April 2016); a Memorandum of Understanding signed with the ADB to “strengthen cooperation for sustainable growth” (May 2016); an agreement to co-operate with the European Bank for Reconstruction and Development (EBRD) (May 2016); and the signing of a





co-operation framework agreement with the European Investment Bank in order to jointly finance projects (May 2016). At its first Annual Meeting, the AIIB stated its intention of further strengthening its collaboration with other multilateral development banks, which will include setting quantitative objectives with the World Bank, ADB and other institutions for high-quality infrastructure investment, and its recently published summary of its 2017 Business Plan and Budget again highlights its intended partnership with multilateral development banks, governments, private financiers and other stakeholders.

This focus on collaboration will help AIIB to build up its experience and portfolio of projects more quickly and efficiently (as evidenced by the high number of its initial projects being approached as co-financings) and also to establish credibility and reduce concerns over the standards and practices to be applied on AIIB-funded projects.

### Living up to its “green” promise

As noted above, AIIB is promoting itself as a “green” institution. A key question raised at the time of AIIB’s foundation was the extent to which AIIB would adopt robust environmental standards and social safeguards, equivalent to those adopted by other multilateral development banks. To answer this question, AIIB moved quickly to adopt its “Environmental and Social Framework” in February 2016 following a consultation process. This framework aims to address the environmental and social risks and impacts of the projects financed, either wholly or partially, by AIIB. The framework consists of a “vision” (setting out the objectives and aspirations of AIIB); an environmental and social policy (setting out mandatory environmental and social requirements for each project financed by AIIB); three supporting environmental social standards (covering environmental and social assessment and management,

involuntary resettlement and indigenous peoples); and an environmental and social exclusion list of those activities that AIIB will not knowingly finance. The policies and standards set out in the framework are broadly similar in nature to those of other multilateral development banks, which will have given comfort to those who feared that less robust standards might be adopted. The key issue now for AIIB will be to show that it is rigorous in applying these standards to its projects, including those where it is not co-financing with other multilateral development banks and is therefore not able to rely on the existing tried and tested policies and practices of its co-financiers.

At a time when funding sources for coal projects are generally dwindling, many Asian governments and developers active in the region have also been keen to understand what AIIB’s policy is and will be towards the financing of fossil fuel power projects. In October 2016, AIIB launched

## The nine AIIB projects approved in 2016

1. Co-financing with the World Bank of the Indonesia's National Slum Upgrading Project, an urban infrastructure project, with AIIB contributing a US\$216.5 million loan.
2. Co-financing with EBRD of a US\$105.9 million project to rehabilitate a 5 km section of the Central Asia Regional Economic Cooperation Corridor 3 connecting Dushanbe in Tajikistan to the border with Uzbekistan. EBRD will be the lead financier and the project will use EBRD's Environmental and Social Policy.
3. Co-financing with ADB and the UK Department for International Development of a US\$273 million project to construct 64 km of a four-lane section of the motorway linking Shorkot to Khanewal in the Punjab province of Pakistan. The project will use ADB's Safeguard Policy Statement.
4. A US\$165 million loan to support an electricity distribution system upgrade and expansion project in Bangladesh.
5. Co-financing with the World Bank of a power house at the fifth tunnel of the Tarbela Dam in Pakistan. The World Bank will be the lead financier and the project will use its environmental and social safeguard policies. The AIIB intends to contribute a US\$300 million loan.
6. Co-financing with IFC, ADB and commercial lenders of the Myingyan 225 MW Combined Cycle Gas Turbine Power Plant Project in Myanmar, with the AIIB intending to contribute a US\$20 million loan.
7. Co-financing with the World Bank of a dam operational improvement and safety project in Indonesia. The World Bank will be the lead financier and the project will use its environmental and safeguard policies. The AIIB intends to contribute a US\$125 million loan.
8. A US\$265 million loan in support of the Duqm Port Commercial Terminal and Operational Zone Development Project in Oman.
9. Co-financing with the World Bank and others of the Trans Anatolian Natural Gas Pipeline Project in Azerbaijan. The World Bank will be the lead financier and the project will use its environmental and safeguard policies. The AIIB intends to contribute a loan of US\$600 million.

the first round of public consultation on its "AIIB Energy Strategy: Sustainable Energy for Asia – Issues Note for discussion" and in January 2017 it published its "AIIB Energy Sector Strategy: Sustainable Energy for Asia – Discussion Draft for Consultation" as part of the second round of consultation (the Consultation Draft). The final approved Energy Strategy is intended to be formally adopted by mid-2017.

The Consultation Draft provides that the Energy Strategy will embrace and be informed by the principles underpinning: (1) the Sustainable Energy for All (SE4ALL) initiative led by the United Nations Secretary-General to ensure universal access to modern energy services, double the share of renewable energy in the global energy mix, and double the global rate of improvement in energy efficiency; (2) the 2030 Agenda for Sustainable Development's set of 17 aspirational "Sustainable Development Goals" including one calling for access to affordable, reliable, sustainable and modern energy for all by 2030; and (3) the agreement reached during the UNFCCC Conference of the Parties

(COP 21) to limit the world's rise in average temperature to "well below 2 degrees Celsius above preindustrial levels and pursue efforts to limit the temperature increase to 1.5 degrees Celsius".

Under the Consultation Draft, AIIB makes clear that it will support development of renewable energy including wind, solar photovoltaic, geothermal and hydropower in order to reduce fossil fuel consumption. In terms of its approach to fossil fuel power generation, AIIB states that it only intends to support coal-fired plants which replace less efficient capacity or are essential to the reliability of the system or if no viable or affordable alternative exists, particularly in low income countries. It seems that AIIB will not, therefore, adopt a blanket prohibition on the funding of coal-fired power projects. It will instead adopt an approach similar to that agreed by OECD member nations which are party to the Arrangement on Officially Supported Export Credits (the Arrangement), whereby export credit agencies from OECD member nations that are party to the Arrangement are limited in their ability to offer finance

to support their country's exporters investing in, or supplying parts for, certain less efficient coal-fired power plants, but with exceptions in certain cases for projects utilising "clean coal" technology or located in emerging markets where less carbon-intensive alternatives may not be viable.<sup>1</sup>

Interestingly, AIIB makes clear in the Consultation Draft that nuclear plants will not be considered by AIIB at this stage, although it could consider engagement "should demand arise for very special case of support in safety enhancement/upgrading". This policy is explained on the grounds of a lack of capacity within AIIB at this early stage to finance such complex and capital-intensive projects.

## Projects that may benefit from AIIB funding

A Brookings Institution study from July 2015 suggested that AIIB could be lending US\$20 billion annually by 2020 (putting it on a par, Brookings suggests, with lending by the World Bank's International Bank for Reconstruction and Development).<sup>2</sup> Naturally, it has had a more modest start, with nine projects approved totalling US\$1.73 billion of lending in 2016. These approved projects are predominantly in the transport and energy sectors and are generally being undertaken on a co-financing basis with other multilateral development banks, indicating that AIIB is keen to build its capacity and expertise by learning from the practices of existing funding institutions.

In a recent interview with Bloomberg, AIIB President, Jin Liqun, indicated that the AIIB will be focusing on achieving a better balance across countries, regions and sectors in 2017, although the specific details of what this might mean are not clear. AIIB's 2017 Business Plan and Budget, published in December 2016, promotes three thematic priorities for its investments in 2017, including the promotion of "green infrastructure" to support countries to meet their environmental goals, the promotion of cross-border infrastructure including roads,

1 See our more detailed note on this at <https://www.ashurst.com/en/news-and-insights/legal-updates/oecc-restricts-ecas-on-coal-ipp/>.

2 "China's rise as a regional and global power: The AIIB and the 'one belt, one road'", David Dollar, July 15 2015; <https://www.brookings.edu/research/chinas-rise-as-a-regional-and-global-power-the-aiib-and-the-one-belt-one-road/>.

rail, ports, energy pipelines and telecoms across Central Asia and the maritime routes in Southeast Asia, South Asia, the Middle East “and beyond” (there have been references in some reports to financing extending to projects in Africa) and, finally, the development of “innovative solutions that catalyse private capital”. These thematic priorities indicate that, in addition to investing in projects to support its green credentials, AIIB appears to be supporting those initiatives that promote China’s “one belt one road” initiative, as many predicted at its foundation.



## Conclusion

At its foundation, there was a perception that China would dominate the AIIB. While it is true that China holds the highest proportion of voting rights, AIIB’s founding membership base was diverse, with several countries unexpectedly breaking with US foreign policy to join, and its Board of Directors and executive management team include representatives from across the globe. A further 30 countries have applied to join the AIIB, perhaps a sign that its efforts to establish its credibility and to put in place robust policies and standards have been well received internationally. At the time of writing this article, Donald Trump’s inauguration as the 45th President of the USA had just taken place. The members

and executive team of AIIB are no doubt waiting with interest to see whether the US’s position on membership of AIIB will change and whether Japan might also consider joining in the future. While China is, and will continue to be, a very large and important presence in the AIIB, the amount of continuing interest in obtaining membership should, over time, lead to a diversity of views, influence and projects.

When the G20 Leaders established the “Global Infrastructure Hub” in Sydney in November 2014, the three-year mandate was to address an expected global infrastructure deficit estimated to be up to US\$20 trillion by 2030. It is all too clear that, just over three years later, this gap in infrastructure spending still remains and, with just US\$1.73 billion committed so far, it is not clear how quickly the AIIB might be able to make a material difference in terms of closing this infrastructure gap. As much as this funding gap urgently needs to be addressed, and as important as the funding of otherwise unbankable projects by multilateral development banks such as the AIIB might be, a key driver to delivering better infrastructure for the Asia region and to closing this infrastructure gap will be for multilateral development banks and other stakeholders to work with national governments to develop a pipeline of well-structured, bankable projects. ADB has been devoting ever greater resources to assisting governments with this, and in engaging the private sector in a wider range of projects, and it is to be hoped that the AIIB’s focus on private capital mobilisation, in partnership with other stakeholders, will provide even greater impetus to these initiatives.

The AIIB has made a promising start since its foundation, moving quickly to establish a credible executive management team and set of governance policies and operational standards, thereby helping to allay many of the initial concerns raised at its foundation. It has taken a sensible approach to the approval of its initial base of projects, with most being undertaken on a co-financing basis, allowing it to increase its capacity to undertake complex projects quickly and to apply international environmental and social practices to its projects. This co-financing strategy should also help to position it as a collaborator and partner with existing funding institutions, rather than a competitor. Moving further into 2017, governments in Asia will be hoping to see a continued steady stream of projects approved. Given its thematic focus on “green infrastructure”, many stakeholders will also be awaiting with interest the final, approved Energy Strategy, to see if it retains its current approach to fossil fuel power generation. However, perhaps the biggest question of the year for the AIIB will be whether Donald Trump’s presidency will change the US’s position on the AIIB. Stakeholders in the region continue to watch with interest.



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LATIN AMERICA OPPORTUNITIES AND CHALLENGES:

# Trends in Colombia, Mexico and Peru

by Vincent Casey and Manuel Zapata



Latin America continues to lag in terms of the infrastructure required to improve quality of life in the region. Estimates indicate that Latin America needs to invest approximately 5 per cent of its annual GDP for an extended period in order to close this infrastructure gap. If this estimate is correct, the investment needed in the region equates to approximately US\$300 billion per year.

Studies suggest a direct relationship between infrastructure spend and a country's ability to generate economic growth. For instance, in 2015, Standard & Poor's estimated that infrastructure spending of 1 per cent of the country's GDP would increase the size of the economy by 2 per cent in Brazil, 1.8 per cent in Argentina, and 1.3 per cent in Mexico.

Major infrastructure projects are now an essential component of most Latin American countries' national development plans. This has triggered an infrastructure boom in the region which is reliant on private investment to enable these plans to come to fruition.

However, as has been reported in the international press, the region is facing a number of challenges such as corruption and the resulting governmental instability, which inevitably affects the appetite of

investors and lenders. For instance, the recent Odebrecht scandal, involving a number of high-profile politicians, including an ex-president of Peru, revealed payments of some US\$788 million in bribes to win construction contracts in various countries, and has led to the paralysis of a number of large infrastructure projects (which are waiting to be re-tendered, sold or taken back by government).

In this context, the feasibility and, ultimately, the success of Latin American major infrastructure projects which are privately financed will depend on the reliability, stability and predictability of the relevant market, as well as achieving a commercially acceptable risk allocation between the parties.

Countries in the region are making considerable efforts to refine their internal regulations and policies in order to create

the necessary conditions to attract private investment in infrastructure development. As noted in more detail below, various new and more "professionalised" regulatory bodies have been established, reforms to the applicable legal frameworks have been enacted, and reductions in the number of barriers to foreign investments have been approved. The success of these changes can be seen in the number of new and international players participating in these markets, and in the increased level of activity in projects in the region.

This article will provide a general overview of current trends in relation to the implementation and financing of public-private partnership ("P3") infrastructure projects in Colombia, Mexico and Peru, three Latin American countries currently attracting a large volume of investment.

## Mexico: *Fideicomisos* and other legal tools

Mexico has a robust track record in P3 projects. Most of the major international players, and in particular Spanish construction companies, have had a presence in the country for more than a decade and have become so familiar with the business environment that they operate as if they were locals. For banks, the story is similar: for instance, BBVA and Santander have operated there since 2000 and 1996 respectively, and are the first and second largest banks in the country.

Track records such as this, coupled with the current opportunities brought about by the National Infrastructure Plan, as well as recent energy reforms (since 2014, certain electricity, oil and gas activities which had previously been the exclusive prerogatives of the state have been liberalised) have positioned Mexico as one of the most dynamic countries in the region for private investment in infrastructure.

Under the National Infrastructure Plan (2014 to 2018) investment of around US\$600 billion is anticipated, more than 50 per cent of which is earmarked for energy-related projects, with urban/residential development and transportation projects following with approximately 20 per cent and 17 per cent respectively of the total expected investment.

Although the plan anticipates that some 63 per cent of the total investment required will be funded by the Government, private investment will be required for the remaining 37 per cent.

The most significant projects include the *Red Compartida* wholesale broadband service project, a new airport for Mexico City, and the extension of the port of Veracruz. Outlined below are some of the key differences in the financing structures being adopted for these projects.

The *Red Compartida* project has recently been awarded to Altan Group, a consortium headed by Morgan Stanley Infrastructure, to provide wholesale broadband services from 2018 in exchange for a licence fee and a proportion of the project's revenues, which will be shared with the Government. This US\$7 billion project will be entirely funded through private investment.

The US\$13 billion Mexico City airport project will be structured in a completely

different way, being financed through a mixture of government funding (approximately US\$4 billion), bank debt and project bonds. A US\$3 billion syndicated loan has already been granted to the governmental agency managing the airport. In addition, US\$2 billion in green bonds (US\$1 billion in 10-year bonds and US\$1 billion in 30-year bonds) has recently been placed. This private financing is backed by the passenger charges generated by some 38 million passengers per year currently using the existing airport, and will be further backed by charges generated at the new airport, which will have a capacity of 50 million passengers by 2020, increasing to 120 million once it is fully operational.

Irrespective of the financial structure used, a common thread runs through all major Mexican infrastructure projects in that all such projects are structured through a *Fideicomiso*, a Latin American equivalent of a trust, which is a mechanism used to create protections and rights for financing parties to a project (similar to a first priority security interest available in the United States) since the project cash flows are isolated from other parties' risks.

Mexico was the first Latin American country, back in 1924, to include the *Fideicomiso* in its legal regime and, since then, this instrument has been widely used for a variety of transactions, and has been a key component when structuring infrastructure projects in order, among other things, to make them financeable. Currently, *Fideicomisos* (and similar structures such as the Colombian *patrimonio autónomo*) are used to structure infrastructure projects across various Latin American countries.

Under a typical Mexican *Fideicomiso* on an infrastructure project, the concessionaires set up the relevant project trust by irrevocably contributing to it all the equity and loan investments to be made, as well as the receivables to be generated by the project (including, for instance, toll revenues, receivables under operation and maintenance contracts and credit rights under the concession agreement including any contingent payment such as termination fees, etc.). In fact, it is not uncommon to see *Fideicomisos* themselves (rather than the concessionaires) acting as the borrowers under project finance agreements, as a way of ring-fencing the project.



All the assets and proceeds contributed to the *Fideicomiso* are managed exclusively by a trustee appointed by the concessionaire, which must be a Mexican bank or financial institution. The trustee is usually the only entity authorised to manage bank accounts where funds invested into and received from the project are credited.

In doing so, the trustee must follow the instructions given to it in accordance with the trust agreement, which sets out the waterfall of the various payments to be made from the project proceeds, including:

- i. VAT and other tax payments;
- ii. payments under the operation and maintenance agreements;
- iii. payment of the project costs (including costs relating to bonds issuance, insurance, trustee fees, advisers' fees, etc.);





and their repayment is not guaranteed. Although CKDs are flexible instruments which can be used to invest in both greenfield and brownfield projects, they are not as widely used as had been anticipated, in part due to the regulatory burdens they impose.

FIBRA-E is a type of investment vehicle similar to the master limited partnership structure used in other countries, which provides tax benefits such as the deferral of income tax up to a specified limit and the elimination of the Mexican dividend tax on distributions from FIBRA-E vehicles. Unlike CKDs, FIBRA-Es can only be used for brownfield investments.

### Peru: The Peruvian model of retribution certificates

Although new greenfield projects could slow down in the short term as a result of the recent Odebrecht bribery scandal, it is expected that Peru will continue to seek to reduce its infrastructure gap by investing around US\$87 billion over the period 2012 to 2021.

Some of the most important recent projects to have closed include the US\$5+ billion Metro de Lima Line 2, the US\$1.6 billion concession for the public services provision of three blocks of broadband nationwide, the US\$600 million Molloco hydroelectric power station and several other projects relating to, for example, highways, telecommunications and transmission lines.

Peru is considered one of the most attractive countries in which to invest in infrastructure, as it has a track record going back more than ten years of successful infrastructure projects carried out in accordance with the Peruvian “milestone-based” scheme, an innovative model which has proved very popular with international investors.

Under this payment model, the construction phase of a project is divided into a number of stages. On confirmation by the supervising authority that the relevant works for a given stage have been duly completed, a construction progress certificate acknowledging the achievement of the relevant milestone is issued in favor of the concession company.

Although these construction progress certificates are not tradable financial instruments, they give the concessionaire

the right to deferred consideration for an amount corresponding to the progress stage. The right to receive this consideration is, in turn, documented in government-issued retribution certificates.

Retribution certificates are long-term debt instruments which incorporate an unconditional, irrevocable and transferable payment obligation on the granting authority, regardless of the performance of the concessionaire in relation to its outstanding obligations under the contract.

Unlike the similar predecessor instruments which had been in use until 2010, the Peruvian central government usually has no direct payment obligation: instead the obligation remains at the national or sub-national level of the granting authority and is backed by the Peruvian central governments, which has an obligation to honor the payment if the granting authority fails to do so.

The face value of a retribution certificate is normally paid by means of a fixed schedule of periodic instalments made during the life of the instrument (which is normally 15 years).

The main characteristics of retribution certificates, which have resulted in their becoming among the most attractive tools in the region for private investment, are as follows:

- they incorporate a right for the holder to collect the relevant amounts as they fall due;
- this right is not affected by any breach or underperformance by the concessionaire, nor in any other circumstances;
- the issuer has no rights of set-off, withholding or similar;
- tax gross-up provisions are usually included;
- if a payment is not made on time, the holder can accelerate the debt;
- they rank *pari passu* to other similar debts of the public sector entity; and
- they are all freely transferable.

One key reason for the success of this payment model is the removal – or, at least, the material mitigation – of some of the main risks typically encountered in project finance. For instance, the construction and performance risks sometimes borne by concessionaires (and, indirectly, by their lenders) in milestone-based projects

- iv. payment of debt (under the project finance agreements, to bond holders, etc.);
- v. allocation of funds to any reserve account required by the lenders or by the contracting authority; and
- vi. distributions of excess cash to the concessionaire.

In addition to the *Fideicomiso*, other legal instruments are available in Mexico for investments in infrastructure such as the *Certificados de Capital de Desarrollo* (known as CKDs) and Energy and Infrastructure Investment Trusts (FIBRA-E).

CKDs were introduced into Mexican law in 2009, and are listed securities issued by trusts. They are similar to equity investments in that the return is variable (it is linked to the performance of the project), no interest accrues on the principal amount



are removed since, once a milestone has been reached, the right to be paid for that portion of the work cannot be taken away, irrespective of the concessionaire's performance in relation to the remainder of the project (this reduces risk to a level similar to the issuing nation's sovereign risk).

In addition, retribution certificates are usually denominated in US dollars, so currency risk is assumed by the Peruvian state rather than transferred to the concessionaire or its lenders.

Formerly, another appealing feature of retribution certificates had been the fact that their payment obligations were usually subject to New York law (and the New York courts). However, this has now changed and retribution certificates linked to recent projects have tended to be subject to Peruvian law, and disputes in relation to payments must be heard by the Peruvian courts.

The typical financing structure for Peruvian projects entails the incorporation by the concessionaire of a wholly owned vehicle which acquires the retribution certificates. This vehicle issues bonds which are secured by the payments to be made under the retribution certificates, and the proceeds from the placement of the bonds are used by the vehicle to pay the concessionaire the consideration for the acquisition of the retribution certificates

from the concessionaire. This consideration is, in turn, used by the concessionaire for the development of the project, including payment owed in relation to the construction of the project for which the retribution certificates were generated. The proceeds received by the issuer from the Peruvian granting authority under the retribution certificates are, in turn, used to pay the debt under the bonds.

Some examples of projects in which this model has been used include Carretera IIRSA Norte, Carretera IIRSA Sur, the Huascacocha-Rimac water supply system, the Taboada wastewater plant, Red Dorsal Nacional de Fibra Óptica and Metro Línea 2.

Given the success of the Peruvian model, other countries in the region have imported it into their own project finance models. For example, in some Paraguayan infrastructure projects a similar model has been adopted, although with some different features such as sometimes treating the debt resulting from retribution certificates as sovereign debt.

### Colombia: The 4G toll road projects

In Colombia, the fourth generation (4G) toll road projects are regarded as a national strategic priority.

These projects, which are being procured by Colombia's National Infrastructure Agency (ANI), form an

ambitious plan to develop more than 6,000 kilometres of toll roads with an aggregate investment value of around US\$18 billion. To give an idea of the size of these projects, the expected total investment under the 4G program is approximately 1.4 times the aggregate amount invested in transportation in Colombia over the last 15 years.

At the time of writing, there have been three rounds of bidding processes under the 4G roads program for more than 20 projects, as well as a number of unsolicited projects launched through private sector initiatives.

4G roads projects generally require two levels of financial closing: (i) the formal financial close, by evidencing to ANI the existence of funding commitment letters; and (ii) the definitive closing entailing the actual drawdown of the funds. Some investment projects in Colombia can take 12-18 months to reach financial close after having been awarded.

As at December 2016, only seven 4G projects had reached the definitive closing stage: more than 20 definitive closings are pending, 11 of which are under analysis. It is expected that most of these will take place during 2017.

Each concession agreement regulating a 4G project separates the project into different functional units each representing a portion of the whole project, such as a specific section of the roadway, a tunnel or a bridge. Remuneration in favor of the concessionaire begins to accrue as the functional units are completed.

Delays relating to the completion of a functional unit generally result in penalties (which accrue on a daily basis), and prolonged delays can trigger the termination of the concession agreement. To mitigate the adverse effects that such a termination would cause to the parties financing the project, concession contracts permit the lenders to take over the entire project and to appoint a new concessionaire (who must meet certain financial and technical requirements) should there be a termination event attributable to the concessionaire, or upon an event of default of the concessionaire under the financing agreements.

In terms of revenues, the general rule is that, upon completion of a functional unit,



that functional unit will generate revenue for the concessionaire via the following:

- a) availability payments paid by the Colombian Government;
- b) toll payments; and
- c) revenues from the operation of commercial areas adjacent to the road (such as gas stations).

The total revenues generated by a project are therefore the aggregated revenues generated by each of its functional units.

It is estimated that availability payments made by the Government as per (a) above may range from 40 per cent to 70 per cent of the total revenues of the project, with the remaining revenues coming from toll payments and the operation of commercial areas.

As regards the collection of toll revenues, the Colombian Government has undertaken to make payments to cover any shortfalls in toll revenues below predicted levels. Depending on the concession, these payments are made on a catch-up basis once every number of years for the duration of the concession: e.g. in years 8, 13, 18 and 25, as was the case on the Pacifico Tres Highway.

The concessionaire's revenues are normally calculated and paid on a monthly basis, and can be subject to deductions of up to 10 per cent if the service levels for operation and maintenance are not achieved.

One of the major challenges of the 4G program has been to obtain equity and debt financing for the approximately US\$18 billion required to enable all these projects to go ahead. Each project is being financed through a combination of approximately 30 per cent equity and 70 per cent debt.

For bank debt financings in Colombia, the requirements of the financing parties can be more demanding than those required under the concession agreements.

For instance, in order to mitigate construction risk relating to the project as a whole, banks normally require all major permits and rights of way for the entire project to have been obtained prior to funding. The concession agreements tend to impose less stringent requirements before starting the construction phase, such as holding at least those permits required for the first functional unit or to have acquired at least 40 per cent (rather than 100 per cent) of the required land pursuant to a specified right-of-way acquisition plan. Financing parties may also require high debt service reserves which can prove prohibitively expensive.

To mitigate the challenge of obtaining financing, various initiatives have been introduced. For example, Colombia has established its own development bank, the National Development Financing Agency (FDN), a public-private entity, with the goal of bolstering infrastructure development. FDN has been involved as a lender on almost all of the 4G projects which have currently reached financial close.

Also, if requested by the concessionaire, a portion (which must be between 25 per cent and 50 per cent) of the government payments may be denominated in US dollars. Revenues generated from tolls and from the operation of commercial areas will, however, always be denominated entirely in Colombian pesos.

In addition, different sources of financing have been explored on account of the very significant financial requirements of these projects. For instance, the US\$844 million Pacifico Uno Project awarded to Covipacifico (a consortium of Episol and Iridium)

was partially financed through a facility granted by local and international banks including Crédit Agricole, Mizuho, CaixaBank and Sumitomo Mitsui Banking Corporation. In addition, the Pacifico Tres Highway was partially financed through a US\$260 million bond issue underwritten by Goldman Sachs (along with two loans made in local currency). To mitigate exchange rate concerns, Goldman Sachs and Bancolombia worked with ANI to structure the availability payments so that they would be based on the exchange rate applying at the end of the previous month, thus limiting their exposure to currency fluctuations. This arrangement enabled Fitch to grant an investment-grade rating to the project bonds.

Additionally, given that the winning consortium would only receive around 34 per cent of its revenue from availability payments (the rest coming from toll revenue and payments to be made by the Government to compensate for any shortfalls in toll revenue), the lenders worked with FDN to provide a revolving subordinated facility (for an amount up to US\$100 million) to cover any potential liquidity issues caused by low revenues.

Colombia is now expanding the P3 model used for the 4G roads to other types of projects. For instance, the *Ciudad CAN* project, for the construction, operation and maintenance of buildings to be occupied by agencies of the central government, replicates the structure of the 4G contracts.

Along with Colombia, Mexico and Peru, other Latin American countries have been attracting interest from international infrastructure developers and investors. Argentina, for instance, looks like an interesting proposition, given its recent change of regime, the potential of its natural resources, its recently enacted P3 Act and the recent announcement of plans for major infrastructure projects with private investment involvement. Chile continues to be an interesting market, particularly given its long track record of projects, stability and developed capital markets. In Brazil a wave of brownfield deals is expected, partly due to the lack of financing caused by the Petrobras scandal, and Cuba is also attracting interest from international investors who are monitoring how opportunities evolve as a result of the political opening-up currently taking place on the island.

Latin America still faces some challenges such as the uncertainty of the "Trump effect" on inbound foreign investment, exchange rate volatility, social and political issues, and concerns around corruption but, to the extent that investors and governments continue to find mechanisms to mitigate these risks, it is hoped that the region will continue to provide international investors with excellent business and growth opportunities for many years to come.



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THE CHANGING FACE OF MIDDLE EASTERN  
SOCIAL INFRASTRUCTURE PROJECTS:

# The post-oil-boom economy

by Yvonne Cross and Sophie Kapoor



**In this article we consider the impact that the reduction in oil revenues has had on the infrastructure market of regional Middle Eastern economies, including consequential spending adjustments, and how this shift has also made governments reconsider traditional procurement strategies in favour of partnership and private-finance-based approaches.**

We will be concentrating on the Gulf Corporation Council member states (the Kingdom of Bahrain (Bahrain), Kuwait, the Sultanate of Oman (Oman), Qatar, the Kingdom of Saudi Arabia (Saudi Arabia) and the United Arab Emirates (the UAE) (together, the GCC)).

For decades, the GCC countries' economies have relied on oil as the main source of export and fiscal revenues. The spectacular collapse in the global oil price since 2014 has led to a significant deterioration in the fiscal balances of the GCC countries. The direct correlation between oil prices and infrastructure spending in the GCC has therefore had

a resounding impact on the delivery and growth of current and future infrastructure projects. The obvious challenges are evidenced across the region with many infrastructure projects delayed, cancelled or scaled back. The record lows seen in the oil market have resulted in substantial budget deficits for many previously cash-rich regional governments, causing a widespread halt to many non-profit-producing "social" infrastructure schemes.

It is these social infrastructure projects that have tended to be procured by governments based on the socio-economic needs of their people, despite

the often inherent lack of profitability of the projects themselves. These projects require a different level and nature of government support to pure concession projects in profit-generating sectors such as resources and utilities. Budget cuts due to falling oil revenues are now encouraging governments across the GCC to explore new delivery models and alternative sources of funding for such projects. This article will explore in detail both the general impact of the fall in the oil price in the GCC region as well as these alternative delivery strategies, which must surely become the governments' new reality for social infrastructure project delivery.





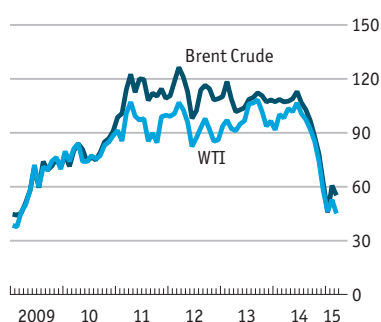
## GCC governments' dependence on oil

The price of oil reached a record high of around US\$140 a barrel in July 2008. Those highs were followed by unsettled times where the price of oil fluctuated somewhat, before finally stabilising at around US\$100 per barrel in the summer of 2014. This US\$100 per barrel price spelled good times for oil-rich countries and consequently saw a surge in public spending.

This reliance on public money for the majority of infrastructure projects in the GCC (both social and economic) has meant that, while governments have had few worries about funding their far-reaching infrastructure agendas, they have also tended to avoid capitalising on the private sector's expertise and project delivery capabilities. Generally speaking, there has been no substantive need, to date, for public-private partnership (PPP) laws to be developed regionally, but now these governments, for the first time, are encountering a new and very real challenge

### Oil prices

\$ per barrel



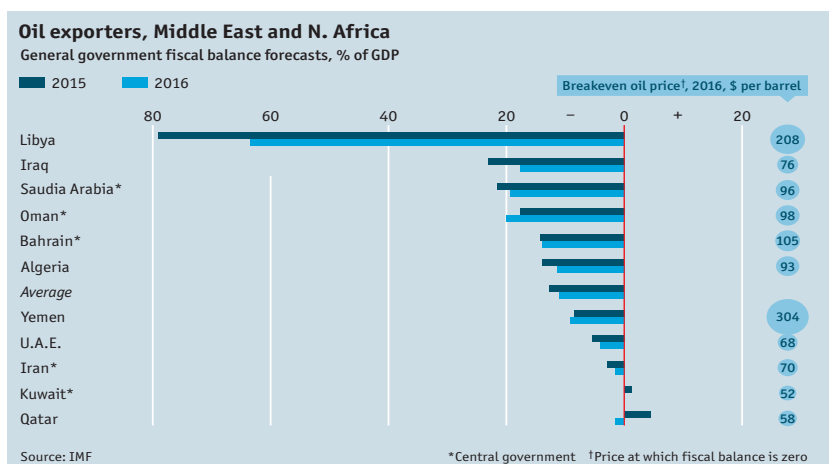
Source: Thomson Reuters  
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to infrastructure project funding. Following the oil price collapse, governments are being forced to re-assess their typical project funding structures and explore new methods of financing and delivery, all the while ensuring that public projects are necessary, affordable and efficient.

The inflated oil prices in the 2000s saw rapidly expanding government budgets and spending. This meant that investment

in infrastructure projects accelerated throughout the region, as can be seen by the impressive modern skylines of Dubai, Doha, Riyadh and Abu Dhabi, to name a few. With such a high price for a much needed commodity, GCC countries, with their well-developed oil and gas industries, were riding high and planning their infrastructure programmes and budgets based on high oil prices continuing unabated. In the last two years, however, there has been an unprecedented slump: average oil prices were below US\$50 a barrel for the whole of 2015 and this continued for most of 2016, despite a relative peak towards the end of the year. In 2015, oil reached record lows of below US\$30 a barrel, which wiped US\$360bn off the GCC countries' revenue in 2015 and led to an overall GCC fiscal deficit of 7.9 per cent of GDP.<sup>1</sup> After an initial "wait and see" strategy, when it was hoped that the fall would turn out to

<sup>1</sup> <https://www.emiratesnbd.com/plugins/ResearchDocsManagement/Documents/Research/Quarterly%20Jul%202015.pdf>



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be a temporary glitch, GCC oil producers have now come to the realisation that the current oil price decline may not be a short-term phenomenon. Despite recent negotiations between the Organisation of the Petroleum Exporting Countries (OPEC) and non-OPEC countries to reduce supply, there is no certainty of compliance, particularly after the International Energy Agency's (IEA) recent report that OPEC members pumped a record high of 34.2 million barrels of oil in November 2016. Therefore, as supply continues to outstrip demand, GCC governments are being forced to take action.<sup>2</sup> The situation has been further exacerbated by a number of factors, including increased production from hydraulic fracking in the US and also with the lifting of UN sanctions in Iran. With daily production of 3.8 million barrels,<sup>3</sup> Iran has nearly reached pre-sanction levels of production, adding to the fears of oil futures trading in backwardation (i.e. where the spot price of oil is higher than its expected future price).

This decline in the oil price has had a significant impact on the GCC's infrastructure projects and the current lack of abatement in production has done little to ease this, particularly when it comes to social infrastructure spending. The slump has required the GCC governments to completely re-assess their public spending strategies as they are forced to plug revenue gaps in their extensive nation-building programmes and welfare networks. Traditionally across

the GCC those areas of the economy which are not directly influenced by oil, such as tourism, travel and infrastructure, have been supported and heavily subsidised by revenues generated by the sale of oil and other resources. Although each of the GCC countries has been impacted in different ways and to differing degrees by the slump in oil price, there is a common theme: a significant fiscal deficit and a corresponding reduction in public spending. This has often been associated with far-reaching overhauls of government institutions. For many GCC countries the fall in oil prices has materially impacted their sovereign wealth, with news reports suggesting that, for example, almost US\$50bn was wiped off Saudi's foreign reserve in a four-month period in 2015.<sup>4</sup> Throughout the GCC, sovereign wealth funds have often been a principal revenue source for the funding of social infrastructure programmes. Typically, when times were good, spending would spiral upwards, without regard to the possibility that such funding could ever dry up. The widespread changes of the last couple of years, including cutting back subsidies and welfare payments, putting big-ticket developments on hold, and even the planned introduction of a value-added tax (VAT), were unthinkable even a handful of years ago. With all this in mind it is becoming clear that, unless the GCC governments can act to increase oil prices to above their respective breakeven points, they must implement change or project delivery will stall indefinitely. Recent action

by OPEC to reduce production levels has had the desired effect of raising oil prices somewhat. However, this cannot disguise the underlying trend that the price remains generally far lower than previously and is likely to remain so for some time. This requires new thinking at a strategic level from the region's governments.

## Breakeven requirements and the effect on infrastructure

While some infrastructure spending is purely discretionary (and, therefore, may be budgeted down when times are hard), some can be very hard to avoid. For many regional governments this issue is greatly exacerbated by the enormous social pressures being generated by demographic change. The populations of the GCC countries are growing rapidly and, as a result, are overwhelmingly youthful, which creates a huge challenge to regional leadership: these young people require healthcare, education and employment and in most cases the regional infrastructure is incapable of delivering this to the required level. That adds up to an urgent need to upgrade schools, hospitals, parks, airports, roads and railways precisely at the time when the fiscal squeeze is making this much harder to do. As a result, some key themes have emerged on the agendas of many of the region's governments: reform of government institutions and legal frameworks; accessing private sector intellectual and financial capital through PPP/partnership programmes and, above all, the diversification of sources of GDP away from an over-reliance on hydrocarbons.

A report by Standard & Poor's Rating Services estimates GCC governments "need" US\$604bn to fund projects through to 2019, including US\$100bn on infrastructure. The actual planned capital expenditure for the region is much lower, at approximately US\$300bn, with only about US\$50bn earmarked for infrastructure.<sup>5</sup>

It is important to consider each GCC country's breakeven requirements in order to assess the impact the low oil price has had on each country's ability to spend on infrastructure projects.

2 <http://gulfbusiness.com/have-low-oil-prices-changed-the-gccs-spending-patterns/>  
3 <http://themarketmogul.com/what-the-future-holds-for-iran/>

4 <http://gulfbusiness.com/saudi-lost-49bn-of-foreign-reserves-in-4-months-due-to-low-oil-prices/>

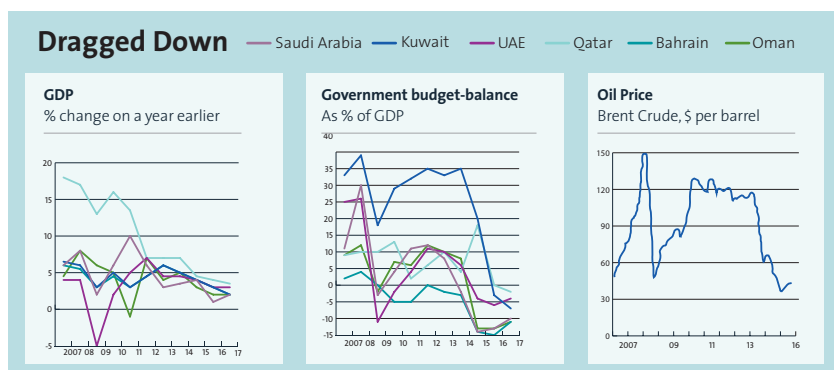
5 <http://www.ogj.com/articles/print/volume-114/issue-2c/general-interest/the-editor-s-perspective/low-oil-prices-push-liberalization-of-gcc-project-finance.html>

Governments have been impacted differently across the GCC and this is reflected in the GCC governments' levels of public spending and, therefore, the number of social infrastructure projects delivered.

Kuwait has the lowest breakeven oil price of all the GCC countries;<sup>6</sup> it is therefore not surprising that, compared with other regions in the Middle East, Kuwait's robust infrastructure projects market expanded in 2016.

Other governments, such as Saudi Arabia, the UAE and Qatar, have drawn down on reserves and taken on additional sovereign debt on the one hand (Saudi Arabia in particular successfully placed a record amount of government bonds in 2016), while also imposing spending cuts on the other. This has meant that progress on infrastructure projects has slowed, and contractors, developers and suppliers are facing delays on new developments and payments for work already completed. On the whole, however, infrastructure projects are still viewed positively in the market with hopes for progress in the near future as governments adapt and respond practically to these changing times. It is worth noting that Dubai has already taken progressive and successful steps to diversify its economy. Oil accounts for only 5 per cent of revenues by virtue of a prolonged, concentrated and successful drive to diversify into tourism and other services industries. Other GCC countries would do well to follow Dubai's example.

Some of the other GCC countries have not been as fortunate as Kuwait and Saudi Arabia and have had no option but to raise debt or cut funding, as they hold relatively low reserves. Oman, for example, posted a larger than expected budget deficit in 2015 at almost 16 per cent of GDP, which widened to 17.2 per cent in 2016.<sup>7</sup> By the end of 2017 Bahrain's debt is expected to reach 65 per cent of GDP and, with Bahrain requiring an oil price of US\$120 to break even, it is more exposed than most GCC countries to low oil and gas revenues.<sup>8</sup> It is



likely to be some time before the situation in Bahrain and Oman improves markedly, particularly as these Governments have suspended, and in some cases cancelled, local infrastructure projects in a bid to rein in public spending.<sup>9</sup>

Such breakeven requirements and their impact on infrastructure spending have been clearly reflected in each GCC country's newly released 2017 budget allocations for infrastructure. Dubai's allocation for infrastructure spending increased by 27 per cent compared to the fiscal year 2016, to reach 17 per cent of total government expenditure this year, while Saudi Arabia has allocated nearly US\$14bn in its 2017 budget to infrastructure and transport. On the other hand, Bahrain's and Oman's 2017 budgets both focus on austerity measures. Bahrain has been forced to scale back 22 municipal projects due to be completed this year and next, as a result of budget cuts.<sup>10</sup> Oman has been handed one of the hardest-hitting budget statements in recent years, reporting a deficit of nearly US\$8bn. However, the budget envisages a major role for the private sector in supporting the nation's infrastructure and economic development.

The breakeven requirements have had a direct and dramatic effect on each government's ability to fund social infrastructure projects. It is therefore vital for governments to assess their financial models to ensure that: (i) they are not hindered by a long-term fiscal deficit; and (ii) the ambitious social infrastructure

projects needed to promote diversified GDP growth are able to progress under a workable financial structure.

### Alternative funding and procurement

Given the breakeven requirements discussed above, it is not surprising that the GCC governments are now exploring alternative funding and procurement options as a priority. In February 2016 Moody's announced that it was downgrading Bahrain and Oman and putting a watch on the four other GCC countries,<sup>11</sup> a signal to all regional governments that they are going to have to consider seriously how they can deliver their vast social infrastructure programmes in the face of this new fiscal reality. To boost income, a number of GCC countries have announced the introduction of VAT in 2018. This is, however, unlikely to sufficiently recompense the GCC governments' coffers in the short term given that there have been such significant drops in oil revenues. Therefore, the money for social infrastructure will need to be found elsewhere.

Export credit agencies (ECAs) are another form of financing that GCC governments are turning to on account of the low oil price. ECA-backed financing structures enable the export and supply of the goods, services and contractors of an ECA's domicile through loan guarantees, or, in some cases, even direct lending, from the agency to an overseas borrower.<sup>12</sup> Previously, the Al Sufouh Tram in Dubai received loan guarantees from ECAs in France

6 <http://gulfnews.com/business/economy/uae-least-vulnerable-among-gcc-countries-to-oil-price-decline-1.1354071>

7 <https://www.fitchratings.com/site/pr/1017155>

8 [http://www.kuwait.nbk.com/InvestmentAndBrokerage/ResearchandReports/\\$Document/MonthlyBriefs/en-gb/MainCopy/\\$UserFiles/EB\\_BahrainMacro\\_2016\\_0412E.pdf](http://www.kuwait.nbk.com/InvestmentAndBrokerage/ResearchandReports/$Document/MonthlyBriefs/en-gb/MainCopy/$UserFiles/EB_BahrainMacro_2016_0412E.pdf)

9 <http://www.tamimi.com/en/magazine/law-update/section-14/december-january-3/gulf-cooperation-council-countries-continue-to-offer-favourable-environments-for-foreign-investment.html>

10 <http://www.constructionweekonline.com/article-42455-bahrain-scales-down-22-projects-due-to-budget-cuts/>

11 <http://www.economist.com/news/middle-east-and-africa/21695539-low-oil-price-manageable-short-term-gulf-states-must-make>

12 <http://gulfbusiness.com/gcc-governments-enlist-export-credit-agencies-fund-mega-projects/>



and Belgium in support of construction contracts won by their domestic companies, while it has also been reported recently that Kuwait National Petroleum Company has selected ten international banks to provide an ECA-backed loan of over US\$5bn, which will be channelled into that country's extensive infrastructure agenda.<sup>13</sup> It is also believed that ECA-backed financing will represent a large part of the approximately US\$7bn that is needed to finance the projects related to World Expo 2020 in Dubai.<sup>14</sup> In particular, Asian and European export credit agencies are increasingly providing funding or finance guarantees to help their contractors secure projects in the GCC region. For example, the US\$2.9bn LNG import and regasification terminal in Kuwait was awarded to a consortium led by South Korea's Hyundai Engineering and Construction, backed by ECA guarantees.

Japanese banks have also recently become more active in project finance, alongside the syndicated loan market, on account of negative interest rates in Japan. This is, to some extent, helping to alleviate funding limitations on infrastructure projects in the GCC. Furthermore, nearly all the GCC sovereign wealth funds have tapped into the international and/or local debt markets during 2016: Saudi Arabia's record US\$17.5bn bond sale in October; Qatar's US\$9bn bond sale in May; Abu Dhabi's US\$5bn bond sale in April; and Oman's US\$3bn bond sale in June, to name a few.<sup>15</sup>

Project restructuring has been the other great "post-oil-boom" trend in the GCC region. One way that GCC governments have been seeking to alleviate fiscal pressure is by revisiting the size and scope of each project (to revise it down to a more manageable size) and looking at different project structures for delivering individual projects. This sort of "value engineering" was a universal feature of the GCC social infrastructure market in 2016. A core of these projects will always be considered vital to the public interest, and governments have had to consider

alternative project models to bring them to fruition in the current economic climate.

PPP, whereby a public project is funded and operated through a partnership of government and one or more private sector entities, usually accessing private sector funding (in a manner decidedly different to government loans and ECA funding and guarantees discussed above), is the prime alternative project delivery candidate for GCC governments to consider in the current climate. The attractiveness to government of this delivery model is that the initial capital expenditure to create the asset is funded by the private sector, thus reducing the fiscal strain on already stretched budgets. In addition, it allows governments to reduce their technical and operational risk exposure by transferring this risk to the private sector, which is generally considered better at delivering major infrastructure on time and on budget.

Governments need to be aware that the PPP model of project delivery is not all "upside". The asset is not "free", and financing will require governments to guarantee debt pay-out should the project collapse. Governments will generally also pay more over the life of the asset, and may also need to provide financial security to lenders in terms of its capacity to pay when it comes to the operational phase. The eventual realisation that the government will be required to make such payments – usually in the form of an availability or performance fee – has been the stumbling block for many regional PPPs. As noted above, the significant capital expenditure requirements of most social infrastructure projects and the understandable reluctance of the private sector to take demand risk on "greenfield" projects means that these projects tend not to lend themselves to "pure concession" structures. This is something which governments implementing PPP programmes for social infrastructure must accept as the price for being able to meet the needs of citizens when the government itself does not have the funds for such large capital expenditure, and appropriate structuring and documentation can always help mitigate government risk to market-acceptable levels.

It is worth noting as a corollary to the current focus on project delivery through PPP in the GCC region that Dubai

and Kuwait introduced new PPP laws in 2015. Qatar's and Oman's PPP and private investment frameworks are currently also being put in place and this issue is under active consideration in Saudi Arabia too. Despite the underdevelopment and absence of a formal PPP regulatory framework in all GCC countries, social infrastructure projects in the region have used PPP structures (or some variant thereof) in the past, including for the Prince Mohammad Bin Abdulaziz Airport in Madinah, Saudi Arabia, and the Queen Alia International Airport in Amman, Jordan. There has always been the appetite for considering alternative project delivery methodologies, but now there is also a material financial driver (and, increasingly, a suitable regulatory framework) for governments to start proceeding at pace with these alternatives.

It can be expected, therefore, that more PPP structures will enter the market as the process of change takes effect through value engineering, project re-prioritisation, and legal, regulatory and institutional reform.

A number of alternative project delivery models to traditional procurement and PPP also exist, although these are unlikely to gain significant traction regionally. Just briefly, project alliancing is another example of an alternative form of procurement in the social infrastructure sphere. This model, used mainly in the UK and Australia, involves the equitable sharing of risk and reward, with the government and one or more service providers working together as an integrated team to deliver a project where their commercial interests are aligned to the actual project outcomes.<sup>16</sup> The main principle behind this form of contracting is that the parties share equally in the upside of the project (the gain share) but, more importantly, they also share equally in the losses of the project (the pain share) with no risk-loading under the contract to try and shift risk to the private sector participants. A high degree of complexity is associated with alliance contracting and there is no recourse to litigation or arbitration for the parties involved. Therefore it is unlikely in the short or medium term that GCC governments will

13 <http://www.hydrocarbonprocessing.com/news/2016/12/kuwait-knpc-mandates-banks-for-eca-backed-club-loan>

14 <http://gulfbusiness.com/gcc-governments-enlist-export-credit-agencies-fund-mega-projects/>

15 <http://www.constructionweekonline.com/article-41968-finding-funding-for-gcc-infrastructure-projects/>

16 <http://nvnorden.org/lisalib/getfile.aspx?itemid=584>



look to adopt this model and the focus should, as discussed above, be on PPP-style procurement. Alliancing may be a long-term option for governments once a structured and well-established PPP market has been successfully achieved.

## Conclusion

For many years oil revenue in the GCC countries has directly correlated to government spending. As GCC governments have traditionally financed projects from their sovereign wealth, it is unsurprising that the social infrastructure market in particular has been hampered by the decline in oil revenues. As governments begin to explore and embrace alternative partnership and finance-based strategies, in addition to placing much greater emphasis on diversification of sources of GDP, growth in the region's economy will provide further impetus to the social infrastructure market.

The future is, of course, uncertain. The agreement in December 2016 between OPEC and non-OPEC countries to cut production sent oil prices soaring above US\$58 a barrel. However, with record high levels of oil being pumped in some countries in November 2016 alone, the price rise is already on shaky ground, undermining the original agreement. Whether the region will demonstrate full compliance with the oil output cut in the short, medium or long term is as yet unclear and untested. However, recent comments by Saudi Arabia's Minister of Energy, Industry and Mineral Resources, that the production cut deal is unlikely to be extended beyond the initial six-month period,<sup>17</sup> has sparked renewed fears that this is not the end of the glut in oil supply, with an estimated two-thirds of the oversupply remaining by the end of this year, should the deal not be renewed.<sup>18</sup> If, however, the OPEC agreement is complied with, there is also a strong possibility that this may trigger a drilling boom in US

shale, negating the upward price resulting from such compliance. This is very likely given the Trump administration's First Energy Plan in which it commits "to embrace the shale oil and gas revolution".<sup>19</sup> This climate of volatility and uncertainty will continue to have a huge impact on the delivery of social infrastructure projects in the GCC. It is therefore important that GCC governments mitigate their risks through exploring new delivery models and alternative sources of funding for projects, regardless of a possible contango in the oil price (i.e. where the futures price of oil is higher than its current spot price). Cheaper funding sources from ECAs along with private sector engagement and project involvement, particularly through PPPs, will be critical tools in supporting the ongoing delivery of social infrastructure projects regionally.

The pace of change may vary and fluctuate, but there is significant scope for opportunity and improvement. How each government seeks to capitalise on this opportunity remains to be seen but those governments which get the balance of debt funding and project structuring right will ultimately be the most successful in improving the lives of their citizens, increasing trade and tourism and diversifying their economies away from a dependence on oil, effectively future-proofing themselves against a repeat of the 2015 oil crisis. This should, and must, be the agenda for all GCC governments going forward.

<sup>19</sup> <https://www.whitehouse.gov/america-first-energy>

<sup>17</sup> [http://gulfnews.com/business/sectors/energy/opec-deal-unlikely-to-be-extended-due-to-compliance-saudi-oil-minister-says-1.1963000?utm\\_content=1.1963000&utm\\_medium=RSS&utm\\_source=Feeds&utm\\_campaign=Opec+deal+unlikely+to+be+extended+due+to+compliance%2C+Saudi+oil+minister+says&localLinksEnabled=false&utm\\_term=Most+viewed+RSS+](http://gulfnews.com/business/sectors/energy/opec-deal-unlikely-to-be-extended-due-to-compliance-saudi-oil-minister-says-1.1963000?utm_content=1.1963000&utm_medium=RSS&utm_source=Feeds&utm_campaign=Opec+deal+unlikely+to+be+extended+due+to+compliance%2C+Saudi+oil+minister+says&localLinksEnabled=false&utm_term=Most+viewed+RSS+)

<sup>18</sup> <http://oilprice.com/Energy/Energy-General/Oil-Prices-Slide-As-Saudis-See-No-Need-Of-Extending-OPEC-Deal.html>



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THE FOURTH RAILWAY PACKAGE:

# All change?

by Naomi Horton and Jonathan Turner

**A**s with many other industries and sectors, the recent trend in EU rail policy has been towards greater liberalisation. The reason for this move towards liberalisation is because the opening up of passenger rail services to competition is often associated with benefits such as improvements in quality and frequency of rail services, more innovation and greater overall passenger satisfaction.

Despite this, the majority of rail passenger services in Europe have, until recently, remained largely in the hands of state-owned operators (and many still are). The reasons for this are closely tied to the legislative framework and the industry structure, which impose obstacles for new entrants to the market. Key issues which have historically prevented a liberalised railway market in the EU include:

- differing national technical and safety rules and authorisation processes, which create access barriers;
- the ability of EU member states to award certain rail contracts directly, without going through competitive procurement processes; and

- the close relationship between those who operate passenger rail services (train operators) and those who manage the track, stations, signalling systems and other infrastructure on which the trains run (infrastructure managers).

Since 2001 the European Commission has enacted a series of “Railway Packages” to address these issues, with the aim of enabling privately owned train operators to access the European rail market on a competitive basis.

The separation of train operators and infrastructure managers is often considered to be a prerequisite to the true

opening up to competition of passenger rail operations. This separation ensures that access to rail infrastructure is not restricted by discriminatory measures imposed by infrastructure managers: for example, by granting preferential train paths to train operators within its corporate group. This separation has been instrumental in liberalising (or, in some cases, part-liberalising) passenger rail operations markets in a number of EU member states, although the degree of liberalisation so far actually implemented varies significantly between member states.

However, it is interesting to note that the latest step in the EU legislative process,





the Fourth Railway Package, does not make the final leap of requiring full separation between train operators and infrastructure managers, as had been anticipated by many. It also comes at a time when the Government in the UK (which has one of the most liberalised rail markets in Europe) has begun to make noises about the possible combination of train operations and infrastructure management (known as “vertical integration”), with the recent announcement of plans to develop a new rail line between Oxford and Cambridge which could be run by a single-entity train operator and infrastructure manager, in sharp contrast to previous government policy.

These developments present both opportunities and challenges for players in the EU rail market.

### **Previous Railway Packages**

The First Railway Package, introduced via three EU directives in 2001, focused

on opening up the European rail freight network by providing international freight service providers access to the Trans-European Rail Freight Network (from March 2003) and to the entire EU rail network from March 2008.

The First Railway Package laid the foundations for liberalisation by requiring operational separation of the functions of managing infrastructure and providing train operations.

The Second Railway Package (2004) and the Third Railway Package (2007) brought further incremental steps towards full liberalisation.

### **The Fourth Railway Package**

Since the provisions of the three previous Railway Packages have not yet been fully implemented in all member states, the extent of liberalisation in each member state varies significantly. Despite this, at the beginning of 2013, the European Commission proposed a Fourth Railway

Package, originally intended to remove the remaining legal, institutional and technical obstacles to creating a single European railway area.

When it was initially presented in 2013, the Fourth Railway Package set out far-reaching measures to enable new entrants to access the market, including a requirement for member states to competitively tender all public service contracts and a proposal to “unbundle” train operators and infrastructure managers to ensure fair access to infrastructure for all operators. These reforms, in their initial drafts, were not well received by all EU member states, most notably Germany and France. After some debate, the original proposals of the Fourth Railway Package were “diluted”, with the result that member states may keep a “vertically integrated” structure which combines train operators and infrastructure managers, provided certain legal, financial and operational separations are put in place.

The Fourth Railway Package consists of six legislative proposals, split into a “market” pillar and a “technical” pillar, to amend a number of European directives. The technical pillar relates to rail safety and interoperability, while the market pillar concerns the governance of railways and the opening up of the passenger market. The technical pillar of the Fourth Railway Package was approved by the European Parliament in April 2016 and came into force in June 2016.

The European Parliament voted to adopt the market pillar of the Fourth Railway Package at a plenary session in Strasbourg on 14 December 2016. Of particular interest in the market pillar are the amendments that the Fourth Railway Package proposes to Directive 2012/34/EU (the 2012 Directive). These amendments include additional requirements regarding separation between train operators and infrastructure managers.

### The original 2012 Directive and management separation

The 2012 Directive establishes a Single European Railway Area and makes clear that the roles of the train operator and infrastructure manager have to be managed separately.

To implement this, member states must ensure that train operators and infrastructure managers have separate profit and loss accounts in respect of a train operator and an infrastructure manager (Article 6). In addition, certain “essential functions” must be entrusted to bodies which do not themselves provide rail transport services, so as to ensure equitable and non-discriminatory access to infrastructure (Article 7). These “essential functions” relate to decision-making on: (i) train path allocation; and (ii) infrastructure access charging. Keeping these “essential functions” separate from bodies that provide train operations is seen as a prerequisite to enabling competition and avoiding market distortion.

### Amendments to the 2012 Directive and vertical integration safeguards

The amendments to the 2012 Directive retain the concept that network capacity (i.e. train path) allocation and responsibility for setting the charges for

access to infrastructure must be kept separate, but expressly acknowledge that the required separation can be achieved within a vertically integrated structure. This concession was the product of a hard fought battle by a number of member states. Vertical integration is therefore permitted rather than outlawed, but with a clear set of safeguards.

Some key issues addressed by the proposed amendments include:

- **Legal independence**  
Infrastructure managers must be legally distinct from train operators, and cross-shareholdings are prohibited.
- **Funding**  
An infrastructure manager’s income may not be used to finance other legal entities within a vertically integrated structure. The infrastructure manager must keep detailed records of any commercial and financial relations with other legal entities within a vertically integrated structure, and make them available to a regulatory body upon request.
- **Independence of staff and decision-making powers**  
An infrastructure manager must have effective decision-making powers, independent from any other entities within a vertically integrated structure, and no other legal entity can influence the decisions of the infrastructure manager. Equally, the members of the management board and senior staff members of the infrastructure manager cannot hold similar senior positions within other legal entities in the vertically integrated structure.

### Current state of EU rail liberalisation

Even in its diluted form, the Fourth Railway Package represents an important opportunity for liberalisation in Europe. Many member states will need to make changes in order to meet the requirements outlined above, particularly those which have not yet complied with the separation requirements of the first three Railway Packages and the 2012 Directive. The degree of EU liberalisation completed to date in the various jurisdictions varies enormously, with the UK and Sweden currently among the most liberalised, and France and Spain

among the least (according to a recent IBM index of liberalisation). Accordingly, the impact of the Fourth Railway Package differs across the EU, depending in part upon the current state of liberalisation in the relevant member state.

### France

France has implemented the series of EU directives aimed at liberalising the European railway market. However, France’s implementation of liberalisation legislation has been slow, and it did not initiate the liberalisation of passenger rail operations before being obliged to do so by the Third Railway Package of 2007 (in relation to international passenger services only).

France’s national railway services operator, SNCF, currently enjoys a monopoly over national and regional passenger services.<sup>1</sup> This will only change with the implementation of the Fourth Railway Package, which will require the opening up to competition of long distance commercial passenger services in 2020 on an open access basis, and of national and regional services from 2023/2024 on a “franchise/concession” basis.

The tradition of railway services being provided by SNCF as a monopolistic operator still seems to be deep rooted in France. The concessions provided in the Fourth Railway Package have been welcomed by French authorities and, accordingly, it may be the case that the French domestic passenger market is not significantly opened up to competition in the short to medium term.

### Spain

The effective liberalisation of passenger rail operations in Spain has not yet taken place. From 2013 to 2015 the Spanish Government introduced significant legislative reforms to create the legal framework for liberalisation. However, no tender processes for specific lines have yet commenced (although the Valencia corridor was announced in 2014).

The liberalisation process was put on hold by the Spanish Government in 2015, on account of the national elections and political discussions around the

<sup>1</sup> Pursuant to article L. 2141-1 of the French transportation code (*code des transports*).

privatisation and liberalisation of public services. At the moment, passenger services are operated almost exclusively by RENFE (an entity controlled by the Spanish Government). Despite limited private sector operation to date, given that the legal framework has already been modified and a number of private companies have obtained licences to operate passenger services, future liberalisation remains a real possibility.

In December 2016, the Government confirmed in an official statement in the Spanish Parliament that, by 2020, passenger operations would be liberalised. It therefore appears likely that significant opportunities for private sector rail operators will arise in Spain in the coming years.

## Germany

The German rail passenger operations market is a legally liberalised sector with opportunities for private train operators. In recent years, competitors of the state-owned Deutsche Bahn have acquired a share of the regional rail market. In fact, by 2015, competitors of Deutsche Bahn were operating almost one-third of the German regional rail passenger transport (SPNV) market.

The infrastructure manager in Germany remains a subsidiary of Deutsche Bahn, a position which the German Government has been keen to protect. The infrastructure manager is split into two parts: one responsible for the rails, the other for the station infrastructure. With over 33,000 kilometres of track under its control, DB Netz AG owns and manages the longest rail network in Europe. Meanwhile, DB Station & Service AG operates the station infrastructure and some of the station buildings at almost all of the passenger stations in Germany. Access to the rail infrastructure on a non-discriminatory basis is supervised by the German Federal Network Agency (*Bundesnetzagentur*). DB Netz AG and DB Station & Service AG are subsidiaries of state-owned Deutsche Bahn AG, but they do not operate passenger transport services. Within the Deutsche Bahn group, passenger transport services are operated by separate group subsidiaries, such as DB Fernverkehr AG and DB Regio AG.

The German regional rail passenger sector has developed into a competitive market. Competitors of Deutsche Bahn have steadily increased their market share by winning passenger rail tenders and winning contracts which were previously operated by Deutsche Bahn. Although Deutsche Bahn is still the transport operator with the largest market share in the German passenger rail sector, it is steadily losing market share to private competitors. It is likely that this process of liberalisation will continue with the implementation of the Fourth Railway Package.

## UK

The UK has one of the most liberalised rail markets in Europe, with a number of operators owned by foreign entities competing successfully for franchise awards alongside fully domestic operators. Separation between infrastructure managers and train operators has been in place since the privatisation of the rail network in the 1990s, well before EU legal requirements to do so had been enshrined. The main infrastructure manager, Network Rail, is a separate government body which is independent of the train operators.

One might therefore assume that the impact of the Fourth Railway Package in the UK is likely to be less significant than in other

member states where there is currently less separation. However, proposals recently announced by the Transport Minister, Chris Grayling, for a fully privatised rail line from Oxford to Cambridge signal a possible move away from the principles of separation. In a speech in December 2016 Mr Grayling set out plans for a new entity to be responsible for track and infrastructure, as well as the operation of train services, on a new Oxford to Cambridge line. If these plans are implemented, it will be the first integrated heavy rail operation in Britain for many years. Mr Grayling also outlined proposals for franchises, as they are re-competed (starting with South Eastern and East Midlands), to have integrated operating teams between train services and infrastructure. Depending on the extent of this integration in practice, it may well require careful navigation of the separation between infrastructure manager and train operator stipulated by the Fourth Railway Package.

It is perhaps worthy of note that the government of the most liberalised rail system in Europe, which has lived with this separation of wheel and rail for the longest time, is now keen to point out the technical and operational difficulties which can arise from such separation: *“When things go wrong, a lack of a joined up approach can make things much worse for the passenger ... Our railway is much better run by one joined up team of people. They don’t have to work for the same company. They do have to work in the same team”*.<sup>2</sup>

While the UK Government has made clear that, until the process of withdrawing from the EU is complete, it will continue to meet its obligations as a member state, withdrawal from the EU could allow the reintegration of infrastructure management and train operations in the UK without fear of contravening the Fourth Railway Package.

## Conclusion

It is clear from the range of levels of liberalisation existing in the various EU member states that the impact of the Fourth Railway Package will depend largely on the extent to which each European country implements the Fourth Railway Package. The extent of liberalisation will depend on a number of factors, such as the political will of the domestic government and domestic fiscal considerations. Given the relatively slow pace of liberalisation since the First Railway Package was introduced, it seems unlikely that the Fourth Railway Package will achieve all of its original goals. Indeed, although at the time of writing details are thin on the ground, the UK may well be coming full circle in its approach to rail liberalisation.

<sup>2</sup> <https://www.gov.uk/government/news/transport-secretary-puts-passengers-at-the-heart-of-the-railway>



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# Trends in Africa

by Yann Alix

**T**he key to economic development for many emerging countries lies, at least initially, in the effective exploitation of their natural resources, which are quite often located in remote and poorly explored areas. A lack of transport infrastructure and, in particular, rail (and port) infrastructure, is therefore often considered, alongside political risk, as one of the key impediments to the development of greenfield mining projects in Africa.

Given their limited financial resources, governments have historically looked to such mining-related infrastructure, especially mining-related railways, to unlock their economic potential and promote wider economic development.

A number of African railways were built during colonial times, some of them by private sponsors to support mining activities (e.g. the Zouerate-Nouadhibou railway built by Miferma to exploit the Kedia iron ore deposit in Mauritania and the Hahotoe-Kpeme railway built by CTMB to operate the Hahotoe phosphate mine in Togo, both in the early sixties). Certain African railways have also been financed and constructed by governments, especially in state-controlled economies backed by the USSR (e.g. the Sangaredi-Boké-Kamsar and the Kindia-Conakry railways in Guinea-Conakry in the seventies).

Given the cost of such infrastructure, the “integrated” model, whereby the railway is built by the mining sponsor, which is in turn granted the right to operate it under a

concession agreement, is still the preferred option in Africa. It is also viewed favourably by lenders, as it gives the mining operator control over the use of the infrastructure.

However, this model has been criticised as creating de facto monopolies, preventing other potential users (and competitors) from accessing the railway. A number of concession agreements have been singled out as containing no or limited, vague and/or highly conditional undertakings in relation to third-party access (e.g. provided that third-party access does not impair the conduct of the project at all or subject to terms to be agreed with the “first-mover”, with no specific settlement mechanism).

As a result, it has been suggested that an alternative model, whereby the mining-related infrastructure is owned and operated by a third-party private sector investor, should be developed in Africa. In support of this option, it has been argued that mining operators may prefer third-party private sector ownership

over government ownership on account of efficiency and functionality issues, and that they may even prefer this model to the “integrated” model as it would enable them to focus their efforts and their capital on their core business.

This approach was adopted in the Guinean Mining Code enacted in 2011 and amended in 2013<sup>1</sup> and by Rio Tinto and the Government of Guinea in relation to the Simandou project in 2014.

However, this alternative model has not been successfully developed yet. The pool of third-party operators with the required financial, operational and technical expertise is quite small in Africa, and mining companies (and lenders) are wary of losing

<sup>1</sup> The Guinean Mining Code provides that “the building of the infrastructure necessary for Mining Activity is carried out by the State or within the framework of a Public-Private Partnership (PPP)” and that “Infrastructure projects are subject to an international competitive tender procedure, and shall in all cases comply with the master plan for the transport infrastructure that ensures access to the infrastructure by third parties”.





control over the railway, increasing the structuring and contractual complexity of their projects and, potentially, incurring higher transportation costs in jurisdictions where other risks are already high.

As a consequence, the case has been made for open-access regulations and tighter third-party access regimes in concession agreements (or for the entry into specific, detailed railway concession agreements) ensuring, among other matters, that the infrastructure is built to accommodate additional capacity and that tariffs are non-discriminatory.

African governments have also been encouraged to create or bolster independent regulatory agencies to monitor the operation of such infrastructure and the effectiveness of a third-party access regime (e.g. by reviewing or endorsing decisions concerning access and tariffs).

Other options exist to balance the legitimate expectations of the “first-movers” and the equally legitimate expectations of governments and new users. They include:

- the provision of “access holiday” or “sunset” clauses, whereby specific priority rights are made available to the “first-mover” for a certain period of time (potentially linked to the amount of tax paid or the profitability of the project) in order to prevent rent situations and anti-competitive behaviours; and
- the attribution of a golden share or specific rights to the government in relation to the infrastructure built by the “first-mover”.

While mining companies are still weathering the current commodity price cycle and while the perceived political risk of doing business in Africa remains high, flexibility is key in encouraging the development of mining projects and related infrastructure in Africa. This should not discourage governments from using their rights under existing agreements and regulations to support third-party access to existing infrastructure where the “first-mover” costs have been recouped, the project has been de-risked and access is requested by new users.



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## UK INFRASTRUCTURE PROMISES AND DELIVERY:

# Mind the gap

by Mark Elsey



**W**hat do President Donald Trump, Chancellor Philip Hammond and Premier Li Keqiang all have in common? The answer is infrastructure, which all three have highlighted as key to bolstering their national economies against the threat of slowing global growth. And they are not alone – the World Economic Forum estimates the shortfall in global infrastructure investment to be at least US\$1 trillion per year.

The infrastructure challenges in each country are of course different. If we look at the UK, there are four main challenges to the Government’s ability to deliver on its infrastructure agenda: the “4Ps” of pipeline, planning, private finance and procurement. So what are these challenges and what should the Government do to meet them?

### Pipeline

A consistent theme is the need for a clear pipeline of deliverable infrastructure projects. The National Infrastructure Pipeline looks great from a distance but when examined closely does not contain the committed list of publicly backed projects that the UK enjoyed between the

mid-1990s and the global financial crisis.

Even given the latest plans from the Chancellor (if they are delivered) the UK will still be spending less on infrastructure than under the previous Labour administration, and significantly less than the average of the G7 nations. Without a genuine pipeline of opportunities, global developers and investors will continue to focus on markets such as the US and Australia where there are more established programmes and greater perceived opportunities.

One way to address this would be to devolve greater power and responsibility for formulating and promoting infrastructure projects to a wider group of bodies who could identify more localised solutions,

rather than the Government devoting disproportionate resources to large trophy projects. There is already within Government a recognition of the need to devolve such powers, and the creation of the National Infrastructure Commission and the move to create sub-national transport bodies are both helpful steps. But if the Government is serious about effective devolution of powers and responsibilities, it also needs to devolve appropriate control over delivery decisions, fundraising and spending to these bodies.

Alongside public sector change, the Government also needs to encourage more private sector innovation. With the UK likely to exit from the EU, the Government should consider providing the private sector with





more capacity to put forward unsolicited proposals which, subject to sensible value and deliverability tests, can proceed without having to go through a long and costly market procurement process.

### Planning

Even with the advent of the Development Consent Order process, planning hurdles are still seen as a major impediment to infrastructure development, creating significant uncertainties, costs and delays. There are no easy answers here, unless the Government is prepared to make a fundamental shift in the balance between individual rights and national or local strategic priorities. If it is not prepared to make that shift and to give individuals and individual interest groups less ability to protect their own interests, it is hard to see how the UK is ever going to extract itself from the current infrastructure log jam. If the Government is prepared to change that balance, the time and costs which could be saved by expediting planning

processes would probably fund far greater compensation for those affected.

### Private finance

It is no secret that public purse strings are tight. On the other hand, there is significant private liquidity, and infrastructure has become increasingly attractive to investors across the globe. The UK, despite the challenges of Brexit, is still a major destination of choice for many global investors and, as they continue to hunt yield and look for better returns, these investors' appetite for risk is increasing. The Government needs to be proactive about attracting this money to the UK. Therefore, it is good to see that, under the current Chancellor, HM Treasury appears more receptive to alternative funding mechanisms.

Importantly, there needs to be a greater understanding that private finance is not just a balance sheet issue but that there is real value to be derived from bringing in private sector funding, in

terms of true financial accountability and the involvement of participants who are motivated by profit – thus incentivising them to be more innovative and efficient and to take a “whole life” view of assets.

We also need to move away from the idea that private funding equates to privatisation, and from the idea that private sector profit is a “bad thing” and represents some kind of procurement failure. It does not; profit is good as long as it is reasonable and proportionate, and the prospect of profit is the best way to motivate and incentivise efficient and cost-effective project delivery. Market competition and ultra-low debt funding rates have driven out the prospect of “super profits” in relation to new infrastructure.

We also need to accept that many infrastructure projects will not be self-funding. So, where there is a need to mix public and private money or financial support, the Government needs to use its money wisely. In particular, this does not mean that public support must



automatically take the form of cash or guarantees. The Thames Tideway Tunnel project is a good example of the Government being smart in how it provided financial support. The aim should always be for the Government to facilitate private sector funding for new infrastructure in a manner that delivers infrastructure at a lower cost for consumers.

### Procurement

With some honourable exceptions, the public sector is often not a cost-effective and efficient infrastructure deliverer. The public sector needs to act as facilitator, establishing more clearly its needs and priorities and focusing more on defining how it wants infrastructure to perform and how it will assess and pay for this performance. These considerations are at the heart of any major project, but too often in the past they have not been given appropriate priority. One of the main reasons for this is that procurement is seen by many as principally an engineering exercise. Public sector delivery should be about defining what is required by way of outputs and how best to procure, fund and pay for these. It is not about how to design and build the solution and,

through over-engineering and over-prescription, stifling private sector innovation and efficiency.

### Closing the gap?

There has rarely been such a consensus on the needs and benefits of developing new infrastructure. Fortuitously, there has also never been the same opportunity to access cheap private funding from across the globe in order to support the delivery of this infrastructure. Despite this, there remains a real gap in the UK between the political rhetoric and “spades in the ground”. Addressing these “4Ps” will not provide all the answers to the UK’s infrastructure challenge, but sensible and smart progress in each of these areas, and a willingness to take some bold steps, can help us to close that gap.



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WASTE PROJECTS:

# Waste-to-wealth initiatives

by Michael Harrison, Richard Guit and Nick Stalbow



**A**s populations grow and urbanise, the quantity of “municipal solid waste” arising also grows.<sup>1</sup> With this growth, the environment is subject to greater environmental pressure from both contamination and emissions: a fair proportion of waste is not collected and is subject to open dumping (and possibly open burning). In addition, contaminants leach into water (both groundwater and coastal waters) giving rise to associated on-going health risks.

In an urban environment, waste provides a resource that can be “mined” and otherwise used to avoid or reduce contamination and emissions – effectively an “urban ore body”.<sup>2</sup> In a rural environment, organic waste produced through agriculture and forestry (including bagasse and biomass) provides a resource – a “rural ore body”. Borrowing the terminology used in the Eleventh Malaysian Plan (2016 to 2020), these urban and rural ore bodies can be mined for “waste-to-wealth initiatives”. In recent times there has been a shift in the global language surrounding waste: it is

now seen as a resource, rather than being considered as “garbage” or “rubbish”.

The World Bank has estimated that, by 2025, between 2.2 billion and 2.4 billion tonnes of municipal solid waste<sup>3</sup> (MSW) will be generated annually by the world’s urban population.<sup>4</sup> This figure may be conservative, given that some countries have already outpaced the 2025 projections.<sup>5</sup> If the right mix of waste projects and diversion from landfill is achieved, this will reduce greenhouse gas emissions by well over a billion tonnes

per year on current waste and MSW volumes, and considerably more as waste volumes increase.

MSW can be: (i) used to produce energy (as fuel or feedstock for waste-to-energy (WtE)<sup>6</sup> facilities); (ii) processed by mechanical and biological treatment plants (MBTs) to create organic compost material and to sort re-usable<sup>7</sup> and recyclable<sup>8</sup> “fractions” of MSW; or,

1 “Waste arising” is a term of art within the waste management industry. For the remainder of this article we refer to waste volume.

2 Reflecting the fact that early projects in Australia made use of processing technologies used in, and were engineered by contractors to, the mining industry.

3 As distinct from sewage or waste water.

4 Daniel Hoorweg, Perinaz Bhada-Tata & Charles Peterson, ‘What a Waste: A Global Review of Solid Waste Management’ (Report, World Bank, 2012).

5 Indonesia has outpaced the 2025 projection of 150,000 tonnes a day. Currently, over 175,000 tonnes a day is generated.

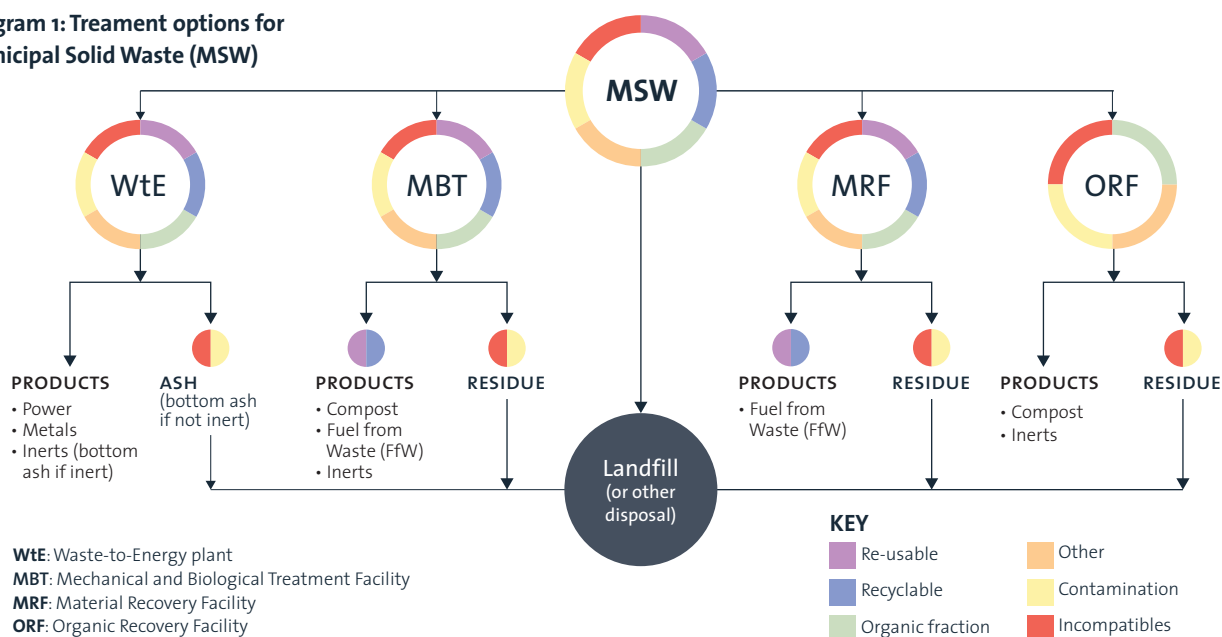
6 The terminology differs between hemispheres: “Energy from Waste” (EfW) and “Waste-to-Energy” (WtE) are the same thing.

7 Materials that may be recovered from the waste stream and re-used: in the context of waste projects, re-usables are not typical.

8 Materials that may be recovered from the waste stream and recycled, for example, cardboard, paper (including newspapers and magazines), glass bottles, plastic bottles and containers, drink cans (aluminium) and food cans (ferrous metals), the recycling of which will require the use of energy.



**Diagram 1: Treatment options for Municipal Solid Waste (MSW)**



(iii) sorted into re-usable, recyclable and organic fractions and processed using material recovery facilities (MRFs) or organic recovery facilities (ORFs) to derive and produce saleable materials. Ideally, WtE project technologies will sort and remove re-usable and recyclable materials from the MSW first, in a process known as pre-sorting; see Diagram 1 for further details. In some parts of the world, the higher calorific value fractions of MSW (having low or no organic content) are first processed into a solid fuel<sup>9</sup> (FfW) for use by power or manufacturing facilities. There is no single process for creating energy from waste, creating compost or sorting and processing the re-usable, recyclable and organic fractions, although certain methods are preferred globally.

In this, the first of three articles, Michael Harrison, Richard Guit and Nick Stalbow provide an outline of waste projects in general. In subsequent articles, we will consider in greater detail WtE, FfW and MBTs first, and MRFs and ORFs second, in the context of key markets, including Asia Pacific, Africa, and South America (in each case by country).

9 Depending on the jurisdiction, “Fuel from Waste” (FfW) may be referred to as PEF (process engineered fuel), RDF (refuse derived fuel) or SRF (solid/specified recovered fuel). These are solid fuels as opposed to gaseous fuels, such as methane (derived from landfill capture in some circumstances) or syngas (derived from gasification of MSW using some forms of WtE technologies).

### Waste Volumes

The World Bank estimates that more than 40 per cent of the MSW produced by the world’s urban populations by 2025 will be produced in the Asia and Pacific region (which includes East Asia).

Within the Asia Pacific region, China has the largest quantity of waste volumes and some of the most developed waste management systems. It is estimated that between 180 and 200 million tonnes per year of MSW is collected from the urban population in China. This equates to sufficient MSW to provide feedstock for nearly 900 average sized MBTs (with capacity for 225,000 tonnes a year) or up to 345<sup>10</sup> average sized (i.e. 50 MW) WtE facilities or, stated another way, 17,250 MW of electricity generation capacity. China’s current intention is that WtE facilities will treat 40 per cent of MSW volumes by 2020. According to the World Bank, by 2025, 1.4 million tonnes of MSW will arise each day in China, equivalent to over 510 million tonnes per year. If these volumes of MSW are collected, the scope for the WtE industry in China is vast.

It is estimated that Indonesia produces between 175,000 to 180,000 tonnes of MSW per day, or 64 to 66 million tonnes

10 Assumes 0.75 MW per tonne of MSW, or 584,000 tonnes of MSW for a 50 MW (438,000 MW/h per year) WtE facility. We have seen 0.55 (wetter MSW) to 0.8 (drier MSW) MW per tonne of MSW depending on the mix and origin of waste stream, which impacts the calorific value of the MSW and as such the MJ/kg derived.

of MSW per year.<sup>11</sup> The composition of this MSW is ideal for some waste projects.<sup>12</sup> If all of the MSW arising in Indonesia were collected this would equate to 290 average sized MBTs or up to 115 average sized (i.e. 50 MW) WtE facilities or, stated another way, 5,750 MW of electricity generation capacity, equivalent to one sixth of Indonesia’s planned 35 GW expansion of installed capacity by 2019.

The USA continues to be the world’s biggest producer of MSW (producing at least 260 million tonnes per year).<sup>13</sup> While the USA has a considerable number of established waste businesses, it offers great potential for waste projects.<sup>14</sup> For example, the US Energy Information Administration reported over 70 operating WtE facilities in the US at the end of 2015, using approximately 29 million tonnes of MSW in that year and providing approximately 2,320 MW of generation

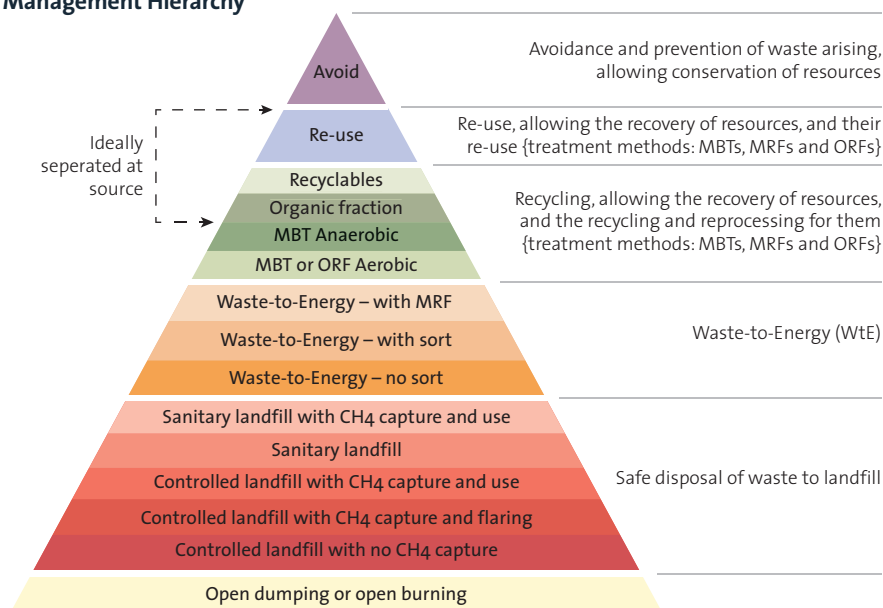
11 These figures were reported in The Jakarta Post in October 2015. While reported in tons (short tons), we have assumed metric tonnes.

12 Approximately 60 per cent is organic, 15 per cent plastic (and as such re-usable or recyclable), 9 per cent paper (and as such capable of being used for PEF/RDF/SRF), and 4 per cent metal (and as such re-usable).

13 Estimates of MSW arising vary by source of information, with this being the most conservative estimate.

14 In the USA, as published by the United States Environmental Protection Agency in 2014, 54 per cent of MSW is landfilled, 26 per cent is recycled, 8 per cent is composted, and 12 per cent is used in WtE (tending to indicate MSW arising of 270 million). A Biocycle/Columbia University State of Garbage Survey indicates that up to 69 per cent of MSW is being landfilled.

**Diagram 2: The Waste Management Hierarchy**



capacity (sufficient for a little under 2,000,000 homes): for the time being at least, the USA has the potential to be the largest user of MSW feedstock for WtE projects in the world.

Europe<sup>15</sup> produces approximately 240 million tonnes of MSW a year<sup>16</sup> and has some of the most developed and diverse waste management systems in the world, including approximately 490 MBTs<sup>17</sup> and 510 WtE facilities.<sup>18</sup>

## The Waste Management Hierarchy

The development of waste projects directly achieves the re-use, recycling, MBT and WtE outcomes set out in the “Waste Management Hierarchy” (see Diagram 2) and, through diversion from landfill, reduces the quantity of waste disposal to landfill.

The Waste Management Hierarchy is the touchstone for environmental

legislative initiatives around the world: it provides an overarching statement of policy outcomes that are widely recognised. Further, this statement of policy outcomes has been applied in many legislative initiatives worldwide.

Some legislative initiatives have underpinned the development of the MBT and WtE industries and, thereby, the achievement of and progression towards the Waste Management Hierarchy outcomes. Most notably in this regard, within the European Union, EC Council Directive 26 April 1999<sup>19</sup> was the catalyst for government sponsored initiatives and regulatory policy settings aimed at diverting waste from landfill and facilitating investment in waste sorting, processing and treatment alternatives.<sup>20</sup>

## Waste Projects

Waste facilities are typically developed as “projects” aimed at delivering a solution in line with the Waste Management Hierarchy.

Waste projects which achieve the policy outcomes of the Waste Management Hierarchy are as follows:

- Organic Recovery Facilities (ORFs) which recover and process the organic

fraction from green waste<sup>21</sup> and other organic waste (including food waste and garden waste),<sup>22</sup> but not from MSW. ORFs derive and produce organic products for agricultural use (effectively re-use), thereby diverting organics from landfill;<sup>23</sup>

- Materials Recovery Facilities (MRFs) which recover re-usable and recyclable materials<sup>24</sup> from the waste stream, including as part of a pre-sort to a MBT or WtE facility, thereby allowing re-use, recycling and reprocessing of resources, the production of FfW and diverting waste from landfill;
- Mechanical Biological Treatment facilities (MBTs)<sup>25</sup> which recover re-usable and recyclable materials from the waste processed (invariably MSW, often C&I Waste,<sup>26</sup> and in some instances C&D Waste<sup>27</sup>) typically as part of a front-end pre-sort MRF, and

15 For these purposes Europe includes Austria, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Lithuania, Luxembourg, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Switzerland and the United Kingdom.

16 2014 figures, source: OECD, Municipal Waste, <<https://data.oecd.org/waste/municipal-waste.htm>>.

17 With a disposal capacity of around 47 million tonnes per annum, source: Mark Doing, “The Market for Mechanical Biological Waste Treatment Plants in Europe”, (September 2016) 6 Waste Management.

18 2014 figures, source: Confederation of European Waste-to-Energy Plants, <[www.cewep.eu](http://www.cewep.eu)>.

19 Directive 1999/31/EC.

20 In jurisdictions such as the UK, local planning laws have also influenced outcomes, such as investment in MBT solutions over WtE solutions (as councils adopted anti-“incineration” policies based on bad experiences in the 1980s and early 1990s in the time prior to technological advancement and cleaner WtE technologies).

21 Organic material from domestic “green” bins and activities of municipalities (typically, parks and gardens and lopping and topping of trees).

22 Note: ORFs usually require organic waste to be segregated at source, with a low tolerance for contamination from non-organic waste materials.

23 Depending on the profile of the organics delivered to an ORF, diversion of 95 percent by mass can be achieved.

24 In our second article we will consider in detail materials regarded as re-usable and recyclable by reference to various markets.

25 In our second article we will consider in detail the range of MBT technologies used.

26 Commercial and industrial waste from commercial and industrial premises.

27 Construction and demolition waste from construction and demolition sites.



process and treat waste in an aerobic or anaerobic environment, in order to separate, process and treat the organic fraction of the waste stream, thereby allowing re-use, recycling and reprocessing of resources, the production of PEF,<sup>28</sup> RDF<sup>29</sup> or SRF,<sup>30</sup> the use of organic products, as well as diverting waste from landfill,<sup>31</sup> and

- WtE facilities (also known as EfW facilities) which use thermal technologies to burn waste or use gasification technologies to burn the gas produced by the waste (typically MSW, often C&I Waste, and in some instances C&D Waste and bio-solids<sup>32</sup>) thereby generating electricity (or producing power and heat on co-generation<sup>33</sup>), diverting waste from landfill,<sup>34</sup> and reducing emissions. WtE

- 
- 28 Process engineered fuel (PEF), being fuel (with limited or no organic content) derived from waste used to fire industrial facilities, including cement kilns, being a FfW.
  - 29 Refuse derived fuel, being solid fuel (with limited or no organic content) derived from waste used to fire industrial facilities, including cement kilns, being a FfW.
  - 30 Solid/specified recovered fuel, being solid fuel (with limited or no organic content) derived from waste used to fire industrial facilities, including cement kilns, being a FfW.
  - 31 In terms of mass, MBT can divert up to 90 per cent by mass from landfill, although diversion of 70 per cent by mass is more usual.
  - 32 Animal and human waste matter derived from waste water processing, that may be used in agriculture or as supplementary feedstock for WtE facilities.
  - 33 The generation of electricity and the production of heat (typically steam).
  - 34 The use of land to dispose of waste arising in urban and rural areas. In terms of volume, typically WtE diverts 90 per cent by volume from landfill: fly ash and bottom ash are residual by-products of WtE, with fly ash requiring safe disposal but bottom ash may be usable as alternative daily cover or re-used as a constituent for road covering.

facilities may or may not recover re-usable and recyclable materials from waste as part of a front-end pre-sort MRF.

### Secondary Waste Projects

As noted above, MRFs (including as front-end pre-sort to MBTs and WtE facilities) may produce FfW. The FfW may be subject to further processing to allow for its use in industrial processes, most typically as feedstock to fire cement kilns.

### Policy settings are key for the development of waste projects

#### Background

Unless municipalities choose to develop waste projects simply because it is the right thing to do, broader policy settings are required to facilitate investment in the delivery of waste projects.

In practice, these policy settings are most effective when they place a cost on landfill and place a value on the environmental benefit resulting from the waste project. It is critical for municipalities, and any central or provincial government, to consider the direct and indirect impact of a move away from landfill, including in some jurisdictions the impact on disposal scavengers.

As we will note in our two subsequent articles, because waste projects need the right policy settings to be developed and to maintain viability, one of the key risks for waste projects – if not the key risk – is the risk of a change in the law (including a “timing out” of any law) which places a cost on landfill and/or attributes value to environmental benefits.

#### Landfill

If one ignores the cost of environmental contamination, and the health consequences, of open dumping (and, in some jurisdictions, open burning and burying waste) open dumping<sup>35</sup> is the cheapest way to dispose of waste. For waste projects to be developed in jurisdictions that currently allow open dumping, municipalities, as well as central and provincial governments, must make policy decisions prohibiting open dumping (and open burning) and move to a policy of controlled landfill<sup>36</sup> and sanitary landfill<sup>37</sup> (and in so doing place a cost on landfill), or impose limits on the use of landfill (and thereby stimulate a programme of new non-landfill waste infrastructure).

As a general statement, for waste projects to be developed the cost of landfill needs to be such that waste projects are able to provide waste sorting, processing and treatment services at a price that is comparable with the cost of landfill,<sup>38</sup> i.e. the levelling of the playing field. This may not be achieved by prohibiting open dumping and placing a cost on controlled or sanitary landfill. It may be necessary

- 
- 35 Dumping of waste other than at a controlled or sanitary landfill, including at any unlicensed landfill.
  - 36 Landfill that is licensed, including compliance with requirements as to control and operation.
  - 37 Licensed landfill isolated from the environment such that disposal to it is safe because isolation continues until waste has degraded biologically and physically.
  - 38 For project finance funded WtE projects, the WtE project must be able to earn sufficient revenue from payments for diversion of waste from landfill and from sale of electricity, or electricity and steam, to service debt, repay principal and earn a rate of return for equity investors.



to place limits (caps) on the quantity of waste that can be landfilled at controlled or sanitary landfills, thereby making landfill capacity (airspace or void space) more scarce and, as a consequence, more expensive. A decision of this kind is unlikely to be taken at the municipal level and, as such, may have to be a central or provincial government level decision. If this is not sufficient to level the playing field, the imposition of levies or taxes on waste which is disposed of to landfill may assist<sup>39</sup> but, again, this is likely to be a central or provincial government decision.

It is likely that scarcity of airspace (or void space<sup>40</sup>) at landfill, in combination with a levy or tax on waste disposed of to landfill, will level the playing field. In some jurisdictions, ultimately landfill will be phased out completely, thereby forcing the development of waste projects: landfill can be phased out completely by either price signals (including levies and taxes) or through not consenting to new landfill sites. In other jurisdictions, the cost of developing new controlled or sanitary landfill may be regarded as prohibitive, as increasingly stringent licence conditions are imposed to ensure emission, environmental and health outcomes which are broadly consistent with an equivalent waste project.

### Renewable energy

In many countries in Asia, WtE (or EfW) projects (and renewable energy projects generally) are supported by feed-in-tariff (FiT) regimes.<sup>41</sup> Typically, the government obliges a generator or transmission or distribution company to source renewable energy from renewable energy generators for a fixed price (which may escalate over time). This provides developers of WtE projects with revenue certainty for the electricity that they generate.

In other countries, governments require

39 Examples of jurisdictions in which landfill levies and taxes have been imposed include the United Kingdom, where a per tonne tax on landfill was imposed ten years ago and has risen incrementally to £82.60 per tonne for non-inert waste, and Australia, with the landfill levy rate in each state for MSW is set out below: **New South Wales**, Metro: AU\$135.70 per tonne; Regional: AU\$78.20 per tonne. **Victoria**, Metro: AU\$62.03 per tonne, and Rural: AU\$31.09 per tonne. **South Australia**, Metro: AU\$76 per tonne; Regional: AU\$35 per tonne. **Western Australia**, Putrescible (including MSW): AU\$60 per tonne; and Inert: AU\$50 per tonne.

40 The capacity at a landfill capable of being used to dispose of waste.

41 In our second article we will include details of FiT regimes.

retailers of electricity and large users of electricity to source from renewable energy sources a percentage of the electricity they sell. To underpin this requirement, the government issues renewable energy certificates to renewable energy generators and requires retailers to pay a penalty if they do not source the required percentage of electricity from these generators. The penalty may be avoided or reduced if the retailer surrenders renewable energy certificates. The cost of the renewable energy certificates is prescribed by legislation.

In the context of a co-generation WtE facility (being a facility that produces heat and power), revenue may also be earned by the sale of heat (in the form of steam) to an industrial user.<sup>42</sup>

### Other policy settings

While placing a cost on landfill and placing a value on the benefits of renewable waste projects are key, they are not the only policy settings used to encourage the development of waste projects, or other environmentally-beneficial projects for that matter.

Another option is to make a contribution to the cost of development of waste projects, for example in the form of grants or financing on concessionary terms, subsidies or concessionary treatment. In addition, international agencies (including the Asian Development Bank) may provide assistance.<sup>43</sup>

In addition to this, local planning and development schemes can influence the type of waste project that is to be developed. For instance, local planning laws in many parts of the UK expressly rejected developing “incineration” or “mass burn” style WtE facilities. This was largely a legacy policy position from the 1980s when those plants were notoriously bad polluters. Consequently, many waste projects developed in the UK in the mid-2000s took the form of MBT plants – producing an SRF (which was then used as a fuel by WtE facilities in other locations).

42 In addition, for some waste projects the policy settings confer value in terms of certificates that may be sold by project and therefore provide another source of revenue. We will consider these in later articles.

43 In the two subsequent articles, we will consider the form of assistance given.

The policy objectives of diverting waste from landfill were still achieved by this type of project.

Finally, in some jurisdictions companies undertaking waste projects are eligible for concessionary tax treatment.

## Importance of collection and segregation at source

### Collection and delivery

Waste projects are facilitated by effective waste collection systems which enable the delivery of appropriate waste to individual waste facilities. This may comprise direct delivery to the waste facility or a network of transport routes and sites (transfer stations) used to consolidate certain wastes for onward transport to the waste facility.

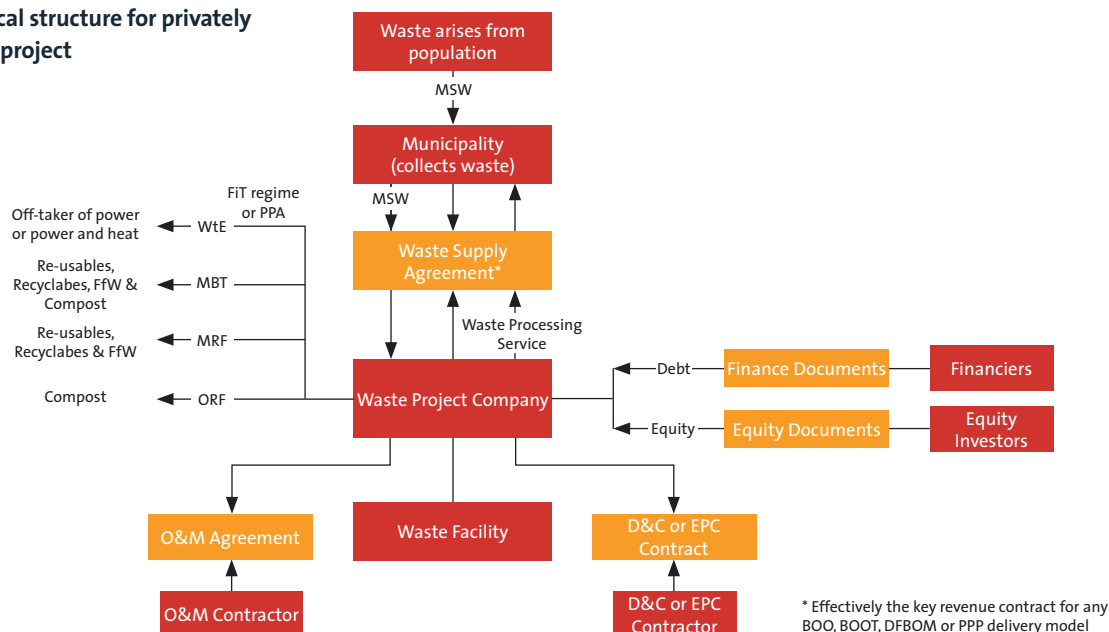
In many jurisdictions, the collection of waste is the responsibility of municipalities. In many other jurisdictions, the collection of waste is not an established practice and is regarded as expensive.

With increasing urbanisation in many jurisdictions, the collection of waste by municipalities is a new activity for them, and the cost of doing so is a new cost, and a relatively expensive one. This new cost may be regarded as being outweighed by the environmental benefits of coordinated collection and management.

### Separation at source

At its simplest, “source separation” is giving households the ability to put their waste into different bins: organics (food, kitchen and garden), recycling (plastic and paper) and residual (everything else!). For some types of waste processing facility, segregation of the waste stream at source is very helpful. The strong preference of operators of MRFs and ORFs is for source separation, so that the re-usable and recyclable fraction of the waste stream is delivered to the MRF (dry MRF) and the organic fraction (food, kitchen and garden waste) is delivered to the ORF. In contrast, MBTs can sort and process deliveries of separated-at-source materials (e.g. plastics, metals, glass and cardboard) and unseparated-at-source materials. There is also a class of MRF (“dirty” or “wet” MRFs) which processes the re-usable, recyclable and organic fraction, although the compostable output has

**Diagram 3: Typical structure for privately financed waste project**



more limited application due to potential cross-contamination.<sup>44</sup> Separation at source requires a multiple bin system and multiple collections and deliveries. These systems have higher running costs, which are ultimately borne by households. Consequently, they tend to feature in jurisdictions where developed waste collection and management system are well established.

Re-usable and recyclable waste may be of value, and one-bin systems (which contain re-usable and recyclable waste) can be perceived as beneficial by some waste project operators, particularly if there is a front-end MRF which will allow separation of the re-usable and recyclable fraction for an MBT. At the end of the day, different processing technologies have different limitations in terms of what they can receive and process, and a tailored solution will be required in each case.

**Power of municipality to collect and quantity collected**

One of the key risks on any waste project is the volume and type and, therefore, the composition of waste within the municipality's catchment area. Will there be sufficient waste from the catchment area (typically, the geographic area for which a municipality is responsible) to justify the investment in the particular waste project? Sufficient volume is needed to reduce the

44 There are different economics to dry and wet MRFs (including in the context of the source of the waste containing the recycle fraction). We will consider these in the later articles.

cost per tonne of waste processed or treated, and to deliver the efficient operation of the waste project, particularly for WtE facilities.

There are a number of dimensions to waste volume and supply risk, the first of which is whether or not the municipality with which the private sector developer is to contract actually has the power to collect waste and to deliver that waste to the facility. This is not always a straightforward matter.

In those cases where the cost and risk of financing a waste project rests with the private sector, the waste project company (and its financiers) will be concerned to understand the waste volume risk of the municipality and, therefore, the waste supply risk to the project. This is relevant if the municipality chooses to procure the delivery of the waste project under a Build Own Operate (BOO), Build Own Operate Transfer (BOOT), Design, Finance, Build, Own, Maintain (DFBOM) or Public Private Partnership (PPP) delivery model: see Diagram 3 for a typical project structure for such an arrangement. If the municipality develops and pays for the project itself under a Design and Construction (D&C) or Engineering Procurement Construction (EPC) delivery model, the risk of insufficient waste volume within the municipality and, therefore, the number of tonnes supplied to the waste project, usually remains with the municipality.

Other dimensions of waste volume and supply risk include the actual type and quantity (and, therefore, the composition) of waste generated within the area (and

how this may change over time) and assumptions made as to the growth in that waste volume and, therefore, the waste supply over time (as it would be unusual for a waste plant to be sized without contemplating growth in waste volumes),<sup>45</sup> and whether or not the private sector is being given exclusive rights to that waste. Each of these issues will be addressed in more detail in articles 2 and 3 of this series.

**Project Participants**

Waste projects are developed using a variety of project delivery models and, as such, can have different project participants.

Municipalities may develop a waste project themselves, contracting with a D&C contractor or EPC contractor to deliver the project, and then either operate the project themselves or contract with an Operations & Maintenance (O&M) contractor to operate and maintain (and repair) the project. This tends to be the more prevalent model in China.

Alternatively, municipalities may choose to contract with a private sector developer under a BOO, BOOT, DFBO or

45 In the context of WtE projects delivered as PPPs, it is more likely than not that the waste project will be over-sized in order to accommodate growth in municipal waste arising over the life of the project facilities. In order to optimise the cost of finance, it is often important to bank the gate fee and electricity revenue from the spare capacity. This puts pressure on sponsors to guarantee their ability to secure merchant waste in the quantities needed to operate the facility at full capacity.



PPP delivery model, as described above. These delivery models are the most complex contractually. (We will describe these models in greater detail in articles 2 and 3 of this series.)

Industrial companies may develop waste projects themselves, most typically a WtE facility (possibly using bagasse, biomass or another by-product of a primary industry and, in some instances, waste from a secondary industry). As with municipalities, industrial companies may develop a WtE facility by contracting with a D&C or EPC contractor to deliver the project, and then operating the facility themselves or contracting with an O&M contractor to do so. Or, alternatively, an industrial company may choose to contract with a private sector developer under a BOO, BOOT or DFBOM model.

Some electricity generators or transmission/distribution companies may develop WtE facilities. Electricity companies are more likely to develop and to operate such facilities themselves, rather than contracting with the private sector, other than with a D&C or EPC contractor to construct the facility.

Some projects are developed as merchant facilities (i.e. the feedstock is non-municipal waste, or feedstock is supplied by a municipality but the developer is taking risk on the volume and composition of waste supplied) with the waste project company (and its debt providers and equity investors) satisfying itself that sufficient waste is committed contractually or is otherwise obtainable within the facility's catchment area<sup>46</sup> to meet the tonnage capacity, and a route to market for the power (either to a captive off-taker or through access to the electricity grid under a FIT regime) to allow for export of all electricity generated.

<sup>46</sup> Unlike a municipality, the catchment area of a merchant facility is not defined by an area within which the municipality has power, or the obligation and power, to collect and to dispose of waste. The catchment area of a merchant facility is defined by the substitutability of the service provided by the merchant facility by another means of waste processing or treatment, which is a function of the cost to the customer for the service provided by the merchant facility (compared to any substitutable service), which includes the charges/fees of the merchant facility, the cost of transportation to the merchant facility, and the cost of disposal of any residue, and whether sufficient waste can be derived from that catchment area will enable the merchant facility to generate sufficient electricity (in the context of WtE), re-usables/recyclables, FFW and compost (in the context of an MBT), re-usables/recyclables or FFW (in the context of a MRF) or compost (in the context of an ORF).

Combined heat and power projects will require a heat offtake commitment. In order to be commercially viable, such demand for waste capacity, electricity and heat must be at pricing levels which enable the facility to generate sufficient revenue to service debt, repay principal and provide a rate of return for the equity invested in the facility. Merchant facilities may be delivered by a D&C or EPC contractor (depending on the required level of transfer of technology risk) and may be operated and maintained (and repaired) by the waste project company (as the owner of the facility), by an equity investor in the project with experience as an O&M contractor, or a separate O&M contractor.

### In conclusion

As noted at the start of this article, the demand for waste projects is driven by the growth in waste volume as the world's population grows and becomes increasingly urbanised. This means that there will continue to be a growing demand for new waste treatment infrastructure.

In articles 2 and 3 we will explore the different types of waste projects in more detail.



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# There is no such thing as a free bridge...

## Mark Elsey writes...

Infrastructure has never been so popular (well, perhaps not since the second half of the nineteenth century). Governments are keen to build it, populations want to enjoy it (unless they live nearby) and institutions of all sorts are keen to invest in it.

In macro-economic terms, the logic of investing today to support and generate future growth which in turn provides wealth to pay for the original investment appears irrefutable. There are also plenty of financial institutions willing to invest in infrastructure. Not surprisingly, cash-constrained governments across the globe are increasingly looking to the private sector to help deliver their infrastructure programmes.

One of the most popular delivery models is the PPP “project finance” structure. Under this model, the upfront capital costs are funded principally through private sector debt and equity. This is invested in a special purpose vehicle operating under a concession of a duration generally dictated by the amortisation profile and tenor of the debt and an agreed forecast return on equity.

The problem of course is that, while there is plenty of finance available, someone still has to pay for it. Debt requires interest and principal payments. Equity investors require a dividend stream. The macro-economic returns referred to above may well materialise on a different timescale or in forms (e.g. tax receipts) that are not directly referable, or that cannot be hypothecated, to an individual project.

Some projects (for example, tolled estuarial crossings) may be self-funding, although many are not. Most require some form of public

sector subsidy either through an “availability” payment regime or a more structured price-support mechanism (such as CfDs in the UK renewables market).

In their rush to embrace the global infrastructure bandwagon, too many states and governments overlook this inconvenient truth – PPPs are not a magic wand that allow the construction of something that was previously unaffordable. As my colleagues in the financial advisory world say, “*don’t confuse finance with funding*”.

So how do the many states and governments around the world, already struggling with budget deficits, cut through this affordability conundrum? How do they break into the virtuous circle of enhanced infrastructure generating growth and wealth, which in turn enables further enhanced infrastructure?

Well, you will have to wait for the next edition of InfraRead to see my thoughts on this tricky global challenge.



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