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**BACKGROUND EVIDENCE: UK INFRASTRUCTURE PIPELINE ANALYSIS**  
**FINAL REPORT**

Submitted by:

**Cambridge Economic Policy Associates Ltd (CEPA)**

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## LIST OF ACRONYMS

Bid Weighted Cost of Capital (BCCC)	Macquarie European Infrastructure Funds (MEIF)
Cambridge Economic Policy Associates (CEPA)	National Grid Electricity Transmission
Capital asset pricing model (CAPM)	National Infrastructure Commission (NIC)
Civil Aviation Authority (CAA)	Offshore Transmission (OFTO)
Competitively Appointed Transmission Owners (CATO)	Ontario Municipal Employees Retirement System (OMERS)
Contract for Difference (CfD)	Operation, maintenance and repair (OMR)
Department for Transport (DfT)	Pensions Infrastructure Platform (PIP)
European Investment Bank (EIB)	Private Finance Initiative (PFI)
Greater Manchester Pension Fund (GMPF)	Private Finance 2 initiative (PF2)
Green Investment Bank (GIB)	Public Private Partnership (PPP)
High-Speed 2 (HS2)	Rail Development Group (RDG)
Infrastructure Journal database (IJ Global)	Regulatory Asset Base (RAB)
Intercity Express Programme (IEP)	Regulatory Capital Value (RCV)
Japanese Bank for International Cooperation (JBIC)	Renewable Obligation Certificates (ROCs)
Final Investment Decision enabling for Renewables (FIDeR)	Retail Price Index (RPI)
German Development Bank (KfW)	Rolling Stock Operating Company (ROSCO)
Greater London Authority (GLA)	Sovereign Wealth Fund (SWF)
Great Western Mainline (GWML)	Thames Tideway Tunnel (TTT)
Heathrow Airport Limited (HAL)	The Greater Manchester & London Infrastructure Pension Fund (GLIL)
Her Majesty's Treasury (HMT)	Train operating companies (TOCs)
Infrastructure Provider (IP)	Transmission Network Use of System (TNUoS)
London Pension Fund Authority (LPFA)	Tender Revenue Stream (TRS)
Local Loop Unbundling (LLU)	UK Guarantees Scheme (UKGS)
Low Carbon Contracts Company (LCCC)	Weighted Adjusted Cost of Capital (WACC)

## **1. INTRODUCTION**

Cambridge Economic Policy Associates (CEPA) has been appointed by the National Infrastructure Commission (NIC) to undertake research into the strategic financing choices made by the private sector when investing in infrastructure projects in the UK and the role that public funding and financing interventions can play in facilitating greater private investment. This UK infrastructure pipeline analysis has been produced as part of the analysis that supports the summary findings and conclusions report.

### **1.1. Purpose of the assignment**

The aim of this project is to provide the NIC with research that is suitable for publication and which examines a range of issues related to the provision of private finance for infrastructure projects in order to support the development of the National Infrastructure Assessment. The first part of the study reviews trends in the provision of private finance to infrastructure investments in the UK over the last ten-years – with a particular focus on new-build infrastructure projects; large-scale expansion projects; and investments in existing assets that require considerable financing for ongoing maintenance. In the second part of the study we interrogated the evidence-base to address some of the key strategic questions facing the UK, such as:

- Considering the extent to which the evidence supports the contention that there are insufficient ‘investable’ projects that match the requirements of institutional investors.
- Examining the key variables and considerations that determine whether a project requires some form of government support to be investable and bankable.
- Identifying and then assessing the value for money of the main government support mechanisms that can be used to assist an infrastructure project to attract private finance. This will include reviewing the approaches that have been used in other countries and will take account of the devolution agenda in the UK.
- Infrastructure projects (which include Greenfield, expansions, and or significant investment for ongoing maintenance) of a reasonable scale.

### **1.2. Scope of the work**

The study is focused on the following:

- UK infrastructure projects in the transport, energy, water & wastewater, digital communications, solid waste and flood risk management sectors and relevant international comparators for these sectors (defined as the economic infrastructure sectors throughout report).

- Projects that have or are seeking to attract private finance, either alone or in combination with public funding and / or financing. We understand that the work is not considering projects that rely solely on public finance.

### **1.3. Objectives of the infrastructure pipeline analysis**

One of the main findings from the complementary paper 10-year review of UK infrastructure finance market is that there is currently no significant constraint in the availability of private finance for UK economic infrastructure projects. Instead the main constraint limiting the provision of private finance to infrastructure in some sectors is a lack of a supply of bankable infrastructure projects.

Given this finding this report seeks to look into the different economic infrastructure sectors in more detail to examine the factors that have been limiting the development of a pipeline of opportunities. The report makes use of a combination of consultations and desk-based review to determine if the number of investable opportunities is limited by fundamental issues related to funding constraints or if there are potential policy interventions that could increase the pipeline.

### **1.4. Structure of the report**

The report contains the following sections:

- Section 2 of the report reviews the current published UK infrastructure pipeline.
- Section 3 reviews the arrangements that are in place to bring energy projects to market and summarises some of the main approaches that have been fundamental to the development of a relatively robust energy infrastructure pipeline.
- Section 4 discusses the approaches used to develop the pipeline in the transport sector and discusses the factors that have constrained the growth of the pipeline.
- Section 5 covers the waste-to-energy, water and telecoms sectors.
- Annex A provides a detailed review of the way in which the project pipeline is developed in the Dutch roads sector.

## **2. INTRODUCTION TO THE UK INFRASTRUCTURE PIPELINE**

This section summarises information on the current UK infrastructure pipeline as set out in the National Infrastructure and Construction Pipeline (NICP).

### **2.1. UK infrastructure pipeline**

According to HM Treasury Autumn 2016 NICP there are over 700 projects and programmes in the pipeline, of which over a third are in the transport sector: 81 large Local Authority transport projects, 86 national road projects (A-roads and motorways) and 30 rail projects. The other main source of projects is expected to be in the energy sector (including renewables), which has 114 projects and programmes in the pipeline of which: 37 are nuclear projects (including new generation and decommissioning), 31 offshore and onshore wind projects along with other renewable generation, gas importation and storage and Oil & Gas.

The NICP also includes a significant amount of energy investment in the utilities sub-sector, with energy transmission and distribution assets included in this category, which was included as part of the energy sub-sector in previous releases of the National Infrastructure Pipeline. 96 utility projects and programmes are included in the pipeline, of which 66 are energy network investments totalling over £47bn.

In terms of value the NICP estimates that over £500bn (in 2015/16 prices) of investment from all sources is needed in the UK economic infrastructure sectors. The average project size is £690m, though this is in part driven by a small number of mega projects such as the £55.7bn HS2 project. A large number of projects in the pipeline, such as HS2 will be publicly financed, hence we reviewed the NICP to understand where the opportunities for private investment are currently thought to be.

#### **2.1.1. Nature of private investment opportunities in the NICP**

Out of the £500bn indicated in the NICP approx. £280bn is expected to come in the form of private investment. The vast majority of this will be in the energy sector, which accounts for around 90% of the private investment captured in the NICP.<sup>1</sup>

Out of the £270bn of private energy investments, £69bn is post 2020 investment in energy generation, £45.8bn is for three large nuclear generation projects (Hinkley, Moorside and Wylfa) and £45.6bn is investment in oil and gas related investments.

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<sup>1</sup> Note our definition of energy includes all sub-sectors included in the NICP's definition of energy plus electricity and gas network assets.

More than £100bn of the private investment relates to projects/ programmes involving assets that are subject to economic regulation in the energy, transport and water sectors. These investments will be made by large publicly-listed entities that are in a position to issue bonds to finance large capital investments.

The remaining approx. £180bn of private investment is seeking finance through a combination of on-balance sheet investment and investment that may need to make use of project financing approaches.

The 2014 NIP estimated that there will be £79bn of project financing opportunities in the future (this needs to be updated to reflect the additional investments indicated in the 2016 pipeline and the fact that TTT has since reached financial close). The main project financing opportunities included the three mega-nuclear generation projects and around £17bn of additional offshore and onshore wind renewable projects. Overall, as stated in a recent British Banking Association report (2015) many of the project finance opportunities are expected to be in the riskier greenfield assets, for often quite large projects.<sup>2</sup>

### **2.1.2. Issues with the existing pipeline?**

One of the obvious issues with the pipeline of opportunities for private investment is the dominance of energy projects/ programmes. In some of the economic infrastructure sectors, particularly flood defence, the expectation is that given the nature of the sector the investment will continue to be funded and financed by the public sector. However it is not necessarily clear why there are relatively so few investment opportunities in the UK transport sector – whilst in some of the transport sub-sectors, such as roads, government has currently taken the decision to provide the majority of financing it is not immediately clear why there should be only around £11bn of infrastructure investment that is expected to come from the private sector.

The remainder of this report reviews the main economic sectors to detail what arrangements are in place to develop the pipeline of opportunities and what, if any, features of the sector are limiting the availability of bankable projects.

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<sup>2</sup> BBA (2015). Financing the UK's infrastructure needs.

### **3. UK ENERGY INFRASTRUCTURE – A ROBUST PIPELINE**

This section outlines examples of how the energy projects have been developed and brought to market in the generation, transmission and distribution sub-sectors, highlighting the role of different institutions in the process. The section also discusses potential issues in the sector going forward.

#### **3.1. Private investment in energy infrastructure**

##### **3.1.1. Electricity generation**

Generation in Great Britain is a competitive market where firms are not subject to price control regulation. When the electricity market was privatised in 1989, the 14 regional electricity companies were created and were initially responsible for generation and supply in Great Britain. After a number of mergers and acquisitions, these vertically-integrated companies reduced from 14 to six, and became what is known as the “Big Six” energy firms, comprising Centrica, EDF Energy, E.ON, RWE, SSE and Scottish Power. These firms currently supply just under 90% of domestic customers and generate over 70% of electricity.<sup>3</sup> Other firms outside of the Big Six that have a considerable amount of investment in electricity generation (known as mid-tier generators) include Drax, GDF Suez, Intergen and DONG Energy.

Electricity generation companies use a range of instruments to access institutional finance. For example, several companies are listed either on UK or international stock exchanges (although several, including EdF Energy, continue to be state-owned companies). In addition, a number of bonds have been issued by these companies in recent years, with the Big Six currently having nearly £96bn bonds outstanding.<sup>4</sup> A number of project finance opportunities have also been present in the UK generation market, which has attracted equity finance primarily from utility companies, while debt finance has largely been provided by commercial lenders, public sector institutions such as EIB and GIB and (to a lesser extent) direct lending from institutional investors.

#### **What drives the pipeline?**

In recent years the pipeline has been driven by the government’s policy of decarbonisation. For example, as part of the Electricity Market Reform (EMR), the government developed mechanisms to support both investment in renewable generation (through CfDs) and

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<sup>3</sup> CMA (2016), Energy market investigation: Final Report.

<sup>4</sup> Bloomberg (2016). Note that several bonds have been issued in other currencies.



improving security of supply via the Capacity Market.<sup>5</sup> Both these mechanisms have played an important role in providing stable prices to generators which helps to limit the level of demand risk that they face, making their activities more attractive to a wider range of investors. In addition, the government has played a key role in driving investment in the offshore wind market.

## Onshore generation

Government schemes such as the Capacity Market and CfDs have helped to improve the overall bankability of onshore generation projects, given that they allow generators to obtain stable payments for providing capacity or energy, which in turn provides comfort to lenders regarding the level of demand risk faced. Because of this, if projects have been able to obtain a CfD or a Capacity Market payment, it is likely that they are able to obtain finance at a significantly lower cost of capital, whereas projects that are not awarded these contracts will be paid prices at prevailing market rates, which will result in less certain payments and in turn costs of capital are likely to rise.

While a considerable amount of new investment has taken place in renewable generation, supported by these mechanisms, other barriers can be challenging to overcome. Project developers of onshore generation installations with more than 50MW of capacity are required to obtain relevant consents, including development consent from the Planning Inspectorate for National Significant Infrastructure Projects (NSIPs) in England and Wales.<sup>67</sup> A number of these projects are therefore being developed on existing generation sites, allowing them to modify and extend their licences, as opposed to requiring a completely new application. For example, the Carrington Combine Cycle Gas Turbine in Greater Manchester is to be constructed on land where a previous coal power plant was located.

Onshore wind projects have also been required to obtain development consent for projects that are above 50MW capacity from the Planning Inspectorate, while projects that are below 50MW are required to obtain consent from local authorities under the Town and Country Planning Act 1990. However, recent developments by the government have attempted to ensure all onshore wind projects are required to obtain consent from local authorities as part

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<sup>5</sup> The Capacity Market provides electricity generators with a guaranteed payment to provide specified levels of electricity generation capacity to the market in order to meet high levels of demand during peak times, or face paying penalties. Contracts are issued via competitive tenders which take place four years prior to the required level of capacity. These capacity agreements are allocated via a multiple-round descending clock auction with a single clearing price. Ahead of the auction, the government announces the demand curve the auctioneer will use to determine the amount of capacity to procure, allowing it to trade off the quantity it procures with the cost of doing so.

<sup>6</sup> Planning Inspectorate (2008), Planning Act 2008.

<sup>7</sup> Note that projects in Scotland will be subject to a separate planning process which is the responsibility of Scottish Ministers.

of the Town and Country Planning Act 1990, as opposed to the Planning Act 2008. This aims to increase the role of local communities in determining whether onshore wind farms are built in their areas.

## Offshore wind

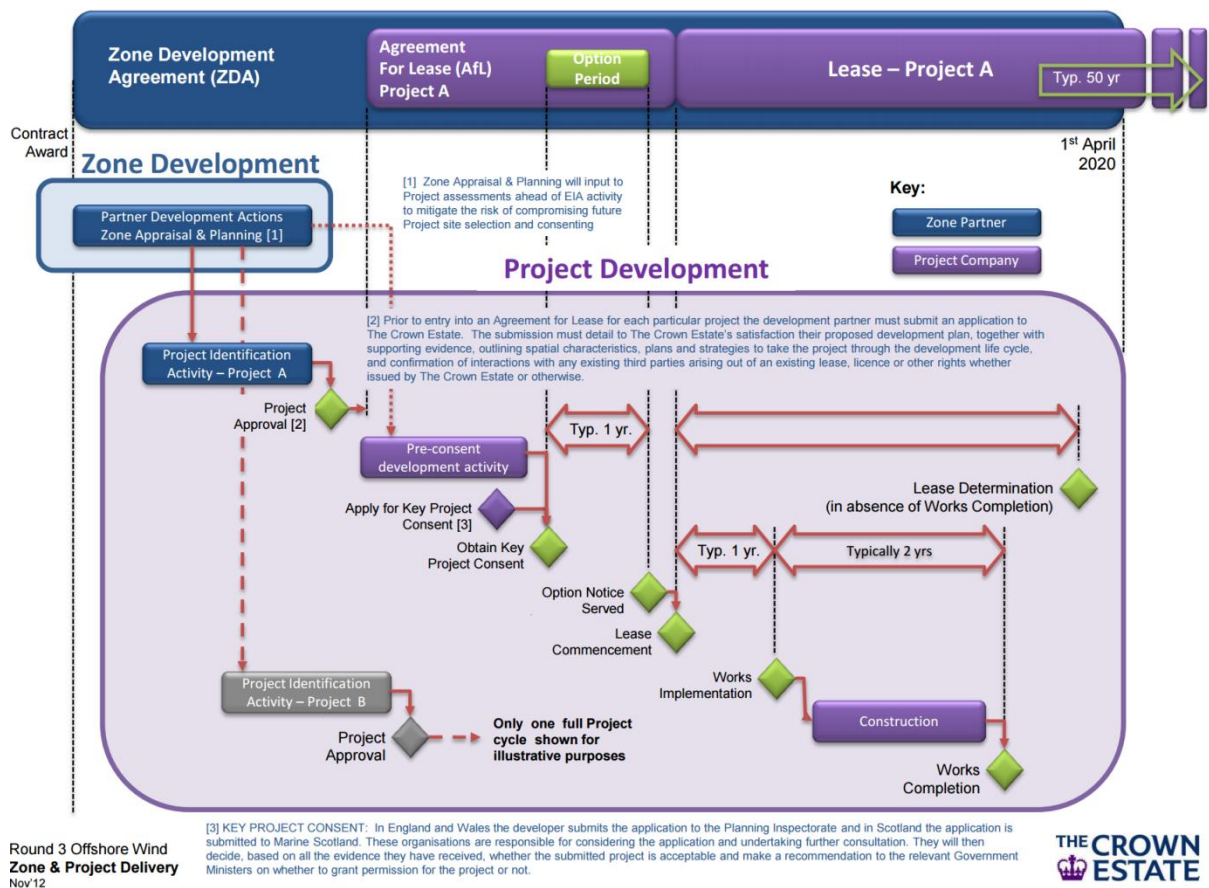
The government has placed offshore wind at the centre of its plan to increase low-carbon generation. While the cost of such projects is high relative to onshore wind farms, technology costs have fallen significantly over recent years and offshore wind farms do not need to overcome issues raised by local communities when developing the sites, as has been the case with onshore wind. Prioritising offshore wind has helped the UK become the global market leader in the sector, with the 5.7GW of capacity currently installed or under construction, making it the largest offshore wind market in the world.<sup>8</sup> The UK also consistently tops international rankings as the best place to invest in offshore wind.

A considerable amount of activity has taken place in recent years as a result of government efforts effort to improve project pipeline. For example, following DECC's Strategic Environmental Assessments (SEAs) in 2009 and 2011, it was confirmed that up to 33GW of offshore wind could be developed off British shores. Using the SEA as a basis, the Crown Estate identified nine development zones that would be most appropriate for wind farms. Once these zones were identified, each was competitively tendered whereby preferred bidders would be allocated leases which gave them the right to develop the projects within the specified zones. Developers were then responsible for selecting specific sites where the wind farms would be developed. This round of tendering was referred to as Round 3, and different from previous rounds as developers were normally provided leases on a project-by-project basis, as opposed to leasing out a number of different zones. This latter approach was adopted as it was believed that the case-by-case approach would not result in the uptake required to meet renewable energy targets. A diagram of the full project development process is provided below.

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<sup>8</sup> Department of International Trade (2016), UK Offshore Wind: Opportunities for trade and investment.

Figure 3.1: Round 3 project development process



Source: The Crown Estate.

In addition to acquiring leases and relevant consents, developers are required to source their own financing from the markets. While obtaining leases and consents is important for this, five offshore wind farms have also been allocated CfD contracts to help attract private finance.

### 3.1.2. Private investment in electricity and gas transmission and distribution

The greater role of low carbon generation has also called for higher investment in transmission assets. The majority of investment in the onshore transmission and distribution networks takes place via localised monopolies, who own significant parts of the network in different regions. For example, National Grid owns the gas transmission network in the UK and the electricity transmission network in England and Wales. Historically, it has also owned the gas distribution infrastructure in the Midlands, North West and East Anglia, although it recently sold 61% of its stake in these activities to a consortium backed by Macquarie, the Australian investment bank, and China Investment Corporation, China's sovereign wealth fund. SSE and Scottish Power own electricity transmission assets in Scotland while gas and electricity distribution is divided between localised monopolies.

Meanwhile offshore transmission assets are generally delivered as distinct projects and financed as part of the OFTO regime.

### **Onshore electricity and gas transmission and distribution**

Transmission and distribution companies are subject to regulation by Ofgem, whereby capital expenditure allowances are determined as part of the regulatory regime.<sup>9</sup> The company's capital expenditure risks are largely associated with regulatory determinations that affect company financeability. Crucially, investors are generally comfortable with Ofgem's performance as a regulator which has helped facilitate the extensive level of private investment in the sector. This has partly been achieved through Ofgem's consultative approach to the design of the key regimes and during price controls. For example, during the design of the RIIO regime, Ofgem consulted widely with stakeholders, who were regularly kept informed about Ofgem's views on how it should be designed and areas where improvements may be needed, including in being able to achieve financeability.

It is worth noting that project financing opportunities within the sub-sector have been limited, and therefore investment largely takes place on a corporate finance basis via stocks and bond issuances by companies.

### **The offshore transmission pipeline under the OFTO regime**

Ofgem was responsible for leading the development of the OFTO regime, which involved a large amount of consultation with the industry in order to determine what would make projects investable for the private sector. Following this extensive design phase, it was determined that projects in the initial tender round would be part of a "Transition Regime", in which investors would bid for the right to finance, operate and maintain the assets while developers would be responsible for obtaining relevant consents and also for construction.

For future regimes, initial plans were for OFTOs to be tendered under an "OFTO Build" arrangement, whereby the OFTOs themselves would be responsible for constructing the asset, rather than use the generator-build approach.

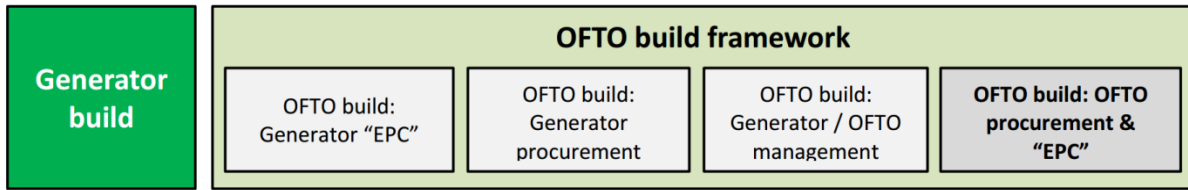
When generators were allowed to select the generator build or OFTO build tender as part of TR3, generators opted for the generator build approach, and no projects have been tendered as an OFTO build to date, despite Ofgem and the government hoping that this approach would be used. The reason why this approach has not been used as developers often would like to have control over the whole construction process and avoid interdependency risks.

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<sup>9</sup> As part of RIIO, the current regulatory regime in the energy sector, companies are required to submit total expenditure (totex) requirements, and a capitalisation rate is applied to this. In the previous regulatory regime (RPI-X), capital and operating expenditure was determined separately.

Ofgem has even introduced a range of tender models that can be used for tendering OFTOs under the OFTO Build model, as shown in the figure below.

Figure 3.2: OFTO Build models



Source: Ofgem (2014).

While the OFTO is still responsible for construction under each of the different OFTO Build options, each differs in the degree of control the OFTO will have over procurement and construction. For example:

- Under the **Generator EPC** option, the generator carries out all the supply chain procurement and manages construction under an EPC contract with the OFTO.
- For the **Generator procurement** option, the generator carries out elements of supply chain procurement but the OFTO manages construction under an EPC contract with a third party.
- Under the **Generator/OFTO management** option, the generator splits responsibility for managing construction of the transmission assets with the OFTO (e.g. across onshore/offshore elements).
- Under the **OFTO procurement & EPC** option (or the 'late OFTO build' option), the OFTO will deliver procurement of the transmission assets and construction elements of the build programme, after the generator has completed pre-construction works, including consenting.

In addition to these options, Ofgem has previously outlined the 'early OFTO build' option, whereby the OFTO would be appointed following initial scoping work by the generator, and would be responsible for all aspects of pre-construction, consenting, procurement, construction, operation and decommissioning of the assets.

In addition to introducing the enduring regime as part of TR3, Ofgem also reduced the number of application stages to help introduce efficiencies into the tender process. For example, for TR1 and TR2, both a Pre-qualification (PQ) and Qualification to Tender (QTT) stage were undertaken. For the PQ stage, bidders were required to submit summary information on their experience and capabilities, demonstrating that they were capable of taking over the asset and assuming the responsibilities and duties associated with being an OFTO licensee. For the QTT stage, bidders were required to submit generic and project-specific information which

were assessed against a number of criteria that were a combination of financial and operational information. Rather than undertaking the PQ and QTT stages separately, Ofgem combined these stages for the TR3 to increase efficiencies in the process (known as the Enhanced Qualification to Tender stage), and intend to keep this approach for the future tender rounds.

Based on QTT submissions, then identified a shortlist of bidders who undertook detailed due diligence and finalised their tenders (Invitation to Tender (ITT) stage). Following this, bidders could be required to submit a Best and Final Offer (BAFO) if Ofgem could not identify a preferred and reserve bidder. Once a preferred bidder was appointed, a period for confirmatory due diligence, final credit approvals and finalisation of transfer documentation would take place. This would then be followed by a 28 day consultation to incorporate OFTO specific provisions and following this financial close would be reached.

Ofgem's consultative approach and tendering of OFTOs has been praised widely by investors, who have noted the following aspects as being particularly important:

- **Consultative design phase** – Ofgem posted regular updates of how OFTOs would be designed, regulated and tendered throughout the process, which kept investors informed on what was being tendered and how returns could be made.
- **Transparent tender process and pipeline** – Ofgem has tendered projects across different tender rounds, making the process manageable for bidders, while also ensuring that they feel it is worthwhile getting to know the sector. Prior to the launch of tender rounds, Ofgem holds investor days to notify potential bidders of upcoming opportunities and any changes to the regime, and also maintains an open-door policy to investors.
- **Standardised licensing and tender regulations** – By creating a standardised asset in terms of what is included in the licence and how projects will be tendered, Ofgem has created a programme of opportunities that is attractive to investors.

The design of the regime and Ofgem's approach to bringing projects to market has resulted in a considerable amount of private investment and the creation of an "OFTO asset class".

### Subsequent lessons for other transmission regimes

Following the success in attracting private finance into OFTOs, Ofgem is currently working with the market to develop the Competitively Appointed Transmission Owner (CATO) regime. As part of this, Ofgem have been engaging with the market through the design process to allow stakeholders to comment on different aspects of the regime. By notifying the market of how the CATO licences will be structured, investors are already aware of upcoming market opportunities and therefore are able to incorporate this into their investment strategies.

Ofgem has also adopted a consultative approach to the design of the cap and floor regime for interconnectors. For example, Ofgem has recently responded to market feedback to make project finance opportunities feasible should projects be structured in this way.<sup>10</sup> This has resulted in a wider range of investors being attracted to the sector and a number of market participants have commended Ofgem for introducing these options. Further details of the cap and floor regime are provided in Annex A of our review of the complementary infrastructure financing market report.

### **3.2. Key issues for private sector investment**

As shown in Section 2 of our review of the infrastructure sector, the energy sector has benefited in relatively high levels of private sector finance in recent years, particularly in renewables. Network infrastructure has also benefited from large levels of institutional investment.

In the energy sector public sector bodies such as Ofgem and DECC have played an important role in developing an environment that is conducive to creating a pipeline of private financing opportunities. This has included the development of wider programmes with standardised project structures that are attractive to bank and institutional investors. Network assets have also benefited from stable regulatory frameworks that has facilitated private sector investment at relatively low rates of return. Ofgem's institutional capacity with respect to supporting wider programmes of activity and its role in network regulation has resulted in investors seeing it as a reasonable stakeholder to engage with, which has helped attract investment into the sector.

As noted in Section 2.1, a large proportion of future infrastructure investment is expected to take place in the energy sector. This includes large and complex projects such as Hinkley Point C and other nuclear power plants. While our consultations have suggested that sufficient amounts of finance are available for investment grade assets, it is probable that projects of this size will require the use of a public support mechanism to make them suitable for private sector finance.

This has recently taken place on some energy projects, with Hinkley Point C and a number of other generation projects benefiting from UKGS guarantees, while some future generation projects have also been awarded CfDs or will receive additional payments under the Capacity Market regime. These mechanisms can result in additional costs to customer energy bills, therefore it will be important to ensure that these costs remain controllable going forward. This is partly being achieved through DECC's Levy Control Framework, which has been put in

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<sup>10</sup> Ofgem (2015), Open letter: Financing electricity interconnectors under the cap and floor regime.

place to cap the cost of levy-funded schemes, including CfDs. However, the Capacity Market is currently not covered under this arrangement, although the NAO has stated this will need to be closely monitored given that it is expected to cost customers £1bn-£3bn by 2017/18.<sup>11</sup> This demonstrates that attracting private finance and ensuring affordability needs to be carefully balanced going forward.

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<sup>11</sup> NAO (2016), Controlling the consumer-funded costs of energy policies: The Levy Control Framework.



## **4. UK TRANSPORT INFRASTRUCTURE – LACKING A CLEAR PIPELINE**

Through a collection of case studies, this section takes an in-depth look at financing new investment in the transport sector, specifically the rail, road and airport sub-sectors. First, it sets out the arrangements which have facilitated private sector investment in each sub-sector over the past 10 years. Second, it examines whether there are barriers which limit the attractiveness of transport projects to private investors, with a particular focus on the development of forward-looking investment pipelines.

### **4.1. Private sector investment in transport projects**

This section reviews the existing arrangements for private investment in each of the main transport sub-sectors below.

#### **4.1.1. Rail**

The experience of privatisation in the UK rail sector demonstrated the difficulty in increasing private sector participation whilst maintaining quality of service delivery. A variety of arrangements evolved over time to facilitate private sector financing of new infrastructure. Examples include the creation of rolling stock leasing companies (ROSCOs), a spectrum of PPP arrangements and the delivery of small enhancement projects through the franchising of freight and passenger operating services. Nonetheless, the majority of new investment and maintenance of track infrastructure is carried out by Network Rail and is publicly financed. Recent private sector investment has generally been characterised by very large but infrequent projects, such as the Thameslink and IEP rolling stock procurements. The section below explains these arrangements in outline, the most important of which are discussed in more detail in annex A.5 of our supplementary report, *Background evidence: Review of the UK infrastructure financing market*.

#### **Evolution in the procurement of rolling stock**

Rolling stock is mostly owned by three ROSCOs which were created during the privatisation process: Eversholt, Porterbrook, and Angel. The train operating companies (TOCs) which operate passenger services lease train fleets from the ROSCOs, often for the length of their franchise.

ROSCOs are responsible for procuring and financing the rolling stock. The arrangement is a form of operating lease style financing where the ROSCOs obtain syndicated debt finance from a group of banks which they repay over time using the funds gained from the lease and maintenance payments from the TOCs. Decisions on whether to invest in new fleets are taken

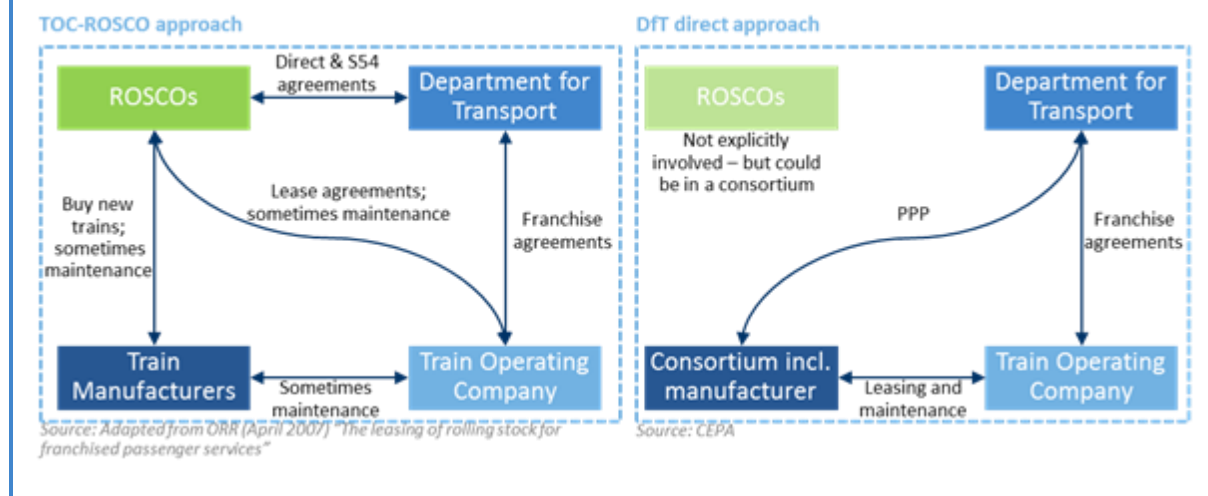
by the ROSCOs, but in practice they work closely with the TOCs during franchising competitions to understand their future rolling stock requirements.

The left panel in box 4.1 below outlines the arrangements between the ROSCOs, TOCs, train manufacturers and government under the traditional model.

#### Box 4.1: Rolling stock models of procurement

Figure 1 below outlines the traditional rolling stock approach, where TOCs will request and then lease new rolling stock from the ROSCOs. It also shows an alternative model of rolling stock procurement, which DfT has used to directly procure new rolling stock for the IEP and Thameslink projects, including the involvement of private finance.

Figure 4.1: The traditional rolling stock model, and that used in the IEP and Thameslink projects



In practice, the operation of the rolling stock leasing market had limitations which inhibited competition between the ROSCOs, for example the limited number of alternative fleets available to TOCs when bidding for rail passenger franchises.<sup>12</sup> The Thameslink and IEP rolling stock procurements presented an opportunity to test an alternative model. A DfT-led procurement was thought to offer the best value for money because the orders were too large relative to the size of the ROSCOs, such that the ROSCOs would not have been able to finance them. Both projects also involved bespoke designs that were complementary to ongoing track infrastructure upgrades which DfT were sponsoring.

Instead of the traditional operating lease style financing, the Thameslink and IEP commercial structures borrow heavily from PPP models where a private sector consortium is procured to design, build, finance and maintain the trains (and depots), and the TOCs are separately contracted to operate services via their franchising agreement with the government. To varying degrees, the contracts also transferred more performance risk to the consortium than

<sup>12</sup> Rolling stock leasing market investigation, Competition Commission (April 2009)

a standard ROSCO arrangement by structuring the payment stream under the contract to include usage payments that could be reduced if performance fell below certain standards.

The right panel in box 4.1 above outlines the arrangements between DfT, the consortium and train manufacturer under the DfT-led procurement approach.

The IEP and Thameslink deals were popular with investors because of the availability-based PPP structure with which the market was already familiar. The debt financing requirements in the initial transactions were oversubscribed and, subsequently, pension funds have become actively involved with this model.

The size of Thameslink and IEP should reduce the market power of the ROSCOs and introduce more competitive pricing pressures for existing fleets. They also helped to reduce the costs of the design and production of subsequent new fleets, as the manufacturers were able to use similar designs in other orders. Overall, the DfT-led approach was a success although it had some teething problems, such as delays in concluding negotiations between the banks on the final documentation, and the degree of leverage available to DfT over the preferred consortium at financial close.

Although DfT would prefer the industry to lead rolling stock procurement and develop its own pipeline, these deals have contributed to a new interest in rail amongst private financiers, which suggests there are opportunities to attract more private capital. A potential issue to explore is to what extent an oversupply of rolling stock could emerge which makes future deals more difficult.

## **4.2. Rail - an evolving approach to funding and financing new lines and extensions**

### **4.2.1. TfL Experience**

#### **Funding major infrastructure**

New rail infrastructure is typically financed by the UK government, delivered by Network Rail and funded by a combination of taxpayers and through user charges from rail passengers.

Sometimes, however, discrete projects can be carved out to be delivered using a different approach. One is Crossrail, which is financed by the UK government and a £1bn loan from the EIB, since the large upfront capital cost and long construction period meant that attracting private finance was not viable. But over time the project will be funded from a mixture of public and private sources to reduce the ongoing burden on the taxpayer, specifically:

- future farebox revenues generated by Crossrail services: £1.9bn;
- DfT grant: £4.8bn;
- Business Rate Supplement (BSR) (2 pence supplement levied by the GLA): £4.1bn;

- Network Rail work: £2.3bn;
- property income: £0.5bn;
- developer levies: £0.6bn; and
- private contributions among which Canary Wharf Group (£150m), Heathrow (£70m), City of London (£250m) and Berkeley Homes (£30m): £0.6bn.

The London Underground Northern line extension of the Charing Cross Branch, which involves two new stations at Nine Elms and Battersea Power Station, has built on the Crossrail approach. The project is financed by the Greater London Authority (GLA) through a £1bn loan from the Public Works Loan Board and a £480m long-term loan from the EIB. Like Crossrail, the project will fund the loan repayments from a mixture of public and private sources, specifically contributions from property developers in the Vauxhall, Nine Elms and Battersea Opportunity Area and the incremental business rates generated. The incremental business rates take advantage of the consequential increase in property value in the Opportunity Area. This approach is known as tax increment financing and is being used for the first time for a major infrastructure project in the UK.

Despite growing pressures on the network, ongoing constraints to the public finances and existing commitments to Network Rail and High Speed 2 are likely to limit the ability of government to finance and fund the necessary pipeline of new rail infrastructure in the future. Crossrail 2, which is currently estimated to cost between £27bn and £32bn in 2014 prices, is likely to follow and expand on the funding arrangements used in Crossrail 1 and the Northern line extension. The project is at a very early stage of development and no decision has yet been taken on funding, but the Treasury has indicated that over 50% of the cost should come from sources other than the UK government. London First, the business lobby group, has proposed a menu of sources including additional fare-box, developer contributions, capturing the value of more intensive residential and retail development, council tax and business rate supplements, and tax increment financing (TIF). This suggests that the Crossrail 2 package is likely to include a wider range of funding sources than the first Crossrail project.

During our interviews with investors, a number of them raised an interest in High Speed 2 and the opportunities it presented. The government is proceeding on the assumption that HS2 will be publicly funded and, whilst it continues to investigate private financing and third party funding<sup>13</sup>, the most appropriate options are probably a future infrastructure concession in the style of HS1, and funding contributions from property developers, businesses, local authorities and others who would directly benefit from the development HS2 generates.

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<sup>13</sup>[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/286797/financial-case-hs2.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/286797/financial-case-hs2.pdf)

## Property-led approach

TfL has begun to demonstrate approaches of extracting value from property to reinvest in the transport network that could be replicated by Network Rail and HS2 Ltd.

It has entered into a number of joint venture style arrangements with real estate developers to fund the delivery of transport improvements around the Westfield shopping centre and the extension of the London Overground to Barking Riverside. It has also developed arrangements which see private developers invest in TfL's property portfolio to help generate commercial revenues from its estate. This approach is now being used by TfL to develop 50 owned sites over the next ten years with 13 property partners.

We draw four main lessons from TfL's property-led approach. First, it reduces the burden on the public sector to fund new transport infrastructure, but it still requires the public sector to finance the up-front investment. Second, it needs significant government support beyond funding and financing. Government needs to have the commercial capability to deliver property ventures and be joined-up with other public sector actors, for example to secure planning approvals. Third, as with other areas of rail infrastructure, it is easier to secure private sector involvement in stand-alone projects with few interfaces (e.g. Barking Riverside extension, Westfield). However, integration with operational assets is not impossible since there are already residential/commercial development companies who are also experienced rail infrastructure contractors working for Network Rail. Finally, there is a lot of interest in rail given perceived under-utilisation of public assets and because investors believe these sites are ripe for development and intensification of use.

### 4.2.2. Private investment in the classic rail network

Other examples involving enhancements to operating rail assets demonstrate that the delivery of infrastructure projects by organisations other than Network Rail is only likely to be practicable under certain conditions. One example where these conditions were present is the Evergreen programme, a series of infrastructure enhancements delivered by Chiltern Railways under its franchise agreement with DfT, although the final phase of the project was taken over by Network Rail. The characteristics of this which enabled it to work are:

- A long-term franchise which enables works to be fully remunerated. Given the upfront costs involved, the longer the franchise period, the longer the TOC has to make a reasonable return on investment during the period of its franchise. If the franchise period is not long enough to make a reasonable rate of return, the TOC has insufficient financial incentive to undertake the project. Chiltern Railways was able to extend its franchise agreement to 20 years.

- A reasonably isolated network. This makes it more straightforward to plan and undertake disruptive engineering work and reduces the number of parties who will have a direct interest in the infrastructure changes. Chiltern has some interface with other operators, but it is limited compared to other routes.
- A network with potential / opportunity for growth, both in terms of asset expansion, and in terms of potential passenger demand.

Chiltern financed the infrastructure works associated with Phase 2 of the project with a loan facility arranged with a commercial bank. The completed assets were transferred back to Network Rail and added to the RAB which Network Rail was allowed to recover through an additional track access charge.

Chiltern was also supposed to finance and deliver Phase 3, but the project was less successful and highlights the specific conditions which make private sector investment viable. Chiltern, which lost engineering and managerial expertise during a change in ownership from John Laing to Deutsche Bahn, underestimated the additional size and complexity of the project and were unable to manage their main contractors. Other factors were to an extent uncontrollable, such as the lack of private finance available due to the financial crisis which led Chiltern to seek funding from Network Rail.

Overall, the Evergreen experience indicates that there can be private sector appetite for infrastructure projects in the right circumstances. But the conditions on the Evergreen project are quite unique, which may limit the scope for a repeatable pipeline of opportunities on other routes.

### **Infrastructure concessions**

High Speed 1 (HS1) Ltd has a 30-year concession to operate maintain and renew the railway between St Pancras and the Channel Tunnel. HS1 is the UK's only current railway infrastructure concession although others have been considered. The deal closed on 5 November 2010. The successful consortium comprising Borealis and Ontario Teachers Pension Plan, will pay the government a total concession value of £2.1 billion over the life of the concession. Borealis consider that HS1 operates in an attractive and stable regulatory environment with good long term visibility on inflation-linked cash flows.

Important features of HS1 include:

- It being until recently the only significant example of pension fund investment in UK rail (there has since been some investment in rolling stock).
- The transfer of some demand risk (international train paths) but Government effectively underpins 60% of usage via commitments to service levels on the domestic network. Revenue from car parking and retail etc. remains unregulated.

- The concession has a regulatory dimension in that ORR undertakes a five yearly price control review of the cost efficiency of operations, maintenance and renewal and sets an associated charge. The first such review took place in 2013.
- An important part of the architecture is that the regulator may not adjust or amend the Investment Recovery Charge which recovers the initial capital cost of the line.
- As all the assets were relatively new at the concession start date the concessionaire is required to build a renewal fund over time.

The concession has gone well to date. In its 2015 performance report ORR noted that HS1 performance during the year exceeded regulated targets. Its data monitoring continued to improve and it achieved greater efficiencies than were originally assumed, with savings being passed on to the train operators in the form of lower charges. In 2014-15, traffic volume on the HS1 network also increased due, in part, to a significant increase in freight traffic.

HS1 perhaps provides a model that could be applied to other relatively separable parts of the UK rail network including East-West Rail, the proposed new link between Oxford and Cambridge, for which the Transport Secretary has recently confirmed that he will establish “a new and separate organisation, to accelerate the permissions needed to reopen the route, and to secure private sector involvement to design, build and operate the route as an integrated organisation”.<sup>14</sup>

### **4.3. Investment in the road network**

Road projects are usually publicly financed. Investment in the strategic road network is delivered by Highways England and financed by government through a 5-year capital expenditure settlement. Highways England has an agreed programme of major works over the that totals over £15bn of capital expenditure across 112 schemes until 2020/21.<sup>15</sup> Local authority road maintenance is also financed by government through a 6-year capital allocation and is delivered by local transport authorities.

The private sector previously had greater involvement in financing road investment. Between 1996 and 2009, the Highways Agency (predecessor to Highways England) entered into 12 PFI contracts for the design, build, finance and operation of sections of the strategic road network.<sup>16</sup> The most recent PFI deal was the widening of the M25, for which the Highways Agency ran the procurement itself to award a 30-year contract to design, build, finance and operate the project (see annex A.7 of our infrastructure financing report<sup>17</sup>). Although these

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<sup>14</sup> <https://www.gov.uk/government/speeches/rail-reform-future-of-the-rail-network>

<sup>15</sup> *Road Investment Strategy: for the period 2015/16 – 2019/20*, Department for Transport (March 2015)

<sup>16</sup> Highways England Annual Report and Accounts 2015-2016

<sup>17</sup> *Background evidence: Review of the UK infrastructure financing market*

commitments are ongoing, we understand that due to value for money concerns around legacy PFI deals, Highways England has no plans to enter into new contracts for the foreseeable future. During our interviews with commercial lenders they consistently pointed us to other countries with a stronger pipeline of road PPP projects and questioned why this approach was not suitable for the UK. It also unclear whether local authorities will sign additional highways maintenance PFI deals beyond the existing commitments undertaken by Birmingham, Sheffield, Hounslow and the Isle of Wight.

More recently, the Mersey Gateway Bridge is being delivered under a PPP arrangement, led by Halton Borough Council ("Halton"). Halton contracted a consortium to design, build, finance and operate the bridge over 30 years. The consortium raised a finance package which included wrapped senior bonds which are listed on the Irish Stock Exchange, but the project also required the assistance of the UK Guarantee Scheme to access the volume of private finance necessary. Halton agreed to a 12-year operating grant settlement from the UK government which, along with tolls charged on users, will enable it to fund unitary charge payments to the project consortium.

#### **4.4. Private investment in airports**

With the exception of locally authority ownership shares in some regional airports, airports are almost entirely privately financed. Much of that finance is obtained from institutional investors via bond markets and secured against the corporation and its airport assets.

Airport infrastructure is attractive to investors because it has a clear revenue stream attached to it in the form of airport charges. Heathrow and Gatwick, the two regulated UK airports, are particularly attractive because of the stability of their regulated revenues. The regulatory regime subjects capital investment planned by Heathrow and Gatwick to a price review process, but seeks to ensure that efficient investment can be added to the respective RABs and investors can receive a return on capital set by the regulator.

This is a stable framework which ensures that the operator is financeable in the private markets. Heathrow and Gatwick are owned by high-profile institutional investors and sovereign wealth funds, and able to tap a broad range of debt finance. Within Heathrow's capital structure, the holding company is able to issue bonds currently rated at BB+(S&P)/Ba3 (Moody's) - non-investment grade - but the airport subsidiary (Heathrow Funding Ltd) issues tranches of Class A and B bonds mortgaged over the airport's assets currently rated at A-/BBB respectively (upper/lower medium investment grade).<sup>18</sup> Gatwick has an ongoing £5bn multicurrency programme for the issuance of bonds to finance, among other things, the airport's on-going capital expenditure programme. The company's senior secured notes are

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<sup>18</sup> Presentation to 2012 Citi European Credit Conference, Heathrow (November 2012)



currently rated at BBB+ and has access to revolving bank facilities and medium term bank debt.

Regional and local airports have less market power and are not subject to economic regulation, which means their revenues can be less stable. Decisions on capital investment are taken by the private operators on grounds of commercial viability. Manchester Airport Group owns four regional airports which provides some diversification of revenues. The parent company has a capital structure which is similar to Gatwick, with a £5bn bond issuance programme rated at BBB+, revolving bank facilities and medium term bank debt. Birmingham airport is also able to finance itself through bond issuance, and has a range of private placement notes outstanding with maturities between 10 and 25 years. Smaller regional airports, for example Edinburgh, are owned by specialist infrastructure investors and finance themselves with term loans arranged with a syndicate of banks and institutions, and revolving bank facilities.

We draw two conclusions from the airports sector. First, it already functions well as a fully privately financed and funded industry and we cannot see any rationale for government support beyond the gradual evolution of the regulatory framework, which facilitates good investor visibility of the future investment pipeline. Second, we think there is limited scope to extend the model to other parts of the transport sector because there is a clear private revenue stream attached to airports where there is currently less of an opportunity to rely fully on user charges model in other transport sectors.

#### **4.5. A lack of clarity over the future transport pipeline is a major barrier to privately financed investment**

In the previous section we discussed how under the right conditions transport projects can and do attract private finance. But it also demonstrated that the regimes are quite different and often bespoke, even within the sub-sectors. This means that private investors, particularly more risk averse institutional investors, have to invest a lot of time in getting to understand each project and its regime.

Many of our interviewees stressed the argument that investing the time involved in bidding for a project and hiring the necessary expertise to appraise project risks is only worthwhile if there is a planned programme of repeatable bidding opportunities, or if the project on offer is sufficiently large to stand on its own. Whilst many of the specialised infrastructure investors and experienced project finance banks have existing expertise in-house, institutional investors often do not (although this may be changing).

The investment and construction industries have made repeated calls for government to improve the visibility of the future pipeline of infrastructure projects which could be privately

financed and the underpinning policy. Since the National Infrastructure Plan (NIP) was first set out in 2010, this has been an iterative process. In March 2016, the government set out its latest infrastructure pipeline, but it is notably thin on privately financed transport projects and light on detail. TfL is considering a privately financed approach for the Silvertown Tunnel and Lower Thames Crossing. Our interviews with potential investors repeatedly highlighted that the NIP needs to progress from a list of forthcoming infrastructure projects into a pipeline with enough detail on each individual project for investors to understand the anticipated revenue stream, how risk will be allocated between the parties, the size of the asset and estimated capital expenditure, and the estimated timescale for reaching financial close.

Beyond this very limited selection, future opportunities may be linked to the Heathrow third runway, High Speed 2 and Crossrail 2, although the latter two will likely proceed on the assumption of a very significant proportion of public financing. With regard to funding existing commitments to new infrastructure, the government has made welcome steps towards arranging longer term settlements, with capital expenditure allocated until 2021. This helps to create greater certainty that projects will go ahead in the rail and roads sectors, where it is the main funder.

Nonetheless, the investors we interviewed consistently replied that the UK was behind other countries and cited the Netherlands as an example (see Annex A). The Netherlands has a detailed pipeline of roads PPP projects. Projects are announced fairly early in the development process to facilitate market engagement. The repeatable pipeline also helps to attract potential bidders, as if they are unsuccessful at their first attempt, the cost of preparing a bid can be spread across several opportunities and reduces the cost of bidding in later rounds. The pipeline is developed in a more systematic way: all infrastructure projects must undergo the “market scan” stage which takes an initial view of the potential value of getting private parties involved in the project, and the likely best form of that involvement.<sup>19</sup> Any transport infrastructure project which is expected to cost more than €60m must be considered for a PPP and undergo the comparison process, through the construction of a public-private comparator (PPC)<sup>20</sup> which looks at the costs of implementing a project through different approaches, comparing the public and private assumptions of costs.<sup>21</sup> The PPC decides if the project should enter the pipeline, and so projects enter the PPP pipeline at an early stage, labelled as potential PPP projects.<sup>22</sup>

The absence of a repeatable pipeline in parts of the UK transport sector is a disincentive to institutional investors building in-house capacity capable of assessing the risks involved in

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<sup>19</sup> Dewulf, G. & Blanken, A. & Bult-Spiering, M. (2006) “Strategic issues in Public-private partnerships”

<sup>20</sup> Government of the Netherlands ([Online](#), accessed Dec 2016) “Public-Private Comparator Manual 2013”

<sup>21</sup> Rijkswaterstaat (Nov 2012) “Evaluating Value for Money: Auditing Public Private Partnerships”

<sup>22</sup> Hebly, J. , & Klijn, M. (2016) “The Netherlands: Public-Private Partnership in the Netherlands”

individual projects. Whilst there is growing interest in transport infrastructure amongst institutions, the path to improved capability could be accelerated if the pipeline was beefed up with more opportunities.

Investors also consider the capability of the public sector counterparty as important. Interviewees expressed a common desire for the public sector to minimise the cost of bidding for projects by hiring capable staff and establishing a clear and transparent process. Three key messages stood out to us as important to investors.

First, bid development is expensive but timelines can be shortened by engaging potential investors early in the development process to test market appetite and turn projects into investible propositions. Second, it helps to understand the procuring authority's attitude towards project requirements which are known and those that are flexible can be developed through dialogue. Third, using a "competitive dialogue procedure" can shorten the timeline by allowing bidders to make interim draft submissions of elements of their bid prior to final deadline.

Some public bodies are already ahead of others – both DfT and TfL have internal corporate finance units which support privately financed projects under their respective mandates through the procurement and contracting stages. They can also draw upon central government relationships through the Infrastructure and Projects Authority. Other public sector organisations and regulators, for example Network Rail, have less expertise and without upskilling their internal resources this could place the successful delivery of major infrastructure projects at risk.

## **5. ENERGY FROM WASTE, TELECOMS AND WATER PIPELINES**

This section makes use of desk-based research to review the development of the energy from waste, telecoms and water pipelines.

### **5.1. Energy from waste**

This section assesses energy-from-waste (EfW) investment in the UK. The box below summarises the key points on the sector.

#### **5.1.1. Background**

EfW is the process of generating energy (i.e. electricity, heat, gas or biofuel) from the treatment of waste materials. This is distinct from biomass generation using feedstocks grown specifically for that purpose, though in practice EfW plants may use a mix of waste and non-waste feedstocks. Waste inputs often come from municipal sources, and contracts to generate energy from municipal waste are typically awarded by local authorities as long term (around 25 years) concessions on a design, build, finance, maintain and operate basis. These contracts often include other waste management services such as sorting and recycling.

The introduction of landfill diversion targets in the mid-1990s helped to increase interest in EfW technologies. Since then, the UK Government has developed a more coherent policy underpinning by launching several schemes to support investments in renewable generation and EfW, including:

- direct investment through the Green Investment Bank, focusing on projects that would struggle to find conventional finance, such as those looking to utilise commercial waste or innovative technologies;
- funding towards research and demonstrator level projects from organisations such as WRAP and ETI;
- Waste Infrastructure Credits worth £1.7bn were earmarked for 28 local authorities to co-fund around a third of the cost of waste management PFIs - paid over the course of the contract (the scheme was curtailed and provisional credits withdrawn after the 2010 Spending Review);
- Feed-in-tariffs, renewables obligation, and renewable heat incentive schemes described in section 3; and
- the incentive provided by the tax on waste sent to landfill.

### 5.1.2. Private sources of EfW investment

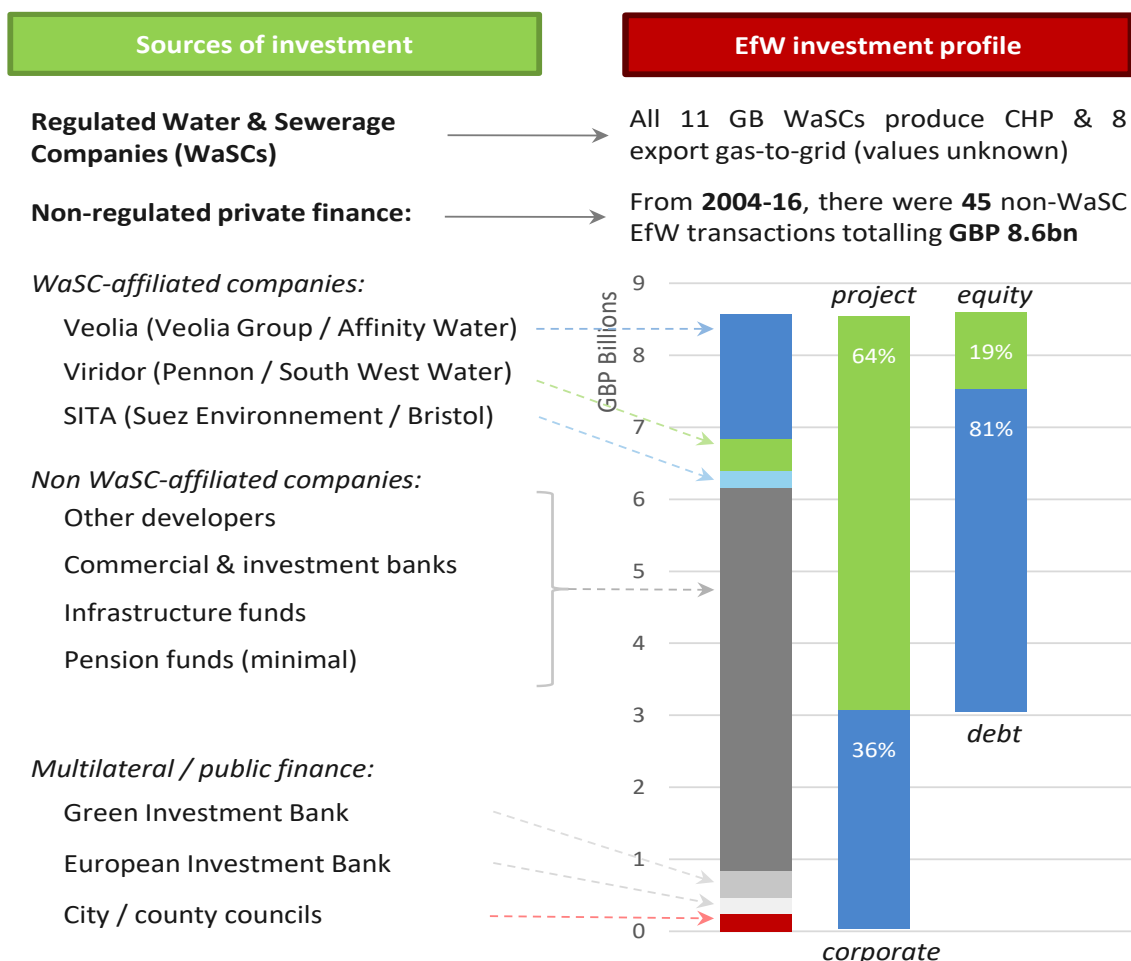
EfW projects in the UK have attracted increasing volumes of investment from a range of sources over the last decade, including:

- Regulated UK Water and Sewerage Companies (WaSCs);
- WaSC-affiliated non-regulated environmental service companies;
- Non-WaSC-affiliated companies - that is, a mix of developers, construction firms, banks, infrastructure funds and a very small amount of direct investment from institutional investors; and
- Public / multilateral lenders - including the UK's Green Investment Bank (GIB), the EIB; and some debt contributions from county/city councils.

Figure 5.1 illustrates a summary of EfW investments made in the UK since 2004. During this period the IJGlobal database records 45 EfW transactions that reached financial close. However, this does not include EfW facilities built by regulated WaSCs without drawing on public capital markets. This data is not publically available, but we understand that all 12 UK WaSCs have CHP facilities, six export biogas to the grid from anaerobic digestion (AD) facilities, and two others are currently developing AD gas-to-grid plants.

Figure 5.1 may overstate the volume of EfW investment from non-WaSC companies, since some EfW-related projects include other activities. For instance, an EfW facility might be constructed as part of a wider waste treatment PFI including sorting, recycling and landfill. However, for the purposes of this analysis it gives a reasonable overview of investment into the sector.

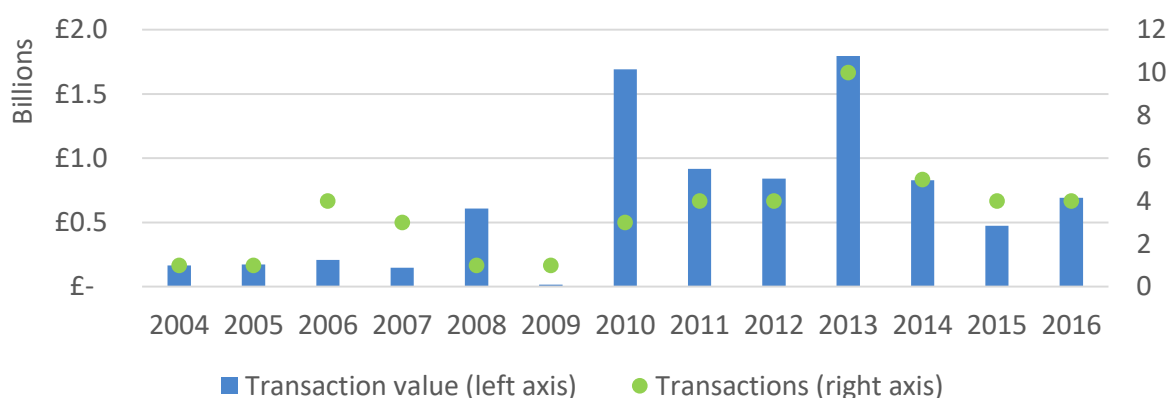
Figure 5.1: Overview of UK EfW investment



Source: IJGlobal; CEPA analysis

Figure 5.2 shows the value and number of UK EfW financings that reached financial close between 2004 and 2016 - not including those undertaken by regulated WaSCs on their own balance sheets. It is subject to the same caveat as the data presented in figure 5.1 since facilities are often financed alongside larger waste PFIs. The figure suggests that there has been a healthy pipeline of EfW financings since 2010, perhaps in response to initiatives such as Feed-in tariffs, the Commercial Renewable Heat Incentive, the Renewable Obligation scheme, and steady increases to landfill tax rates. However, it also appears that the investment pipeline may already have peaked in 2013 following curtailment of grant support to local authorities for waste PFIs and withdrawal of credits from three EfW projects shortly before financial close.

Figure 5.2: Value (left) and number (right) of EfW transactions recorded between 2004 and 2016



Source: IJGlobal; CEPA analysis

Aside from regulated WaSCs, a range of distinct investor groups have contributed to financing EfW projects, which we discuss in more detail below.

### WaSC-affiliated project developers

According to IJGlobal's database, 28% of non-regulated EfW investment since 2004 was provided by one of three environmental-service providers affiliated with UK WaSCs (Veolia, Viridor, SITA). These are companies under the same group as a regulated WaSC, but which are not regulated themselves. In some cases there is a degree of overlap between the two which requires regulatory oversight (e.g. if a WaSC buys services from its non-regulated affiliate). Otherwise the most pertinent difference is that WaSC-affiliated companies may be able to draw on the extensive resources of the group to negate the need to involve public capital markets. For instance, Veolia Environmental Services (UK) Plc (UK branch of Veolia Environnement Group that also owns Affinity Water) undertook £1,724m of EfW investment across five projects during the 2004-16 period - all five of which used corporate finance from Veolia only.

The UK EfW sector is therefore sufficiently mature to be receiving a large proportion of investment direct from company balance sheets.

### Other private investors

EfW facilities being built using project finance are typically developed by an environmental services contractor with support from a bank consortium or multilateral lenders (see below). To-date, there has been very little engagement from institutional investors. Of the 45 non-WaSC EfW projects to have reached financial close since 2004, only one received direct investment from institutional investors. This was the purchase of a £9m stake in the Leeming Anaerobic Digestion EfW plant by a joint venture between the Greater Manchester Pension

Fund and London Pensions Fund Authority. In January 2015 the two funds announced that they were forming a £500m joint venture vehicle (Greater Manchester and London Infrastructure Limited / GLIL) specifically to invest in UK infrastructure. In October 2015 GLIL announced its intention to invest £60m in up to 10 UK biomass assets owned by Iona Capital. The Leeming purchase was the first such investment, made in January 2016. The full list of assets to be acquired by GLIL from Iona Capital has not been disclosed.

GLIL's Leeming plant equity investment was made over a year after the project had reached financial close, and its other purchases from Iona Capital are expected to follow a similar pattern. This would suggest that, although institutional investors have not shown much interest in EfW projects to-date, the risk profile of mid-construction assets can be sufficiently low to attract direct equity investment from institutional sources.

Institutional investors are also engaging indirectly through infrastructure funds such as Scottish Widows Investment Partnership; the Israeli Noy Infrastructure Fund; Gravis Capital Partners; and Eternity Capital - amounting to some £56m of equity and debt since 2004.

### **Public / multilateral investment**

The UK's Green Investment Bank has been a major funder of EfW projects - contributing £384m of equity and debt to 16 projects as of March 2016.<sup>23</sup> Its aim has been to catalyse investment into small-scale energy from waste and recycling projects. The Green Investment Bank has also contributed capital to fund managers to make EfW investments on their behalf. In particular, in 2012 it appointed Foresight Group to manage £78m of its funds through the UK Waste Resources and Energy Investments Fund and the Recycling & Waste Fund. Following additional funding from private investors, Foresight Group has now made equity investments worth £83m across five EfW projects.

Given the Green Investment Bank's focus on smaller projects, investment from the European Investment Bank has been limited to providing debt to two of the larger EfW projects - amounting to £224m.

In two instances, projects have also received loans from city/county councils.

### **Regulated Water & Sewerage Companies (WaSCs)**

WaSC activities are currently regulated by Ofwat in England and Wales, the Water Industry Commission for Scotland in Scotland, and the Northern Ireland Utility Regulator in Northern Ireland. Their regulated activities include separation and disposal of "sludge" solids from

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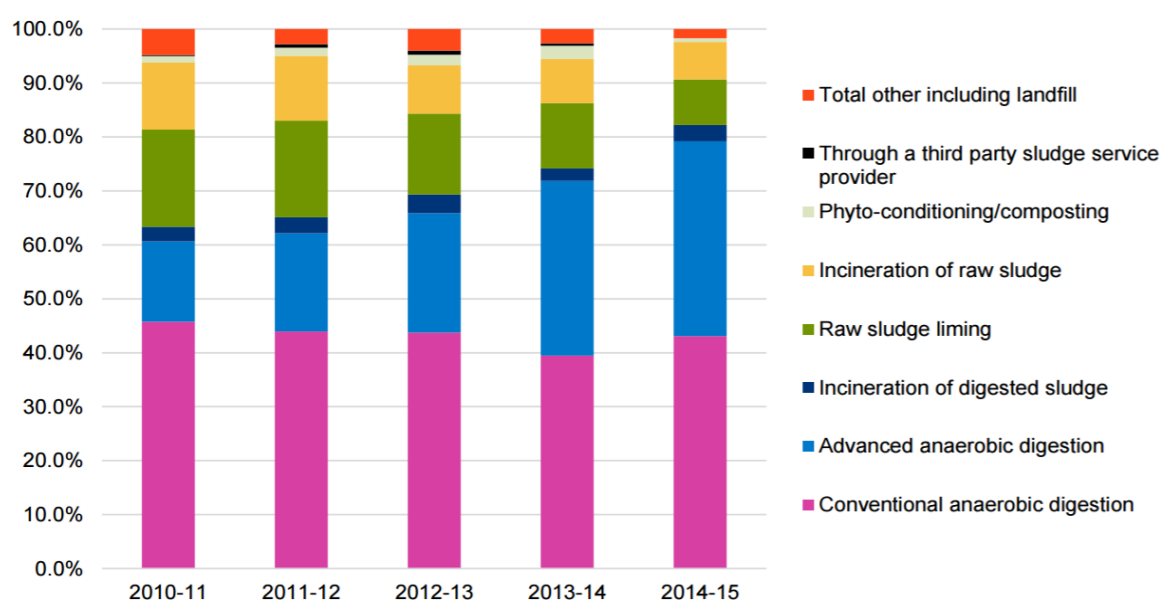
<sup>23</sup> Green Investment Bank (2016), "Annual Report and Accounts 2015-16".



wastewater - of which they produce around 1,585,000 tonnes (dry weight) per annum in England and Wales alone.<sup>24</sup> While this is only 1.4% of the UK's annual production of organic waste, sludge is well-suited for the adoption of EfW technologies.

Historically, sludge was mostly recycled direct to agricultural land after being made safe through liming. A proportion was also incinerated or sent to landfill. However, sludge is increasingly being treated as a valuable bioresource rather than a waste product. Most sludge is now digested anaerobically - producing a methane-rich biogas which can be converted into heat, electricity, or conversion into bio-methane for injection into the gas grid. Figure 5.3 illustrates the consistent trend towards uptake of anaerobic digestion for treating sludge in England and Wales over the past five years.

Figure 5.3: Sludge technology use over time in England & Wales



Source: Ofwat<sup>25</sup>

We do not know exactly how much energy WaSCs are producing from sludge, what proportions are converted to heat, gas or electricity, or what proportions are used internally, sold to third parties, or sold to the electricity or gas grids. However, we do know that all 12 UK WaSCs have CHP facilities; at least six export gas to the grid; and two are currently developing gas-exporting EfW facilities.<sup>26</sup>

Unlike non-regulated companies, WaSCs can rely on a revenue stream to reimburse its efficiently-incurred costs and are able to invest directly in EfW facilities under their general

<sup>24</sup> [http://www.ofwat.gov.uk/wp-content/uploads/2015/12/pap\\_tec20150525w2020app2.pdf](http://www.ofwat.gov.uk/wp-content/uploads/2015/12/pap_tec20150525w2020app2.pdf), p.40

<sup>25</sup> [http://www.ofwat.gov.uk/wp-content/uploads/2015/12/pap\\_tec20150525w2020app2.pdf](http://www.ofwat.gov.uk/wp-content/uploads/2015/12/pap_tec20150525w2020app2.pdf)

<sup>26</sup> Source - CEPA analysis of company sites / Utility Weekly. Current gas-to-grid exporters include Thames; Wessex; Welsh; Severn Trent; Northumbrian; and Scottish. Yorkshire and United Utilities have facilities under development.

bond finance programmes rather than resorting to project finance. Consequently, WaSC EfW investments are not reported on in the same way as projects financed through public capital markets. Although we are unable to know exactly how WaSC investment compares to investment from other sources, we do know that most WaSCs have been investing in EfW over the past few years, and that some of these facilities involved substantial costs. For instance, Yorkshire Water opened a £34m CHP facility in 2014, and is building a £72m AD facility at their Knostrop wastewater treatment plant.

### 5.1.3. Barriers to investment and sustaining the pipeline

Despite having a fairly healthy investment pipeline over the last five years, EfW investment can be challenging and may drop off as and when Government support is withdrawn. Specific barriers to investment include the following:

- **Investor caution with unproven technologies.** Newer waste conversion technologies often claim higher efficiencies and more flexible outputs, e.g. through clean-up and use of syngas. However, lenders prefer to work with technologies with a proven track record of full scale operation in the UK. Building a track record for newer EfW technologies is difficult without finance to build such plants in the first place. This barrier to investment is perhaps less of an issue today than it was just a couple of years ago, given that several first-of-their-kind EfW projects have reached financial close since then. UK WaSCs are particularly well placed to invest in unproven technologies. For instance, in 2014 Wessex Water's subsidiary GENeco became the first company in the UK to export gas to the grid from digesting a mixture of sewage sludge and food waste.
- **Barriers to shorter-term commercial and industrial waste contracts.** Investors tend to prefer projects based around long term waste contracts because the income for an EfW project is not just the power produced but the fee charged for accepting the waste – the gate fee. This gate fee is charged on a 'per tonne of waste' basis and contracts usually include guaranteed minimum tonnages per year. Together this gives the plant a minimum guaranteed source of income which investors are looking for. Such long term contracts are usually only available for local authority waste. Commercial waste contracts are generally much shorter, making it harder to finance projects taking primarily commercial and industrial waste.
- **Risk of local overcapacity.** It would be challenging to attract finance for an EfW plant without evidence that the waste inputs will be there to supply it over a long timescale. Waste management contracts therefore typically include minimum guaranteed tonnages (known as 'put or pay') to manage the risk of local overcapacity. Local authorities are sometimes reluctant to provide these guarantees. This can be

especially problematic when EfW operators are unable to accept waste from other sources for contractual, technical or planning permission reasons.

- **Planning permissions.** Receiving planning permission can be a significant risk even at a late stage of project development. The £204m Hatfield Recycling and Energy Recovery Facility project was cancelled in 2014 after the then Secretary of State for Communities and Local Government rejected the planning application after a public inquiry. The project reached financial close in July 2011 and received planning permission from Hertfordshire County Council in October 2012, but the Secretary of State then called the application in for a public inquiry given its proximity to London's green belt and a grade 1 listed building.<sup>27</sup> In another case, Flintshire County Council rejected planning permission for the Parc Adfer EfW plant in April 2015 by a vote of ten councillors to six, before narrowly over-turning the decision at a special meeting the following month by seven votes to six.
- **Policy uncertainty / withdrawal of waste infrastructure credits.** In July 2006, Defra established the Waste Infrastructure Delivery Programme to help the UK meet EU Landfill Directive targets for 2020. To meet these targets Defra allocated £1.7bn of 'Waste Infrastructure Credits' to 28 local authorities in England with a PFI waste project. Defra would effectively pay a fixed amount of money to each local authority over the 25-year life of the PFI contract - typically funding around a third of each project. However, at the 2010 Spending Review, the Government forecast that further support may not be necessary to meet 2020 targets. Defra therefore decided to withdraw provisional credits from seven projects in 2010, and a further three in 2013. Of these ten projects, only four have since reached financial close.<sup>28</sup> The decision was criticised by some for the late timing of the withdrawals, some of which had serious cost implications. For example, Norfolk County Council became liable to pay its contractor more than £30m in compensation when PFI credits were withdrawn and a project was cancelled.

Some of these points have already been considered by Defra in its 2014 *"Energy from waste - a guide to the debate"* report.<sup>29</sup>

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<sup>27</sup> <https://ijglobal.com/articles/92222/uk-rejects-veolias-hatfield-waste-to-energy>

<sup>28</sup> <http://www.out-law.com/en/articles/2013/february/withdrawal-of-waste-credits-at-odds-with-governments-commitment-to-infrastructure-says-expert/>

<sup>29</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/284612/pb14130-energy-waste-201402.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/284612/pb14130-energy-waste-201402.pdf)

#### 5.1.4. Future pipeline

Following a period of rapid expansion, and given recent reductions to government support, there is a prospect that the pipeline for EfW investments could slow down in the coming years. However, projects are still entering the pipeline - demonstrating that there is continued appetite even after cessation of waste infrastructure credits and uncertainty around future renewable support schemes. The table below lists six projects which are currently in pre-development - three of which are at a relatively advanced stages, suggesting that over £1bn of investment may reach financial close in 2017. It may be significant that only one of these six is a PPP. The other projects will obtain their own supplies of waste from a mix of municipal, commercial and industrial sources without being underpinned by a long-term municipal contract. This has the advantage of removing risks associated with state aid rules and public procuring authorities, but presents greater issues around securing a reliable supply of feedstock.

*Table 5.1: EfW projects in pre-development (as of December 14<sup>th</sup> 2016)<sup>30</sup>*

Project	Developer	Current stage	Value
Parc Adfer EfW Plant (PPP)	Wheelabrator	FC expected Q1 2017	200
Rivenhall Airfield CHP Plant	Gent Fairhead	FC expected Q1 2017	500
Rookery South EfW Plant	Covanta / Veolia	FC expected Q2 2017	350
Ebioss Energy EfW Plant	Ebioss Energy	Pre-development	93
Newcastle EfW Plant	Ebioss Energy	Pre-development	53
Leicestershire EfW Plant	Biffa	Pre-development	Unknown

In the longer term, EfW investment will depend on the direction of UK landfill and renewable energy policies: including clean energy support budgets for the early 2020s; carbon targets for the late 2020s; and the fourth carbon budget.

## 5.2. Telecoms

### 5.2.1. Existing arrangements for private investment

The telecoms sector in the UK is dominated by a small number of large companies who often operate across different parts of the industry, including fixed, mobile and TV services.

In the fixed line sector, BT, through its subsidiary Openreach, owns a nationwide core network and a “last mile” network. In order to provide these services, other service providers are required to pay BT to access the network, and BT is required to allow service providers with

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<sup>30</sup> This list is based on industry news reports over the last eighteen months, and may not be exhaustive.

access on the same terms as BT's downstream services. Services have traditionally relied on the copper wires used for telephones to provide services, although BT has also been investing in fibre broadband infrastructure in order to provide faster services to customers.

BT's access charges for its last mile infrastructure assets are regulated by Ofcom. Leased lines, i.e. private, dedicated, often high speed lines that are owned by BT and leased to separate companies are also regulated by Ofcom. Virgin Media also provides broadband, TV and telephone services through its cable network, allowing it to compete with BT without having to pay access charges to BT's network (although Virgin Media's activities are not regulated). However, as of 2015 Virgin Media only covered around 50% of UK households, mainly in urban areas.<sup>31</sup> Therefore some customers continue to rely on BT's services for internet, telephone and TV provision.

Mobile telephone and broadband infrastructure are provided by four Mobile Network Operators (MNOs), namely EE (which as of 2016 is owned by BT), Vodafone, O2 and Three. These MNOs also allow mobile virtual network operators (MVNOs) to access the infrastructure on a wholesale basis and provide retail services to customers. While most activities are not regulated in the mobile sector, termination charges (i.e. calls from fixed and mobile phones terminating on another provider's network) are subject to price caps. In addition, international roaming charges continued to be set through formal regulatory interventions.

Financing in the sector has mostly been provided on a corporate finance basis, with the companies mentioned above making several bond issuances to finance their infrastructure investments. Despite this, both fixed line and mobile network providers have come under heavy criticism for the lack of investment that has taken place in recent years, which many have attributed to the UK's poor fixed and mobile network coverage when compared to other countries.

### **5.2.2. Current market barriers**

Openreach has faced widespread criticism from other retail providers and customers for its poor service while still earning significant profits. In addition, many believe that the level of investment has been insufficient and as a result broadband speeds for some 5.7 million UK internet customers (including 3.5 million in rural areas) is below Ofcom's regulatory requirement of 10Mbit/s.<sup>32</sup> Following BT's lack of progress in making voluntary reforms to separate its network and retail businesses, Ofcom announced in November 2016 that it plans to notify the European Commission of a motion to legally separate Openreach from the rest of BT's business. This will mean that Openreach will operate with a separate board and

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<sup>31</sup> Ofcom (2015), The Communications Market Report.

<sup>32</sup> British Infrastructure Group (2016), Broadband: A study into broadband investment and the role of BT and Openreach.

chairman. However, BT will maintain ownership of Openreach, despite calls from competitors for BT to sell its stake in the company, which was not pursued due to concerns over BT's pension scheme.

As with the fixed line sector, the mobile broadband providers have also faced widespread criticism regarding the level of investment that has taken place in the sector. For example, a recent report by the NIC notes that 4G network coverage is not sufficient in many parts of the country, with the UK's coverage ranking 54<sup>th</sup> in the world in terms of coverage.<sup>33</sup> As part of the future rollout of telecoms infrastructure, the NIC recommends that the Government takes a more commanding role in the sector. This includes creating a strong digital champion backed by a dedicated cabinet committee. The report also recommends that the Government ensures the future 5G network is delivered across major cities and transport (road and rail) networks.

### 5.2.3. Current and future pipeline

The National Infrastructure Delivery Plan sets out a range of targets for digital communications by 2021. This includes the provision of superfast broadband to 95% of premises by 2017. There are also targets for voice coverage (90% of geographic area by end of 2017) and 4G (98% of premises by 2017), with plans to publish in 2017 a 5G strategy to help achieve the government's intention for the UK to be a world leader in 5G.<sup>34</sup> Additionally, by 2020 500MHz of public spectrum will be released, with a further 250MHz by 2022.

Table 5.2 below shows the projects and programmes making up the £6bn NIC communications pipeline, aimed at achieving these targets (£6bn is the figure being delivered from 2016-2021, with the table below including investments prior to 2016-17).

*Table 5.2: Telecoms infrastructure pipeline*

Programme / Project	Detail
<b>Broadband network</b>	
Virgin Media "Lightning" Broadband (2015-20)	<ul style="list-style-type: none"> <li>• Virgin Media will extend its fibre-rich network for 4m additional premises to 17m premises by 2020.<sup>35</sup></li> <li>• Private financing of £3bn and private asset ownership.</li> </ul>
Super Connected Cities [Broadband] Programme (2013-16)	<ul style="list-style-type: none"> <li>• Consists of 66 projects being delivered by Broadband Delivery UK (BDUK, part of the Department for Culture</li> </ul>

<sup>33</sup> NIC (2016), Connected Future.

<sup>34</sup> 5G is expected in the UK by 2025, and £70m of public funds are allocated to the 5G Innovation Centre at the University of Surrey. IPA (Mar 2016) National Infrastructure Delivery Plan 2016-2021, Ch14.

<sup>35</sup> Virgin Media (Apr 2016) Virgin Media announces largest UK fibre broadband rollout [[Online](#); accessed Nov 2016]

Programme / Project	Detail
	<p>Media and Sport) to provide WiFi in public buildings and other broadband capabilities.</p> <ul style="list-style-type: none"> <li>• £150m central Government funding</li> </ul>
Superfast Broadband Rollout Programme (2012-17) <sup>36</sup>	<ul style="list-style-type: none"> <li>• Phase 1: 24Mbps+ to 90% of UK premises by December 2016 and 2Mbps to all, through 44 projects which were awarded to BT through a procurement process. Involves £530m BDUK investment and £1.2bn of public funding. Some DEFRA involvement in rural projects.</li> <li>• Phase 2: 24Mbps+ to 95% of UK premises by December 2017 using £250m BDUK funding and seeking £250m of local or European financing. This deadline has potentially slipped to 2018, with the project underway in England, contracts signed for Wales and Northern Ireland but procurement for Scotland has not yet started (as of Aug 2016).</li> <li>• Public funding in this project is split equally between Government and local bodies.</li> </ul>
<b>Mobile network</b>	
700MHz spectrum for mobile broadband (2015-22)	<ul style="list-style-type: none"> <li>• Investment to make 700MHz spectrum band available for mobile broadband use</li> <li>• £550m investment</li> </ul>
Mobile Infrastructure Project (2013-16)	<ul style="list-style-type: none"> <li>• Provision of mobile voice coverage to UK “not spots” (full or partial) through new mobile masts.</li> <li>• Government funding of approximately £30m</li> </ul>
Mobile Network Upgrade Programme (2013-17)	<ul style="list-style-type: none"> <li>• There is some public funding, for the release of the “digital dividend spectrum” (800MHz and 2.6GHz)</li> <li>• The four Mobile Network Operators (MNOs) have committed to investing £5bn in 4G</li> </ul>

Source: IPA (Apr 2016) “National Infrastructure Pipeline Spring 2016” and House of Commons Library (Aug 2016) “Briefing Paper: Superfast Broadband Coverage in the UK)

These projects together are estimated to cost approximately £7bn, and only 25% of that is expected to be pure private financing with the remainder coming from a combination of public and private sources.

<sup>36</sup> More detail on the superfast broadband rollout is in: House of Commons Library (Aug 2016) Briefing Paper: Superfast Broadband Coverage in the UK).

Due to the level and nature of public funds being paid to private companies to undertake activities, a State Aid agreement with the EU was required and granted from 2012 to June 2015: Department for Culture, Media, and Sport (Nov 2014) State aid - Decision on the National Broadband Scheme for the UK.

There also exists a range of projects outside of the NIC pipeline, imitated by both the private and public sectors. A few of these projects are highlighted in the table below.

*Table 5.3: Telecoms projects outside of the NIC pipeline*

Programme / Project	Detail
BT investment	In May 2016 BT declared that it would invest £6bn in fibre and mobile broadband, although there has been criticism that this is not far removed from their anticipated investment over the next few years. <sup>37</sup>
Digital Scotland Superfast Broadband Programme (2014-18)	Scotland has been undertaking the “Digital Scotland Superfast Broadband Programme” in response to anticipated slow roll-out of fibre broadband in Scotland. It was launched in 2014 and aims to bring fibre broadband to at least 95% of Scottish premises by March 2018.  There are two separate projects: Highlands and Islands Enterprise (£146m), and Rest of Scotland (£266m). This includes £126m of investment from BT with the remaining £286m met by the Scottish and UK Governments, the EU, and councils.
Digital Infrastructure Investment Fund	The Fund was initially announced in the March 2016 statement, with the Government in June 2016 inviting proposals from prospective fund managers that would be responsible for sourcing the private sector investment.  It intended to begin investments by the end of 2016-17, with investments to be made by HMT “on arm’s length commercial terms alongside the private sector.” <sup>38</sup>
Rural broadband programme <sup>39</sup>	This is a £1.7bn programme, in which the government has invested £790m.
York ultra fibreoptic (UFO) broadband project <sup>40</sup> (2014-ongoing)	This project is being developed by Sky, Talk Talk, and City Fibre (an owner of infrastructure in many UK towns and cities) to provide a fibre network to homes and businesses.  The York network is a trial which includes £5m initial investments from both Sky and Talk Talk, with the intention to seek debt from infrastructure funds to finance future works.  CityFibre’s contribution will be through use of its existing fibre network between public-sector buildings in York. The three developers will be joint equity-holders.

We look at the Broadband Infrastructure Fund (BIF) in more detail below.

<sup>37</sup> The FT (May 2016), BT to invest £6bn in ‘ultrafast’ broadband [Online; accessed Nov 2016]

<sup>38</sup> HM Treasury and Infrastructure and Projects Authority, (Jun 2016) Broadband Investment Fund: request for proposals.

<sup>39</sup> NIC (Mar 2016), National Infrastructure Delivery Plan 2016-2021, Ch7.

<sup>40</sup> The FT (Apr 2014), TalkTalk and Sky plan to build own fibre network. [Online; accessed Nov 2016]



## UK Digital Infrastructure Investment Fund (UK DIIF)

The government is currently in the process of developing the UK DIIF. We understand that the aim of the fund is to increase access to commercial finance to support the growth of the UK's ultrafast broadband network, in particular for alternative network developers (other than Openreach).<sup>41</sup> According to multiple sources the government will commit £400m to the fund with the expectation that the government's funds will be matched by the private sector.

It will potentially be structured as a closed-ended fund and seek debt or debt-like investments for at least 50% of its capital. However, the fund will not rule out equity investments.<sup>42</sup>

Three fund managers have been selected as final bidders to raise capital and manage the fund, it is expected that the winning bid will be announced by the end of the year and officially start fund raising in Q1 of 2017.

### 5.3. Water

The water and wastewater sector in England and Wales comprises ten water and sewerage companies (WaSCs) and ten smaller water only companies (WOCs), whose activities are regulated by Ofwat.<sup>43</sup> As with the energy sector, the water sector has adopted a "totex" approach to regulation for the current price control period (PR14) whereby companies capital and operating expenditure are determined together, and companies choose what amount will be recovered as current expenditure and what will be added to the Regulatory Capital Value (RCV). Although the sector is largely non-competitive at the moment, retail competition for non-domestic customers is expected to be launched in 2017, while the transition to competition in the domestic market is expected to begin before the end of the current Parliament.

Although companies are subject to regulation through the revenue caps placed on them by Ofwat, companies are responsible for raising their own finance to pay for their capital expenditure programmes. WaSCs have largely done this through bond issuances, with some financing also being provided by EIB. On the other hand, prior to the downturn in the monoline insurance sector, WOCs used Artesian Finance to finance their capital expenditure programmes.<sup>44</sup> Artesian Finance involved creating a special purpose vehicle (SPV) that would

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<sup>41</sup> <https://www.gov.uk/government/publications/broadband-investment-fund/broadband-investment-fund-request-for-proposals>

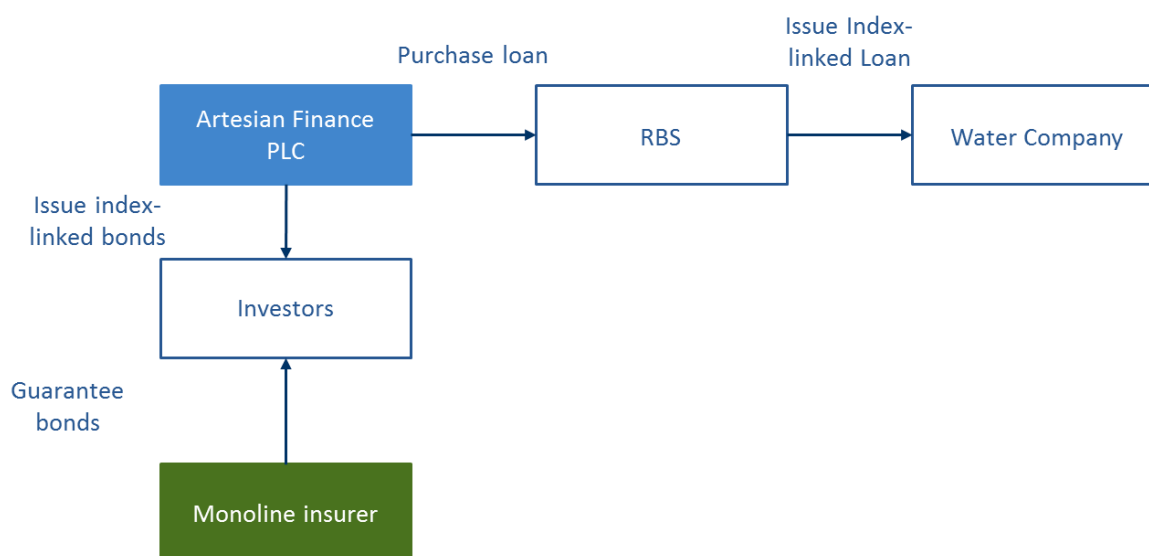
<sup>42</sup> <https://ijglobal.com/articles/103463/uk-commits-400m-to-digital-infrastructure-investment-fund>

<sup>43</sup> A single state-owned company (Scottish Water) supplies water and wastewater services in Scotland.

<sup>44</sup> In 2002 Royal Bank of Scotland (RBS) created the Artesian Finance facility, a special purpose vehicle that helped pool £500m of smaller water-only company lending in order to lower their debt financing costs. The SPV in turn is guaranteed by monoline insurers, which allows it to benefit from the high credit ratings AAA. Artesian Finance's issuance was guaranteed by Financial Security Assurance (FSA), a leading monoline insurer that covered the principal and interest on the bonds provided.

issue index-linked bonds on behalf of WOCs, which were guaranteed by monoline insurers. The monies raised from these bonds would then be issued to WOCs via Royal Bank of Scotland (RBS) through an index-linked loan. A summary of the arrangement is provided in Figure 5.4 below.

Figure 5.4: Overview of Artesian Finance



Source: RBS; CEPA analysis.

Artesian Finance allowed smaller firms to access 30-year debt from institutional investors that would not have been provided without such an arrangement. However, the last issuance under this facility took place in 2005, and following the downturn in the monoline insurance market, WOCs have not made any new issuances using an Artesian facility.

Aside from the recent Thames Tideway project (see Annex A in our review of the infrastructure market for more details), project finance opportunities in the water sector have been relatively limited to date. Under the existing regulatory framework, companies can engage third party companies to build and finance water infrastructure through “direct procurement”. This arrangement allows companies to competitively tender either new, discrete, large infrastructure projects or service provision under new appointments and variations (NAVs). As part of the next price control period (PR19), Ofwat is examining how changes to existing direct procurement in the sector can offer more customer-centric and efficient service delivery, including facilitating long-term savings for customers, hoping to increase the use of this arrangement going forward. Ofwat also sees direct procurement as a means of better leveraging “markets in the financing and provision of new assets by third parties”.<sup>45</sup> Ofwat has reviewed direct procurement models in other sectors, as well as the

<sup>45</sup> Ofwat (2016). Water 2020: Our regulatory approach for water and wastewater services in England and Wales.

experience of TTT. From these, Ofwat has reviewed four direct procurement options, which are as follows:

1. **Encouraged model:** This involves Ofwat promoting the use of competitive procurement for high value projects identified in business plans. Ofwat will employ a risk-based review (RBR) to assess the extent to which direct procurement has been considered and companies will be required to justify why it was not used for qualifying projects (i.e. projects over a certain value). Water and wastewater companies will be responsible for the tendering process of these projects.
2. **Prescribed model:** Companies would be required to use direct procurement for projects that are above a specified threshold. Ofwat would then set the rules for the tendering process, which would then be run by the companies themselves. Companies may or may not be able to bid in the tendering process, depending on the rules set by Ofwat.
3. **TTT model:** This will follow a similar approach that was adopted for the TTT project whereby a separate licence will be issued to the successful bidder on a project. However, projects would be considerably smaller and would not have the government guarantees and assurances provided as part of TTT. Such an arrangement would require changes to primary legislation in order for Specified Infrastructure Projects (SIPs) regulations to apply for a wider range of projects.
4. **Ofgem model:** This will involve Ofwat running the tender process and will involve significantly more involvement by the regulator relative to the other approaches. Water companies would be allowed to bid for the projects and the winning bidders would be granted a separate licence. As in the TTT model, this would require changes to primary legislation so that new licences can be created.

From the options above, Ofwat is currently considering the “Encouraged model” for all projects (excluding sludge projects) with a whole-life totex of over £100m. In addition to third parties providing and financing services, Ofwat will also allow companies themselves to bid for projects that they are tendering, and can be awarded bids should they be able to demonstrate that they can provide the best value for money for consumers. However, the degree of ownership and flexibility given to companies may change over time as Ofwat consults with the industry on how larger projects should be delivered.

While this may allow for financing to be more directly linked to specific projects, Ofwat does not expect it to be a considerable proportion of the total capital expenditure requirements of companies. For example, through reviewing part business plans on the potential scale of direct procurement, Ofwat found that direct procurement could be used for about 2% of the total value of the water and wastewater value chain, and specifically estimated that the minimum

and maximum value of projects in any five year price review is likely to be between £1.05bn and £1.8bn in 2015/16 prices.<sup>46</sup>

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<sup>46</sup> Ofwat (2016). Water 2020: Regulatory framework for wholesale markets and the 2019 price review; Appendix 5: Enabling direct procurement for customers – further evidence and analysis.

## **6. CONCLUSIONS AND EMERGING FINDINGS**

The motivation behind this report is the finding in the complementary evidence-base report (10-year review of infrastructure financing in the UK) that there is currently no significant constraint in the availability of private finance for UK economic infrastructure projects. Our consultations suggest that this is particularly the case for opportunities that are a couple of notches up the investment grade rating (or equivalent if the project has not achieved a formal credit rating). Instead the main constraint limiting the provision of private finance to infrastructure in some sectors is the lack of a pipeline of infrastructure projects that are accessible to private finance.

The research that we have completed suggests that if a project has a credible funding stream – revenue certainty – it can be structured in such a way as to attract private investors. The question that we have thus sought to understand in this report is whether there are any policy, institutional or market constraints that have limited the pipeline of investable projects in the different economic infrastructure sectors.

This report has therefore provided a review of the economic infrastructure sectors to assess the current processes and institutional roles that are in place to develop projects. As shown in Section 2, the current NICP suggests that the majority of the investment opportunities will be in the energy sector, with very few opportunities in the other sectors. While in some of the economic infrastructure sectors, particularly flood defence, the expectation is that given the nature of the sector the investment will continue to be funded and financed by the public sector. However, it is not necessarily clear why there are relatively so few investment opportunities in the UK transport sector.

We have therefore focused much of this report on contrasting the progress made with the development of the energy pipeline with the lack of progress in transport (primarily rail and to a lesser extent roads). The key findings from the report are as follows:

### **Upfront signalling of opportunities for private investment**

One of the issues that was raised consistently by different groups of investors is the lack of visibility that they have about future investment opportunities, particularly in the transport sector.

A number spoke favourably about the approach used in the Netherlands (and discussed in Annex A), in which there is a defined process that requires government to conduct a market scan to consider the potential to make use of private finance for all infrastructure projects larger than approx. £50m.

The Dutch process includes the completion of public-private comparator (PPC)<sup>47</sup> analysis very early on in the process, which facilitates a decision on whether potential projects should enter the PPP pipeline.<sup>48</sup> This gives investors much greater visibility up-front on where the potential investment opportunities will be.

More fundamentally this type of process may suggest more openness to the use of private finance across sectors. In certain parts of the UK transport sector (particularly rail and roads) there is a sense that the opportunities are closed off to the private finance approach with a heavy reliance on the public funding and finance model. This is despite the potential, as discussed in the examples of the HS1 concession and Evergreen programme (Section 4.2.2) for projects in certain circumstances to attract private investment.

### **Information required in the pipeline**

Linked to the above point there is a view amongst investors that there is a lack of information provided in the current pipeline documentation. At the moment there is a useful list of projects/ programmes together with other information such as the expected size of the investment. However, there is a lot of information missing that investors will typically look for, this includes:

- Details on the nature of the anticipated source of funding for each project/ programme.
- Information on the expected allocation of risks between the relevant public sector stakeholders and potential private investors.
- The expected timescales for the project/ programme to reach financial close.

### **Absence of a repeatable pipeline of opportunities**

Until investors have the skills and experience in a given sector they are unlikely to be in a position to carry out direct investment within it. Therefore one of the important features to building the range of potential investors to a sector is to explore the potential to develop a programme of repeat transactions

Indeed the absence of a repeatable pipeline of opportunities was highlighted by a number of institutional investors as being a disincentive for them to invest in building their own skills and expertise in a sector. It takes time and requires significant cost for investors to develop these skills in-house; they are unlikely to be willing to make the investment if they think that there will be only a few opportunities available. Whereas if they have confidence/ visibility that there are likely to be a reasonable flow of deals, it will make sense for them to make the up-

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<sup>47</sup> Government of the Netherlands ([Online](#), accessed Dec 2016) “Public-Private Comparator Manual 2013”

<sup>48</sup> Hebly, J. , & Klijn, M. (2016) “The Netherlands: Public-Private Partnership in the Netherlands”

front investment in skills development because there will be more chance that the investment will pay-off - even if they fail with the first few investment opportunities they can put the knowledge to use in future bids. The relative success that Ofgem has had with securing private finance for its OFTO transactions (as discussed in Section 3) demonstrates this point.

The approach that we discussed as regards carrying out early analysis to identify the scope for making use of private finance on a systematic basis, together with providing more detailed information on the pipeline can quickly help to identify where there is likely to be a number of similar project opportunities (assuming that the underlying policy/ public interest is there) helping to signal to investors that it is worth investing in specific sectors.

### **Capacity of public sector sponsor to carry out project preparation activities**

One of the keys to developing a credible pipeline of investment opportunities is the capacity of the key public sector stakeholders to carry out the market engagement/ up-front project and programme development activities that are required to attract private investors.

Again the example provided by Ofgem and the market engagement activities that it carried out to develop the OFTO regime provide a good example of the role that the public sector stakeholder can play in supporting the development of private financing opportunities. Other good examples include the role that the corporate finance team at TfL has been playing to identify projects/ programmes that could benefit from private sector investment and then engaging with investors to develop the opportunities.

## **ANNEX A     ROADS PPP PROGRAMME IN THE NETHERLANDS**

The Dutch Government's approach to infrastructure, including their PPP programme, is well-developed and is successful at attracting investors. In 2006 the Ministry of Transport, Public Works, and Water Management Rijkswaterstaat (RWS) opened the first of the Netherlands' PPP units, following the success of the €100m N31 highways project in demonstrating that roads PPPs can deliver value for money.<sup>49</sup> The subsequent success of roads PPPs in the Netherlands has several key factors:

- **RWS present a sustainable pipeline** to attract and maintain investors' interest.
- **Projects reach financial close quickly**, thanks to a streamlined and clear process.
- **They standardised the process to gather investor interest** to keep it simple and develop confidence early (standardised contracts, duration, revenue stream).

The following subsections discuss these in more detail.

### **A.1.             Sustainable pipeline**

There is a strong advanced pipeline of roads PPP projects in the Netherlands (waterways are also in the transport PPP pipeline), with projects being announced fairly early in the process. This helps to attract potential bidders, as if they are unsuccessful at their first attempt, the cost of preparing their bid is not completely wasted – they can now bid for a future similar project at much lower cost than was incurred on the first. The pipeline is therefore helpful as it includes projects early in their development and also provides some details on what the project will involve, including:<sup>50</sup>

- The length of road being constructed, widened, rebuilt, etc.
- Estimated capital expenditure (capex).
- Targets of the project (e.g. improved traffic flow, accessibility).
- Expected year of financial close.

#### **A.1.1.           How a project enters the pipeline**

In the Netherlands, all infrastructure projects must undergo the “market scan” stage: this takes an initial view of the potential value of getting private parties involved in the project,

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<sup>49</sup> PwC (2005) “Delivering the PPP promise: A review of PPP issues and activity”

<sup>50</sup> Government of the Netherlands (Oct 2013) “PPP in the Netherlands – dealflow October 2013”



and the likely best form of that involvement.<sup>51</sup> After this initial view for all projects, any transport infrastructure project which is expected to cost more than €60m must be considered for a PPP (it was initially €112.5m but transaction costs fell over time allowing the minimum project size to fall too).<sup>52</sup> These projects then undergo the comparison process, through the construction of a public-private comparator (PPC)<sup>53</sup> which looks at the costs of implementing a project through different approaches, comparing the public and private assumptions of costs.<sup>54</sup> The PPC decides if the project should enter the pipeline, and so projects enter the PPP pipeline at an early stage, labelled as potential PPP projects.<sup>55</sup>

For the projects that enter the PPP pipeline, the value for money comparison is updated as uncertainties are removed (private parties place their offers, risks are allocated, etc.). During the tender process, a public-sector comparator (PSC) will be constructed to compare an updated assumed cost for public delivery with the best PPP offer. The PSC is used to understand the actual value for money of the scheme, which is in many cases higher than in the PPC (e.g. the N31 had a PSC of 31% (compared to a PPC of just 7%).<sup>56</sup>

## **A.2. Streamlined procurement process**

It is often noted by investors that the Netherlands' roads PPPs procurement procedure is relatively fast, with a target of 16 weeks from the bid deadline to financial close. Between 2009 and 2015, the Netherlands and Spain took PPPs to financial close in an average of 22-23 months, while others took 27 months (UK, Germany, France) or even longer (Belgium and Ireland averaged 34-35 months).<sup>57</sup> It is not unusual for a Dutch roads PPP to take as little as 15-19 months.

The speed is helped by the design of the process, including standardisation across the transport PPPs and the use of the competitive dialogue procurement procedure to allow faster bid evaluation. An explicit financial incentive is applied to the preferred bidder: there is a 5% bid bond requirement which the public authority can demand if the preferred bidder fails to progress to financial close within the specified three months – the government has not yet had to call this in. Quick progression to financial close is also helped by the requirement that bidders at the final stage must all have 100% committed finance.

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<sup>51</sup> Dewulf, G. & Blanken, A. & Bult-Spiering, M. (2006) "Strategic issues in Public-private partnerships"

<sup>52</sup> European PPP expertise centre (2009) "European PPP Report 2010"

<sup>53</sup> Government of the Netherlands ([Online](#), accessed Dec 2016) "Public-Private Comparator Manual 2013"

<sup>54</sup> Rijkswaterstaat (Nov 2012) "Evaluating Value for Money: Auditing Public Private Partnerships"

<sup>55</sup> Hebly, J. , & Klijn, M. (2016) "The Netherlands: Public-Private Partnership in the Netherlands"

<sup>56</sup> Rijkswaterstaat (Nov 2012) "Comparison PPC and PSC: Auditing Public Private Partnerships"

<sup>57</sup> Dockreay, A. (May 2015) "Spanish and Dutch most efficient for PPP procurement" IJGlobal.com

### **A.2.1. Standardisation**

RWS uses DBFM for infrastructure and DBFMO for government building projects.<sup>58</sup> This standardisation is helpful for ensuring clarity on both sides of the transaction. Importantly, the Government has developed a standardised DBFM(O) model contract<sup>59</sup> for transport projects, which allows clarity to potential participants and is relatively short at just 250 pages. The standardisation means that participants (bidders, legal advisers, etc.) have over time become familiar with the process, which contributes to ensuring prompt progression of the PPP from initiation to financial close.

The use of the standardised contract meant that some potential PPP projects, which did not fit that standard contract format, had to be removed from the pipeline (the pipeline of 12 approximately halved). It was seen as more important to progress with a standardised approach to build investor confidence. Given the success that the roads PPP programme has since achieved, it is now possible for the Netherlands to evolve the original contract and even move away from the standardised contract on specific projects.<sup>60</sup> This includes introducing waterways projects, which are more varied than roads projects and tend to carry a larger upfront cost and more construction risk.

Additionally, by their nature the roads projects in RWS's pipeline are all very similar, with similar revenue streams (availability, for 20-25 years). While this limits the potential for innovation, it does enhance the "repeatability" capability for potential bidders to reuse what they learned for one bid in a later opportunity.

It has been noted, however, that often the sponsors and financiers are from the same relatively small pool – that over time these participants have built up knowledge and experience (including of the grading of the tenders) that leaves a rather large barrier to entry for potential new participants.

### **A.3. Competitive dialogue procurement procedure**

Transport PPPs in the Netherlands use the competitive dialogue procedure. This was initially introduced by the EU in 2004 with the main advantage that it allows a reasonable amount of negotiation between the government and potential suppliers.<sup>61</sup> This allows Governments to

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<sup>58</sup> Government of the Netherlands ([Online](#), accessed Dec 2016) "When is PPP appropriate?"

<sup>59</sup> An English (unofficial) translation is available: Government of the Netherlands (Mar 2012) "Model DBFM Agreement Directorate-General Waterways and Public Works 2012"

<sup>60</sup> World Bank Group Open Learning Campus webinar presentation by Jan van Schoonhoven, Senior Advisor on Innovative Financing in RWS (Nov 2016) "An Attractive Environment: The Netherlands Approach to Identifying/Screening PPP Projects"

<sup>61</sup> [EU rules](#). Also: European Institute of Public Administration (2009) "Competitive dialogue – a practical guide"

set out a required outcome and invite bids that may set out innovative methods of reaching those outcomes, often a key source of value in PPPs.

In the Netherlands, where the roads PPPs offer limited opportunity for innovation, the biggest impact of implementing the competitive dialogue procedure is that it allows the timelines to be shortened. The bidders make interim submissions prior to the deadline for financial bids.<sup>62</sup> While these interim submissions are not formal, there are often only small changes between these and the final bid which allows much of the analysis to be set up and undertaken in advance. Therefore, the Government is able to announce their preferred bidder one month after the final bid deadline.

#### **A.4. Attracting finance**

Transport infrastructure PPPs in the Netherlands are medium-sized; between €60m and around €600m. The requirement for full committed finance at BAFO stage<sup>63</sup> speeds up financial close but might be considered a hindrance to bidders in some countries.

However, in the Netherlands the roads PPPs do not struggle to achieve the required finance, including throughout the financial crisis.<sup>64</sup> This is predominantly due to the well-publicised sustainable pipeline and the standardised procurement process. Further elements the RWS has focused on, to ensure there are more bidders and lower financing costs, include:

- **Industry engagement:** The Government undertakes industry days to prepare the market prior to launch. These are mostly in English, with Spanish and French days also held to ensure a wider audience.<sup>65</sup>
- **Role of the EIB:** Additionally, the EIB provides finance to a majority of the roads PPPs, which helped to build confidence for other investors to take part in early projects (and also helps to reduce the costs of financing given the EIB's AAA rating).
- **Compensation of bid costs:** The bidders that are chosen to progress to submitting final offers in the PPP procurement process (normally three) will receive compensation towards their bid costs. The amount only covers part of the bid costs (approximately €1m on some previous projects; waterways projects are estimated to have bid costs of €5-8m<sup>66</sup>) and was introduced to encourage bidders.

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<sup>62</sup> The technical deadline is before the financial deadline and generally makes up 20-25% of the scoring.

<sup>63</sup> PwC (2013) "Capital Markets: The Rise of Non-Bank Infrastructure Project Finance"

<sup>64</sup> Partnership bulletin (Sep 2014) "Country Watch – Netherlands"

<sup>65</sup> World Bank Group Open Learning Campus webinar presentation by Jan van Schoonhoven, Senior Advisor on Innovative Financing and PPP for Water and Infrastructure (Nov 2016) "An Attractive Environment: The Netherlands Approach to Identifying/Screening PPP Projects"

<sup>66</sup> Dockreay, A. (Jul 2015) "Dutch sea locks: new PPP risks" IJGlobal.com

- **The private sector does not take demand risk:** the revenue stream for all roads PPPs is based on availability of the roads (including quality aspects).<sup>67</sup> There are two key benefits of this: that bidders then do not include a risk premium in their bid amount and there is lower operational cost through less need to monitor the traffic (either through a toll or to calculate a shadow toll amount).
- **The operator will receive a milestone payment at the end of the construction period,** to help to reduce the overall (whole-life) financing costs of the project. This is now around €10m or €20m depending on the value of the project but has been larger in the past (the 2003 N31 project received €40m when construction was finished).<sup>68</sup>

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<sup>67</sup> Rather than through a toll, which is politically difficult due to high taxes in the Netherlands.

<sup>68</sup> PwC (2005) "Delivering the PPP promise: A review of PPP issues and activity"