

EnergySource

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FINANCING OFFSHORE WIND: Plain sailing?

by David Wadham

UK oil and gas industry: The evolution of an independent midstream sector

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Market view: Subsidy-free UK solar and wind projects

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Investment protection: Managing investment risk in an uncertain world

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Waste-to-wealth initiatives: Examining
policy settings in Asia-Pacific
BY MICHAEL HARRISON, RICHARD GUIT, RATIH NAWANGSARI AND
RIZALDY TAUHID

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We are delighted to introduce this twentieth issue of **EnergySource**, our biannual publication in which we cover a range of legal and transactional issues relevant to the energy sector from our offices across the globe.

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FINANCING OFFSHORE WIND:

Plain sailing?

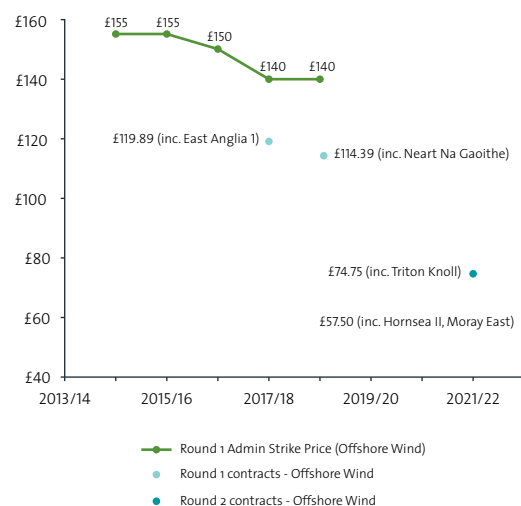
by David Wadham

In Europe, offshore wind is rapidly becoming a mainstream form of power generation. According to WindEurope, a trade organisation for the wind industry, Europe's total installed offshore wind capacity increased by 23 per cent in 2017. Europe is now home to more than 4,000 offshore wind turbines across 11 countries. Thirteen new offshore wind farms were completed in 2017, with the UK and Germany leading the way.

The offshore wind market is also developing rapidly in Asia too. Taiwan held offshore wind bid rounds in April and June 2018, and in doing so it has met its goal of awarding 5.5 GW of offshore wind capacity to be developed by 2025. Denmark's Orsted completed financial close on its first Taiwanese offshore wind project on 8 June 2018. Other markets, such as Japan, are not far behind: in March 2018 Japan introduced a new law designed to facilitate the development of offshore wind projects.

This surge in wind projects is being sustained by a change in the economics of offshore wind power generation. As shown by figure 1, setting out the strike price for recent UK offshore wind auctions, the market has become much more competitive in a short space of time.

Figure 1: UK CfD strike prices for offshore wind



This boom in offshore wind development has been underpinned by increasing interest in the sector from financial institutions. Whereas many of the earlier projects were financed by major utilities on balance sheet (and indeed some developers still prefer to pursue an equity finance route), there has been an increasing use of limited recourse debt financing to fund these projects.

This article seeks to highlight some of the features of this recent financing boom, drawing on Ashurst's practical experience of advising sponsors and funders across the UK, France and Germany.

Legal due diligence matters

As with any project, potential funders will need to understand the key risks if they are being asked to fund a project's construction on a limited recourse basis. Many of the risks are similar to those applicable to other forms of conventional or renewable power generation.

Land, planning and grid

As with any generation project, acquiring the necessary rights to land, connecting to the grid and obtaining the necessary permits is fundamental. For the developers, undertaking these activities on an offshore wind project can be a time-consuming process.

In relation to land rights, acquiring land rights offshore will inevitably involve interaction with the national or regional competent authorities responsible for the ownership and management of a country's offshore domain, and some form of participation in a tender competition to acquire those rights.

In relation to grid connection, responsibility for constructing the necessary connection to link the wind farm with the national transmission grid varies. For example, in the UK, it is (invariably) the developer of the offshore wind farm who assumes the obligation to construct the cables linking the wind farm to the onshore transmissions grid. Irrespective of the contractual responsibility for the cables to grid, offshore wind farms are increasingly being built in remoter locations and so the

timing and process for grid interconnection needs to be properly understood.

By the time potential funders become involved, land, planning and grid activities will normally be well advanced and funders' due diligence will normally be able to focus on the fundamentals:

- **Land:** What onshore and offshore land rights are needed to build the wind farm and connect it to the grid? Have those rights all been obtained or are some still under negotiation? If onshore rights are required, does the project company have the benefit of compulsory purchase powers to obtain the necessary land rights?
- **Consents:** Given that offshore wind project development takes place over such a long period of time it is not uncommon to find that land rights or consents are not in the project company's name and need to be transferred (often backed by appropriate credit support) or that the requisite consents need to be varied because the precise layout of the site has changed, or the turbine technology has moved on so that the capacity and number of turbines has changed.
- **Appeals process:** With regard to consents, have all necessary consents been obtained and have all statutory appeal periods expired? For example, in the UK decisions of a competent authority in granting the necessary licences can be subject to a judicial review. However, in all but limited circumstances judicial review proceedings must be brought within three months of the relevant decision.

Construction contract

It is perhaps in the area of construction contract strategy that offshore wind practice diverges most from other forms of power generation. Most comparable large-scale gas-fired independent power projects (IPPs) are developed on the basis of a single lump sum turnkey EPC contract.

However, while such structures were seen on a number of the early offshore wind deals, such structures are now quite rare. It is worth noting that while gas-fired

CCGTs are quite complex integrated plants with a single high value gas turbine at their core, wind farms are much more modular, with different components. It is therefore very difficult to ask, say, the turbine manufacturer, to "wrap" every element of an offshore wind farm's construction.

A bankable practice has developed whereby the construction is split into a number of packages with no overall EPC wrap. These packages could be:

- turbine supply and installation;
- foundations;
- offshore platforms;
- inter-array cabling;
- main transmission cable; and
- onshore works.

While the project sponsors will try to align the contract terms as much as possible and will build in extensive cooperation and coordination obligations on each contractor, there is no overall EPC wrap. In these circumstances, technical due diligence becomes key to bankability and the lenders' technical advisor will be asked to do a top down analysis, testing the degree of practical interface risk between the various contract packages and assessing the project's available contingency to cope with an agreed delay/cost overrun downside scenario.

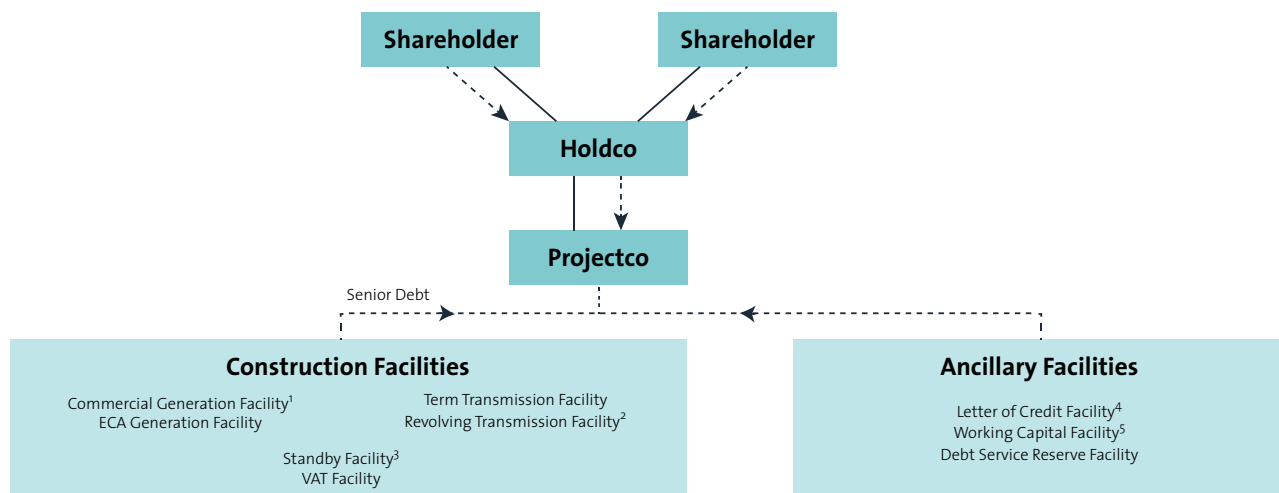
Alternatively, some experienced developers still utilise a multiple contract strategy, breaking the project down into 20+ sub-contracts which they manage. While this structure has not typically been capable of attracting limited recourse finance, some more experienced developers may be prepared to put an EPC "wrap" round the project, thereby elevating its credit profile to investment grade and marketing the debt accordingly.

Offtake arrangements

Offtake arrangements will vary from jurisdiction to jurisdiction, depending on the applicable regimes for renewables. There are essentially three types of arrangement:

- feed-in tariffs, where the project company is paid a fixed price for the renewable power it generates;

Figure 2: Offshore Wind: Typical UK Financing Structure



- 1 Facility may be split if credit support is required
- 2 Revolving facility used to provide credit support for transmission and/or OFTO sale obligations
- 3 Contingency may be built into base facilities
- 4 There may be multi-currency facilities
- 5 For working capital or letters of credit

- green certificates, where the project company is given a certain number of green certificates for the renewable power it generates to supplement the revenue from its commercial power purchase agreement (PPA); and
- contacts for difference (CfDs), where the project company is paid an agreed top-up payment up to an agreed strike price to supplement the revenue from its commercial PPA (which, for the purposes of the CfD, is deemed to be the relevant market price and referred to as the “reference price”).

Irrespective of the relevant government’s procurement strategy, the tendering authority will look to deliver some degree of competition into the process: with costs reducing so rapidly, tariffs rapidly become off-market: witness France’s recent decision to cut the tariffs for offshore wind projects awarded tenders in 2012 and 2014.

From a financing perspective, feed-in tariffs and CfDs both deliver a stable revenue stream (provided that, in the case of CfDs, the generator can also secure a long-term PPA). Green certificates, although used for many of the older UK offshore wind projects, are slightly more challenging because the project is still exposed to a fluctuating revenue stream under its PPA (which will typically pay the (variable) market price for power).

The key point about a PPA combined with green certificates or CfDs is that lenders will want an offtaker not only to purchase the power but also take the system imbalance risk that arises from a wind farm’s variable generation: a single windfarm is unable to balance its position such that it always sells precisely the amount of power it generates. Some of the key points in relation to the PPA will include:

- ensuring that the pricing mechanism is back-to-back with any CfD, such that there is no price leakage;
- negotiating the discount to the reference price that the offtaker pays (either on a fixed amount per MWh basis or on a

percentage basis) for taking “imbalance risk” in relation to the wind farm’s output;

- negotiating caps on liability for termination that provide the project with a sufficient buffer should the PPA be terminated for counterparty default while not unduly negatively influencing the discounts; and
- credit support should the offtaker not have an investment grade rating, and risk mitigation strategies such as placing multiple PPAs with different offtakers.

Operation and Maintenance Strategies

Lenders will also need to be happy with the project’s proposed operation and maintenance strategy. While the favoured option may be for a long-term maintenance contract for the wind turbines with the original equipment manufacturer, more experienced developers may prefer to take such a contract for perhaps five years and then take over the O&M themselves. The project’s ability to undertake the balance of plant O&M will also need to be assessed.

Financing matters

Facility structure

As offshore wind financings have increased in size and the cost pressures have become more intense, so the facility structures have become more complicated. Set out in figure 2 is a typical facility structure for an offshore wind deal.

The following are some key observations on facility structuring:

- UK financings will incorporate a separate tranche for the construction of the transmission facility. This tranche will typically be financed on a higher leverage and will be prepaid out of the proceeds of the sale of the offshore transmission assets to the successful bidder who wins the competition to own and operate these assets.

- How each of the generation and transmission financing facilities will be split depends to some extent on whether there is just commercial debt or commercial debt plus direct or credit enhanced lending from export credit agencies or multilaterals such as EIB or EKF. These facilities may also need to be split into a term facility and a revolving facility to enable them to be used to provide credit support for construction obligations. The value added tax (VAT) element of any project costs will also be financed from a VAT facility which is structured as a revolving facility to be prepaid from refunds of VAT.
- In common with many other projects, offshore wind financings may also incorporate a standby facility to provide additional funding in the event of cost overruns or delays.
- The precise scope of the ancillary facilities will depend upon the specific project requirements, but it is not uncommon to see a working capital facility, a debt service reserve facility (DSRF) and one or more letter of credit (LC) facilities (depending on currencies required).
- The DSRF is becoming an increasingly common feature of major renewables financings, with sponsors seeking to avoid tying up money in a debt service reserve account (DSRA) or funding a sponsor-backed DSRA letter of credit. The idea of a DSRF is to have a project-level loan facility that is available if required to meet unpaid debt service. Whether or not all banks are participating in the DSRF will determine the precise availability conditions of the DSRF: if all banks participating in the term facilities are lenders in the DSRF, then this is less of an issue, but if there are (ECA or other) lenders who are not participating in the DSRF, then this can give rise to intercreditor issues, as those funders will want the DSRF to be a cash equivalent with extremely limited conditions precedent to drawing.
- The scope of a project's LC facilities will vary considerably depending on the specific requirements of the project and the extent to which credit support is coming from the sponsors.

Common credit support requirements for offshore wind projects can include:

- credit support to contractors;
- security to state or private landowners; and
- security to civil or military air authorities to secure the building or upgrade of radar equipment.

Wind risk

Electricity production from an offshore wind project and the resulting revenue will ultimately depend on wind speeds over time at the wind farm site. Lenders will therefore be keen to understand the forecast of wind energy resource at the project site and any uncertainty to which the expected electricity production from the wind farm is exposed.

The energy yield assessment (EYA) is therefore one of the fundamental pieces of technical due diligence. The project sponsors will have carried out their own EYA during the development phase and the lenders' technical advisor (LTA) will need to validate that EYA. The sponsors' EYA will be the subject of careful scrutiny; it may be that there will be some disagreement as to the data or methodologies used which will need to be resolved between the sponsors and the LTA.

Wind output will typically be assessed over three projections and for the following purposes:

- P50 probability – the wind yield estimate can be expected to be exceeded 50 per cent of the time. Project sponsors will often base their own economics around the P50 analysis. In connection with the financing, P50 is typically used to determine whether or not projected coverage ratios are met for distribution purposes.
- P90 probability – the wind yield estimate can be expected to be exceeded 90 per cent of the time. Typically the lenders' debt sizing case is based around the more conservative P90 and any events that give rise to a recalculation of base case ratios will typically employ the P90 definition (see below).



- P99 probability – the wind yield estimate can be expected to be exceeded 99 per cent of the time. P99 is typically used for certain downside sensitivity analyses (e.g. does the project meet a one-year P99 debt service cover ratio of 1.0) and it may also be used when calculating pre-completion revenues (PCRs) (see below).

Equity structure/Pre-completion revenues (PCRs)

A key part of the overall financing plan will be the equity structure. Like any project, sponsor equity can be contributed up-front, pro rata with senior debt and even after debt, subject to the provision of appropriate credit support. Project sponsors may also choose to utilise an equity bridge loan to defer the funding of their actual equity commitment. In particular PCRs can play a significant role in the funding structure for wind farms.

Large offshore wind farms can generate a significant amount of PCRs during the commissioning period and before the wind farm as a whole achieves its commercial operation date (COD). Project sponsors will want to use the PCRs to reduce the funding burden on them and indeed will in most cases want to treat PCRs as equity.

For example, a project might be structured such that project sponsors commit to contribute the required amount of equity net of the P50 projection of PCRs plus all PCRs actually generated up to the projected P50 figure. The lenders will contribute the senior debt and may be asked to assume that the P90 revenues will be generated (i.e. the project sponsor does not credit support the P90 revenues even though they are treated as equity and only credit supports the difference between the P50 and the P90 figure).

While treating some level of PCRs as equity is acceptable to most commercial banks, some other funders may have strict policy requirements that do not allow PCRs to be treated as equity but rather as both debt and equity, reducing project cost rateably. In this case P99 revenues may be allowed to be taken into account in the financial model on an unsupported basis to reduce project costs. However, the treatment of PCRs cannot be considered in isolation and needs to be reviewed in conjunction with the gearing ratio: from a sponsor's perspective a higher gearing ratio can offset the impact of a more conservative treatment of PCRs.

Equity cure and wind reforecasting

In more recent offshore wind deals, strong project sponsors have been able to introduce other features that are favourable to equity, namely the concepts of wind reforecasting and equity cure. Equity cure, namely the right during operations to inject equity to cure a ratio breach and/or prepay debt, is not specific to offshore wind, but the prevalence of this feature is a good indicator of the strength of the sponsors and the banks' appetite for financing these projects. Typically project lenders resist granting sponsors automatic cure rights like this.

More specific to offshore wind is the wind reforecasting concept. It is worth remembering that P90 ratios are calculated on a ten-year basis and as such it is still possible that in the given calculation period for a ratio test the energy yield is so low that revenue generation drops and a default ratio is triggered. Sponsors will argue that the project is still fundamentally sound notwithstanding the ratio breach. Lenders will argue that this may be true, although they will want to know that the reduced energy yield is not a longer term issue. Wind reforecasting is essentially

an additional cure mechanism for a historic DSCR event of default whereby the project's revenues are recalculated assuming that the wind yield had corresponded with the P90 data. If this recalculation demonstrates that the ratio would have been above the event of default level, then there is no event of default. There will be negotiations around the number of times that this cure right can be used both consecutively and in the aggregate.

Deferral and mandatory resizing

Unlike a conventional power plant, where the plant is essentially a single integrated plant, a wind farm is a series of tens of individual wind turbines, all of which can generate revenue once common infrastructure is in place. Many subsidy regimes cater for the uncertainty that flows from needing to commission multiple generating units and allows the COD to be achieved within a target window rather than by a single date, and gives the project company the option to decide not to commission all its turbines (provided a minimum number are commissioned).

Wind farm financings therefore ideally need to allow for shifts in the COD and/or reductions in project size. This can be achieved through a deferral mechanism and associated mandatory resizing events. The deferral mechanism allows an agreed number of repayments to be deferred and the debt reprofiled at COD such that the debt tenor matches the subsidy contract. Any reprofiling or reduction in the number of the project's turbines gives rise to a mandatory resizing where the base case financial model is rerun applying the project ratios to the actual position at COD. If this calculation shows that the sizing case ratios cannot be maintained, then this "excess debt" is repaid via an agreed cash sweep mechanism.

Security

In common with regular IPP financings the lenders to a wind farm project financing will look to take the maximum security possible over the project. While there is nothing surprising in this, potential lenders will need to understand the security that is available to them offshore, particularly if the wind farm is located outside territorial waters. For example, in the UK it is not possible to perfect security outside the 12 nautical mile limit, because there is no applicable land registry where the security can be registered. Lenders may therefore have limited security over these assets, although depending on the lease terms they may be able to take an assignment of the project company's rights under the leases.

Hedging

Like any heavily leveraged project, lenders will want to ensure that the project puts in place an appropriate hedging strategy to ensure the project's construction costs are properly protected against adverse movements in interest or currency rates. Likewise during operations the project may need to protect itself against adverse currency movements if the major operation and maintenance agreement for the wind turbines with the original equipment manufacturer is denominated in a foreign currency. There is nothing particularly novel about this, save that due to the long time periods from project award to financial closing we have seen sponsors extensively deploying pre-hedging strategies to mitigate interest and currency risk and indeed, rather than automatically novating any pre-hedges to lending banks

at financial close, seeking optionality to break those hedges and take the profit and loss into account, either taking the profit for equity or using it to reduce project costs and including any negative hedging termination payment as a project cost. Depending on what happens to any positive mark to market there may be some upside to sponsors, but the key attraction is building in a mechanism that allows sponsors flexibility not to have to novate a hedge with a perhaps large negative mark to market to incoming lending banks.

The second interesting feature is the growing use of CPI hedges in the UK. The “strike price” which is used for the calculation of the difference payments payable under the UK CfD is indexed to the consumer price index (CPI). As with any project, sponsors will have made an assumption at the outset as to future CPI (inflation), and the project can therefore hedge its CPI profile, paying or receiving the difference between the actual CPI payment received and the assumed CPI payment.

CPI hedges are therefore helpful in stabilising a project’s cashflow and protecting coverage ratios, particularly in a low interest rate scenario. However, CPI hedging is relatively new and there are a limited number of counterparties, meaning that there may be some intercreditor discussions around orphan swaps and ranking.

Sponsor support

Project sponsors will need to decide at the outset the degree of sponsor support that will be available for the project. There are two key areas where sponsor support may be required. The first is in relation to construction and operation activities. The project’s funders will be keen to see some involvement from the main sponsors in these areas. Involvement during construction may simply take the form of various technical services and secondment arrangements. Alternatively the sponsors may take on a more coordinating role and provide some form of construction management services. Such a contract may be valuable where an experienced sponsor can provide these services during construction, although limited liability is likely to attach to their activities. Similarly an experienced sponsor may take on a role during operations, providing balance of plant O&M services and even O&M services for the wind turbines after, say, five years.

Secondly sponsors may provide credit support for the project’s obligations towards third parties such as landlords and contractors. Additionally, in the UK context, credit support may also be needed in relation to the sale arrangements for the offshore transmission cable or in relation to its maintenance. While such credit support has historically been provided by the sponsors, it has become the norm to build these third party credit requirements into the project facilities. Although this means the project and its founders have less recourse to the sponsors, it has the advantage of ensuring that all required credit support for the project can come from the project facilities and the project is therefore more insulated against events affecting individual sponsors.

Accommodating different financing strategies

Not all project sponsors want to use project financing to undertake offshore wind projects. A number of the leading sponsors in this space are large-scale, well-rated utilities or multinational companies who typically fund project development on their own balance sheet. This has led to a number of interesting structures in the market,

where sponsors with different commercial approaches seek to combine different financing structures.

One approach is to use a “HoldCo” financing, where the sponsor who wishes to raise debt does so at a HoldCo level. However under a normal HoldCo financing the HoldCo funders are structurally subordinated and reliant on dividends or other distributions to repay their debt. They also have no security over the asset. On some projects, a HoldCo financing has been structured such that the HoldCo and the project company enter into a PPA for the HoldCo’s pro rata share of the power generated and the HoldCo then on-sells this power such that there is a revenue stream sitting within the HoldCo and not just a dividend flow. This revenue stream may also include an element of the project’s green certificate revenue. This PPA can also be assigned to the HoldCo’s lenders.

On other projects we have seen lenders willing to accept a sponsor co-lender structure, whereby project sponsors are allowed to participate in the financing as senior lenders and even hedge banks *pari passu* alongside the commercial senior lenders. Clearly such structures can give rise to a degree of inter-creditor complexity as commercial banks will want to ensure that sponsor funders are disenfranchised with regard to lender decision-making.

Conclusion

There is no doubt that the offshore wind market is in a period of major growth: an increasing number of ever larger wind farms are seeking finance in a growing number of countries and existing wind farms are being refinanced. Happily, for now funder appetite remains strong: funders have become more familiar with offshore wind farm construction risk and seem to like the combination of large ticket sizes backed by strong sponsors that are on offer for these renewable financings.

Ashurst has advised sponsors and funders on offshore wind farm developments across a number of European jurisdictions. In the UK we are currently advising funders or potential equity parties on two of the three offshore wind farms awarded a CfD in the last UK CfD allocation round, and prior to that we advised on a number of projects, including Westernmost Rough and West of Duddon Sands. In France, we have advised bidders involved in all three offshore tender rounds, including the St Nazaire, Fécamp and Courseulles projects awarded to the EDF led consortium in the first round. In Germany we advised on the Baltic 2 and Butendiek projects, as well as advising bidders in the first two rounds of tenders for tariffs in 2017 and 2018.



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UK OIL AND GAS INDUSTRY:

The evolution of an independent midstream sector

by Michael Burns and Justyna Bremen

Recent years have seen significant change in the UK upstream oil and gas industry, spearheaded by the disparate but equally defining forces of the Wood Review and variations in oil prices. The need to change and adapt has also trickled down to the midstream sector, as integrated oil and gas corporates re-evaluate their business models and seek to restructure their balance sheets, while investors, particularly infrastructure funds, seek new opportunities.

The traditional ownership model for midstream assets

While the exact definition of what comprises the midstream sector, as opposed to upstream and downstream, is not black and white, the term midstream is generally considered to be broad and include the transportation, storage and processing of oil and gas and derivative products. For the purposes of this article, we are focusing on UK gas and oil pipelines, primarily offshore, and associated processing and storage infrastructure.

In the early days of the UK Continental Shelf (UKCS) oil and gas industry, upstream oil and gas companies constructed and

operated midstream infrastructure required to realise the value from newly discovered oil and gas fields. As early as the 1970s it was recognised that it was not desirable to replicate new infrastructure for each project, and therefore an ownership model evolved whereby assets originally commissioned for a particular field or fields are made available to third party users (i.e. owners of other fields) who pay a tariff for the use of the existing infrastructure.

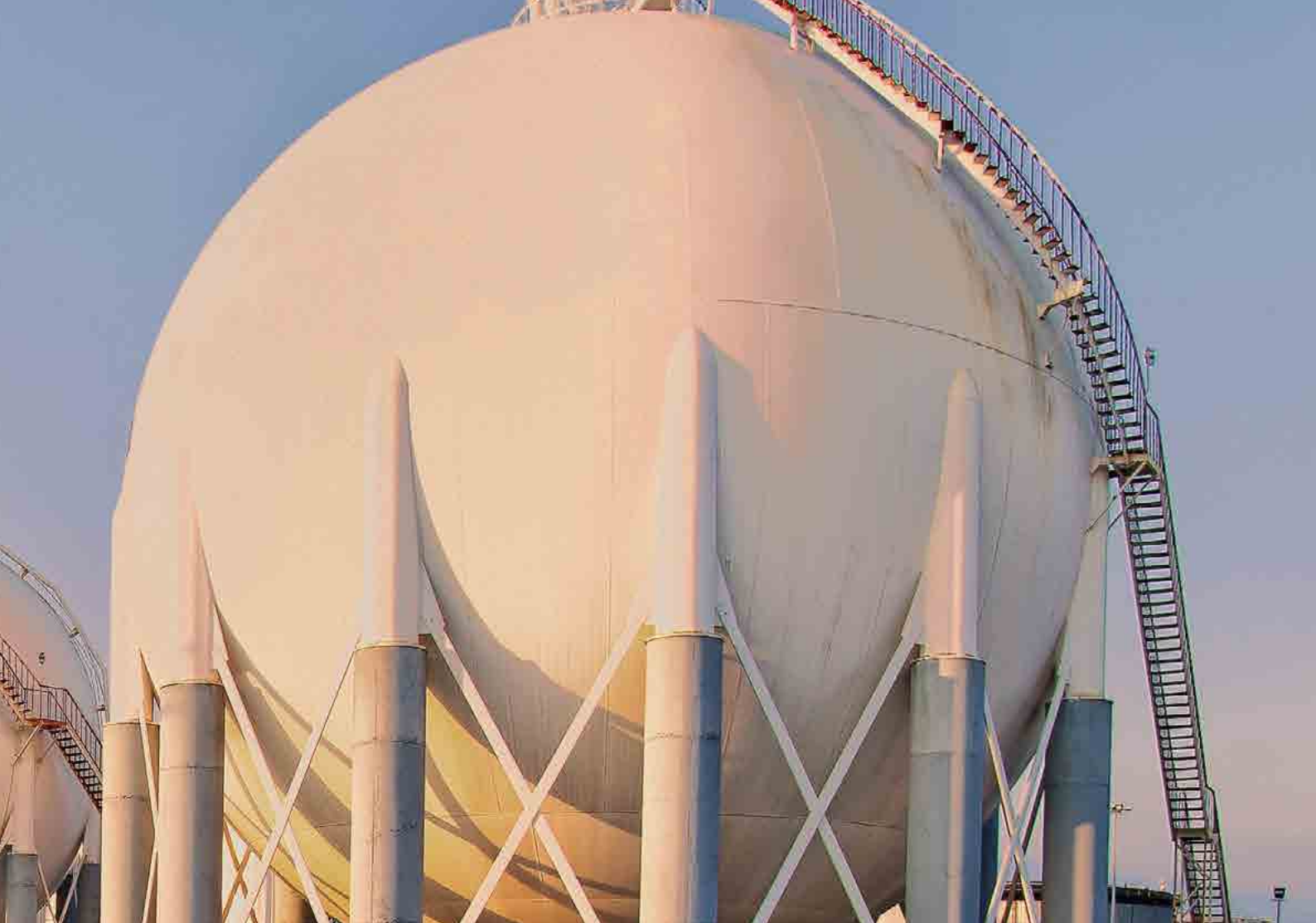
Therefore, the traditional ownership model for UKCS midstream assets has involved ownership by one or more oil and gas companies, with a designated operator (typically an oil and gas company with a

majority interest in the relevant fields or its subsidiary) and a number of third party users, being other oil and gas companies producing oil and gas from other fields.

Currently there are approximately 300 offshore fields operated by a mix of large and small oil and gas companies, with 20,000 kilometres of pipelines connecting these fields and platforms to onshore terminals.

The need for change

The Wood Review published in February 2014 noted a need for the efficient management of existing ageing infrastructure, as well as investment in



new infrastructure, and that therefore a new model involving the “independent transporting and processing on third party production” should be encouraged.

The publication of the final Wood Review report was followed by the dramatic fall in oil prices, creating an economic impetus for oil and gas companies to closely scrutinise their asset bases. The disposal of midstream assets presented, and continues to present, an opportunity to generate immediate cash which can be applied in other directions, be that payment returns to shareholders, paying down debt or used for investment elsewhere in the group. Additionally, much of the existing UKCS infrastructure is in need of investment to maintain and upgrade it, and new ownership brings with it the potential for much needed capital investment programmes.

The new model in practice

There have already been a number of examples of disposals of midstream assets, resulting in ownership by companies that are not themselves users of the

relevant assets. The Frigg gas processing and transportation system (FUKA), which originally served the Frigg field (now no longer in production), together with a 67 per cent interest in the SIRGE pipeline, was sold by Total to North Sea Midstream Partners (NSMP) in 2016. NSMP was formed by Arclight Capital in 2012 through the acquisition of the Teesside Gas Processing Plant. It is no surprise that NSMP has US roots, as the independent midstream sector is well established in the US.

Similarly, BP sold the Central Area Transmission System (CATS) pipeline to Antin Infrastructure Partners (Antin). This acquisition followed an earlier disposal by BG Group of its interest in the CATS pipeline to Antin.

More recently, in November 2017, Ancala Midstream Acquisitions Limited completed the acquisition of Apache’s interests in the Scottish Area Gas Evacuation (SAGE) System and the Beryl Gas Pipeline.

In December 2017 Antin announced that it is increasing its portfolio of UKCS assets: CATS Management Limited (CML), an Antin

portfolio company, agreed to buy a 65 per cent interest in the Esmond Transportation System, which comprises a 165-kilometre pipeline that transports gas from fields in the southern North Sea to the Bacton gas.

Ensuring a safe and efficient operating model

For the disposing owners of midstream assets, where those outgoing owners will need to continue to use the assets, as well as third party users of the assets, one of the key aspects to any sale is the safe and efficient operation of the assets going forward. Often infrastructure fund buyers will team up with leading operators, such as Wood Group, to operate the assets on an arm’s length basis post completion of the transaction. In the case of the Esmond Transportation System, one of the outgoing owners, Perenco, is expected to continue in its role as operator. In addition, as discussed in more detail below, the existing UK petroleum regulatory regime provides important parameters to support how the asset is maintained and operated.

In terms of new field owners securing access to infrastructure, new infrastructure owners are likely to be motivated to sign up users of any spare capacity. In addition, a key component of the UKCS regulatory structure has been a right of recourse to the regulator in cases of disputes between the owners of midstream assets and third party users. The current third party access regime, underpinned by a voluntary industry code, allows a party that seeks access to upstream infrastructure, and cannot agree such access with the owner, to apply to the OGA for a notice granting the relevant rights.

Regulatory and third party consents

The UK offshore oil and gas industry is subject to a highly developed regulatory regime, encompassing economic, environmental and health and safety oversight involving a number of different regulators. The remit of these regulators extends to not just exploration and production, but also to the offshore infrastructure.

As a consequence of this, there are a number of different regulatory consents that will be required upon a pipeline changing ownership, and this regulatory oversight will continue for the life of the asset. A comprehensive list of the consents that may be required will depend on the nature of the individual transaction – in particular, the characteristics of the assets in question, as well as the sale structure (e.g. asset sale versus share sale). However, below we discuss some of the key consents that may be required.

Pipeline Works Authorisation

Under the Petroleum Act 1998, a Pipeline Works Authorisation (PWA) is required for the construction, modification and continued use of an offshore pipeline. The PWA names the parties that hold the PWA (i.e. are a “holder”) or that are a “user, operator or owner” of the pipeline (note that a party can have more than one role). In accordance with the terms and conditions of a PWA, the holder of the PWA must apply to the regulator, the OGA, before making any changes to the “holder, user, operator or owner” information. Where there is to be change in the operator or owner on an asset deal, the OGA will want to satisfy itself that the incoming owner/operator will have appropriate standing. This is linked to the legal requirement that the OGA exercises its powers in accordance with the MER UK Strategy (the Maximising Economic Recovery Strategy for the UK).

Health and Safety Executive and OPRED

Again, in the context of an asset deal, the approval of the Health and Safety Executive, which administers the safety regime applying to pipelines, may also be required, and this regulator plays an important role in ensuring that pipelines are operated safely. The Offshore Petroleum Regulator for Environment and Decommissioning (OPRED) will also need to be consulted. For example, a permit issued to the operator of a pipeline under the Offshore Petroleum Activities (Oil Pollution Prevention and Control) Regulations 2005, may not be transferred to a new operator without the consent of OPRED.

The Crown Estate

Where a pipeline has been laid within 12 nautical miles of the coast, there will usually be a Crown Estate lease in place. As a condition of the lease, the consent of the Crown Estate will need to be obtained if there is to be a transfer of that lease.



Third parties and stakeholders

Before an asset sale can proceed, in most instances the consent of various other third parties including any joint venture partners of the existing owner, as well as other users of the system (depending on the terms of use), will be required. It is important to identify and engage with such third parties and any other stakeholders as early as possible in the transaction, to ensure that any potential “sticking points” are identified and resolved. Where there is to be a change in operatorship of the pipeline, the employees of the existing operator may be transferred to the new operator under the Transfer of Undertakings (Protection of Employment) Regulations 2006 – the so-called “TUPE” regime.

Carving out the midstream business

It is important on any midstream deal where there is an existing upstream link to ensure that the midstream assets are appropriately carved out from the integrated upstream and midstream business. This may involve putting in place new long-term transportation agreements, agreements of joint venture partners at the upstream to execute the carve-out and also to put in place specific decommissioning security arrangements in relation to the midstream assets (as distinct from the integrated business).



Decommissioning liabilities

One significant issue that can present a challenge to investors not familiar with midstream assets, particularly in the UKCS context, is the decommissioning liability that attaches particularly to offshore pipelines. The UK Petroleum Act 1998, which governs oil and gas activities in the UKCS, imposes an obligation on owners of pipelines to decommission them at the end of their life. While for most midstream assets decommissioning may still be a distant prospect, a combination of the relatively significant cost of decommissioning (although not as high as the cost of field decommissioning) and the fact that the UK Government is able to pursue a wide range of people, including former owners and associated companies, to cover decommissioning costs should the works not be carried out, means that in any midstream transaction the parties will wish to robustly document who will take responsibility for decommissioning the infrastructure, as well as any security that is required to back-up that agreed position.

Conclusion

While UKCS midstream transactions are complex, the new ownership model in the UKCS business is now well established through transactions that have been completed in the sector and remains an area of focus for investors looking at the midstream infrastructure space. It is likely to be a theme that sees further development in the future.

This is an updated and expanded version of an article first published in April 2018 in [Financier Worldwide Magazine](#).



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MARKET VIEW:

Subsidy-free UK solar and wind projects

by Antony Skinner and Nicholas Hilder

The UK energy market is evolving. With the UK's first subsidy-free solar project opening in September 2017, the industry is beginning to shift to a new era of "subsidy-free" renewables out of necessity. However, while subsidy-free energy projects reduce the overall cost to the consumer of delivering new clean energy capacity, they are not without their challenges. Overcoming the higher cost of financing subsidy-free schemes is one hurdle, while managing variable wholesale prices is another.

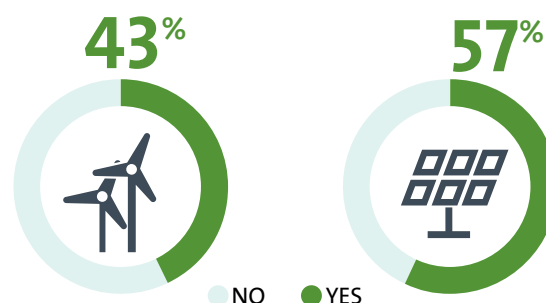
To understand the extent of the impact of these challenges on the development of wind and solar projects in the UK, Ashurst sought the views of solar and wind developers and commercial and institutional lenders, together with financial, legal and market advisers, at a forum hosted at our offices in Spring 2018. The forum was subject to the Chatham House Rule, but the attendees kindly agreed that we could share their responses, which we analyse in this article.

Withdrawal of subsidies for onshore wind and solar

Despite the UK Government's gradual withdrawal of various subsidy mechanisms, 57 per cent of those consulted disagreed with the Government's decision to abolish subsidies for onshore wind compared to 43 per cent who were in agreement. On the other hand, this is reversed when focusing on solar, with 57 per cent of respondents agreeing with the UK Government's decision to abolish solar subsidies. (See figure 1.) This reflects the view that solar is a more established technology with a lower construction cost, ready to compete with conventional generation on a subsidy-free basis.

Nevertheless, it appears that the market view is that subsidies were removed too soon in the UK.

Figure 1: Do you agree with the UK Government's decision to abolish subsidies for onshore wind and solar?



Many in the industry are of the view that solar and onshore wind projects in the UK do still require some support, and market participants consider that the UK Government should have



introduced a price stabilisation mechanism for both onshore wind and solar projects even if this was on a subsidy-free basis. In our research 86 per cent of respondents agreed that these generating technologies still require some level of price stabilisation, to allow risks to be fairly shared between energy firms and the Government, while helping to attract investment. (See figure 2.)

Figure 2



think onshore wind and solar need a government-backed subsidy-free price stabilisation mechanism in order to stimulate investment.

The consensus is that subsidy-free renewables will happen later in the UK than elsewhere. Fifty per cent of respondents agreed that the UK renewables market will see material investment in subsidy-free onshore wind and solar projects over the next two to five years. (See figure 3.) This is in stark contrast to Southern Europe, where there has been a growing emergence of subsidy-free projects since late 2017. For solar in particular, this is due to the higher load factors in these jurisdictions, which increases output and in turn increases return on investment.

Figure 3: Within what time horizon will we see material investment in subsidy-free wind and solar projects in the UK?



Risks to subsidy-free deployment

Those operating in the energy sector perceive current regulatory risks in the UK energy sector to be one of the most significant barriers in the industry to driving development and investment.

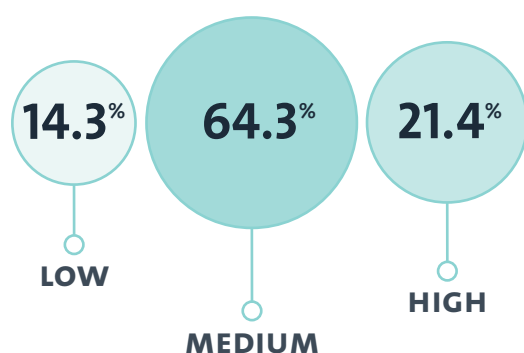
Alongside concerns around the uncertainty Brexit brings to the energy market, participants identified a number of additional regulatory risks, including:

- cuts to so-called embedded benefits, one example of which being Ofgem's decision to cut the Triad avoidance payment for embedded generators by 95 per cent over three years;
- changes to the way the transmission loss adjustment is calculated, including Zonal Transmission Losses, as implemented on 1 April 2018; and
- recent amendments to the capacity market rules, including the de-rating of battery storage projects which cuts the derating factor in capacity market auctions by almost 80 per cent for 30 minute duration batteries. As a result, a majority of battery storage projects that had qualified for the capacity market auction in 2018 were unable to compete.



Despite these issues/changes, the vast majority of respondents do not currently view the UK energy sector as being heavily impacted by regulatory risk, with only 21 per cent of participants perceiving the UK to have high regulatory risk. (See figure 4.)

Figure 4: How concerned are you with regulatory risk in the UK energy sector?



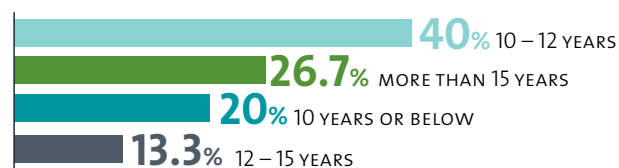
While there is no evidence that the Government would seek to impose regulatory changes on a retrospective basis, the rebanding of support under the Renewables Obligation and changes to solar support under the Feed-in Tariff regime are well-remembered. Regulatory stability is paramount to promote investor confidence, and at a time when the Government is focused on reducing the cost of capital, investors may consider adding a risk premium to investments in the UK energy sector to reflect the regulatory uncertainty.

Financing renewable energy

The move to subsidy-free deployment brings into question whether or not classic project finance debt structures remain the most efficient way of financing projects. In particular, the higher exposure to less stable revenue streams could result in financiers demanding higher margins to match the risk.

When considering the debt amortisation period for a subsidy-free project, 40 per cent of respondents thought that the appropriate amortisation period was between 10 and 12 years, compared with 20 per cent who thought debt should be repaid over a term of 10 years or less. (See figure 5.) The preference for short-term debt reflects the banking community's perception that subsidy-free onshore wind and solar carries with it more risk than subsidy-backed schemes.

Figure 5: What debt amortisation period should be used for a subsidy-free wind/solar project?





Continuing the theme, there was recognition that the margins to be earned across the solar and wind space are relatively low at present, and 86 per cent of respondents believed that margins should be higher for subsidy-free projects. (See figure 6.)

Figure 6: Should margins be higher for a subsidy-free solar/wind project?



The majority of participants, 65 per cent, also considered that the debt to equity ratio should be lower, requiring sponsors to invest more of their own capital in the project and therefore helping to lower the risk for lenders. Thirteen per cent thought that there would be no change irrespective of subsidy. (See figure 7.)

Figure 7: Should debt to equity ratios be lower for a subsidy-free solar/wind project?



For the banks there was recognition that deal structures may need to become more flexible. One possible solution discussed was to include a lower fixed repayment schedule, but with a cash sweep and immediate prepayment of the debt during periods of strong economic performance such as high winds/irradiation and/or higher than expected power prices.

Direct PPAs

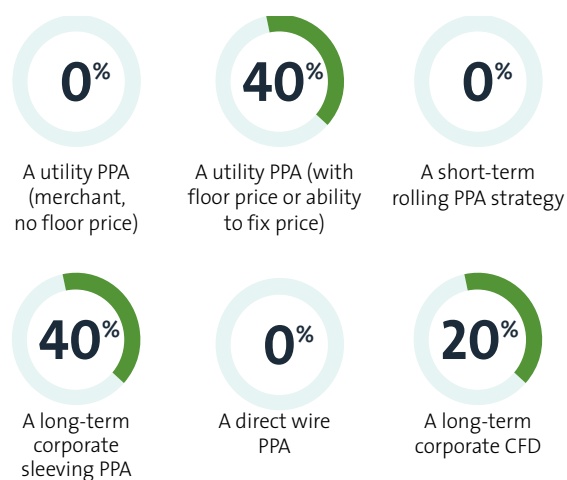
Since the UK Government decided to abolish subsidies for some technologies, direct power purchase agreements (PPAs) have become more prominent in the market and are now seen as a key feature of subsidy-free wind, solar, biomass and energy from waste projects.

The concept of direct PPAs has been in existence for many years but, in practice, their use has been relatively limited with the majority of projects to date opting to enter into a long-term PPA with an established licensed supplier, and preferably with one of the large utility companies.

There are three main types of direct PPA – a contract for difference, a sleeving PPA and a direct wire PPA¹.

In our research 40 per cent of respondents favoured a PPA with a licensed supplier with a floor price or ability to fix prices. Another 40 per cent favoured a long-term corporate sleeving PPA, and 20 per cent favoured a long-term corporate contract for difference. None of the respondents favoured a utility PPA on a purely merchant basis, a direct wire PPA or a short-term rolling PPA strategy. (See figure 8.)

Figure 8: What is your preferred PPA strategy?

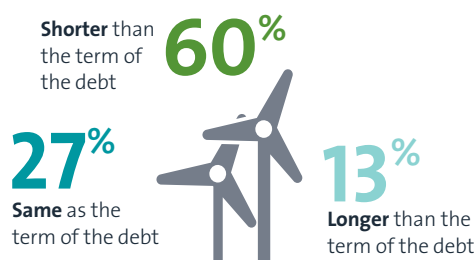


¹ For more information about these different types of direct PPAs, see our earlier article, "Direct PPAs: Connecting with corporates", published in issue 18 of *EnergySource*.



Looking into this further, 60 per cent of the respondents thought that the PPA could be shorter than the term of the debt. Twenty-seven per cent thought that the PPA should be for the same term of the debt, and 13 per cent thought that the PPA should be longer than the term of the debt. (See figure 9.) Clearly, when considering a PPA that is shorter than the term of the debt, lenders will be keen to ensure that their loan documentation contains appropriate controls on the borrower's replacement PPA strategy.

Figure 9: Will a subsidy-free wind farm require a PPA in place for the term of the debt?

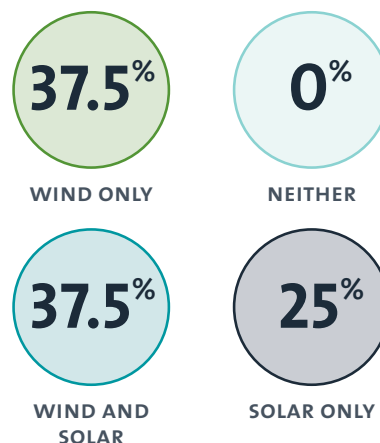


Utility PPAs with floor prices can be less appealing to sponsors because the utility will usually offer a low floor price, which may not even be contemplated in lender downside sensitivity testing for debt sizing purposes, and the utility will charge for this floor price by way of a higher deduction from the power price under the PPA. We note that PPAs with the built-in ability to forward fix prices are becoming increasingly popular.

Price cannibalisation

Investment in subsidy-free projects can also be affected by "price cannibalisation". This arises when there is a lot of solar or wind power connected to the grid. By definition, wind and solar projects have a near zero marginal cost of production and so will always generate when they can. This means that on sunny or windy days (or even more of an issue on sunny and windy days) supply goes up but demand for power in the UK is relatively fixed. Basic economics dictate that when supply is high and demand is low or level, price will reduce. This means that wind and solar generators are often generating at the time of the lowest power prices. Respondents believed this effect will have a bigger impact on wind generators, with 37 per cent agreeing, compared to 25 per cent who believed the decline in value will be steeper for solar generators. (See figure 10.)

Figure 10: Will price cannibalisation deter investment in merchant projects?



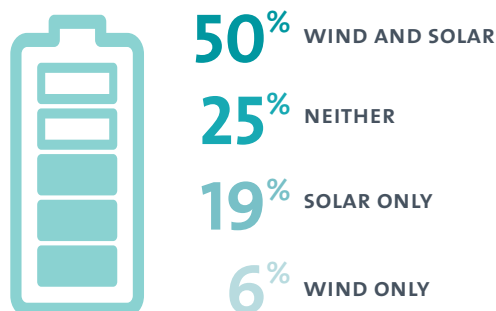
Battery storage has the potential to mitigate the impact of price cannibalisation as further discussed below.

Co-location of battery storage on renewables sites

There has also been an increasing focus on colocating battery storage alongside solar or wind energy projects as a means to mitigate the impact of price cannibalisation and in order to benefit from a shared grid connection, which in turn helps to reduce overall costs of development. At times of low prices, the electricity generated by the wind farm or solar park will be used to charge the batteries. When power prices increase, the generator will either export directly from the wind farm or solar park to the grid or discharge the battery. The ability to do both will depend on the size of the grid connection, but in all likelihood the generator will be able to use the battery to smooth the output of the wind farm or solar park.

Furthermore, having battery storage located onsite behind a meter negates the effect of bid-offer spread on pricing compared to a situation where the wind farm/solar park and battery storage project are located separately. This is reinforced with 50 per cent of respondents agreeing that colocation would make a material difference to the economics of a project for both wind and solar, compared with a quarter of respondents who thought colocation would have no impact. (See figure 11.)

Figure 11: Will battery storage colocated with wind or solar projects make a material difference to the economics of the project?

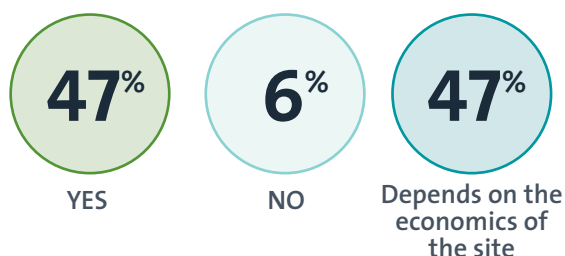


A developer does not necessarily need to colocate a battery storage project onsite in order to realise the benefits. Instead, a developer could use the battery as a tool to arbitrage the low price a wind farm/solar park might receive during periods of high supply and low prices by charging the battery from the grid at such time and then exporting from the battery to the grid when power prices are high. However, this exposes the developer to the bid-offer spread of power prices.

Repowering wind farms

A number of wind farm sites with the best wind resource, wind data and grid connection were developed when the industry was in its infancy and turbine technology embryonic. Repowering these sites and deploying the latest in turbine technology will see a significant increase in capacity and reduction in opex. Furthermore, since repowering often involves enhancing an existing site rather than building on a new site, there should be less public opposition which could facilitate a positive planning consent outcome. As such, there has been a steady increase in interest in repowering, with some secondary market acquisitions and financings now being concluded with repowering assumptions built into the base case. This is reflected in our research, with 47 per cent of respondents saying that they would consider repowering an existing asset before the end of its modelled life as a matter of course, while 47 per cent said that their decision to repower would depend on the specifics and economics of the site. (See figure 12.)

Figure 12: Would you look to repower an existing asset before the end of its modelled life?



Overriding themes

Supply chain pricing

One of the overriding themes emerging from the research was that the supply chain serving both solar and wind industries needs to be more flexible in its approach to pricing and more creative in its offering, to allow onshore wind and solar projects to become economically viable without the support of subsidies. Structures whereby the whole life cost of a particular asset is linked to the revenue generated by that asset were widely seen as having potential for development. While there is precedent for such structures within renewable energy deals (for example, it is often the case that the landlord's rent under a wind or solar lease is linked to the revenue earned by the project) consensus is that it would be a brave operator that took the first step to receive an O&M fee linked to project revenues.

Additional thoughts on offtake arrangements

Lenders do not like taking the balance sheet risk on corporate offtakers for longer than three to five years. The ratings of tech firms, in particular, are not seen as robust. Favourable credit ratings offer some comfort to lenders but even the credit default swap market is not liquid enough to cover longer term exposure to corporate offtakers. Lenders' preference would be for a regulated utility (such as a water company) to be the offtaker, but there are not enough of them. Therefore, the risk associated with corporate offtakers is a key risk which lenders are going to have to come to terms with in order for subsidy-free wind and solar projects to be developed.

One potential way to structure around this is to give credit to the fixed price offered by a corporate offtaker for a period of up to (say) five years, but then to assume the medium or low price case provided by a market adviser for any subsequent period. One could also attach a higher risk weighting (with respect to the required debt service cover ratio) for the purposes of debt sizing. This issue is a good example of where sponsors and lenders are both going to have to compromise in order to establish a bankable structure for subsidy-free wind and solar projects.



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INVESTMENT PROTECTION:

Managing investment risk in an uncertain world

by Tom Cummins and Emma Martin

We live in an uncertain world, where the risk landscape for international investors in the energy industry has seldom been as challenging. Political and economic risk factors such as Brexit, import restrictions in the Middle East, the US-China “trade war” and the high profile use of financial sanctions are the daily fodder of the financial press. Arguably, in this environment international investors are in need of the protection offered by investment treaties, no matter whether the location of their investment is in a traditionally stable jurisdiction like the UK or a country with a track record of political instability. However, this need for investment protection comes at a time when investor-state dispute settlement (ISDS) is subject to increasing public criticism, giving rise to a shifting landscape in the nature and extent of the investment protection available.

This article considers some of the key global developments which have the potential to impact foreign investors, and the extent to which investors can mitigate against such risks by restructuring their investments to take advantage of investor protection rights and guarantees available under existing bilateral and multilateral investment treaties.

Traditional investor protection

Foreign investors have long sought to structure their investments so as to take advantage of the investor protection provisions included in bilateral and multilateral investment treaties.

Bilateral investment treaties (BITs), are public international law agreements whereby two states agree to provide reciprocal guarantees and protection for

investments made by foreign investors within their jurisdiction. States typically agree that foreign investors and their investments will be afforded fair and equitable treatment, freedom from discrimination (judged against the treatment that the host state provides to both domestic investors and investors from third states), and protection against expropriation without adequate compensation. Multilateral investment

treaties (MITs) often provide similar guarantees, but have three or more state signatories. One of the most high profile MITs is the Energy Charter Treaty.

BITs and MITs typically provide investors with a direct means of enforcing their rights by allowing them to commence arbitration proceedings against the host state. This is particularly valuable as it dispenses with the requirement for a separate arbitration agreement between the investor and the state.

The type of arbitration provided for in BITs and MITs varies, but arbitration under the rules of the International Centre for the Settlement of Investment Disputes (ICSID, a World Bank entity), Stockholm Chamber of Commerce (SCC), or the United Nations Commission on International Trade Law, (UNCITRAL) is common. Those rules typically provide for hearings to be held in private, and there is little public disclosure of details about the case, the parties' respective positions, and any awards rendered, although there have been a number of steps in recent years to promote transparent arbitration of investment disputes. There is also little scope for the parties to challenge or appeal unsatisfactory awards, which are enforceable globally under either the New York Convention or the Washington Convention (in the case of ICSID awards).

The changing landscape

Over the past decade, there has been a significant increase in the number of claims brought by foreign investors against the states hosting their investments. Many of those claims have been against emerging economies with stretched budgets, and in respect of politically controversial projects. They have frequently resulted in states being ordered to pay hundreds of millions, if not billions, of dollars in compensation to multinational corporations. Many of those claims have arisen in the oil and gas, power and renewables industries.

Much has been written both in the press and in academic journals condemning ISDS. Critics have derided ISDS for amounting to "hotel room justice", where arbitration hearings in politically charged

cases take place in private, away from public scrutiny, in the conference rooms of luxury hotels. Having once justified such treaties as a means of encouraging foreign direct investment, a number of states are finding it difficult to quantify the economic benefits realised and to justify to their own citizens the benefits of remaining a party to BITs and MITs in their current form.

This fresh look at BITs and MITs is leading to policy decisions and legal, regulatory and political reform which could, in turn, adversely impact foreign investors. In May 2018, the United Nations Conference on Trade and Development issued a report noting that investment treaty making had reached a "turning point". It noted that the number of new investment treaties concluded in 2017 was the lowest since 1983 and that, for the first time, the number of effective treaty terminations outpaced the number of new treaties.

European intervention

In Europe, it is perhaps in part because of such growing public scrutiny that the European Commission has taken steps itself to condemn bilateral investment treaties. In June 2015, the European Commission commenced infringement proceedings against Austria, the Netherlands, Romania, Slovakia and Sweden, asking them formally

to denounce their intra-EU BITs (BITs concluded between EU member states) on the basis they were incompatible with EU law. All but Sweden have since terminated some – if not all – of their intra-EU BITs.

More recently, in March 2018, the European Court of Justice (ECJ) handed down its decision in the *Achmea case*.¹ That case concerned a Slovak-Dutch BIT, which had been invoked by the Dutch investor against the Slovak Republic in response to the Slovak Government's decision to change its health insurance legislation. The ECJ held that the BIT violated EU law because it infringed the ECJ's role as the final arbiter of EU law (as it permitted the investor to commence international arbitration proceedings in respect of disputes arising under the treaty, which would in turn involve an international tribunal determining matters of EU law).

The *Achmea* decision concerned the decision of an ad hoc tribunal appointed under an intra-EU BIT, and it is not yet clear whether the ECJ will take a similar stance in relation to ICSID arbitration commenced under an intra-EU BIT, or with regards to arbitration proceedings (ad hoc or otherwise) commenced under an intra-EU

¹ Case C-284/16, Slovak Republic - v - Achmea BV, Judgment of the court on 6 March 2018.



BIT but seated outside of the EU. The ECJ's views on the legitimacy of MITs (such as the Energy Charter Treaty) also remains unclear. However, what is clear is that intra-EU ISDS, as we have long known it, will very quickly become a thing of the past.

Treaty termination

The problem is not confined to Europe. A number of states have sought to amend their BIT and MIT obligations in recent years. Perhaps most famously, the current US President, as part of his election campaign, promised to “tear up” the North American Free Trade Agreement (NAFTA), the MIT that has regulated trade between Canada, Mexico and the US for around 14 years. NAFTA is currently being renegotiated, with Mr Trump continuing to threaten to terminate it if the revisions are not to his liking.

NAFTA is only one of the MITs to fall foul of Mr Trump's protectionist policies. The US has withdrawn from the Trans-Pacific Partnership (an MIT which would otherwise have involved countries responsible for 40 per cent of the world's economic output) in January 2017, with the remaining state parties continuing with the agreement but narrowing the ISDS provisions.

The US is not the only state looking to reduce the scope for investors' claims against it. A number of Latin American states, as well as India and South Africa, have terminated their BITs in recent years, many as a result of substantial arbitral awards obtained by investors against them. Some states, including Bolivia, Ecuador and Venezuela, have gone a step further and withdrawn from ICSID altogether.² The Netherlands has published a new draft investment treaty for comment. It significantly restricts the protections afforded to investors under Dutch BITs. The Dutch Government intends to use the draft treaty to renegotiate its existing BITs with non-EU states.

Protectionist policies

Even in those states where treaties remain in place, the position remains uncertain for foreign investors. States are displaying increased reluctance to enter new treaties and to renew treaties that are due to lapse. Some have sought to amend their model treaties to “water down” the investor protection obligations they will take on in the future. India, for example, now requires investors to exhaust all local remedies before commencing arbitration proceedings (meaning that any foreign investment dispute will need to originate in the Indian courts, and thus that investors will be significantly delayed in getting their dispute before an international tribunal).

All of this presents a significant degree of uncertainty and unforeseeability for investors. Will investments currently benefiting from investor protection guarantees continue to do so in the future? Will the standards and level of protection currently offered remain the same? Is the level of protection likely to change in the future? None of these questions can be answered with any degree of confidence. It simply is not yet clear exactly how the landscape will change and what the impacts of such change will be. What is clear is that we have entered a new period fraught with uncertainty. What can investors faced with such uncertainty do?

² For more on the implication of states terminating their investment treaties, see previous article “Is the sun setting on BITs”, published in our International Arbitration Newsletter in December 2017: <https://www.ashurst.com/en/news-and-insights/legal-updates/is-the-sun-setting-on-bits/>



Investor protection – is restructuring an option?

One issue for consideration by foreign investors who do not currently have the benefit of treaty coverage (or who have treaty coverage that is likely to be eradicated or “watered down” in the near future) is whether the investment can be restructured so as to ensure appropriate treaty coverage in the future. If, for example, intra-EUs are likely to fall away, can foreign investors revisit the nationality of their investment vehicle in order to secure the nationality of a state that retains appropriate treaty coverage with the host state?

Brexit – itself a source of significant uncertainty – may in fact provide an opportunity for European investors in that regard. It remains to be seen how the UK's legal and regulatory landscape will change as a result of Brexit, but in circumstances where the UK will no longer be part of the European Union, and may be outside of the jurisdictional reach of the ECJ, Brexit may provide investors in Europe with a means of ensuring that their investments remain subject to traditional investor protection and ISDS provisions, should they re-route their investments into the EU through the UK. The availability of that option, of course, depends on the UK entering into, and in some cases maintaining, investment treaties with favourable provisions for investors as well as there being no denial of benefits clause in those treaties (which would permit states to deny treaty protection benefits to investors who have no substantial business presence in the state in which they claim nationality for the purposes of investment protection and impose an additional nationality hurdle that some restructurings may not be able to meet).

Putting the UK position to one side, whether restructuring is necessary and appropriate will depend upon the foreign investor's



current rights and how they are likely to change in the future. Most BITs do not expressly prohibit the restructuring of investments to gain treaty protection. Indeed, it has been held that the restructuring of investments through a holding company in a third country in order to gain treaty protection against a breach of rights by the host state authorities is a “perfectly legitimate goal as far as it concern[s] future disputes”³ and that “corporate groups are routinely restructured for a variety of reasons”⁴.

The key point is that treaty protection will be secured only where the restructuring was motivated by an aim to obtain such protection in respect of “future disputes”. Arbitral tribunals have used the “abuse of rights” doctrine to decline to consider investment treaty claims where the restructuring has been motivated wholly or partly by a desire to gain access to investment protection in circumstances where a specific dispute exists or is foreseeable.

Most notably, in the *Philip Morris case*,⁵ the Australian Government succeeded in arguing in its defence that the Philip Morris tobacco company had restructured its investment (so as to route it through Hong Kong) primarily for the purpose of gaining access to the ISDS provisions in the Hong Kong-Australia BIT once it became likely that tobacco plain packaging laws would be introduced, which it would want to dispute. As a result, the Tribunal held that Philip Morris was not entitled to rely upon the investment protection standards set out in the Hong Kong-Australia BIT.

3 *Mobil -v- Venezuela* (ICSID Case No. ARB/07/27) (Decision on Jurisdiction).

4 *Philip Morris Asia Limited -v- The Commonwealth of Australia* (PCA Case No. 2012-12) (Award on Jurisdiction and Admissibility).

5 *Ibid.*

Philip Morris is not the only case on the topic. Other tribunals have also provided guidance on the extent to which a restructured investment will be subject to investment treaty protection. The key question is whether the dispute was in existence or foreseeable at the time of the restructuring. If there was a very high probability of a specific future dispute, and not a mere possible future controversy, the restructuring to take advantage of a specific treaty will likely be held to constitute an abuse of rights.

While there is no system of binding precedent in public international law, publicly available investment treaty awards are often considered persuasive, if not de facto precedent. Together with the increased public scrutiny to which ISDS is subject, it is likely that arbitral tribunals faced with claims by companies that have restructured their investments will give careful consideration to the reasons underpinning any such restructuring and the abuse of rights doctrine.

What next?

Foreign investors should think carefully about their existing investments as well as any new commitments under consideration now or in the future. They should consider whether those investments are at risk. Do they currently benefit from treaty protection? Is legislative change likely in the future which will impact the investment? Is the investor reliant upon protective measures set out in a treaty that may now be considered unenforceable, or which may be terminated, in the future?

Restructuring may allow investors to position their investment under the protective umbrella of a different BIT or MIT, but they may fail in subsequent attempts to seek redress from the state hosting their investment if they restructure for the sole or dominant purpose of securing rights against the host state to pursue a foreseeable dispute. Early consideration of the factors likely to impact a foreign direct investment, and a careful approach to any restructuring, will be crucial if investor protection rights are to be preserved. Therefore, if restructuring is considered necessary, it should be conducted in a timely manner, long before any specific dispute arises or becomes likely. Properly documenting the reasons for the restructuring will also be key.

It may be that it is too late to restructure with any real benefit. In those circumstances, investors may want to consider seeking additional contractual protections from the state and/or lobbying the host government to reconsider its actions (or intended actions).

In either case, early legal advice should be sought to ensure that the steps taken do not undermine the investment and to ensure that the investor is properly able to seek redress against the state should it need to do so.



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BLOCKCHAIN:

Opportunities for the energy industry

by Tara Waters

Much has been said about digitalisation in the energy industry and the transformative and disruptive effect that technology will continue to have across the value chain. Indeed, for those that understand the promise of new technologies such as blockchain, smart contracts, artificial intelligence and internet-of-things (IoT), it is not difficult to envisage a future where each drop of oil, unit of natural gas and charged ion will be traceable from inception to consumption.

At the core of this future is blockchain (also, and more correctly, referred to as distributed ledger technology or “DLT”). Blockchain technology utilises advanced cryptographic methods to securely validate, store and transmit information across a network. That information is captured and shared in such a way that all network participants have access to an unaltered and auditable view of the same information being updated in real-time. Moreover, the robustness of the security methods employed mean that so-called trusted intermediaries are no longer necessary, and no longer need to act as gatekeepers (or roadblocks) for transactions.

Proponents tout that blockchain technology will not only enable parties to transact faster and more directly with one another, but that it will eliminate manual and redundant processes, reducing the risk of error, fraud and costly dispute resolution, and increasing transparency and costs savings. The potential use cases are numerous and have been posited by many observers both within and outside of the industry. However, the current reality is that most blockchain technology applications for the energy industry are very much still in the proof-of-concept stage. End-to-end adoption is several years off and will be reliant on the maturation of other aspects

of digitalisation — not least a change in mind-set among industry participants.

So where do the real opportunities lie for businesses in the energy industry looking to capitalise on blockchain technology trends now?

Corporate venturing

One of the fastest ways for businesses to capitalise on blockchain technology is through direct investment. Corporate venturing is on the rise, with the likes of Centrica, BP, Statoil, ENGIE and Tokyo Electric Power investing in blockchain-based projects both on their own and alongside more traditional venture capital funds, as well as governments.

Through corporate venturing, businesses may be able to reap the benefits of having immediate access to the bleeding edge of technology without having to up-end their existing business. Growing organically can take too long and acquisitions carry certain risks. Corporate venture investment offers a middle path that businesses and, more importantly, boards are more readily willing to tread.

However, investment in a blockchain-based project is not necessarily the best or right action to take. Corporate venture arms should have clear investment criteria. While they may not have an expectation of the same level of returns as their traditional venture capital counterparts, it is an investment nonetheless and there should be the potential for returns (whether financially, commercially or both).

And, naturally, there is no substitute for proper due diligence. It is essential to have advisers with the right blend of legal, commercial and technical experience in relation to the specific nuances and issues that may arise in relation to blockchain technology.

Consortia

Interest in understanding blockchain has in particular fuelled the rise of consortia of industry participants looking to leverage the advantages of group learning. In addition to sharing knowledge and know-how about how blockchain technology works, consortium members are able to collaborate on proof-of-concept projects. To date these have included a commodities trading platform (BP, Shell and Statoil), a petroleum supply chain management platform (e.g. Petroteq, EPMEX and SOCAR Energy) and an energy asset marketplace (e.g. Electron, Statkraft, Shell, Northern Powergrid and EDF Energy).

Joining a consortium is a good option for businesses looking for a more hands-on and collaborative approach, even if they are new to blockchain technology. However, participants should be clear as to what membership affords them, what goals they are looking to achieve, and be willing to commit sufficient resources (from a time, cost and personnel perspective) to any projects. Deriving value from consortium membership is as much a question of what a member is willing to put in as what it is seeking to get out.

Increased collaboration by businesses which may be (or be seen as) competitors also raises questions of competition law that need to be carefully navigated. Competent authorities have recently started to focus on the potential anti-competitive effects of having access to large data pools. Blockchain technology is underpinned by the concept of having access to a permanent and growing data pool and, so, if competitors are working together to share such data it may raise questions.

Joint ventures and strategic partnerships

Businesses aiming to utilise blockchain technology in a more proprietary manner may seek to implement their project by partnering with one or more other businesses, either through a joint venture and/or, increasingly, a strategic commercial partnership. For newer entrants in the industry, who may be more familiar with blockchain technology, partnerships can provide much needed access to the deep industry knowledge, regulatory connections and infrastructure of long-time players. For industry incumbents, this can



provide the access to and expertise in blockchain technology that they have not yet cultivated in-house.

Through partnership, whether legal or commercial, businesses can leverage the expertise of their partners to bring their blockchain-based projects to fruition more quickly and with less investment than might be required if they had to develop or acquire the necessary expertise and experience on their own. For example, LO3 Energy, a joint venture among Centrica, Siemens and Braemar Energy Ventures, teamed up with leading blockchain technology company, Consensus, to form TransActiveGrid, which has developed one of the first and most well-known energy industry blockchain projects, the Brooklyn Microgrid. The project started in early 2015 with the first transaction being the trading of solar power within a community in Brooklyn, which took place in April 2016¹.

There is a sliding scale as to how formal the partnership will be, and deciding the best form of the partnership requires careful consideration. Regardless the form, partner relationships can be complex. All parties need to be clear as to how the governance of both the relationship and the project will work in order for it to succeed, and the resulting legal documentation needs to reflect this.

Conclusion

There is nothing to fear in the technological change affecting the energy industry. This change is still in its earliest stages and there is much to be learned by incumbents and new entrants alike. The challenges to being able to capitalise on blockchain technology are far from insurmountable. By finding ways to get access and exposure to blockchain technology and its myriad of uses, businesses in the industry will be better prepared to adapt, adopt and, ultimately, evolve.

¹ For more information about the Brooklyn Microgrid project please see our earlier article, "Blockchain: Beyond the Microgrid", published in issue 18 of *EnergySource*.



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ITALIAN RENEWABLES:

A bond evolution

by Carloandrea Meacci

In this article we consider how reform of Italy's debt financing market in the past few years has spurred bond financing activity in the renewables sector. Until a few years ago it was virtually impossible for non-listed companies in Italy to issue bonds. So, traditionally, non-listed companies were only financed by banks. However, the long financial crisis and credit crunch of the last few years prompted the Government through several waves of regulatory changes to liberalise the financing market and relax the rules on the banking monopoly, making it possible for certain qualified investors, albeit without a banking licence, to lend to Italian companies through bonds.

In addition, the Government modernised the tax regime and harmonised the tax treatment of bonds and loans. The reform measures include an exemption from withholding tax on interest payments and registration/stamp taxes for the security package where the financier is resident in a white-list country, and a 0.25 per cent imposta sostitutiva applicable on the bond amount in lieu of up to an aggregate of 3 per cent registration/stamp taxes for a full security package.

The nature of “mini-bonds”

Currently, there are two types of bonds: bonds in certain key infrastructure sectors expressly defined by law – for example, toll roads and gas and electricity transmission and distribution – known as project bonds; and bonds in any other sector – for example, renewables – known as mini-bonds.

The term mini-bond is misleading and is rooted in the fact that historically the withholding tax exemption on bonds was available only to large issuers – listed companies and banks – and

has nothing to do with the size of such bonds, which may be of whatever amount the bondholders wish to subscribe.

The tax and legal differences between the two types of bonds have been reduced over time and nowadays consist mainly in a slightly different registration tax for the security package – 0.25 per cent of the bond amount for mini-bonds and €200 per security document for project bonds – and a more flexible regime for bondholders' meetings in the case of project bonds.

The purpose of this article is to examine only renewable energy bonds, which are technically mini-bonds but have been structured as secured and amortising, similarly to a project finance loan, and therefore can be identified as project bonds in the international finance jargon.

The market

Since the introduction of the new rules on bonds there have been six renewables project bond issuances in Italy for an aggregate principal amount of €550m. Figure 1 below summarises the main features of such bonds based on publicly available information.

Figure 1: Bond details

Issuer	Issue Date	Assets' capacity in MW	Amount (€m)	Structure	Fixed/Floating	Maturity
Antin Solar Investments	December 2014	77.2	85	Hybrid	Fixed and floating	2028
Etrion	December 2015	53.5	35	Hybrid	Floating	2029
TS Energy Italy	July 2016	43.3	40	Bond	Fixed	2032
Sonnedix Italia	December 2016	66.3	95	Hybrid	Floating	2030
Azienda Solare Italiana	December 2016	84.4	125	Hybrid	Fixed and floating	2030
CEF 3 Wind Energy	October 2017	244.7	170	Hybrid	Fixed	2025

All the above bonds have been listed on ExtraMOT Pro, the professional segment of the multilateral trading facility ExtraMOT, regulated by the Italian Stock Exchange and dedicated to the listing of bonds and commercial paper. Such a bond listing is simpler, quicker and cheaper than listing the equity of a company, also in terms of initial and ongoing disclosure requirements.

Following the introduction of the new rules at the height of the credit crisis, the market showed significant interest in this product in late 2014 and early 2015. This was followed by a pause in late 2015 and early 2016 when banks became more active, but activity resumed in the second half of 2016 with a new wave of issuances.

We understand that the above pause was generated by, among other things, the ECB's quantitative easing that flooded the banking market with liquidity, making it more difficult for bondholders to compete with banks – for example, in terms of pricing and tenor.

However, quantitative easing sooner or later will expire while Basel III rules on capital requirements for banks will not (and may actually become even tougher under Basel IV). In the medium to long-term we expect this product to be more frequently used because it will be a more efficient use of capital for qualified investors and infrastructure debt funds than for banks to provide long-term financing for infrastructure projects.

Structures

All the renewables bonds issued to-date have been amortising, some of them have floating interest rates – albeit partially hedged under separate hedging agreements – while others have fixed interest rates. All such bond deals have been refinancings of portfolios of brownfield solar PV assets grouped under a holdco that issued the bond. They all benefited from a cash pooling mechanism where the cash pooler was the holdco and the ratios were calculated at the holdco/ aggregate level. The debt has usually been sized on the basis of a tail calculated on the basis of the weighted average expiry date of the incentives.

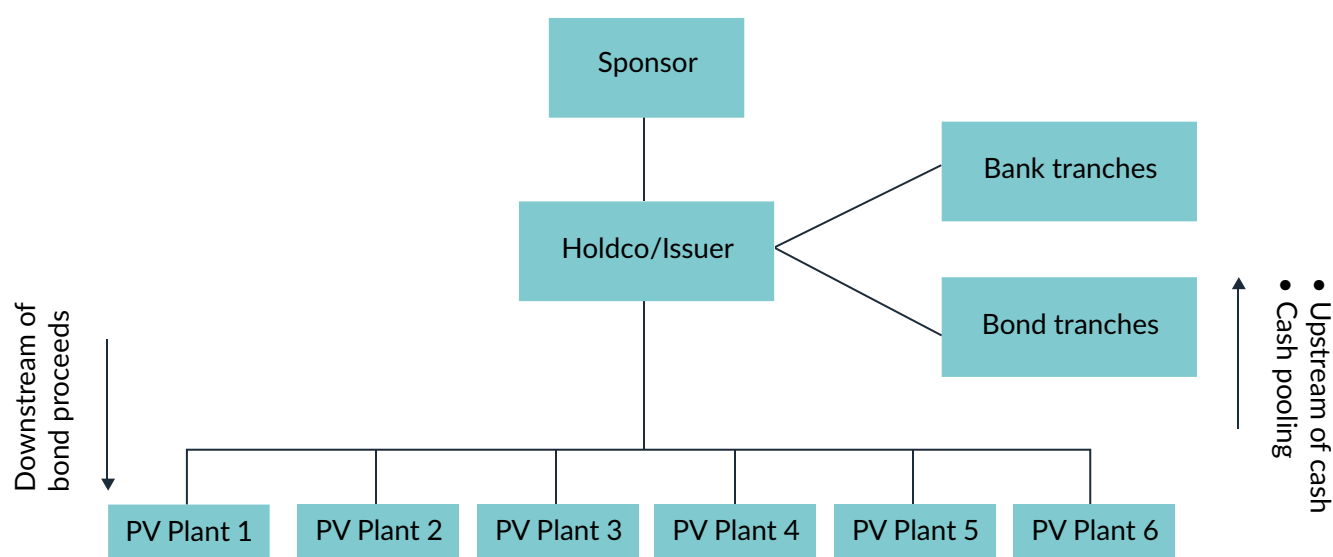
In terms of tranching of the debt, we have seen both pure bonds with no bank tranches and more commonly hybrid structures: that is, a combination of pari passu bond tranches and bank tranches regulated among other things by a common terms agreement.

The hybrid structure is generally used when there are liquidity concerns – as to whether there is sufficient appetite for the asset in the bond market – and when certain bondholders desire that banks share the risk. The need for ancillary facilities traditionally provided only by banks such as a VAT facility, not required when completion is not recent, or a liquidity facility, in lieu of a debt service reserve account, may also play a role in the selection of the hybrid structure.

In terms of rating, most of the renewables bonds issued so far have been unrated because sophisticated bondholders usually rely solely on their internal rating and because rating agencies may require a higher debt service cover ratio (DSCR) than banks and bondholders in order to grant investment grade ratings and such higher DSCRs may not be compatible in terms of debt sizing with the hedging unwinding costs (up to 10 per cent) usually associated with these refinancing deals. However, the absence of a rating sometimes makes it impossible for certain types of bondholders to subscribe to the bond.

In terms of corporate structure, all renewables bonds have been issued at the holdco level for a number of reasons. First, renewables plants are usually small and held by different SPVs grouped in a portfolio under a holdco and it would be practically impossible to issue as many bonds as the SPVs. Second, the tax regime associated with downstreaming of the bond proceeds from holdco to the SPVs – to allow the SPVs to refinance their debt – in the form of equity or quasi-equity (versamenti in conto aumento di capitale) is eligible for a notional interest deduction (the ACE tax relief). However, this equity/quasi-equity downstream triggers increased rigidity and difficulty in upstreaming the cash from the SPVs to holdco to service the holdco debt, i.e. the bond. The typical structure is depicted in figure 2.

Figure 2: Corporate bond structure



Players

In terms of types of bondholders, the subscribers have usually been infrastructure debt funds whose investors have frequently included insurance companies. Insurance companies have sometimes subscribed to the notes directly. In each case the investment rationale was the appetite for infrastructure assets generating stable returns over the long term to allow take-and-hold investors that have no stated intent to sell down the bond in the short/medium-term.

Interestingly, although all such bonds have been listed on a regulated market or multilateral trading facility, the rationale for the listing was not linked to the liquidity or marketability of the bond – which is not a key requirement for a take-and-hold investor – but was rather driven by a legal analysis.

Indeed, bonds listed on a regulated market are not subject to the risk of an unfavourable interpretation of certain legal restrictions, such as the need for the subscribers to be subject to prudential supervision and the liability, in case of insolvency of the issuer, of the initial subscriber vis-à-vis the ultimate bondholder, which is not a professional investor.

Security package

In terms of security package, these bonds benefit from the same security package usually applicable in a bank project financing – share pledge, mortgage, special privilege, accounts pledge, assignment of receivables by way of security including the feed-in tariff – except that the assignment of the feed-in tariff in favour of bondholders is not expressly contemplated by the relevant GSE¹ rules. However, we are not aware of any objection so far by GSE to such assignments and we do not see any rational reason for such objection.

¹ GSE is the government entity that administers the feed-in tariffs for renewable projects in Italy and issues rules relating to their administration, including in relation to the assignment of the tariffs by way of security.

Renewables sources

In terms of technology, all the initial renewables project bonds have been in the solar sector, but most recently, at the end of 2017, there was a bond issue in the wind farm sector (see figure 3).

Figure 3: The Glennmont wind farm portfolio bond issue

Ashurst advised BNP Paribas Securities Services as noteholders' representative, security agent, calculation agent and paying agent in connection with the project bond granted to CEF 3 Wind Energy, a company controlled by Glennmont Partners and PGGM Vermogensbeheer, to refinance part of CEF 3 Wind Energy's wind farm portfolio, which is one of Italy's largest operating wind portfolios with 245 MW of installed capacity.

This is the first project bond in the wind sector in Italy. The finance structure includes a bank loan and a project bond, both senior secured, having an aggregate value of €190 million. The €170 million unrated bond consists of a single fixed rate tranche and is listed on the Italian ExtraMotpro segment with national and international institutional investors.

A bond was also issued in late 2016 in the water sector under the project bond regime rather than the mini-bond regime because it was not a hydroelectric power plant but rather a water management system, which was interpreted by the relevant counsel as falling within the key infrastructure sectors mentioned above.²

The key reasons why all renewables project bonds so far have been in the solar sector despite recent feed-in tariff cuts by the Italian Government include the following:

- there are many more solar plants than wind farms –

² This is the €100m bond issued by Metropolitana Milanese SpA in relation to the Milan water system.

approximately 19,000 MW versus 9,000 MW – and solar plants tend to be smaller;

- the feed-in tariff cuts pushed sponsors to refinance their projects in order to partially offset the reduction in tariff revenues with a reduction in the cost of debt service and avoid dividend lock-ups; and
- the M&A market for solar plants has been more active than for wind farms, which in turn triggered the refinancing push.

Reasons for bond versus loan

Why might sponsors and banks prefer a bond versus a loan in connection with the refinancing of a renewables portfolio? There have been times when the main reason was liquidity or price, but this is no longer the case in the current market. Additional reasons nowadays include the following:

- a bond may be more covenant-lite than a typical project finance loan – for example, in terms of ongoing reporting requirements and in terms of change of control, as sometimes bondholders accept that the controlling sponsor simply needs to fall within certain categories of investor as opposed to maintaining the original sponsor;
- the fact that renewables bonds are listed requires a minimum level of disclosure – a fact that might be welcomed by future potential equity investors that are used to more transparency, and such transparency might be helpful also in case of an IPO of the solar portfolio; and
- there is a general perception that in the long term – particularly after the end of the ECB's quantitative easing – the future of infrastructure financing is in the capital markets, so selecting today a bond structure as opposed to a loan structure is a good way to prepare the team/human capital for the technology of the future.

On the other hand, bonds, compared to conventional loans, have a number of disadvantages, such as prepayment fees that can be phased but very rarely waived, and the potential complexity of the waiver process. However, such complexity is in practice often mitigated by the following factors:

- the agent in a bond deal may have more discretion to act independently than in a loan deal;
- the number of bondholders for this type of project is usually quite limited (a handful in many cases, as opposed to tens or hundreds in typical corporate bonds); and
- bondholders have the “take-and-hold” approach mentioned above, so the relationship with bondholders is ultimately not so dissimilar to that with banks.

Regulatory risk

The main question for any credit committee including bondholders investing in Italian renewables is the regulatory risk, particularly after the retroactive solar feed-in tariff cuts introduced in 2015 and the Constitutional Court decision in December 2016 confirming such cuts. This point is not specific to bonds versus loans, nor to financing versus M&A, but it is still worth mentioning due to its materiality. There are various reasons why investors have achieved a degree of comfort in this respect:

- unlike in other countries perceived as similar (e.g. Spain) Italian

subsidies to renewables are not funded by the Government through general taxation but passed down to energy consumers through electricity bills, so the Government is not incentivised to cut subsidies to improve public finances;

- the rationale for the cut was therefore to reduce electricity bills, to improve the competitiveness of doing business in Italy. However, with the oil price at lower levels, there appears to be no compelling reason for the Government to make further cuts;
- the aggregate curve of incentives paid to renewable energy producers has started to decline in any event due to the natural expiry of old incentives and the phasing out of new incentives for new plants;
- paradoxically, the Constitutional Court decision confirming the tariff cuts has brought a degree of stability to the market because many market players feared that a declaration of unconstitutionality of the cuts by the court could have prompted the Government to take other indirect measures in response to the reinstatement of the old higher tariffs;
- the Government was careful, at the time of formulating the size of the cuts, to ensure that projects would not default and therefore lenders would not be hit directly by the tariff cuts. Indeed, most projects we have seen went into lock-up, (i.e. no dividend distributions) but not in default (i.e. a debt service cover ratio of less than 1) as a result of the cuts;
- with the tariff cuts the Government has lost credibility vis-à-vis the international investor community at a time when Italy is eager to increase international investments and no doubt the Government is mindful of the fact that further cuts may jeopardise appetite for assets in the country;
- the retroactive cuts applied only to solar plants, which, in the absence of any caps/ceilings on capacity, rose to a staggering total of approximately 19,000 MW; and
- some of the largest Italian companies, such as Eni and Enel, both state-owned, have announced programmes to invest in renewables in Italy.

Despite all the above, Italy is still perceived as more risky than Northern European countries and this risk commands a premium. There is a perception by some market players that this premium is worth the risk, with a view to balancing the overall return of a European portfolio of infrastructure assets.

A final connected trend we have seen more recently is that as more international investors look to Italy for debt or M&A deals in the renewables or other infrastructure sectors, competition for Italian assets tends to increase and the premium mentioned above tends to reduce, leading to more sophisticated investors seeking deals at the edges of the classic infrastructure world – for example, in telecoms, real estate with an infrastructure angle or greenfield renewables projects.

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AFRICAN ENERGY FROM WASTE PROJECTS:

A plethora of opportunities

by Cameron Smith

Over the last five years, Ashurst has been involved in the development of energy from waste (EfW) projects across a number of regions. This article focuses on some of the growing opportunities that exist across Africa for the development of such infrastructure and what needs to be done by the public sector in order to make such projects deliverable and, more relevantly, financially feasible.

Furthermore, we have identified those factors that investors in the sector should use to identify the most deliverable projects on which to focus their attention.

Finally, we have included a short summary of the various types of EfW projects being undertaken across Africa to deal with the growing problem of (and opportunities associated with) waste management.

What is waste to energy?

In very general terms, EfW facilities (or, as they are also known, “waste to energy” or “WtE” facilities) create energy in the form of electricity and/or heat from the treatment of waste products. This is usually done by “thermally treating” (or incinerating) the waste.

Most EfW processes produce electricity or heat directly through combustion. Alternatively, they might produce a combustible fuel such as methane or

methanol from the treatment of a waste product.

In addition to “mainstream” moving grate or fluidised bed thermal treatment plants, thermal treatment plants may instead involve:

- **gasification** (producing a combustible gas or syngas); or
- **pyrolysis** (producing other products using high temperature decomposition).

Non-thermal technologies include:

- **anaerobic digestion**, which is ideal for treatment of vegetable matter, food waste and animal by-products, typically producing a biogas; and
- **mechanical biological treatment**, which is used primarily for dry recyclable products and solid waste, often to separate recyclable products and produce a “refuse derived fuel” with the residue.

EfW plants have been used to treat and dispose of a number of waste products, but primarily are used on:

- municipal solid waste;
- commercial and industrial waste;
- food waste;
- industrial by-products (such as bagasse produced during sugar production);
- animal by-products and animal waste (e.g. chicken droppings); and
- sewage.

Current state of the EfW market globally

Most EfW technology is not new. Among the 420 plus EfW plants in Western Europe and 80 plus EfW plants in the United States, there are a number of large EfW facilities which have now been in operation for three to four decades. In fact, the use of solid municipal waste to produce biogas and electricity dates back to the early 20th century.



However, due to dwindling fossil fuel resources, the increasing focus on energy security, a greater awareness of the social and environmental hazards of poor waste management and an overwhelming global focus on reducing greenhouse gases, the development of EfW projects has increased significantly over the last 20 to 30 years.

In many developing economies (e.g. many African jurisdictions, and on the Indian sub-continent), alternative and far cheaper waste management solutions have been used, as a result of greater levels of scavenging and recycling, the low cost of labour, the ready availability of landfill sites and the lack of available capital.

However, concerns over energy security and a greater recognition of the environmental and social concerns associated with existing waste management systems have opened up greater opportunities for developers, banks and equipment manufacturers in the EfW space, particularly in the emerging markets.

In addition, as compared to renewable electricity generated from wind turbines or solar CSP or PV panels, power generated from waste represents baseload capacity and is therefore a far more reliable and stable source of electricity (often achieving availability levels of around 90 per cent).

Challenges of waste management in Africa

Changes to demographic and social factors affecting many African countries are challenging the adequacy and sustainability of current waste management practices across the continent. In particular, African cities are facing:

- growing populations;
- rising incomes;
- increasing volumes of waste arising as a result of population growth, industrialisation and modernisation;
- limited space, particularly in expanding urban areas, over which to build or expand landfills;
- increasing risk of disease and other health risks associated with unregulated and illegal dumping practices;
- pressure on continued use of landfills in light of changes in views towards waste management and the environment more generally; and
- the fiscal challenge of meeting infrastructure demands across all sectors.

On the other hand, Africa has also seen the following developments over the past decade which position it well to become a growing frontier for EfW projects:

- a generally more stable investment climate, which has resulted in more active involvement in project financing by regional investment and development banks;
- the development of more sophisticated regional energy markets and networks, allowing for greater energy trading and transmission (e.g. the Southern African Power Pool);
- continuing power shortages in most countries across the region, ensuring that any power generation (particularly the generation of baseload renewable energy) will be welcomed and attract favourable tariffs;
- a current shortage of effective and modern waste infrastructure, justifying investment into the sector;
- such investments are aligned with national priorities and strategies promoting infrastructure development, inclusive growth, sensitivity to the environment and sustained job creation;
- the imposition of more onerous national emission reduction obligations under the Paris Agreement signed in April 2016 under the United Nations Framework Convention on Climate Change;

- the more favourable regulatory environment in African countries towards thermal treatment of waste (compared, for example, to the EU which has focused on waste reduction);
- increasing use of public private partnerships (PPPs) to deliver economic and social infrastructure and greater familiarity with these structures; and
- a greater focus on Africa by internationally recognised and experienced developers keen to develop new markets.

In addition, the last few years have witnessed a greater emphasis on the development of infrastructure dedicated to alleviate environmental as well as health and safety concerns.

Urban growth in Africa has led to the development of poor waste management practices, particularly in slum areas, including the widespread dumping of waste in water courses and uncontrolled dump sites. As a result of those practices and trends, sanitation levels have remained low and, in the worst affected areas, this has resulted in outbreaks of disease including plague, cholera and typhoid fever in various African countries.

Key economic drivers

Economic drivers of EfW developments

While the social and environmental drivers for a project may seem compelling, the same cannot always be said for the economic rationale for those projects.

The reality is that many EfW facilities are not currently affordable or bankable, as they are based entirely on the revenues from the sale of the power generated (regardless of whether the facility also produces heat). This is largely due to the cost of electricity produced in this manner being higher than the cost of

producing electricity using other technologies.

Globally, a range of measures have been employed to facilitate the development of EfW projects. These measures include:

- feed-in tariffs;
- green certificates (in a variety of forms);
- renewable heat incentives;
- enhanced capital allowances and other tax incentives; and
- the imposition of landfill taxes.

Other revenue streams

A lack of focus on the waste supply side of the equation has proved to be problematic in financing long-term EfW projects in developing countries.

Most large-scale, successful EfW projects have relied heavily on the revenue arising from their waste disposal activities, typically charged on the basis of a “gate fee” or “tipping fee” per tonne of waste. These fees will also be payable by the relevant municipal authority responsible for the disposal of waste.

Gate fees or tipping fees usually account for between 40 per cent and 70 per cent of the revenue for a project. The other revenue streams derive from:

- sales of electricity and/or heat;
- public sector subsidies (e.g. green certificates, feed-in tariffs, contracts for difference, etc.); and
- sales of recyclable products (e.g. ferrous and non-ferrous metals, glass, paper, etc.).

This structure may be resisted in cities in Africa which historically have not paid for waste disposal and where it would be politically difficult to pass on gate fees to the local residents.



Given the volatility of energy prices and the unpredictability of most government subsidies, most lenders to EfW projects will welcome the stable long-term revenue stream which derives from waste gate fees, particularly when such payment arrangements benefit from:

- strong counterparty credit ratings;
- fixed gate fee rates per tonne of waste;
- guaranteed minimum waste volumes (usually structured on a “put or pay” or “deliver or pay” basis);
- change of law protection; and
- protection in respect of changes to waste composition.

In an African context, however, waste disposal is often carried out at no cost to the local population and at little cost to the relevant municipal authority, particularly where waste can be landfilled or dumped and there is no overriding policy or macroeconomic driver to avoid landfill.

This makes it very difficult in many cases to structure EfW projects with long term reliance on waste gate fees, particularly where the local economy and political situation will not allow for such gate fees to be passed to the end-users.

Furthermore, although the investment outlook is improving, there continues to be a lack of public and private sector counterparties for projects that have strong credit ratings.

The legal frameworks across several African countries are also still developing and do not have the same standard of transparency and rule of law as in developed countries. This means less certainty to funders and other parties involved with respect to any conflicts.

Identifying African opportunities

As is the case for any energy development, EfW projects are best developed where favourable or (at the very least) acceptable investment regimes prevail.

Investors and banks will inevitably look for a legal framework which facilitates the resolution of disputes and the enforcement of any awards or decisions which arise. The legal processes of the country should always be transparent and the rule of law and respect for the sanctity of contractual commitments should prevail.

Investors also need to be aware that even jurisdictions with very stable investment regimes and legal systems can throw up some surprises. As government policymakers juggle climate change and other environmental concerns with security of energy supply issues, and seek to meet various self-imposed and external targets, there are likely to be some policy reversals, leading to regulatory changes. It is therefore important for investors to always consider not only the existing regulatory regime, but also to keep a close eye on policy developments.

In the context of EfW projects, there are a number of additional characteristics which any investor will inevitably look for, to ensure that the legal and commercial framework for these projects is attractive for both foreign investors and commercial and multilateral lenders.

Key ingredients of any EfW project will therefore include:

- a regulatory system which is supportive of the thermal treatment of waste (surprisingly, such regulatory systems may be more prevalent in developing markets than in more established markets, e.g. Ireland and the UK);

- an organised waste collection and regulatory regime which facilitates the centralised collection of municipal and commercial waste and discourages illegal, unregulated or ad hoc disposal (e.g. fly-tipping) of waste;
- the ownership by municipal authorities of the waste stream (typically where the municipal authorities have a statutory duty to collect and dispose of waste);
- creditworthy long-term suppliers of waste (which may comprise municipal authorities/local government or, alternatively, financially stable and technically proficient corporate entities);
- a significant need (on a regional or national level) for new energy generation and readily available offtakers for any new energy produced (e.g. district heating networks, existing industrial users of heat and power or an established electricity grid system);
- creditworthy long-term power and/or heat offtakers (which may be public utilities or corporate offtakers with sufficient balance sheet strength);
- a transparent licensing and planning regime which is capable of enabling all key consents and permits to be obtained in a way which is both efficient and incapable of subsequent challenge;
- appropriate government authorities prepared to shoulder the political risks associated with EfW projects; and
- low or negligible levels of organised or political resistance to the development of thermal waste treatment facilities.

Due to the inherent nature of the waste feedstock for EfW projects, and various international regulations which prevent or regulate the transnational shipment of solid waste products, securing sufficient feedstock for EfW projects has traditionally been a problematic area for these projects.

In particular, securing long-term supplies of waste feedstock is more problematic than would typically be the case for coal, gas, oil or other biomass-fuelled independent power projects. For this reason, a significant amount of up-front legal, regulatory and commercial due diligence often needs to be carried out up-front to determine the viability and bankability of any such deal.

Once the viability of the project is established, in order to ensure the success of any EfW project, it will also be necessary to ensure that the usual ingredients exist for a successful and bankable project, including:

- strong sponsor support;
- demonstrable knowledge and track record by the sponsors of project-financing infrastructure developments;
- a strong and experienced advisory team (with both waste and energy experience);
- an EPC contractor with an established track record of developing EfW projects utilising proven technology (e.g. preferably moving grate or fluidised bed);
- recognised and reliable equipment suppliers for the chosen technology;
- an appropriate security package from the EPC contractor which reflects the nature and extent of EPC risks involved in the project; and
- an acceptable strategy for the disposal of all ash residue and other by-products.

Snapshot of current developments in the EfW market in Africa

Below we have listed some recent projects and initiatives in the EfW sector in Africa, illustrating the very real opportunities which currently exist.

Ethiopia

The US\$120 million Reppie waste to energy project in Addis Ababa, Ethiopia, transforming the country's largest landfill into a waste to energy site which can dispose of 1,400 tonnes of waste per day through a controlled combustion process and generate enough power to supply households with 30 per cent of their electricity needs. This is still in the process of being built.

Ghana

Armech Africa Limited is to construct a US\$300 million waste to energy power plant in Tema, Ghana to generate 60MW of clean energy. The project will be pre-financed by the Armech Group via Industrial and Commercial Bank of China but is yet to start construction.

Kenya

The sustainable Energy Fund for Africa has approved a grant of US\$995,000 to support the planning stages of the construction of a 10 MW grid-connected municipal waste to energy plant in Nairobi, Kenya.

Uganda

The Kampala Solid Waste Treatment and Disposal PPP Project which is intended to manage at least 1,000 tonnes daily of Municipal Solid Waste, and is still being planned.

Kenya

The Nairobi City County Government has published an Expression of Interest notice to establish a waste to energy facility in Dandora, which we understand has received submissions but is yet to be awarded to a developer.

Zambia

The Government of Zambia has expressed interest in establishing an EfW facility and has been looking for a private partner to take forward this project.

South Africa

The Johannesburg Landfill Gas to Energy Project, involving the development of five landfill gas to energy plants, producing up to 19 MW of energy.

Nigeria

The Municipal Solid Waste Composting Project, Ikorodu, Nigeria, being developed by EarthCare Nigeria Limited, processing 1,500 tonnes of solid waste per day to produce a composted material.

Ghana

The biogas plant at Kumasi Abattoir, Ghana, involving the production of biogas from the treatment and disposal of animal, crop and sewage waste.

Nigeria

The Ketu Ikosi Biogas Project, Lagos, Nigeria, being developed by Midori Environmental Solutions in conjunction with the Lagos Waste Management Authority, treating food waste as the feedstock.

Senegal

The Pilot Biogas Initiative, Ferlo, Senegal, involving a development of 40 bio-digesters in Ferlo, with animal waste being used as the feedstock.

Kenya

The Gorge Farm AD Power Plant, Naivasha, Kenya, commissioned by Tropical Power in collaboration with biogas plant manufacturer, Snow Leopard Projects GmbH, processing 500,000 tonnes of organic waste per year.

While not all of these developments are significant in size, compared to many of the European and US EfW projects, nonetheless they illustrate a growing understanding across the region of the benefits to be gained from diverting waste away from landfill and using waste feedstock as a resource to produce renewable energy.

There are therefore very real opportunities for power developers and utilities across Africa to develop this form of renewable energy technology.

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WASTE-TO-WEALTH INITIATIVES:

Examining policy settings in Asia-Pacific

by Michael Harrison, Richard Guit, Ratih Nawangsari and Rizaldy Tauhid

The development of waste-to-energy (WtE) and other waste projects is usually dependent on a combination of environmental and public health policies and (sometimes) energy policies. Without the right policies being in place it is challenging to develop long-term waste projects. Local circumstances can greatly affect policy development – but increasingly a policy in one jurisdiction can affect other jurisdictions and wider markets.

In this article,¹ we outline some frequently used policy levers in the Asia-Pacific region and consider specific jurisdictions.² For each jurisdiction, we consider the key policy levers used, landfill regulation and diversion, the environment for developing waste projects and, in some cases, the use of WtE projects to achieve environmental and public health outcomes.

Our next article will consider material recovery facilities (MRFs), mechanical biological treatment (MBT) facilities, organic recovery facilities (ORF) and food and organics (FOGO) projects, including the responses to recent structural market changes affecting them. Our fifth article will outline the more frequently used policy levers in Europe, the Americas (Argentina, Brazil, Canada, Mexico, Peru, and the USA) and Africa.

Policy is important but it can and will change

Policy is ever-present: The People's Republic of China (PRC) has recently changed its policy on the importation of recyclables.³ This policy change has affected waste projects which relied on exporting recyclables to the PRC, with the recycling industries in many jurisdictions now needing to consider how to respond to the structural change resulting from this policy change. In Australia, for example, container deposit schemes are being introduced in some states for the first time, with the policy objective of increasing levels of recycling, thereby diverting recyclables from landfill.⁴ In Europe and America, there is renewed focus on how best to combat the

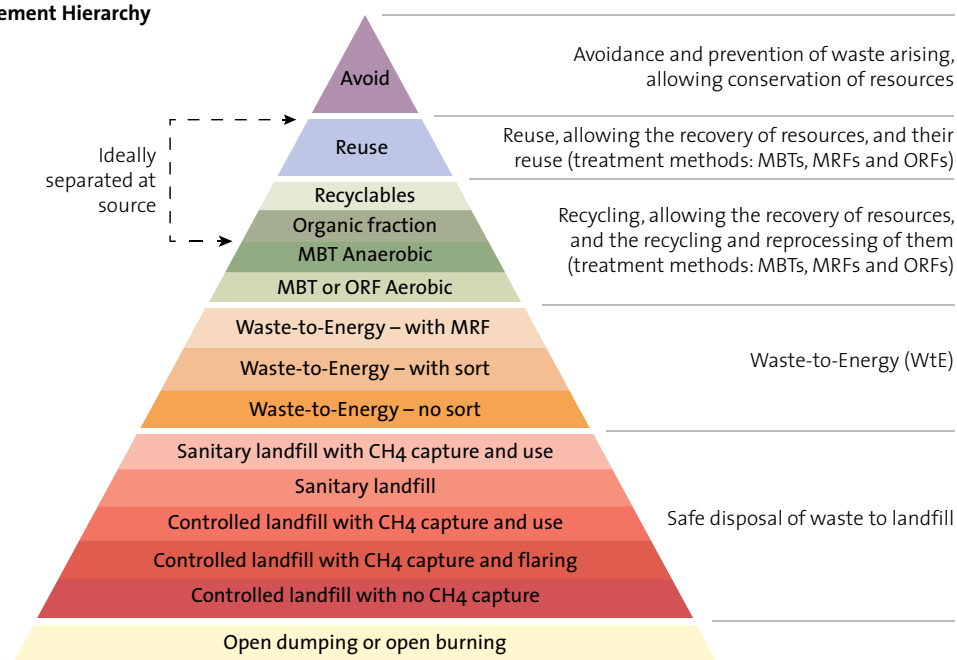
¹ This article continues the "Waste-to-Wealth" series: previous articles appear in issue 9 and issue 10 of InfraRead (go to Ashurst.com and search "Waste-to-Wealth").

² With so much activity taking place across Asia-Pacific, we will cover Europe and the Americas (which we had also planned to discuss) in a later article.

³ In July 2017, the PRC notified the World Trade Organisation that it would ban the importation of 24 categories of recyclable and solid waste ("foreign garbage") by the end of 2017. The ban has affected the recycling industries in a number of jurisdictions.

⁴ Container deposit schemes (CDS) aim to achieve the avoidance, reuse and recycling of waste: the outcomes at the pinnacle of the Waste Management Hierarchy – see Diagram 1. South Australia's Environment Protection Authority has reported that its CDS has promoted an overall return rate of 79.9 per cent.

Diagram 1: The Waste Management Hierarchy



presence of plastics in our oceans and rivers.⁵ There is increasing recognition of the need for countries to work together to address the issue of plastics in our oceans.⁶ Thus, local and international policy underpins the waste sector in many ways.

Policy does not stand still: These recent "headline" policy developments illustrate that policies can and do change, and that a policy in one jurisdiction can have a significant impact on commercial interests in other jurisdictions. In our first and second Waste-to-Wealth articles, we noted the importance of change in law provisions in waste projects. The recent policy change in the PRC has resulted in owners and operators of waste projects (and MBTs and MRFs in particular) looking closely at the change in law provisions in their contracts. Why? The economics of many projects rely heavily upon the ability to sell recyclables into the PRC. Given the nature of the PRC policy change, structural change has arisen in some jurisdictions, forcing policy makers to consider again the importance of markets for recyclables.

As noted in our previous articles, the Waste Management Hierarchy (see Diagram 1) is the touchstone for environmental and public health policy initiatives around the world.⁷

In our first Waste-to-Wealth article, we noted that legislative initiatives have sometimes underpinned the development of waste projects to achieve outcomes reflective of the Waste Management Hierarchy. The most significant of these is EC Council Directive 26 April 1999 (Directive 1999/31/EC). This was the catalyst in the European Union for government sponsored initiatives and regulatory policy settings aimed at diverting waste from landfill and facilitating investment in waste sorting, processing and treatment alternatives. In some form or another, the principles represented in the Waste Management Hierarchy have influenced the policy levers in each of the specific jurisdictions covered below.

In this article we consider the policies of the larger and more populous and still urbanising jurisdictions in Asia (the PRC, India, Indonesia, and the Philippines) and, as a point of different emphasis, Malaysia, which has high urbanisation levels, but still needs to respond to environmental and public health issues arising from waste.

Revisiting policy levers in projects

Core policy drivers: Outlined in the table below are the key policy levers which are combined to allow WtE and other waste projects to be developed and to be economically sustainable. These include environmental and public health policy levers as well as energy policy levers which enable WtE projects to derive revenue (being **Core Policy Drivers**). In considering specific jurisdictions, we look at what we regard as the current dynamics in those jurisdictions, including, as appropriate, key policy levers used in these jurisdictions. **Implementation:** The right mix of municipality powers and enforcement must exist to support and sustain the Core Policy Drivers. It is also important to recognise that policy implements change over time, not overnight, and that landfill still has a role to play.

- 5 The Norwegian container recycling scheme requires consumers to pay an additional charge per bottle, which is then refunded when the bottle is deposited in a recycling machine. If Norway's recycling rates are any indication, the scheme is highly successful, with 97 per cent of plastic bottles being recycled. In March 2018, the UK government announced that, subject to a consultation later in 2018, it will be introducing a deposit return scheme in England for single use drinks containers (whether plastic, glass or metal).
- 6 For example, the Commonwealth Heads of Government meeting in London in April 2018 will include a discussion on how to protect our oceans.
- 7 For example, the Solid Waste Management Rules, 2016, applicable in India, define waste hierarchy as the priority in which the solid waste is to be (or should be) managed by giving emphasis to prevention, reduction, reuse, recycling, recovery and disposal, with prevention (i.e. avoid) being the most preferred option and disposal to landfill being the least preferred.

Core Policy Drivers: Environmental and public health levers

Environmental prohibitions prohibiting or reducing ocean dumping, prohibiting open dumping and prohibiting landfilling of specified waste streams. Regulation of this kind is prevalent across Asia-Pacific.	Environmental standards for landfill to address contamination, leeching into the water table and methane emissions. Regulation of this kind is typical across Asia-Pacific.	Environmental standards on emissions to limit emissions, contamination and residue disposal for waste projects. Regulation of emissions to air is increasingly prevalent across Asia-Pacific.
Co-ordinated approval and licensing process to allow timely and effective development. This is recognised as important, and has been introduced in the PRC, Indonesia and Malaysia.	Licensing for expansion of project over time to take advantage of increased waste arising in specific areas. This is permitted in most jurisdictions, but is a project-by-project issue.	Classification of waste to regulate how and where waste may be disposed of and to license receipt of waste. Classification of waste has become typical across Asia-Pacific.
Disposal of Hazardous Waste, Medical Waste and e-waste to divert from landfill to specialist disposal to provide additional feedstock. As might be imagined, this is regulated across Asia-Pacific.	Specification of residue to regulate how and where residue may be disposed. This is increasingly regulated across Asia-Pacific.	Enforcement of approvals and regulation as noted above, many of the key policies to achieve beneficial environmental and public health outcomes are in place, but in some jurisdictions achieving those outcomes is dependent on enforcement.

CONSISTENCY OF REGULATION AND ENFORCEMENT: Unless regulations are consistent and enforced across a jurisdiction, market forces will find a way to dispose of waste at the least cost and for the greatest profit, even in jurisdictions with developed waste collection systems.

Core Policy Drivers: Energy drivers creating revenue opportunities

Revenue from renewable energy generation under power purchase agreements, into market, under contracts for differences or the feed-in tariff (FIT) regime (or other regimes). While there are FIT (and other) regimes in place across Asia-Pacific, not all of them apply to WtE projects.	Sale of power and heat to co-located businesses within development zones to promote smaller refining and paper businesses or to provide district heating. This is favoured in some jurisdictions, but is not widely used across Asia-Pacific.	Allowing broader revenue opportunities including the development of land to enable sponsors to cross-subsidise WtE projects and other revenue streams. This is not used to any great extent across Asia-Pacific.
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Non-Core Policy Drivers

Revenue from particular waste generators such as C&IW ⁸ and C&DW ⁹ and particular waste streams, such as from shopping centres or malls. As yet this is not used across Asia-Pacific.	Revenue from landfills to manage available landfill capacity over time, e.g. requiring a WtE project to take landfilled waste at a higher Gate Fee ¹⁰ and methane off-take. In some Asia-Pacific jurisdictions methane is being captured.	Revenue from government-sourced waste where municipalities are able and willing to pay, which may result in higher Gate Fees. As yet this is not used.
Large power users pay more for WtE energy to close revenue gap, but preventing material increase in power prices for all users. As yet this is not used on a regulated basis across Asia-Pacific.	Government pays higher price for WtE energy to close revenue gap, but preventing material increase in power prices for all users. As yet this is not used on a regulated basis in Asia-Pacific jurisdictions other than where a government chooses to contract for energy supply.	Revenue from reusable and recycled products where there exists a sophisticated separation at source or pre-sort regime. This is a key policy outcome across Asia-Pacific.

Levelling the playing field

Waste and landfill levies to incentivise more environmentally beneficial waste projects on a consistent basis across jurisdictions. In the Asia-Pacific region this policy lever is not prevalent.	Gap funding including government grants and subsidies to achieve environmentally beneficial outcomes using WtE projects. There are examples of gap funding, but it is not a policy lever that is prevalent across Asia-Pacific.	Revenue from MSW processing and treatment¹¹ including Gate Fees because municipalities choose WtE over landfill. This remains a policy decision to be taken at a micro-level, but as yet Gate Fees alone are not at a level to sustain WtE projects.
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⁸ C&IW or C&I waste is commercial and industrial waste from commercial and industrial premises.

⁹ C&DW or C&D waste is construction and demolition waste from construction and demolition sites.

¹⁰ A Gate Fee being an amount paid by a municipality for acceptance and processing of waste at a landfill or waste project.

¹¹ MSW is municipal solid waste (as distinct from sewage or waste water).



As we consider specific jurisdictions in the Asia-Pacific region, it is important to recognise that policy – and therefore law – is not fixed, nor should it be. Policy and law may need to change to respond to the needs of the specific jurisdiction over time. While it is important for each jurisdiction to be aware of private sector concerns in relation to investing in waste projects, it is as important for governments to review continuously and to put in place policies that respond to the particular circumstances of and within each jurisdiction, including recognising that implementing policies may take longer than anticipated. In this context, private sector participants who understand how to respond to changing circumstances will have a greater ability to respond to changing policies (including through contractual change in law provisions) over time.

As such, the risk of change in law is important to the private sector investing in waste projects. If a project is to be project financed, debt and equity financiers will want to contract on the basis of economics that are sustainable for the term of the debt and which will allow equity its required return. For these purposes, debt and equity will want to understand the likely regulatory and enforcement prospects, in order to satisfy themselves that underlying costs and revenue remain relatively predictable.

Policy levers – background and context

No one size fits all: Each jurisdiction in Asia-Pacific is unique. While we may identify common policy levers, if one looks closely, they are in fact different, in both form and substance. Each policy must be understood in the context of the specific jurisdiction as it has been developed to be responsive to, and to be implemented in, that particular jurisdiction.

Policy must recognise what is achievable: Adapting a truism from the world of business management ("Culture eats strategy for breakfast") so it is with policy: culture eats policy for breakfast. If a policy is not cognisant of the culture in which it is intended to work (in the sense of being achievable within a particular jurisdiction) then it will not work.

Scale of Asia-Pacific: The Asia-Pacific region matters. At least one-third (and, by some estimates, up to 40 per cent) of the world's waste will be produced within the Asia-Pacific region by 2050, with the PRC, India and Indonesia likely to produce close to, if not more than, 70 per cent of the region's waste. The way in which these jurisdictions respond will be critical to the environmental outcomes and the health outcomes of their populations, as well as for the region and the world generally.

Space does not permit us to cover each jurisdiction within the Asia-Pacific region, but we are currently preparing a "ready reckoner" of policy across the region, including for Bangladesh, Pakistan, Sri Lanka and Vietnam, as well as for Japan and South Korea. This will be available on the Ashurst website later this year.

Policy leavers by jurisdiction

PRC

The PRC continues to experience rapid urbanisation,¹² with a resulting increase in municipal solid waste (MSW): an estimated 180 to 200 million tonnes of MSW is collected annually, and there is also an informal waste collection industry collecting what is likely to be material quantities of MSW. The concentration of urbanisation in the PRC provides opportunities for more effective and efficient waste management and disposal, with the possibility of planning over the medium- and long-term for optimal waste collection and disposal.

The PRC has been developing policy levers to respond to the production of increasing quantities of solid waste (including MSW) for some time. One of the reasons for the change in policy on the importation of recyclables is the desire to manage the waste arising within the PRC more effectively, and to allow effective waste recycling policies to be developed and to mature. As the population of the PRC urbanises and the standard of living continue to increase, so too does the volume of MSW (in both absolute and per capita terms) along with the pressure to dispose of that MSW.

Landfill continues to be the predominant means of disposing of waste. While landfill may not be considered to be a viable option over the medium to long term, it is nevertheless an important part of the current waste disposal industry in the PRC. This will continue into the medium term. That said, landfill is increasingly regulated. In this context WtE projects are seen as the key alternative to landfill, with an ever-increasing number of WtE facilities being developed.

With the development of WtE facilities has come a recognition that emissions from WtE facilities need to be controlled, and for this purpose emissions need to be regulated and the "right" WtE technology needs to be used. The two go hand-in-hand, with emissions (and the control of them) being a function of the pre-treatment of feedstock, efficient combustion and the control of flue gases, all of which are dependent on the WtE technology chosen.

Emissions and their control is a solid waste issue, not just an MSW one. MSW is one of four major solid wastes produced in the PRC, the others being industrial solid waste (which may be regarded a sub-

¹² It is now estimated that 60 per cent of the population of the PRC lives in urban areas (including a material percentage of the population travelling to the urban environment to work, and in that urban environment produce waste). This figure is expected to exceed 70 per cent by 2030. There are over 100 cities in the PRC with populations of more than 1 million people, and 15 municipal areas of more than 10 million people.

category of commercial and industrial waste), hazardous waste and agricultural waste. While all solid wastes give rise to environmental and health concerns, industrial solid waste is responsible for the greatest level of environmental degradation as its emissions degrade air quality. A challenge for the continued development of the WtE industry in the PRC is to distinguish itself from the production and treatment of industrial solid waste and its associated emissions. This will be possible through the use of thermal technologies that achieve more efficient combustion and that control flue gases and emissions generally. A particular challenge in this area arises because many municipalities prefer a direct procurement methodology for WtE technologies, and there are instances in which a lower (or the lowest) capital cost option has been preferred over more efficient and cleaner (principally, lower emission) technologies.

More broadly still, waste disposal and waste management needs to be considered in the context of the targets for major pollutant emissions reductions (principally NO_x and SO_x)¹³ as part of the 13th Five Year Plan and the recently introduced Carbon Trading Scheme. This illustrates our general point that each policy needs to be considered and understood in the broader context.

The challenge for the PRC is balancing its continued economic growth while at the same time ensuring the sustainability of that growth by avoiding or mitigating adverse environmental and health impacts of growth. This is a challenge for many jurisdictions across the Asia-Pacific region, but one that the PRC is particularly well placed to manage.

The PRC is an excellent example of a jurisdiction that has recognised that there is no "one size fits all" approach and which does not have a "set and forget" set of policy solutions. The portfolio of policy levers being used by the PRC will continue to develop, including at provincial and municipal levels, in response to particular circumstances and needs.

India

India continues to experience strong economic growth, and, as a result, the volume of waste produced by the Indian population is increasing. As yet, the levels of urbanisation in India have not reached the levels in the PRC, but over time it is reasonable to expect that they will. India has recognised that the urban environment and urbanisation itself results in the production of solid waste,¹⁴ and that there is therefore a need to regulate those who generate waste.

It is also clear that the continued growth of urban populations is contributing to the ever-increasing levels of MSW production in India. It is difficult to estimate the quantity of waste that is produced in the urban environment: estimates of MSW range from 62 to 80 million tonnes per year, of which approximately 50 to 55 million tonnes comes from the urban environment. It is estimated that up to 90 per cent of waste is open dumped or burned, rather than being disposed of in regulated (i.e. approved engineered/sanitary) landfill. (In passing, we consider that the estimates of waste arising in India

are likely to underestimate materially the actual waste arising.)

Key legislation in India (critically, the Solid Waste Management Rules, 2016) recognises that, in the urban environment, a key policy objective is to allow the development of a system to promote the effective collection and recovery of reusable and recyclable solid waste from multiple sources of solid waste within that urban environment. This policy is intended to increase the quantity of solid waste that is collected (and, as a result, to reduce the quantity of solid waste not collected and which may give rise to environmental and health degradation). This policy recognises the existing interests of all participants in the urban environment including, importantly, the waste pickers. The policy thus recognises that the private sector in India has developed a sophisticated, but labour intensive, system for recovering reusable and recyclable materials from waste, and that it makes sense to make use of this system.¹⁵

Given the composition of MSW (18 to 25 per cent (by mass) comprises waste capable of being recovered), making use of the waste pickers can only be part of the solution. The balance of waste comprises approximately 40 to 45 per cent organic fraction and 35 to 40 per cent inert fraction. The relatively high levels of organic and inert fractions, and the high recovery rates achieved by waste pickers, means that the calorific value of the MSW available for WtE projects in Indian cities is at the lower end of the calorific values required for efficient combustion using thermal WtE technologies. This is one of the reasons for the relatively low number of WtE projects in India. There are, of course, other reasons, the key one being that waste management systems in India are continuing to develop. If it were possible to implement source separation of the organic fraction having higher levels of moisture and the inert fraction, it could be possible to develop WtE projects on a consistent basis in India.

In addition, and just as importantly, the key legislation recognises that implementation of waste management policy is a municipal and local issue within a national framework, thereby allowing appropriate responses to local conditions. The development of waste management systems in India is currently at a critical juncture. Given the estimated levels of unregulated disposal of MSW, engineered/sanitary landfill capacity needs to be developed in the short- to medium-term, possibly with other solutions which divert waste from landfill, including WtE projects.

Indonesia

As the third most populous country in the Asia-Pacific region, with increasing urbanisation (much of it on Java, the most populous island in the world) the way in which Indonesia responds to the environmental and health consequences of increasing levels of MSW may provide a blueprint for other jurisdictions around the world.

As noted in our first Waste-to-Wealth article, it is estimated that Indonesia produces between 64 and 66 million tonnes of MSW a year. If all this MSW were collected it would provide the feedstock for 115 50MW WtE facilities, equivalent to one sixth of Indonesia's planned 35GW expansion of installed capacity by 2019. In response

¹³ NO_x is the generic term for the Nitrogen Oxides which are most relevant to air pollution; SO_x is the equivalent term for Sulphur Oxides.

¹⁴ The Solid Waste Management Rules, 2016 define solid waste as including "solid or semi-solid domestic waste, sanitary waste, commercial waste, institutional waste, catering and market waste and other non-residential wastes, street sweepings, silt removed or collected from surface drains, horticultural waste, agriculture and dairy waste, treated bio-medical waste excluding industrial waste, bio-medical waste and e-waste, battery waste, radioactive waste..."

¹⁵ It is our understanding that waste pickers are able to recover a very high percentage of reusable and recyclable material from municipal solid waste. Again our understanding is that approximately 80,000 people are engaged as waste pickers for every 3 million tonnes of reusable and recyclable material recovered.

to this opportunity, the Ministry of Energy and Mineral Resources (MEMR) has developed a Waste-to-energy Guidebook (MEMR Guidebook). The MEMR Guidebook provides an overview of both the waste industry in Indonesia and the prospective range of projects as well as providing a lot of useful information for any municipality wishing to develop a WtE project. In addition, the MEMR Guidebook is realistic in that it recognises that landfill remains an important part of Indonesia's waste management industry.

In the context of the PRC, India and Indonesia the challenge is to manage the calorific value of the MSW (or other feedstock) which is delivered to WtE projects: as referred to above in relation to India, the calorific value of the feedstock is a key consideration in the design of all WtE technologies. In each of the PRC, India and Indonesia the level of moisture in the MSW is critical: because of the nature of the organic fraction in the waste stream and because reusables and recyclables may have been removed (as is the case in India), the moisture level of the MSW is likely to be higher (i.e. it is wetter) and the MSW will have a lower calorific value.

In Indonesia (as well as in the PRC and India) there is a need to balance the use of MSW that is wetter with the interests of existing stakeholders who remove some of the higher calorific materials from the waste stream. Although this may result in the use of less thermally efficient WtE technologies it is not helpful to be dogmatic. It needs to be recognised that WtE projects are just a part of the broader waste management solution in Indonesia: as the MEMR Guidebook states, the most appropriate technology should be preferred, which is not necessarily the most thermally efficient. As a general statement and as a starting point, moving grate thermal technology is generally considered to be the most appropriate option, providing as it does a reasonably high level of flexibility to deal with variations in the composition of the MSW, a reasonably high level of efficiency, a proven track record, lower levels of emissions to air (flue gases) compared to some other thermal technologies, as well as reasonable capital and operating costs.

The key elements for any WtE project in Indonesia are the off-take agreement for power which is entered into with the Indonesian State-owned power utility PLN (the Power Purchase Agreement or PPA) and the supply of waste from the applicable municipality's sanitation agency or department. It is likely that the PPA will provide all (or most of) the revenue stream for the project company to develop the WtE project. It is less likely that the municipality's sanitation agency or department will pay the project company a Gate Fee for taking waste delivered by it, but the municipality may take an interest in the WtE facility.

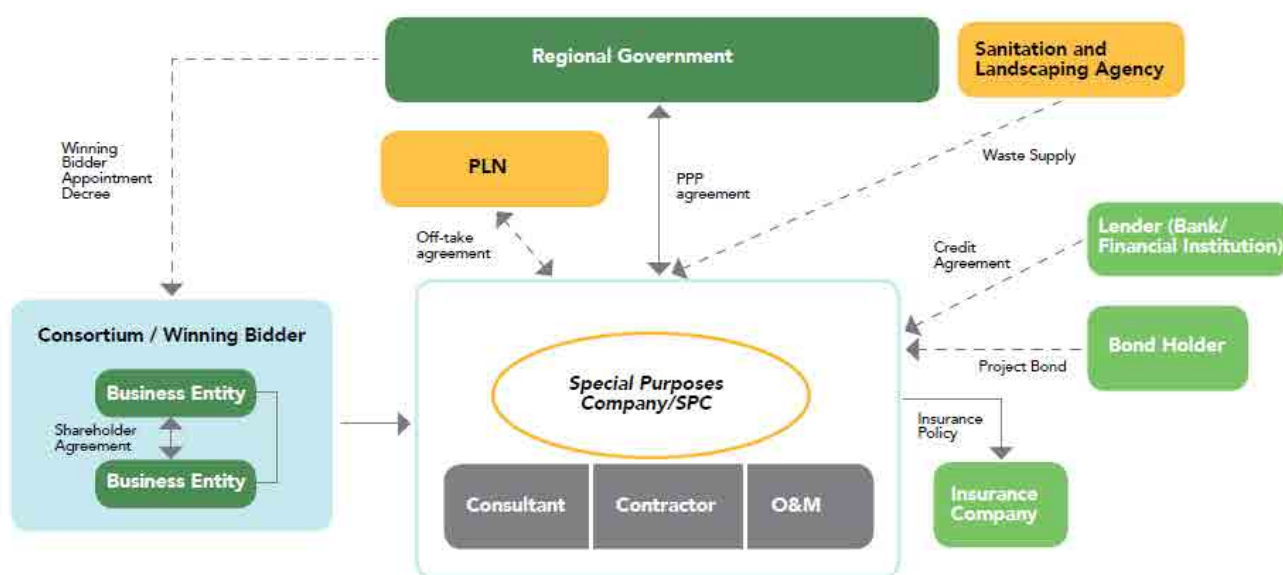
Under MEMR Regulation No. 50 of 2017 on the Utilisation of Renewable Energy Resources for Electricity Production (MEMR Regulation 50/2017), the feed-in tariffs (FiT) payable by PLN are based on Biaya Pokok Penyediaan Pembangunan (BPP) (Basic Costs of Production), being PLN's costs in supplying electricity, excluding costs for electricity transmission and distribution. In this respect, PLN must refer to the BPP as the calculation threshold in purchasing renewable electricity. The BPP comprises: (i) Local BPP based on the location of the relevant power plant (Local BPP); and (ii) National BPP based on the average of all Local BPP (National BPP). The Local and National BPPs applicable from 1 April 2018 until 31 March 2019 are set out in MEMR Decree No. 1772 K/20/MEM/2018.

For power plants powered by waste (PLTS), the FiT payable by PLN is either:

- if Local BPP is greater than National BPP: 100 per cent of Local BPP; or
- if Local BPP is equal to or less than National BPP: the tariff agreed by PLN.

On 8 January 2016, the President enacted Presidential Decree No. 3 of 2016 on the Acceleration of National Strategic Projects (PD 3/2016). PD 3/2016 listed WtE projects located in Semarang (Central Java Province), Makassar (South Sulawesi Province) and

Diagram 2: The contractual framework for WtE under a PPP¹⁶



¹⁶ This is a facsimile of Figure 8.2 of the MEMR Guidebook, p129, which is reproduced with kind permission of the MEMR.

Tangerang (Banten Province) as National Strategic Projects.

These WtE projects enjoy certain benefits, including:

- expedited/simplified processes for the licences required for projects, namely a Location Permit, an Environmental Licence, a Forestry Land Use Licence (if the location of the project is located in a forestry area) and a building construction permit, in addition to other fiscal and non-fiscal incentives (e.g. exemption from import duty);
- government support for any spatial layout adjustments required for project development;
- the land acquisition law for public interest development may be used, providing timing and cost certainty for the acquisition of land;
- possible government guarantees; and
- support from government for WtE development.

On 15 June 2017, the President enacted Presidential Decree No. 58 of 2017 (through an Amendment to Presidential Decree No. 3 of 2016) for the Acceleration of National Strategic Projects (PD 58/2017).

Under PD 58/2017, the government added five new WtE projects to the list of National Strategic Projects. These five additional projects are located in Jakarta (DKI Jakarta Province), Bandung (West Java Province), Surakarta (Central Java Province), Surabaya (East Java Province) and Denpasar (Bali Province).

Pursuant to MEMR Reg 50/2017, PLN is obliged to purchase the electricity generated by PLTS.

Indonesian law recognises that projects may be delivered in a variety of ways, including traditional BOO¹⁷ and BOOT¹⁸ delivery models. Critically important to the development of WtE projects as a sustainable industry across Indonesia is the ability of the government at every level to be assured that each WtE project is economically sustainable. The MEMR Guidebook emphasises this.

Based on a study undertaken by the MEMR's Directorate of Bioenergy, the challenges for WtE in Indonesia are as follows:¹⁹

- no uniformity in the payment of, or the amount of, any Gate Fee;
- a need for increased awareness by regional governments of the use of MSW as a feedstock for WtE projects;
- a perception by regional governments that the sale of electricity to PLN means that the regional government does not need to manage waste through Gate Fees: a deeper understanding of the basis on which PLN purchases electricity is required;
- limited funding is allocated for managing waste; and
- regional governments do not have the necessary "know-how" to prepare procurement documents and there is no uniform mechanism for procurements.

¹⁷ Build Own Operate (BOO) means that the project sponsor builds, owns and operates the WtE project, and the municipality (or government agency, authority or corporation) contracts with the WtE project for the provision of services using the WtE project (i.e. the provision of waste acceptance, treatment and processing).

¹⁸ Build Own Operate Transfer (BOOT) means that the project sponsor builds, owns and operates the WtE project for the term of the BOOT contract, providing services to the municipality (or government agency, authority or corporation) and then transfers the WtE to the municipality (or government agency, authority or corporation) at the end of the term of the BOOT contract, usually at the option of the municipality, and typically for a nominal purchase price on the basis that the municipality has effectively paid for the WtE project through the payment of service charges.

¹⁹ Extracted from a Presentation entitled "Policy on Waste to Energy Development in Indonesia" dated 18 December 2017, prepared by the MEMR's Directorate of Bioenergy.

As well as an increasing interest in developing WtE projects in Indonesia, other initiatives which are already in place are helping the country to address environmental and public health issues, and are improving the urban environment. For example, Indonesia's second largest city by population, Surabaya, has a population of approximately 3 million within the city itself, and a population of 6.5 million in its larger urban area. It is estimated that nearly 1,800 tonnes of waste is produced each day. The municipality itself collects nearly 1,550 tonnes of waste per day, and it is estimated that close to 250 tonnes is recovered by the private sector.

The system of waste management in Surabaya (including a long-standing arrangement in which the private sector plays an important part through waste banks to which recyclables are delivered) has made a material contribution to improving the environmental and public health outcomes in Surabaya over the past 15 years or so. For those visiting Surabaya over the years, the change has been clear to see.

Malaysia

Malaysia has a population of approximately 31 million people, producing approximately 9,125,000 to 10,950,000 tonnes of MSW a year (equivalent to 25,000 to 30,000 tonnes of waste per day). While the volume of MSW production is not at the levels of the PRC, India or Indonesia, the Malaysian government's waste management policies encourage the collection of waste and it is estimated that more than 70 per cent of MSW generated in Malaysia is collected from kerbside or from collection centres. As such, Malaysia has the necessary systems in place to collect MSW as feedstock for WtE facilities. The issue for Malaysia is how to develop WtE projects in an economically efficient way as part of its ever-developing waste management system, while at the same time developing state of the art engineered/sanitary landfill facilities (some with annual capacity in excess of 1 million tonnes a year) and methane collection systems.

In the Malaysian context, neither the rate of population growth (historically fast, but slowing), nor the rate of urbanisation (close to 75 per cent) are going to drive the development of a large WtE energy industry. Rather the development of WtE projects will tend to be more strategic as part of the Malaysian federal government's policy objective of reducing the quantity of waste landfill and greenhouse gas emissions from landfill, and generating energy from solid waste.

The policy settings in Malaysia have long responded to the fact that a high proportion of the landfill sites in Peninsula Malaysia have limited remaining air/void space. The majority of existing landfill sites are open landfills, as opposed to engineered/sanitary, and as such there are environmental and health implications arising from existing landfill sites. Landfill will remain a requirement of Malaysia's waste management industry, but the challenge is how best to extend the life of some landfill sites and manage the closure of others.

One of the distinguishing features of the Malaysian waste management industry (compared to the PRC, India and Indonesia) is the opportunity for separation at source of reusable and recyclable materials. There is an opportunity in Malaysia to encourage higher rates of recycling, and this may be an area that will be considered in the medium term. We say the medium term because, at present, the issue with increased recovery of recyclables is finding a market for them (as has been shown by the response of exporting nations to the



PRC's prohibition on importing foreign recyclables). Notwithstanding the policy of reducing MSW sent to landfill and the reduction in greenhouse gas emissions from landfill, in the absence of a market for increased volumes of recyclables recovered, what is the best means of disposing of them? It may be that, in the medium term, one solution is the increased use of recyclables as feedstock for WtE facilities, even though in the longer term, there is a desire to move to an outcome higher up the Waste Management Hierarchy, including reuse.

Philippines

The Philippines has a population of approximately 107 million people, producing approximately 12,775,000 to 14,600,000 tonnes of MSW a year (or 35,000 to 41,000 tonnes a day). The most recent estimates place production at a little under 41,000 tonnes a day, with over 70 per cent of this waste comprising household waste. (As with the estimates of MSW produced in India, it is likely that more MSW than this is actually produced.) Depending on the source of forward estimates, by 2025 the Philippines may be producing between 16,425,000 and 18,250,000 tonnes of MSW a year (or 45,000 to 50,000 tonnes of waste a day). There are estimates from 2012 which predict up to 28,100,500 tonnes a year, i.e. a doubling of some other forward estimates. What this illustrates is that, as the population of the Philippines continues to urbanise, the assumption is that more waste will be produced. As urbanisation increases, so too does the need for effective management of increased levels of MSW.

The Philippines recognised the need to address the management of MSW relatively early, and put in place a policy framework intended to address the environmental and public health issues arising from the ineffective management of MSW, including closure of landfill and a prohibition on incineration as the natural alternative. Under the laws of the Philippines, each municipality (in the Philippines, referred to as a local government unit (LGU)) is obliged to establish a waste management system to manage MSW within its geographical area. In addition, the law has placed an emphasis on the avoidance, reduction and recycling of MSW, including by requiring separation at source, so as to divert MSW from landfill: the law requires that not less than 25 per cent of MSW must be diverted or recovered.

While there have been and remain challenges (including, in particular, enforcement) many municipalities working with the private sector have achieved relatively high levels of separation at source and recycling (with close to 10,000 MRFs in operation across the Philippines) achieving diversion rates of up to 48 per cent in Metro Manila. A key challenge remains the relatively low collection rates for MSW in some areas. The contrast between areas can be stark: one of the real successes has been the level of collection of MSW in some urban areas – for example, it is estimated that the collection rate in Metro Manila is in the 85-87 per cent range – but in other areas 40 per cent rates are said to exist. The level of collection has a direct impact on the effectiveness of the management of MSW.



Notwithstanding the use of policy levers, some key policies remain to be implemented (and enforced). Open dumping remains the predominant practice: even though municipalities were obliged to close their then-existing open dumping landfill sites some years ago, many of these landfill sites remain in use. Furthermore, while engineered/sanitary landfills have been developed, these have not been developed at the rate projected by government policy, and the environmental and public health objectives sought to be achieved have therefore not been achieved at the projected rates.

This is an illustration of the practicalities of waste management "bumping up" against the cost of implementing policy, and the time taken to do so. To address the costs issue, the government is suggesting to municipalities that they work together to share the costs of the development of engineered/sanitary landfills. This is an approach which has been used successfully in other jurisdictions, although in each jurisdiction it is important to confirm that a municipality is permitted to work with other municipalities, and the extent to which it may do so.

As with other jurisdictions, the development of long-term solid waste management plans by municipalities to outline the way in which waste is to be managed within their geographical areas is key. In this context, there are clearly opportunities for municipalities to plan co-ordinated waste management with other municipalities. We understand that the level of submission of 10-year plans by municipalities for approval by the Department of Environment and

Natural Resources' (DENR) Environmental Management Bureau continues to increase. That said, many municipalities are still to establish solid waste management boards, submit plans, and move to engineered/sanitary landfills.

Over the past two to three years, the private sector has proposed (on an unsolicited basis) the development of WtE projects in the Philippines, and from statements from the DENR there is a clear recognition that the prohibition on incineration does not apply to all WtE projects: the critical issue for the DENR is the following of appropriate guidelines in relation to emissions to air.

This acceptance of the possible development of WtE projects reflects a recognition that other policy levers need to be applied to satisfy the environmental objectives of the Philippines (including the management of greenhouse gas emissions from landfill) provided public health concerns (emissions to air) are appropriately managed. Given the collection rates of MSW in Metro Manila, the development of a WtE facility (announced in 2016) at Quezon City (within the area of greater Manila) may be regarded as a natural private sector response to assured levels of necessary feedstock to enable the development of WtE facilities. (Other WtE facilities are planned and will follow.) In the Philippines, as in all jurisdictions, the choice of technology will be key, particularly in response to the higher level of the organic fraction in the waste stream.

Conclusion

Policy levers are critical to the effective implementation of waste management systems. The variety of responses described above illustrates that the policies in place in individual jurisdictions must recognise the needs of, while at the same time recognising what is achievable in, that particular jurisdiction.

In our next article we will consider MBT, MRF, ORF and FOGO projects, and the key commercial and legal issues relevant to each, as well as the trend towards facilities that are able to process all forms of waste using mechanical and biological treatment.



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Stop press

Ashurst named Most Innovative Law Firm at the FT Innovative Lawyers Awards Asia-Pacific 2018

Ashurst has been named the **Most Innovative Law Firm (Internationally Headquartered Law Firms)** at the Financial Times Innovative Lawyers Awards Asia Pacific 2018, held on 7 June 2018 in Hong Kong.

The FT Innovative Lawyers Report is one of the top legal rankings across the Asia Pacific, and its corresponding awards are widely regarded as the best researched in the market, celebrating the most innovative legal work from law firms and in-house legal teams operating across the region.

Paul Jenkins, managing partner, commented: *"Being recognised as a leader in innovation is a great achievement. Innovation is at the heart of our culture at Ashurst and we are committed to embedding it in everything we do, with our clients and for our clients. The global legal services market is undergoing fundamental change which makes it an exciting time to be in the profession. We have no doubt that innovation will continue to play an integral role in shaping the future of the industry."*

In addition, the firm received the following accolades among others:

- **Standout for Technology and Data** – Re-engineered and automated the process for creating transaction bibles, the pack of signed documents sent to a client after a deal closes, slashing the time from seven hours to 10 minutes.
- **Highly Commended for Legal Expertise: Managing complexity & scale (International)** – Acted as project manager in multiple concurrent transactions for Crown Resorts, including the sale of its interest in Melco Resorts, a casino in Macau. The proceeds were used in capital management initiatives to ensure a strong asset valuation.
- **Highly Commended for Business of Law: New Products & Services** – The firm's Integrity Due Diligence service uses a team of lawyers, risk and financial crime specialists to help clients manage risk reporting requirements in an accessible way.

New office opening in Luxembourg

Ashurst is launching a new office in Luxembourg, having now received Luxembourg Bar Association licence approval.

Partner Isabelle Lentz, head of the firm's Luxembourg desk, will act as managing partner of the office, which is set to open in October 2018. The firm's Luxembourg desk was set up in 2011 and advises on a broad range of corporate, private equity, funds, restructuring, regulatory, real estate and banking matters.

Commenting, managing partner Paul Jenkins said: *"As a leading investment fund centre in Europe, the second largest globally in terms of assets under management and a hub for international banks and fintech, the opportunities in Luxembourg are significant. Growing our offering and building on the proven track record of our established Luxembourg desk is an exciting prospect and one which will greatly enhance our client service offering."*

Isabelle Lentz added: *"Over recent years, Luxembourg has secured its status as a key financial centre and as one of the frontrunners of preferred EU locations for transfer of business related to Brexit, that is only set to increase. I am really looking forward to capitalising on this by developing our presence in Luxembourg and enhancing our capability."*

For further information on how we can support your business in Luxembourg, please contact your usual Ashurst contact or Isabelle Lentz below:



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