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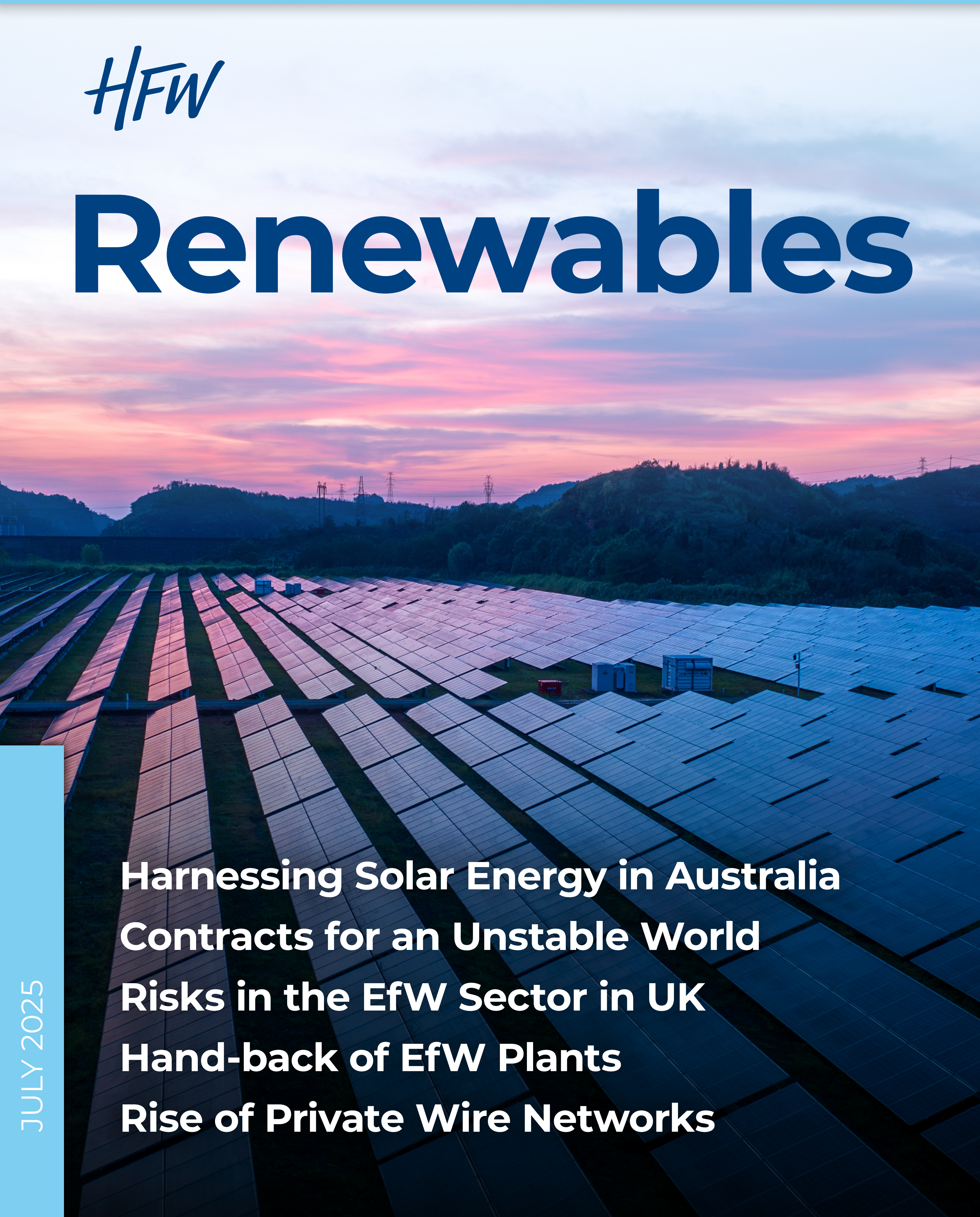

Renewables

Harnessing Solar Energy in Australia

Contracts for an Unstable World

Risks in the EfW Sector in UK

Hand-back of EfW Plants

Rise of Private Wire Networks

JULY 2025

Welcome to HFW's Renewables magazine

This publication is designed to give professionals working on the construction of renewable energy projects a concise and user-friendly update on recent legal and contractual developments.

We focus on the issues we perceive as important to the industry such as construction challenges, project delivery, risk allocation, dispute resolution, and regulatory developments across all renewables, including solar, wind, waste to energy, hydro-electric and battery storage projects.

We hope you find our magazine interesting – but please let us know what you think, and what you would like to see covered in future editions.

HFW Renewables Team

Challenges with harnessing solar energy in Australia

In striving to be a "renewable energy superpower", Australia has committed to increase renewable energy to 82% of electricity generation by 2030. Blessed with an abundance of sunshine and land, solar energy is a vital part of Australia's energy transition.

Solar farms have encountered various challenges during their development, construction, and initial operation. This article explores key issues that have led – and may continue to lead – to disputes in their development and management.[1]

Delays during construction and commissioning

Although solar projects are susceptible to delay from typical construction issues – for example unexpected ground conditions – they may also be affected by less common problems.

There may be delays to obtaining the necessary environmental approvals under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth), particularly if new or rare species of native fauna and flora are identified during initial surveys.

The connection and commissioning phases may also be very challenging. Most solar farms in Australia are located in remote areas where the electricity network is weak. These networks have been unable to cope with the substantial volume of solar (and wind) farms being connected to them, and the intermittency of generation from these renewable sources. The Australian Energy Market Operator (**AEMO**) was required to introduce new regulatory requirements to stabilise the grid. This in turn slowed down the modelling, approval and commissioning process, thereby causing substantial delays for the completion of many solar farms. Generation was also curtailed by AEMO in some areas, such as West Murray Zone on the NSW and Victorian border, to protect grid stability and prevent risking power system security.

Various disputes have arisen out of the significant delays resulting from the impact of these regulatory changes on connection and commissioning. For example, during the construction of the 200MW Sunraysia solar farm in NSW a dispute arose between the owners, John Laing and Manoneng Australia and the lead contractor, Decmil Group Limited (**Decmil**) under the EPC contract. Decmil in turn raised a dispute with Schneider Electric Australia Pty Ltd, the inverter supplier. Whilst these disputes were commercially settled, some contractors have not been able to manage the commercial consequences. This has led some contractors to become insolvent, such as RCR Tomlinson, while others have decided to no longer work on solar farm projects.

Even if contracts provide for liquidated damages for delays during construction and commissioning, actually receiving such damages can take some time. For example, in *Rimfire Energy Pty Ltd v BSF Co Pty Ltd* [2025] FCA 384, court proceedings were required to secure liquidated damages for the buyer of electricity under a power purchase agreement (**PPA**).

As the necessary improvements and investment in the physical infrastructure are undertaken with the construction of new transmission lines, new challenges to connection and operations will arise. Challenges are also arising with the connection and operation of large scale battery projects to solar farms.

Defects relating to materials, equipment and technology

Defects may arise in relation to the handling of materials and equipment during transportation and construction.

1 See also, J. Delaney, "Disputes arising out of energy transition projects in Australia", Global Arbitration Review (**GAR**), Asia Pacific Arbitration Review, 2023; "Challenges, risks and disputes in the Australia energy transition", GAR Asia Pacific Arbitration Review 2024; and "Future of disputes in the Australian energy transition", GAR Asia Pacific Arbitration Review 2025.

Whilst the technology for traditional solar farms is well developed, defects have also arisen where materials and equipment used in one environment, such as inverters used in Europe, have not been fit for purpose for the different climatic conditions in Australia. Further, defects have arisen from innovative storage solutions for solar energy where the commercial use of new technology was untested.

Rectification of major defects can cause delays of months or even years, as identifying root causes and developing solutions takes time. Manufacturing and replacing these parts can then cause additional delays.

Performance and operations issues

Poor performance may mean that the developer or operator may not be able to meet the generation levels or efficiency requirements, or availability percentages required by the PPA or the operations and maintenance contract (**O&M contracts**).

O&M contracts often provide for the payment of liquidated damages by the contractor to the owner when rectification or maintenance works prevent or inhibit generation. Liquidated damages may also be imposed by the offtaker on the owner under the PPA as a result of poor performance from defects, maintenance issues or if generation is otherwise curtailed.

Dispute resolution mechanisms

The timely and efficient management of any claims that arise, through agreed and well-established dispute resolution processes is also imperative to minimise the impact of any disputes. Most project agreements for energy transition projects include extensive dispute resolution mechanisms that provide for flexible and efficient resolution of disputes before resorting to litigation or arbitration.

Whilst negotiations and mediation are commonly included in multi-tiered dispute resolution clauses, the need to fulfil these steps as a condition precedent can delay the resolution of a dispute that is unlikely to settle early.

Some clauses may require the parties to refer all or certain disputes to expert determination, which may be an efficient tool for technical disputes.

Otherwise, arbitration is commonly used as it is a confidential forum that results in an enforceable award.

Conclusion

Solar farms are essential to Australia's energy transition. Agreeing an appropriate risk allocation in the contractual frameworks between the relevant stakeholders, particularly the owner/developer and the construction contractor, during negotiations will contribute substantially to the effective management of commercial and legal risks that may arise. However, managing that contract and issues as and when they arise is also vital to reducing and mitigating delays and minimising resulting claims. It is also important to consider an appropriate dispute resolution mechanism which will efficiently and effectively resolve any disputes.

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Toucan Energy v Wirsol Energy [2021] EWHC 895 (Comm)

Toucan Energy, a developer, brought a claim against the contractor, Wirsol Energy, for systemic defects to equipment across 18 industrial scale solar parks. Toucan claimed £30 million in damages for remedial and replacement costs, diminution in the value of the solar parks due to the ongoing "blight" caused by the defects, refinancing debt costs, revenue lost due to underperformance, and liquidated damages.

Wirsol denied Toucan's claims arguing that the solar parks were properly built. Wirsol counterclaimed for payment of £6.5 million in outstanding invoices for asset life extensions. Toucan denied liability for payment arguing that a condition precedent for payment under the contract had not been satisfied or waived.

The Court ordered Wirsol to pay damages to Toucan for certain defects but rejected most of Toucan's claims, acknowledging that most of the defects could be remedied. The Court found that Toucan was obliged to pay Wirsol's outstanding invoices.

Contracts for an Unstable World

I learned a new buzzword recently – polycrisis. This refers to multiple intervening events affecting the world simultaneously. I would say that we are currently in an era of polycrisis. This era likely began in 2020 with the interplay between the COVID-19 pandemic, the war in Ukraine and the resulting surge in energy costs and general high inflation. It is, however, broader than just those events.

State actors are increasingly challenging the stability of what has been a relatively peaceful era in global politics. Conflicts on almost every continent raise significant security concerns. And in economics, global trade dynamics are being re-shaped through changes to tariff regimes.

The renewables industry will inevitably be caught in the crossfire of this polycrisis.

The potential impacts of the polycrisis must, therefore, be given serious attention in renewables contracts. Particularly when the impact is felt in such basic terms as pricing, and safety of assets and people.

This requires a particular focus on whether contracts appropriately allocate risks associated with external events to the party best-placed to respond to them.

Contractors are unlikely to be able to rely on a standard 'force majeure' clause if the event(s) is already known about at the time the contract is entered into. This is because force majeure mechanisms, such as those in FIDIC contracts, only bite on events or circumstances that a party could not have reasonably provided against before entering into the contract, or which (having arisen) are events that the party could not reasonably have avoided or overcome.

The types of events I am talking about as part of the polycrisis include war, hostilities, sabotage, terrorism and trade wars. These are all 'classic' force majeure events.

However, there are numerous examples around the world where 'hostilities' are already being demonstrated. Subsea infrastructure have been covertly surveyed, and some pipelines damaged or destroyed. Vessels have increasingly suffered GPS spoofing in the Arabian gulf, leading to groundings and collisions. Cyber attacks are paralysing global businesses. Abrupt changes in tariffs have caused tremendous economic uncertainty. And it is increasingly critical who has control over the raw materials needed for manufacturing - especially rare earth metals required for electronic chips and WTG fabrication.

"For new/future contracts, a force majeure clause may be ineffectual for the polycrisis events."

* This is an expanded version of an article that was featured in a ReNews special edition for Global Offshore Wind 2025 in London.

"Parties may consider a further contractual right permitting the removal of assets (vessels, plant and equipment) and people from the site and jurisdiction if a polycrisis event manifests."

As such, it is far from clear whether these events – or similar/related ones - would fall within the definition of 'force majeure' in standard contracts. There is a strong argument that they are not 'unforeseeable'.

Force majeure clauses are often mistakenly considered to be 'boiler plate' and as a consequence given less consideration compared to other clauses in tender negotiations. However, in current circumstances, that approach is not appropriate.

Just as recent events such as the 2010 volcanic ash cloud, the Covid pandemic and the Ever Given blockage of the Suez Canal in 2021 led to updates to parties' standard drafting, so the current polycrisis should also prompt updates to these clauses.

In the UK, we often saw express entitlement provisions being included in contracts after the initial COVID-19 lockdown (sometimes referred to as a 'corona clause') to provide relief if further lockdowns or other Covid measures were implemented by the Government The clause would ensure the contractor receives an EOT, and in some cases was also negotiated to entitle the contractor to additional costs incurred as a result of the event.

For new/future contracts, a similar approach may need to be taken for events which are already foreseeable.

Some points to consider include:

1. the scope of the force majeure mechanism should not be restricted to the site. It should extend to the entire geographical reach of the supply chain including supply routes to the site, with an adequate open-ended list of events.
2. in addition, for international projects, Parties may consider a further contractual right permitting the removal of assets (vessels, plant and equipment) and people from the site and jurisdiction if a polycrisis event threatens – for example rising regional tensions that threaten to spill into hostility – and provide for payment of such action. This goes beyond a typical force majeure remedy by providing a contractual mechanism to remove assets in anticipation of an event. Clearly, this would require very careful drafting so that it is clear when the right kicks in. However, for some of the polycrisis events I have referred to, the right to demobilise only after the event has happened may be of limited practical benefit (for example, the right to remove a vessel from the Persian Gulf, only after the Straits of Hormuz have already been closed). For larger assets, such as vessels, the contractor may also wish to ensure it is paid its demobilisation costs.
3. the type of insurance cover necessary for these events (and the extent of cover provided). The scope of the available insurance may influence how important it would be for the contractor to be expressly entitled to remove assets from a jurisdiction in anticipation of an event.
4. whether the contractual liability caps should reduce during polycrisis events to reduce the contractor's exposure, and/or whether it is appropriate to have a knock-for-knock indemnity regime if adequate insurance cannot be procured for the types of events contemplated.
5. a sensible price indexation clause to protect against the price escalation effect of these types of events. These events could lead to the works being suspended for a period of time, and it is likely that the event will add a direct inflationary impact on costs during that period of suspension. This has been demonstrated dramatically in the last few years. The supply chain should not be left with the risk of greater costs that flow as a result of events that it is not responsible for.

Finally, given the rising tensions worldwide, parties should prepare a robust crisis management response plan so that they know how to respond to and mitigate the risks if a polycrisis event affecting projects, assets and people were to materialise.

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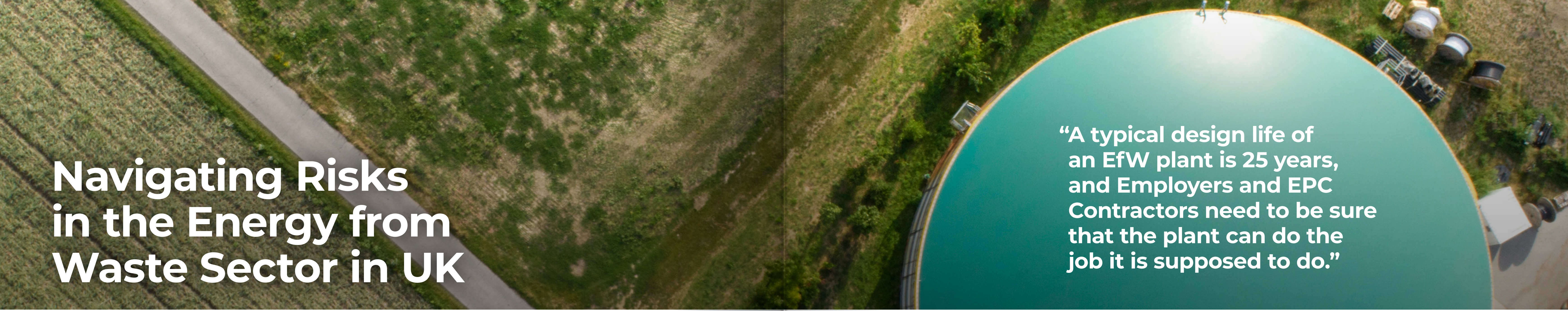

Navigating Risks in the Energy from Waste Sector in UK

> "A typical design life of an EfW plant is 25 years, and Employers and EPC Contractors need to be sure that the plant can do the job it is supposed to do."

In theory, burning rubbish to generate energy sounds like an answer to many modern-day global issues. As a renewable source of energy, it helps to reduce reliance on fossil fuels whilst the whole world transitions to cleaner energy. Waste is diverted from landfills and the push to recycle helps with sustainability. However, in the UK, the Energy from Waste (EfW) sector has been plagued with difficulties. This article sets out some 'what ifs' that should be considered when negotiating EPC contracts for EfW.

There have been real problems getting some EfW process plant technology to work effectively in what is a heavily regulated sector. The process plant technology can be very complex and the interface between components can be tricky to engineer. Together, these things mean that Employers are likely to shift as much liability to the EPC contractor as possible. With subcontractors having inherently different risk profiles, it is often difficult, and sometimes even commercially impossible, for an EPC contractor to appropriately pass down that risk to the supply chain.

> "When negotiating the suite of contracts, it is therefore important for all parties to ask themselves, "what happens if..."

Unfortunately, this imbalance in the risk allocation has resulted in many good contractors withdrawing from the EfW sector altogether. Badly drafted contracts can heavily burden the relevant parties. Like all large infrastructure projects, the EPC contract for an EfW project is an exercise in defining what will be built and how it will be built. Parameters are then put in place around that core, to determine who bears the risk when the '**what**' or the '**how**' does not go as planned.

When negotiating the suite of contracts, it is therefore important for all parties to ask themselves, "what happens if...". That is the only way to really test the contractual machinery and understand who, in that scenario, bears the risk. Below are some things that parties should think about when considering some common "**what happens if...**" scenarios.

Commissioning is delayed

EPC contracts can be light on detail when it comes to testing and commissioning requirements. The focus is usually on getting the plant built, rather than switching it on. This can lead to different expectations between the parties of what is required in order to complete the commissioning process. A clear scope for commissioning together with express testing requirements (particularly for interfaces) should be negotiated up-front to help reduce the risk of parties getting bogged down in commercial/interpretation disputes at a crucial stage of the project. It may also reduce the likelihood of needing to issue change orders later in the project.

Where the technology is varied and sometimes emerging, the fine-tuning typically encountered at the commissioning stage might unexpectedly result in more fundamental design modification works. The interface with a variable fuel supply can also make commissioning difficult such that commissioning is delayed due to factors outside the control of the EPC Contractor or technology provider. The risk for the delay, and resulting costs, should be passed down to the responsible party with back-to-back provisions.

Commissioning delays can be mitigated by specifying requirements for quality management and assurance throughout the project. A clear obligation to conduct factory acceptance testing can avoid some disasters from occurring, and reduce the impact of unforeseen issues on the critical path.

When allocating risk under an EPC contract, it is important to consider external influences, such as other systems that the Employer may have on site, and that fall outside the EPC contractor's scope. For instance, delays to a third party's materials sorting facility, or fuel being out of specification, could impact the commissioning timeline of an EfW process plant.

Further, while it is common to see Liquidated Damages capped at a percentage of the contract sum, this approach may be inappropriate where successful commissioning depends on technology that has been provided under a lower-value subcontract. In such cases, recovery based on a percentage of the subcontract value may be insufficient. Parties should anticipate the possibility of significant delays to commissioning and consider drafting provisions that allow either the EPC contractor or the Employer to assume control of the situation without resorting to the drastic measure of terminating the technology provider's contract.

The plant is defective

Usually, in EfW Plants, the technology provider and the EPC Contractor who bears most of the project risk, are different entities. Therefore, financial caps on liability for subcontractor technology providers must be adequate, especially in circumstances where the technology defines the success of a project. Financial liability capped at a proportion of a subcontract sum, particularly when that sum is modest relative to the overall project value—is unlikely to provide sufficient protection.

Further, provisions for notifying defects downstream should be as flexible as possible to avoid being locked out of potential defect claims for want of notification. Whilst back-to-back clauses between the EPC contract and technology subcontract can be useful in some circumstances, that is unlikely to be the case for defect notification provisions.

Moreover, latent defect provisions must be passed down to the Subcontractor to avoid situations where the EPC contractor is on the hook for defects, long after the subcontractor's liability may have ended. Leaving aside the obvious financial burden, the EPC contractor may not have the technical expertise to attend to defects in the subcontractor's proprietary design.

Shortfall in expected performance

When energy production targets are missed because the plant cannot perform as required, the financial consequences can be catastrophic. A typical design life of an EfW plant is 25 years, and Employers and EPC contractors need to be sure that the plant can do the job it is supposed to do.

Specifications and contract terms are often drafted in silos - the former being drafted by engineers and the latter drafted by lawyers. The specifications must be aligned between packages of work and the terms of the contract. It is not uncommon to see inconsistencies between the performance specifications in the EPC contract and subcontract.

The loss suffered by an Employer as a result of performance shortfalls is usually loss of profit, but subcontracts often include exclusions for consequential loss. It is essential to ensure that exclusion clauses don't apply downstream for losses that the contractor may be liable for upstream.

Additionally, any caps on liability must have appropriate carve-outs for things like deliberate breach, wilful default and misrepresentation. Sub-caps can be hidden away in the contract drafting but could be fatal for a party trying to recover damages. For example, it is not uncommon to see clauses that say the subcontract cap on liability is 50% of the contract sum of which liability for performance shortfalls is capped at 20% of that amount.

Finally, wherever possible, it may be advisable to obtain a wide parent company guarantee (PCG) that covers the performance obligations of any subcontractor to protect against risk of dwindling assets or insolvency becoming a bar to recovery. Where technology providers are invariably based outside the UK, it is essential that any PCG allows for enforcement against the parent company in its home jurisdiction.

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Energy from Waste: As Hand-Back of Plants Approaches, what are the key considerations?

Energy recovery from residual waste in the UK has grown significantly over the last 20 years. By the end of 2023 there were 60 fully operational energy from waste (EfW) Plants in the UK, which generated about 3.1% of the country's total net power.

The rapid development of EfW Plants from 2006 to 2019 was primarily led by the local authority (Authority) sector through Private Finance Initiative (PFI) or Public Private Partnership (PPP) contractual arrangements, which were typically based on 25-year operational design lives. As contractual arrangements approach the end of their lives, many Authorities and incumbent private sector partners (Operators) will need to consider what they need to do in advance of hand back of EfW Plants.

This article highlights key considerations to be aware of in the years leading up to contract end.

Identify any ambiguity in the Contract regarding the conditions of the assets that are being returned

In a 2020 Report produced by the National Audit Office, over half of the respondents acknowledged the need for greater understanding of asset condition in the lead up to contract expiry.[1]

At an early stage,[2] and as a first step, parties should review the contractual documentation and ensure they have a full copy of all relevant documents including any amendments and variations. They should also review the availability and completeness of specific asset related documentation and data that will be required as

1 https://www.nao.org.uk/wp-content/uploads/2020/06/Managing-PFI-assets-and-services-as-contracts-end.pdf

2 The Infrastructure and Projects Authority recommends starting to prepare seven years from the expiry date.

"In a 2020 Report produced by the National Audit Office, over half of the respondents acknowledged the need for greater understanding on asset condition in the lead up to contract expiry."

part of the handover, including O&M manuals and asset registers.

As part of their review, parties should:

- Identify when and how contractual condition surveys are required to be undertaken and should also consider whether it would be suitable to instruct any additional surveys so that issues can be identified and, if necessary, rectification of issues can be resolved prior to Contract expiry.
- For example, if the EfW Plant includes technology that is a non-standard design and is no longer supported by the supplier, it may be necessary to develop a custom maintenance plan in line with the Operator's on the ground knowledge, and prepare an inventory of critical parts. Early engagement between the Operator and the Authority can assist with identifying issues and preventing disputes.
- Ensure they understand their dispute resolution options, so that in the event of any disagreement regarding asset condition, they understand the necessary steps to take and when (including, for example, any relevant time limits).

Ensure that any changes in Legal and Regulatory Standards are understood and factored in

Another key consideration is what changes have occurred in legal and regulatory standards that may affect the EfW Plant. Contracts signed decades ago may not account for evolving legal or environmental requirements, and this can lead to conflicts at hand-back.

For example, the Government has confirmed that from 2028, EfW operators will be paying for CO2 emissions produced from burning waste. Parties should ensure they are aware of deadlines for all relevant preparatory steps for any upcoming changes to regulation and if necessary, should ensure these steps are undertaken prior to contract expiry.

Authorities should consider if they can lean on the Contract or else utilise other commercial arrangements to require the Operator to make upgrades to the Plant infrastructure to help with the reduction of CO2 emissions ahead of Contract expiry.

Authorities should consider their options on expiry

Perhaps the most crucial decision that Authorities need to make in advance of contract expiry is what they want to do with the plant when they receive it back. The Authority may wish to take over direct operation of the Plant or find another operator and enter into a new contractual relationship. All options including continued use and/or modification, through to closure and development of a new solution, should be considered. Once that has been decided, the Authority will need to consider what contractual arrangements it wishes to utilise to ensure that it gets the best value for money.

In weighing up the risks the Authority will want to understand the possible lifespan of the EfW Plant. In continental Europe there is perhaps less of an appetite to "write off" EfW Plants for being too old - for example a plant in Germany, originally commissioned 38 years ago, is among the top energy converters of all waste incineration plants in Germany.[3] The lifespan of EfW Plants is largely determined by its technology and design. If the Plant has been designed in such a way that there is capacity to make cost effective future proofing changes and upgrades, then Authorities can potentially receive fantastic opportunities with the hand-back of these assets.

Authorities taking on EfW Plants will often look to utilise an operating company on shorter term contractual arrangements. In such cases, Authorities will need to consider their ongoing liability and insurance arrangements. As plants get older, the risk of operational failures tends to increase. This can affect liability and insurance coverage and can also lead to potential disputes over who is responsible for maintenance and repairs. It is therefore important to ensure that the extent of the responsibility for maintaining assets is not ambiguous, particularly where there are any interface issues that also need to be considered.

In some instances, it may be better to prolong or renew the previous contract (even on a transitional basis)- some contracts may contain the right to extend (though depending on the drafting of the provisions as this may be tantamount to an agreement to agree and therefore unenforceable), or an extension may be proposed as part of commercial negotiation between parties.

Parties exploring this option should consider revising the approach to performance shortfalls and liability for defects taking into account factors such as age of the assets and the impact of changes in waste composition.

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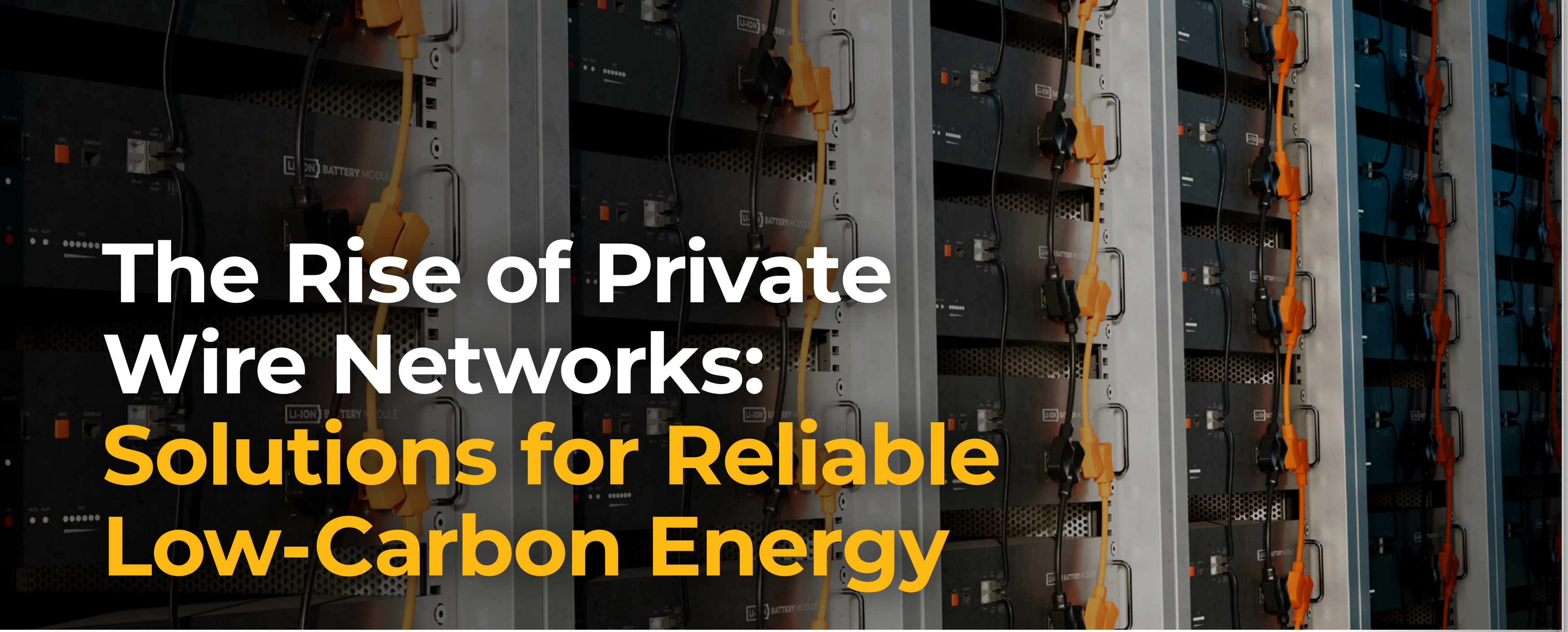

The Rise of Private Wire Networks: Solutions for Reliable Low-Carbon Energy

Corporate Power Purchase Agreements (PPAs) are rapidly expanding as major companies seek long-term, low-carbon energy to meet net zero and ESG goals. However, despite their benefits, grid connection constraints remain a major hurdle for both energy generators and high-demand users such as data centres. In response, businesses are increasingly turning to private wire networks.

Private wire arrangements are not new but are gaining traction with high demand sectors, given the need for stable supply of low carbon (and low cost) electricity without reliance on national grids.

Understanding private wire networks

Private wire networks are systems where there is a direct supply of energy from a generation asset holder (the **Generator**) to a single end-user (**Off-Taker**) via a direct physical connection. Rather than being deployed for wider grid use, the Generator supplies directly to a specific (or cluster of) Off-Taker. For instance, the entire 72MW output of the Shotwick Solar Park in Deeside, the UK's largest private wire connection, is used by a nearby paper manufacturing plant.

The defining characteristic of a private wire system is that it is not connected to the grid infrastructure, and the energy generated does not flow into or is not drawn from the grid.

Benefits

Lower costs

As the electricity generated is not metered by a grid supplier, the Generator (or intermediary) can directly charge the Off-Taker under a privately negotiated agreement, such as a PPA, or a consumer can generate its own power without any grid interaction. In each case, this avoids certain network charges and other statutory costs or levies, resulting in lower costs.

Certainty of supply

In the event of a national grid failure (or material constraint), made more acute by factors such as climate change, aging infrastructure and geopolitical events, a key attraction of private wire networks is that they can operate independently, ensuring a continuous supply of electricity. For example, the UK's largest private wire project is now underway at Teesside and is designed to supply power directly to the industrial occupiers at the Teesworks development.

In the context of renewable generation, stability can be achieved by the integration of Battery Energy Storage System (**BESS**) or otherwise by modulating demand.

Lighter regulation

Private Wire projects must be constructed within a nation's existing regulatory framework for developing energy assets. Regulations will differ depending on the location of the site, but

> **"The regulation of private wire networks could tighten in the future, and with it an increase in levies and licence fees, potentially diluting the savings of 'behind the meter' generation."**

regulatory permits will inevitably need to be obtained. Compliance with licensing laws will also be a consideration.

The licencing and regulatory regimes for both electricity generation and distribution often contain exemptions for private wire projects or otherwise offer a lighter touch regime. In the UK for instance, under the Energy Act Generators are exempt from acquiring a supply licence where the total power supply is below 100MW.

That said, there remains a risk that the regulation of private wire networks could tighten in the future, and with it an increase in levies and licence fees, potentially diluting the savings of 'behind the meter' generation.

Construction

Private wire projects are complex, often involving the integration of multiple technologies (such as wind or solar generation and BESS), multiple off-takers, or the ability to supply to and draw from a local or national grid.

Project scope and initial design

Where generation is on the same site and constructed at the same time as the Off-Taker's facilities, the project can be designed and constructed as a single project. However, where generation is not co-located with the Off-Taker (for instance where there are existing facilities to be supplied by new renewable generation) the project can become more complex, depending on the distance between generation and use. New export cables will need to be laid (as existing grid connections cannot be utilised) and there are likely to be multiple layers of planning and consents required.

These issues, together with the detailed output and performance specification, safety standards and systems integration, should form key elements of the Front-End Engineering Design (FEED), to maximise delivery success and manage budget and schedule. This also enables early identification and procurement for long-lead items such as cables and transformers.

Interfaces

The construction of large-scale private wire projects will involve numerous contractors and stakeholders and will require careful coordination, stakeholder approvals, and often bespoke construction methodologies. Detailed FEED can greatly assist and manage these complex interfaces—across civil works, high-voltage cabling, equipment installation, and facility integration—and also to support execution under EPC, EPCM, or owner-led contracting models. From the outset, clear scope delineation, interface management, and defined entitlements to time and cost adjustments are critical to mitigating claims and delays, especially where multiple contractors and suppliers are involved, each potentially with independent obligations to the Owners to co-ordination with other project participants.

Technical challenges

Private wire projects rely on the Generator being physically located reasonably close to the Off-Taker or near a substation with a direct connection to the Generator. The cost and difficulty of constructing a private wire increases with distance. That alone could make such projects less commercially attractive due to increased capital expenditure.

Private wires usually involve sub-surface works and unforeseen (and unforeseeable) conditions can present a significant challenge for contractors and owners alike. Clear allocation of responsibility and the extent of reliance on surveys and other data provided at tender stage is key to risk apportionment.

Other unique engineering challenges may arise, especially if the planned wire route crosses waterways, roads, railways, and existing utilities and other specialised process plants and technologies. Clear responsibility for obtaining such consents is needed, as is the right to variations in the event such consents are delayed or become unobtainable.

Conclusions

Against the backdrop of an increased focus on energy security and the increasing number of high demand energy users seeking to balance their power-hungry businesses against commitments to lower carbon footprints, interest in private generation and exclusive energy supply is on the increase.

For the technology sector, private wire networks make sense where electricity demand will continue to grow to support the rapid development in AI, with some commentators even suggesting the price for using AI in the future will be intrinsically pegged to electricity prices. Guaranteeing energy supply and lower costs are attractive benefits of private wires. However, there will

> **"For the technology sector, private wire networks make sense where electricity demand will continue to grow to support the rapid development in AI"**

always be a tension between providing enough energy to run data facilities and the intermittent nature of renewable generation. Integration of BESS will provide the necessary stability but will also increase costs and complexity.

Constructing private wire projects will always be complex, requiring integration of multiple technologies and systems, and managing interfaces between existing utilities and infrastructure, contractors, suppliers of key equipment. In addition, the high initial capex costs will be prohibitive for some. For many companies, the long-term benefits can outweigh these initial challenges.

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HFW Renewables Team

Our team has experience across the full range of renewable energy projects, including wind (offshore and onshore), solar, waste to energy, hydro-electric, battery and nuclear projects. This fits within our team's broader construction law focus on large scale international energy and infrastructure projects.

HFW has 21 international offices, giving us the capability to advise our clients on local law across a range of jurisdictions. Our construction team is focussed in 4 main hubs: London, Middle East (UAE, KSA, Kuwait), SE Asia (Hong Kong, Singapore) and Australia (Perth, Sydney, Melbourne). As a fully integrated team, with a close-knit and collaborative culture, we guarantee a seamless and uniform global service.

We can provide flexible advice solutions to suit every type of company, including project retainers, fixed fees, and team member secondments. Please ask anyone in our team for further information about how we can help you..

Areas of specialism:

- Procurement, project advice and set-up and contract risk review.
- Project counsel role, covering advice during the construction phase, including contractual procedures, disagreements on contract interpretation and termination disputes.
- Advice preparing and defending claims, including delay, defects, disruption, variations and other contractual cost entitlements.
- Formal disputes processes, including court litigation, arbitration, DAB, adjudication and mediation.
- Advice on regulatory matters such as sanctions, investigations (arising from bribery or similar allegations) and procurement award challenges.
- Insurance law, advice and claims.

HFW has over 700 lawyers working in offices across the Americas, Europe, the Middle East and Asia Pacific. For further information about our construction capabilities, please visit hfw.com/Construction.