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Renewable Projects Magazine

Contracting mindset for EfW plant revamps

Renewable developments across SE Asia

Developments from Australian wind disputes

Managing fuel risk in EfW projects

Split scope contracting on BESS projects

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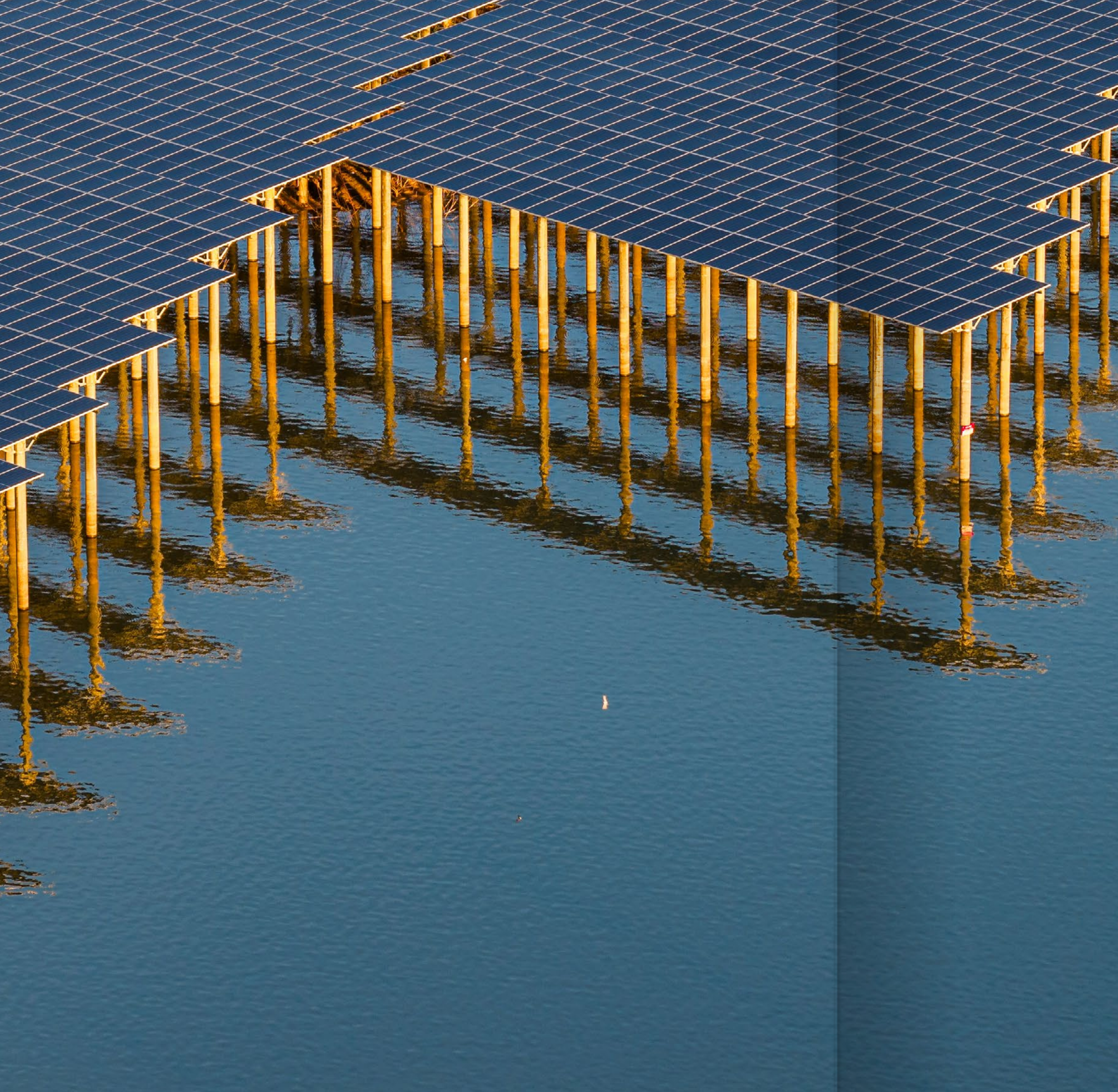

Welcome to HFW's Renewable Projects Magazine

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. Please let us know what you think, and what you would like to see covered in future editions.

HFW Renewables Team

Old Plants, New Risks: Why EfW Revamps Need a Different Contracting Mindset

Across Europe, a number of Energy from Waste (EfW) plants are approaching the end of their original concession periods (usually 25 years). Control and operation of the plant will typically revert to the local authority who will have to make a strategic decision: revamp the existing plant or commit to a full rebuild.

Commercial and technical engineering considerations naturally lead the strategic decisions. Less obvious – but no less important – is how legal and contractual risk should be allocated between the parties going forward. What happens in the future if the plant goes wrong and who will be responsible for what? Getting the risk allocation right is arguably just as important as the technical solution and the commercial viability.

New builds/re-builds

Most EfW owners have experienced the comfort blanket of the "wrapped" EPC. On new build plants, a single EPC contractor typically takes overall responsibility for delivering an integrated, functioning plant. The contractor assumes design, construction, programme and performance risk, backed by performance warranties. If the plant fails to perform during the guaranteed period, the contractor fixes it. If delivery is late, the contractor compensates the owner – at least in principle.

The key integration risk in split scope models is the possibility that separately delivered components will fail to function together to deliver a fully co-ordinated, compliant and functional BESS facility. The scopes, guarantees and liabilities in each supplier contract and the interface between suppliers is therefore fundamental to the successful delivery of the project and to limit the owner's exposure.

On the face of it, the risk allocation looks clean. The contractor wraps the project end to end and carries most of the technical, time and cost risk. That allocation is not ideological – it is practical. In exchange for taking the risk, the EPC contractor is given control. The model works because new builds benefit from four key advantages:

- a clean slate
- brand new components
- the process train is designed as one integrated system
- the EPC contractor controls the supply chain, designers and technology providers

Most things that can go wrong are, therefore, within the contractor's control. Design, interfaces and construction activities sit under a single umbrella. In that environment, a wrapped EPC makes commercial and contractual sense.

Revamps: a different risk profile

That logic does not transfer neatly to revamps. A single point of responsibility is commercially unrealistic.

Revamps are fundamentally different. They involve selective replacement, upgrading or extension of an existing asset, often to extend plant life or address compliance and performance challenges. They are not "controllable" in the same way as new builds – and that difference goes directly to the heart of risk allocation.

Revamp projects are inherently riskier. Incoming contractors are exposed to "unknown unknowns", where neither the risk nor its scale

"Revamps cannot be delivered like new builds. Off the shelf EPC contracts will need to be replaced."

can be identified at the outset, as well as "known unknowns", where risks are anticipated but not fully quantifiable. While drawings, surveys and O&M manuals may exist, the true condition of a plant often only reveals itself once intrusive works begin.

Structural degradation, corrosion or fatigued steelwork may only be discovered once equipment is opened up. Matters can escalate if investigations reveal that the underlying cause is a historic, previously unidentified defect. In those circumstances, it is unrealistic to expect a revamp contractor to accept full responsibility for risk that could not reasonably have been priced or managed.

If a contractor were asked to do so, it would have two unattractive options: price the risk blindly through contingency (commercially unappealing), or accept the risk knowing it would likely be disputed later (practically unappealing).

There is further complexity where multiple revamp contractors are required, working on different systems and interfaces, often in parallel. It is highly unlikely that any of them will agree to a traditional fitness for purpose warranty for overall plant performance – and arguably they should not be expected to. Contractors cannot reasonably warrant assets that:

- pre date the revamp
- may already contain defects
- operate using legacy interfaces
- rely on incomplete or unreliable data

Many revamps are also carried out while the plant remains partially operational, constrained by outage windows and waste throughput requirements.

The dividing line

Revamps offer important advantages: lower capital cost, fewer planning hurdles, reduced interruption to waste processing and earlier revenue certainty. But those benefits only materialise if the contracting model reflects reality.

Revamps demand a broader, more sophisticated risk allocation. Risk must sit where it can actually be managed, and that requires bespoke contracting rather than recycled EPC templates.

In practice, owners and operators may need to retain specific categories of risk, including:

- pre existing defects
- unforeseen conditions
- missing or inaccurate as built information
- interfaces outside the revamp scope
- programme impacts caused by outages or continued operation
- system wide performance risk linked to legacy equipment

Design obligations will also look different. A reasonable skill and care standard – essentially a promise not to be negligent – is often more appropriate than a blanket fitness for purpose obligation.

This does not mean revamp contractors walk away from responsibility. They should take a high degree of responsibility for matters genuinely within their control, including:

- construction of the revamp
- performance of new equipment and technology
- delays caused by their scope
- emissions or regulatory compliance attributable to the revamp

Clear dividing lines are essential for enforceable contracts and deliverable projects.

A mature model for a mature plant

As the EfW fleet ages, revamps will become more frequent, ambitious and critical to maintaining capacity. That shift requires a change in mindset, especially from owners accustomed to wrapped EPC solutions.

Selective scope reduction will be part of the answer. Owners may carve out discrete elements and take direct responsibility for them. Free issued equipment is an obvious example.

Where an owner directly procures proven, bankable technology from a reputable OEM, the incremental risk retained is often limited. The technology is well understood, warranties sit directly with manufacturers and performance characteristics are known quantities.

Performance standards remain crucial. For revamps, blanket fitness for purpose obligations are rarely workable. A more realistic approach is to align performance guarantees with the contractor's actual scope – covering new design and supplied equipment, subject to defined assumptions, interface conditions and express exclusions for legacy systems. Those obligations are far more likely to be priced sensibly and enforced successfully.

Interfaces require particular attention. In revamps, failure is more likely to arise from unpredictable interaction between old and new systems than from defective new equipment alone. Clear interface definitions, documented assumptions and robust testing regimes are not contractual niceties; they are essential risk controls.

The way forward

From a contractual perspective, parties embarking on revamps should have no illusions. Revamps cannot be delivered like new builds. Off the shelf EPC contracts will need to be replaced.

Successful revamps require bespoke drafting, intelligent risk allocation and a willingness to contract for what can genuinely be controlled.

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Exponential growth drives renewables developments across SE Asia

Southeast Asia has emerged as one of the world's fastest growing energy markets, driven by rapid economic growth, urbanisation and rising living standards.

Electricity demand in Southeast Asia grew by an estimated 3% in 2025 and is expected to grow at an average annual rate of 5.3% over 2026 to 2030. Renewables are forecast to expand rapidly, with wind projected to grow by 26% annually and solar photovoltaic (PV) by 19%.

This growth, coupled with global fuel price volatility and supply disruptions, has sharpened the focus on energy security and reinforced the importance of renewables. Eight of the 11 ASEAN member states have strengthened renewable energy targets and updated power development plans, including net-zero or carbon neutrality commitments.

Developments across several key jurisdictions illustrate this momentum.

Vietnam:

PDP 8, green hydrogen and new oil discovery

Vietnam has led recent growth in Southeast Asian renewables driven in particular by rapid solar PV deployment and, increasingly, wind power alongside its Revised Power Development Plan 8 (PDP 8), prioritising LNG and offshore wind for 2026-2035. It aims to bring approximately 22,500 MW of LNG-fired power and 6,000 MW of offshore wind capacity online by 2030, supporting ambitions for renewables to reach 75% of generation by mid-century.

Vietnam is also focusing on green hydrogen. Its National Hydrogen Strategy (approved 7 February 2024) aims to develop a hydrogen energy ecosystem by 2030, supporting energy security, emissions reduction and a transition to a carbon-neutral economy by 2050.

In January 2026, Murphy Oil confirmed a major offshore discovery at Hai Su Vang in the Cuu Long Basin, estimated at 170-430 million barrels of oil equivalent. While a fossil fuel development, it may provide capital to accelerate Vietnam's energy transition.

These ambitions are reinforced by growing international cooperation, including six strategic agreements signed with Japan in May 2026.

The Philippines:

New natural gas source and solar acceleration

The Philippines is currently fast-tracking energy projects to combat rising fuel costs and an aging grid. As of April 2026, 1,471 megawatts (MW) of new power capacity is being expedited. These include 12 solar installations totalling 1,284 MW, six hydroelectric plants (48.23 MW), two biomass facilities (38 MW), one wind project (13.56 MW), and a 20 MW Integrated Renewable Energy Storage System (IRESS), all scheduled for delivery within three years.

Prime Energy has also announced a new gas discovery near Malampaya (98 billion cubic feet). Given Malampaya's historic role in supplying around 20% of Luzon's electricity, this could extend the life of the asset while supporting a shift away from coal.

Indonesia:

Green supergrid

Coal remains the primary source of electricity, accounting for 70% of power generation. The renewables landscape in Indonesia, however, is undergoing a transformation due to its Just Energy Transition Partnership (JETP) and the Green Supergrid, a high-voltage transmission network designed to connect the nation's 3,600 GW of renewables – ranging from geothermal in Java to hydropower in Kalimantan – to industrial centers. The Green Supergrid aims to address the imbalance between power supply in Sumatra and Kalimantan and demand in Java.

Alongside the Green Supergrid, Indonesia recently announced its Microgrid Initiative to expand its renewable energy access to power over 80,000 cooperatives nationwide.

New major LNG projects are entering FEED and beyond.

Malaysia:

Hydrogen hubs

Malaysia saw electricity demand rise by 1.3% in 2025, driven by residential growth, industry and expanding data centres. While coal remains dominant, natural gas is expected to increase to 41% by 2030, consistent with the National Energy Transition Roadmap, which emphasises hydrogen and carbon capture.

The Sarawak H2 Hub is Malaysia's flagship platform for hydrogen production and export within Southeast Asia, anchored by two significant projects: H2ornbill, a collaboration between SEDC Energy, Japan's Eneos, and Sumitomo Corporation to construct two hydrogen plants; and H2biscus, a partnership with South Korea's Samsung Engineering, Posco, and Lotte Chemical focused on developing hydrogen derivative facilities. Together, these projects are expected to produce over 240,000 tonnes of green hydrogen annually for export to North Asia, positioning the Sarawak Hydrogen Hub as a global leader in clean energy production. Additionally, the hub aims to generate approximately 2,000 tonnes per year for domestic consumption.

Thailand:

Solar energy and storage systems

Thailand's Power Development Plan targets renewables contributing over 50% of total power generation by 2037, with solar PV installation targets exceeding 24 GW – a material pivot away from the country's historical reliance on natural gas. To manage the intermittent nature of solar and wind generation, Thailand is pursuing a dual-storage strategy: Battery Energy Storage Systems (BESS) for short-term grid stability, and Pumped Hydro Energy Storage (PHES) for large-scale, long-term storage capacity. The country is also promoting solar-plus-storage schemes, enabling solar energy collected during daylight hours to be discharged to meet peak evening demand.

Singapore:

Cables, imports and hydrogen

Singapore is targeting the import of 4 GW of low-carbon electricity by 2035, driving substantial investment in subsea transmission cable infrastructure. Projects linking Singapore to Indonesia and, separately, to Cambodia are positioning the city-state as a regional hub for cross-border green energy trade. On Jurong Island, Singapore is piloting ammonia-to-power technologies, recognising hydrogen as a key enabler of decarbonisation across the maritime and power sectors.

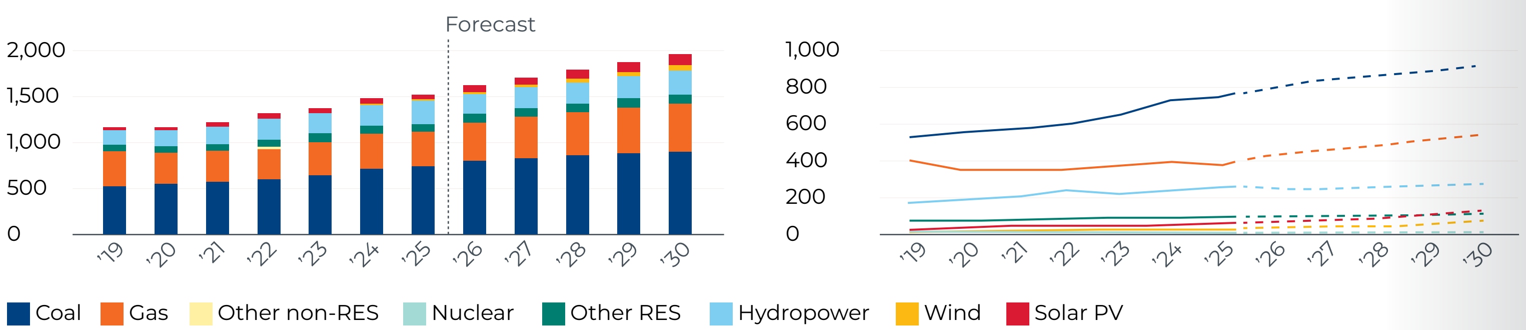
Conclusion: A promising future ahead

Southeast Asia's energy sector is evolving rapidly, driven by economic growth and rising demand. Governments are accelerating renewables deployment and setting ambitious carbon targets, underlining the role of clean energy in security and resilience.

With policy reforms, technology advances, and cross-border cooperation, Southeast Asia is positioned to lead in renewable energy and decarbonisation.

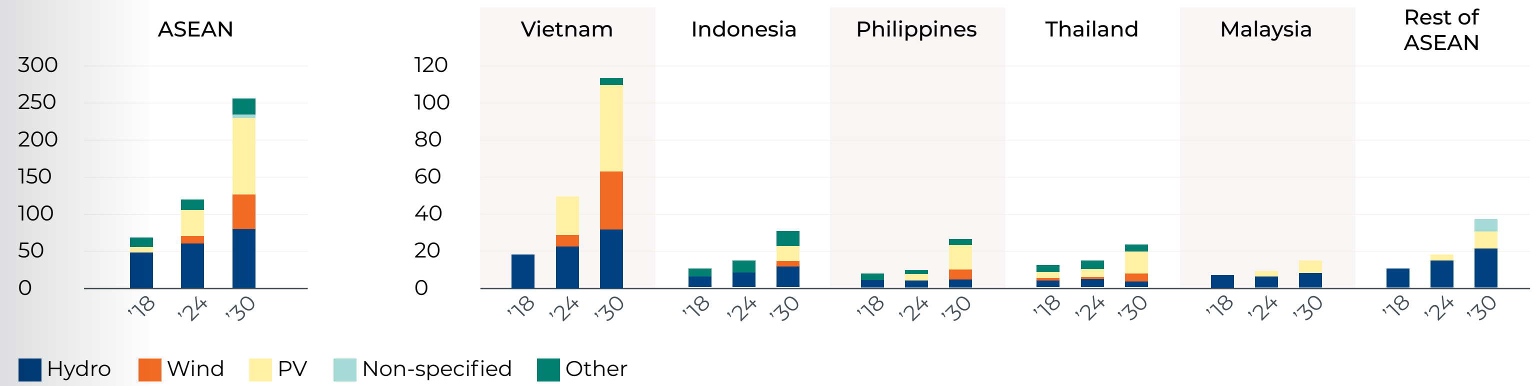
These projects may not happen exactly as planned; such development is rarely linear. But with demand continuing unabated, expanded renewables projects will undoubtedly play their part in fuelling future growth.

Year-on-year change in electricity generation in Southeast Asia, 2019-2030 (TWh)



Source: International Energy Agency.

Total installed renewable capacity (historical and 2030 ambitions) stated in government documents, 2018-2030 (GW)



Source: International Energy Agency.

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Australia's Wind Farm Disputes: Signals for the APAC market

Australia and the wider APAC region have become the world's centre of gravity for wind energy deployment in recent years. This focus has been driven by decarbonisation targets, electrification demand growth, and industrial policy.

As at 2025, wind energy represented approximately 15.7% of Australian energy generation. Major recent developments contributed to an uplift in wind energy generation including the Goyder South and MacIntyre wind farm projects.

The Australian offshore wind market has been slower to develop. Eleven offshore wind farms within Victoria's Gippsland offshore wind zone have received feasibility licences under the *Offshore Electricity Infrastructure Act 2021* (Cth). In August 2026, the Victorian Government will open a Request for Tender auction targeting 2 GW of offshore wind capacity.

The development and construction of onshore and offshore wind farms continue to be plagued by various issues. Courts and lawmakers are working to manage the swift development of the wind industry to help prevent and address these issues.

In this article we explore some of the recurring issues experienced on wind farm projects and the ways they are being addressed by the courts in Australia and APAC generally.

Construction trends – Australia

Over the past seven years, we have regularly acted for clients in relation to multiple large scale onshore wind farms in Australia. Although each project is nuanced, the challenges we see are relatively consistent. They include:

1. lengthy permitting and environmental approval processes;
2. grid-connection constraints and transmission infrastructure gaps;
3. delays caused by inclement weather, variations, defective works and defective turbine components;
4. logistical challenges arising from shipping arrangements, port storage and land transportation availability; and
5. cost inflation affecting turbines, materials and logistics expenses.

Similar issues have arisen in offshore wind farms through APAC including unforeseen ground conditions, lengthy approval processes (particularly for biodiversity and marine ecology), vessel availability restrictions, cost inflation, and financing risk caused by volatile interest rates and construction cost escalation.

No amount of proper planning and effective project management can eliminate all risks. However, many risks can be mitigated through proactive and preventative measures, for example:

1. agreeing clear and unambiguous contract terms that consider the effect of the terms in various scenarios (for example, what does inclement weather really mean and how is it measured?);
2. ensuring considered and adequate risk allocation within contracts (clearly identifying who is responsible for the cost of what risks will avoid nasty surprises and protracted disputes);
3. ensuring harmony between technical and contractual standards;
4. ensuring the scope of works is clearly defined;
5. prioritising effective data and project record management systems from the outset of the project; and
6. implementing compliant contractual notice and claim procedures from the outset of the project.

There is of course a balance to be struck when negotiating contracts. Over-complicating contractual terms often has the unintended effect of creating further ambiguity. For example, a prescriptive contractual regime designed to instruct the parties on how to submit delay claims and to perform delay analyses may become entirely inoperable if the planned programme and delivery schedule is abandoned entirely (for instance if turbine components are delivered out of sequence or not in complete sets). This may render the delay and extension of time provisions dysfunctional and therein lies the basis for a protracted and costly dispute.

Wind farms in other regions throughout APAC appear to face their own iterations of similar issues, shaped by area-specific conditions such as ground conditions, weather, occupational health and safety laws, environmental regulations and manufacturing standards.

> **"The case highlights both the enforceability, and the procedural complexity, of hybrid arbitration arrangements in major renewable energy projects."**

Legal issues and developments

Recent judicial and arbitral cases demonstrate current attitudes towards the renewable energy landscape. Although there are limited significant legal developments, recent cases highlight the common issues and trends encountered on wind farm projects and reinforce existing law.

In South Korea, a Constitutional Court decision in August 2024 recognised the state's obligation to manage greenhouse gas emissions, strengthening the legal foundation for renewable energy expansion, including offshore wind.

Recent arbitration cases seated in Singapore involving renewable energy infrastructure have underscored the importance of robust contractual risk allocation in onshore and offshore wind development.

In 2025, in ***Rainforest Reserves Australia Inc v Minister for the Environment and Water*** the Australian Federal Court was required to navigate the possible impact that the construction of a wind farm would have on local fauna and in doing so consider whether its permit should be approved. In any such case, a balance must be struck between the possible environmental cost of a wind farm and the benefit. The Federal Court determined that the relevant regulations did not prohibit the construction of the wind farm in circumstances where it might cause an unintended and minor impact to local species provided there was no deliberate intention to harm them.

In the same year, in a significant Security of Payment decision, the South Australian Court of Appeal in ***Goyder Wind Farm 1 Pty Ltd v GE Renewable Energy Australia Pty Ltd & Ors*** confirmed that adjudication determinations are strictly interim and do not create estoppel or bar later claims. Contractors are not required to roll all delay or cost claims into a single payment claim, provided claims do not overlap. For project principals, this decision underscores that payment risk must be managed through contract drafting, claim controls and commercial strategy, rather than expectations of finality at adjudication.

More recently, in 2026, the Victorian Supreme Court, in ***Downer Utilities Australia Pty Ltd v Murra Warra Asset Co Pty Ltd*** [2026] VSC 48, has upheld a hybrid arbitration clause commonly found in large wind EPC contracts, confirming that such clauses will be enforced where they provide a workable dispute resolution mechanism. The Court held that arbitration had been validly commenced under the nominated administering body, despite adopting another institution's rules, and declined to intervene in issues better left to the arbitral tribunal. The case highlights both the enforceability, and the procedural complexity, of hybrid arbitration arrangements in major renewable energy projects.

Existing wind farm case law remains useful and relevant and recent cases suggest that many of the issues giving rise to disputes remain unchanged over recent years. Whilst the case law suggests a willingness by courts and tribunals to support the development of wind farm projects, they are limited by the contractual relationships of the parties. Effective contract drafting and proper use of supporting legislative regimes (such as security of payment) is vital to the effective development of the renewable energy industry.

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Managing fuel risk in energy from waste projects

Energy from Waste (**EfW**) projects continue to grow in importance as governments and industry seek sustainable ways to manage waste and generate low-carbon, reliable 'baseload' energy.

EfW plants – and particularly those processing Refuse-Derived Fuel (**RDF**) – require fuel that falls within tight specifications. Using out of specification fuel can lead to serious problems, including plant unavailability, equipment damage and environmental breaches. These risks expose both EPC and O&M contractors to significant potential liabilities which must be carefully mitigated.

Why fuel matters

To operate safely and efficiently, EfW plants need the input fuel to be consistent and predictable. However, EfW feedstocks – in particular RDF – are inherently variable and may contain contaminants, excessive moisture, oversized items, heavy metals, or hazardous materials. Where the feedstock material is outside the plant's design specifications, this can result in:

- **Forced shutdown and unreliable operation:** Out of specification fuel can make stable combustion difficult to maintain. Low Calorific Value (**CV**) or high moisture content reduces combustion temperatures, whilst oversized items can block feed systems or damage grates. Contaminants may also increase slagging and fouling, causing boiler failures and flue gas treatment issues.
- **Equipment damage and accelerated wear and tear:** Out of specification fuel may accelerate wear throughout the entire process train. For example, it can cause high-temperature corrosion where the fuel has a high chlorine or sulphur content.
- **Environmental and safety issues:** Out of specification fuel often contains elevated levels of contaminants, resulting in higher hydrogen chloride output. Failure to effectively control emissions can trigger regulatory breaches. Out of specification fuel can also significantly increase the risk of safety issues arising such as uncontrolled fire and explosions.

Risks for contractors

The risks posed by out of specification fuel affect both EPC and O&M contractors. EPC contractors are required to complete a series of commissioning tests to demonstrate that the EfW facility can meet its performance guarantees, a prerequisite for achieving Take Over. They are then typically responsible for meeting availability guarantees for a defined period thereafter. Where the fuel supplied falls outside the agreed specification, an EPC contractor's ability to satisfy its performance requirements can be undermined, potentially triggering significant exposure to liquidated damages.

O&M contractors, meanwhile, must generally meet ongoing performance targets throughout the O&M contract term. Out of specification fuel can cause these targets to be missed and result in the O&M contractor incurring penalties or a reduction in their O&M fee. O&M contractors may also be exposed to liability for damage to the plant or injury to personnel caused by out of specification fuel.

These risks are compounded by the fact that often EPC and O&M contractors have limited control over the composition of the fuel, which is typically provided by the owner or 'Project Company'.

Mitigating the risks: steps that contractors can take

EPC and O&M contractors can reduce their exposure through strong contractual protections, rigorous testing, and detailed record keeping. They should consider taking the following measures in order to manage fuel risk:

> **"EfW plants require fuel that falls within a tight specification as out of specification fuel can lead to plant unavailability, equipment damage and environmental breaches."**

1. Insist on a clear and detailed fuel specification

An unclear or incomplete contractual fuel specification can lead to disagreements over whether the fuel supplied meets the defined requirements. To minimise the risk of such interpretation disputes arising, EPC and O&M contracts should include a clear and comprehensive fuel specification. This should set out defined ranges or 'envelopes' for *all* key parameters including CV, moisture content, chemical composition, metals content, contaminants and prohibited materials, as well as any assumptions regarding seasonal variability.

2. Provide for a robust fuel conformity and testing regime

To have maximum impact, a detailed fuel specification must be supported by a robust fuel conformity and testing regime. Without this, disagreements can arise over whether the fuel supplied is genuinely out of specification, giving the Project Company scope to argue that EfW plant performance issues stem from other causes. The fuel should be periodically sampled before entering the feed hopper, and parties should seek to agree (and include in the contract) the relevant sampling methodologies to be used.

3. Contractual relief

Contractors should ensure that strong contractual protections are negotiated and agreed at the outset to safeguard them if they are supplied with out of specification fuel. As a minimum, both EPC and O&M contracts should give the contractor a clear, unilateral right to reject any non-compliant fuel without incurring time or cost consequences. Contractors should consider how this rejection will work in practice. Can fuel be sampled and tested quickly enough to reject a non-compliant batch? How will non-compliant fuel be stored and/or removed?

Contractors should also negotiate contractual relief from plant performance requirements, such as generation or throughput targets, where any plant performance shortfall is attributable to out of specification fuel. This should include a defined contractual mechanism for adjusting availability guarantees where the plant cannot perform due to fuel-related issues.

This is particularly important for EPC contractors undertaking plant commissioning. Where the EfW plant cannot meet the performance and availability guarantees, the EPC Contractor will typically be unable to achieve Take Over and may be exposed to significant liquidated damages liability. EPC contractors should ensure that any availability guarantee adjustments apply during commissioning, and that the contract provides an extension of time mechanism for any commissioning delays caused by out of specification fuel.

4. Records, records, records

As with any construction or engineering dispute, it is vitally important that contractors maintain detailed operational and technical records. This can include, for example, records of fuel characteristics, combustion performance, outages, and emissions records.

This data will be essential for the contractor to demonstrate that any plant performance issues stem from out of specification fuel and therefore fall under the responsibility of the Project Company. Contractors should ensure that any fuel issues are reported to the Project Company and related contractual notices are given within the prescribed time period.

Increasingly, AI-enabled sensors are being used to detect hazardous and non-combustible materials so that they can be removed before entering the combustion process. The information generated by these systems can be invaluable in evidencing that performance issues were caused by the fuel. Retaining, organising and maintaining such data in an interrogable form is, therefore, highly important.

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Unwrapped: The rise and impact of split scope contracting on BESS projects

The traditional single turnkey procurement model is being increasingly displaced by split scope contracting.

This article examines that shift and the implications on risk allocation between project participants.

Much has been written about the risks associated with split scope contracting from the perspective of owners and financiers. This article delves into a less discussed consequence: that with a decentralisation of the contracting model, integration and interface risk is often attempted to be passed downstream, frequently onto suppliers.

The single turnkey model

Under the single turnkey model, a single EPC contractor is engaged and takes responsibility for the design, equipment procurement, construction, integration and commissioning of the BESS facility.

The 'full EPC wrap' has historically been preferred by owners and financiers. The EPC contractor stands behind the whole-of-project outcome and manages downstream subcontractors. Contracting with a single EPC contractor reduces the owner's time, effort and coordination burden.

However, this broader scope comes at a cost. EPC contractors typically apply higher premiums to the contract price. These premiums, together with rigidity in procuring long-lead equipment, have led owners to consider alternative models.

Split or hybrid contracting models are increasingly being adopted. However, where they are, owners must be experienced enough and willing to manage integration and interface risk.

Split-scope contracting models

Under the split-scope model, owners contract directly with key component suppliers and typically separately engage one or more balance-of-plant (**BoP**) contractors for civil, electrical installation and grid connection works.

Variations of the split-scope model are emerging. This article considers the risks to BESS component suppliers where a third-party integrator is not engaged, and owners are left to manage integration risk.

The key integration risk in split-scope models is that separately delivered components may fail to function together. The scopes, guarantees and liabilities in each supplier contract and the interface between suppliers is therefore fundamental to the successful delivery of the project and to limit the owner's exposure.

Exposure for BESS suppliers

Where an 'integrator' is not engaged, we are increasingly observing owners seeking to transfer this risk to component suppliers through:

- "Fitness for purpose" obligations and "system outcome" language embedded in the supply contracts.
- Broad interface and cooperation obligations imposed on suppliers that reflect de facto integration duties.
- Commissioning and testing regimes that require the supplier to "achieve the successful commissioning of the facility", thereby disregarding the role of other suppliers and the BoP Contractor to achieve this outcome.
- Delay and liquidated damages regimes that directly or indirectly hold suppliers responsible for site-based delays and delays to final commissioning.
- Risk pushed onto suppliers in relation to grid compliance of the overall facility.

Each project participant shares an interest in the project's successful delivery. But shifting integrator or overall facility commissioning risk downstream is often met with resistance from suppliers and contractors seeking to limit their exposure to risks within their control.

Managing Integration and Interface Risk

From an owner perspective, minimising gap risk is critical. From a supplier perspective where key components are being supplied by multiple vendors and a BoP contractor is engaged to design and construct the facility, limiting obligations and liability to risks within the supplier's control is equally important. A harmonious outcome can be achieved to balance both objectives, but careful attention must be paid to scope boundaries and interface management.

> "The key integration risk in split-scope models is that separately delivered components may fail to function together."

This can be achieved by:

- Creating a clear division of responsibilities matrix and clearly defining the scope and responsibilities of equipment suppliers and contractors.
- Limiting each project participant's obligations to risks within its defined scope.
- Clearly allocating responsibility for coordination of the contractors' works to the owner or a designated integrator (unless a third-party integrator is engaged).
- Tying liquidated damages and liability regimes to each party's scope and establishing mechanisms to identify responsibility for delays and performance failures.
- Considering alternative incentive structures to encourage suppliers to support the timely achievement of final commissioning.

This is ultimately managed through careful drafting of each vendor agreement and clear delineation of responsibilities in the interface deed.

Other risks

Split-scope contracting introduces broader risks beyond integration.

Defects risk becomes more complex to identify, attribute and remediate, as issues arise at the interface between work packages. Questions of causation can become contested. Absent clear contractual mechanisms, owners may be left exposed to gaps in recourse and project participants may be drawn into protracted multi-party disputes.

To mitigate this, projects should adopt a structured defect attribution regime, often in the form of an agreed fault tree or similar framework, to govern the investigation and allocation of defects. This can be supported by clear obligations on all project participants to cooperate in root cause analysis, share relevant data, and implement coordinated remediation measures. Without these disciplines, defects resolution can quickly become inefficient and commercially disruptive, with consequential impacts for programme and performance.

A further tension arises in the treatment of warranties in a multi-contractor environment. Suppliers will typically seek to confine their warranty exposure to defects arising within their own scope, particularly where performance is contingent on third-party equipment, installation or integration. Conversely, owners will seek broader protections tied to system performance. Aligning these positions requires careful calibration of warranty regimes to reflect interface assumptions and dependencies, ensuring that risk is allocated to the parties best able to manage it without undermining the overall integrity of the project.

Final thoughts

The shift towards split-scope contracting in BESS projects fundamentally reshapes how risk is allocated and managed. In the absence of a single point of responsibility, there is an increased tendency for integration, commissioning and system-level risk to be pushed downstream.

Ultimately, successful project delivery in a split-scope model depends on disciplined interface management, clear allocation of responsibility and carefully calibrated contractual protections. Where these elements are addressed with sufficient consideration, the benefits of flexibility and cost efficiency can be realised without compromising deliverability. Where they are not, the model risks creating precisely the gaps and disputes it seeks to avoid.

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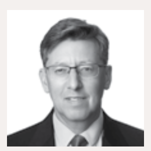

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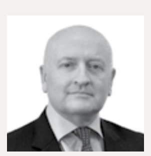

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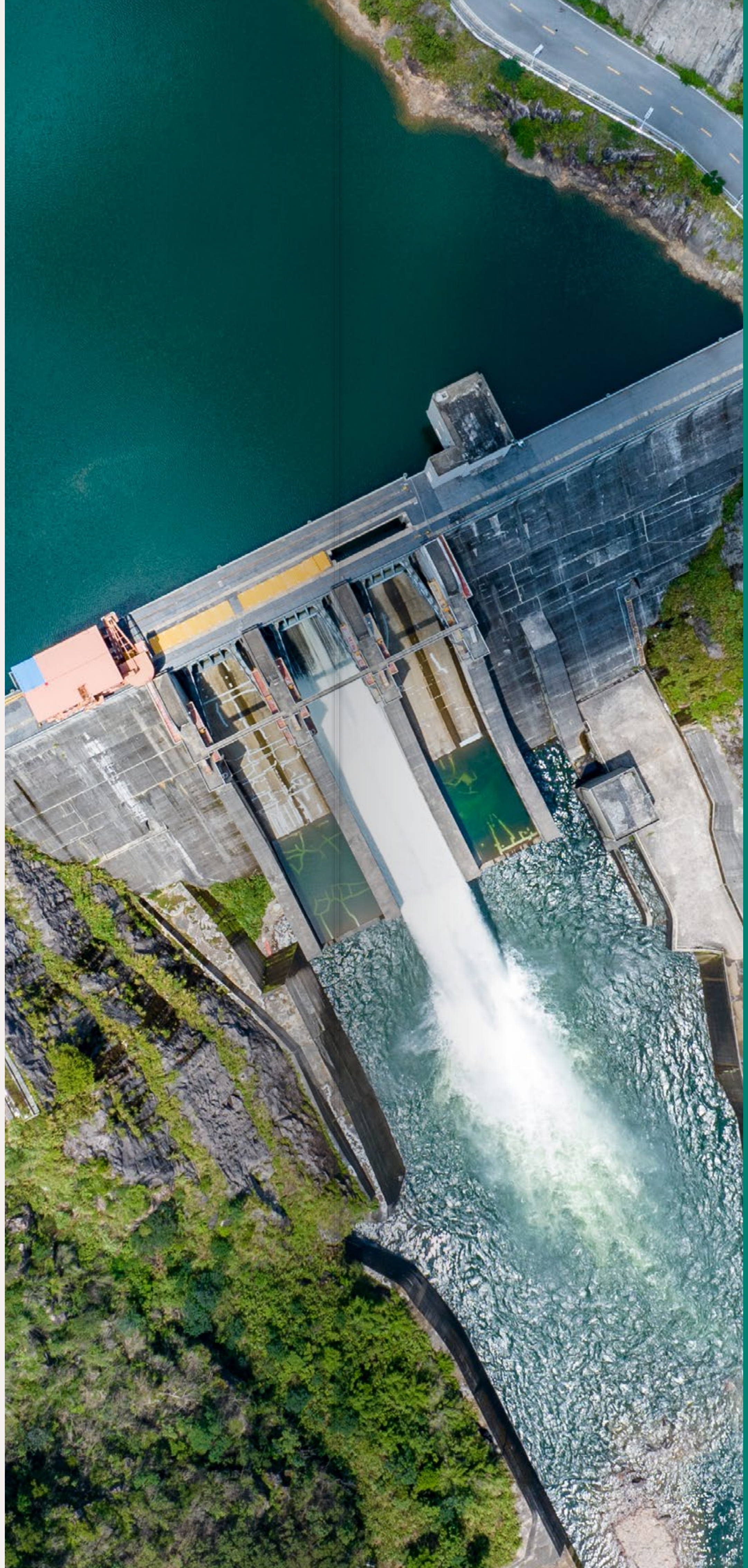

HFW Renewables Team

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.

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