

Legal Overview Report

Renewable Energy Hub

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Disclaimer

The views expressed herein are not necessarily the views of the Australian Government, and the Australian Government does not accept responsibility for any information or advice contained herein.

Glossary of Terms

AEMO	Australian Energy Market Operator
ARENA	Australian Renewable Energy Agency
Cap Contract	A cap contract provides electricity purchasers with insurance against high prices. The standard contract traded in the Australian market is a “\$300 cap”. The buyer pays a regular premium to the seller, and in exchange the seller of the cap is required to pay to the buyer the difference between the spot price and \$300/MWh every time the spot price exceeds \$300/MWh during the specified contract period.
DER	Distributed Energy Resources
Futures Contract (energy)	A futures contract is a legal agreement to buy or sell energy at a predetermined price at a specified time in the future.
Firming	Firming up supply means guaranteeing supply from other sources in the event of intermittency issues with solar and wind generation. Typical physical firming resources include battery or pumped hydro storage. Financial firming solutions include futures contracts and insurance products.
Hedge Contract (energy)	A hedge contract involves establishing a (contracted) position in the futures or options market that is equal and opposite to a position at risk in the physical energy market. It is intended to offset potential losses or gains that may be incurred by rising or falling energy prices.
Option Contract (energy)	An options contract offers the buyer the opportunity to buy or sell—depending on the type of contract they hold—the underlying energy. Unlike futures, the holder is not required to buy or sell the asset if they choose not to exercise their option.
Offtake Agreement	An offtake agreement is an arrangement between a producer and a buyer to purchase or sell portions of the producer's energy generation.
PPA	Power Purchase Agreement, is a physical energy offtake agreement, or financial replication of such, generally structured as a contract for difference and used by sellers and buyers to hedge energy price risk.
Pumped Hydro	A type of hydroelectric energy storage used by electric power systems for load balancing. The method stores energy in the form of gravitational potential energy of water, pumped from a lower elevation reservoir to a higher elevation
Swap Contract (energy)	A swap is an agreement whereby the floating spot (or market) price in a particular NEM region is exchanged, or ‘swapped’, for a fixed price, over a specified period(s) of time. If the spot price is above the agreed strike price the seller pays the buyer the difference. If the spot is lower than the strike then the buyer pays the seller the difference. Energy consumers and retailers utilise swaps in order to fix or lock in their energy costs, while energy generators utilise swaps in order to lock in or fix their revenues.
VRE	Variable Renewable Energy

Executive Summary

Report Overview

This report has been prepared by Renewable Energy Hub and global law firm White & Case. Our teams have prepared this report as part of the Australian Renewable Energy Agency's (ARENA) funding of Renewable Energy Hub to develop a new clean energy firming market to support the renewable energy transition by de-risking, and therefore lowering the cost of, selling and buying variable renewable generation.

The purpose of this Legal Overview report is to provide readers with guidance as to the legal arrangements for transacting in Renewable Energy Hub's hedge contracts. These hedge contracts are financial products that enable market participants to mitigate price and volume risk associated with variable renewable generation.

This report and its accompanying Term Sheet is intended to guide existing and prospective participants in renewable energy markets, from project developers, to energy retailers, to commercial and industrial end use customers. The intention is to achieve a degree of consensus around standardised terms for the sorts of hedge contracts required to firm up variable renewable generation, and to make these standardised terms readily available for renewable energy buyers and sellers. Through this process, we aim to achieve price transparency and liquidity in the markets for renewable energy.

The report summarises current legal conventions for trading electricity futures contracts including use of International Swaps and Derivatives Association (ISDA) documentation, standard trade confirmations provided by The Australian Financial Markets Association (AFMA) and bilateral or bespoke agreements.

We provide an introduction to how these documents function, critical terms and issues addressed including credit, liquidated damages and settlement. We also consider how these documents differ to long form Power Purchase Agreements (PPAs) which may be more familiar to renewable energy developers and investors.

Finally, in this report provides a short summary of a standardised term sheet developed by White & Case for use by market participants when negotiating transactions in the Renewable Energy Hub hedge contracts.

Project Summary

Renewable Energy Hub has commenced an 18-month project with support from the Australian Renewable Energy Agency (ARENA). The Project will work with market participants to develop specifications for a suite of innovative, standardised hedge contracts that are suited to both variable renewable energy (VRE) generators and new sources of clean dispatchable capacity (e.g. battery storage, pumped hydro storage and demand response), as well as the changing needs of energy retailers and large customers.

The Project also involves the development of a digital platform that will enable prospective counterparties to access live market pricing, assess the value of the new hedge contracts, evaluate the risks of different contract positions under a range of scenarios and provide a point of market access for new and emerging clean energy providers (the Project).

The intention is that these new standardised hedge contracts will complement PPAs backed by VRE to support the energy transition and decarbonisation. For this purpose, and to achieve the sorts of liquidity that has developed in markets for thermal generation, standardisation of trading arrangements and price transparency is essential.

Project Rationale

The rationale for this Project is as follows:

- The rapid transformation of the Australian electricity system towards higher penetration of VRE requires commensurate innovation in financial markets to enable market participants to manage the price and volume risk associated with VRE. These two components – the physical supply and financial risk management elements of the electricity system, must both evolve as the system transitions towards a renewable energy future.
- The current suite of products (swaps, caps and options) used in the financial market were designed several decades ago to accommodate established dispatchable generation (such as coal, gas, and hydro) and have not changed materially to accommodate the transforming supply/demand and price dynamics created by the rapid deployment of VRE such as wind and solar (both utility scale and behind the meter).
- Traditional hedge contracts allow electricity retailers and large electricity users manage price risk associated with the electricity volumes that they are required to buy at different times. Generators also rely on hedge contracts to manage risk of volatile wholesale electricity prices and smooth the revenue they earn from selling electricity output into the wholesale market. Such smooth and secure revenue flows are generally a precondition to project financing and, in this sense, traditional hedge contracts function to underpin the financing of generation projects.
- The electricity supply mix is changing due to rapid and sustained growth in VRE generation and this is changing the hedging needs of parties with electricity price exposure, requiring new hedge contracts for those parties to use to cover their exposure.
- At the same time, the traditional sellers of existing hedge contracts are progressively withdrawing from the market due to unfavourable economics associated with operating aging plant (in the case of coal generators), are exposed to volatile fuel prices that reduces their scope for economical operation (in the case of peaking gas generators) or are operationally constrained by environmental conditions such as drought (in the case of hydro plants) creating scarcity and high prices in the existing hedge market.

- Prospective new hedge contract sellers are emerging in the form of battery storage developers, pumped hydro operators, and demand response aggregators. These are unable to trade traditional format hedge contracts, which do not lend themselves to these short-duration assets (for example, current 'peak' swap contracts traded on the ASX cover the period from 7am to 10pm, while battery storage and demand response assets are typically restricted to 1-2 hours of output capability, and pumped hydro to 6 hours of output) and would therefore expose these agents to unmanageable price and volume risk.
- However, the new hedge contracts being developed by Renewable Energy Hub match the physical characteristics of battery storage, pumped hydro, and demand response, as well as providing the sort of complementary coverage required to match VRE such as solar and wind. In this way, the new hedge contracts are well suited to their target market of sellers and buyers with the intention of bolstering their standardisation and maximising their trading liquidity.
- Creating new standardised hedge contracts that are tailored to the physical characteristics of both VRE and clean dispatchable capacity assets, and which are developed in consultation with prospective counterparties, will ensure the development of liquid hedge contract markets for VRE, as well clean dispatchable technology such as battery storage. What is critical for many clean dispatchable energy developers is securing a revenue certainty by way of a foundational hedge contract, and liquid markets for new hedge contracts will make this attainable for more prospective developers, which will mean more clean dispatchable energy assets will proceed to development.
- On the buyers' side, new hedge contracts that more efficiently manage the risk and volatility of the changing supply/demand and price dynamics in the system will enable retailers (and by implication, their customers) to more cost effectively hedge the price of electricity in a system dominated by variable renewable generation.

Renewable Energy Hub Hedge Contracts

Three hedge contract products developed by Renewable Energy Hub, the Super Peak, Solar Shape, and Solar Inverse Shape are currently trading in the market, while a fourth, the Virtual Storage product, is being developed in consultation with prospective counterparties.

Super Peak

The 'Super Peak' swap contract targets intra-day and seasonal peaks offering a new hedging option for participants with exposure during emerging 'super peak' shoulder periods. This product seller is likely to be suited to dispatchable, peaking generators (e.g. hydro) and energy storage operators (e.g. pumped hydro and batteries). The natural buyers of the product are energy retailers looking to more efficiently cover high volatility periods of the day.

The contract covers the high demand hours of the morning and evening peaks when solar output is low. In summer months (Q1 & Q4) the contract covers from 15:00-19:30 and for winter months (Q2 & Q3) the contract covers 06:00 – 09:00 and 16:30 –

19:30. The product trades as one price for the summer evening peaks and for both the winter morning and evening peaks.

Super Peak settlement calculation per trading period for the buyer:

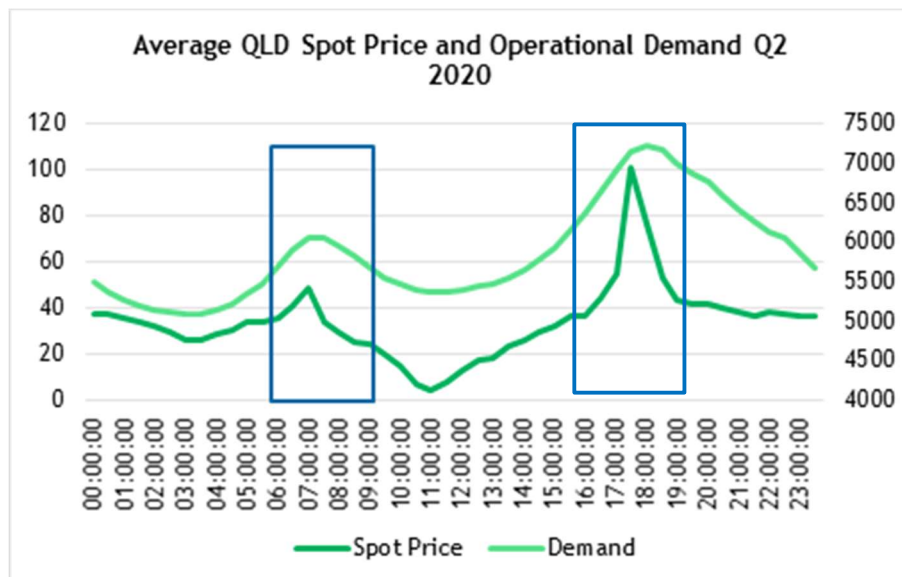
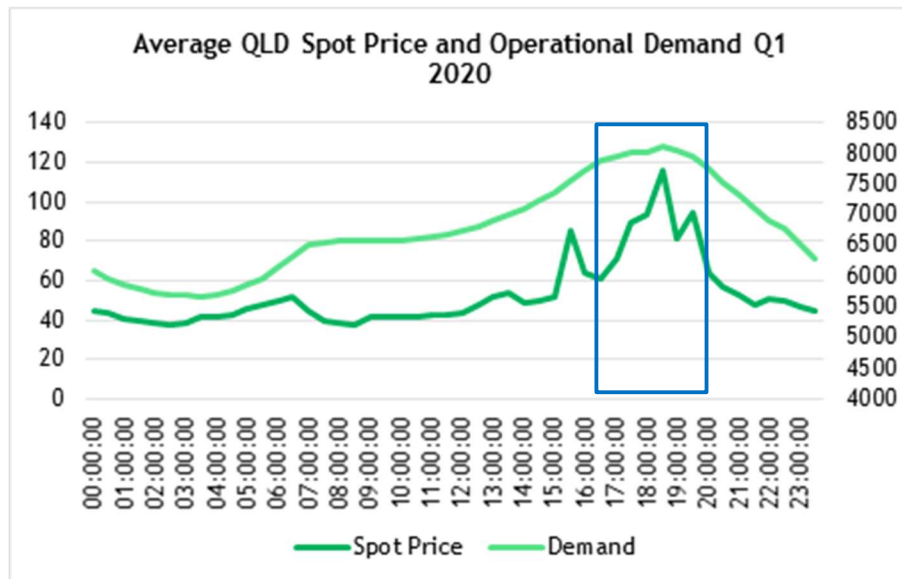
$$\text{Settlement} = X \text{ multiplied by } (\text{RRP} - \text{SP})$$

Where:

X = Contract Volume (MW)

RRP = Regional Reference Price (\$/MWh)

SP = Super Peak Contract Price (\$/MWh)



SUPER PEAK PRODUCT PROFILES: Q1 (Starting 15:00. Ending 19:30) and Q2 (Starting 06:00. Ending 09:00. Starting 16:30. Ending 19:30). Queensland demand and price data is from Q1 and Q2 2020.

Solar Shape

The Solar Shape Swap is a sculpted swap contract designed to reflect the profile of a solar farm at half hour intervals for the relevant contract period. It covers only those hours relevant to a generic solar generation profile, unlike a standard baseload or “flat” contract which cover buyers and sellers for a fixed MW volume, 24 hours/day.

While the peak volume of the contract is constant, the shape of the contract does change monthly to account for seasonal changes in irradiance. The profile is also consistent across all NEM Regions with this consistency facilitating improved liquidity.

Solar Shape Swap settlement calculation per trading period for the buyer:

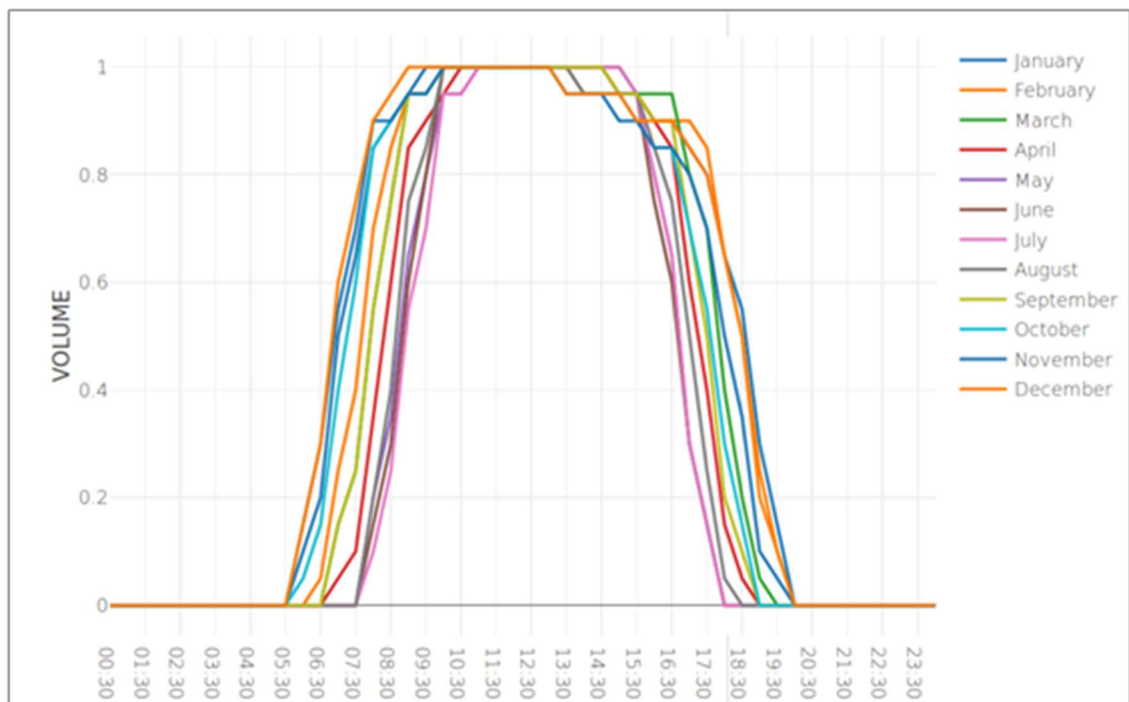
$$\text{Settlement} = X \text{ multiplied by } (\text{RRP} - \text{SS})$$

Where:

X = Contract Volume (MW)

RRP = Regional Reference Price (\$/MWh)

SS = Solar Shaped Swap Contract Price (\$/MWh)



RENEWABLE ENERGY HUB SOLAR SHAPE SWAP CONTRACT VOLUMETRIC PROFILES (1 MW peak profile across 48 half hour trading periods)

Inverse Solar Shape

The Inverse Solar (IS) Swap contract operates in inverse to the Solar Shape Swap product. It operates as a firming product representing the sum of energy required to make a Solar Shape Swap equivalent to a flat or base swap.

While the peak volume of the contract is constant, the shape of the contract does change on a monthly basis to account for seasonal changes in irradiance. The profile is also consistent across all NEM Regions with this consistency facilitating improved liquidity.

Inverse solar shape settlement calculation per trading period for the buyer:

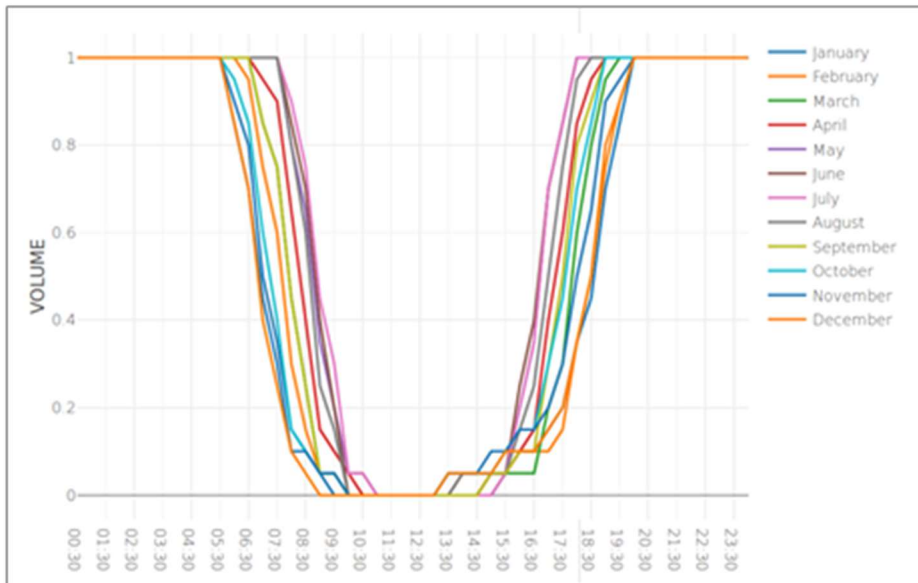
$$\text{Settlement} = X \text{ multiplied by } (\text{RRP} - \text{IS})$$

Where:

X = Contract Volume (MW)

RRP = Regional Reference Price (\$/MWh)

IS = Inverse Solar Swap Contract Price (\$/MWh)



RENEWABLE ENERGY HUB INVERSE SOLAR SWAP CONTRACT VOLUMETRIC PROFILES (1 MW peak profile across 48 half hour trading periods)

Virtual Storage

The aim of this hedge contract is to de-risk merchant energy arbitrage revenue and enable retailers to manage their long (e.g. overnight or middle of the day) and short (early evening) positions.

The buyer of the Virtual Storage product simultaneously sells a fixed MW block of low-priced energy 'charge' and buys a block of higher priced energy 'discharge'. This arbitrage value associated with these trades would then be settled against an agreed strike price, and so enable the buyer to lock in a nominated arbitrage value for their storage asset.

The Virtual Storage product could potentially be designed to suit long duration (8 hours), medium duration (4 hours), or short duration (2 hours) storage assets.

1. Trading Electricity Futures – Legal Conventions

ISDAs / AFMA documentation

The International Swaps and Derivatives Association ([ISDA](#)) is an international trade association that is committed to the development of a safe and efficient global derivatives market. Its membership includes market participants, including corporations, investment managers, government and multi-national entities, insurance companies, energy and commodities firms, and international banks. Most notably, ISDA has developed the ISDA Master Agreement, a standard form document which, together with its Schedule and a Confirmation, can be used by market participants to document a multitude of derivative transactions.

The ISDA Master Agreement is typically entered into by two "sophisticated" market participants intending to enter into one or more bilateral derivative transactions. While the standard ISDA Master Agreement sets out the base terms of the agreement, the parties are required to negotiate the terms of the Schedule which supplements the ISDA Master Agreement by addressing various matters that are specific to the parties.

After the parties execute an ISDA Master Agreement and Schedule, they can enter into one or more transactions governed by their terms. For each transaction, the parties need only prepare a Confirmation that sets out the economic terms of a particular transaction (e.g. price, commodity and trade date). The parties can also vary the terms of the ISDA Master Agreement and Schedule as they apply to a particular transaction by setting out alternate provisions in the Confirmation.

To document an electricity transaction under Australian law using the ISDA Master Agreement participants should:

- negotiate and execute a 2002 ISDA Master Agreement and Schedule. The Australian Financial Markets Association (**AFMA**) publishes a helpful guide for completing the schedule to an ISDA Master Agreement when the commodity is electricity and the parties wish for the law of an Australian state or territory to govern the contract. AFMA's guide recommends that certain clauses be included in the Schedule to an ISDA Master Agreement in order for the parties to pre-agree various issues which would otherwise need to be covered in each Confirmation. Pre-agreeing these issues results in much simpler Confirmations and reduces documentation risk for the parties; and
- attach the "June 2006 Australian Electricity Addendum", which is also published by AFMA, to the ISDA Master Agreement.

As noted above, the term sheet attached to this report can be documented using either a 2002 ISDA Master Agreement or bespoke documentation. If the parties choose to adopt the former, we recommend that they have regard to the market conventions developed by AFMA and, in particular, AFMA's recommended clauses for completing Part 5 of the Schedule to the ISDA Master Agreement.

When might a bespoke PPA agreement be used?

A bespoke PPA can be developed to document the transactions contemplated in the attached term sheet.

Typically, bespoke PPA documentation are used in electricity generation offtakes to allow for greater transparency, alignment or regulation of the operation of the Facility on the financial hedge. These aspects include:

- objective conditions included to defined commercial operation of the Facility and commencement of financial hedge;
- liquidated damages compensation for delays in achieving commencement date;
- minimum volume of guaranteed generation to be provided based on generation profile of Facility
- allocation of risk in relation to operational matters resulting in curtailment of Facility generation;
- allocation of risk in relation to energy market matters resulting in curtailment of Facility generation; and
- intermediary arrangements.

2. Comparison REH Energy Hedge Products to conventional renewable PPAs

Conventional PPA	REH Energy Hedge Products
Primary source of revenue and as such would have a longer tenor (typically 7 years plus).	Used to support or as risk mitigant for supply risk taken. As such, duration of hedge may be relatively short. REH products typically trade as quarterly, calendar year or financial year contracts, with liquidity supported out to three years.
Energy paid is based on volume of energy produced by Facility at its connection point.	Energy is based on a sculpted and pre-agreed energy profile. As such there is less volatility as the energy volume does not fluctuate with actual generation performance (thereby reducing risk of Facility non-performance or network constraints).
Product purchased may be combination of electricity and green products, electricity only or green products only.	Hedge is an electricity only transaction.
Change in law risk exposure in respect of Facility operation and generation and market disruption events.	No exposure to change in law relating to operational or generation matters. Exposure to market disruption events retained.
Generation volume is variable subject to a cap and collar. Liability arises where minimum generation level is not achieved.	Transaction is based on fixed volume by reference to an agreed curve. This fixed commitment is not impacted by actual performance of a generating asset.
Relates to energy generated by a single generating asset.	Can be used to hedge exposure for a single generating asset or on an energy portfolio basis.
Seller is generator of Facility.	Seller may be generator, retailer or energy manager.

3. White & Case / Renewable Energy Hub Term Sheet Summary

Key drivers for legal documentation development

The term sheet has been developed having regard to the following key considerations:

- **Encourage liquidity** by allowing for placement of multiple hedge contracts with ease whilst providing flexibility for key commercial terms to be varied;
- **Reduce cost** in minimising preparation through use of standard documents already familiar to energy participants; and
- **Minimise time** by providing a base framework of commercial terms and structure reflecting current market practice.

While the term sheet has been developed so that transactions can be accommodated through the use of ISDA documentation and issue of confirmations, the term sheet can also be documented as a bespoke hedge agreement. However, unlike a conventional bespoke PPA, if a bespoke approach is adopted, parties should consider the structure of an “umbrella bespoke PPA” agreement with a separate confirmation executed for each transaction.

Requirements for participation

Consideration should be given as to whether hedge counterparties require an Australian financial services licence (**AFSL**) to enter into an REH Energy Hedge Product. An AFSL may be required on the basis that the transactions contemplated by such products may fall within the broad definition of a ‘derivative’ under the *Corporations Act 2001* (Cth). If none of the exemptions under that legislation apply, then the counterparties will either need to obtain an AFSL or obtain the services of a third party who holds an AFSL to act as an intermediary.

Generators that wish to enter into REH Energy Hedge Products may also require other authorisations in order to sell electrical energy into the National Electricity Market and receive market revenue.

Summary of key components

Selection of Energy Hedge Product	Confirmation will identify the energy hedge product. The same base ISDA or bespoke framework agreement can be used with difference hedge products being selected by way of separate confirmation.
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Contract Volume sizing	<p>The volume to be traded for each energy hedge product will also be set out in the confirmation.</p> <p>As the contracted volume will be traded regardless of actual sent out generation, the appropriate volume agreed will depend on individual hedge requirements – whether it is to smooth out or manage energy generation portfolio risk or balance facility operational risk taken by a generator under its primary offtake.</p>
Term	<p>The energy hedge products have been structured for a minimum period of one quarter.</p>
Price	<p>A Fixed Price will be paid by the Buyer. The floating price paid by the Seller will be referenced to the regional reference price of the trading intervals for the period referenced for the relevant energy hedge product.</p>
Credit Support	<p>Depending on duration and value of hedge and identify of counterparties, each participant should consider if it would be appropriate to require credit support.</p>

Readers of this report wishing to obtain a copy of the term sheet can contact Renewable Energy Hub – hello@renewableenergyhub