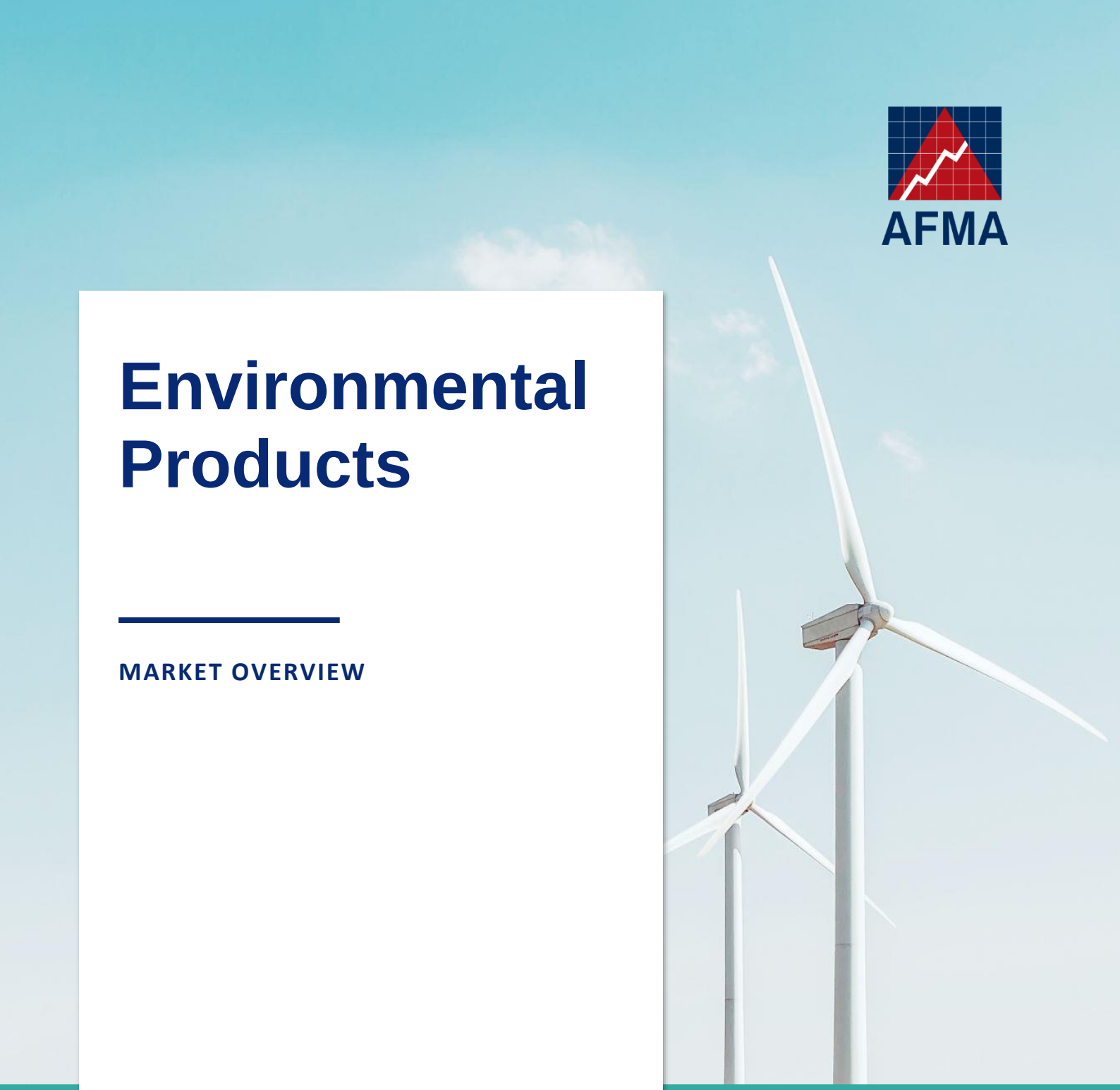


Environmental Products

MARKET OVERVIEW

JUNE 2021

Environmental Products

Overview

Environmental products are a form of commodity used to provide a market-based solution to environmental challenges. The market for environmental commodities is continually evolving as governments seek to reduce greenhouse gas emissions and incentivise cleaner sources of energy generation.

Both federal and state governments in Australia have introduced schemes through legislation designed to reduce greenhouse gas emissions (see Table 1). These schemes either incentivise the reduction of emissions, encourage renewable energy, or focus on energy efficiency.

Organisations and individuals who conduct eligible activities (such as building renewable energy infrastructure, installing energy efficient technology or carbon sequestration) can create certificates or credits under various state and federal legislative schemes which are either used to offset emissions or sold on the secondary market to interested buyers.

The main buyers in the environmental products markets are liable entities (largely energy retailers) who purchase environmental products to meet specified obligations under state and federal legislative schemes. Other buyside participants include those organisations or individuals seeking to purchase products to offset emissions on a voluntary basis.

Table 1: Summary of Australia's main environmental schemes

Scheme	Purpose	Scheme administrator	Certificate name	Certificate creators (supply)	Obligated entities (demand)
Emissions Reduction Fund (ERF)	Provide incentives to undertake eligible offset projects that reduce emissions	Clean Energy Regulator	Australian carbon credit units (ACCUs)	Successful project proponents in reverse auction	Liable entities under the safeguard mechanism; voluntary participants; federal government
Large Scale Renewable Energy Target (LRET)	Encourage new and additional generation of electricity from large scale renewable energy sources	Clean Energy Regulator	Large Scale Generation Certificates (LGCs)	Accredited renewable energy power station	Liable entities such as electricity retailers and wholesale end users
Small-scale Renewable Energy Scheme (SRES)	Encourage investment in small scale renewable technologies such as solar panels and solar water heaters	Clean Energy Regulator	Small Scale Technology Certificates (STCs)	Registered owners of solar water heaters and generating units, or those who have been assigned rights by owners.	As for LRET
Victorian Energy Upgrades Program (VEU)	Encourage efficient use of gas and electricity. Encourage investment, employment and technology development in associated industries.	Essential Services Commission (Victoria)	Victorian Energy Efficiency Certificates (VEECs)	Accredited persons – modifying, replacing, purchasing, installing equipment resulting in greater efficiency, reduced consumption or emissions reduction	Liable entities such as electricity or gas retailers
NSW Energy Savings Scheme (ESS)	Provides incentives to install, improve or replace energy savings equipment and appliances in NSW households and businesses.	NSW Independent Pricing and Regulatory Tribunal (IPART).	Energy Savings Certificates (ESCs)	Accredited Certificate Providers (ACPs) installing, improving or replacing energy savings equipment.	Liable entities such as electricity or gas retailers

Emissions Reduction Fund

Australia's Emissions Reduction Fund (ERF) and the related Carbon Farming Initiative (CFI) were set up under the *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth) (CFI Act) to allow a range of organisations and individuals to generate carbon credits through activities like carbon sequestration and abatement activities that offset emissions.

The ERF is administered by the Clean Energy Regulator, which looks after schemes legislated by the Australian Federal Government for measuring, managing, reducing or offsetting Australia's carbon emissions.[1]

A safeguard mechanism was established as part of the ERF in 2016, placing a legislative obligation on Australia's largest greenhouse gas emitters to avoid increases in Scope 1 emissions beyond business-as-usual levels. This means that facilities emitting more than 100, 000 tonnes of carbon dioxide equivalent per year have an obligation to keep net emissions below a baseline determined by the CER.[2] This is achieved through the reduction of emissions intensive activities or surrender of carbon credits.

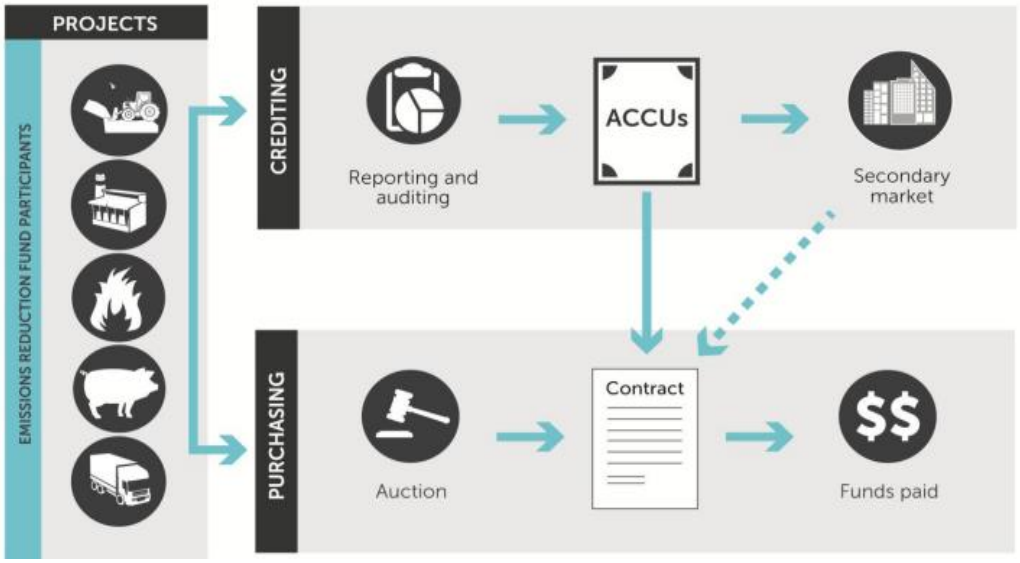
The CFI Act allows for tradeable 'credits' in relation to Australian Carbon Credit Units (ACCUs) and eligible international emissions units from Australian land-based actions that reduce or sequester carbon dioxide emissions, provided that they meet regulatory requirements. Carbon credit units traded include Kyoto ACCUs and Non-Kyoto ACCUs:[3]

- a Kyoto ACCU is an ACCU issued under the *CFI Act* that is also an eligible carbon credit unit under the *Clean Energy Act 2011* (Cth). Each Eligible ACCU represents one tonne of CO_2 equivalent net abatement (through emissions reductions or carbon sequestration) achieved by conducting eligible activities that meet the criteria of 'eligible offsets projects'.[4]
- Non-Kyoto ACCUs may be issued for non-Kyoto offsets projects, or eligible projects with a reporting period ending after the Kyoto abatement deadline (December 2020).

Participation in the ERF is through a voluntary reverse auction process. Those who undertake ERF projects can apply to the CER for ACCUs to certify their emission offsets. The ACCUs can then be sold to the CER (under a carbon abatement contract) or on the secondary market. Kyoto ACCUs can be sold on international markets and exchanged for internationally recognised Kyoto units, with Non-Kyoto ACCUs able to be purchased by individuals and companies wishing to offset the emissions they generate.

[1] CER, *What we do* <http://www.cleanenergyregulator.gov.au/About/What-we-do>
[2] Department of Industry, *Safeguard Mechanism* (2020) <https://www.industry.gov.au/regulations-and-standards/national-greenhouse-and-energy-reporting-scheme/safeguard-mechanism>
[3] CER, *Australian carbon credit units* (2020) <http://www.cleanenergyregulator.gov.au/OSR/ANREU/types-of-emissions-units/australian-carbon-credit-units>.
[4] As defined under the *CFI Act*, the *Carbon Credits (Carbon Farming Initiative) Regulations 2011* (CFI Regulations) and the *Carbon Credits (Carbon Farming Initiative) Rule* 2015 (CFI Rule).

Figure 1: Emissions Reduction Fund process



SOURCE: CER (2015)

CCUs are specified as financial products under the *Corporations Act 2001* (Cth)[5]. This means that those seeking to provide financial services in relation to CCUs must hold an Australian Financial Services Licence (AFSL).[6]

Emission Reduction Units

Under the *Australian National Registry of Emissions Units Act 2011* (ANREU Act 2011),[7] Certified Emission Reductions (CERs) are emission reductions issued for projects outside Australia in accordance with Kyoto rules.[8] Relevant projects are those registered under the Clean Development Mechanism (CDM), which provides for industrialised countries to carry out abatement activities in developing countries.[9] Projects earn CERs each equivalent to one tonne of CO_2, which is then counted towards meeting Kyoto targets of the industrialised country undertaking the project in the relevant abatement period.[10]

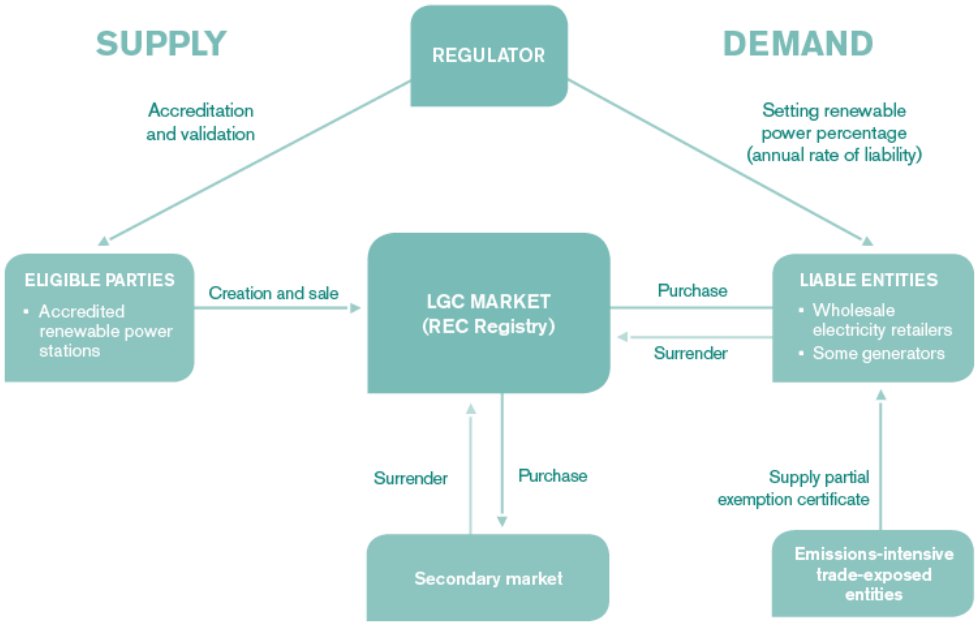
[5] Australian Securities and Investments Commission (ASIC), *ASICs role in carbon markets* (20 October 2014) <https://asic.gov.au/regulatory-resources/financial-services/carbon-markets/asics-role-in-carbon-markets/>.
[6] ASIC, *AFS licensing and the Carbon Farming Initiative: A fact sheet for advisers and project developers* (20 October 2014) <https://asic.gov.au/regulatory-resources/financial-services/carbon-markets/afs-licensing-and-the-carbon-farming-initiative-a-fact-sheet-for-advisers-and-project-developers/>.
[7] s4 *ANREU Act 2011*.
[8] CER, Certified Emission Reduction Units (17 September 2020) <http://www.cleanenergyregulator.gov.au/OSR/ANREU/types-of-emissions-units/certified-emission-reduction-units>
[9] Defined as countries that are non-Annex I Parties to the United Nations Framework Convention on Climate Change (UNFCCC) and Kyoto Protocol (developing country Parties).
[10] UNFCC, *The Clean Development Mechanism* <https://unfccc.int/process-and-meetings/the-kyoto-protocol/mechanisms-under-the-kyoto-protocol/the-clean-development-mechanism>.

Large-scale Renewable Energy Target

Created under the *Renewable Energy (Electricity) Act 2000* (Cth) (REC Act), the Large-scale Renewable Energy Target (LRET) is a scheme administered by the Clean Energy Regulator (CER).

To incentivise investment in renewable generation to achieve 33 000 gigawatt hours of additional renewable electricity generation per annum (until the scheme ends in 2030),[11] the LRET requires liable entities to annually surrender a number of Large-scale Generation Certificates (LGCs) in proportion to the electricity acquired by the entity in an assessment year.

Figure 2: Supply and demand in the LRET scheme



SOURCE: CER, Renewable Energy Certificate Market

Power stations accredited under the LRET create LGCs which can be used to meet an entity's own liabilities, sold to entities with liabilities under the LRET, or sold to organisations and individuals seeking to voluntarily offset their energy use and emissions. Certificates establish that units of electricity have been produced from renewable generation sources.[12] Entities that do not meet their liabilities are required to pay a shortfall charge (unless an exemption applies).

[11] Department of Industry, Science, Energy and Resources (Department of Industry), *Renewable Energy Target Scheme* (2020) <https://www.industry.gov.au/funding-and-incentives/renewable-energy-target-scheme>

[12] Clean Energy Regulator (CER), *How the scheme works* (31 May 2018) <http://www.cleanenergyregulator.gov.au/RET/About-the-Renewable-Energy-Target/How-the-scheme-works>

Greenpower LGCs

Greenpower LGCs or GRECS are LGCs created by a generator accredited under the National GreenPower Accreditation Program. Each certificate represents one megawatt-hour (MWh) of renewable electricity.

GreenPower is a joint initiative of ACT, NSW, SA, Vic and WA government agencies to provide a voluntary accreditation program for renewable energy.

Small-scale Renewable Energy Scheme

The Small-scale Renewable Energy Scheme (SRES) was established under the *REC Act* and is administered by the CER alongside the LRET.

The scheme incentivises individuals and small businesses to install eligible small-scale renewable energy systems (including solar panel systems, small-scale wind systems, small-scale hydro systems, solar water heaters and air source heat pumps) which generate Small-scale Technology Certificates or STCs. STCs represent the expected generation of the installed technology over the period from installation until 2030 (when the scheme is currently scheduled to end).[13]

Liable entities then purchase certificates from suppliers to surrender on a quarterly basis to the CER and meet their requirements under the SRES.

Victorian Energy Upgrades program

The Victorian Energy Upgrades (VEU) program was created under the *Victorian Energy Efficiency Target Act 2007* (VIC) (*VEET Act*). The VEU is administered by the Victorian Essential Services Commission, with the Victorian Department of the Environment, Land, Water and Planning (DELWP) responsible for the development of legislation and regulations.

Large energy retailers are required to surrender Victorian Energy Efficiency Certificates (VEECs) to meet annual targets. VEECs are created through the installation of specified energy efficient products or decommissioning of inefficient products, with the number of VEECs dependent on the energy savings of the activity undertaken (as specified in the relevant acts and regulations[14]). Each VEEC is equal to 1 tonne of CO_2-e abated by an eligible activity.

[13] CER, *Small-scale Renewable Energy Scheme* (31 May 2018) <http://www.cleanenergyregulator.gov.au/RET/About-the-Renewable-Energy-Target/How-the-scheme-works/Small-scale-Renewable-Energy-Scheme>

[14] Essential Services Commission, *VEU program legislation*, <https://www.esc.vic.gov.au/victorian-energy-upgrades-program/about-victorian-energy-upgrades-program/veu-program-legislation>.

NSW Energy Savings Scheme

The Energy Savings Scheme (ESS) was created under Part 9 of the *Electricity Supply Act 1995* (NSW)[15] and is administered by the NSW Independent Pricing and Regulatory Tribunal (IPART). The NSW Department of Planning, Industry and Environment (DPIE) is responsible for policymaking and development of the scheme regulations. Like the VEU program, the ESS places a mandatory obligation on certain entities to obtain and surrender energy savings certificates annually, which represent energy savings. Although the ESS targets are based on electricity sales (MWh), certificates are representative of 1 tonne of CO_2-e emissions abated through eligible energy savings activities.[16]

Historical schemes

GACs - Greenhouse Abatement Certificates (ceased 2012)

A GAC refers to a Greenhouse Abatement Certificate created either under Part 8A of the *Electricity Supply Act 1995 (NSW)* or the *Electricity (Greenhouse Gas Emissions) Act 2004* (ACT).

The NSW Greenhouse Gas Reduction Scheme and ACT Greenhouse Gas Abatement Scheme were introduced in 2005 to set annual targets for electricity and gas retailers to reduce their emissions. Both schemes were closed on 30 June 2012 following the introduction of the Commonwealth Carbon Trading Scheme (which was subsequently repealed in 2013).

GECs - Gas Electricity Certificates (ceased 2013)

GECs or Gas Electricity Certificates were created under Chapter 5A of the *Electricity Act 1994* (QLD).The Queensland Gas Scheme was introduced in 2005 to promote gas fired electricity generation (which accounted for 2% of QLD power generation at the time). Under the scheme, accredited gas-fired generators could create GECs for each MWh of eligible gas-fired electricity produced. The scheme was repealed in 2013 (at which point gas made up 20% of QLD power generation).

More information on Australian environmental schemes

- The CER produces a quarterly Carbon Market Report providing information and data on trading activity for LGCs, STCs and ACCUs.
- Further detail on ACCUs is available from the CER here.
- Information on GRECs is available on the Greenpower website.
- Information on VEECs is available from the Victorian Energy Upgrades page on the Essential Services Commission website.
- Updates and information on ESCs are provided on the ESS site run by the NSW IPART.

[15] Independent Pricing and Regulatory Tribunal New South Wales (IPART), *Legislation & ESS Performance* <https://www.ess.nsw.gov.au/Home/About-ESS/Legislation-ESS-Performance>.
[16] IPART, *Overview of the ESS* <https://www.ess.nsw.gov.au/Home/About-ESS/Overview-of-the-ESS>

How environmental markets work

Creating supply and demand

Broadly speaking, environmental schemes use market structures to achieve their environmental and political objectives. The legislation applicable to each scheme specifies how entities (known as eligible parties or accredited providers) can become eligible to create an environmental product that is evidenced by an electronic certificate, establishing a supply of environmental products. The environmental products then become a valuable, storable commodity (limited only by the life of the certificate).

The legislation also requires certain entities to "surrender" a quantity of the environmental products in order to conduct a particular business activity such as retailing electricity. The specific quantity depends on the extent to which an entity conducts electricity retailing activities in a particular jurisdiction (where a scheme is in place).

The value of each environmental product type is then determined by demand and supply through trading between various parties. Demand is enforced by civil penalties for entities that fail to surrender sufficient environmental products to acquit their obligations.

Certificate creation, transfer and surrender

When environmental targets are met by an entity it receives a numbered electronic certificate, which provides evidence of the environmental product. Ownership is tracked by the scheme administrator's registry system. The certificate creates an identifiable commodity of value that can be traded. Certificates in environmental products can only be created by accredited providers.

If the ownership of certificate changes between entities as the result of an environmental product transaction or from other corporate activities, the transfer is registered by the relevant scheme administrator.

Electricity retailers and end-use customers who buy electricity direct from the wholesale market in a jurisdiction with a particular environmental scheme must surrender certificates to satisfy obligations under the applicable legislation. These surrendered certificates, which must be registered in the name of the obligated entity, can be obtained from an accredited provider (who creates the certificates), or purchased in the secondary market. Shortfall charges for each certificate that a liable party fails to surrender to acquit their obligations create an incentive for compliance.

Environmental scheme participants

Electricity generators

Generators that use appropriate fuel types and/or reduce carbon emissions when producing electricity are the major suppliers of certificates under the Large-scale Renewable Energy Target (LRET)scheme. Generators that produce electricity from renewable sources such as wind, hydro, biomass and photovoltaic can all create large-scale generation certificates (LGCs). To create a certificate, a generator must first have each generation asset accredited to establish that the output of that station meets the requirements specified by legislation plus, where applicable, a base line.

Although the majority of environmental obligations are imposed upon retailers, generators also accrue obligations to acquit environmental products if their other activities contribute to carbon emissions, such as using auxiliary power imported from the network.

Generators may also become liable to acquit environmental products where they sell electricity direct to an end user (i.e. where the end user is not registered under the National Electricity Rules), becoming the notional wholesaler and liable party under the relevant legislation.

Aggregators and installers

Large water heater manufacturers and installers have become significant participants in environmental product markets.

The role for aggregators (agents) has also grown rapidly with the expansion of the various environmental schemes. Many sellers and installers of solar water heaters and small generation units opt to use aggregators to avoid the overheads associated with registering and trading certificates themselves.

Electricity retailers

Australia's environmental schemes impose an obligation on retailers to surrender certificates to acquit their legislated environmental liability. As natural buyers of environmental products, retailers form the largest part of the demand-side in the market.

The liability that a retailer accrues under each environmental scheme depends on the state(s) in which it sells electricity to end users and the size of its retail load in that state.

End users

End users purchasing electricity direct from the National Electricity Market (i.e. not using a retailer or generator as an intermediary) can become directly liable under various environmental schemes.

Although the liability to acquit environmental products (along with the administrative and risk management activities) largely falls on electricity retailers, it is the end user of electricity in Australia that actually pays the cost of environmental schemes. This is because retailers generally pass on the cost of environmental products to end users in order to maintain profit margins.

Brokers and intermediaries

Brokers also play an important role in facilitating the development of the environmental markets by providing improved price transparency and bringing buyers and sellers together. Intermediaries have not been as active in the Australian environmental markets as they have been in electricity and other commodity markets. This has been largely due to the relatively low trading volumes and price volatility, fragmented nature of the market, high administrative costs and regulatory risks involved.

Risks in environmental markets

The risks in environmental markets are correlated with those in the electricity market (although unlike electricity, certificates are able to be stored for extended periods of time). One of the key risks to environmental markets is regulatory risk as legislative changes can have substantial impacts for scheme participants.

The risk perspectives of the two main market participants in the Large-Scale Renewable Target (LRET), eligible electricity generators and liable retailers, are described below. For the other schemes, the liable retailer risk is similar to that of the LRET.

In focus: risks for LRET participants

Eligible generators (supply-side)

Generators may have reduced profit margins if the price of the environmental products it is eligible to create falls. Many generation projects (such as wind farms and large-scale solar projects) are not feasible unless a revenue stream can be earned from the environmental products they create. This is particularly so for renewable energy generation schemes. Many generators prefer long-term

Liable retailers (demand-side)

Retailers, on the other hand, face the risk of lost retail margins if the prices of environmental products for which they have surrender obligations rise.

Most retailers have considerable uncertainty about the volume of environmental products

hedge arrangements for environmental products to obtain financial close on prospective projects and assist profitability.

Generators with shorter-term sales arrangements for their environmental products must manage the risks of more variable short-run marginal costs (net of environmental products) and uncertainty about the capacity at which the generation plant will run. This has implications for electricity trading and risk management strategies.

In general, most energy companies in Australia do not have a diverse range of generators that are eligible to create environmental products. This creates uncertainty about the volume of environmental products they will be eligible to produce each year. Therefore, a high proportion of environmental products are sold under spot and short-term contracts or whole-of-meter agreements, which mitigates supply uncertainty.

they will need to surrender, which remains throughout the liability period (i.e. calendar year). As a result, annual acquittal dates are more than a month after the liability period to allow final meter data and consequent environmental product liabilities to be determined, and environmental product acquisitions settled.

Retailers must also manage the risk of failing to surrender sufficient certificates and the possible adverse publicity associated with incurring civil penalties.

Both supply and demand side participants in environmental products markets must manage market risk, credit risk and regulatory risk.

Market risk

The market, or price, risk associated with environmental products is the main risk managed by market participants. Like all commodity markets, supply and demand are the main drivers of spot and forward prices.

Demand for environmental products is created by legislation linked to electricity consumption. However, the drivers behind electricity consumption are varied.

On the supply side for renewable energy schemes, supply of environmental products largely correlates with renewable electricity generation and is affected by various factors, including drought and snow levels. For the small-scale scheme and the state-based energy efficiency schemes, supply will be affected by cost and small user preference for installing renewable energy or energy saving devices.

As environmental products are a storable commodity, at least for a legislated period of time, supply (and price) is influenced by the extent to which environmental products are stored (i.e. withheld from supply) or even to the extent to which eligible generators are willing to let environmental products expire. Legislative factors that influence supply include limits on the period between generation and creation, as well as limits on the length of time that created certificates remain valid.

Credit risk

The nature of credit risk and methods for determining the size of credit exposures to a specific counterparty are broadly similar to the electricity market, although the diversity of environmental products market participants means that different considerations need to be weighed when entering into contracts.

Many environmental products are created by small-to-medium sized businesses in generation, sequestration or aggregation that do not have the same credit standing as larger national electricity generators, retailers and financial intermediaries.

Methods used to manage the issue of credit and higher perceived probability of default of some participants in environmental markets include diversification of counterparty risk through transacting with a range of parties and embedding terms and conditions into contracts that protect the stronger credit (such as delivery prior to payment).

Regulatory risk

Regulatory risk is a major issue in environmental markets. It is legislation alone that creates demand for, and supply of environmental products. This risk is even more pronounced in Australia due to the number and variety of environmental schemes, the overlapping of state and federal government regulation and the changing political drivers behind the schemes.

While there is some commonality between regulations and processes across schemes, there are some fundamental differences that impose significant administrative costs and operational risks on market participants.

Changes in legislation can alter the supply/demand dynamic. For example, legislation can change which increases targets for liable entities or alters the rules for eligible projects for accreditation and certificate creation.

Environmental product transactions

The three main types of transactions that are used to manage risk in the environmental markets are spot transactions, forward transactions or options. Other risk management strategies employed by participants can incorporate whole-of-meter hedges or bundled hedges.

Spot Contract

Environmental products can be bought and sold via a spot contract, which is a simple contract for a physical exchange of a specified commodity, quantity, and price. Typically, products are delivered on the same day as the trade is negotiated, or at the latest within three business days. An environmental products spot contract template is available from the AFMA website.

Forwards and Options

AFMA maintains an Environmental Products Addendum as part of the OTC Guide to assist market participants to contract for the sale or purchase of environmental commodities on a forward basis. The Addendum is to be used in conjunction with an ISDA® Master Agreement.

Forward contracts are used by eligible generators and retailers to manage their medium to long-term exposure to environmental product price risk. One reason for entering into forwards is to manage revenue and cost certainty and help maintain gross margins. It also provides large-scale project developers with a guaranteed revenue stream, which can assist them in obtaining project finance.

Most environmental product options traded are options with respect to a forward transaction of an environmental product (similar to swaptions in the electricity market). The buyer pays a premium upfront to acquire the right, but not the obligation, to buy (call option) or sell (put option) a quantity of the instrument at a predetermined price (the ‘strike price’).

Risk management strategies

Eligible generators face uncertainty about the volume of energy created (and hence the volume of renewable energy certificates) and a significant lack of certainty about the future revenue stream. Consequently, they can employ certain risk management strategies such as whole-of-meter hedges and bundled hedges.

The whole-of-meter hedge transaction is usually an arrangement where a generator sells all of the environmental products eligible to be created from the metered electricity generation of a

nominated generation unit or units. This type of transaction helps the generator to manage its volume risk while having price certainty for its environmental product revenue stream. Bundled hedges are a form of whole-of-meter hedge where the buyer agrees to take all electricity and environmental product output from a nominated generation unit or units. Bundled hedges are particularly attractive to marginal 'green' projects like wind farms, where the uncertainty of quantity of generation makes it hard to hedge via the firm-volume standard financial market products.

Retailers face uncertainty about the volume of their environmental product liability, and reputational risk if they fail to meet environmental obligations. In general, they attempt to develop a diverse portfolio of direct ownership in 'green' assets, long-term whole-of-meter hedges and short-term hedging to manage the need for long-term certainty of supply, while managing the variable nature of their customers' usage.