

Newsletter

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About Rural Funds Management

Rural Funds Management Limited (RFM) is one of the oldest and most experienced agricultural fund managers in Australia. RFM has a 25-year history and operates from a head office in Canberra, and offices in Sydney and Queensland. The company employs more than 150 staff in fund and asset management activities.

Established in 1997, RFM manages approximately \$1.8b of agricultural assets. This includes two investment funds for which RFM is the responsible entity. Assets are located across New South Wales, Queensland, South Australia, Western Australia and Victoria.

The Rural Funds Group (RFF) is RFM's largest fund under management. RFF is an ASX-listed real estate investment trust and owns a \$1.3b portfolio of diversified agricultural assets including almond and macadamia orchards, premium vineyards, water entitlements, cattle and cropping assets.

Scan the QR code to learn more.



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Image: Almonds collected at harvest, Kerarbury, Riverina NSW, April 2022.

Inflation, land values and the Rural Funds Group

David Bryant, Managing Director

The Australian Bureau of Statistics recently announced that Australia's inflation rate for the 12 months to the end of March 2022 was 5.1%, the highest rate since the introduction of the Goods and Services Tax in 2000. In the US, inflation for the same period rose 8.5%. Consequently, it is now widely accepted that inflationary forces are not transitory, and the global economy has entered a period of rising prices.

In response to these very high price increases it is expected that central banks will increase interest rates until inflation is brought down. Investors are now examining their portfolios to understand how these two economic forces (increasing prices and increasing interest rates) will

impact their investments. This article will examine how these two forces may impact the Rural Funds Group (ASX: RFF) and the 18,000 investors who hold this investment in their portfolios.

Rising prices

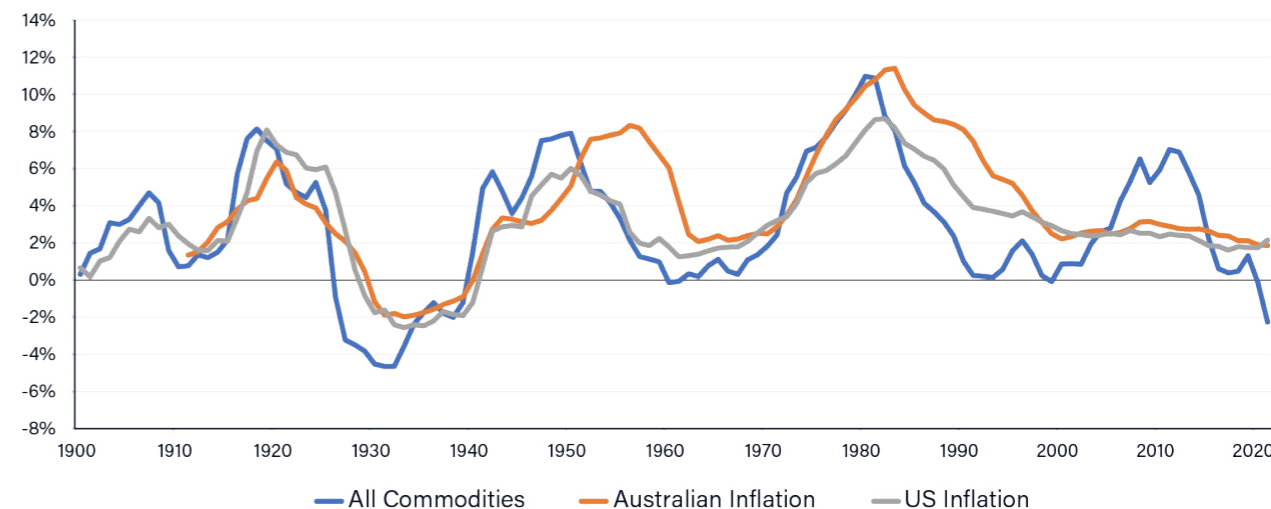
To gain an understanding of how inflation will impact the performance of agricultural assets, it is useful to look at the history of previous inflationary periods. Although history cannot be used to predict the future, it will at least provide a feel for the likely duration and amplitude of what might happen.

Figure 1 presents data from the past 120 years, by plotting the movement

in US commodity prices and inflation for both the US and Australia. The data is presented by plotting the data over rolling ten-year periods to smooth annual volatility and make distinct periods more discernible. During the period, both the US and Australia, and for that matter all developed economies, experienced three very similar periods of high inflation, with what may be a fourth period occurring now. Notably, during the three earlier periods, commodity prices followed the same course as inflation, which is unsurprising, since inflation indices are in a large part the measure of the change in the price of goods which are manufactured from commodities.

Understanding the history of what

US All Commodities prices, Australian Inflation and US Inflation rates¹



drove these periods of high inflation is useful because we can then consider if any of these factors are present now. Furthermore, understanding how these factors were managed, may provide some guide as to what measures will be taken to slow the current rate of increasing prices.

The first wave of rising prices occurred from 1897 to 1920 and was a consequence of the industrialisation of western economies. New technologies such as electrical power stations, telephones and cars were rapidly deployed, creating new jobs in manufacturing and a mass migration of poor rural workers to the cities, in a great wave of urbanisation. Prices then rocketed with the outbreak of World War 1, with the disruption of food production in the battlefields of Europe and the increased demand for food and weapons.

When peace finally came in 1918, European food production began to recover. Demobilisation created high levels of unemployment, so that by 1920, the global economy entered a period of declining commodity prices, low wages growth and consequently lower rates of inflation. A significant contributing factor to this turning point was a change in direction of US monetary policy with accommodative war time interest rates of 4% increasing to 7% between December

1919 and June 1920.

The second wave of rising prices from 1933 to 1951, began with another change in monetary policy when as a consequence of the Great Depression (1929-1933), countries elected to leave the gold standard so they could pursue expansionary monetary policies. Among the first to leave were Australia and Canada in December 1929, then in 1933, the US, by far the world's largest holder of gold, raised its conversion price of gold from USD20.67 to USD35.00 per ounce, which effectively increased that country's stock of money.

From that point on, world economies began to recover, with demand and consequently prices rising once more until the outbreak of World War 2 in 1939. Demand for commodities once again soared as US government spending expanded from 10% of GDP in 1940 to 46% by 1943, then held at 40% for the following two years. Post war, high rates of government spending continued, while interest

rates were kept low due to pressure brought to bear on the US Federal Reserve, by the US Treasury.

The turning point for this period of high inflation, came in 1951 when there were major changes to monetary policy. In March 1951, the US Treasury-Federal Reserve Accord was announced, to define and separate the roles the US Treasury and the Fed. Three weeks later the President announced a new Fed Chairman, and the tightening of monetary policy began.

The third wave of rising prices occurred during the period 1968 to 1981 and was initially caused by debt funded spending by a government reluctant to raise taxes to fund the unpopular Vietnam War. During the ten years to 1975, US government debt doubled, which increased the supply of money. In 1971, confidence in the US dollar was eroding and in response to this, President Nixon abandoned the Bretton Woods agreement which enabled

Inflationary forces are not transitory, and the global economy has entered a period of rising prices.

convertibility of US dollars into gold. This effectively floated the US currency and caused a depreciation against other major currencies.

This chain of events was followed by a decision by major oil producers through OPEC, to price oil off the value of gold, sending US dollar oil prices higher. Then in 1973, Arab oil producers embargoed supplies of oil to the US and other Western nations due to their support for Israel during the Yom Kippur War. This sequence of events caused oil to rise from USD3.00 per barrel in 1972 to USD37.00 by 1980. This caused US inflation to average 9.4% per annum from 1974 to 1981.

Once again, a change in monetary policy following the appointment of Paul Volcker as chairman of the US Federal Reserve, creating the next turning point. Volcker immediately set about tightening money supply and increasing interest rates, with the federal funds rate rising from 11% in 1979 to 20% in June 1981.

There are some common themes among these three inflationary periods that may have some similarities with the current period of rising prices. In the first two waves, robust demand from growing economies was then super charged by war-spending funded

by government debt that increased money supply. In the third wave, war came first and a trade war second. In all cases, the actions taken by government treasuries and central banks initially fed rising prices. Then, with changes of policy direction, through tightening of the supply of money, inflation was reined in.

In more recent times, governments and their central banks intervened to support economic activity in response to the global financial crisis which began in 2007.

Accommodative monetary policy continued for many years following the crisis. Then this was followed by the response to the COVID-19 pandemic, which has increased the stock of money in the global economy by trillions of dollars. With these actions supporting demand, interruptions in supply chains have caused shortages across many sectors. This has resulted in an increase in the price of commodities and the goods manufactured from them. These increases are now being recorded and reported in inflation statistics.

Rising land values

Having gained an understanding of the factors driving inflation, it is now time to consider the implications

of these cycles on agricultural land values. Figure 2 once again presents the long-term movement in commodity prices, a basket of basic goods that includes sub-categories such as energy, metals and agricultural commodities. Agricultural commodities are separately presented to demonstrate the high correlation that exists between agriculture and the broader commodities index.

Figure 3 represents agricultural commodity price movements alongside the change in value of US and Australian farmland. As can be seen, the rate of change in farm values closely follows the waves in agricultural commodity prices, which is to be expected, given farm profits are largely determined by the price that producers are paid for the commodities they grow. While the available Australian data is shorter term, the correlation with commodity prices is still apparent.

It should be noted that lines that describe farmland and commodity price movements are not the outright price, but instead the percentage change in price. In the chart, it is evident that US farm values experienced two periods of outright price decline with the first and most severe spanning the period 1920 to 1933. Throughout the balance

Figure 2: US Energy and Metals Commodities and US Agricultural Commodities prices²

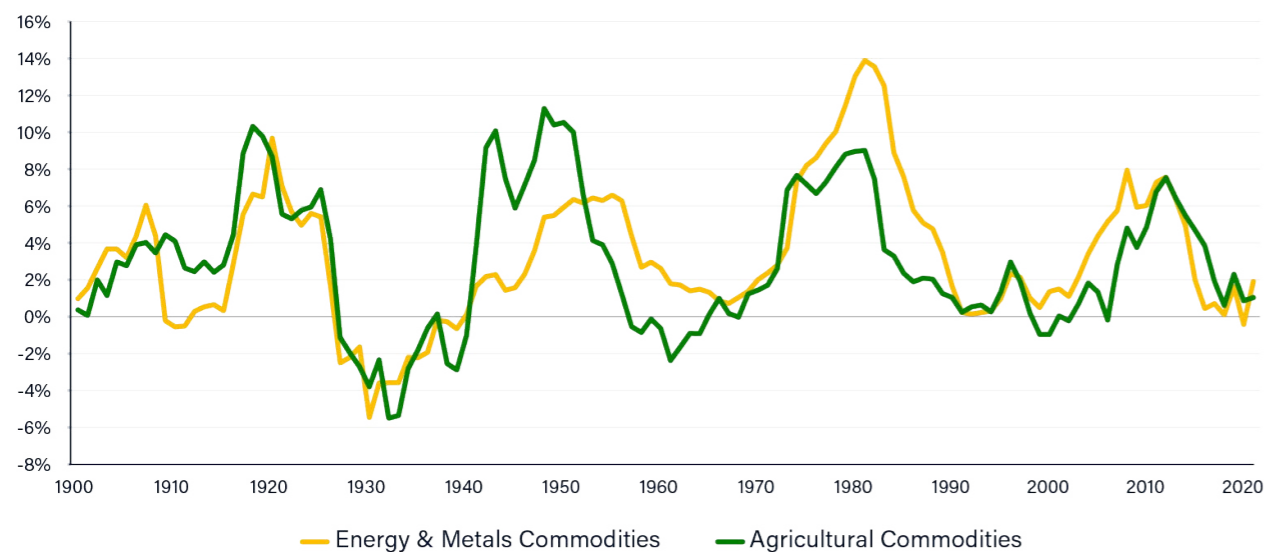
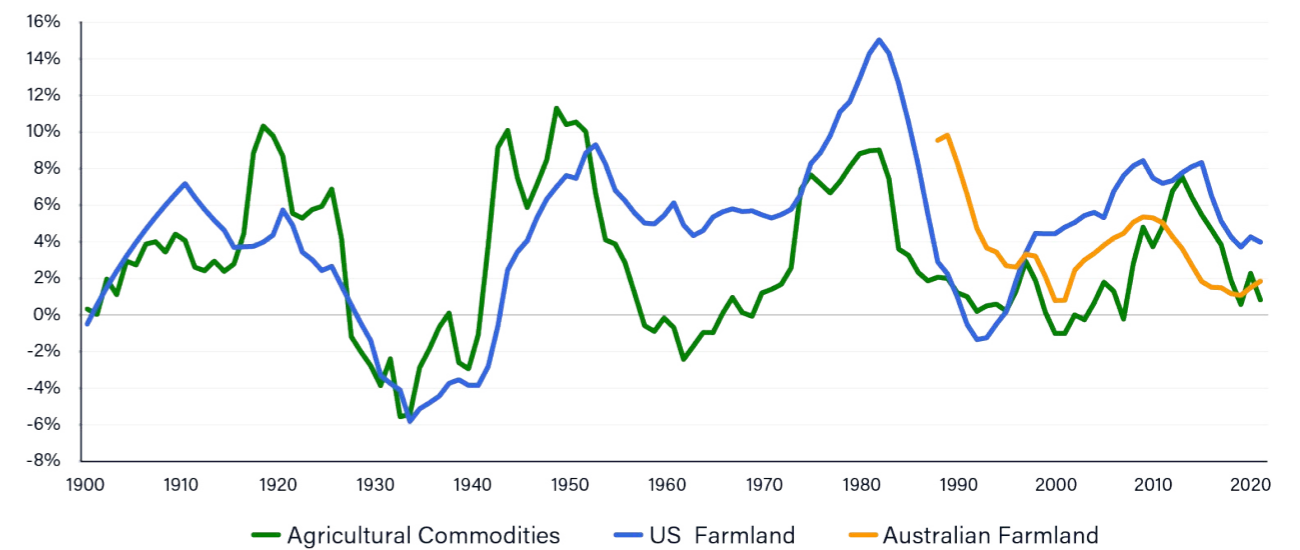


Figure 3: US Agricultural Commodities, US Farmland prices and Australian Farmland³



of this 120-year period, farm values have experienced periods of modest gains and periods of high growth that generally coincide with periods of increasing commodity prices.

One curious period in Figure 3 is from 1951 to 1968, when outright agricultural commodity prices declined by 12.5%, but farm values increased by approximately 140%. This can be explained by the productivity gains achieved by American farmers as they mechanised their operations, applied new synthetic fertilisers and grew better plant varieties. During the 1950s the number of hired workers on American farms declined by 30%, while tractor sales reached 600,000 per year, and land previously used to feed the horses that powered farm operations was turned over to producing higher volumes of grain.

Crop yields also rose, with wheat yields in tonnes per hectare for the US increasing from 1.1 to 1.9, corn yields increased from 2.3 to 5.0 and soybeans from 1.4 to 1.8 tonnes per ha. It is productivity gains such as these, that sustain capital growth in agricultural land values over a full inflationary cycle.

In the past decade agricultural commodity prices have been rising and farm values as well. In Australia, farm values rose at a modest pace

in the decade following the Global Financial Crisis, while over the past two years values have probably increased between 20% to 50%. Higher gains have occurred in the grazing and cropping industries where conditions have been particularly favourable. Liquidity has also been a significant factor in driving recent gains, with better access to finance for working capital and the weight of funds from foreign investors particularly from North America.

The Rural Funds Group

The Rural Funds Group (ASX: RFF), buys farms generally using bank debt equal to 35% of the farms value, because debt is cheaper than equity. In fact, debt has been very cheap recently, with variable interest for farm loans costing around 1.56%.⁴ However, it now appears that interest rates are rising and this will impact the net profits of the fund. RFF has, however, hedged or effectively fixed 42% of its term debt⁵, which means that a 1% increase in interest rates based on current debt⁵, would increase interest expenses by \$2.53m per annum.⁶

This increased cost can, however, be offset by the increase in rental income from the assets that are leased.

As an investor in agricultural land and water entitlements, RFF has been a beneficiary of the recent favourable price movements. Over the past five years, RFF's vineyard values have increased by 47%⁷, although this sector is currently challenged by very high tariffs now imposed in the once fast-growing Chinese market. Almond prices have declined in the last seven years due to large crops produced by the dominant US industry. Despite this, the fund's almond orchards values have increased 22% over the period.⁷ The value of RFF's cropping assets has increased by 15% and cattle assets by 98%.⁷ Water licence values have also increased during the period by 91%.⁷

Increased assets values are a handy thing for RFF, since they increase the net assets of the fund and therefore the amount of equity held by the fund to finance its investment activities.

Over time increasing asset values and inflation also transmit to the amount of cash income generated by the fund from rents because of the rental indexation mechanisms contained in the agreements RFF has with its lessees. Of the leases 44% are indexed to CPI and 34% have fixed annual increases, but with a review to the market value of the farm every five years.⁸ In total, 82% of RFF's leases provide rental



Image: Macadamia orchard developments, Riverton, central Queensland, December 2021.

indexation that occurs as a result of land value changes or inflation.⁸ Importantly, a period of rising commodity prices is of great benefit to RFF's lessees as they generate higher profits from the commodities that they produce.

Conclusion

Having considered the history of previous inflationary cycles and the actions taken by government and central banks, it is apparent that the national economies of the world recently experienced, and indeed created, very similar inflationary conditions. It is also now evident

that central banks at the very least, have now begun the necessary task of reducing inflation, by increasing interest rates.

Agricultural commodity prices have typically risen during periods of inflation, then declined during periods of rising interest rates. Concurrently, farm values have risen during periods of inflation and experienced generally brief periods of price declines as interest rates have risen. For this reason, as we enter the end phase of this inflationary cycle, it is probable that farm values will not increase as they have most recently done so. In our view, RFF's

values will most probably not decline either, due to ongoing productivity gains.

Over the next few years RFF will likely experience higher interest rates on its debt, while accruing increased rents from higher inflation and recently increased land values. Longer term, RFF will need to continue to identify and develop productivity gains across its portfolio of assets, so that increased profits can be shared between landlord and lessee. History shows us that cycles are unavoidable, but progress through productivity is possible.

Notes

1. Graph shows the ten-year moving average of percentage change. US All Commodities includes US energy, metals and agricultural commodities. Source Federal Reserve Economic Data (FRED) St. Louis Fed (stlouisfed.org) and Australian Bureau of Statistics (ABS).
2. Graph shows the ten-year moving average of percentage price change. Source Federal Reserve Economic Data (FRED) St. Louis Fed (stlouisfed.org).
3. Graph shows the ten-year moving average of percentage price change. Source Federal Reserve Economic Data (FRED) St. Louis Fed (stlouisfed.org) and the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES).
4. Based on an estimate of RFF's forecast unhedged cost of debt for FY22.
5. RFF's term debt as at 31 December 2021.
6. Calculated based on an assumed increase in interest rates by 1% on the unhedged term debt balance at 31 December 2021.
7. Percentage increases subject to rounding and are calculated only on assets in each agricultural sector which were owned (and mature in the case of almond orchards) on 31 December 2016 through to 31 December 2021. The increase in values are calculated as the percentage movement between 2016 and 2021 encumbered valuations adjusting for capex. Water license values relate to assets not included in property leases.
8. Percentage increases subject to rounding and based on FY22f revenue by lessee type, as per RFF HY22 financial results.

Image: A split almond hull revealing the almond shell, Kerarbury, Riverina NSW, April 2022.



Scan to watch a video of the 2022 almond harvest at Rural Funds Group (ASX: RFF) owned orchard, Kerarbury, Riverina, NSW.





Sustainability in the spotlight

James Powell, General Manager – Investor Relations & Marketing

Image: Kerarbury almond orchard, Riverina NSW, April 2022.

Undoubtedly, one of the greatest societal shifts of this century is humanity's acknowledgement of climate change and the collective global effort to halt its progress. Indeed, the warming of the planet and the likely catastrophic impact of inaction have become an inescapable part of political, social and economic discussion.

From a business perspective, companies now operate in an environment where regulators, financiers and investors are increasingly seeking information about greenhouse gas (GHG) emissions and strategies for their reduction. In response, across the

globe, companies are factoring environmental considerations into their operational decisions and strategy.

The balance of this article will consider:

- Emissions quantification and reporting;
- Rural Funds Group (RFF) emission reporting considerations; and
- RFF lessees environmental and sustainability initiatives.

Emissions quantification and reporting

Before considering the frameworks

associated with emissions quantification and reporting, it is worth revisiting the main types of GHG emissions produced in the agricultural sector.

The three greenhouse gases that are most relevant to the agricultural sector are methane (livestock production), nitrous oxide (fertiliser application) and carbon dioxide (energy consumption). Figure 1 provides further information on these compounds.¹

Each of the GHG emissions has a different radiative power and differing residence time in the atmosphere. Given the need to quantify emissions,

Figure 1: Primary GHG emissions from agriculture

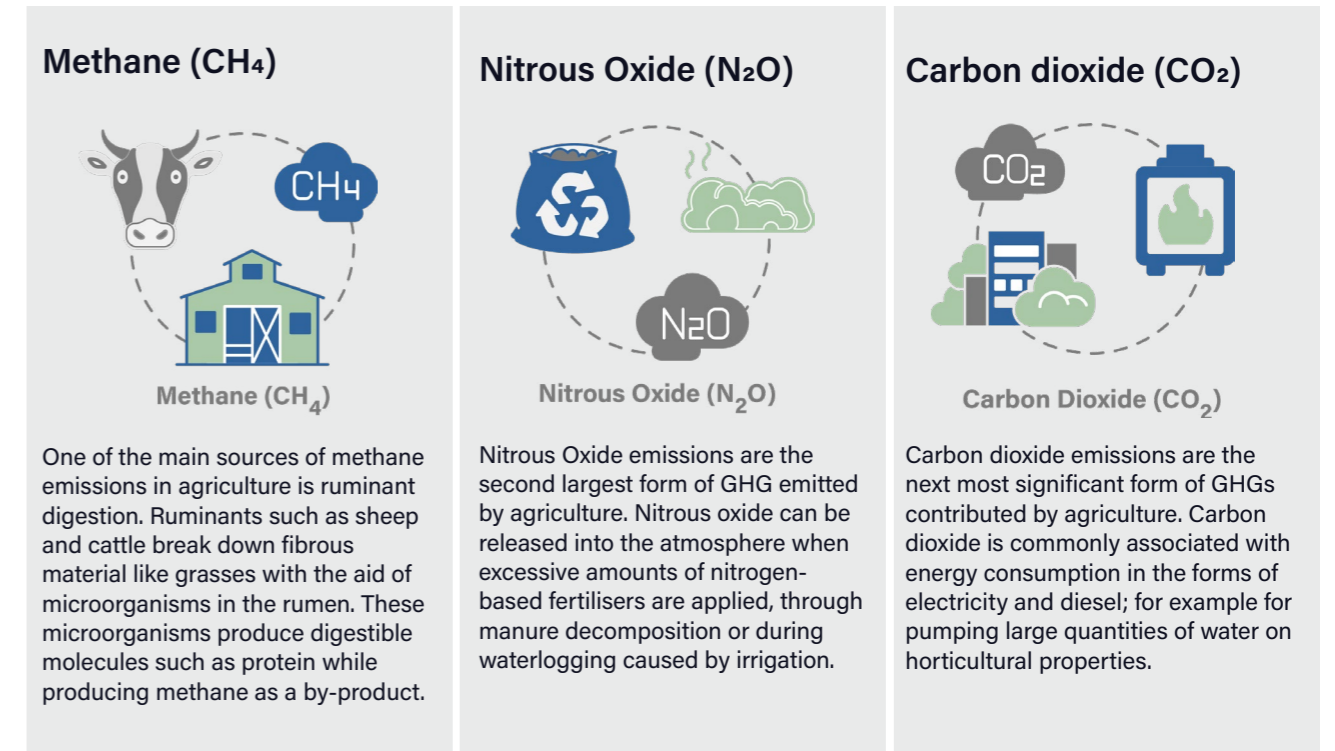


Figure 2: GHG conversion to CO₂e²

GHG	Lifetime	CO ₂ equivalent (CO ₂ e)
Carbon dioxide (CO ₂)	Up to 30,000 years	1
Methane (CH ₄)	12 years	28
Nitrous oxide (N ₂ O)	121 years	265

a standardised unit termed carbon dioxide *equivalent* (CO₂e) is used (see Figure 2).

In Australia, companies that exceed certain thresholds of CO₂e emissions are obligated to report those emissions under the National Greenhouse and Energy Reporting Act 2007 (NGER Act). The thresholds are based on facility and corporate group measurements. For example, reporting is required by an organisation if it operates a facility that produces at least 25 kilotons (kt)

Figure 3: Emissions categories

Scope	Description
Scope 1	Direct emissions that are from sources that are owned or controlled by the company through their operations.
Scope 2	Indirect emissions released into the atmosphere from the use of purchased energy.
Scope 3	All other indirect emissions that occur across the value chain and are outside of the organisation's direct control.

CO₂e. Many of the reporting entities under the NGER Act are energy producers and mining companies.

Rural Funds Management Limited (RFM) has previously considered its reporting obligations and has determined it is under the reporting threshold.

A further distinction in the measurement of GHG emissions is defined by their source. Only emissions generated directly from operations, or indirectly using

energy, are required to be quantified and reported. These types of emissions are also referred to as Scope 1 and Scope 2 (see Figure 3). Emissions which occur outside of an organisation's direct control, called Scope 3, are not required to be quantified or reported.

In the case of Rural Funds Group (RFF), many of the organisations that have the operational control over RFF assets are lessees that report their own emissions independently. The following section provides further details on this distinction.

RFF emission reporting considerations

Figure 4 shows the relative value of RFF property assets split into three categories:

1. assets which are leased;
2. assets which are being temporarily operated until leased; and
3. assets which are undergoing development prior to being leased.

Given RFF is a real estate investment trust, it is unsurprising that most assets, 82% by value, are leased (see Figure 4). The emissions produced by these types of assets are under the operational control of businesses external to RFF, namely, the lessees.

By extension, and in accordance with the NGER Act, Scope 1 and 2 emissions are reported by lessees,

not by RFF.

Included in this group of lessees is RFM. These emissions reporting obligations belong to RFM on assets it leases, not RFF.

The next largest category, by value, are assets being temporarily operated by RFM on behalf of RFF. These include recently purchased sugar cane farms, a cropping property, two mature macadamia orchards and cattle properties. In each of these instances it is the intention for RFM to operate these assets on behalf of RFF while third-party lessees are identified. In most cases, seeking lessees will occur concurrent with productivity developments, which aim to enhance the assets attractiveness to lessees.

The final category of assets are properties which RFM is developing

to higher and better use on behalf of RFF, specifically macadamia orchards. RFM's strategy is to have these assets leased after planting; well before they start producing crops and therefore well before producing meaningful emissions from operations.

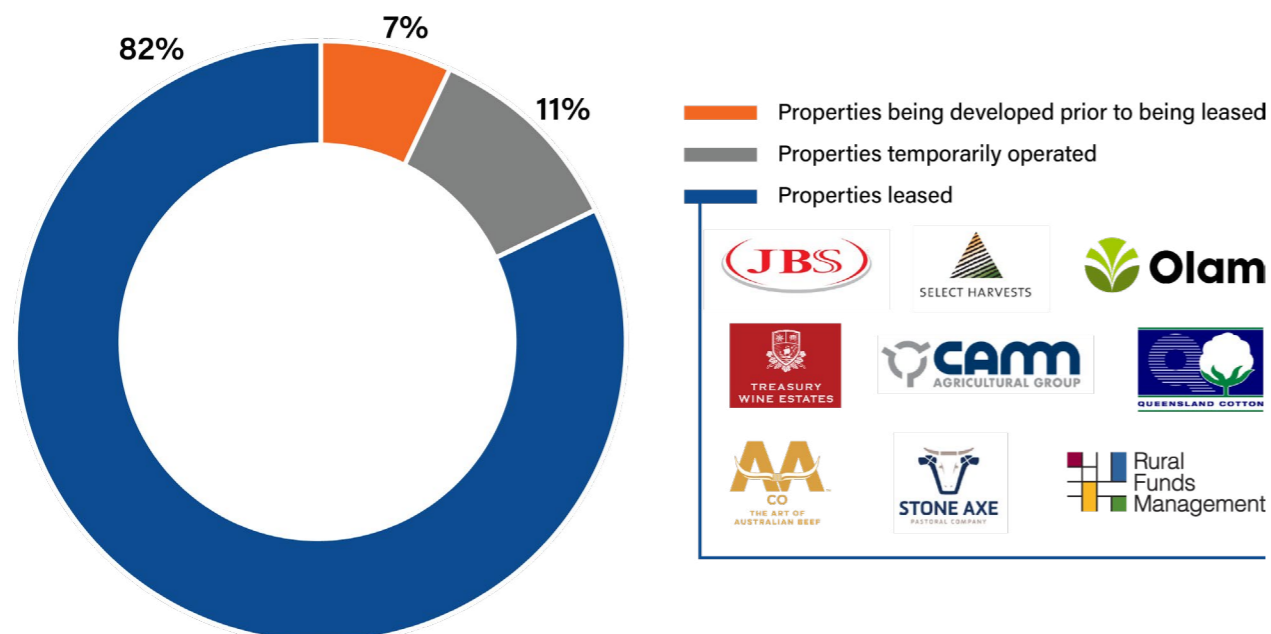
During FY22 RFM has been undergoing a process to identify appropriate sustainability reporting frameworks which may consider the emissions from properties being operated and developed. It is important to note, however, that the emissions from these assets are expected to be both temporary and in the minority.

Conversely, most emissions generated from assets owned by RFF are under the operational control of lessees. While RFM leases require operators to use appropriate production methods including farm management methods which seek to minimise environmental impacts, many lessees also have their own environmental reporting frameworks and commitments.

The following section presents lessees environmental and sustainability initiatives grouped by sector.

Given RFF is a real estate investment trust, it is unsurprising that most assets, 82% by value, are leased. The emissions produced by these types of assets are under the operational control of businesses external to RFF, namely, the lessees.

Figure 4: Property assets value (31 December 2021) categorised by leasing stage³



RFF lessees environmental and sustainability initiatives

Cattle

RFF's cattle property portfolio includes 21 properties and feedlots representing 31% of RFF's assets. Typically, the main GHG emissions that cattle properties produce are methane and carbon dioxide. Lessees of RFF cattle assets include JBS Australia Pty Ltd, Australian Agricultural Company, Stone Axe Pastoral, CAMM Agricultural Group (CAG) and Cattle JV (a wholly owned subsidiary of RFM).



\$100m (30,004 ha) backgrounding properties

Australian Agricultural Company (ASX: AAC) has committed to setting a science-based net zero target and is undertaking several sustainability initiatives including:

- transition of its bore network from diesel to solar by 2024;
- developing remote sensing capabilities for managing soil and vegetation carbon sequestration;
- investing in emerging methane reduction technologies such as feed additives; and
- reducing *emissions intensity* through improvement in operational efficiencies.

Emissions intensity, rather than total emissions, is a metric used for assessing farming enterprises as it compares the GHG emissions generated per unit of farm product, such as kilograms of beef. Improved emissions intensity may be a result of higher farm production and a significant level of avoided emissions that would otherwise have been produced for the same level of output.



\$89m (390,600 ha) backgrounding and breeding properties

CAMM Agricultural Group (CAG) has confirmed its commitment to sustainable agricultural practices. In line with this, projects that CAG is undertaking include reducing emissions through the implementation of solar energy and utilising feedlot waste and composting to improve soil carbon.



\$87m (15,484 ha) backgrounding properties

Stone Axe Pastoral incorporates environmentally sustainable farming practices within its enterprise, adhering to the Australian Beef Sustainability Framework with the goal to minimise environmental impacts, protect biodiversity, manage water and sustain soil health. These practices are evidenced via regenerative grazing, riparian management, dam regeneration and the installation of solar power to reduce their reliance on grid and diesel generators.

Stone Axe Pastoral is committed to reducing GHG emissions intensity through efficient cattle management, improved soil carbon capture and the planting of trees.



\$56m (5 facilities) feedlots

JBS Australia Pty Ltd (JBS) parent company, JBS S.A. has committed to achieve net-zero greenhouse gas emissions by 2040 and was the first major company in its sector to set a net-zero target. The commitment spans its global operations.

The company will also provide annual updates and disclose financial risks

linked to climate change, in line with the Task Force on Climate-related Financial Disclosures (TCFD) framework (see Figure 5).

In addition, JBS is one of 25 companies that have signed up to the Australian Government Corporate Emissions Reduction Transparency report pilot. The program is focused on clear and consistent reporting of emissions from some of Australia's largest companies. The first report is expected to be published in 2022.

Figure 5: Task Force on Climate-related Financial Disclosures (TCFD)



Several RFF lessees have made commitments with respect to the TCFD.

The TCFD is a globally recognised framework which has developed recommendations on the types of information that companies should disclose to assess risks and opportunities related to climate change.

The TCFD's 3,400+ supporting organisations span the public and private sectors and represent over 70 industries in 95 countries and jurisdictions, including the governments of 11 countries.

In 2019 the Australian Securities and Investment Commission (ASIC) encouraged TCFD-aligned reporting and endorsed TCFD as the preferred market standard.

In 2020, 80 ASX200 companies adopted the TCFD framework for climate risk reporting. A further 34 companies have either committed to, or are reviewing the framework.

\$25m (225,800 ha) breeding properties

During FY21 RFM commenced research on multiple projects which seek to quantify and reduce GHG emissions. Research has focused primarily on methods which have been outlined by the Australian Government Clean Energy Regulator.

These methods generally fall into two approaches; either reducing emissions that would normally be produced, or storing carbon in vegetation or soil. The focus of RFM's research during FY22 includes:

- cattle herd management – reducing emissions intensity through productivity improvements;
- soil carbon sequestration – increasing soil carbon levels through changes to farm management practises and converting land usage; and
- reforestation – planting trees to reduce the emissions entering the atmosphere.

For further information see RFF's Annual Report for the period ending 30 June 2021.

Almonds

RFF owns three almond orchards representing 29% of assets. Typically, the main GHG emission that almond orchards produce is carbon dioxide derived from the energy used to reticulate irrigation water. Lessees include Olam Orchards Australia (Olam Australia) and Select Harvests (ASX: SHV).



\$275m (3,133 ha) almond orchards

Olam International Ltd, the parent company of Olam Australia has stated their focus on climate change risk modelling to seek to reduce emissions within its operations

and throughout its supply chain. Olam has also announced that it is responding to the TCFD.

RFM has worked with Olam and AGL to assist in developing a renewable energy system for Kerarbury as outlined later in this article.



SELECT HARVESTS

\$106m (1,006 ha) almond orchards

Select Harvests (ASX: SHV) accepts the science of climate change and the Paris Agreement which commits to hold the increase in the global average temperature to below 2°C and committed to the alignment of reporting standards to the TCFD.

SHV has several environmental focuses including resource efficiency, sustainable farm management, climate change and water management. Highlights that have been achieved include:

- 100% of its orchards use drip irrigation, tree and soil monitoring systems;
- 51% of energy it sources is from renewables;
- approximately 28% reduction in Scope 2 emissions via an almond hull-to-energy co-generation facility; and
- production of over 31,000 of compost for the FY20 season.

Cropping

RFF's cropping portfolio consists of two broad categories of cropping assets: 20 sugar cane farms that mostly will be gradually developed to macadamia orchards and three cotton growing properties. Together these properties represent 11% of RFF's assets. Typically, the main GHG emissions that cropping properties produce are nitrous dioxide from fertiliser application. Lessees include Cot JV (a joint venture between Queensland Cotton and RFM) and private farming businesses (in the case of sugar cane farms).



Cot JV (Queensland Cotton and RFM) \$42m (4,963 ha)

As part of Olam International Ltd, Queensland Cotton shares the goal guided by Olam's sustainability framework outlined earlier in this article.

In 2021, RFM undertook a trial of weed seeker technology. The technology uses near infrared cameras to detect and treat weeds. The total amount of herbicide used is reduced significantly as the sprayed area is substantially lower, affecting only weeds and not bare soil.

Vineyards

RFF owns 7 vineyards, all of which leased to Treasury Wine Estates (ASX: TWE) representing 5% of RFF's assets. Vineyards require a lower level of irrigation than almond and macadamia orchards. The main GHG emitted, however, is carbon dioxide from energy consumption.



TREASURY WINE ESTATES \$65m (666 ha) vineyards

Treasury Wine Estates (ASX: TWE). Australia's largest wine producer, has a sustainability agenda that includes water stewardship, climate risk and GHG emissions. TWE has set a net zero emissions target by 2030 (Scopes 1 and 2) which includes using 100% renewable electricity by 2024.

In May 2021, TWE announced a new agreement to purchase renewable electricity which will reduce emissions at its Barossa Valley site by more than 2,000 tonnes per year and deliver up to 50% of the site's electricity needs. TWE is also looking to accelerate the assessment and reduction of Scope 3 emissions. TWE has outlined plans to align with the TCFD.

Macadamias

RFF owns 5 mature macadamia orchards and 10 which are recently planted or currently being developed. Although macadamia orchards represent 10% of RFF's assets, they contribute only 2% of RFF's FY22 forecast lease revenue as the majority are in the early stages of development. RFM is lessee directly and as responsible entity for an investment fund (2007 Macgrove Project).



\$15m (261 ha) orchards

RFM has commenced assessment of emissions studies for mature macadamia orchards in Bundarberg. This incorporates farm emissions from fuel, fertiliser use, and transportation of harvested macadamias to the processing facility. During FY22 RFM engaged an external contractor to establish baseline data so that future emissions reductions can be quantified.

While macadamia orchards currently only contribute a small component of RFF lease revenue, RFM plans to develop and lease 5,000 ha of macadamia orchards over five years. As described in Figure 6, studies show that macadamia orchards can sequester substantial amounts of carbon from the atmosphere.

Industry bodies

In addition to the commitments by lessees, the industries in which RFF lessees operate are represented by various bodies which also have stated sustainability policies and commitments. These industry bodies include Australian Lot Feeders Association (ALFA), Meat and Livestock Australia (MLA), Australian Almonds, Cotton Australia, Australian Grape & Wine and Australian Macadamia Society.

For example, two industry bodies have net-zero targets:

- MLA has set the target to be carbon neutral by 2030 via a four pronged approach: emissions avoidance; carbon storage on-farm via trees, legumes

and pastures; integrated management systems and leadership building.

- Australian Grape & Wine recently revised the goal to net zero Scope 1 and 2 emissions by 2035.

Sustainability projects

Almond orchard solar installation

RFM has worked with AGL and Olam to assist in developing a renewable energy system for the Kerarbury almond orchard. The proposed system comprises a 6 MW (megawatt) solar array and a 4.3 MWh (megawatt hour) battery which will produce approximately 12,000 MWh annually, enough to power 2,200 Australian households.

The proposed system will provide renewable energy for the significant power required to move large volumes of water which are required to irrigate the almond trees. The seasonality of the power use, predominantly in summer when water requirements are at their highest, was a significant consideration in the design of the system.

Figure 6: How macadamia orchards sequester carbon



Image: Transporting macadamia planting material, Glendorf Maryborough, central Queensland, April 2022.

The macadamia tree has an inherent ability to sequester carbon from the atmosphere.

The average Australian macadamia orchard removes more than 17 tonnes gross and 14.5 tonnes net of carbon per hectare per year from the atmosphere. The macadamia tree's size, volume of foliage, and long lifespan mean that every tree can hold a substantial amount of carbon, more so than many other crops.

Many growers also contribute to improving sustainability by ensuring every part of the macadamia tree and nut can be reused or recycled, with little or nothing going to landfill. For example macadamia shells can be used to generate electricity or made into stock feed. Also, any organic matter such as branches or foliage can be returned to the earth beneath the tree to be reabsorbed by the soil from which they originally grew.

In a research project conducted by Carbon Friendly Pty Ltd in conjunction with a Queensland based macadamia producer, management changes were shown to generate a considerable reduction in the emission levels per tonne of macadamia nut produced from the 2014 crop to the 2019 crop. On-farm changes such as increased fertiliser use efficiency and reduced fuel consumption lead to a decrease in total emissions per tonne of macadamia nut. The project also concluded that increased carbon sequestration rates mainly due to compost applications more than offset the operational emissions, meaning that the total CO₂e emissions were less than the total carbon stored in the soil.

The project, which remains subject to various approvals, is projected to reduce costs and lower GHG emissions by approximately 9,300 tonnes of CO₂e annually, or equivalent to taking 3,000 cars off the road.

Wind turbines on cattle properties

RFF has entered into a 25-year lease with Clarke Creek Energy Pty Ltd for a portion of existing central Queensland cattle property, "Cerberus", for the purpose of installing 17 wind turbines. The turbines will be 4.5 MW each and will be situated on land that is unsuitable for grazing.

The wind turbines form part of the Clarke Creek Wind and Solar Farm which sits within the Tattarang group of companies.

Three wind turbines are also located on the Western Australian cattle property "High Hill" with lease agreements with the APA Group (ASX:APA). The turbines form part of the broader Badgingarra Wind Farm which generates up to 130 MW of power annually.

Conclusion

The global community is increasing its focus on the emissions produced by businesses, with a view to reducing the impacts of climate change over time. As part of this, governments and global organisations have established frameworks which define the ownership and responsibility of emissions.

This article has presented an overview of the emissions standards and how these link to the business structure of RFF. Most assets owned by RFF are leased with many of the lessees already reporting (or planning to report) their emissions, outlining how these may be reduced and/or have made a commitment to achieving "net zero". Furthermore, several of the underlying industries in which lessees operate also have targets to achieve carbon neutrality.

RFM is also playing a part by including reference to environmental practices within leases, working with lessees to identify ways in which their emissions can be reduced and exploring methods which have been outlined by the Australian Government Clean Energy Regulator.

RFM looks forward to providing further information on RFF's sustainability initiatives to investors as part of full-year annual reporting.

Notes

1. For a more detailed discussion see David Bryant's article in the June 2019 issue of the Biannual Newsletter.
2. Source: Pachauri et al, Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, IPCC, (2014).
3. Figures shown are subject to rounding and excludes water entitlements. Olam refers to Olam Orchards Australia Pty Ltd, a wholly owned subsidiary of SGX-listed Olam International Ltd (SGX: O32). Properties undergoing developments include properties to be leased upon the completion of being converted to macadamia orchards.

RFF portfolio update

Additional feedlot development

Feedlots have come to be viewed as an economical production method that complements Australia's grass-fed sector because of the production efficiencies that they provide. These efficiencies extend to GHG emissions. Research shows that beef produced from feedlots creates up to 20% fewer GHG emissions than grass-fed cattle per kilo of beef produced.

This benefit is achieved as cattle on grain-based diets at feedlots reach their ideal weights more quickly than they would on grass. Less time on grass results in a measurable reduction in carbon emissions.

In May 2022 Mort & Co Lot Feeders Pty Ltd (Mort & Co) lodged a development application to construct a feedlot on a portion of existing central Queensland property "Rookwood Farms". Mort & Co is Australia's largest privately-owned beef cattle lot feeding, management and marketing company, operating two feedlots in Queensland with a capacity of approximately 90,000 head.

The majority of feedlot development costs are expected to be funded by Mort & Co. In addition to leasing a portion of "Rookwood Farms", Mort & Co will lease "Coolibah" for supporting cropping area under 20-year agreements.

The feedlot remains subject to council approval. If approval is not received it is expected the properties would be developed to macadamia orchards or operated as cattle properties.

Lynora Downs lease extension

Queensland Cotton and RFM have extended the Cot JV lease for a further five years.

The lease was due to expire June 2022 and will now expire June 2027. Since the commencement of the lease RFF has funded the development of 4,250 ML of water storage and expanded the irrigation area from 779 ha to 1,559 ha.



Image: New water storage near capacity at Lynora Downs, central Queensland, June 2022.

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Image: Late cotton crop under pivot irrigation at Lynora Downs, central Queensland, February 2022.

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