

To	Company Announcements Office	Facsimile	1300 135 638
Company	ASX Limited	Date	13 September 2019
From	Helen Hardy	Pages	58
Subject	Origin Energy 2019 Annual Report Sustainability Report		

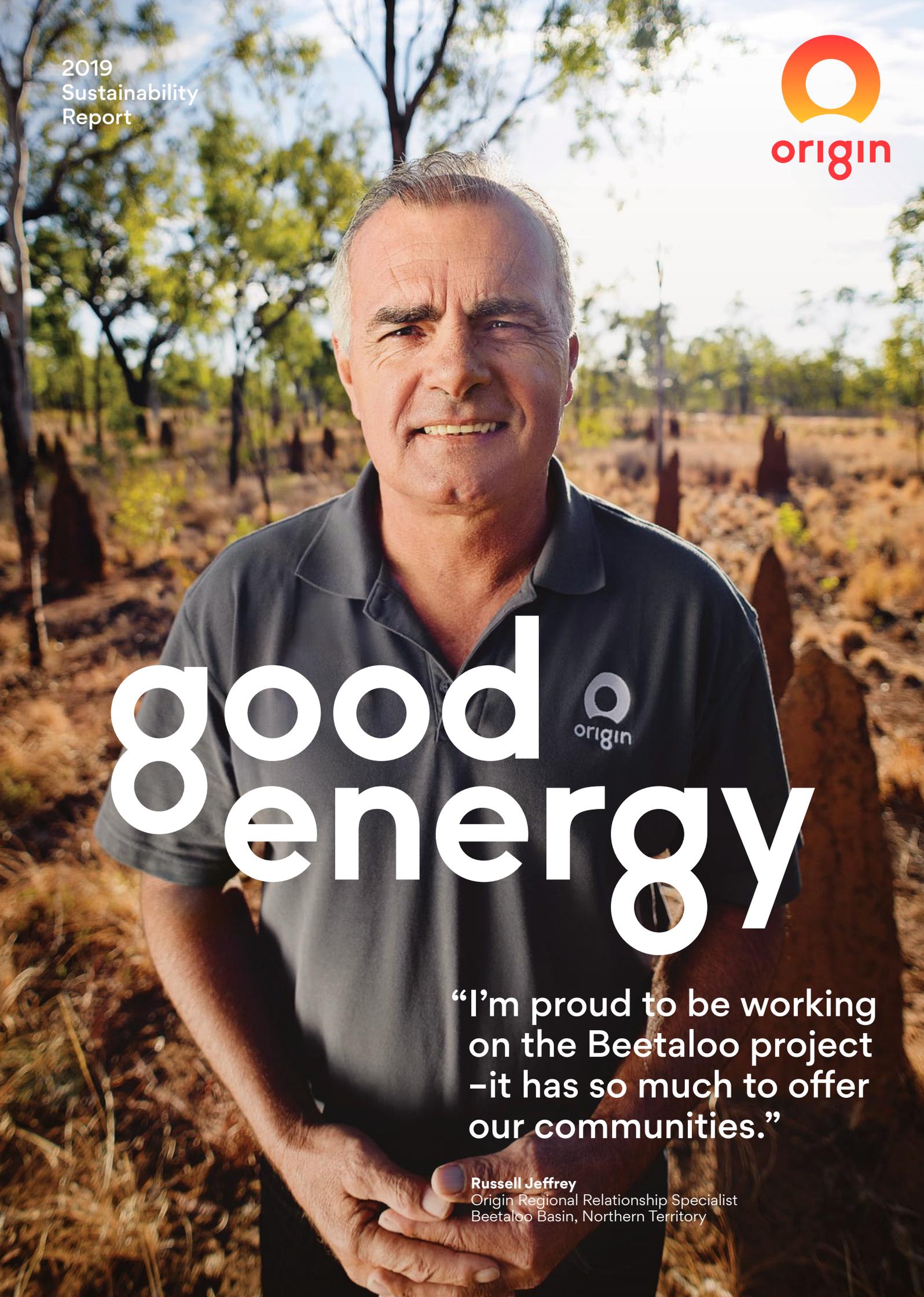
Please find attached a release on the above subject.

Regards



Helen Hardy  
Company Secretary

02 8345 5000



# good energy

“I’m proud to be working on the Beetaloo project –it has so much to offer our communities.”

**Russell Jeffrey**  
Origin Regional Relationship Specialist  
Beetaloo Basin, Northern Territory

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### Important information

Unless otherwise stated, Origin Energy's 2019 Sustainability Report provides a summary of Origin's performance on material social and environmental sustainability aspects and governance procedures for the period 1 July 2018 to 30 June 2019.

Its scope is limited to the assets we operate. The exception is emissions performance, which we report on an operated and equity basis, in line with regulatory and reporting norms. Origin is the upstream operator of Australia Pacific LNG and 37.5 per cent shareholder.

This report may also reference significant events occurring after 30 June 2019. Where this report contains forward-looking statements, including statements of current intention, statements of opinion and predictions as to possible future events and future financial prospects, these statements are not statements of fact and there can be no certainty of outcome in relation to the matters to which the statements relate.

Forward-looking statements involve known and unknown risks, uncertainties, assumptions and other important factors that could cause the actual outcomes to be materially different from the events or results expressed or implied by such statements, and the outcomes are not all within Origin's control. Statements about past performance are not necessarily indicative of future performance.

All monetary amounts are in Australian dollars unless otherwise stated. Due to rounding, numbers presented in this report may not add up precisely to the totals provided and percentages may not precisely reflect the absolute figures.

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### Featured on our front cover is Russell Jeffrey

Russell Jeffrey is an Origin Regional Relationship Specialist who sees himself as the conduit between community and the company for our work in the Beetaloo Basin in the Northern Territory. As part of the Beetaloo team, Russell focuses on building and maintaining relationships with our host Traditional Owners and Native Title holders.

Russell was photographed in the Daly Waters region, within Origin's Beetaloo Basin permit area. Origin holds exploration permits in the Beetaloo Basin that cover around 18,500 square kilometres and commenced a shale gas exploration project there in 2014.

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A message  
from the Chief  
Executive Officer

## Welcome to the 2019 Sustainability Report



.....

**“We remain committed to exiting coal-fired generation by 2032. We are also on track to have more than 25 per cent of our owned and contracted generation capacity to come from renewables and storage by 2020.”**

.....

I am pleased to present Origin’s 2019 Sustainability Report.

It has been more than a year since we launched our new purpose. Since then, we have spent a lot of time reflecting on how we can best live up to the promise of Good Energy, including how we deliver it to our customers, and the communities we serve and ultimately how we impact the planet we live on. Every day our purpose sets us new challenges and new opportunities.

### **Putting the customer first**

The four million customers we serve are at the heart of our business and we are continually looking for ways to deliver a better experience to them.

This includes making it easier and simpler for our customers to use energy more efficiently. This year we gave a trial group an opportunity to participate in demand management, where we turned their thermostats up two degrees for two hours on hot days to ease pressure on the grid. More than 60 per cent of the trial customers opted in, which makes us optimistic that we can encourage more customers to come onboard, when we make it easy to do so, and clearly demonstrate the benefits.

Affordability is unquestionably one of the most pressing issues for our customers. We recently went beyond what was required of us with the introduction of the Commonwealth Government's default market offer on 1 July 2019 by extending the regulated price to our customers on non-discounted plans with a flat tariff. This means more than 520,000 residential and small business customers are now paying less for their electricity. Just as importantly, we have protected our hardship customers from the impact of price rises since 2016.

### A cleaner, smarter energy future

Origin recognises we have an important contribution to make in helping Australia meet its emissions reduction targets through the United Nations Framework Convention on Climate Change's Paris Agreement. We have a five-pillar approach to progressively decarbonise our business.

As part of this strategy, we remain committed to exiting coal-fired generation by 2032. We are also on track to have more than 25 per cent of our owned and contracted generation capacity to come from renewables and storage by 2020, all the while using our strong gas portfolio as a lower-emissions firming fuel.

We have now resumed exploration in the Beetaloo Basin after the independent Scientific Inquiry into Hydraulic Fracturing in the Northern Territory handed down its recommendations in 2018 to ensure the Territory can support a safe and viable onshore gas industry. We firmly believe that gas development has the potential to transform the Northern Territory through jobs, infrastructure and skills while supporting a cleaner energy future.

Russell Jeffery, who is on the cover of this report, is our regional relationship specialist based in the Northern Territory. As we resume our exploration in the Beetaloo Basin, Russell has played a pivotal role in strengthening relationships with our host Traditional Owners and Native Title holders. It's important to note that any future developments in the Beetaloo Basin will only be undertaken by Origin following negotiation of a Production Agreement with the relevant host Traditional Owners and Native Title holders.

### Giving back to the community

This year also marked an important step on the journey to reconciliation for Origin with the launch of our Stretch Reconciliation Action Plan (RAP). Our Stretch RAP includes commitments to double the number of Indigenous employees at Origin by 2022, actively supporting Indigenous businesses through procurement and helping to fund better educational outcomes through the Origin Foundation.

This coming year we will celebrate 10 years of the Origin Foundation, our philanthropic foundation, which has provided over \$25 million to support communities since inception. Over the past decade, the Origin Foundation has helped more than 25,000 students around the country discover their potential through the power of education. The Origin Foundation's Give Time program has seen more than 1,400 of our people volunteer their time in the last year, including activities like cooking breakfast for vendors of the Big Issue and assembling Solar Buddy lights that help children living in Papua New Guinea overcome energy poverty. I am especially proud that the Origin Foundation was recently awarded first place by GoodCompany in its Top 40 Workplaces to Give Back survey.

### The people who make up Origin

The promise of Good Energy goes beyond our customers and stakeholders. It's important that the more than 5,300 people who come to work with us every day see this commitment in action. We are striving to create a diverse, inclusive and fulfilling workplace – one that attracts the very best people to come and work with us.

To that end, we have introduced one of the most generous parental leave schemes in the Australian energy industry, increasing paid parental leave from 13 weeks to 20, paid secondary carer's leave from two weeks to four and eliminating qualifying periods, which means that expecting a child is no barrier to anyone starting a great new career at Origin.

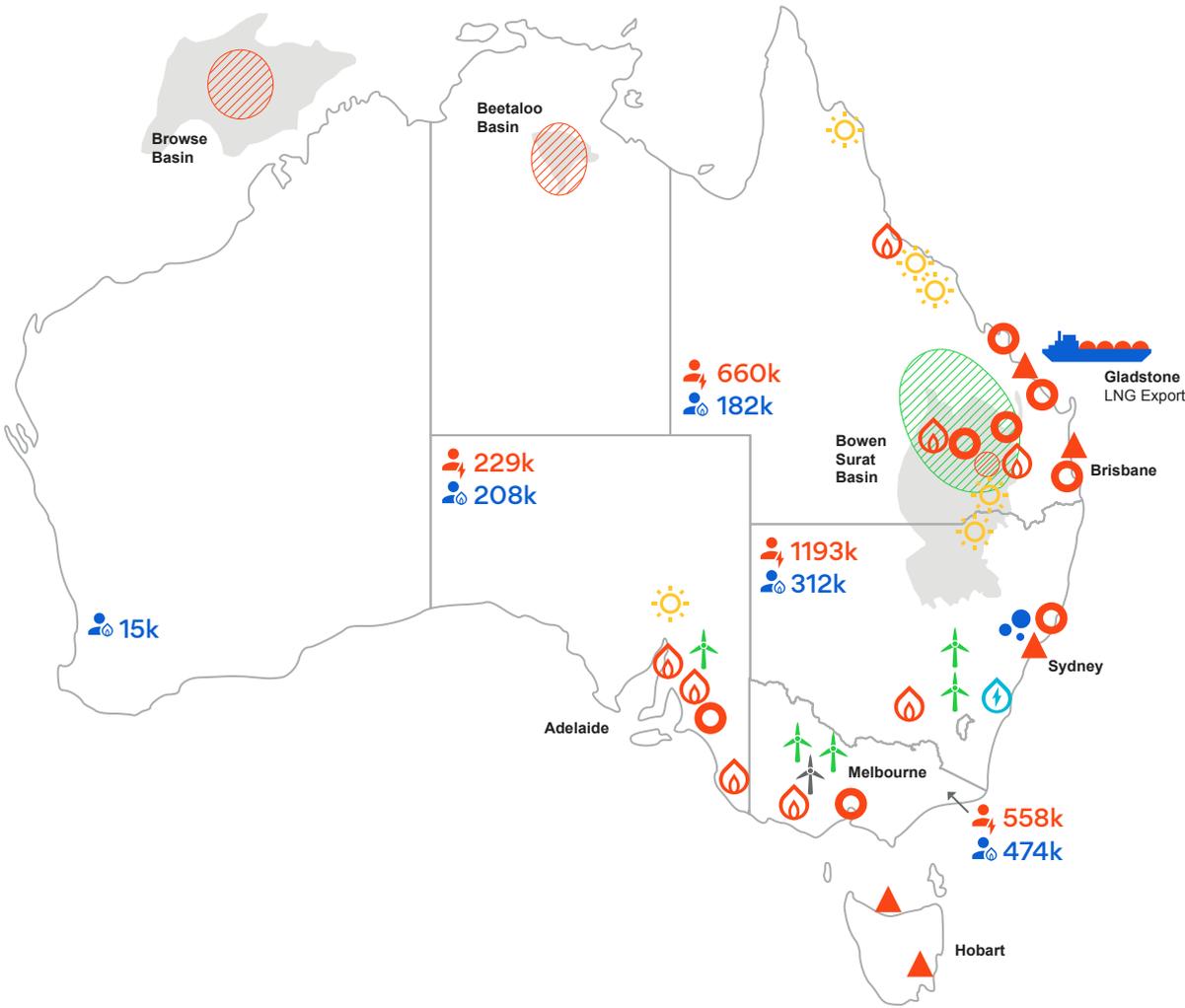
Disappointingly, after recording our lowest ever Total Recordable Injury Frequency Rate last year, we saw a rise this year from 2.2 to 4.5. This is unacceptable, and we introduced a number of significant safety programs and interventions to address this critical issue. The safety of our people is paramount, and the efforts of the entire leadership team at Origin are focused on making sure our people return home to their families safely every day.

I hope this – our 18<sup>th</sup> Sustainability Report – gives you a sense of how we are performing as a company to deliver for our customers, communities and planet.



**Frank Calabria**  
Chief Executive Officer

# About Origin – where we operate



### Generation

- Gas
- Pumped hydro
- Solar (contracted)
- Wind (contracted)
- Coal
- Under construction

### Exploration acreage

- Origin upstream acreage
- APLNG upstream acreage
- Production facility
- APLNG pipeline
- Office

LPG seaboard terminal

Electricity customer accounts  
 Natural gas customer accounts

# How we report



## This Sustainability Report discloses our performance and how we manage material environmental and social aspects of our activities and governance procedures for the 2019 financial year (FY2019) and historically.

These aspects align with the sustainability-related risks identified in the Operating and Financial Review contained in our Annual Report.

We also engage with our stakeholders to identify aspects of sustainability that are important to them.<sup>1</sup>

This report references the Global Reporting Initiative (GRI). We also use the AA1000 AccountAbility Principles to inform our reporting.

Visit [originenergy.com.au/sustainability](http://originenergy.com.au/sustainability) for more details on our management approach, materiality assessment process and GRI Supplement, and to view full details of our sustainability performance in FY2019.

In addition to this report, we provide details about different aspects of sustainability in various publications, including the Annual Report, public policy submissions and online at [originenergy.com.au](http://originenergy.com.au).

### Stakeholder engagement

We engage with our stakeholders in a variety of ways throughout the year. We recognise the importance of talking to our stakeholders to understand the key sustainability priorities of each stakeholder group.

Further details of our engagement activities with our key stakeholder groups are included in *Appendix 2: Stakeholder engagement*.

We are members of various industry associations and peak bodies. These memberships enhance our ability to reach and advocate for common industry views and gain industry insights. We may not align with every element of an association's public position, but where we believe there is a benefit in constructive dialogue or advocacy we will maintain our membership. Details of our key industry associations are included in *Appendix 3: Industry association memberships*.

You can read Origin's policy on industry association memberships on our website at [originenergy.com.au/industryassociations](http://originenergy.com.au/industryassociations)

### FY2019 materiality assessment outcomes

Each year, we complete a materiality assessment that involves examining each aspect of sustainability according to its level of risk to the company, its topicality and the degree of stakeholder interest. The aspects of our business that have been identified through our materiality assessment are:

- Climate change;
- Customers – affordability and reliability of energy;
- Customers – service;
- Diversity and inclusion;
- Ethical business practices;
- Governance;
- Impact on local communities;
- Land access and coexistence;
- Managing emissions;
- Process safety;
- Procurement;
- Water management;
- Waste management; and
- Workforce health and safety.

### Task Force on Climate-related Financial Disclosures

The G20 Financial Stability Board's Task Force on Climate-related Financial Disclosures (TCFD) has developed a set of voluntary recommendations for companies to disclose information on how they oversee and manage climate-related risks and opportunities. Origin became a supporter of the TCFD in FY2018 and continues to implement its recommendations.

*Appendix 1: TCFD disclosure* provides details on where our FY2019 disclosures align with the TCFD recommendations.

### United Nations Sustainable Development Goals

We continue to align reporting of our material aspects with the United Nations Sustainable Development Goals (SDGs).

Companies such as Origin identify which of the 17 goals are relevant to their business and report accordingly.

Where appropriate in this report, an SDG icon accompanies a section where Origin's activities align with the specific SDG. For example, the icons below appear in the section, *Energy and climate change*, reflecting that our second and fourth pillars of decarbonisation and our emissions targets contribute to these goals.



<sup>1</sup> Drawn from investor, customer, employee and community feedback.

# Energy and climate change



## Performance at a glance

- Commitment to exit coal-fired generation by 2032.
- Commitment to reduce absolute Scope 1 and Scope 2 greenhouse gas emissions by 50 per cent approved by Science Based Targets initiative.
- On track to have more than 25 per cent of our owned and contracted generation capacity from renewables and storage by 2020.



## Climate change remains one of the most significant challenges facing companies worldwide and managing the transition to a low-carbon economy is a high priority for Origin.

Origin supports the United Nations Framework Convention on Climate Change and the Paris Agreement, and actions consistent with ensuring any rise in global temperatures is limited to well below 2°C.

Electricity generation contributes approximately 33 per cent of Australia's emissions<sup>2</sup>, and as one of Australia's largest generators we believe the sector, and our company, should be at the forefront of reducing emissions. We continue to support a national goal of net zero emissions in the electricity sector by 2050 or earlier and are proud of our ongoing contribution to the decarbonisation of the National Electricity Market (NEM).

We believe the electricity sector should be responsible for more than its proportional share of any national reduction measure by helping to unlock abatement in other sectors, such as transport and construction.

A global response is required to achieve the targets of the Paris Agreement, and we believe that gas plays a key role as a transition fuel on the path to decarbonisation alongside renewables. A recent International Energy Agency (IEA) report found that coal-to-gas switching has saved around 500 million tonnes of CO<sub>2</sub> since 2010.<sup>3</sup>

Australia is on track to become the world's largest exporter of liquefied natural gas (LNG) and is playing an important role in meeting the world's energy demand while facilitating the global shift to lower emissions. Exports of LNG from our joint venture, Australia Pacific LNG, to China and Japan have contributed to lowering greenhouse gas emissions and reducing air pollution when replacing coal-fired generation and coal heating.

At home, Australia Pacific LNG continues to be a significant contributor to the Australian east coast gas market. However, we remain mindful of the significant challenge of balancing the transition to a low-carbon energy future, with a secure and affordable energy supply.

## Managing climate change risks and opportunities

Climate change impacts many parts of Origin's business, and we have long considered the effect of decarbonisation on the value of our assets over the short, medium and long terms.

We believe the transition to a low-carbon future provides more opportunities than risks for Origin. The key risks and opportunities that we regularly consider in our strategic planning include the ongoing decarbonisation of energy markets, lower demand for fossil fuels in the markets in which we operate, a shorter lifespan of carbon-intensive assets such as Eraring Power Station (Eraring), changes to energy market dynamics caused by the intermittency of renewables, increased demand from our customers for lower-carbon sources of energy and the electrification of other sectors such as transport.

2 [environment.gov.au/system/files/resources/408fcc37-dcfd-4ab8-a4f9-facc6bd98ea6/files/nggi-quarterly-update-dec-2018.pdf](https://environment.gov.au/system/files/resources/408fcc37-dcfd-4ab8-a4f9-facc6bd98ea6/files/nggi-quarterly-update-dec-2018.pdf).

3 [iea.org/publications/roleofgas](https://www.iea.org/publications/roleofgas).



**1**  
Exit coal-fired generation by 2032.



**2**  
Significantly grow renewables in our portfolio



**3**  
Utilise our strong gas position as a lower-emissions firming fuel.



**4**  
Empower customers with cleaner, smarter energy solutions.



**5**  
Demonstrate leadership in climate change advocacy.

## Decarbonisation strategy

We have a five-pillar approach to progressively decarbonise our business, achieve our emissions reduction targets and contribute to Australia's emissions reduction targets.

### 1. Exit coal-fired generation by 2032

To reduce our carbon emissions and help lead the transition to a decarbonised future, we have committed to exiting coal-fired generation by 2032. In FY2019, Eraring contributed 10 per cent of Origin's revenue and represented 4 per cent of Origin's total assets. Eraring is Australia's largest coal-fired power station, providing much needed stability and reliability in the NEM. As a black coal generator, Eraring has a lower-emissions intensity than brown coal-fired plants.

As more renewable generation enters the market, and as emissions-intensive brown coal generation plants reach the end of their operational lives, gas and lower-intensity coal will play an important role in maintaining reliability in the NEM.

Eraring is one of the most flexible coal-fired power stations in the NEM, and as demand for baseload power continues to decline and peak market demand becomes more pronounced, we are looking at new ways to operate this asset. During FY2019, to support the introduction of more intermittent renewables to the NEM, we trialled better aligning Eraring's generation units with changes in demand. The trial provided insights into how best to improve Eraring's flexibility to support the continued growth in renewable generation, while ensuring safe and efficient operations.

We anticipate the replacement of Eraring's 2,992 megawatts (MW) capacity will be from a combination of renewables, gas and batteries, which will provide ongoing affordability and reliability in the NEM.

### 2. Significantly grow renewables in our portfolio

We sell more electricity than we generate. This gives us the opportunity to expand our generation portfolio with renewable generation, which is the lowest cost new-build generation today, and progressively reduce the emissions intensity of our generation portfolio.

Since March 2016, we have committed to purchase the offtake from approximately 1,200 MW of new wind and solar projects. In FY2019, the second stage (110 MW) of the Bungala Solar Farm in South Australia was commissioned and available to the grid, creating Australia's largest solar farm as of November 2018.<sup>4</sup> Clare Solar (100 MW), Daydream Solar (150 MW) and Darling Downs Solar (110 MW), all in Queensland, were also commissioned in FY2019.

The 530 MW Stockyard Hill Wind Farm<sup>5</sup> is currently under development and expected to be online in 2020, putting us on track to reach our target of more than 25 per cent of our owned and contracted generation capacity being made up of renewables and storage by 2020 – up from 19 per cent in FY2019.

We are also working to see how large-scale storage will play a role in energy reliability and security. We are investigating expanding our Shoalhaven pumped hydro storage scheme (Shoalhaven) by 235 MW, which would bring total capacity up to 475 MW. We have performed a feasibility study, and, in June 2019 the expansion plan passed the first stage of government approvals, allowing geotechnical works to begin.<sup>6</sup>

Graph 1: Origin's owned and contracted renewables and storage capacity as a percentage of total generation capacity



### 3. Utilise our strong gas position as a lower-emissions firming fuel

Gas has a key role to play in the transition to a decarbonised world, both in the domestic market as a firming fuel for renewable generation during morning and evening periods of peak demand, and through emissions savings in Asian economies as they switch from more carbon-intensive fuels.

A recent study commissioned by the Gas Industry Social and Environmental Research Alliance (GISERA) found gas from the Surat Basin, Queensland, where Australia Pacific LNG's coal seam operations are located, offers an overall lower-carbon solution when compared to coal. It also confirms the greenhouse gas emissions benefit from increased use of natural gas in domestic and export markets.<sup>7</sup>

4 Ramp-up of Bungala 2 follows commissioning of its sister farm Bungala 1, bringing the Bungala project to an operating capacity of 220 MW available to the grid (of which 37 MW has been connected and is in operation), making it Australia's largest solar farm to date.

5 [originenergy.com.au/content/dam/origin/about/investors-media/presentations/Origin-Energy\\_Macquarie-Conference-2019.pdf](http://originenergy.com.au/content/dam/origin/about/investors-media/presentations/Origin-Energy_Macquarie-Conference-2019.pdf).

6 [planning.nsw.gov.au/News/2019/Hydro-To-Deliver-More-Power-To-The-People](http://planning.nsw.gov.au/News/2019/Hydro-To-Deliver-More-Power-To-The-People).

7 [gisera.csiro.au/project/whole-of-life-cycle-greenhouse-gas-assessment](http://gisera.csiro.au/project/whole-of-life-cycle-greenhouse-gas-assessment).

As a flexible fuel, gas is a perfect partner for the increase in intermittent renewable energy as it can quickly respond to changes in both capacity and output. Origin owns Australia's largest fleet of gas-fired power stations, which support the growth of renewables in the NEM and provide stability as the Australian coal fleet continues to age.

We continue to invest in our existing gas fleet to improve its reliability and flexibility. In FY2019, at our Quarantine Power Station in South Australia, we commissioned a new fast-start aero-derivative turbine that can start up in as little as three minutes, helping support growth in renewables.

**4. Empower customers with cleaner, smarter energy solutions**

The energy market around the world is rapidly transforming with both low-cost renewables and new technologies, and Australia is no exception. The continued penetration of distributed assets, combined with the rise of internet-enabled devices, is changing the way our customers interact with us and use energy at home and in business. As one of the leading energy retailers in the NEM, we are ideally placed to provide access to smart energy solutions that can save customers energy, lower costs and reduce emissions.

During FY2019, we trialed an internally developed artificial intelligence (AI) platform to connect and orchestrate distributed assets. Customers were offered internet-enabled air conditioning

controllers to control their air-conditioning units from their mobile phone, and Origin was able to run demand response events where customers opted in to have their temperature adjusted on hot days. We are planning a number of other customer trials to extend the AI platform capability. Ultimately the platform will be instrumental in managing distributed assets at critical times of market volatility.

We continue to engage with domestic and international businesses to ensure that we give ourselves every opportunity to identify and source the right solutions for our business and customers. The Free Electrons accelerator program is now in its third year. The program, co-founded by Origin, brings together 10 global utilities and 15 leading start-ups looking to trial and deploy new and exciting technologies and business models. The program is committed to supporting next-generation ideas that will transform energy markets and provide differentiated energy solutions for millions of customers.

Origin continues to sponsor EnergyLab, Australia's leading platform for launching energy start-ups. EnergyLab's accelerator program continues to grow in both geographic reach and interest from early-stage start-ups, with 36 companies having been accepted into the acceleration program since its inception.

Please see our *Smarter and easier energy* section for more information on our future energy solutions.

**5. Demonstrate leadership in climate change advocacy**

Origin continues to be a leading advocate for climate change action and the progressive decarbonisation of the energy sector. Our portfolio positions us well to meet today's demands and take opportunities presented by national or global commitments for cleaner energy.

In 2017, we led the sector and became the first Australian company to set an emissions reduction target endorsed by the Science Based Targets initiative (SBTi), ensuring that our decarbonisation trajectory is in line with the 2°C Paris Agreement. As an energy company, we remain at the forefront of carbon action in Australia. Refer to the *Decarbonisation targets* section following for further details of our targets and progress.

Origin is a supporter of the TCFD, and our related disclosures are included in *Appendix 1: TCFD disclosure*.

During FY2019, we contributed strongly to the Australian energy and climate policy debate, including supporting an emissions intensity scheme for the electricity sector, such as proposed in the former National Energy Guarantee (NEG). We continue to support a similar type of policy and believe that targets for the electricity sector should be more aspirational than what was previously proposed under the NEG.



## Supporting customers to take up renewable energy

We understand the importance of accessing cleaner energy. With this in mind, we offer both solar energy and green energy products to help our customers.

### Solar energy

Origin is a Clean Energy Council accredited retailer of solar energy and was the second largest installer of solar, in terms of both commercial solar and overall capacity installed, in FY2019. At 30 June 2019, 441,000 Origin customers had solar installed at their properties.

For more than 10 years, Origin has been a leader in rooftop solar, offering new products to encourage greater uptake. We launched new solutions during the year offering our customers proactive maintenance services. These services included solar cleaning and health checks to ensure their solar systems are being used to their full capacity, as well as a solar repairs service and a system replacement offering to customers with older installations.

We are also making it easier to purchase solar and understand usage through improved online journeys in our digital channels. For the first time, our customers can now see their feed-in credit for solar, net electricity cost and consumption in 'My Account' on our mobile app. This is helping our customers understand how their solar is working for them and its positive impact on the environment.

### GreenPower and Green Gas

We are one of Australia's largest providers of GreenPower and Green Gas products, with more than 109,000 green energy customers.

When customers choose GreenPower, they are supporting renewable energy in Australia. Under the scheme, customers choose the percentage of their electricity that they would like Origin to match with an equivalent amount of electricity from GreenPower-accredited renewable sources. With our GreenPower products, we offer customers the option to offset up to 100 per cent of their household electricity greenhouse gas emissions.

When customers choose Green Gas, we offset emissions from natural gas usage through our independently audited Carbon Reduction Scheme.

## Carbon resilience

In October 2017, we released a paper on the resilience of our wholesale electricity portfolio to a low-carbon economy.<sup>8</sup> Our scenario analysis demonstrated the value of our wholesale electricity generation portfolio increases under both Australia's Nationally Determined Contribution (NDC) scenario and a 2°C scenario aligned with the Paris Agreement.

In October 2018, the Intergovernmental Panel on Climate Change released a new 1.5°C scenario analysis (IPCC SR15).<sup>9</sup> We are in the process of updating our scenario analysis on the value of our wholesale generation portfolio for the impact of a trajectory which limits the rise in global average temperatures to less than 1.5°C.

Origin has invested in a relatively low-carbon, cost-competitive and flexible energy-generation fleet. Our generation capacity represents approximately 14 per cent of Australia's total NEM. We have a lower proportion of coal than the NEM average, a similar level of wind and solar renewables, significantly less hydro, reflecting the significance of the government-owned Snowy scheme, and a higher proportion of gas which serves as more reliable, dispatchable ('firming') capacity for the market as coal is retired and renewable generation increases.

Table 1: Origin's portfolio mix compared to the NEM, July 2019

	National Electricity Market		Origin portfolio (owned and contracted)	
	MW	%	MW	%
Generation capacity	52,987		7,476	14
Coal	23,006	43	2,880	39
Gas	12,064	23	2,726	36
Hydro	7,983	15	240	3
Wind and solar	8,903	17	1,207	16
Other	1,031	2	423	6

<sup>8</sup> [originenergy.com.au/content/dam/origin/about/investors-media/AGM%202017/Scenario%20Analysis%20FY2017.pdf](http://originenergy.com.au/content/dam/origin/about/investors-media/AGM%202017/Scenario%20Analysis%20FY2017.pdf).

<sup>9</sup> [ipcc.ch/sr15/](http://ipcc.ch/sr15/).

## Case study



# Delivering renewable energy to Australia's busiest airport

Seventy-five per cent of Sydney Airport's electricity will be supplied by wind power in an innovative energy agreement that combines renewables with firming generation.

When Sydney Airport decided it wanted a cost-effective way to reduce its emissions and meet its energy needs, we helped develop an innovative agreement.

Sydney Airport is Australia's busiest airport, so any energy agreement needs to meet the airport's load even when the wind does not blow. We structured an all-in-one agreement with Sydney Airport which includes contracted wind power from Crudine Ridge Wind Farm, helping reduce its emissions, bundled with firming energy such as gas, to meet its load and transition to a cleaner energy supply.

Crudine Ridge Wind Farm is located 45 km south of Mudgee in New South Wales, has 37 turbines, an output capacity of 135 MW and is expected to be fully operational by late 2019. Sydney Airport's offtake will represent approximately 25 per cent of the output from Crudine Ridge.

Daniel Teng, Head of Origin's Electricity Portfolio, said there is growing interest from commercial customers for renewable energy solutions. "As renewable energy in Australia continues to grow in scale, we're helping our customers source energy with direct line of sight to wind and solar projects, which in turn helps address their sustainability targets."

"Increasingly, our customers want to combine clean energy with the assurance of firming energy and expert portfolio management. That's where we come in, creating new products to help our customers meet their sustainability aspirations whilst providing firming fuel from our generation portfolio backed up with our extensive experience," Daniel said.

## Decarbonisation targets

As the first Australian company to set an emissions reduction target approved by the SBTi, we have a formal, public commitment to reduce Scope 1<sup>10</sup> and Scope 2<sup>11</sup> greenhouse gas emissions on an equity share basis<sup>12</sup> by 50 per cent by 2032, while also committing to work with our value chain on reducing Scope 3<sup>13</sup> emissions on an equity share basis by 25 per cent over the same time period.

### Scope 1 and Scope 2 target

Our target is to halve our Scope 1 and Scope 2 greenhouse gas emissions by 2032 from our FY2017 baseline. Our FY2017 base year data has been restated to incorporate emissions from Australia Pacific LNG's Train 2 which was not fully operational when the baseline was initially set. The new FY2017 baseline is 18,246 kilotonnes (kt) CO<sub>2</sub>-e.

Our equity Scope 1 and Scope 2 emissions were 19,715 kt CO<sub>2</sub>-e in FY2019, in line with FY2018.

The intended closure of Eraring by 2032 will make the most significant contribution to the realisation of our Scope 1 and Scope 2 emissions reduction target.

### Scope 3 target

Origin has also committed by reducing Scope 3 emissions by 25 per cent by 2032 from an FY2017 baseline. Following an audit review and updated calculation methodology, our FY2017 base year data has been restated to 27,451 kt CO<sub>2</sub>-e.

This approved Scope 3 target covers all supply chain emissions incurred within the domestic market.<sup>14</sup> It includes the electricity and gas our Energy Markets business sells to customers, and the gas Australia Pacific LNG sells to domestic customers. It does not include Australia Pacific LNG volumes, which meets SBTi's minimum two-thirds coverage requirement for Scope 3 targets.

Our FY2019 Scope 3 emissions were 23,863 kt CO<sub>2</sub>-e, a decline on FY2018. The decrease in Scope 3 emissions is primarily due to lower electricity demand from our customers, the commencement of new renewable Power Purchase Agreement generation contracts and the overall decarbonisation of the NEM emissions intensity as new renewable generation was commissioned throughout FY2019.

Further details of our FY2019 emissions are included in the *Greenhouse gas emissions* section.

- 
- 10 Scope 1 emissions are from sources that are owned or operated by Origin, in particular electricity generation and gas development.
  - 11 Scope 2 emissions result from the electricity that we consume to power our offices and operating sites.
  - 12 Emissions on an equity basis capture the emissions relating to the assets we own, including our generation fleet and Origin's 37.5 per cent share of Australia Pacific LNG, including the downstream operations and non-operated areas.
  - 13 Scope 3 encompasses indirect emissions, other than Scope 2, relating to our value chain that we do not own or control, including wholesale purchases of electricity from the NEM.
  - 14 Liquefied Petroleum Gas (LPG) and Corporate Scope 3 emissions are excluded as their emissions are not material.



## We Mean Business

Origin is a proud member of the We Mean Business coalition, which is dedicated to accelerating corporate action on climate change.

In 2015, we became the first energy company in the world to sign up to the first seven commitments. We continue to make progress in key areas, such as setting a science-based emissions reduction target and continuing to improve our public disclosures.

### Progress against our climate change commitments<sup>15</sup>

#### 1. Publish climate change information in mainstream reports

Origin became a supporter of the TCFD and began implementing the recommendations of the TCFD in FY2018. The TCFD provides a framework for consistent and coherent disclosures on climate-related risks to help stakeholders make informed financial decisions.<sup>16</sup> Our TCFD disclosure is located in *Appendix 1: TCFD disclosure*.

Origin also voluntarily participates in the annual Carbon Disclosure Project Climate Change questionnaire. We report climate change information in this report and in our Operating and Financial Review within our Annual Report.

#### 2. Undertake responsible corporate engagement in climate policy

During FY2019, we continued to support an emissions intensity scheme and emissions reduction policy as a way for Australia to meet its decarbonisation obligations. This included advocating for more ambitious targets for the electricity sector.

We also engaged in various climate change-related policy at the State Government level, including a range of policies to support renewable energy, associated firming technologies (such as batteries and pumped hydro), energy efficiency schemes and support for electric vehicles.

#### 3. Adopt a science-based emissions reduction target

In 2017, we proudly became the first Australian company to have our emissions reduction target approved by the independent SBTi.<sup>17</sup> This accreditation confirms that Origin's emissions reduction targets are in line with the Paris Agreement's 2°C objective.

#### 4. Set measures to factor in the cost of carbon internally, to judge its effect on investment decisions to drive down carbon emissions

Origin incorporates a range of carbon prices into our annual strategic financial planning process and for specific investment and market analysis. This range enables us to test the resilience of existing assets and the strength of future investments by considering business-as-usual decarbonisation scenarios and more ambitious cases such as the Paris Agreement's 2°C and the more aggressive IPCC SR15 1.5°C scenario. During FY2019, we analysed carbon prices of up to \$80 per tonne.

#### 5.(a) Become Australia's leading renewable and low-carbon energy provider, helping our customers to procure electricity from renewable sources

This year we made a significant step towards our target of more than 25 per cent of our owned and contracted generation capacity being sourced from renewables and storage by 2020 with the commissioning of multiple solar farms in South Australia and Queensland.

Innovative energy agreements that combine renewables with firming generation were secured in corporate power purchase agreements with the University of NSW (100 GWh), Southern Regional Organisation of Councils (SSROC) (40 GWh) and Sydney Airport (95 GWh).

Origin was the number one Commercial Installer in the 10–100 kW solar category for the second year in a row<sup>18</sup>, and in March 2019, the largest commercial office battery in Australia was installed in our Melbourne office.

We also began work on a \$5 million feasibility study to nearly double the Shoalhaven pumped hydro scheme with support of the Australian Renewable Energy Agency (ARENA).<sup>19</sup>

#### 5.(b) Procure 100 per cent of energy from renewable sources for our office premises and, where possible, all other operations by 2050

We purchase 100 per cent GreenPower for our eligible<sup>20</sup> offices in Sydney, Brisbane and Adelaide.<sup>21</sup> We also continue to pursue cost-effective ways to convert our regional operational sites to GreenPower, where available. Solar has been installed at nine of our Liquefied Petroleum Gas (LPG) terminals and we are evaluating the potential of further solar installations at both leased and owned LPG terminal sites.

#### 6. Reduce short-lived climate pollutants

The majority of our short-lived climate pollutants (SLCPs) are methane emissions from our Integrated Gas business and make up approximately 1 per cent of our total emissions. We report our SLCPs via the National Greenhouse and Energy Reporting Scheme (NGER) and National Pollution Inventory. To better quantify our methane emissions, where possible we are moving away from factors to higher order *National Greenhouse Emissions Reporting Act 2007* methodologies that allow us to more accurately measure our emissions. This reflects improvements to metering, measurement and calculable outcomes. We have also commenced designing and installing new infrastructure to reduce these emissions.

#### 7. Remove commodity-driven deforestation from all supply chains

The launch of our Supplier Code during the year and the supplier information gathered through our Vendor Portal self-assessment questionnaire will help target appropriate improvement actions in areas where we may have a material deforestation risk. Refer to the *Procurement* section for more details on our Supplier Code.

15 Note: these are the original commitments Origin signed up to in 2015. There have been subsequent revisions and additions to the commitments, which Origin reviews on a regular basis for relevance and consideration in our climate change strategy.  
16 [fsb-tcdf.org/tcdf-supporters](http://fsb-tcdf.org/tcdf-supporters).  
17 The Science Based Targets initiative is the only WMB-authorised body able to verify the scientific and mathematical validity of decarbonisation targets – that is, they confirm our trajectory is in line with the Paris Agreement 2°C objective.  
18 *Sunwiz 2018 Year in Review*, February 2019.  
19 ARENA is contributing \$2m towards the detailed feasibility assessment to nearly double the overall generating capacity via a new 235 MW unit.  
20 An office location is eligible if it is CBD-based, the lease arrangements allow for electricity negotiations and the building does not include an equivalent grid energy product, e.g. cogeneration plants. Origin's Melbourne office is exempt as it has a trigeneration unit in the building, which provides low-carbon onsite electricity, and waste heat is converted to provide heating and cooling within the building.  
21 The lease arrangements for our CBD sites in Sydney, Brisbane and Adelaide require a nomination of GreenPower supply volume in advance; therefore, minor differences arise between actual consumption and nominated. In FY2019, this difference resulted in Origin's GreenPower consumption being ~95 per cent of total consumption.

## Profile

# Amber Fennell

General Manager,  
Business Energy  
and Energy Services



### Delivering solutions for Origin's business customers

Origin's General Manager, Business Energy and Energy Services, Amber Fennell, says Good Energy is about striking a balance between getting the basics right and delivering innovative products and services.

"Increasingly, our customers are looking to Origin to help them take advantage of the dramatic technological changes occurring across the energy sector. What they really want to know is whether there are solutions available to help them to manage their energy costs and consumption," said Amber.

"We are actively trialling a range of battery and demand response technologies, and right now we're putting these to the test in a Virtual Power Plant trial we're running with the Victorian Government. By connecting customers' batteries and solar photovoltaic (PV) systems to our demand management platforms, we're able to help customers manage their stored and generated electricity, and ultimately have this traded into the electricity market and reduce demand placed on the existing electricity network.

"We've also helped a number of our customers achieve their carbon neutrality aspirations by tailoring Power Purchase Agreements that guarantee a portion of their electricity supply will be matched with electricity from renewable sources like wind and solar. With the Stockyard Hill Wind Farm coming online in 2020, there will be further

opportunities for our customers to directly access renewable energy in this way.

"We continue to maintain a relentless focus on making life easier for our customers. Sometimes the simplest things are the hardest to get right. Responding promptly to our customers and getting bills out on time and accurately are just as important as engaging with customers on the range of innovative products and services we offer.

"In the year ahead, we'll continue to bring innovative products to market and will support this with a program of digitisation that will improve how we serve our business energy customers and ultimately simplify how they interact with us," said Amber.

# Greenhouse gas emissions



## Performance at a glance

- Total Scope 1 and Scope 2 operated emissions in line with FY2018.
- 40 per cent reduction in emissions from flaring.
- Implemented a range of emissions reductions initiatives across the business.



The output of our power generation portfolio drives our total emissions and emissions intensity. We also produce emissions as part of our natural gas activities as upstream operator of Australia Pacific LNG.

Our Energy Markets portfolio continues to support the reliability of the NEM, with output of 20,281 GWh in FY2019. Overall, internal generation output was down 6 per cent on FY2018, reflecting lower gas generation with more gas being directed to business customers.

While our gas generation was lower in FY2019, our gas generation fleet plays an increasingly important role in providing the required reliability and firming support for the rapid increase of intermittent renewables in the NEM.

The decrease in gas generation was partly offset by an increase in output at Eraring to support affordability, stability and reliability in the NEM and a 60 per cent increase in output at Shoalhaven, reflecting the use of hydro as a store of energy to support the increase in intermittent renewables.

We also increased the amount of generation sourced from contracted renewables by 18 per cent with the commissioning and commencement of offtake from a number of solar farms during the year.

Gas production at Australia Pacific LNG continues to support both the domestic market, with affordable and reliable gas, and exports of LNG to growing Asian economies.

## How we report

In line with our formal emissions reduction targets under the SBTi, we consider our direct emissions (Scope 1 and Scope 2) and the indirect emissions (Scope 3) in our value chain.

We report our Scope 1 and Scope 2 emissions under the NGER framework. We are not required to report our Scope 3 emissions under the NGER framework; however, we believe it is important that entities take responsibility for influencing emissions up and down the supply chain and as such we report our Scope 3 emissions data. We calculate Scope 3 emissions based on the Greenhouse Gas Protocol's Corporate Value Chain (Scope 3) Accounting and Reporting Standard and Scope 3 guidance documents.

Where data is not available due to timing, we apply a reasonable estimation methodology. Where applicable, we revise prior year data in the Sustainability Report to replace estimates and align with external reporting requirements such as NGER.

More information on how we are decarbonising our business can be found in the *Energy and climate change section*.

Additional emissions information is available in our FY2019 sustainability performance data, which can be found at [originenergy.com.au/about/sustainability](http://originenergy.com.au/about/sustainability).

## Greenhouse gas emissions across Origin

We report our Scope 1 and Scope 2 greenhouse gas emissions on both an equity basis and on an operational control basis.

### Greenhouse gas emissions – equity basis

Emissions reported on an equity basis capture the emissions relating to the assets we own, including our generation fleet and Origin's 37.5 per cent share of Australia Pacific LNG, including the downstream operations and non-operated areas.

In FY2019, Scope 1 and Scope 2 emissions on an equity basis were 19,715 kt CO<sub>2</sub>-e. This is in line with FY2018, reflecting a decrease in Scope 1 emissions due to lower generation from our gas fleet against increased output at Eraring, offset by higher Scope 2 emissions due to increased pumping at Shoalhaven and an increase in the proportion of gas produced from electrified facilities at Australia Pacific LNG.

**Table 2: GHG emissions – equity basis (kt CO<sub>2</sub>-e)**

	Scope 1	Scope 2	Total
Energy Markets	17,319	292	17,611
Integrated Gas	1,205	893	2,098
Corporate	-	6	6
<b>Total FY2019</b>	<b>18,524</b>	<b>1,191</b>	<b>19,715</b>
Energy Markets	17,460	160	17,620
Integrated Gas	1,221	861	2,082
Corporate	-	7	7
<b>Total FY2018</b>	<b>18,681</b>	<b>1,028</b>	<b>19,709</b>

**Table 3: GHG emissions – operational control basis (kt CO<sub>2</sub>-e)**

	Scope 1	Scope 2	Total
Energy Markets	17,159	292	17,451
Integrated Gas	909	1,994	2,902
Corporate	-	6	6
<b>Total FY2019</b>	<b>18,068</b>	<b>2,291</b>	<b>20,359</b>
Energy Markets	17,189	160	17,349
Integrated Gas	973	1,922	2,896
Corporate	-	7	7
<b>Total FY2018</b>	<b>18,162</b>	<b>2,089</b>	<b>20,252</b>

## Greenhouse gas emissions – operational control basis

Our operational control Scope 1 and Scope 2 emissions represent emissions from our operated assets, being our generation fleet and 100 per cent of the upstream operations at Australia Pacific LNG. Operational control emissions reporting aligns with the NGER reporting requirements. Our Scope 1 and Scope 2 operated emissions were less than 1 per cent higher than last year.

Our operational control Scope 1 emissions decreased slightly in FY2019 to 18,068 kt CO<sub>2</sub>-e, while our operational control Scope 2 emissions increased in FY2019 to 2,291 kt CO<sub>2</sub>-e, for the reasons described above.

### Greenhouse gas emissions from Energy Markets

On an operational control basis, Energy Markets' Scope 1 and Scope 2 emissions were 17,451 kt CO<sub>2</sub>-e in FY2019, a slight increase on FY2018.

## Emissions intensity

Our Scope 1 and Scope 2 emissions intensity in power generation, including contracted renewables, increased to 0.72 tonnes of CO<sub>2</sub>-e per MWh in FY2019, from 0.71 tonnes of CO<sub>2</sub>-e per MWh in FY2018. We increased generation sourced from contracted renewables, which provide negligible emissions intensity, by 18 per cent during FY2019.

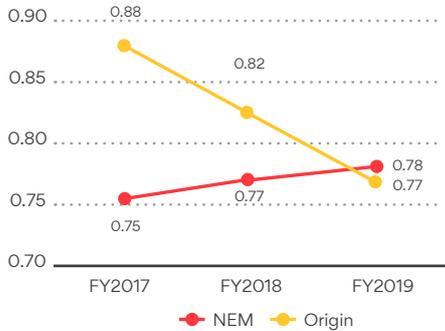
To enable a valid comparison of our performance against the NEM, where intensities consist of Scope 1 and Scope 3 emissions, we also report our emissions intensity in this format. The emissions intensity of our electricity generation portfolio, including contracted renewables, was 0.78 tonnes of CO<sub>2</sub>-e per MWh, compared to the NEM average of 0.77 tonnes of CO<sub>2</sub>-e per MWh in FY2019.

This is the first year our portfolio has had a higher emissions intensity than the NEM, partly reflecting the continuing decarbonisation of the NEM. As the NEM decarbonises via the closure of old, carbon-intensive coal-fired power stations and the introduction of renewables and storage, Origin is playing an important role both in ensuring the reliability of the NEM during this transition phase, and in decarbonising the NEM through the growth of our own renewable generation portfolio. This is most evident in the increase in generation output from Eraring required to meet the generation shortfall created from the closure of generation capacity in the NEM. This increased output from Eraring results in a higher average emissions intensity of our generation portfolio.

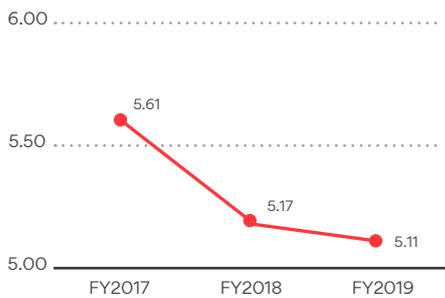
**Graph 2: GHG emissions by Scope (kt CO<sub>2</sub>-e) – operational control basis**



**Graph 3: Average emissions intensity NEM vs Origin (t CO<sub>2</sub>-e/MWh, Scope 1 and Scope 3)**



**Graph 4: Integrated Gas emissions intensity (t CO<sub>2</sub>-e / TJ)**



Our higher emissions intensity also reflects a reduction in generation from our gas fleet, as a proportion of our total generation, as gas played more of a firming role to support the increase in intermittent renewables in the NEM.

Emissions intensity across our Energy Markets portfolio varies, depending on the type of generation, and is calculated using Scope 1 emissions only. Emissions intensity associated with Eraring decreased to 0.92 tonnes of CO<sub>2</sub>-e per MWh in FY2019, from 0.93 tonnes of CO<sub>2</sub>-e per MWh in FY2018 as a result of efficiency improvements such as the real-time optimisation project described on page 19.

Gas-fired power stations are typically less emissions-intensive than coal-fired power stations. At the end of FY2019, gas represented 36 per cent of our internal and contracted generation capacity. The emissions intensity of our gas generation fleet was 0.56 tonnes of CO<sub>2</sub>-e per MWh in FY2019.

### Greenhouse gas emissions from Integrated Gas

On an operational control basis, Integrated Gas produced total Scope 1 and Scope 2 emissions of 2,902 kt CO<sub>2</sub>-e in FY2019, in line with FY2018 emissions. Approximately one-third of the reported emissions from Integrated Gas in FY2019 occurred directly from our onsite activities (Scope 1), and two-thirds were produced when the electricity we used to run these operations was generated (Scope 2).

#### Emissions intensity

The Scope 1 and Scope 2 emissions intensity of Integrated Gas was 5.11 tonnes of CO<sub>2</sub>-e per TJ in FY2019, a reduction from the FY2018 emissions intensity of 5.17 tonnes of CO<sub>2</sub>-e per TJ, mainly due to reduced flaring at Australia Pacific LNG, offset by an increase in the proportion of production at Australia Pacific LNG's electrified gas processing facilities.

#### Scope 1 emissions

Integrated Gas Scope 1 emissions declined by 7 per cent in FY2019 to 909 kt CO<sub>2</sub>-e.

Of our Scope 1 emissions, 287 kt CO<sub>2</sub>-e consisted of methane emitted into the atmosphere from venting and leaks as carbon dioxide equivalents. Vented and leaked methane is measured using a combination of methods: approximately half from regulatory emission factors and the balance from metering and engineering calculations.

Venting increased by 29 per cent during FY2019, mainly due to changing the type of gas used in the dehydration process from nitrogen to methane as part of a process safety improvement project. Australia Pacific LNG's upstream methane emissions from venting and leaks have remained at approximately 0.1 per cent of metered gas sales from operated areas.

Origin has a robust risk-based inspection and infrastructure integrity program that is designed to manage venting and minimise leaks. It includes an annual maintenance program for wellheads and surface facilities, and continual testing of pipework and vessels for cracking and erosion. We continue to focus on our gas monitoring program, aiming to reduce our reliance on regulatory emission factors. This monitoring data also informs about whether to retrofit or change the design of new infrastructure to reduce these emissions. An example of a recent change involves a number of our new wells now featuring one electric valve instead of three gas valves, which reduces methane emissions.

Emissions from flaring are predominantly CO<sub>2</sub>, as the methane is combusted during the flaring process. Integrated Gas teams have worked throughout the year to substantially reduce flaring at our gas processing facilities (GPF) by 39 per cent by better managing the supply from wells during planned maintenance shutdowns at the GPFs.

**Table 4: Integrated Gas Scope 1 emissions – operational control (kt CO<sub>2</sub>-e)**

	Emitted gas	FY2019	FY2018
Venting	CH <sub>4</sub>	266	206
Leaks	CH <sub>4</sub>	21	16
<b>Fugitive emissions from venting and leaks</b>	<b>CH<sub>4</sub></b>	<b>287</b>	<b>222</b>
Flaring	CO <sub>2</sub>	171	283
Fuel gas & other	CO <sub>2</sub>	450	468
<b>Total Integrated Gas Scope 1 emissions</b>		<b>909</b>	<b>973</b>

### Methane emissions from the landscape

Shallow gas and seeps are naturally occurring, but we know gas developments can change the natural methane migration and emission patterns, as observed in the Surat Basin.

We have performed targeted intercept and development work around the Condamine River, including drilling specifically designed wells for these seeps. These wells have helped us capture the methane emissions before they reach the surface and direct them to our production facilities. Recent measurements show a 95 per cent drop in Condamine River seeps since the peak during 2016 as a result of the intercept and development work.

We continue to monitor the seeps using a methodology developed by the Commonwealth Scientific and Industrial Research Organisation (CSIRO) and will continue to engage with the neighbouring landholders and communities to understand their concerns and provide updates on our activities.

### Monitoring and studies

During the year we have continued the work of the Picarro 'sniffer truck', with the vehicle travelling over 17,000 kilometres in FY2019. The sniffer truck includes sensors which detect background greenhouse gas emissions and is so sensitive it can detect emissions from a single cow at 50 metres. The truck is helping us to measure landscape emissions as well as emissions from infrastructure. The data continues to show that our methane emissions are low.

We are also working collaboratively with CSIRO to investigate methane emissions from Origin's operations, including coal seam gas (CSG) wells, gathering lines, gas processing plants and water treatment facilities and gathering ponds. The research will be used to validate the estimations produced by the Picarro truck and assist Origin to verify annual reporting of methane emissions.

An initial progress report from CSIRO confirms the Picarro truck estimates are comparable to emissions rates estimated in a 2014 report by CSIRO to the Commonwealth Department of Environment.<sup>22</sup> A final report is expected during FY2020.

While there is no regulatory requirement to report emissions outside of our operations, we continue to work with CSIRO and other independent scientific experts to research landscape emissions, which occur naturally across the Surat and Bowen basins in Queensland. We aim to quantify these emissions against our operations and to identify and quantify other sources of emissions, such as abandoned coal exploration bores that pre-date CSG landowner bores, and other agricultural activity.

### Indirect emissions (Scope 3) performance

As detailed in the *Energy and climate change* section, Origin's Scope 3 emissions do not include Australia Pacific LNG's exported LNG volumes, purchased LPG and corporate emissions which meets SBTi's minimum two-thirds coverage requirement. Our Scope 3 emissions are reported on an equity basis.

Our total Scope 3 emissions declined to 23,863 kt CO<sub>2</sub>-e in FY2019.

Scope 3 emissions in Energy Markets decreased because we purchased less electricity from the NEM and increased our contracted renewable generation, and there was an overall fall in electricity demand in FY2019. The NEM also saw a decline in emissions intensity due to increased renewable generation, which further reduced our Scope 3 emissions.

Integrated Gas also saw a decline in Scope 3 emissions due to a 5 per cent reduction in domestic gas sales at Australia Pacific LNG.

Table 5: Scope 3 emissions (kt CO<sub>2</sub>-e)

	FY2019	FY2018
Energy Markets	20,095	20,805
Integrated Gas	3,768	3,946
<b>Total</b>	<b>23,863</b>	<b>24,751</b>

<sup>22</sup> [environment.gov.au/climate-change/climate-science-data/greenhouse-gas-measurement/publications/csg-fugitive-emissions](http://environment.gov.au/climate-change/climate-science-data/greenhouse-gas-measurement/publications/csg-fugitive-emissions).

## Reducing greenhouse gas emissions across the business

We understand that while the majority of our carbon emissions come from Eraring, which we have committed to closing before 2032, we can also reduce greenhouse gas emissions through other means.

### Improvements at Eraring

During FY2019, we continued work on a Real Time Optimisation (RTO) project at Eraring, which is an Australian-first digital tool to optimise power plant performance. During FY2019, over 136,000 tonnes of CO<sub>2</sub>-e\* were avoided due to the RTO efficiency improvements. Once the project is fully implemented, we aim to avoid a total of 1 million tonnes of CO<sub>2</sub>-e at Eraring between 2020 and 2025.

### Electric vehicles

Electric vehicles produce zero direct emissions and will play an important role in the decarbonisation of the transportation sector. We operate a fleet ranging in size from passenger vehicles right through to heavy duty trucks, and we now have a program to transition to electric vehicles where we can.

We will initially focus on the small to medium passenger segment – 4 vehicles have been ordered to date, with up to 10 vehicles expected to be operating in our fleet by the end of 2019.

We will continue to assess emerging electric solutions for other vehicle types, such as heavy-duty trucks.

### Solar powering our LPG sites

As part of our We Mean Business commitments, we have committed to sourcing 100 per cent of energy from renewable sources for our office premises and, where possible, all other operations by 2050. To help with that commitment, and to get energy right for our planet, we are installing solar at our LPG terminals. To date, we have installed solar at nine of our LPG terminals and we are looking to expand this installation at other sites.

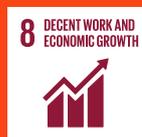
\* Compared to FY2016 baseline performance.

# Working in the Beetaloo Basin



## Performance at a glance

- Seven on-country meetings with Native Title holders.
- Supporting the community with local sponsorships and maintaining local airport.
- 6.6 TCF of 2C contingent resource booked in 2017.



Origin holds exploration permits in the Northern Territory's Beetaloo Basin that cover 18,500 square kilometres of pastoral leasehold land east of the Stuart Highway between Daly Waters and Elliott, around 600 kilometres south of Darwin.

The Beetaloo Basin is the Northern Territory's most prospective onshore basin for shale gas, with four, stacked, unconventional hydrocarbon plays identified. Initial appraisal has indicated there is a very large natural gas resource of outstanding potential, with 6.6 trillion cubic feet recognised as a contingent resource in FY2017.<sup>23,24</sup>

In mid-2014, we commenced a multi-year, nine well shale gas exploration project in the Beetaloo Basin. Since then, four wells have been drilled within regulations and with the consent of pastoralists and our host Traditional Owners.

In 2018, the Northern Territory Government lifted its moratorium on onshore gas production in response to the outcomes of the independent Scientific Inquiry into Hydraulic Fracturing in the Northern Territory.<sup>25</sup> Origin has since resumed work, adopting the recommendations made by the Inquiry and will continue to seek the necessary regulatory approvals to continue our exploration activities.

We are planning to drill two wells over FY2020 to evaluate the potential for liquids rich gas. The term, liquids-rich gas, refers to a mixture of natural gas with associated LPG and condensate.

Origin's Beetaloo exploration project has the potential to provide both greater domestic energy security, support local industry, and through the export of gas to Asia assist that region to decarbonise by replacing more carbon-intensive energy such as coal.

Natural gas plays a critical part in energy generation given it is cleaner than coal and its flexibility means it is well placed to support the growth of renewables. Refer to our *Energy and climate change* section for more details on gas as a transition fuel.

## Benefits of safe and responsible development

If exploration is successful and the Beetaloo project matures into a development, the project will deliver a range of benefits for the Northern Territory and local communities, including:

- employment opportunities for people living in the region;
- the opportunity for local companies to supply goods and services to the project;
- financial payment for pastoralists and Native Title holders; and
- taxes and royalties to the Northern Territory Government that can go to improving community services, infrastructure and telecommunications.

Maximising potential economic and employment opportunities continues to be a priority as our exploration program in the Beetaloo progresses. In mid-2019, business networking forums were held in Darwin, Alice Springs and Tennant Creek to assist Origin and its specialist principal contractors to better understand local service and supply capabilities to maximise local business participation in the project. Support for these events was reflected by representatives from more than 100 businesses attending the Darwin event, 36 businesses attending in Alice Springs and 18 in Tennant Creek. See our *Procurement* section for further details on our regional and Indigenous procurement programs.

<sup>23</sup> Origin is not aware of any new information or data that materially affects the information included in the announcement to the ASX on 15 February 2017 and all material assumptions and technical parameters underpinning these estimates continue to apply and have not materially changed.

<sup>24</sup> [originenergy.com.au/about/investors-media/media-centre/beetaloo-basin-drilling-results-indicate-material-gas-resource.html](http://originenergy.com.au/about/investors-media/media-centre/beetaloo-basin-drilling-results-indicate-material-gas-resource.html).

<sup>25</sup> [frackinginquiry.nt.gov.au/inquiry-reports/final-report](http://frackinginquiry.nt.gov.au/inquiry-reports/final-report).

## Working with host Traditional Owners

Our host Traditional Owners have been working with us for the past four years on this project and they are optimistic about the economic and employment opportunities our project could deliver to their families and their communities into the future.

The Northern Land Council is the statutory body responsible for determining who are the Native Title holders that may legally and culturally make decisions about the areas within our exploration permit. We work with the Northern Land Council to ensure we are engaging with the Traditional Owners who are the rightful Native Title holders for Origin to consult and work with.

During the past 12 months, Origin has worked with the Northern Land Council and our Native Title holders to complete sacred site clearance and avoidance surveys, secured Aboriginal Areas Protection Authority certification for nine potential exploration locations and participated in seven on-country meetings with Native Title holder families. Our agreements with Native Title holders are secured through mutual negotiations guided by the principles of free, prior and informed consent.

## Supporting the community

Supporting the Northern Territory community is important to us and we have made a meaningful contribution to the local community in a number of ways.

We have sponsored the local Australian Football League, the Elliot Hawks, for the last five years and we recently partnered with the local Elliot community, the Barkly Regional Council and other sponsors, including some of our principal contractors, to establish a football oval for the Hawks.

For the last three years we have been maintaining the Daly Waters airfield, an important way for the community to access emergency treatment that would otherwise be many hours' drive away. We have recently completed clearing work at the airport, purchased lighting and trained both Origin employees and members of the community to support night landings for emergency services such as the Royal Flying Doctor Service.

## Hydraulic fracture stimulation

Hydraulic fracture stimulation, or fracking, is the technical process designed to release the gas trapped in the dense shale rocks deep underground, as shown in the diagram below.

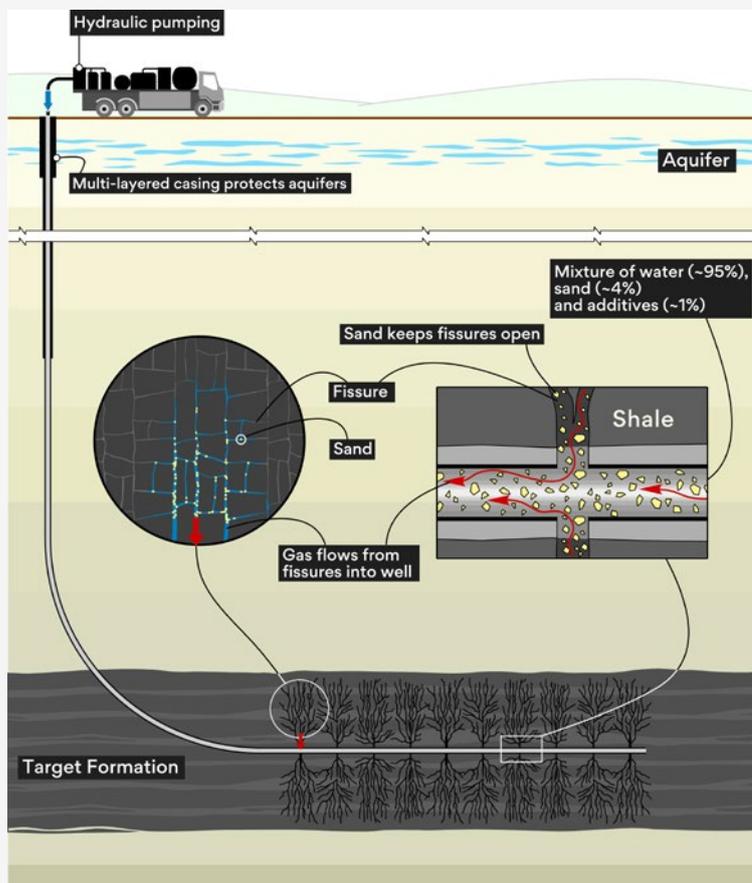
Fracking has been carried out safely in the Northern Territory for the past 40 years. Fracking involves pumping water mixed with sand and some chemical additives

in low concentrations under pressure to fracture the shale. This creates tiny pathways in the rock that allow the gas to flow into the well and be brought to the surface.

The recent independent Scientific Inquiry into Hydraulic Fracturing in the Northern Territory found the risks identified with fracking can be mitigated or reduced to an acceptable level, and in some cases eliminated.

### Key facts about fracking in the Beetaloo Basin

- Distance offers important protection – there is over two kilometres between the shallow aquifers and the deeper rocks where gas is found. Both zones are effectively sealed off by several thick geological layers in between.
- A fracture cannot extend upwards into the aquifer because there is not enough energy and pressure used in fracking to create pathways into different rock formations from where gas is found.



Note: Not to scale.



## Protecting underground water sources

Origin recognises how important groundwater resources are to Traditional Owners, pastoralists and the community. Both engineered and natural geological barriers and controls isolate and protect these vital underground water sources and we test these controls prior to proceeding with work.

A water monitoring program was established in 2014 to provide a baseline of the natural variability in water levels and water quality and detect any impacts associated with gas exploration activity. This monitoring has found no evidence of any impact from our work to date.

The well standards we apply in the Beetaloo Basin are high when measured against best practice by the world's reputable and proven operators. We design and engineer our wells to protect aquifers and to ensure they are strong enough to withstand the most extreme caseloads they could be subjected to. Added to this is a program of regulatory control and oversight, and a requirement to appropriately decommission wells at the end of their operational life.

## Minimising above-ground impacts

By adopting multi-pad drilling techniques and horizontal wells we aim to minimise disruption to pastoral operations.

Origin's submission to the Northern Territory Scientific Inquiry described the surface footprint for a future large-scale development scenario for our exploration permits in the Beetaloo Basin being no more than 10 square kilometres. This is based on adopting a multi-pad well design, and with related surface infrastructure taking up no more than 2 per cent of a 500 km<sup>2</sup> land area.

GISERA has recently completed a study to measure the baseline methane emissions of the Beetaloo Basin. The study covered the various seasons in the Northern Territory and was carried out using the Picarro 'sniffer truck' technology also used to measure methane emissions at our Australia Pacific LNG operations. The baseline will provide an important measure for developing appropriate policy and responses to shale gas development.

## Profile

# Russell Jeffery

## Regional Relationship Specialist

Origin Regional Relationship Specialist, Russell Jeffrey, sees himself as the conduit between the local community and the company for our exploration work in the Beetaloo Basin in the Northern Territory.

Born and raised in Darwin, and a proud Territorian, Russell's role focuses on building and maintaining relationships with the host Traditional Owners and Native Title holders for Origin's permits.

"I really feel that I'm a strong voice, and a strong advocate. They ask me questions; I give them the answers. And if I can't, I find the answers for them. For me it's about supplying the real facts behind what we do, and how we do it," Russell said.



Russell recalls it wasn't always that way when it comes to his own understanding and comfort about the gas industry and topics such as fracking.

"I went out of my way to learn the process and get the real news, I suppose, and get the truth. And I'm very happy I did that and am comfortable in the fact it is safe."

Origin is preparing to resume operations in the Beetaloo Basin, adopting the recommendations made by the recent Scientific Inquiry and gaining the necessary regulatory approvals.

Russell says host Traditional Owners are happy for Origin to be coming back and resuming work, which will see the opportunities and benefits begin to flow again for their families and in their communities.

"Every one of our Native Title holders has spoken strongly about wanting their kids and their grandkids to have the opportunities they didn't have - because there aren't a lot down this way, so for them it's all about the now and the future for their kids and their grandkids to actually have some choices in life," he said.

Like most Territorians, Russell has a relative view of distance, and what it's like to work in more remote areas. For him being accessible is the key.

"If I get a phone call and they want to have a yarn about anything, or they want me to come on country and say hello, I can jump in the car and I'm six-and-a-half hours away. It doesn't worry me whether it's the working week or a weekend. If there's anything I can do to help I'll certainly make sure I do."

He also can't hide his love for working in the bush. "I've been bush all my life, so I've got a natural affiliation with it.

"I'm extremely proud to be working for Origin on this project which offers so much; not just to our Traditional Owners and pastoralists. I see this as a project that has so much to offer the whole of the Northern Territory - and being a Territorian that makes me extremely proud to be a part of it," Russell said.

# Australia Pacific LNG



## Performance at a glance

- \$198 million spent on regional procurement.
- Supporting local communities through \$143,500 of sponsorship and donations.
- Signed 137 conduct and compensation agreements with landholders.

6 CLEAN WATER AND SANITATION



As upstream operator of Australia Pacific LNG, Origin is responsible for CSG exploration and production, with major gas processing and water treatment facilities located near the regional towns of Roma, Chinchilla and Miles.

Australia Pacific LNG is a joint venture between Origin (37.5 per cent), ConocoPhillips (37.5 per cent) and Sinopec (25 per cent) and is Australia's largest producer of CSG. Australia Pacific LNG supplies the domestic gas market, as well as processing CSG into LNG to meet growing export demand.

During FY2019, Australia Pacific LNG continued strong production levels from Queensland's Surat and Bowen basins with 124 export cargoes of LNG shipped during the period and total production of 679 petajoules of gas.

Domestic gas supply is vital for commercial and industrial gas users in Australia. Australia Pacific LNG provided approximately 30 per cent of gas supply to the east coast market in FY2019 and has been a net contributor to the domestic market every year since it was formed in 2008.

Through its exports of LNG, Australia Pacific LNG helps reduce global greenhouse emissions in Asia where gas is used to replace coal-fired electricity generation.



## Community involvement

When conducting activities at this local and regional level, we always seek to improve the communities where we operate.

Origin do this by procuring local goods and services wherever possible and ensuring our major contractors do the same. We support local community initiatives through dedicated funding programs, offering local apprenticeship and traineeship opportunities and we provide financial incentives for our people to 'live local'.

Origin made significant contributions in FY2019 across the Western Downs and Maranoa regions. A total of 29 community-based organisations have benefited from just over \$143,500 in our sponsorship or donations, and we continue to support local businesses with \$198 million spent on regional procurement. Refer to our *Procurement* section for further information.

Donation recipients included Roma State College, where we provided support for the school's Indigenous senior students' camp, and the Chinchilla State School where our support provided onsite paramedics at the Chinchilla Trail Ride fundraising event.

Chinchilla's popular Melon Festival, the Miles Back to the Bush Festival and the Tara and Cobb & Co festivals were again proudly supported by Origin in FY2019. Our people also regularly volunteer their time to support these community events.

Australia Pacific LNG continues to support the Queensland Symphony Orchestra as it takes classical music performances and classes to schools and communities across the Surat Basin region.

In 2019, we resumed our 'Origin of Gas' tours where local residents and visitors to the Surat Basin region are shown through our Condabri and Talinga gas processing and water treatment facilities.

The tours are proving to be a popular attraction, with 44 people, including students on a university field trip, attending a tour in July 2019.

## Profile

# A fitting achievement

After a few early challenges, Chinchilla's Sinade Crothers-Wilcox says she has now got the balance right between work and family life.

And much of this is thanks to Origin seeing her potential and giving her a second chance to finish her mechanical fitter apprenticeship, which she began in 2009 as a 17-year-old.

Not that Sinade's potential would be hard to miss. "Welding is still my favourite thing to do," said the 26-year-old with a smile as she cast her mind back to when she was 10, and built a trailer and car with her dad, Colin, who taught her how to weld.

Sinade was successful in gaining a place in Origin's 2018 Apprentice and Trainee Program intake to complete a four-year Mechanical Fitter apprenticeship.

"Getting this job has helped my family tremendously and has given me the opportunity to finish my apprenticeship doing what I love," said Sinade.

Origin's General Manager for the Condabri, Talinga and Orana asset, Alex Kennedy-Clark, said the apprenticeships are an important part of the company's commitment to local employment.

"We're keen to provide employment opportunities for local people to start a career in the industry," Alex said.

"We currently have a dozen apprentices and trainees from two previous intakes living in the Chinchilla, Miles and Roma communities and working at our operational sites from Talinga and Condabri, up to Reedy Creek and Spring Gully," she said.

Origin's apprenticeship program combines on-the-job learning, professional and technical training, mentoring and career development opportunities within the gas industry and is run in partnership with MIGAS Apprentices and Trainees, a registered group training organisation.



## Land access and coexistence

Many of our activities require access to land owned by others. We recognise that productive, ongoing relationships with landholders are vital to our operations.

Our approach to accessing someone else's land includes:

- Engaging with landowners before any activity occurs to ensure they are informed and supportive;
- Locating and scheduling activities to minimise the impact on landowners; and
- Always working towards outcomes, that, where possible, benefit both parties.

## Conduct and compensation agreements

Conduct and compensation agreements (CCAs) between Origin and landholders set out the details of how we will enter the land to carry out our activities and how landholders will be compensated.

We negotiated and signed 137 CCAs<sup>26</sup> with landholders connected to Australia Pacific LNG in FY2019. These CCAs bring the total number of agreements signed since the Australia Pacific LNG project began to 1,175.

## Responding to landholder feedback

In FY2019, we received 25 complaints from landholders with whom we have negotiated or are negotiating a CCA. More than half of these complaints related to the way Origin employees and contractors had accessed their land, including leaving gates open, and driving heavy vehicles in certain areas. We strive to improve our performance and further reduce the number of complaints.

## Hydraulic fracture stimulation

At Origin, at a minimum, we comply with the stringent regulatory requirements that guide fracking.

As the upstream operator of Australia Pacific LNG, we fracked and completed 91 wells as part of our CSG operations in FY2019. This compared to 79 wells in the prior period. There were no reportable groundwater impact incidents caused by fracking at any of our operations in FY2019.

We only hydraulically stimulate wells when we need to improve the flow from less-porous gas-bearing coal seams. Over the life of Australia Pacific LNG's operations, we expect to frack around half of all wells.

Australia Pacific LNG uses water-based fluids in the fracking process. The majority of the hydraulic fracture fluid is recovered from the well during the initial production phase that is part of normal CSG operations. However, a small component (i.e. sand) is designed to remain within the reservoir.

Refer to our online Hydraulic Fracture Stimulation Fact Sheet for further information, including a list of the additives in the hydraulic fracturing fluid used by Origin.<sup>27</sup>

## Environmental impacts of our gas operations

Communities near Australia Pacific LNG's operations have told us that one of their main concerns is the potential for our activities to impact groundwater levels and quality. Australia Pacific LNG participates in an extensive water monitoring program, which includes complying with management plans and regularly submitting test results to the Queensland Government.

Since FY2018, Origin has supported a grants program to install monitoring equipment in landholder bores to enable them to participate in CSG Net, which is a monitoring network of private bores. This program provides continuous water data online and also enables landholders to contribute water data to the government's online database.

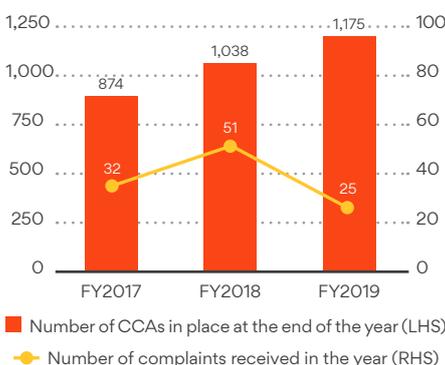
The groundwater extracted from Australia Pacific LNG's operations is treated and either directed to irrigation of crops, aquifer reinjection or potable water for operations. Our *Environment* section contains more information about our water use.

## Cultural Heritage Management Plans

Cultural Heritage Management Plans (CHMPs) set out processes and plans for protecting Indigenous cultural heritage in areas where we operate, including Australia Pacific LNG's operations.

During FY2019, Australia Pacific LNG was not associated with any incidents of non-compliance with Indigenous Land Use Agreements or CHMPs.

Graph 5: CCAs and landholder complaints



<sup>26</sup> The number of Australia Pacific LNG CCAs, as defined by Queensland's *Mineral and Energy Resources (Common Provisions) Act 2014* signed during the 12-month period. This excludes non-operated sites.

<sup>27</sup> [originenergy.com.au/content/dam/origin/about/our-approach/docs/OurApproach-2016-Hydraulic-Fracture-Stimulation.pdf](http://originenergy.com.au/content/dam/origin/about/our-approach/docs/OurApproach-2016-Hydraulic-Fracture-Stimulation.pdf).

# Affordability and reliability of energy



**We work every day to make energy more reliable, affordable and sustainable, never forgetting that energy is an essential daily service for households and industry.**

Origin is Australia's largest energy retailer, with 4.2 million customer accounts. We value our customers and the choice they make in selecting Origin as their energy provider.

In past years, customers have experienced a rise in electricity prices, in part due to rising wholesale electricity costs driven by the rapid retirements of coal-fired power stations. To help address these cost pressures, we have increased supply into the market by lifting output from Eraring and delivering additional gas supply into the domestic market.

In June 2019, we took a leadership role and announced that we would go beyond what is required by the Commonwealth Government's Default Market Offer (DMO) to ensure that none of our electricity customers on a flat rate tariff pay more than the DMO.

Given the essential nature of energy, protecting people in financial hardship is always a priority for Origin, having protected our hardship customers from price increases since 2016. We are also working closely with community partners to support these customers in other ways, including investing more than \$15 million in our Power On hardship program.

## Energy affordability and support for vulnerable customers

During the year we continued to deliver the South Australian Government's Concessions Energy Discount Offer and increased the level of support to our customers by uplifting the discount from 18 per cent of usage and supply to 20 per cent on both gas and electricity. To date, we have helped more than 50,000 concession cardholders.

We have taken action to reduce electricity prices by moving more than half a million homes and small businesses across New South Wales, Queensland and South Australia onto lower prices on 1 July 2019. This included a range of customers who are not impacted by the DMO, such as customers on non-discounted market contracts. And for those customers already benefiting from lower-priced discounted market offers, we announced that tariffs would be kept flat.

We are also working closely with community partners to support financial hardship customers. At the end of FY2019, our Power On hardship program had supported 44,000 customers, with 48,600 customers having paid their debts and successfully completing the program. For almost 16 years, this program has helped vulnerable customers with personalised payment plans, matched incentive payments, energy efficiency audits and appliance replacement schemes.

## Customer snapshot

We are the leading retailer of energy – electricity, natural gas, LPG and solar – to homes and businesses across Australia.

At the end of FY2019, we had 2.6 million electricity customer accounts, 1.2 million natural gas customer accounts, 362,000 LPG customer accounts and 8,000 broadband customers.

Through Australia Pacific LNG, our Integrated Gas business sells gas to commercial customers domestically and also exports gas to large customers in Asia, including energy utilities.

## Performance at a glance

- Lowered prices for more than half a million customers, including absorbing cost increases in NSW.
- Co-developed and committed to industry-wide Energy Charter.
- Continued to support our most vulnerable customers through our Power On hardship program.



## Championing the customer

During the year, Origin was one of 15 companies that co-developed and committed to an industry-wide, customer Energy Charter. The charter is focused on ensuring a customer-centric culture and conduct in energy businesses and is supported by five key principles. Each principle has a set of actions, which in many cases we currently meet and against which we will report annually.

We see the charter as an important step by us and our industry in ensuring the community has confidence in energy businesses, particularly as we transition to a future energy system. For more information, visit [theenergycharter.com.au](http://theenergycharter.com.au).

In March 2018, we launched our Financial Inclusion Action Plan (FIAP) to make energy accessible and affordable for all Australians. Good Shepherd Microfinance runs the FIAP program, which was developed to support Australia's 2015 commitment to the G20 FIAP and the United Nations' Sustainable

Development Goals. To date, we have met 11 of our 15 FIAP commitments to tackle financial exclusion, with the remaining four commitments well underway.

We continued our involvement with the Consumer Advocacy Panel we established in FY2018, comprised of representatives from Australia's leading social welfare, consumer protection, energy policy and customer advocacy groups. In FY2019 we established a Customer Insights Panel and a Customer Experience Lounge to drive greater engagement and discussion with a range of customers across the country. These forums help us to ensure that customers' views are well considered and represented in our business decisions and promote a diversity of views related to consumer products and services.

## Policy certainty to deliver lower energy prices

The Retailer Reliability Obligation was introduced by the Commonwealth Government on 1 July 2019 and requires energy retailers to hold contracts or invest

directly in generation or demand response to support reliability in the NEM.

Nevertheless, certainty in Australia's national energy policy needs to remain a major priority to help address energy affordability for customers and to contribute to more sustainable pricing in the future. Policy certainty is needed to encourage timely investment in new energy supply – vital for putting downward pressure on prices. This is particularly important given that many of Australia's ageing coal-fired power stations will reach the end of their operational lives over the coming decade and will need to be replaced. Ensuring this is done at the least cost to customers while maintaining reliable supply must be a priority.

Our *Policy and regulation* section contains more information about Origin's contribution to the policy discussion on energy supply, reliability and affordability.

## Profile

# Mel Homes-Allen

## Project Lead Advocacy Programs



## Keeping the power on

At Origin, we're committed to providing Australians with energy that's reliable, affordable and sustainable, and continuing to prioritise support for vulnerable members of the community.

With a background in social work, Mel Homes-Allen always wanted to make a positive impact in the community. For over 15 years she's been part of the Origin team promoting financial inclusion and resilience and providing support for vulnerable customers.

"As Origin Project Lead Advocacy Programs, my role is all about ensuring our vulnerable customers receive the support they need, so they can continue to turn on their lights and get back on track," said Mel.

Since 2003, we've been supporting vulnerable customers to get on top of their energy bills and stay there through Origin's hardship program, Power On.

Mel explains, "We meet hundreds of customers at events such as Bring Your Bills Day. They bring along their bills, letters from retailers and any concession cards.

"We're able to provide face-to-face support, help people understand their bills, ensure they're on the best plan for them and provide energy saving tips. For customers facing financial difficulty, we're able to apply eligible rebates to their accounts and discuss options to help manage their ongoing energy costs."

We're currently supporting over 44,000 customers through Power On. "I feel proud when I see customers successfully move off the program. But early intervention, education and awareness can help to reduce debt, energy disconnection and the number of customers entering the program. It's incredibly rewarding to contribute to this and help shape a leading hardship program that aims to improve financial inclusion for all Australians.

"For me, Good Energy means doing everything I can to help all Australians feel Good Energy too. It means making energy accessible and affordable for everyone. It's helping to keep the lights on, cook dinner, connect via social media, do the laundry, relax and watch TV – we all need affordable and reliable energy for these things. It's how we power our lives," said Mel.

# Smarter and easier energy



Origin is committed to creating a positive customer experience and looking for ways to make our customers' lives easier.

## Making energy simpler for customers

Origin has long supported the introduction of a reference price across the sector as a way of making it clearer and easier for customers to navigate the market and compare offers between retailers.

By requiring all retailers to promote their offers off a common reference price, the introduction of the DMO and the Victorian Default Offer (VDO), on 1 July 2019, will go some way to making it easier for customers to navigate the market and realise the benefits of competition. We see this as a positive way to build customer confidence.

We are simplifying our product offerings to reduce complexity for our customers through a smaller number of product variants.

During the year, we also expanded Origin's Broadband offering, allowing customers to benefit from easily organising their energy and broadband with one interaction when they move home and are time poor.

## Digital-first

In FY2019, we launched new multichannel experiences across web and mobile apps, making it easier for customers to interact with us. We continue to see growth in our LiveChat function, with the volume of chats answered doubling over the previous year.

We have made improvements across key interactions with our customers, such as moving house or renewing a plan. We simplified both of these journeys, creating a new, shorter, three-click path, providing a fast and easy experience.

We know that electricity usage can be hard to understand so we have been helping our customers with the roll out of the Usage Buster tool which splits customers' electricity usage by appliance.

We have also added usage and cost information into MyAccount and our Origin App so customers can see costs and actual consumption in a quarterly, monthly or daily view.

To help our small to medium enterprise (SME) customers we launched a portal with improved usage and billing information, as well as Origin Connect, a portal to help builders streamline processes. Our new metering tool allows users to provide us with meter access information to enable timely meter upgrades as well as submitting a self-meter read.

Our digital-first approach is driving more customer interactions through our online channels, including increased MyAccount registrations and greater uptake of eBilling accounts.

## Innovative and low-carbon products

Recognising the ongoing changes in energy markets, we continue to partner on various initiatives and trials aimed at connecting customers to the energy and technologies of the future.

Origin is continuing to work with participants from Free Electrons cohorts to develop business applications in the areas of big data, the Internet of Things, demand response, energy management, plug-and-play storage solutions and electric vehicle smart charging.

## Performance at a glance

- Improved customer satisfaction – Interaction Net Promoter Score up to 22.0.
- Expanded Origin Broadband and launched new multichannel experiences across digital platforms.
- Continued investment in innovative and low-carbon products, including Sunshine Cycles in Byron Bay.



In FY2019, we co-invested in Intertrust Technologies (Intertrust) with a large German new energy company, innogy, our co-founder of the Free Electrons initiative. Intertrust is a US-based company that specialises in data security, data management and trusted transactions. We will work together with Intertrust to build capability in and deliver digitally enabled customer solutions.<sup>28</sup>

Through our sponsorship of EnergyLab, we have teamed up with Sunshine Cycles, a Byron Bay-based start-up. Sunshine Cycles offers locals and visitors alike the opportunity to ride vintage-style electric bikes which have been entirely charged using solar power. Sunshine Cycles users pick up their ride from their preferred SunPod and at the end of their selected rental period return it back to a pod within the area. The bikes are then charged overnight from batteries which have been charged during the day from solar panels on the roof of the pod.

### Customer satisfaction

One of our key customer satisfaction measurement tools is the Net Promoter Score (NPS), which measures customer advocacy, and helps us understand what our customers are saying about their experience with us. We measure NPS as a business (at the strategic level) and after a customer has a conversation or digital experience with us (at the interaction level).

Origin's Strategic NPS improved by seven points from -13 in FY2018 to -6 in FY2019. A key driver of this improvement centred around the value customers are receiving across plans and pricing, including an eight-point increase in the measure that Origin provides good value for money.

At the interaction level, our NPS was 22.0 in FY2019, an improvement from 21.7 at the end of FY2018. Since we began measuring Interaction NPS in FY2016, our performance has improved 79 per cent. This is due to improved customer experiences and more specifically, customer needs being met in the first instance (first call resolution).

We were also rated the top energy retailer by Reader's Digest in its 2019 Trusted Brands and Quality Service Awards survey and top for customer satisfaction in Canstar Blue's annual survey of Australian small business customers.

### Complaints and resolutions

We endeavour to resolve customer complaints quickly and identify learning opportunities to enhance our service delivery and customer experience. If a customer feels that, despite our best efforts, we have not addressed their issue or concern, they can have the matter reviewed by the relevant ombudsman in their State or Territory.



In FY2019, the number of ombudsman complaints per 1,000 Origin customers was 2.7, a decrease on FY2018 when we had 2.8 complaints per 1,000 customers. In FY2014, ombudsman customer complaints were 6.6 per 1,000 customers.

### Privacy and compliance

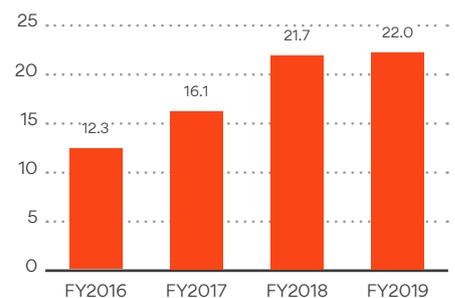
We are committed to protecting our customers' privacy and managing their personal information in accordance with the requirements of the Commonwealth *Privacy Act 1988* (Privacy Act). Our Privacy Policy and associated Collection Statements explain how we collect, use, hold and disclose personal information in accordance with the Privacy Act and the Australian Privacy Principles. For more information visit: [originenergy.com.au/privacy](http://originenergy.com.au/privacy).

In FY2019, we again ran our Privacy Awareness Week training sessions with a focus on general privacy requirements, customer-facing roles and dealing with Origin third-party vendors. There were no reportable privacy matters to the Office of the Australian Information Commissioner during FY2019.

Origin submits any compliance breach reports to the Australian Energy Regulator (AER), the Essential Services Commission of Victoria (ESCV) and the Economic Regulation Authority (ERA) in Western Australia. In FY2019, Origin reported breaches to the AER, ESCV and ERA relating to the timeliness and content of bills, wrongful disconnections, explicit informed consent, planned supply outage notifications<sup>29</sup> and lost call recordings.

No infringement notices were issued to Origin by the AER, ESCV or ERA in FY2019. In July 2019, the AER issued Origin with four infringement notices totalling \$80,000 in relation to wrongful disconnections that occurred between March and May 2018, two of which were the result of a system issue. Additionally, in line with an enforceable undertaking given to the AER, we are undergoing an external audit of controls to prevent this system issue reoccurring and to ensure disconnections occur only in accordance with regulations.

Graph 6: Interaction Net Promoter Score



<sup>28</sup> [originenergy.com.au/about/investors-media/reports-and-results/quarterly\\_report\\_march\\_2019](http://originenergy.com.au/about/investors-media/reports-and-results/quarterly_report_march_2019).

<sup>29</sup> This notification is a retailer responsibility following the Australian Energy Market Commission's Power of Choice review.

## Case study

# LPG delivery tracker

At Origin, we are always looking at new ways to make energy smarter and easier for our customers. We deliver LPG to around 250,000 homes and businesses right across Australia, and we wanted to improve that experience for our customers.

Our logistics team came up with the idea of the LPG Delivery Tracker to help our customers prepare for LPG deliveries, track the delivery in real time and alleviate everyday hurdles our drivers face, such as unrestrained dogs and locked gates.

When our customers order LPG, either over the phone or online, they now receive text messages with a tracking link. Customers can also cancel their delivery slot through the tracker and soon they will be able to reschedule it as well. On the morning of delivery, customers receive an update with a delivery slot and a reminder to unlock their gates or restrain their dogs. Once the driver is enroute, the customer can track the delivery in real time with a map showing the location of our truck and a final confirmation is sent once the delivery is complete.

Our drivers are really noticing the difference. Matt Bell, the leading hand for our Somerton terminal, echoes this: "Now that my customers know exactly when I am coming, I arrive to see gates unlocked and dogs tied up. This means I can complete more deliveries on my first attempt."

We began the roll out of the tracker in April last year, and it is now available Australia-wide to our residential and business customers. We now have over 100,000 customers who receive regular notifications when they place an order, reducing their uncertainty and the need to call for updated delivery information.



# Our people and culture



## Performance at a glance

- Our engagement score remained at 61 per cent, compared to the energy and utilities industry's average engagement score of 56 per cent.
- Indigenous employment increased to 41 employees, up from 35 last year.
- Introduced a new parental leave policy with increased paid primary and secondary carer's leave.



Our people are our greatest asset and play a critical role in Origin's success. Providing a workplace and culture for people to thrive in is key to the continuation of this success.

Our purpose, Getting energy right for our customers, communities and planet, was launched last year, and is supported by five values:

1. Work as one team, one Origin.
2. Be the customer champion.
3. Care about our impact.
4. Find a better way.
5. Being accountable.

During FY2019, we have built on our purpose and values by describing a set of behaviours, linked to each value, expected of our people. The behaviours demonstrate our values in action and set clear expectations of how we ask our people to work every day and with each other.

## About our workforce

Origin employed 5,360 people at 30 June 2019, compared to 5,565 employees in FY2018. The reduction is due to changes in corporate staffing levels and efficiencies in our Retail business.

At the end of FY2019, there were 463 Origin employees based at our regional operations.

## Employee engagement

Each year we commission Aon Hewitt to conduct an independent employee engagement survey.

In FY2019, 86 per cent of Origin employees participated in this survey. Our overall score was 61 per cent, consistent with last year's result despite significant organisational changes throughout the year. We remain ahead of the energy and utilities industry engagement score of 56 per cent, which declined over the year.

We strive to lift engagement across Origin with an aspiration to be placed in the top quartile of organisations across Australia and New Zealand in FY2020 by achieving a score above 69 per cent.

Part of executive remuneration is tied to Origin's overall engagement score in this survey.

Graph 7: Employee engagement score

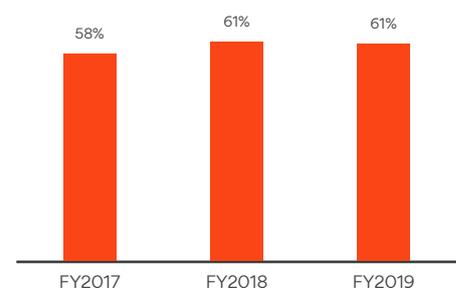


Table 6: Origin workforce

	FY2019	FY2018
Number of employees	5,360	5,565
Percentage of females	37%	38%
Percentage of males	63%	62%

## Diversity

Origin achieved 30 per cent of women in senior roles in FY2019. We continue to deliver gender pay equality on an equal pay for equal work basis. This will remain one of our targets in FY2020, along with improving the appointment rate of women to senior roles by 15 per cent year-on-year (from 31.5 per cent in FY2019 to 36.2 per cent) and improving the retention rate for women in senior roles from 79 per cent in FY2019 to 85 per cent.

Further details of our diversity and inclusion policy and targets can be found in our Corporate Governance Statement at [originenergy.com.au/about/investors-media/governance](http://originenergy.com.au/about/investors-media/governance).

We believe balancing career and life is important and acknowledge it can be challenging. One way we have helped with this is by enhancing our parental leave policy to increase paid primary and secondary carer's leave, introducing flexible parental leave which allows new parents to choose to work part-time during parental leave and removing the previous qualifying period of 12 months.

We are a proud gold partner with Women & Leadership Australia through sponsorship of four Australian Women's Leadership Symposiums across the country. The symposiums help advance our female and male leaders who receive thought-leading content, exposure to industry wide diversity practices and an opportunity to network.

Origin continues to be recognised as an Employer of Choice for Gender Equality by the national Workplace Gender Equality Agency (WGEA) and remains accredited by the Australian Breastfeeding Association as a Breastfeeding Friendly organisation.

In May 2019, Origin reported its annual gender equality performance with WGEA. This report can be viewed at [originenergy.com.au](http://originenergy.com.au).

In FY2019, the Pride@Origin Committee was formed to create a safe and inclusive workplace for Origin's LGBTIQ community with the aim to exceed contemporary business standards in relation to our LGBTIQ community.

## Cultural diversity and Indigenous Australians

Since the launch of our Innovate Reconciliation Action Plan (Innovate RAP) in 2015, the inclusion of Aboriginal and Torres Strait Islander peoples in our workplace and communities has been an area of focus for us.

We launched our Stretch Reconciliation Action Plan (Stretch RAP) in July 2019, building on our Innovate RAP and embedding social change in our workplace. Our Stretch RAP aligns with Reconciliation Australia's three pillars: relationships, respect and opportunities. We have various commitments under our Stretch RAP, including doubling Indigenous employment at all levels by 2022. Further details can be found at [originenergy.com.au/about/community/reconciliation-action-plan](http://originenergy.com.au/about/community/reconciliation-action-plan).

In FY2019, we launched our Indigenous Employee Network (IEN). The IEN gives Indigenous employees a culturally safe space and acts as a sounding board for Origin, providing guidance on matters relating to reconciliation and Indigenous engagement.

Origin continues to be part of the CareerTrackers 10x10 program by providing temporary work placements for a minimum of 10 Indigenous graduates a year. The program aims to transition Indigenous students into full-time employment once they complete their degree. We continue to exceed this goal, providing 13 work placements in FY2019.

## Ethical business

Our Code of Conduct guides us in meeting our ethical standards and legal requirements, and all Origin employees complete a training program to understand its requirements. We encourage employees to report known or suspected breaches of the code and any other policies and directives, and to raise any other serious concerns they may have.

The Code of Conduct includes an Anti-bribery and Corruption directive that covers all aspects of our business.

Our Corporate Governance Statement in our Annual Report outlines our FY2019 disclosures on ethical behaviour and our Code of Conduct. This statement is available at [originenergy.com.au/about/investors-media/governance](http://originenergy.com.au/about/investors-media/governance).



Radiating Country by Riki Salam was commissioned by Origin as part of our Stretch RAP. It follows the wonderful 'Illuminating Country' artwork commissioned in 2014. It is the next iteration of the Origin story, and one we are enormously proud of.

This new artwork has been created around the idea of a journey – not just as a business that is continually evolving, but literally travelling the length and breadth of our beautiful country to share Good Energy across the nation.

# Safety



## Performance at a glance

- Improvement in process safety performance outcomes with no Tier 1 incidents.
- Decline in our TRIFR performance.
- Introduction of an industry-leading process safety dashboard.

We believe everyone has a part to play in making Origin a safe workplace so we, and those impacted by our activities, can all return home safe and well at the end of every work day.

One of our core values is caring about our impact – on each other, on the environment and on the communities in which we operate. We expect our people to demonstrate care by complying with safety regulations, our Health, Safety and Environment (HSE) policy, our HSE Management System and our Life Saving Rules, and by taking action to make our workplace safe. They can do this fully supported by our Authority to Stop Unsafe Operations, which is endorsed by our Executive Leadership Team and the Board of Origin.

Our HSE policy describes how we think about, plan and manage HSE impacts and initiatives across our business. This policy is supported by our HSE Management System, including directives that outline minimum requirements for how we manage HSE risks and impacts. The policy is available at [originenergy.com.au/safety](http://originenergy.com.au/safety).

We measure and track our HSE performance to gain insight into areas to focus on. The measures are aligned to our priorities for health, safety and environment, and are supported by annual targets. This year, we improved our process safety performance with no Tier 1 incidents and increased our reporting of potential serious incidents. However, our TRIFR performance declined in FY2019 as detailed below. Refer to our *Environment* section for details of our environmental performance.

## Personal safety

Our primary measure for managing personal safety is our Total Recordable Injury Frequency Rate (TRIFR).

Our FY2019 personal safety performance has reinforced the need for us to do better. We remain highly committed to preventing all injuries and continuing to achieve zero fatalities in our workplace.

Our HSE strategy outlines the key focus areas for us to improve our performance. It identifies three key levers: leadership, the management of critical controls for our material HSE risks, and learning.

We have set a TRIFR target of 2.8 for FY2020 and will continue to implement targeted programs and activities which support our strategy to reduce specific risks, including land transport, aviation, health and wellbeing, environment, as well as contractor management.

Working and partnering with our contractors during preventative maintenance shutdowns is crucial to improving our personal safety performance. We are undertaking a review of site-based HSE improvement plans to simplify and focus HSE activities and actions on key hazards related to personal safety.

We are consolidating our Safety Leadership Programs into one Origin-wide program that equips our people with consistent knowledge and understanding of the tools and techniques that drive an HSE-focused culture where everyone is accountable, mindful of risk and continuously learning.

## Process safety

Our process safety focus for FY2020 will be to continue to sustain and build on the improvements made in FY2019.

Our FY2020 priorities include a continued focus on safety-critical equipment, including preventative maintenance, as well as aligning performance standards, hazard analysis simplification and continued investment in building technical process safety competency across the workforce.

**Table 7: Origin safety performance**

Goal	Performance
<p><b>TRIFR</b> measures the number of company-wide work-related recordable injuries per million hours worked for employees and contractors.</p> <p><b>Target: 2.1</b></p>	<p>Following an improvement in our TRIFR performance over the last two years, in FY2019 we did not meet the high expectations we set for ourselves. Disappointingly, our TRIFR increased to 4.5 – which means 35 more people were injured than in FY2018.</p> <p>Our Lost Time Injury Frequency Rate (LTIFR) also increased to 1.1 from 0.5 in FY2018, with an additional nine injuries in FY2019. LTIFR, a subset of TRIFR, measures the frequency of injuries that result in an employee missing at least one full shift of work per million hours worked.</p> <p>Targeted activities that focus on and support the safety of our people and contractors have been introduced and will continue into FY2020 as a result of an increase in the number of injuries.</p>
<p><b>Actual Serious Incidents</b> measures the number of incidents that resulted in serious, major, critical or catastrophic outcomes for our people or the environment.</p> <p><b>Target: 4</b></p>	<p>Two targets were introduced in FY2019 to focus attention on reducing Actual Serious Incidents while also seeking to encourage reporting of Potential Serious Incidents – incidents that offer opportunities to learn and improve where the outcome could have been more serious.</p> <p>The Actual Serious Incident target of four was not achieved with nine Actual Serious incidents occurring.</p>
<p><b>Potential Serious Incidents</b> measures the number of incidents that had the potential to result in major, critical or catastrophic outcomes for our people or the environment.</p> <p><b>Target: &gt;30</b></p>	<p>The Potential Serious Incident target of &gt;30 was exceeded with 36 incidents being reported that potentially could have had a more serious outcome but did not. All of these incidents were shared across the business through incident learning forums which focus on improving awareness of risks and support learning to prevent Actual Serious Incidents occurring.</p>
<p><b>Process Safety</b> measures the number of process safety incidents that resulted in Tier 1 or Tier 2 events.</p> <p><b>Target: 7</b></p>	<p>In FY2019, there was no Tier 1 and eight Tier 2 process safety events, against a target of seven. While the target was not achieved, our performance represents an improvement on the FY2018 performance of 12 events and with no Tier 1 incidents occurring in FY2019 compared to three in FY2018.</p> <p>A contributing factor was the introduction of a company-wide process safety dashboard to improve the reporting and visibility of key process safety indicators. Additional programs focused on strengthening operational discipline and management of safety critical elements have also been implemented.</p>



## Case study



“It’s important that all of our people feel fully supported and can bring their whole selves to work.”

# Origin Health, Safety, Environment and Community awards

In FY2019, we extended our Energy Markets Health, Safety, Environment and Community (HSEC) awards to the whole of Origin. The awards recognise individuals and teams across the company who bring HSEC to life every day and take it upon themselves to find solutions to improve the way we work.

Deirdre Lewis, Head of HSE Energy Markets and sponsor of the awards, said, “There are many risks in our business that we need to manage every day. Our teams in the field do a wonderful job keeping HSEC front of mind at all times. The applications covered all areas of the business, demonstrating our culture of innovation and our peoples’ commitment to living Origin’s purpose, values and behaviours.”

The five finalists were:

- **Condamine seeps project** – the winning entry has helped minimise gas seeps from the Condamine River, reducing community concern and changing the way we develop gas. Refer to our *Greenhouse gas emissions* section for further information.
- **Powered trolley delivers LPG cylinders** – Luke Chaille (above), manager of our Gympie and Maryborough LPG terminals in Queensland, developed a powered trolley to deliver 45 kg LPG cylinders to our customers. After a successful trial across Queensland, the powered trolley will now replace manual trollies across our operations. This means safer deliveries by our people to homes and businesses, including to some customers we could not previously service, such as those with steep driveways.
- **Pride@Origin Committee** – the committee works to create a safe and inclusive workplace for Origin’s LGBTIQ community and improve awareness of all our people. Pride@Origin aims to exceed contemporary business standards in relation to commitment and action for our LGBTIQ community. Topher Foote, Chair of the committee, said, “It’s important that all of our people feel fully supported and can bring their whole selves to work.”
- **Process safety dashboard** – managing process safety is key to ensuring all our people and assets remain safe while being operated. The dashboard gives near real-time information to help us to view how well we are managing process safety controls and insights on how to improve. The dashboard has been recognised by International Oil and Gas Producers Association as industry best practice and was awarded the Queensland Generators Health and Safety Innovation Award.
- **Creation of a fault current calculator** – Application Engineer, Enam Khan, created a fault current calculator to identify potential risks when connecting protection boards to a customer’s solar system. As a leading solar system installer in Australia, most of our installations require us to install a protection board on the customer’s premises to protect personnel and equipment. Enam’s calculator ensures that the protection board installed can withstand any faults in an individual system, keeping both our people and customers safe.

# Environment



We understand the importance of the environment to the community and our operations. We seek to operate responsibly and protect the environment in which we work.

## Environmental performance

We exceeded our environmental performance target with no environmental consequence incidents occurring in FY2019. An environmental consequence incident is an incident that results in an actual consequence of a moderate, short-term impact to the environment (or above). Our result demonstrates an increased focus on our environmental impact across all operations.

Our environmental goal for FY2020 is to continue minimising our environmental impact by maintaining the strong performance outcome we demonstrated in FY2019.

## Waste

Origin is committed to safely and effectively managing waste across our entire business. Our two most significant waste-generating activities are at Erating and at the upstream operations of Australia Pacific LNG.

### Erating Power Station

The main by-product from burning coal as part of the energy generation at Erating is fly ash. The fly ash we produce has numerous applications across the industrial and construction sectors and is supplied onsite to multiple customers for a range of end uses or it is deposited in our ash dam adjacent to the power station.

In FY2019, Origin implemented new arrangements to increase Erating's ash reuse rate by 125,000 tonnes to 35 per cent of ash produced, up from 30 per cent in the year previous. We are actively pursuing new supply opportunities and non-traditional markets to support increasing our re-use levels.

As part of our ongoing maintenance and monitoring of the Erating site, we commissioned an engineering review of the ash dam in late 2018. This review found that while the dam is stable, its integrity could be affected in the event of a significant earthquake.

## Performance at a glance

- Improvement in environmental performance outcomes.
- 35 per cent of ash produced is reused, an increase from 30 per cent in FY2018.
- 99.9 per cent of water drawn by Erating is returned to Lake Macquarie.



Table 8: Ash produced and recycled at Erating (tonnes)

	FY2019	FY2018
Ash produced	1,733,399	1,604,296
Ash deposited	1,130,819	1,127,004
Ash recycled	602,580	477,292

In response to the findings of this stability assessment, the New South Wales Office of Sport took the decision to close its operations at the nearby Myuna Bay Sport and Recreation Centre. We are progressing extensive stabilisation works on the ash dam and we are in discussions with the Office of Sport to relocate the Myuna Bay centre at Origin's expense.

In addition to commencing the design of extensive stabilisation works, Origin also has an application before the New South Wales Department of Planning and Environment to undertake a moderate expansion of the Eraring ash dam.

### Australia Pacific LNG brine management

The main waste product from Australia Pacific LNG's upstream operations is brine. Its operations extract groundwater from CSG wells, and the water contains naturally occurring salt. We use reverse osmosis to remove the salt so that most of the water can be made available for beneficial use (see the *Water* section for more information). This process produces a salty waste product known as brine, which is stored in engineered ponds. These ponds are built to regulatory standards and are inspected annually by certified engineers.

Each Australia Pacific LNG water treatment facility has multiple brine ponds. The total available storage capacity in the brine ponds was 9,885 megalitres (ML) in FY2019. The total volume of stored brine at the end of the reporting period was 5,829 ML.

Some facilities can transfer brine between ponds to optimise storage use. Brine levels are monitored daily, and monthly assessments update our forecast storage requirements for the following two years. We review our five-year storage requirements annually as part of our budgeting processes.

There were no reportable loss of containment events at the brine ponds in FY2019.

## Water

We responsibly manage our water consumption and seek to protect water resources in the natural environment and ensure water is available for other users near our operations.

Origin mainly uses water for cooling while generating electricity, primarily at Eraring. We also extract water while developing natural gas at our Australia Pacific LNG operations.

### Origin's water use

We draw most of our water for electricity generation from surface sources, such as rivers and lakes. Eraring uses water from Lake Macquarie for cooling purposes. This represents the vast majority of water use in our Energy Markets business. More than 99.9 per cent of the water we draw at Eraring is returned to the lake, in accordance with our environmental approvals.

Our gas-fired power stations require much less water to operate than Eraring. Our combined cycle gas turbine at our Darling Downs Power Station uses air-cooled condensers, which reduces its water use by more than 95 per cent compared to a typical gas-fired generator.

Australia Pacific LNG's operations extract groundwater and gas from coal seams and small volumes of water from other sources like dams or bores for project use. In FY2019, we extracted 21,885 ML of groundwater in the Surat Basin through Australia Pacific LNG's operations. Around 91 per cent of this water, or 19,864 ML, was treated to remove naturally occurring salts through reverse osmosis, which significantly improves the water quality. The remaining 9 per cent was used for project activities, is stored as untreated water or was lost through natural evaporation.

Of the treated water, 17,169 ML, was available for beneficial use such as irrigation of crops, aquifer reinjection, for project use and as potable water for operations and 2,695 ML of brine was produced. More information on our approach to brine management is available in our *Waste* section. In FY2019, there were no releases to water courses, which sometimes occurs if we have excess water and can only be done under strict environmental licensing.

**Table 9: Water use across Origin's portfolio\***

Operation	Water cycle overview	Water extracted from source (ML)	Water returned to source (ML)	Water consumed (ML)	Water directed to beneficial use (ML)
Eraring Power Station	Water is drawn from Lake Macquarie for cooling. More than 99.9 per cent is returned to the lake, and the remainder lost as steam.	2,760,732	2,758,795	1,937	-
Australia Pacific LNG	Water is extracted to depressurise the coal seams and for project activities. The depressurisation allows production of CSG. Most of the extracted water is provided for beneficial uses (see section <i>Water for other uses</i> ).	21,885	-	4,716	17,169
Other	This includes water for gas-fired power stations, municipal water supply and minor operational uses.	88	-	88	-
<b>FY2019 totals</b>		<b>2,780,705</b>	<b>2,758,795</b>	<b>6,653</b>	<b>17,169</b>
FY2018 totals		2,871,334	2,846,491	7,438	17,405

\* Shoalhaven is excluded from the table as pumped storage is not considered a water withdrawal because the water circulates in a closed loop. Furthermore, no excess water was extracted from the catchment in FY2019.

### Protecting water resources

Our operational water management systems seek to ensure that our activities do not adversely affect water quality in the environment.

Within our gas operations, production wells are installed in coal seams to access gas reserves. These wells extract gas from below-the-water aquifers generally used by other users such as local landholders. As part of the installation process, and in accordance with regulation, steel casing is cemented into place to preclude aquifer interconnection during operations. We continuously monitor for interconnection which can be detected by observing changes in the groundwater levels of shallower aquifers surrounding the gas production well and by changes in the quality of water pumped from the water well.

### Water for other uses

#### Beneficial use<sup>31</sup>

Our irrigation program comprises:

- Purpose-built Fairymeadow Road Irrigation Pipeline, which started delivering treated water to participating landholders in April 2014.
- Spring Gully 285-hectare Pongamia plantation, operational since 2010, has been expanded to a larger landholder-run irrigation scheme to further enhance beneficial use for treated CSG water at Spring Gully.

We inject treated CSG water into aquifers in the Surat Basin for recharge and beneficial use by others in the community. We operate two aquifer injection schemes, one at Spring Gully, with a daily capacity of 8.1 ML, and the other at Reedy Creek, with a daily capacity of 40 ML.

#### Make good agreements

To allow gas to flow from target coal seams, water needs to be removed from the seam to reduce the pressure. The coal seam can also be a minor groundwater aquifer and some landholder bores extract water from the coal seams that CSG is produced from. Where we have identified a potential reduction in groundwater availability or increased gas release in water bores that access coal seams, potentially as a result of CSG production, we make good any impacts.

To date, it has been possible to install a replacement bore in an alternative aquifer nearby to access an equivalent water supply where this has been the landholders' preferred option. In the past, Origin has completed work on legacy coal bores, which were unrelated to our activities and off our tenures, to stop gas leakage.

We have installed 216 monitoring bores to date, which we use to regularly monitor groundwater levels and water quality around our Australia Pacific LNG operations. We submit our results to the Queensland Government as part of its regional monitoring and management program.<sup>32</sup>

### Air emissions

We report our air emissions under the National Pollutant Inventory (NPI) framework.

Electricity generation at Eraring produces the majority of the nitrogen oxides (NOx), sulphur oxides (SOx), and particulate matter (PM) emissions. Our operations at Australia Pacific LNG produce most of the volatile organic compounds (VOC).

During FY2019, our air emissions increased by 10 per cent. This was primarily due to increased SOx emissions at Eraring as a result of increased output as well as variations in coal quality used in the generation process.

While an increase in air emissions is disappointing, Eraring is one of the most efficient coal-fired power stations in the NEM and is the only coal generator in New South Wales that has installed low NOx burner technology, helping to minimise emissions.

As part of our commitment to halve direct emissions from our business, we have confirmed Eraring's closure by 2032. In the meantime, Eraring is crucial to both the security and reliability of power supply in the NEM.

**Table 10: Air emissions (tonnes)**

	FY2019	FY2018
NOx emissions	27,772	26,764
SOx emissions	45,049	39,329
VOC emissions	1,020	913
PM <sub>10</sub> from Eraring Power Station	225	245
Total	74,066	67,251
PM <sub>2.5</sub> from Eraring Power Station <sup>30</sup>	121	131

<sup>30</sup> PM<sub>2.5</sub> is a subset of PM10.

<sup>31</sup> Beneficial uses of the extracted water are "of value to the environment, existing or new water users, and existing or new water dependent industries", according to the Queensland Government [ehp.qld.gov.au/management/non-mining/csg-water.html](http://ehp.qld.gov.au/management/non-mining/csg-water.html).

<sup>32</sup> Surat Underground Water Impact Report Water Monitoring Strategy [dnrm.qld.gov.au/\\_data/assets/pdf\\_file/0003/345684/uwir-section8.pdf](http://dnrm.qld.gov.au/_data/assets/pdf_file/0003/345684/uwir-section8.pdf).

# Communities



## Performance at a glance

- Origin recognised as Best Workplace to Give Back in 2019.
- Origin employees participated in more than 2,000 instances of volunteering through the Origin Foundation's Give Time program.
- Spent over \$750,000 on community programs during the year in addition to Origin Foundation grant funding.



We respect the rights and interests of the communities in which we operate by listening to them to understand and manage the environmental, economic and social impacts of our activities.

Origin's three most significant interactions with communities occur in Queensland, at our Australia Pacific LNG operations, in the Northern Territory as part of our Beetaloo Basin exploration project and at our power stations, the largest of which is Eraring in New South Wales.

We understand the importance of our relationships with communities as our assets, such as power stations, gas processing facilities and pipelines, can have a lifespan of several decades, which means we have a long-term presence in the communities in which we operate.

Through the Origin Foundation we support programs which enable equality of educational opportunity for young people – particularly those from rural and regional locations, and of Aboriginal and Torres Strait Islander heritage, as well as programs which promote and encourage diversity in Science, Technology, Engineering and Maths (STEM).

## Community investment and support

We aspire to support regional communities and local economies. This support is reflected in our response to community feedback, which includes our Regional Buy program. Further information on this program is available in the *Procurement* section.

During FY2019, we spent over \$750,000 on various community programs. The programs are chosen by teams across the business and represent the issues that are important to those teams and the communities in which they work.

For example, the team at Uranquinty Power Station, in the Riverina region of New South Wales, contributed to funding for equipment and excursions for a regional school and to the Wagga Wagga Fusion Multicultural Street Festival, aimed at celebrating and uniting the Wagga community which comprises members from 112 countries, who speak 107 languages and practise 62 faiths.

Throughout the year we have also sponsored various community events and hosted information-sharing sessions across Queensland and the Northern Territory. For further details refer to both the *Working in the Beetaloo Basin* and *Australia Pacific LNG* sections.

## Engaging with communities

We continuously engage with the communities in which we work. We understand that a two-way dialogue is important to give the community a chance to raise any concerns they may have and to discuss upcoming activities.

In the Northern Territory, we host meetings at least annually with our Native Title holders for discussion, explanation and approval of our upcoming exploration plans. For further details refer to our *Working in the Beetaloo Basin* section.

Our Community Relations Advisors regularly hold meetings to share information and to listen to any uncertainties within communities.

## Responding to community complaints

We continue to monitor complaints from community members, our response time and the resolution of these matters. The majority of the Energy Markets complaints in FY2019 related to noise, while most of the Integrated Gas complaints were about land access (see the *Land access and coexistence* section for details).

The number of community complaints declined FY2019. This decrease is largely the result of a greater focus on community engagement and transparency with many issues resolved 'in the field' and thereby not requiring a formal complaint.

**Table 11: Community complaints**

	FY2019	FY2018
Community complaints received:	12	86
Energy Markets <sup>33</sup>	10	16
Integrated Gas	2	70
Community complaints resolved:	10	71
Energy Markets <sup>34</sup>	8	16
Integrated Gas	2	55

<sup>33</sup> This figure does not include complaints from customers. This information is contained in the *Smarter and easier energy* section.

<sup>34</sup> This figure includes resolving complaints from previous periods in FY2019.

## Case study



# Australian innovation starts young

Origin's littleBIGidea competition encourages innovation in young Australians. From day one, budding young inventors have used creative thinking, curiosity and practicality to solve real-world problems.

Now in its sixth year, littleBIGidea is an annual search for Australia's next generation of inventors. The competition invites Australian kids in grades three to eight to enter their innovative ideas – BIG and small – for the chance to win a trip to NASA's Kennedy Space Center in the USA.

Regardless of the outcome, the process of invention can be rewarding. Innovation is a key to success, and it starts when we are young. Encouraging creativity and curiosity in children can strengthen their adaptability and problem-solving skills later in life.

LittleBIGidea is about trying and testing new things, exploring important social and environmental issues and finding ways to create a better future.

Since launching in 2014, the competition has received over 7,000 entries and discovered many budding inventors. Some have gone on to achieve bigger things, using the opportunity to further their study and career ambitions, commercialise their ideas, as well as attract global attention.

Previous winners include Bridgette Veneris (2016) who invented the Faster-Aid Band-Aid Dispenser, which dispenses bandaids like a roll of tape; Charlie Johnstone (2018) who created Re-Print – a product to help minimise environmental waste and improve access to 3D printing; and Hamish Lane (2018) who invented a Colour-Blind Watch that detects colours, inspired by his vision-impaired younger brother.

Recently returning from his trip to the USA, Hamish said, "NASA was the best part of the trip – thank you Origin for giving me this miraculous opportunity. When I'm older I am very keen to study science and work in science. This is an opportunity of a lifetime and I will never forget it."

## Case study

# Lights for learning

## Origin Foundation

The Origin Foundation believes in the power of education to help transform lives and improve communities.

Founded by Origin in 2010, the Foundation has provided more than \$25.2 million to support community organisations. Through grants, volunteering and workplace giving programs, over \$1.5 million was distributed to the community in FY2019.

The Foundation's focus, chosen by Origin's employees, is to support education programs that help break the cycle of disadvantage and empower young Australians to reach their potential.

Origin employees support good causes in education through the Foundation's Give Time volunteer program. This year, our participation rate<sup>35</sup> of 42.2 per cent saw employees donate over 9,000 hours to help our community partners.

Working with teachers and schools, our volunteers have brought science and engineering to life in classrooms around Australia. They have helped students assemble portable solar lights, prosthetic hands and water filters for those in need in developing countries. Supporting communities across Australia, Origin volunteers have also shared their career stories, mentored young people, cooked meals for families in need, built homes, cleaned up rubbish, and restored natural wildlife habitats.

The Foundation's volunteer program was recognised at the 2018 Workplace Giving Excellence Awards, winning Good in the 'Best Pro Bono/Volunteering' category. We were also recognised by GoodCompany, which ranked Origin number one in their Top 40 Workplaces to Give Back survey for 2019, in recognition of our matched giving and volunteering programs as well as Origin's broader commitment to social responsibility.

Through our workplace giving program, the Origin Foundation matched employee donations of \$406,857 to over 250 Australian not-for-profit organisations in FY2019, doubling their contribution to the causes they care most about.



All around Australia, Origin volunteers and school children are working together to make solar-powered lights for Papua New Guinea (PNG) communities living in energy poverty.

The Origin Foundation has partnered with SolarBuddy, an Australian charity working to improve the educational outcomes of children throughout the South Pacific, South East Asia and Africa, by distributing portable solar lights.

The solar-powered lights are easy to operate, carry and charge. Without them, school students must rely on dangerous and unsustainable sources of fuel like kerosene, diesel, wood or candles to study after dark.

Despite many years of strong economic growth, much of the population of our closest neighbour, PNG, remains overwhelmingly poor, with only 7 per cent having access to the electricity grid. PNG has a young population, with 40 per cent under the age of 15. SolarBuddy lights help

children living in remote communities to study when the sun goes down, providing the opportunity for these young people to use education as a means of lifting their communities out of poverty. Results show that students are studying up to 78 per cent longer with a solar light.

During FY2019, more than 360 Origin volunteers helped almost 3,000 Australian students to become part of the solution. Together they have assembled over 1,000 solar-powered lights in 30 schools from Caboolture to Perth and Wagga Wagga to Hobart. Australian students participating in the program learn about the potential humanitarian impact of careers in science, technology, engineering and maths and improve ethical and intercultural understanding.

Narangba Valley State School in Brisbane was the first to participate in the program, in August 2018.

Principal Mrs Lorna Cogle said, "We are proud to be involved in a program which not only helps to teach students about science and engineering but is also designed to help those in need."

Year 6 student Heather, shared that she "felt so special that I'm in this class and able to help people in Papua New Guinea who aren't as privileged as us."



<sup>35</sup> Participation rate is calculated as number of volunteering instances divided by average employees across the year.

## Profile

# Mark Bernhardt



Mark Bernhardt joined Origin's Health, Safety and Environment team in 2012 and before long started participating in the Origin Foundation's volunteering program.

"My manager encouraged me to get involved because volunteering was something I was pretty passionate about," said Mark.

Mark participated in several volunteering opportunities but it was the Beacon Foundation's 'MyRoad' program where he really felt he could make a difference. The program provides young people in school, often disengaged and in disadvantaged areas, the opportunity to connect with volunteer mentors from different areas and learn about the world of work and potential career paths.

"If you had told me when I left school in year 10, that I'd have a degree under my belt and be in a pretty responsible position, I would never have believed you and that's one of the messages that I try to communicate to the kids that I mentor," said Mark.

Mark has volunteered nearly 80 hours with the MyRoad online mentoring program, reaching more than 150 students across 28 schools. To help prepare, he completed several training courses, including a course for specialist mentoring at the Goodooga Central School, where 94 per cent of the students identify as Aboriginal.

When asked about highlights of his role as a volunteer mentor, he immediately suggests the post-session feedback from the young people, provided by Beacon Foundation. After participating in a session with Mark, one student remarked, "The most important thing I learnt from my mentor was to persevere and to maintain hope and focus when entering the workforce or doing anything in life."

"My job is pretty serious; the volunteering gives some balance and variety. It's a really good feeling to know that you are potentially making a difference to a kid that may otherwise not have the opportunity to speak to someone about a future career. It's hard to put words around the value that brings," Mark said.

"Even if they've just taken one thing away from the session that helps them to be more successful when they leave school, I feel like I have made a difference."

At the 2018 NSW Volunteer of the Year Awards, Mark was nominated by Beacon Foundation for Corporate Volunteer of the Year, in recognition of his extraordinary commitment to the program, and the impact of his sincerity and caring attitude.

Mark actively encourages his colleagues to get involved. "We are so lucky to have the Origin Foundation available to us. It's a brilliant opportunity to make a difference."

**"Even if they've just taken one thing away from the session that helps them to be more successful when they leave school, I feel like I have made a difference."**

# Procurement



## Performance at a glance

- \$247 million spent directly with regional suppliers.
- Purchased goods and services from 34 Indigenous suppliers.
- Launched our Supplier Code outlining our expectations of suppliers.



We are committed to improving our supply chain's social, ethical and environmental footprint. We select suppliers who share this purpose to make a lasting, positive difference in our communities.

Origin procurement includes suppliers and contractors and the commercial parties that directly or indirectly help them meet our requirements. We consider our suppliers and contractors to be an extension of our business.

## Regional procurement

We recognise that procuring goods and services from local and regional suppliers is an important avenue for sharing economic value in the communities in which we operate. In FY2019, we spent \$247 million directly with regional suppliers.

We continue to engage with local communities around our operating assets, including hosting information evenings with some of our key suppliers and their communities to discuss supply opportunities on various projects. We also incorporate regional participation plans in major contracts, requiring principal contractors to commit to targets for regional employment, procurement and community engagement.

## Small business support

Origin became a signatory to the Business Council of Australia's Australian Supplier Payment Code in FY2018. This voluntary initiative emphasises the importance of complying with best practice standards by making on-time payments to small business suppliers. We have now converted the payment terms of all of our eligible vendors, bringing them in line with the code. Enhanced reporting of payment timeliness has also been implemented to enable continuous improvement and monitoring of compliance with this commitment.

## Responsible procurement

In April 2019, we launched our Supplier Code, outlining the attributes we expect of the suppliers we work with. These attributes relate to labour and human rights, health and safety, sustainable procurement and business integrity, community involvement and our suppliers' broader supply chain. Our Supplier Code allows us to build a more diverse, inclusive and transparent supply chain for the goods and services we buy.

Following the enactment of the Australian *Modern Slavery Act 2018*, we will be providing our first statement in the second half of 2020. The roll out of the Supplier Code and gathering of information about the suppliers with whom we do business is critical to identifying and eliminating modern slavery across our supply chain.

We have commenced rolling out the Supplier Code to our existing contracted suppliers by using a vendor portal. More than 500 of our key suppliers have now been sent invitations to register on the vendor portal to confirm their acceptance of the Supplier Code and provide further information about who they are, what they do and where they operate. This information will support our commitment to removing commodity-driven deforestation from our supply chain, as part of our We Mean Business commitments (refer to the *Energy and climate change* section for more details).

To bring this to life, we have updated our standard contract clauses which will be progressively implemented into our supplier contracts.

Our Supplier Code can be found at [originenergy.com.au/about/procurement](http://originenergy.com.au/about/procurement).

## Case study

### Increasing Indigenous participation

In FY2019, we continued to promote business and employment opportunities for Aboriginal and Torres Strait Islander peoples throughout our supply chain. We procured goods and services from 34 Indigenous businesses across construction, personal protective equipment, security services, and training.

Origin continues to provide opportunities for Indigenous businesses to engage with our procurement teams. These discussions enable Origin to better understand the capabilities and capacity of our local Indigenous businesses. This increased awareness has led to Origin taking such action as splitting large projects into smaller scopes of work to allow regional and Indigenous suppliers the opportunity to tender for a contract.

See our *People and culture* and *Communities* sections for information on cultural diversity and Indigenous participation in our workforce, including our Reconciliation Action Plan and the work of the Origin Foundation.



Kennelly Constructions Directors, Shane Kennelly (below) and Adam Kennelly (above).

## Breaking new ground

When Origin teamed up with leading Indigenous company Kennelly Constructions to do the early civil works on a large, new, engineered pond at the Condabri gas facility near Miles, Queensland, it meant a big shift in more ways than one.

For starters, the package of work involved shifting or relocating topsoil and spoil – approximately a quarter of a million cubic metres in total – ahead of the main pond construction activity commencing.

Kennelly used a fleet of machines including six large scrapers, excavators, graders and a water cart, along with a crew of operators who worked for around eight weeks to complete the job, which was finished in May 2019.

For Origin, it also marked a shift in approach for large construction projects such as this. Instead of tendering the construction of the pond scope as a whole, the project team separated out the early works package, giving local and Indigenous businesses an opportunity to bid for the job, in turn allowing their skills and capabilities to expand.

It also broke new ground in that it was the first time both companies had worked together – and at around \$2 million, it was the largest individual contract with an Indigenous business Origin's Integrated Gas business had struck.

Origin's Project Manager for Ponds and Major Civil Projects, Jason Ridley,

said the approach demonstrated that there is room for Indigenous suppliers at all levels of our supply chain.

“As a company we procure millions of dollars' worth of goods and services each year, and we have the opportunity to make a significant impact on the success and growth of Indigenous businesses,” Jason said.

Origin and Kennelly Constructions were recognised at the 2019 Queensland Resource Council's Indigenous Awards event held during National Reconciliation Week, coming runner-up in the 'Best Company Indigenous Procurement Initiative' category.

Shane Kennelly, Kennelly Constructions' Director, appreciated the efforts of the Origin Procurement team and the opportunity to work on the contract.

“Working with Origin has been a great way to demonstrate our capability and capacity to deliver work and develop relationships for future business opportunities. All of this is helping to create a sustainable economic future for our kids and generations to come,” said Shane.

# Policy and regulation



## Performance at a glance

- Origin is working with governments and regulators on market reforms and has taken action to reduce electricity prices for customers.
- Origin supports policy that encourages private sector investment in new electricity generation and gas supply.



Energy plays a critical role in almost every aspect of the economy and our everyday lives. As such, the energy industry is of considerable interest to governments and is highly scrutinised and regulated at Commonwealth and State government levels.

More than a decade of policy inaction and confusion around climate change policy has resulted in a muted investment signal and the retirement at short notice of ageing coal generators. There has been investment in variable renewable energy to meet the Renewable Energy Target but little other investment over this period.

Origin continues to advocate for a coordinated and long-term energy policy at the national level to give industry the confidence to invest in new electricity generation and gas supply. Investment is critical to maintain reliability and improve affordability as we transition to a low-carbon energy system.

## The ACCC review

The Australian Competition and Consumer Commission (ACCC) completed a review of the electricity retail market, releasing wide-ranging recommendations for reform across the energy supply chain in its July 2018 report.<sup>36</sup>

Origin supports well-considered market reforms that can reduce power prices while avoiding unintended consequences that might erode customer benefits, halt innovation or distort the market. To date, the Commonwealth has focused on the retail and generation recommendations and not the network or climate change policy recommendations.

A key recommendation of the ACCC review, and the previous Finkel review into the future security of the NEM, was to integrate energy and climate change policy and encourage new generation. The formerly proposed NEG was designed to integrate energy and emissions policy in a way that encourages new investment in clean and low-emissions technologies while allowing the electricity system to continue to operate reliably. Origin supports the objectives of bringing together energy and climate change policy and providing a clear investment signal.

<sup>36</sup> [acc.gov.au/publications/restoring-electricity-affordability-australias-competitive-advantage](http://acc.gov.au/publications/restoring-electricity-affordability-australias-competitive-advantage).

## Electricity policy

The Commonwealth Government is not progressing the emissions arm of the NEG but is implementing the reliability arm as the Retailer Reliability Obligation (RRO). The RRO commenced on 1 July 2019 and places an obligation on retailers to have sufficient dispatchable generation through ownership and contracts to support their customer demand.

## We have encouraged the Australian Government to adopt an emissions policy and will continue to work constructively with the all levels of government in this area.

A key policy is the Treasury Laws Amendment (Prohibiting Energy Market Misconduct) Bill 2018. This proposed legislation features interventions including, under certain circumstances, contracting orders from the Treasurer and forced divestiture of assets.

The Australian Government has implemented price regulation through the DMO, which commenced on 1 July 2019 in New South Wales, South Australia and southern Queensland. This policy makes it easier for customers to compare offers and provides protections for the small number of customers who remain on standing offers. However, the policy may discourage innovation and competition.

The government has also undertaken an expression of interest to support new investment in dispatchable generation. The process is targeted at new entrants and smaller players. They have also committed to Snowy 2.0 and support the investigation of a second Bass Strait link between Tasmania and the mainland.

The Victorian Government completed a review of its energy market and supported the expert panel's report, known as the Thwaites Report. This includes reregulation through the implementation of the VDO that commenced on 1 July 2019. The VDO is set at low levels and is likely to significantly reduce competition.

## Gas policy

Natural gas is an important fuel source in its own right. It also plays a critical role in firming up variable renewable energy and maintaining a reliable and affordable supply of electricity as we transition to a low-carbon energy system.

In 2017, tightness in the domestic gas supply market saw the Australian Government introduce the Australian Domestic Gas Security Mechanism (ADGSM). The ADGSM is designed to maintain domestic gas supply at competitive prices by directing LNG exporters to increase sales of gas to the domestic market, under specified circumstances.

Following commitments made by LNG exporters, including Australia Pacific LNG, the government announced it would not invoke the ADGSM, and therefore gas export volumes would not be affected. These commitments were extended into 2018 with the ACCC also finding that supply-demand balance is improving and prices decreasing.

Some large customers remain concerned about prices as traditional low-cost fields are in decline. Interventions such as export controls are considered unnecessary. Australia has abundant gas resources in all mainland states and new supply is needed to put downward pressure on prices.

Therefore, Origin does not support moratoria or other State-based restrictions on the development of onshore natural gas resources. Our operations in Queensland have shown that onshore gas production is safe and environmentally responsible and coexists harmoniously with farming activity. It was pleasing that the Northern Territory Government lifted its moratorium on onshore gas production in 2018, following the independent Scientific Inquiry into Hydraulic Fracturing in the Northern Territory. We have worked hard to meet the Northern Territory Government's preconditions and have resumed exploration in our highly prospective shale gas opportunity in the Beetaloo Basin. We encourage other States to follow the Northern Territory Government's lead, as we will need more onshore gas as traditional sources of supply decline.



# Governance



Origin is committed to meeting the expectations of all stakeholders to practise sound corporate governance.

We aspire to the highest standards of integrity, personal and process safety, community and social responsibility, and environmental performance. To achieve this, every employee and contractor is required to act in accordance with Origin's governance and business conduct standards across our operations in Australia and internationally.

Our Corporate Governance Statement outlines our approach to governance and risk management and is available at [originenergy.com.au/about/investors-media/governance](http://originenergy.com.au/about/investors-media/governance).



## Climate Change Risk Governance

### Board

Ultimate responsibility for climate-related risks and opportunities sits with the Origin Board. The Board considers, reviews and monitors climate-related risks and opportunities as part of investment considerations, and regular financial and operational performance reviews.

The Board's monitors and oversees progress on our emissions reduction targets and considers climate-related risks and opportunities at least annually as part of the Company's strategic planning process.

The Board's Risk Committee oversees climate change risk governance and related issues. Its role is to assist the Board to monitor our material, strategic and emerging risks. It is also responsible for making recommendations to the Board on the approval and release of climate-related disclosures, including our Sustainability Report, as well as reviewing and making recommendations to the Board on climate-related risks and opportunities associated with the Company's strategy, operations and investment.

Each year, the Risk Committee is presented with a summary of all material climate-related risks using the categories defined by TCFD, including Policy and Legal, Technology, Market, Reputation and Products and Services. The report summarises the reporting to the Board of each climate-related risk during the year. This provides assurance to the Board that all material climate-related risks are covered at least once during the year.

The Board's HSE Committee's role is to support and advise the Board on matters including material HSE risks and impacts arising out of our activities and operations. It considers specific HSE matters at the Board's request or where the HSE Committee itself feels that additional attention will be of benefit in the governance of HSE risks or impacts.

The Risk and HSE Committees meet at least quarterly.

### Management

The Executive Leadership Team Risk, Assurance and Compliance Committee (ELT RAC) is the primary executive level risk governance committee at Origin. Its primary role is to enable the Chief Executive Officer and Executive Leadership Team to discharge their responsibilities under Origin's Risk Management Policy and Risk Management Directive. This includes identifying and assigning responsibilities for climate-related risks, climate change risk governance which is reviewed at least annually, monitoring regular business unit reports, the quarterly Strategic Risk Report and the annual Sustainability Report.

The ELT RAC also reviews any escalated risks that arise within business unit risk, assurance and compliance meetings, based on the assessed risk level, and agreed escalation protocols.

Our Executive HSE Committee is the primary executive-level HSE governance committee at Origin. Its primary role is to support and enable our ELT and the Board to discharge their responsibilities under our HSE Policy and HSE directives.

The Executive General Manager, Integrated Gas and the Executive General Manager, Future Energy and Business Development are responsible for identifying, quantifying and managing climate-related risks and reporting these to the Board and the Board's Risk and HSE Committees.

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## Climate Change Risk Governance

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**Risk management framework** Climate-related risks and opportunities are identified, assessed and managed using Origin's risk management framework in the same way as all other risks at Origin.

Origin's risk management framework supports the identification, management and reporting of material risks in areas such as health and safety, environment (including climate change), finance, reputation and brand, legal and compliance and social impacts. Our framework is aligned with the International Standard (AS/NZ ISO 31000).

In general, risks are identified that have the potential to affect Origin's ability to meet its business objectives and impact its future financial prospects. They are categorised into one of four broad categories: strategic, operational, financial and project risks. Within this framework, climate-related risks tend to be categorised as either strategic or operational risks. Strategic risks are defined as internal and external uncertainties and potential opportunities affecting Origin's strategy and strategy execution. Operational risks are defined as losses resulting from inadequate or failed internal processes, people and systems or from external events.

The core of Origin's risk management framework is the Risk Rating Toolkit, which describes the criteria by which management judges the likelihood and potential consequences of all risks associated with our activities. The Toolkit requires management to assess potential impacts of our decisions and actions, not just by reference to law and regulation, but by reference to the impacts on our own people, the environment, the community and our shareholders.

As defined by the TCFD, climate-related risks extend from product development through to resource extraction with many different activities in between. The way we manage each risk or opportunity depends entirely on the context in which that risk or opportunity arises. All risks are governed by the risk management framework described above.

All material risks that meet our reporting thresholds are reported to the Board either monthly, quarterly or annually depending on materiality.

At least once a year, climate-related risks are gathered together and reported to the Board using the structure of the TCFD, namely Policy and Legal, Technology, Market, Reputation and Products and Services. This year, we also completed a risk culture survey across senior managers to get feedback about the quality and success of Origin's risk management processes in managing risks, including climate-related risks.

Further details on our risk management framework can be found in Section 7 of the Operating and Financial Report within our Annual Report.

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## Case study



## Site visits

During FY2019, members of the Origin Board made numerous site visits to our operations for first-hand experience of our assets and the opportunity to meet our dedicated teams and to observe and ask questions.

### Shoalhaven

Chairman, Gordon Cairns and Director, Scott Perkins visited our operations at Shoalhaven pumped hydro scheme in April 2019 to review its operations and safety aspects. They met with members of the operating team to discuss the potential expansion of the site (from 240 MW to 475 MW), which forms part of our strategy to grow renewables and storage in our generation portfolio.

### Reedy Creek

In July 2018, Director Steve Sargent visited Australia Pacific LNG operational sites at Reedy Creek in Queensland. Mr Sargent toured the gas processing and water treatment facilities and observed a completions drill rig in action. The tour provided an opportunity for Mr Sargent, a member of the Board HSE Committee, to have discussions on the controls in place that manage safety and environmental risks.

### Eraring

In June 2019, Chairman, Gordon Cairns and directors, Teresa Englehard and Steve Sargent visited Eraring Power Station. The visit provided an opportunity for the Board members to discuss their commitment to the safety of our people, the environment and the communities in which we operate.

### Beetaloo Basin

Director, John Akehurst visited the Beetaloo Basin in July 2018. Mr Akehurst visited a well site and met with local contractors who are working with us on the Beetaloo exploration project. During the visit, Mr Akehurst discussed the potential opportunities of the project with contractors and local community members and gain further insights on exploration results to date.

# Ratings and awards



## Carbon Disclosure Project

Origin has participated in the Carbon Disclosure Project (CDP) climate change survey since 2006, and the CDP water security survey since 2016. The surveys are conducted globally and reported in arrears.

Origin's 2018 CDP climate change performance score (covering FY2017) declined to 'D', signifying a 'disclosure' level, and partly reflecting that we were yet to adopt the TCFD disclosures for the period being assessed. We are working to improve this score and, since the 2018 survey, have become a supporter of TCFD as well as setting emissions reduction targets.

Origin's 2018 CDP water security performance score declined to a 'C', indicating an awareness level.

In 2019, we participated in the climate change survey, which covers our performance during the FY2018 reporting period. These responses will be available on the CDP website in late 2019.



FTSE4Good

## FTSE4Good

2004-2019

FTSE Russell confirms that Origin Energy has been independently assessed according to the FTSE4Good criteria and has satisfied the requirements to become a constituent of the FTSE4Good Index Series. The series measures the performance of companies demonstrating strong environmental, social and governance practices.

## Australian Council of Superannuation Investors

Leading rating for disclosure of sustainability risks in 2009-2011, 2013-2019.

In 2019, the Australian Council of Superannuation Investors reviewed Origin's level of sustainability disclosure and assessed it as being at a 'Leading' level within the energy and utilities sector for the last four or more consecutive years.

## Workplace Giving Excellence

The Origin Foundation's volunteer program was recognised at the 2018 Workplace Giving Excellence Awards, winning Gold in the 'Best Pro Bono/Volunteering' category.



## MSCI

In 2018, Origin received a rating of AA (on a scale of AAA-CCC) in the MSCI Ratings assessment.

MSCI's disclaimer can be found at [originenergy.com.au/sustainability](http://originenergy.com.au/sustainability).



## Sustainalytics

2019

Sustainalytics assessed Origin's overall environmental, social and governance score for performance in 2018 as 35.3/100 - high risk. We were ranked 27 out of 50 companies under Sustainalytics' new methodology.

## GoodCompany

Origin was recognised by GoodCompany, which ranked Origin number one in their Top 40 Workplaces to Give Back survey for 2019, in recognition of our matched giving and volunteering programs.

## Appendix 1

## TCFD disclosure



Climate change remains one of the most significant challenges facing companies worldwide and a high priority for energy companies given energy production is a major source of carbon emissions.

Origin unequivocally supports the United Nations Framework Convention on Climate Change and the Paris Agreement, and actions consistent with ensuring any rise in global temperatures is limited to well below 2°C.

We support the recommendations made by the TCFD and we set out here where our disclosures on climate-related risks and opportunities can be found in this Sustainability Report.

TCFD recommended disclosure	Where to find more information
<b>Governance</b>	
Disclose the organisation's governance around climate-related risks and opportunities	
a) Describe the board's oversight of climate-related risks and opportunities	<i>Governance</i> section, pages 48-49
b) Describe management's role in assessing and managing climate-related risks and opportunities	<i>Governance</i> section, pages 48-49
<b>Strategy</b>	
Disclose the actual and potential impacts of climate-related risks and opportunities on the organisation's businesses, strategy, and financial planning where such information is material	
a) Describe the climate-related risks and opportunities the organisation has identified over the short, medium and long terms	<i>Energy and climate change</i> section, Managing climate change risks and opportunities, pages 8-10
b) Describe the impact of climate-related risks and opportunities on the organisation's businesses, strategy, and financial planning	<i>Energy and climate change</i> section, Managing climate change risks and opportunities, pages 8-10
c) Describe the resilience of the organisation's strategy, taking into consideration different climate-related scenarios including a 2°C or lower scenario	<i>Energy and climate change</i> section, Carbon resilience, pages 11
<b>Risk management</b>	
Disclose how the organisation identifies, assesses and manages climate-related risks	
a) Describe the organisation's process for identifying and assessing climate-related risks	<i>Governance</i> section, pages 48-49
b) Describe the organisation's process for managing climate-related risks	<i>Governance</i> section, pages 48-49
c) Describe how processes for identifying, assessing and managing climate-related risks are integrated into the organisation's overall risk management	<i>Governance</i> section, pages 48-49
<b>Metrics and targets</b>	
Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material	
a) Disclose the metrics used by the organisation to assess climate-related risks and opportunities in line with its strategy and risk management process	<i>Energy and climate change</i> section, We Mean Business, page 14
b) Disclose Scope 1, 2 and, if appropriate, Scope 3 greenhouse gas emissions, and the related risks	<i>Greenhouse gas emissions</i> section, pages 16-19
c) Describe the targets used by the organisation to manage climate-related risks and opportunities and performance against targets	<i>Energy and climate change</i> section, Decarbonisation targets, page 12

## Appendix 2

# Stakeholder engagement



To be a sustainable business, we must demonstrate how we are meeting the needs and expectations of those who are most interested in our business: our investors, customers, people and communities.

To understand the potential impacts and opportunities our activities create for our stakeholders, we actively listen to their feedback. What we learn from directly engaging with them is supplemented by research, to help determine the activities that are most important to our business and stakeholders.

This is how we engaged with our stakeholders in FY2019.

## Our investors

### Our commitment

Deliver market-leading performance for shareholders by identifying, developing, operating and growing value-creating businesses.

### Areas of interest

- Sustainable earnings
- Remuneration
- Identification and management of risks
- Climate change and emissions
- Future energy solutions
- Water

### How we engaged

- In addition to our Annual General Meeting, we hosted various investor, analyst and media briefings, investor roadshows, including a sustainability roadshow and investor meetings with the Origin Chairman and Chair of the Remuneration and People Committee.
- We responded to regular investor, analyst and media enquiries.
- We undertook surveys to gather investor feedback.
- We responded to sustainability-related information requests and participated in benchmark surveys.
- We distributed price-sensitive information to investors and media via the Australian Securities Exchange.

## Our customers

### Our commitment

As part of our purpose, getting energy right for our customers involves supplying them with reliable, affordable and sustainable energy.

### Areas of interest

- Quality of our service
- Energy affordability
- Ease of interacting with Origin

### How we engaged

- We reduced electricity prices for more than 500,000 residential and small business customers.
- We have simplified our product offering allowing for easier comparison.
- We continued to provide customers with valuable information to help them manage their energy use through the Origin blog, and our Usage Buster tool for smart meter customers.
- We have improved our mobile app with increased self-service capability and improved information.

## Our people

### Our commitment

The health and safety of our people remains paramount and we are working to improve on our FY2019 TRIFR result. Employees require an inclusive workplace, fair and equitable remuneration, and recognition of good performance.

### Areas of interest

- Behaviours linked to our purpose and values
- Health, safety and environment
- Culture and engagement
- Inclusive workplace
- Career development opportunities

### How we engaged

- We maintained our annual engagement survey, to give employees a voice so they can provide feedback on culture and engagement and help shape their future working environment.
- We introduced Origin's behaviours, linked to our purpose and values.
- We increased our presence on digitised employee communication channels.
- We established the Pride@Origin Committee, which works to create a safe and inclusive workplace for Origin's LGBTIQ community and improve awareness of all our people.

## Our communities

### Our commitment

Our communities are interested in the public safety, and environmental and social impacts of our operations, and the opportunities for jobs and economic development.

### Areas of interest

- Public policy as it relates to climate change and emissions
- Water
- Land access and coexistence
- Impact on communities
- Sharing economic benefits

### How we engaged

- We communicated and engaged with communities and the Traditional Owners of the land around our operations and developments.
- Our Community Relations Advisors convened meetings in various locations and communicated with communities through targeted newsletters and public information centres.
- We interacted with intermediaries, such as governments, regulators, the media and non-government organisations that reflect community interests, both in Australia and internationally.
- We advocated for sound policy outcome through the peak industry associations for our core areas of business, listed in *Appendix 3: Industry association memberships*.
- We undertook scientific research in partnership with communities and scientific organisations.
- Our Origin Foundation continued to support not-for-profit organisations with a total of \$1.5 million in financial grants, volunteering and workplace giving programs as well as providing Origin employees with a variety of community volunteering opportunities.

Appendix 3

# Industry association memberships



### Industry associations can be an effective way to reach and advocate for a common industry view on key policy matters.

Industry associations often have a broad range of members and views. Origin uses its memberships to understand the views of other industry participants and present and advocate its views on relevant policy. While there may not be full alignment across industry representatives on some key policy areas, we may remain a member of an industry association with whom we don't have complete alignment on the basis that there is opportunity for constructive industry dialogue and advocacy.

It is our policy to be a member of an industry association where that association:

- 1. gives Origin access to industry insights, expertise or information that may improve commercial, technical, or operational performance; or
- 2. provides Origin with insight or access into new markets; or

- 3. enhances Origin's ability to advocate for sound and/or commercially beneficial policy outcomes.

As a precondition to membership of an industry association, Origin must understand the public environmental and/or climate change policies of the industry association and consider the association's culture of compliance with competition laws. We have undertaken that review for all current memberships.

While we may not always agree with every element of an industry association's response to climate change issues, where we believe there is a benefit to Origin in constructive industry dialogue or advocacy, we will maintain our membership. We keep a register of all industry association memberships and review memberships annually.

As part of our annual review, we reviewed the climate change and other key policy positions of each association, particularly of key industry associations. Our review did not find any significant differences in formal positions on climate change policy between Origin and key industry associations.

However, several industry associations have made comments regarding the possible use of prior period carry-over credits towards meeting future climate change targets. Origin does not support using carry-over credits for Australia to meet its current National Determined Contribution target and we have reinforced this position to the relevant industry associations.

We spent around \$1.4 million on industry association memberships in FY2019.

You can read Origin's policy on industry association memberships on our website at [originenergy.com.au/industryassociations](http://originenergy.com.au/industryassociations).

## List of industry association memberships

### Key associations

**Australian Energy Council (AEC)**  
Peak energy industry body

**Australian Petroleum Production & Exploration Association (APPEA)**  
Peak oil and gas industry body

**Business Council of Australia (BCA)**  
Peak body for large businesses

**Clean Energy Council (CEC)**  
Peak body for renewables

**Gas Energy Australia (GEA)**  
Peak body for LPG

**Queensland Resources Council (QRC)**  
Peak body for Queensland resources

### Secondary associations

**Australian Financial Markets Association (AFMA)**  
Peak body for financial markets

**Australian Industry Greenhouse Network (AIGN)**  
Business network on climate change

**Australian Institute of Energy (AIE)**  
Promotes understanding of energy issues

**Australian Logistics Council (ALC)**  
Peak industry body for logistics

**Australian Pipelines and Gas Association (APGA)**  
Peak body for pipelines

**Australian PV Institute (APVI)**  
Access to PV data and information

**Carbon Markets Institute (CMI)**  
Promotes carbon markets

**Energy Efficiency Council**  
Peak body for energy efficiency, co-generation and demand management in Australia

**Energy Policy Institute of Australia (EPIA)**  
Not-for-profit energy policy body

**Electric Vehicle Council (EVC)**  
Peak body for electric vehicles

**Future Business Council (FBC)**  
Innovative and sustainable businesses

**Group of 100 (G100)**  
Australia's peak body for chief financial officers and senior finance executives

**Hydrogen Mobility Australia (HMA)**  
Peak industry body for organisations with an interest in hydrogen.

**International Gas Union (IGU)**  
Peak international gas body

**Maritime Industry Australia (MIAL)**  
Representing maritime businesses, primarily those operating maritime assets or facilities from Australia, and including organisations that move products by ship.

**Smart Energy Council (SEC)**  
Renewable energy

**World LPG Association (WLPGA)**  
Peak body for LPG globally



# Glossary



## Ash dam

A pond used for disposing of coal ash generated by coal-fired power plants.

## Beneficial use of CSG water

The re-use or recycling of wastewater produced during the coal seam gas extraction process in a way that maximises its productive use as a valuable resource.

## CO

Carbon monoxide.

## CO<sub>2</sub>

Carbon dioxide.

## CO<sub>2</sub>-e

Carbon dioxide equivalent (CO<sub>2</sub>-e) is a measure for describing how much global warming potential a given type and amount of greenhouse gas may cause, using the functionally equivalent amount or concentration (CO<sub>2</sub>) as the reference.

## Consequence rating of serious and above (environmental)

An environmental consequence rating that includes medium to long-term reversible impacts to low-risk or listed species, habitats, ecosystems or area/s of cultural significance; extensive long-term partially reversible damage to vulnerable species, unique habitats, ecosystems or area/s of cultural significance; or extensive permanent damage to endangered species, habitats, ecosystems or area/s of cultural significance.

## Consequence rating of serious and above (safety)

A safety rating that includes injury or illness to one or more persons, resulting in a fatality, permanent partial or total disability, life-threatening illness, hospitalisation, five or more days lost time or alternative/restricted duties for one month or more.

## CSG

Coal seam gas. Natural gas contained within coal seams.

## CSIRO

Commonwealth Scientific and Industrial Research Organisation.

## Electricity measures:

### Watt (W)

A measure of power when one ampere of current flows under one volt of pressure.

### Kilowatt (kW)

One kW = 1,000 watts.

### Kilowatt hour (kWh)

Standard unit of electrical energy representing consumption of one kilowatt over one hour.

### Megawatt (MW)

One MW = 1,000 kW or one million watts.

## Megawatt hour (MWh)

One MWh = 1,000 kilowatt hours.

## Gigawatt hour (GWh)

One GWh = 1,000 megawatt hours or one million kilowatt hours.

## Terawatt hour (TWh)

One TWh = 1,000 gigawatt hours, or one million megawatt hours.

## Flaring

A process to release gas by burning the methane in specially designed flares within infrastructure. Flaring converts methane to carbon dioxide, which is a less potent greenhouse gas than methane.

## Fugitive emissions

Fugitive emissions are the gases that leak or are vented or flared while extracting, producing, processing, storing, transmitting or distributing certain fossil fuels. The Australian regulatory definition for fugitive emissions includes flaring but excludes landscape emissions.

## Gas measures:

### Joule (J)

Standard unit of measurement for energy.

### Gigajoule (GJ)

One GJ = 10<sup>9</sup> joules.

### Terajoule (TJ)

One TJ = 10<sup>12</sup> joules.

### Petajoule (PJ)

One PJ = 10<sup>15</sup> joules.

## GHG emissions

Greenhouse gas emissions mainly refers to carbon dioxide, methane, nitrous oxide, sulphur hexafluoride, hydrofluorocarbons and perfluorocarbons.

## GHG emissions intensity

The level of greenhouse gas emissions per unit of economic activity.

## GISERA

The CSIRO's Gas Industry Social & Environmental Research Alliance is a collaboration between CSIRO, Commonwealth and State governments and industry established to undertake publicly reported independent research.

## Hydraulic fracture stimulation

Creating or enhancing fractures in rock using fluid injected at high pressure. It increases the ability of water or gas to flow through a geological formation.

## kt

One kilotonne = 1,000 tonnes.

## Leaks

Gas can leak from infrastructure, particularly at pipe joints and valves.

## LNG

Liquefied natural gas.

## LPG

Liquefied petroleum gas.

## National Electricity Market (NEM)

The wholesale electricity market for the electrically connected States and Territories, with the exception of Western Australia and the Northern Territory.

## NO<sub>x</sub>

Nitrogen oxide.

## Paris Agreement

An agreement within the framework of the United Nations Framework Convention on Climate Change.

## PM2.5

Particulate matter that is 2.5 micrometres or less in diameter.

## PM10

Particulate matter that is 10 micrometres or less in diameter.

## Process safety event

An unplanned or uncontrolled Loss of Primary Containment (LOPC) of any material, including non-toxic and non-flammable materials from a process, or an undesired event or condition that under slightly different circumstances, could have resulted in LOPC.

## Production Agreement

An agreement we would put in place with our host Traditional Owners in the Beetaloo Basin (those who are recognised by the Northern Land Council as having the cultural authority to speak for a future development within our permit area) to enable a development.

## Reverse osmosis

A process that uses a membrane under pressure to separate relatively pure water (or other solvent) from a less pure solution.

## SBTi

The Science Based Targets initiative is an independent body made up of representatives from the World Resources Institute, the Carbon Disclosure Project, the World Wildlife Fund and the UN Global Compact.

## SO<sub>x</sub>

Sulphur oxide.

## Venting

The process that relieves pressure in the system, releasing gas.

## VOC

Volatile organic compound.

## Water measures:

### Kilolitre (kL)

One kL = one thousand litres (1,000 L).

### Megalitre (ML)

One ML = one million litres (1,000,000 L).

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## Directory

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### Registered Office

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### Secretary

Helen Hardy

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### Auditor

KPMG

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Further information about Origin's  
performance can be found on our website:

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