



# SUSTAINABILITY REPORT 2019

**Incitec Pivot Limited**

**DYNO**  
Dyno Nobel

**INNOVATION  
ON THE GROUND**



## Benchmarking Our Performance

As part of our commitment to transparent reporting and to create real value for all our stakeholders, we are committed to improving the quality and quantity of data we use to report. This gives us the opportunity to benchmark our performance against other organisations in our sectors, provides insight into areas for improvement, and provides shareholders, investors and other stakeholders with an objective measure of our environmental, social and governance (ESG) risk management and business practices.

Dimension	2015	2016	2017	2018	2019
Economic	67	74	73	71	72
Environmental	51	60	61	64	73
Social	63	65	68	57	60
<b>Total for IPL</b>	<b>60</b>	<b>67</b>	<b>68</b>	<b>65</b>	<b>69</b>
Chemicals sector average	58	56	53	44	47

MEMBER OF  
**Dow Jones Sustainability Indices**  
In Collaboration with RobecoSAM

**DJSI**  
Member since 2010



**EcoVadis**  
Member since 2015



**FTSE4Good**  
Member since 2014



**Bloomberg GEI**  
2019 and 2020 Member

As a result, IPL has been included in the Dow Jones Sustainability Index (DJSI) for the past ten years, where we are benchmarked against peers in the global 'Chemicals' sector. In 2019, the FTSE Group again confirmed that IPL has been independently assessed according to the FTSE4Good criteria, and has satisfied the requirements to remain a constituent of the FTSE4Good Index Series for the sixth year running. Companies in the FTSE4Good Index Series have met stringent environmental, social and governance criteria. Other indices and memberships are shown below.

### CDP Reporter since 2009

IPL has been a voluntary CDP (formerly Carbon Disclosure Project) reporter since 2009. Our most recent CDP report can be downloaded [here](#).

### CDP Water reporter since 2014

IPL has been a voluntary CDP Water reporter since its introduction in 2014 and uses the WRI Aqueduct Water Tool to report. Our most recent CDP Water report can be downloaded [here](#).

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## About This Report

For ten years Incitec Pivot Limited (IPL) has produced a stand-alone Sustainability Report, incrementally improving disclosure each year against the Global Reporting Initiative (GRI) Guidelines. This is the sixth year that sustainability data has been included in the [Annual Report](#), thereby providing a full account of IPL's annual economic, environmental, social and governance performance in one document.

This online interactive Sustainability Report contains further information on those issues most material to the sustainability of IPL in 2019 so that stakeholders can better understand our Zero Harm focus and our management of environmental, social and governance issues. The Report covers the 12 month period from 1 October 2018 to 30 September 2019, the Company's financial year. Our last Sustainability Report was also published online in March 2019 for the 2018 financial year. It can be downloaded [here](#) along with prior year sustainability reports.

This Report covers the performance of IPL and its subsidiaries and the activities over which we have operational control for all or part of the financial year ended 30 September 2019. This period is referred to throughout the report as '2019'. Together, this online Report, the [2019 Sustainability Summary](#), the [2019 Annual Report](#) and the [2019 Corporate Governance Statement](#) provide the full account of IPL's performance for the period.

This online interactive report has been prepared in accordance with the GRI Standards: Core option. See our [GRI Index and Data here](#).

We recognise the need to report on issues most relevant to our business and our key stakeholders, and we welcome feedback on this Report and our sustainability progress. Please direct any questions or comments regarding this Report or its content to us via [sustainability.feedback@incitecpivot.com.au](mailto:sustainability.feedback@incitecpivot.com.au)

## A Message from our CEO



I'm pleased to present our Sustainability Report for 2019 which is part of our commitment to transparent reporting across a range of areas that contribute to how we care for our people, our communities and the environment.

This is now the 10th standalone Sustainability Report we have created and each year we improve our disclosure against Global Reporting Initiative (GRI) Guidelines, making it easier for our investors and other stakeholders to track our progress.

In line with our strategy, we aim to deliver sustainable growth and shareholder returns, while proactively managing issues most material to the long-term sustainability of our business, and the broader environment in which we operate.

During 2019 we continued our relentless efforts to embed Zero Harm as the number one value and priority right across our global business. We also offered leading technology solutions to improve our customers' safety, while reducing their environmental and social impacts and increasing productivity. This is creating value for our customers and our mining and farming communities.

We were starkly reminded of the importance of embedding Zero Harm in everything we do following a tragic accident late in 2018 in the US. It involved one of our Dyno Nobel vehicles on a public road and tragically, two passengers in another vehicle died. We were all deeply saddened by the event and the impact on the family and local community.

This continues to emphasise the importance of Zero Harm across our global business. In 2018 we set a goal for a step change in our workforce Total Recordable Injury Frequency Rate (TRIFR) to achieve a 30% reduction by 2021. That focus drove a 15% reduction in this important safety metric during 2019, putting us well on track to reach our goal.

Zero Harm, of course, includes our impact on the environment, where societal expectations continue to grow, as do ours. We know we can do better and in 2020 we are further increasing our focus on minimising the impact of our operations on the environment and ensuring a zero-tolerance mindset for regulatory non-compliance across the company.

We have also progressed our sustainability agenda by formally integrating climate change management into our strategic drivers, in line with the recommendations of the Taskforce on Climate Related Financial Disclosures (TCFD).

Along with minimising other impacts on the environment, reducing greenhouse gas emissions is clearly hugely important to our mining and farming customers, and our leading technology solutions and high efficiency products are playing a critical role to assist, along with helping achieve safety and productivity improvements.

In our own operations, energy efficiency and abatement opportunities are a key part of our manufacturing excellence strategy, along with ensuring reliable and consistent performance across our manufacturing assets to reduce our emissions intensity. Securing a new gas supply contract through to 2022 for our Gibson Island manufacturing facility was a key achievement during the year, providing certainty to our operations and valued employees.

We also began a \$2.7 million feasibility study, supported by the Australian Renewable Energy Agency, to assess the potential to use renewable hydrogen to increase ammonia production at our Moranbah manufacturing facility. If successful, the project will provide a pathway to delivering the largest renewable ammonia plant in the world and also to more significant reductions in our greenhouse gas emissions intensity.

During 2019 we also saw the impacts of external events beyond our control, including a one in one-hundred-year flood event in North Queensland. Flood damage to third-party rail infrastructure affected our supply chain due to the interruption of services to our Phosphate Hill facility, resulting in a three-month shut-down at the site. We acknowledge that our climate is changing and the learnings from this event will allow us to prepare, respond more quickly and work more effectively with service providers to minimise the financial impacts on our business, should events of this scale become more frequent in the future.

Talented and engaged people remain key to the delivery of our One IPL mindset, which emphasises collaboration across our global operations to make us stronger together. In 2019 we conducted a second company-wide employee engagement survey as part of our three-year employee engagement plan and saw a meaningful improvement in engagement scores.

We also achieved a target of three percent Indigenous employees across our Australian businesses and remain committed to our gender diversity stretch target of a 25 percent female global workforce by September 2022. Key highlights of our progress include a 9.5% increase in female employees in the US during 2019 and an increase from 8.4% to 13.4% over the last two years in our Indonesian business.

Our site-based community engagement and investment approach continued to grow in 2019, with more site-based teams working across the globe to engage with their diverse and unique communities. In particular, we continued to support our Australian farming communities as they responded to drought.

For the fifth year, this online Sustainability Report supplements the short form Sustainability Report in our Annual Report. Our objective is to be open and transparent, informing and meeting the needs of our diverse stakeholder group effectively and efficiently.

I welcome your interest in our Sustainability Report and your feedback, as we continue to work with our customers and all our stakeholders to better care for our people, our communities and the environment.

**Jeanne Johns**  
Managing Director and CEO

## Our Approach

**Our Sustainability Strategy is to deliver sustainable growth and shareholder returns while caring for our people, our communities and our environment.**

IPL is committed to operating in a manner which acknowledges and proactively manages those issues which are most material to the long term sustainability of our business, the environment and the communities in which we operate. As described in our Value Creation Model on the following page, this commitment is driven by our Company Values which are core to our business, and built into our Strategic Drivers, to deliver outcomes which include a safe and high performing workplace, mutually beneficial partnerships with our customers, long-term and meaningful relationships with our local communities and a continued drive towards increasing resource efficiencies and environmental improvements.

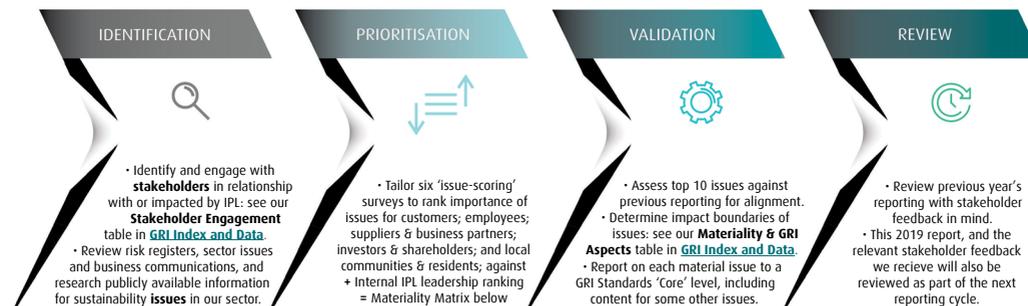
### The Precautionary Principle

The Precautionary Principle advises that when an activity raises threats of harm to the environment or human health, precautionary measures should be taken even if some cause and effect relationships are not fully established scientifically. IPL recognises that there are risks and opportunities associated with climate change, and our risk management procedures associated with these are reported in our CDP response, our 2019 Annual Report under Principal Risks, and under Managing Climate Change in this report. We also seek to mitigate our impact by exploring new ways to reduce our energy use and greenhouse gas emissions.

### Content Selection Process

IPL recognises the need to provide focused and accessible disclosures on the topics that are most important to our stakeholders. With this in mind, we conduct a biennial formal materiality assessment to identify and rank the topics that matter most to our stakeholders, and to our business success. The steps in this process follow GRI guidelines and are summarised below. The output of the most recent review, conducted in 2019, is summarised in the table below which shows the chapter in which each topic is discussed. 'Economic Performance' is addressed in the IPL 2019 Annual Report. The other material topics have been used to shape this report, with content on some non-material issues also included. Material topics are grouped into 10 main material issues on the following page.

### Materiality Assessment



### Material Topics and other topics by Report Section

How We Operate	Zero Harm	Resource Efficiency and Emissions	Managing the Impacts of Climate Change	Sustainable Products and Services	Talented, Diverse and Engaged Workforce	Caring for our Communities
<ul style="list-style-type: none"> <li>Ensuring Ethical Conduct</li> <li>Modern Slavery</li> </ul>	<ul style="list-style-type: none"> <li>Workplace Safety</li> <li>Employee Health and Well Being</li> <li>Managing Environmental Impacts: Environmental Compliance</li> </ul>	<ul style="list-style-type: none"> <li>Managing Environmental Impacts: Energy and GHG</li> <li>Water</li> <li>Waste</li> <li>NOx and SOx emissions</li> </ul>	<ul style="list-style-type: none"> <li>Climate Change Governance and Strategy</li> <li>Climate Change Risks and Opportunities</li> </ul>	<ul style="list-style-type: none"> <li>Customer Safety</li> <li>Customer Relationships</li> <li>Innovation and Technology</li> <li>Collaborative Research and Development</li> <li>Product Quality</li> <li>Working with Our Suppliers</li> </ul>	<ul style="list-style-type: none"> <li>Employee Engagement</li> <li>Diversity</li> <li>Talent Attraction and Retention</li> </ul>	<ul style="list-style-type: none"> <li>Community Safety</li> <li>Community Engagement</li> </ul>

• Topics identified as material sustainability topics: these are grouped into 'Material Issues' on the following page.

# OUR VALUE CREATION MODEL

**Our purpose** is to make people's lives better by unlocking the world's natural resources through innovation on the ground

## Who we are

IPL is a recognised world leader in the resources and agricultural sectors. We manufacture ammonium nitrate-based explosives, nitrogen and phosphorus fertilisers, and nitrogen related industrial and speciality chemicals.



Through our two customer facing businesses, Dyno Nobel in the Americas (DNA) and across Asia Pacific (DNAP) and our fertiliser business – the largest in Australia, Incitec Pivot Fertilisers (IPF), we make people's lives better by unlocking the world's natural resources through innovation on the ground.

Our advanced technology, manufacturing excellence and world class services are focussed on the diverse needs and aspirations of our customers, ensuring IPL's continuing key role in developing the efficiency and sustainability of the world's resource and agricultural sectors.

## Issues most material to our business' sustainability

- Workplace health and safety
- Managing the impacts of climate change
- Ensuring ethical conduct
- Managing, engaging and ensuring a diverse workforce
- Sustainable economic performance
- Managing environmental impacts
- Sustainable products, services and customer relationships
- Resource efficiency and GHG emissions
- Product quality
- Caring for our communities
- Innovation and Technology

## Our strategy

To deliver sustainable growth and shareholder returns while caring for our people, our communities and our environment.

### Inputs



**Talented and Engaged People**  
Building a One IPL collaborative culture with engaged, diverse and inclusive teams

**Customer Focus**  
Partnering with our customers to develop new products and specific solutions

**Zero Harm**  
Setting year-on-year improvement objectives across key metrics including health, safety, environment and process safety

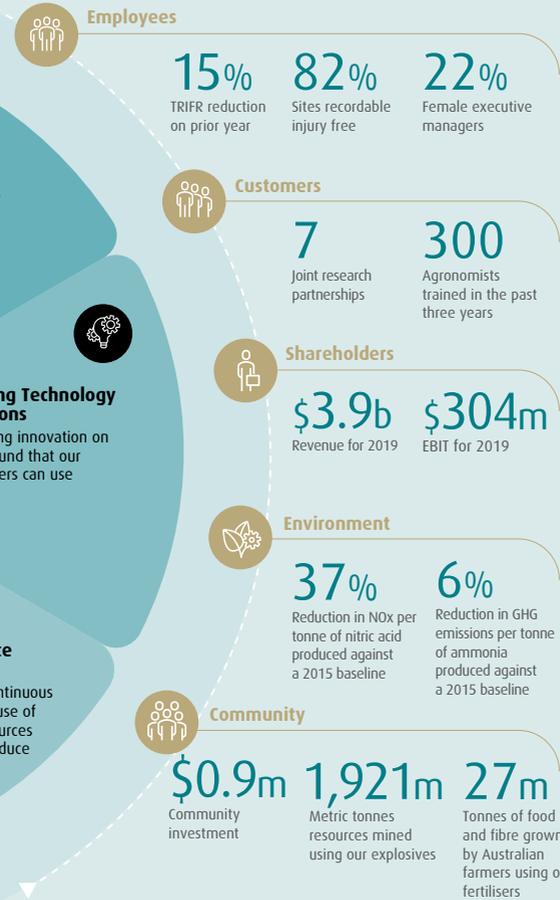
**Leading Technology Solutions**  
Providing innovation on the ground that our customers can use

**Profitable Growth**  
Focusing on both existing and new opportunities that are distinctive to our differentiated technology, core markets, core capabilities and market segments

**Manufacturing Excellence**  
Driving consistency across the performance of our assets, continuous improvement in the efficient use of energy and other natural resources and exploring new ways to reduce our greenhouse gas intensity

### Our strategic drivers

### Outputs



### Outcomes

**A safe, diverse and high performing workplace** built upon easy-to-use systems and processes; non-negotiable safety and environmental standards; a high level of ownership and accountability; a learning culture; and innovation enabled through diversity of people and perspectives.

**Mutually beneficial partnerships with our customers** that provide them with efficient, quality products that reduce their environmental and social impacts; improve operational safety; and give them access to ongoing research and development.

**Sustainable returns for our shareholders** driven by our focus on new opportunities; continuous improvement and cost efficiency; and strategic management of climate risk.

**Continued drive towards environmental improvements** through consistently applying non-negotiable environmental standards; using energy and water more efficiently; and exploring new ways, such as solar hydrogen, to reduce greenhouse gas emissions.

**Long-term and meaningful relationships with our local communities** through an active and grass-roots approach to community engagement; the measures we use to monitor, manage and prevent potential negative impacts; the economic development that flows from employment provided by our business and the resources our products unlock, such as quarry and construction materials, iron ore and other metals, and increased crop yields.

## Governance

We are committed to achieving and demonstrating the highest standards of corporate governance. Our governance framework and practices are consistent with the Australian Securities Exchange (ASX) Corporate Governance Council's Corporate Governance Principles and Recommendations (3rd Edition).

- Code of Conduct
- Climate Change Policy
- Modern Slavery Policy
- Diversity Policy

# Sustainability Scorecard

The Sustainability Scorecard shows our performance across a range of economic, social and environmental indicators for the past three years.

Indicator (Unit of measure)	2017	2018	2019
Product manufactured for sale (million tonnes)	3.7	4.0	3.5
<b>Zero Harm - Key Metrics</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
Total Recordable Injury Frequency Rate <sup>1</sup>	0.95	0.94	0.80
Employee fatalities	0	0	0
Contractor fatalities	0	0	0
Potential high severity incidents <sup>2</sup>	41	42	34
Process safety incidents <sup>3</sup>	28	27	33
Significant environmental incidents <sup>4</sup>	1	1	3
<b>Resource Efficiency and Emissions</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
<b>GHG Emissions (tonnes CO2e)</b>			
Direct GHG emissions (Scope 1)	2,749,847	3,423,867	3,080,346
Indirect GHG emissions (Scope 2)	336,707	327,536	307,167
Total GHG emissions <sup>5</sup>	3,086,553	3,751,403	3,387,513
GHG intensity per t ammonia	2.04	1.90	1.98
GHG intensity per t nitric acid	0.40	0.42	0.71
<b>NOx and SOx emissions</b>			
Total NOx emissions (tonnes NOx)	3,178	3,143	2,498
Total SOx emissions (tonnes SOx)	16,853	14,459 <sup>6</sup>	14,285
<b>Energy (GJ)</b>			
Global direct energy consumption	61,972,212	68,500,621	60,553,895
% energy from fossil fuels <sup>7</sup>	95%	95%	95%
<b>Water (GL)</b>			
Gross water withdrawal	47.6	50.5	45.5
Water discharge <sup>8</sup>	32.4	30.9	30.4
Net water use <sup>9</sup>	15.6	23.0	15.4
<b>Waste</b>			
Global solid waste (kt)	6.5	6.6	8.0
Solid waste recycled (%)	23%	21%	24%
Australian solid waste (kt)	4.1	3.6	4.7
Global solid chemical waste (kt)	2,224.6	2,307.5	1,799.3
Australian solid chemical waste (kt)	2,224.1	2,306.7	1,791.8
Global liquid waste (ML)	15.2	19.6	19.7
Global liquid waste recycled (%)	56%	51%	46%
Australian liquid waste (ML)	10.7	11.3	9.3
<b>People</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
<b>Total workforce (excl. contractors)</b>	<b>4,570</b>	<b>4,766</b>	<b>4,820</b>
Americas	2,328	2,452	2,527
Asia Pacific	1,971	2,050	2,067
Europe	271	264	226
<b>Gender Diversity (% female)</b>			
Board <sup>10</sup>	25%	42.9%	50.0%
Executive Team	33.3%	22.0%	30.0%
Senior Management <sup>11</sup>	18.8%	16.7%	22.0%
Professional/Management Roles	11.3%	18.9%	19.5%
Global	15.8%	15.9%	17.2%
<b>Indigenous Australians (% Australian workforce)</b>	<b>2.3%</b>	<b>2.6%</b>	<b>3.0%</b>

Direct Economic Value Generated & Distributed	2017	2018	2019
<b>A. Direct economic value generated (AUD\$M)</b>			
Revenues	3,533.1	3,903.4	3,975.1
<b>B. Economic value distributed</b>	<b>3,529.5</b>	<b>4,083.7</b>	<b>4,171.7</b>
Operating costs incl. payments to suppliers, non-strategic investments and royalties	2,620.3	3,102.1	3,180.4
Employee wages and benefits: total monetary outflows for employees (current payments)	602.9	650.1	682.0
Payment to providers of capital, including dividends and interest	154.7	159.8	127.6
Government taxes (income tax, payroll tax, Australian GST & FT and fringe benefits tax)	151.2	171.2	180.8
Voluntary community investments	0.4	0.5	0.9
<b>C. Economic value retained (A-B)</b>	<b>3.6</b>	<b>(180.3)</b>	<b>(196.6)</b>
<b>Government Taxes Paid Per Country</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
Australia <sup>12</sup>	75.4	88.3	85.3
United States	28.6	32.3	39.5
Mexico	7.6	5.0	3.8
Canada	28.1	31.1	28.5
Chile	2.5	3.3	8.0
Hong Kong	0.0	0.0	3.1
Turkey	4.4	5.5	4.7
Indonesia	3.6	4.1	5.5
Papua New Guinea	1.0	1.6	2.3

- TRIFR is the number of recordable injuries per 200,000 hours worked and includes contractors. TRIFR results are subject to finalisation of the classification of any pending incidents. Prior year numbers were restated due to finalisation of classification of incidents pending at the time of previous publication date.
- Incidents with potential consequences of 5 or higher on a 6-level scale (excluding near misses and hazards).
- Tier 1 and Tier 2 Process Safety Incidents as defined by the Center for Chemical Process Safety.
- Environmental Incidents as assessed against IPL's internal risk matrix with potential consequences of 5 or higher on a 6-level scale. A category 5 incident is 'a major event or Environmental repeat non-compliance with regulatory, licence or permit conditions leading to prosecution or restriction incident of operations' and a Category 6 incident is one which results in 'permanent or long-term impacts to water, land, biodiversity, air or ecosystems and requires significant remediation, rectification or investment in mitigation'.
- Scope 1 + 2.
- Restated due to improved calculation methodology.
- Excluding natural gas and diesel used as production raw material.
- Includes stormwater at sites where it is captured and treated along with other discharge before release.
- Gross water use minus clean water discharge.
- The IPL Managing Director & CEO is classified as a Board member.
- Defined as roles which are 1-2 levels below the Executive Team.
- Volatility in Australian taxes paid year on year is due to changes in IPL's Australian business earnings.

# Our Targets

Our targets, our performance and our progress towards future targets is summarised in the table below.

Topic	Metric	2019 Target	2019 Progress	Future target
<b>Zero Harm</b>				
<b>Workplace Safety</b>	TRIFR <sup>1</sup> (includes contractors)	Year-on-year reduction	0.80 (-15%) ●	0.70 by 2021
	Potential high severity incidents <sup>2</sup>	Year-on-year reduction	34 (-8) ●	Year-on-year reduction
	Tier 1 & 2 process safety incidents <sup>3</sup>	Year-on-year reduction	33 (+6) ●	Year-on-year reduction
<b>Environmental Compliance</b>	Significant environmental incidents <sup>4</sup>	Zero	3 (+2) ●	Zero in 2020
<b>How We Operate</b>				
<b>Ensuring Ethical Conduct</b>	Policy development and training	Anti-Bribery training for all applicable employees	Complete ●	IPL Modern Slavery Policy completion & training in 2020
<b>Ensuring a Talented, Engaged and Diverse Workplace</b>				
<b>Gender Diversity</b>	% females in our global workforce	Year-on-year increase	17.2% ●	25% by 2022
<b>Engaging our employees</b>	Employee engagement scores	Meaningful year-on-year improvement	●	Meaningful year-on-year improvement
<b>Managing the Impacts of Climate Change</b>				
<b>TCFD Alignment</b>	3 year IPL TCFD Roadmap: Governance & Strategy actions	IPL Climate Change Policy	Complete ●	2020 completion of \$2.7 million solar hydrogen feasibility study
<b>Resource Efficiency and Emissions</b>				
<b>GHG emissions</b>	tCO2e per t ammonia produced	2.0 (-6% since 2015)	2.0 ●	2.0 in 2020 (-6% since 2015)
	tCO2e per t nitric acid produced	0.4 (-9% since 2015)	0.7 <sup>5</sup> ●	0.4 by 2020 (-9% since 2015)
<b>NOx emissions</b>	tNOx per t nitric acid produced	0.002 (-33% since 2015)	0.002 ●	0.002 (-33% since 2015)
<b>Water use</b>	Groundwater extraction at our Phosphate Hill ammonia facility	5% reduction on 2018 extraction	0.5% ●	5% reduction by 2020 (on 2019 extraction)
<b>Sustainable Products and Services</b>				
<b>Product Quality</b>	% fertiliser sales compensation due to quality issues	Less than 0.1%	0.03% ●	Less than 0.1%
	Global Explosives Initiating Systems Manufacturing quality 'Escape Rate' <sup>6</sup>	Less than 1	0.02 ●	Less than 1
<b>Caring for our Communities</b>				
<b>Community Safety</b>	Compliance with required Community Safety Communications	100%	100% ●	100%

- Total Recordable Injury Frequency Rate: the number of recordable injuries per 200,000 hours worked, including contractors.
- Incidents with potential consequences of 5 or higher on a 6-level scale (excluding near misses and hazards).
- Tier 1 and Tier 2 Process Safety Incidents as defined by the Center for Chemical Process Safety.
- Environmental Incidents as assessed against IPL's internal risk matrix with potential consequences of 5 or higher on a 6-level scale.
- An unexpected maintenance issue at IPL's nitric acid plant at Moranbah in Australia

late in the 2018 financial year resulted in an unexpected increase in emissions of N2O (a potent GHG) at the site, impacting on our global tCO2e per tonne of nitric acid produced. To address this, IPL invested \$4 million in the fabrication and installation of new equipment and \$1.8 million in GHG abatement catalyst replacement during the 2019 financial year.

6. The Global Explosives Initiating Systems Manufacturing quality 'Escape Rate' is calculated as ((Total 'Escaped' Defects / Total Production) x 1,000,000). Total 'Escaped' defects are IS units not meeting our high standards of quality control.

# How We Operate

## 2019 Highlights



**Face-to-face Anti-Bribery training for applicable employees**



**Publication of the IPL Modern Slavery Policy**



**Publication of the IPL Climate Change Policy**



**Updating of the IPL Board Charter and Charter of the Audit and Risk Management Committee for Climate Change governance**



We are committed to operating to the highest standards of ethical behaviour and honesty, with full regard for the health and safety of our employees, customers, the wider community and the environment.

IPL's highest governing body, the Board of Directors, is responsible for charting the direction, policies, strategies and financial objectives of the Company. The Board serves the interests of the Company and its shareholders, as well as other stakeholders including employees, creditors, customers and the community, in a manner designed to create and continue to build sustainable value.

The Board operates in accordance with the principles set out in its Board Charter, which sets out the Board's own tasks and activities, as well as the matters it has reserved for its own consideration and decision-making. To assist the Board in meeting its responsibilities, the Board currently has the following four standing Committees:

- the Audit and Risk Management Committee;
- the Nominations Committee;
- the Remuneration Committee; and
- the Health, Safety, Environment and Community Committee.

Day-to-day management of Company affairs and the implementation of the corporate strategy and policy initiatives are formally delegated to the Managing Director & CEO. The Managing Director & CEO and her direct reports form the Executive Team. This team also has a sub-committee called the Zero Harm Council.

## KEY POLICIES

As part of our commitment to operating to the highest standards of ethical behaviour, we have a range of policies and systems that set ethical standards for directors, senior management and employees. These policies describe core principles designed to ensure ethical conduct is maintained in the interests of shareholders and other stakeholders. The following policies or summaries are available for download on our [Corporate Governance](#) webpage:

• **The IPL Code of Conduct** sets out the Company's global code for business conduct. It contains principles and standards of conduct which are based on the Company's values and represents the Company's commitment to uphold ethical business practices and meet applicable legal requirements. The Code applies to all directors, officers and employees of the Company and each subsidiary, partnership, venture and business association including agents and other contractors that are effectively controlled by the Company or act on its behalf.

• **The IPL Health, Safety, Environment & Community Policy** sets out our commitment to our Values of "Zero Harm for Everyone Everywhere" and "Care for the Community and our Environment".

• **The IPL Climate Change Policy** was adopted by the Board during 2019, and the IPL Board Charter and Charter of the Audit and Risk Management Committee were updated to formally enshrine Directors' roles in relation to the strategic management and oversight of climate change-related issues. Read more under [Managing the Impacts of Climate Change](#) on page 20.

• **The IPL Human Rights Policy** articulates the fundamental elements of the Group's approach to human rights and how the Group demonstrates its commitment to respect human rights in line with the Universal Declaration of Human Rights and other international frameworks.

• **The IPL Modern Slavery Project Team** was formed in 2018 to manage the requirements associated with the Australian Modern Slavery Act 2018 (Cth) which came into effect in January 2019. During 2019, the Team progressed with the development of a set of tools and procedures to enable the identification and mitigation of any risks associated with human rights in the IPL supply chain, and to ensure due diligence in IPL's own operations. As part of this, the [IPL Supplier Code of Conduct](#) was published in March 2019 and the [IPL Modern Slavery Policy](#) was published in December 2019.

• **The IPL Anti-Bribery and Improper Payments Policy** prohibits the making of unlawful or improper payments to any individual or entity and outlines the processes for ensuring that appropriate controls are implemented in relation to third parties who are engaged to act on our behalf. The policy forms part of, and is supported by, the Fraud and Corruption Control framework and a mandatory online Fraud & Corruption training course delivered through IPL's Learning and Development Platform.

• **The IPL Sanctions Policy** outlines the expected standards of conduct relevant to the Group's compliance with Australian and international sanctions laws when engaging in international trade. This includes engagement in appropriate due diligence in relation to third parties, transactions or activities that present a potential risk in relation to sanctions laws compliance.

• Our dedicated **Global Conflict of Interest for Personnel Policy** aims to ensure employees and full-time contractors understand the key principles regarding conflicts of interest and, in particular, are able to identify circumstances which may give rise to a conflict of interest and understand the processes to disclose and manage conflicts of interest.

• **The IPL Group Risk Policy** and risk management framework ensures that risk is managed within a comprehensive risk management process

## OUR VALUES

Our Company values are at the core of the way we work, and our people are fundamental to the way we work. With a One Team mindset and behaviours, coupled with cross functional and geographical collaboration across our functions and businesses, we are able to capture diversity of thought in an inclusive environment where the contribution of everyone is valued.



Care for the Community & our Environment



Think Customer. Everyone. Every day.



Treat the Business as our Own



Value People - Respect, Recognise & Reward



Challenge & Improve the Status Quo



Deliver on our Promises



which is consistent with the Australian/New Zealand Standard for Risk Management (AS/NZS ISO 31000:2009). A key element of this risk management process is the Board's assessment of risk, which is based on the level of risk we are prepared to sustain in achieving the corporate objective of delivering value to shareholders. Risks are identified, analysed and prioritised using common methodologies and risk controls are designed and implemented having regard to the overall corporate strategy. To help ensure quality and consistency in the identification, assessment, documentation, management and reporting of risk, a complete risk management document suite is available to all employees via the company's intranet. The document suite is further supported by comprehensive training programs that are tailored to specific employees' needs and delivered via on-line media and face-to-face workshops.

• **The IPL Sustainable Communities Policy** includes our commitment to listen to and work with the community, strive to be a valued corporate citizen in the communities where we operate; and respect our neighbours, their values and cultural heritage and be considerate to them in carrying out our operations.

• **The IPL Diversity Policy** outlines our commitment to being an inclusive and accessible organisation through the development of a culture that embraces diversity. Our Board of Directors maintains

oversight of the Diversity Policy and the implementation of the Diversity Strategy.

• **The IPL Whistleblower Protection Policy** was reviewed for consistency with the Australian Standard AS 8004 last year. The Whistleblower process ensures that all staff can confidentially report improper, unethical or illegal conduct and raise concerns regarding actual or suspected contraventions of ethical or legal standards, without fear of victimisation, reprisal or harassment. The externally managed worldwide service is multi-lingual, confidential and designed to efficiently facilitate the resolution of business conduct queries and/or issues that staff feel they are unable to raise and resolve locally. It is able to take calls in all our major operating languages, being English, French, Spanish, Chinese, Turkish and Bahasa, and provides our staff with multiple lines of communication and the opportunity to provide further information, or respond to requests for further information, whilst remaining anonymous.

• **The IPL Information Security Framework** ensures procedures and training are in place to protect our global information network. Implementation of the Framework is governed by the Audit and Risk Management Committee of the Board and managed by our Chief Information Officer (CIO) who is a member of the IPL Executive team.

• Our annual [Tax Transparency Reports](#) outline our Board approved strategy with regards to tax and reflect IPL's ongoing commitment to tax transparency.



# Zero Harm

## 2019 Highlights



Refresh of our 3 year Zero Harm strategy and plan by collaborating across our organisation

15% reduction in TRIFR - strong progress toward our 2021 target of 0.70

83% of sites recordable injury free

19% reduction in Potential High Severity Incidents



Establishment of a global IPL Process Safety Community



Rollout of online Environmental Licence Compliance & Environmental Awareness training modules



Zero Harm is good business. Our ambition is to achieve industry leading performance in occupational health, safety, process safety and environmental compliance.

## OUR APPROACH

IPL's Zero Harm strategy drives the success of the Company. In 2019, IPL took the opportunity to consult widely across all levels of the organisation and, as One IPL, refreshed our approach to deliver the Zero Harm Ambition developed in 2018. Our refreshed strategy creates a strong connection to the Zero Harm Strategic Driver, and integrates all HSEC elements under one framework.

The new strategic themes of Simplify, Get the Fundamentals Right, Lead and Engage and Strengthen our Learning Culture provide a common language and basic principles which will guide our effort, reflect the voice of our internal customer and improve our performance. A revised 3-year tactical plan will target the delivery of global Zero Harm initiatives and Global Collaboration Networks will be created to focus on specific Health, Safety, Process Safety and Environment continuous improvement plans. Actions in 2019 and those planned for 2020 are presented on the opposite page.

The Company's ambition to achieve industry leading performance in occupational health and safety, process safety and environment, is supported by IPL's integrated [Health, Safety, Environment and Community Management System \(HSECMS\)](#) which provides the foundation for effective identification and management of Health, Safety and Environmental (HSE) risks. The management system includes 18 global standards and is a key tool underpinning safety performance at all levels and across all functions.

These standards are aligned to ISO14001, OHSAS 18001, ISO 31000 and AS 4801 international standards, as well as American Chemistry Council Responsible Care Management System and Center for Chemical Process Safety risk based process safety standards.

To track and monitor our HSE performance, we use a global HSE reporting system called Cintellate. Incident reporting and analysis is key to our ability to continuously improve our safety practices. By recording and investigating incidents and 'near misses' to establish the root causes – be they injury, environmental, process safety or quality related – we gain valuable insights into the hazards faced by our people and communicate these learnings across all of our sites. A risk register template is included in Cintellate, which provides a uniform approach to risk ranking, management and reporting across the business.

## Zero Harm governance

We have a governance structure in place to ensure a strong Zero Harm focus across the organisation. Data extracted from Cintellate is reported to the Board and Executive Team regularly. The Board's Health, Safety, Environment and Community (HSEC) Committee assists the Board in its oversight of health, safety and environment matters arising out of our activities as they may affect employees, contractors, and the local communities in which we operate.

The Vice President Health, Safety and Environment is accountable for advising the Managing Director & CEO and Executive Team on best practice strategies for health, safety and environmental improvement. This role supports our organisation in developing and delivering the Zero Harm strategy and works with a Group-wide network of safety and environmental professionals, as well as operational leaders, to achieve our goals and support line management in improving our performance.

Regional safety managers provide advice and support to line management, to enable them to make the most effective use of resources, by sharing best practices, and standardising, streamlining and coordinating health and safety activities across the Group. 100 percent of our workers and contractors are represented in formal joint management-worker health and safety committees which operate at a site based level in the organisation. At large sites, these may also operate at a plant level.

The Zero Harm Council (ZHC), chaired by our Managing Director & CEO and consisting of all members of the Executive Team and the Vice President Health, Safety & Environment, is accountable for overseeing the Group's execution of the Zero Harm Strategy and reviewing health, safety and environmental performance.

On a day-to-day operational level, our leaders are expected to consistently demonstrate and communicate high standards of behaviour and operating discipline and promotion of our Zero Harm Value. They must take proactive action to continuously improve our safety performance and use both leading and lagging indicators to monitor that performance.

Personal responsibility at all levels is integral to promoting continuous health and safety improvement across the Group. We lead, engage, empower and develop, and expect everyone to be leaders in Zero Harm. We are embedding this culture through specific training, and supplementing this with the use of techniques such as safety observations, and incident and near miss investigations to share learnings.

## STRATEGIC THEMES

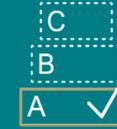
### SIMPLIFY

We support people with easy to understand and easy to use systems.



### GET THE FUNDAMENTALS RIGHT

We define our minimum expectations: we will be excellent at the fundamentals.



### LEAD AND ENGAGE

We empower, develop and expect everyone to be leaders in Zero Harm.



### STRENGTHEN OUR LEARNING CULTURE

We learn, we share, and we fix for good.



## ACTIONS IN 2019

- Simplification & standardisation of the HSECMS including a revised incident management process, revised PTW electrical certificate, and development of a global Fatigue Management procedure;
- Implementation of the global standardised Management of Change (MoC) process and online tool;
- Development of a global injury classification checklist for Injury Management consistency
- Continued use of visual management tools and lean processes, particularly 5S, to increase loss of containment awareness globally.

- Establishment of the IPL Process Safety Community;
- PSM Improvement Plan including Process Safety Event classification guidance;
- The successful pilot of a new Operations Risk Management process;
- Mapping of the Explosive Management System across DNAP customers systems;
- Standardisation of metrics through an automated online dashboard;
- PDC Management system development across IPF;
- Continued use of an engineering framing assessment model to identify and mitigate key environmental licencing and permit compliance.

- Further development, improvement and embedding of the fatal risk program for our commercial operations, with a focus on leadership participation and critical control verification;
- Site Safety Leadership Development Program across our North American business, including the piloting of a new site leader orientation program with 120 site managers and supervisors participating;
- Health and Wellbeing Program including health challenge, RUOK and Mental Health workshops;
- Active engagement of site based leadership and teams in programs to prevent product spills across their sites.

- Core and Refresher Safety Partner (Behavioural based Safety Leadership) training completed with approximately 4000 employees and contractors trained;
- Communication of the refreshed and redefined Zero Harm Strategy;
- Piloting of a customised Zero Harm Culture assessment tool globally with a plan for sustainable implementation to be developed;
- Updating of the Online Environmental Licence Compliance training module and roll out of the Environmental Awareness Training Module.

## FOCUS IN 2020

- Designing the future state of a One IPL Operations Management System;
- Defining requirements to manage operations-based risk including emerging, process safety, critical HSE activities and common engineering controls;
- Developing a refreshed and engaging Zero Harm strategy roll out with a clear connection to our WHY.
- Improving work instructions to simplify and clarify the requirements of environmental permits, licenses and regulations.

- Establishing metrics and governance processes to embed management of change processes in the organisation;
- Implementing Global standards to set minimum expectations for the management of fatigue and transport risks globally;
- Developing Global standards to set minimum expectations for the management of our highest transport risks;
- Review of manual handling practices;
- Continued focus on environmental compliance across the organisation through automation.

- Refreshing of the content of Safety Partners Training to provide a linkage to the Zero Harm Strategic Driver and our refreshed Zero Harm Strategy;
- Establishing Global Functional Collaboration Networks to co-create solutions for common HSE hazards and issues across our business;
- Targeting of key sites for assessment of the risk of non-compliance with environmental licencing and permits, with improved management and mitigation programs where risks are identified.

- Implementation of the refreshed Event Management process;
- Continued focus on improving environmental awareness through training, with emphasis on loss of containment, spill prevention, site cleaning processes and stormwater pollution prevention.

## ZERO HARM

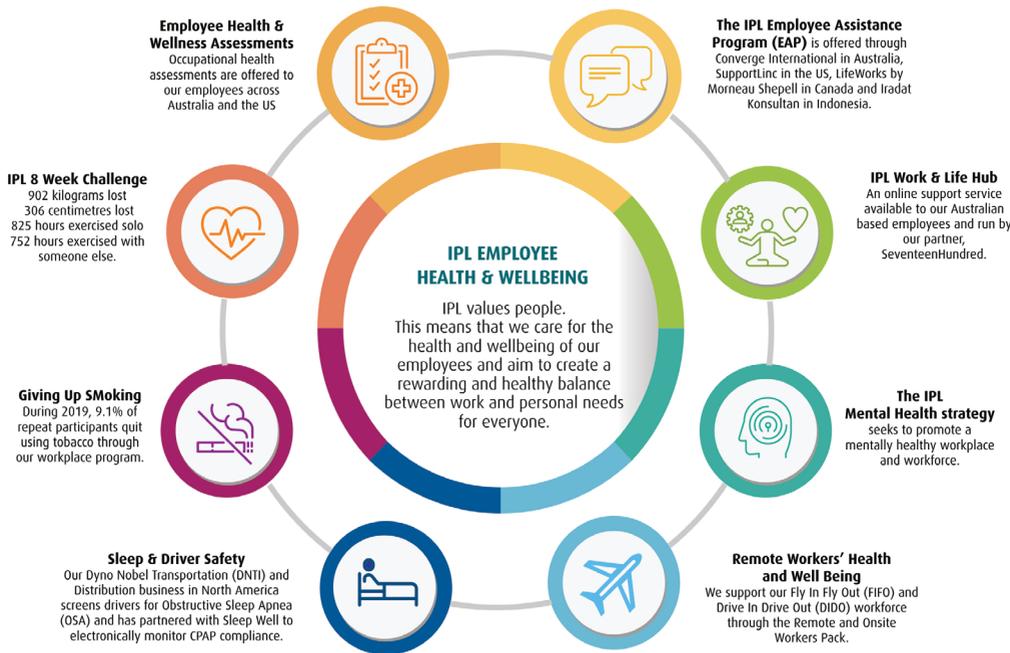
### Zero Harm learning culture

Our global behavioural safety training program is called 'Safety Partners.' The IPL Safety Partners Standard, which was approved by the IPL Board last year, sets minimum standards to embed Safety Partners as a primary driver of strong safety culture at IPL whilst providing a degree of business unit flexibility to allow adaptation for particular site and business needs. The initial program is based on the concept of how people think, which invariably impacts on what they do. By giving attention to individual attitudes and behaviours we are able to influence the results we achieve on and off the job. Ultimately, this approach will help to influence our attitude towards safety, understanding what is truly important to us and creating a personal safety action plan.

The Standard was incorporated into the Global HSEC Management System last year and includes the following requirements:

- All new employees and full-time contractors must complete Safety Partners orientation eLearning as part of the IPL induction process;
- All new employees (and contractors) must complete a two-day Safety Partners training program within six months of hire;
- All IPL Safety Partner facilitators/trainers must have participated in, and received, accreditation in the IPL Safety Partners 'Train the Facilitator' program.

Employees also receive safety and environmental training as part of their induction process, which is compulsory for all new employees (including contractors whose duration of engagement exceeds 40 hours). Our 'safety non-negotiables' as described in the 'Rules to Live By' are clearly communicated at induction and reinforced by managers. We also use the '5S' approach to workplace efficiency. 5S is a workplace organisation method which uses 5 systematic procedures to allow the identification and removal of safety and environmental hazards.



### HEALTH AND WELLBEING

The IPL Zero Harm Council has responsibility for employee health across the Group and each business unit and site offers health and wellbeing programs appropriate for local needs and to suit local regulatory and cultural requirements.

**The IPL Employee Assistance Program (EAP)** provides a number of confidential specialist counselling sessions each year, and is available 24 hours per day, offering support for work and personal issues either face-to-face, over the telephone, online or via a mobile phone app. The counselling and tip sheets offered through the IPL EAP can help with managing conflict, coping with change, stress, grief, career transitions, relationship issues, gambling, alcohol and substance abuse, parenting conflict, pain, trauma, anxiety, depression and many types of emotional difficulties.

**The IPL Mental Health Strategy** seeks to promote a mentally healthy workplace and a mentally healthy workforce at IPL. A key strategy of the program is to increase the awareness of mental health, its effect at work and where and how to seek help. As at 30 September 2019, over 900 workers have participated in Mental Health Workshops.

**Sleep and driver safety:** Our North American Driver Alertness Program screens our drivers for Obstructive Sleep Apnea, and those who are diagnosed are assisted to access treatment to improve their sleep. As with all of our drivers, determination for fitness for driving is made by the Department of Transport doctor. In the case of OSA, doctors confirm CPAP treatment compliance and monitor progress before issuing drivers with a medical card to drive. Dyno Nobel Transportation has partnered with Sleep Well to electronically monitor CPAP compliance where required. In Australia, 'fitness for driving' medical assessments are conducted as part of the requirements for Dangerous Goods Drivers' licencing.

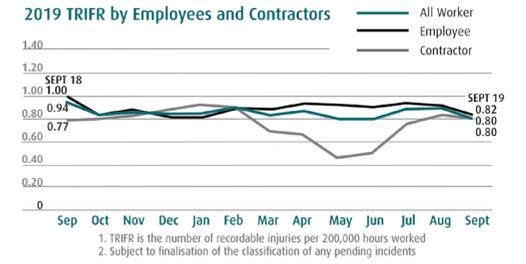
### SAFETY PERFORMANCE



Region	2017	2018	2019
Australia	1.09	1.04	0.92
North and south America	1.04	1.10	0.83
Canada	1.69	1.30	1.25
Turkey	0.35	0	0.71
Indonesia	0	0	0
Papua New Guinea	0	0	0

Gender	2017	2018	2019
Male	0.81	1.03	0.79
Female	0.89	0.85	0.95

\*Restated due to reclassification of 3 injuries



### MANAGING ENVIRONMENTAL IMPACTS

We are subject to environmental regulation under the jurisdiction of the countries in which we operate including Australia, United States of America, Mexico, Chile, Canada, Indonesia, Papua New Guinea and Turkey. These environmental laws and regulations generally address the potential aspects and impacts of our activities in relation to, among other things, air and noise quality, soil, water, biodiversity and wildlife. In certain jurisdictions, the Group holds licences for some of our operations and activities from the relevant environmental regulator. We measure our compliance with such licences and report statutory non-compliances as required.

During 2019, our fertiliser business, IPF, was awarded the Fertiliser Australia Platypus Award for improved product control and environmental performance across our distribution sites, where we focused on this outcome. However, three significant environmental incidents, which related to events from prior reporting years, have also been included in this year's reporting due to fines being received during the year.

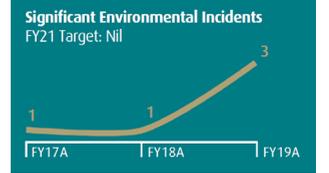
In the first matter, the Group received a civil penalty of US\$492,000 and was ordered to provide US\$939,852 worth of emergency equipment to the local community, relating to unplanned ammonia released in 2010 and 2015 and the alleged failure to accurately estimate and report ammonia releases to the EPA.

In the second matter, the Group was convicted of four environmental charges with regard to offsite releases at Geelong in 2017, receiving a fine of \$120,000. In the third matter, the Group was prosecuted for a breach of licence conditions in Townsville relating to the 2016 release of stormwater with elevated levels of ammonia. This resulted in a fine of \$21,500.

All corrective actions associated with these significant environmental events have been closed to prevent a repeat non-compliance.

The Group also received a number of fines from the Queensland environmental regulator during 2019. Three fines totalling \$38,725 were incurred in connection with stormwater releases at Phosphate Hill, one fine of \$13,055 in connection with a sulphuric acid spill at Gibson Island and one fine of \$13,055 in connection with a sulphuric acid spill at Mt Isa.

In accordance with Standard 16 of the IPL Global Health, Safety and Environment Management System, all incidents, including near misses, are reported immediately to the Manager of the Site and elevated to Senior Leadership, Legal and/or external authorities based on the event potential consequence and outcome. All incidents are recorded and investigated according to the IPL Incident Reporting, Investigation and Root Cause Analysis Procedure. Incident investigations identify and prioritise corrective and preventative actions, in order to eliminate or reduce the risk of the incident recurring.



As part of our Zero Harm strategy, environmental compliance is recognised across the business as a non-negotiable: we target Zero Significant Environmental Incidents. We know we can do better, and moving into 2020 we will further increase our focus on minimising the impact of our operations on the environment.

# Resource efficiency & emissions

## 2019 Highlights

**6%** reduction in GHG per tonne ammonia produced against a 2015 baseline

**\$5.8 MILLION** invested in N2O abatement to reduce our GHG per tonne nitric acid in line with targeted intensities

**37%** reduction in NOx per tonne nitric acid produced against a 2015 baseline

**\$2.7 MILLION** feasibility study begun to assess the potential of renewable hydrogen for ammonia manufacture



Our [Health, Safety, Environment and Community \(HSEC\) Policy](#) states that we will promote the efficient use of resources and energy and strive to minimise our impact on the environment. This commitment is enacted on a day-to-day basis through Standard 11 of our [HSEC Management System](#).

Our consumption of resources, such as natural gas, electricity and water and the amount of greenhouse gas (GHG) emissions we produce is representative of the scale and capacity of our manufacturing plants, in particular the energy-intensive manufacture of ammonia-derived products, including urea, ammonium sulphate, ammonium phosphate and ammonium nitrate for the fertiliser and explosives markets. All of these products require natural gas as both an energy source and a raw material for production, with carbon dioxide being liberated during the process. In addition, carbon dioxide is liberated during the acidulation of phosphate rock in the manufacture of phosphate fertilisers, and nitrogen oxides (NOx) and nitrous oxide (N2O, a potent GHG) are released during the production of nitric acid.

In Australia a central reporting system collects energy use, water use and waste data from all manned sites. The data is obtained from utility bills, except where electricity is generated on site. Electricity generated from natural gas at remote sites is metered on site and this is also entered into the database. Municipal water use is obtained from water bills, whereas volumes for storm water, river water, recycled process water or ground water are typically metered on site. The data is then consolidated and verified for reporting purposes. Energy use, water use and waste data for our sites in North America and Europe are supplied separately.

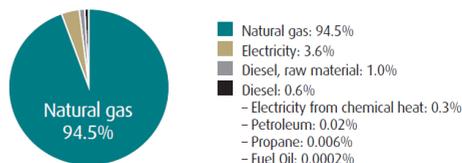
### ENERGY USE & GHG

IPL used 60,553,895 gigajoules (Gj) of energy over the past year, 2,034,762 of which was purchased electricity. While energy efficiency measures contributed, this decrease in energy use was mostly due to decreased production, and therefore gas use, at our Phosphate Hill and Waggaman, Louisiana ammonia plants.

Approximately 80 percent of the electricity purchased was generated from non-renewable sources. Approximately 20 percent of the purchased electricity (indirect energy) was generated from renewable resources, mostly hydroelectric. Natural gas and diesel amounts used as raw materials and on-sold in our products have been included in our energy use figure. Approximately 1 percent of our direct energy is from CO2e-free sources, which includes electricity that is generated from heat captured during the manufacture of sulphuric acid.

Natural gas prices in Australia have increased sharply in recent years and we continue to advocate that gas exports do not come at the expense of an adequate local supply. During 2019 we secured gas for our Gibson Island Manufacturing Operations through to 2022.

### Energy sourced



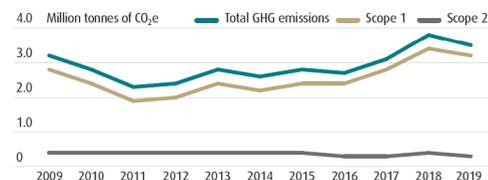
### GREENHOUSE GAS EMISSIONS

In 2019 our recorded Scope 1 (direct) and 2 (indirect) absolute GHG emissions decreased to 3,387,513 tonnes of carbon dioxide equivalent (CO2e). The total figure comprises 3,080,346 tonnes of Scope 1 (direct) emissions and 307,167 tonnes of Scope 2 (indirect) emissions. While a portion of this decrease was due to decreased production, an unexpected maintenance issue at IPL's nitric acid plant at Moranbah in Australia late in the 2018 financial year resulted in an unexpected increase in emissions of N2O (a potent GHG) at the site. To address this, IPL invested \$4 million in the fabrication and installation of new equipment and \$1.8 million in GHG abatement catalyst replacement during 2019. This will contribute to a target of 0.4 tonnes of carbon dioxide equivalent (CO2e) per tonne of nitric acid produced by 2020, which is a 4% reduction in GHG emissions intensity against 2018 emissions and a 7% reduction against our 2015 baseline.

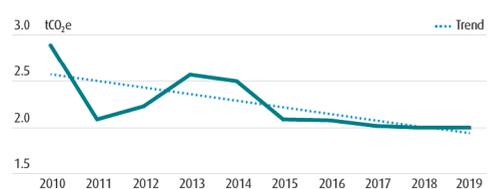
The targeted reduction in GHG per tonne of ammonia produced was achieved due to targeted energy efficiencies at our Waggaman Louisiana ammonia plant which were linked to executive remuneration through the IPL Long Term Incentive plans, as explained on page 32 of our 2018 Annual Report.

A third party was engaged to provide an assurance opinion over our Australian GHG emissions, energy consumption and production figures for the period 1 July 2018 to 30 June 2019, with the third party issuing an [unqualified opinion](#).

### Total direct and indirect GHG emissions



### GHG intensity (tCO2e) per tonne of ammonia produced



### Improving our performance

In line with the sustainability strategy to use less and care for the environment, which is integrated into our Manufacturing Excellence Strategy, we continue to investigate new ways to reduce our emissions as well as our energy use. Our current reliance on natural gas as a feedstock for hydrogen means that new technologies will be required for significant reductions.

Our \$2.7 million feasibility study, supported by the Australian Renewable Energy Agency (ARENA), will determine whether renewable hydrogen can be made at an industrial scale at a commercially competitive price. Rather than being made from natural gas, renewable hydrogen can presently be made at very small plants using solar energy to split water into hydrogen and oxygen, allowing ammonia to be produced without the GHG associated with natural gas. Although in its early stages, this technology at industrial scale would provide a pathway to set more significant reduction targets.

We also continued to pursue a range of energy efficiency projects during 2019 which contributed to the maintenance of targeted global reductions in GHG emissions per tonne of ammonia produced in 2019 against a 2015 baseline. These include the following:

- A boiler replacement at the Donora, Pennsylvania site is expected to reduce gas consumption by 91,683 GJ per year and save \$410,000 annually. This project will also reduce water and electricity consumption.
- Process optimisation at our Cheyenne, Wyoming ammonia and nitric acid plants allowed purge gas from the ammonia plant to be reused in the nitric acid plant, reducing natural gas use by 26,825 GJ and GHG emissions by 1,377 tCO2e annually.
- At Moranbah, Queensland a project to preheat deaerator feedwater with process heat currently lost to the atmosphere saved 196,000 GJ of natural gas, reduced GHG emissions by 10,000 tCO2e and saved over \$1,000,000 in 2019.
- Air compressor replacements at Carthage in Missouri, Simsbury in Connecticut, and Geelong, Phosphate Hill and Moranbah in Australia will reduce energy use by 1,313,375 kWh and GHG emissions by 7,000 tCO2e each year.
- During 2019, IPL's Waggaman, Louisiana ammonia plant captured 78,306 tCO2e for use by a neighbouring melamine manufacturing plant, avoiding the release of these GHG emissions to air.

We also quantified the Scope 3 emissions associated with our global shipping for the fourth year, and purchased voluntary carbon credits to offset the GHG associated with our shipping out of [Townsville Port](#).

### IPL CDP CLIMATE CHANGE & CDP WATER SECURITY

reports are completed annually. These are available on our website and can be [downloaded here](#). Our 2019 CDP Report, which corresponds to the period covered in this online report, will be completed in June 2020.

### MAJOR PRODUCTS LIFE CYCLE ASSESSMENTS

have been conducted at a high level for the energy & carbon emissions associated with our two major manufacturing processes: ammonia & ammonium nitrate (AN). The first LCA is based on our Phosphate Hill site, which makes ammonia based fertilisers. The second is based on our Moranbah AN manufacturing site. These are representative of the scale of our operations across the Group.

### OUR SCOPE 3 GLOBAL SHIPPING EMISSIONS

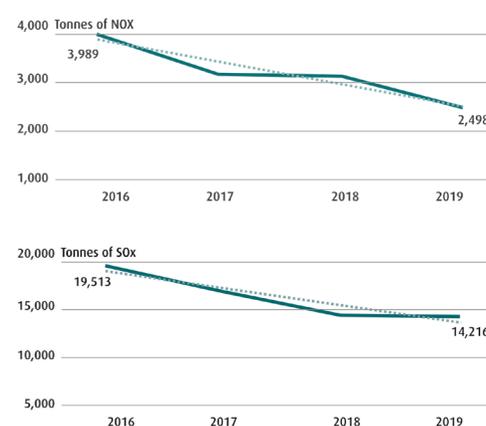
are quantified annually. In 2019 we offset a portion of these emissions with the purchase of voluntary carbon credits.

### NOx & SOx EMISSIONS

IPL also continued to invest in the ongoing maintenance of abatement technology which captures, treats and so reduces process emissions to air. Nitrogen oxides (NO2 and NO, referred to collectively as NOx) are released when fuels are burned at high temperatures, and when nitric acid is manufactured. As of 2016, all of our nitric acid manufacturing sites have NOx abatement units installed. Sulphur oxides (SO2, SO3, referred to collectively as SOx) are emitted when fossil fuels are combusted, and in the making of sulphuric acid.

This year our operations emitted 2,498 tonnes of NOx and 15,668 tonnes of SOx. Although not greenhouse gases, NOx and SOx have other environmental impacts, such as air pollution. We are committed to reducing emissions of NOx and SOx across our global manufacturing sites. During 2019, the Selective Catalytic Reduction unit installed at the Louisiana, Missouri nitric acid plant in 2017 reduced potential emissions of NOx by 90%. In Australia, the more efficient \$1,480,000 sulphur oxide (SOx) reduction catalyst used in recent years at Mt Isa, Queensland reduced 2019 SOx emissions by 24% against a 2016 baseline.

### Total global NOx and SOx emissions



## RESOURCE EFFICIENCY & EMISSIONS

### WATER

Cooling water is a key necessity for our ammonia manufacturing process and the majority of our water use is either for single pass cooling or as recycled cooling water. A small percentage is used for steam to power equipment and as an input for the chemical reaction that makes ammonia. The risks and opportunities associated with water management as it relates to climate change have been assessed and are described in our annual CDP Water Security reports.

In addition to IPL's comprehensive annual risk management process, the World Resources Institute (WRI) Aqueduct Water Tool is completed each year for long term projections and reviewed by the Chief Risk Officer. While the majority of IPL's manufacturing plants are located in regions with plentiful natural supplies of water, the WRI Water Tool analysis has identified several of our Australian sites and one in the South West of the United States as operating in regions where water conservation is a critical issue. Initiatives at these sites are outlined under 'Where Water is a Material Issue'. In other regions, where there is higher rainfall, we recognise that water management is also important.

#### Water use by source

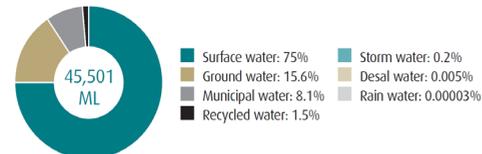
During 2019 we withdrew 45,501 ML (mega-litres) of water, a 10% decrease from last year. In addition to water saving initiatives, this decrease is mostly related to decreased production, and therefore cooling water, at our Phosphate Hill, Queensland and Waggaman, Louisiana ammonia plants. Our total reported water use includes the categories shown in the graph below. A large proportion of this water is used more than once within our plants, but most sites do not meter the recycling of cooling water. 695 ML of water was recycled and reused at sites which have meters. This represents 1.5 percent of our total withdrawal and 4 percent of our net water use.

#### Water discharge by destination

During 2019 we discharged 30,447,587 m3 of water to the environment. This total discharge excludes sewage, discharge of collected rainwater and waste water removed for treatment or disposal as liquid waste (which are included under 'Waste'). It includes some discharge of rainwater where runoff is collected and treated at several sites in North America, and therefore cannot be separately metered.

As shown in the graph, 98.7% of discharge was clean cooling water which was released to the natural waterways from which it was taken, reducing our net water use to 15,449 ML. We monitor the water quality of such discharges on an ongoing basis to meet local regulatory requirements and also seek to improve water quality beyond the standards required by licensing wherever possible.

#### Water Use by Source



#### Water discharge by destination



### Where Water Is A Material Issue

#### Cheyenne in Wyoming, USA

At our ammonia manufacturing site at Laramie County, Cheyenne, Wyoming, USA, water resources are of particular concern and management involves multiple stakeholders. The site is located in a semi-arid area which the WRI Water Tool has identified as an area of high baseline water stress<sup>1</sup>. Water for the site is drawn from an underground aquifer which is recharged each year by precipitation, including snowmelt. We engage with key stakeholders including the Wyoming State Engineer's Office (SEO) which manages stakeholder access to the aquifer and maintains databases for ground water levels, along with the Ground Water Division of the U.S. Geological Survey, and our Cheyenne site monitors wells through totalizing flowmeters and water level measurements and reports to the SEO annually. Water saving initiatives at the site include:

- The monitoring and maintenance of steam traps and condensate systems to reduce water loss.
- Operation of a brine concentrator unit which recycles approximately 100 gallons of water per minute.
- Operation of several reverse osmosis water treatment units, which recycled a total of 241,626 kL of waste water for reuse during 2019.
- Communication to personnel through daily reports to watch for, and prevent, excess water from running.
- Visual management board for water reduction projects and efforts.
- The position of Focused Improvement Engineer to implement an overall strategy of increasing the recycling of waste water streams and reducing waste water volumes.

#### Gibson Island in Queensland, Australia

Our Gibson Island site manufactures ammonia and urea and is located near the capital city of Brisbane. Although the WRI Tool identifies the site as being located in a catchment identified of 'low-to-medium' overall water risk, it is also identified as being subject to high baseline water stress due to the larger local population and the high inter-annual variability in rainfall.

We are currently working with Seqwater, the Queensland Government Bulk Water Supply Authority, and Urban Utilities, who operate a water recycling plant located near our site, to purchase recycled water for use at Gibson Island. During 2020, we aim to conclude an agreement and begin laying the pipeline to bring around 6,000 kL per day of recycled water into the site.



**This will leave 6 million litres of potable water in south-east Queensland dams every day for our local communities.**

#### Phosphate Hill in Queensland, Australia

Located in the Georgina Basin, our Phosphate Hill manufacturing site produces ammonium phosphate fertiliser in remote North West Queensland where a natural phosphate deposit is located. While the WRI Water Tool identifies this site as being at 'low-to-medium' overall water risk, it is identified as being in an area of high inter-annual variability of rainfall. To ensure supply, groundwater is drawn under licence from the phosphate orebody, which is porous and contains an aquifer called the Duchess Embayment Aquifer (DEA).

The many aquifers in the Georgina Basin are naturally recharged by rainfall during the summer wet season and were identified as a renewable (annually replenished) groundwater resource with high groundwater development potential (over 100GL/yr) by a recent inquiry into the development of northern Australia by the CSIRO. Although wet season rainfall varies annually, ongoing model prediction and quarterly monitoring conducted using 39 monitoring bores across the embayment indicate that adequate supply to the site is currently being maintained. In addition to monitoring for potential changes in

<sup>1</sup> The WRI Aqueduct Water Tool identifies areas subject to 'Baseline water stress' by measuring the ratio of total annual water withdrawals to total available annual renewable supply, accounting for upstream consumptive use. Higher ratings indicate more competition among users, with 'High' being 40-80%.

the embayment, the Phosphate Hill site submits an annual Borefield Performance Report to the Queensland Government Department of Natural Resources and Mines (DNRM) each year in September and completes an Annual Aquifer Review in December each year.

Our Phosphate Hill site is committed to reducing water usage wherever possible through continuous improvements and water recycling strategies. These presently include multiple re-uses of cooling water (our major use) and reclamation of water from waste gypsum stacks. In addition, projects involving the reuse of process water to allow both the recapture of phosphates and the reduction of fresh groundwater extraction, were completed during 2018 and contributed to a 19% reduction in water extraction last year (2018) against 2017 usage.

#### Geelong: Victoria, Australia

The Geelong site manufactures single super phosphate fertilisers, a process which requires much less water than ammonia manufacture. However, the site has been identified by the WRI Water Tool as being in a water catchment subject to high baseline water stress<sup>1</sup> and of medium-to-high risk regarding overall water risk. The site obtains its water from the state government-managed Barwon Region Water Corporation, Victoria's largest regional urban water management body. Barwon water is predominantly sourced from forested catchments on the upper Barwon and Moorabool rivers, but during periods of prolonged drought water is sourced from underground aquifers via the Barwon Downs and Anglesea bore fields. In extreme drought, the water management body can also access supply from the water grid of the City of Melbourne via the Melbourne to Geelong Pipeline, a 59-kilometre underground pipeline which is part of the state's long-term plan to secure the region's water supply into the future.

Water saving strategies at the site include the on-site capture, treatment and reuse of large volumes of stormwater, with 33,782 kL being treated and re-used this year. The site completed a site wide water balance project in 2019 to identify potential water savings and opportunities to better manage waste water and stormwater. This project initiated the use of rainfall prediction models at the site to more closely manage levels and capacities of water storage ponds. The collection of rooftop rainwater has been identified as an option to reduce reliance on municipal water supplies and increase the amount of stormwater collected and recycled and this will be further investigated in 2020.

#### Mt Isa in Queensland, Australia

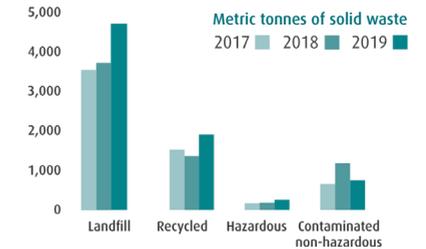
With an estimated population of 22,000, the mining town of Mount Isa is the administrative, commercial and industrial centre for the state's vast north-western region. Our Mt Isa site manufactures sulphuric acid using waste sulphur obtained from a nearby metal ore smelter. This process also uses less water than ammonia manufacture, however steam is also used at the site in the process of generating electricity from waste heat captured from the sulphuric acid making process.

Water for the site is obtained through the Mount Isa Water Board which is responsible for the sustainable management of water supplies in the region. Although identified by the WRI Water Tool as being located in a catchment where overall water risk is 'low-to-medium' and baseline water stress is 'low' (due to the small population), it is also identified as an area of extremely high inter-annual variability, and the local Water Board manages supply using two man-made Lakes. Water is drawn mostly from Lake Moondarra (owned by a metal ore mining company, but transported by the Mt Isa Water Board) 13 kilometres downstream of Mt Isa, and pumped 60km up from Lake Julius in times of extreme drought to ensure supply is maintained. Water saving strategies at the site include the condensing of all steam used in our on-site electricity generation turbine and the returning of any blow down water from our cooling towers to the nearby metal ore mine as process water. While total rainfall is expected to increase across the north of Australia due to climate change, our risk bowtie analysis to manage climate related issues at the site identified that pre-emptive actions to secure access to water in advance of potential future water restrictions should be investigated and implemented as a control.

### WASTE

#### Solid waste by destination

This year our sites generated 8,054 tonnes of solid waste, 15% more than last year due to several large maintenance shutdowns during the year. 24 percent of our solid waste, 1,903 tonnes, was sent for recycling. Our global waste to landfill has declined by 43% since reduction targets were introduced in 2014. In 2019, approximately 4.7% of our solid waste was classified as hazardous and is mostly waste from the manufacture of our explosives products. In the Americas, 16,232 tonnes of ammonium nitrate that was unsuitable for use in explosives manufacturing was converted to fertiliser and sold to local farmers as either a nitrogen rich liquid fertiliser, or a low grade solid fertiliser. In Australia, 6,423 tonnes was recycled into making explosives emulsions.



#### Solid chemical waste

Our sites generated 1,799,154 tonnes of solid chemical waste this year, a 29% decrease from last year. Over 99% of this was phosphogypsum chemical waste that was stockpiled at our site in Phosphate Hill, Queensland, Australia. This waste is considered hazardous because of its low pH, however water and phosphate are currently being reclaimed from this material and it is planned that these stockpiles will ultimately be capped and re-vegetated. The other 7,293 tonnes (0.4%) of hazardous chemical waste was mostly generated during explosives initiation system manufacturing.

#### Liquid waste by destination

Our sites generated 19,721 kL of liquid waste that was sent offsite for re-use, recycling or disposal this year, about the same as last year. This liquid waste total includes 11,606 kL of contaminated water, 8,480 kL of hazardous liquid waste and 519 kL of non-hazardous waste. Approximately 46% of the total liquid waste was nitrogen-rich water from our fertiliser manufacturing and distribution sites in Australia that was sent offsite to third parties for use as fertiliser and/or woodchip additive. 89% of the hazardous liquid waste was septic liquid or sludge (considered a bio-hazard) which was sent offsite for disposal or treatment.



#### Waste Reduction initiatives

Waste reduction initiatives across our sites include waste sorting for external recycling; on-site recycling of waste water, waste product and floor sweepings; solids recovery from waste water; and a Micro-Auto Gasification System (MAGS) at our Carthage site which converts the organics in non-hazardous explosives contaminated waste into syngas. The syngas is then used as fuel for the MAGS and to generate hot water.

# Managing the Impacts of Climate Change

## 2019 Highlights



**Publication of the IPL Climate Change Policy**



**Updating of the IPL Board Charter and Charter of the ARMC for Climate Change governance**

**\$2.7 MILLION**

**Feasibility study to assess the potential of renewable hydrogen for ammonia manufacture**



**Integrating climate change related financial risks into IPL's risk management processes**

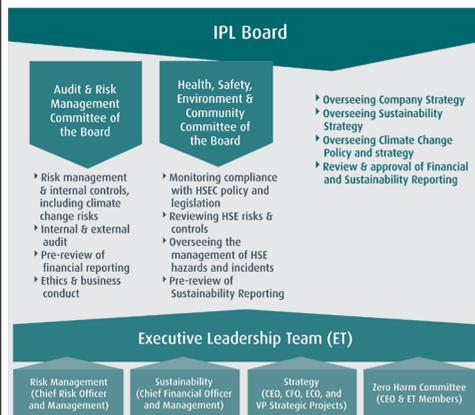


## IPL CLIMATE CHANGE POLICY

During 2019, the [IPL Climate Change Policy](#) was developed by the Executive Team and approved by the Board. The policy states IPL's commitments and describes how the management of climate change related issues is built into the Company's Strategic Drivers.

## CLIMATE CHANGE GOVERNANCE

During 2019, the [Board Charter](#) and its [Audit and Risk Management Committee \(ARMC\) Charter](#) were updated to formally and specifically assign oversight of the Climate Change Policy and climate change-related risks and opportunities to IPL's Directors. As discussed under How We Operate, the Company's highest governing body, the Board of Directors, is responsible for charting the direction, policies, strategies and financial objectives of the Company. The Board operates in accordance with the principles set out in its Board Charter. Day-to-day management of Company affairs and the implementation of the corporate strategy and policy initiatives are formally delegated to the Managing Director & CEO, and her direct reports form the Executive Team. As shown in the governance diagram below, we recognise that managing the impacts of climate change requires a comprehensive governance structure which includes the Risk, Finance, Sustainability, Strategy and HSEC functions.



## CLIMATE CHANGE STRATEGY

We recognise the challenge of reducing our own emissions while continuing to provide products which improve people's lives by unlocking the world's natural resources on the ground. We believe that innovative fertiliser and explosives products & services will play an increasingly important role in reducing emissions and land clearing while increasing yields of food & fibre, and efficiently and effectively accessing the minerals and aggregates required for new technologies & infrastructure rebuilding in a world impacted by climate change.

For these reasons, and as summarised in the graphic above, managing the risks, opportunities and impacts associated with climate change is integrated into our six strategic drivers, on which the success of the Company is built. Download our [Climate Change Policy](#) for more details.

## ASSESSING CLIMATE CHANGE RISKS & OPPORTUNITIES

As previously noted, IPL's main manufacturing process currently relies on sustainable access to natural gas and water, and is GHG emissions intensive. In addition, our farming and mining customers, and therefore our markets, can be impacted by extreme weather events such as droughts, floods, hurricanes and tropical cyclones, as can our own manufacturing facilities (see 'Case Study: Preparing WALA for future extreme weather events' on page 19 of our [2018 Sustainability Report](#)).

For these reasons, the risks associated with emissions, access to natural gas and water, and the physical impacts of extreme weather events have been integrated into IPL's existing risk management processes and corporate strategy for many years, with geographical and market diversification remaining a key management strategy.

This integrated risk assessment process was strengthened last year with the engagement of an expert third party to complete a comprehensive assessment of IPL's physical and transitional (market-based) risks and opportunities associated with climate change. The assessment was conducted using two future climate related scenarios created specifically for IPL (a two-degree scenario (2D) and a four-degree scenario 4D) in line with TCFD guidelines.

The identified risks and opportunities are reported on pages 14-17 of our 2019 [GRI Index and Data](#) supplement to this report. Descriptions of the 2D and 4D scenarios and the methodologies used to create them are included in our 2018 Sustainability Report under 'Climate Change Scenario Methodology' on page 18. Risks considered to be material to IPL are reported under 'Principal Risks' in the Director's Report of the 2018 and 2019 IPL Annual Reports.



## Exploring renewable hydrogen to make ammonia

**New challenges require innovation and new technologies backed by investment.**

In line with our commitment to reducing our GHG emissions and driven by our Manufacturing Excellence and Profitable Growth Strategic Drivers, we commenced a \$2.7 million feasibility study, supported by the Australian Renewable Energy Agency, to assess the potential to use renewable hydrogen to increase ammonia production at our manufacturing facility at Moranbah, Queensland. Rather than being made from natural gas, renewable hydrogen can presently be made at very small plants using solar energy to split water into hydrogen and oxygen, allowing ammonia to be produced without the GHG emissions associated with using natural gas as a hydrogen feedstock. The aim of the feasibility study is to determine whether renewable hydrogen can be made at an industrial scale at a commercially competitive price.

**If successful, the project will deliver a pathway to the largest renewable ammonia plant in the world.**

## INTEGRATED CLIMATE CHANGE RISK MANAGEMENT

IPL has an integrated Group Risk Framework for the oversight and management of material business risks and manages risk within a comprehensive risk management process which is based on the principles and guidelines outlined in ISO 31000 - Risk Management. Risks are identified, analysed and prioritised using common methodologies, and risk controls are designed and implemented having regard to the overall corporate strategy, with risk controls administered via Group-wide processes.

The Board is responsible for reviewing and approving the overall management of risk and internal controls, including those relating to climate change, and monitors the Company's risk profile, risks and mitigating strategies primarily through the Audit and Risk Management Committee (ARMC). The ARMC's duties with respect to internal control and risk management are set out in the Charter for the ARMC, which requires the updating of IPL's future climate-related scenario assessments every three years.

The Audit and Risk Management Committee and, through it, the Board, receive regular reports from management on the effectiveness of the Company's risk management process. Management, through the Managing Director & CEO and Chief Financial Officer, is responsible for the overall design, implementation, management and coordination of the Company's risk management and internal control system.



## Delivering products & services that reduce our customers' impact

**We aim to provide leading technology solutions to meet our customers' needs.**



In 2019 we released our third high efficiency fertiliser, eNPower™, to market. Like our Green Urea™ and Entec® products, eNPower™ is specially formulated to retain nutrients in more stable forms for longer periods, increasing plant nutrient uptake and reducing the likelihood of volatilisation losses to the atmosphere as GHG and to waterways through leaching.

Our Delta E proprietary explosives method reduced both energy use and GHG emissions associated with blasting for our mining and quarry and construction customers. Read more about these products in [Sustainable Products & Services](#).

During 2019 work began on integrating IPL's identified material climate-related financial risks into this comprehensive risk management framework.

Risk Bowtie analyses were used to identify causes and causal groups associated with each material risk, and controls are being identified, modified or specifically designed, with risk and risk control owners assigned to each.

Following the recent one-in-one-hundred year flood event which impacted our supply chain, and therefore production at our Phosphate Hill site in Australia, a [comprehensive review of contingency plans for interruptions to the affected rail line was completed](#). Internal risk reporting system capabilities are also being investigated to enable reporting by site, region or business unit to management and the ARMC that is specific to climate change-related controls as part of regular reporting processes.

In addition, a climate change-related risk review pack is being developed for use in annual site risk register reviews. The pack will include the 2D and 4D future climate scenarios for that site or region, as well as prompts designed to identify any existing risks in each site register which may be impacted by those future conditions.

# Sustainable Explosives Products & Services

## 2019 Highlights



The continued successful rollout of **Differential Energy technology to the Australian market**



Continued testing of waste recycled, reclaimed & treated hydrocarbons to supplement virgin fuel sources



Further research on inhibited emulsion explosives for safer blasting in hot & reactive ground



Further research on products & delivery systems that reduce blast fume emissions & minimise groundwater nitrate leaching



The growth in our premium technology offering is underpinned by the accelerating adoption of electronics and delivery systems by the mining industry which is improving safety, environmental outcomes and productivity at their mine and quarry sites.

Our technology strategy is focused on working in partnership with our customers and innovating in ways that help them achieve their goals. To do this, we focus on delivering products and services that:

- Improve the safety of mining and quarry operations;
- Reduce the environmental and social impacts of mining and quarrying activities; and
- Increase the productivity and efficiency of our customers.

Efforts to mitigate the environmental impacts of our explosives products continue to be focused on the development of new product and delivery technologies which solve our customers' challenges on the ground as well as improving the sustainability of the input materials we use for manufacture.

### Reducing NOx

We continue to research both the formation of NOx and methods to reduce NOx to minimise the impacts of the use of our explosives products. Having completed a previous project on effects of different additives in reducing NOx formation, we are now working on the development of low fume explosives for critical areas. This research has resulted in more than six published papers in scientific journals related to reducing NOx emissions during blasting, and we are using this research to develop improved products and on-site product delivery methods.

### Developing Biofuels

In North America, we have developed technology that allows the use of biofuels and biofuel by-products as an alternative to petroleum-derived hydrocarbons for the manufacture of blasting agents and bulk emulsion products. This technology has been enabled in our product line, though take up has been slow due to limited product availability and the relative costs associated with using biofuels if the mine site is not located close by. We continue to offer this service to our North American customers and expect greater uptake in the future. Our Delta E emulsions include biofuels, further reducing our customers the GHG emissions.

### Recycling hydrocarbons & other waste materials

We have also undertaken work with customers and third party suppliers to introduce technologies that use petrochemicals extracted from waste materials as part of the explosive composition. Discarded tyres and waste oil from machinery are ideal candidates for use, particularly at remote mine sites where trucking virgin materials in and waste materials out consumes resources and time. The recycling of a range of 'out of specification' (OOS) materials has also been

developed, and we will continue to test non-traditional sources for recycling hydrocarbons and other materials in partnership with our customers as the opportunities arise.

### Developing products for safer mining in hot and reactive ground

Addressing hot and reactive ground also continued to be a significant focus in north America in 2019. The testing of ore samples to determine product compatibility was conducted for a number of our customers in the USA. Working in collaboration with the engineering group, the research and development team continued to develop a process to allow customers to selectively modify standard emulsion products to inhibit them against hot and reactive ground. This included the modification of delivery systems and the creation of an inhibiting solution to allow variable inhibition of the final product. This was successfully trialled at a customer site and was very well received as it improved mine efficiency and product performance.

## PRODUCT QUALITY

We collaborate across our global businesses to enable a strong working partnership between our explosives research and development laboratories and our manufacturing plants. This supports our drive for continuous improvement in our operating procedures, particularly where product analysis is required. Ongoing improvements in both the product formulations and the raw materials sourced have resulted in improved explosives product quality and enhanced performance.

A specialised Quality Management System operates in our Explosives Initiations Systems manufacturing plants and our Australian bulk emulsion manufacturing plants that allows us to track and correct product quality using a range of KPIs. These metrics include:

- First Pass Yield, also known as Throughput Yield;
- Process Capability Index, a measure of how closely a process is running to its specification limits, relative to the natural variability of the process;
- Financial cost of non-conforming products; and
- Escape Rate ( $(\text{Total 'Escaped' Defects} / \text{Total Production}) \times 1,000,000$ ) of units not meeting our high standards of quality control. Our 2019 Escape Rate was just 0.30, a better result than our target rate of <1.

The 'Marketing & Technology Ideas & Work Requests Database', which was upgraded last year, not only provides research and development assistance across the organisation, but also facilitates knowledge sharing and collaboration between IPL's employees across the globe as they find innovative ways to improve product quality.

## RESEARCH & DEVELOPMENT PROJECTS IN 2019

### INCREASING CUSTOMER PRODUCTIVITY & DECREASING NOx, DUST, VIBRATION, ENERGY USE & GHG

- Continued development of explosive products & delivery systems that reduce blast fume emissions & minimise groundwater nitrate leaching, including a joint research project with Murdoch Uni.
- R&D support for the continued introduction of Differential Energy technology to the Australian explosives market.

### INCREASING CUSTOMER SAFETY & PRODUCTIVITY

- Continued collaboration with customers to test ore samples & modify emulsion products to create new products for hot & reactive ground in north America, allowing customers to operate safely in these demanding environments.
- An Australian Research Council funded project with the University of Sydney to further develop inhibited emulsion explosives for safer blasting in extreme hot and reactive geothermal environments.

### SUSTAINABLE RAW MATERIAL SOURCING

- Continued testing of recycled, reclaimed and treated oils, hydrocarbons and waxes to supplement the use of virgin fuel sources in emulsion-based explosives.
- Continued testing of oxidiser (an ingredient of explosives) sourced from internal and customer waste streams to generate cost-savings by capturing value in recycled raw materials.

## Partnering with the University of Sydney to focus on safer mining in high temperature geothermal ore bodies

In line with our strategic value drivers of Customer Focus and Leading Technology Solutions, this project is allowing us to develop solutions to our customers' challenges when working in hot and reactive ground.

As Rob Rounsley, our Chief Technology Development Officer explained, mining in high temperature ground, such as extreme geothermal environments, has always been a challenge for the industry.

"Creating a solution that improves safety whilst lifting productivity through innovative technology is a key driver for Dyno Nobel, and we are excited to be working on developing this ground breaking project," Mr Rounsley said.

Dyno Nobel has some of the world's most innovative explosives chemists on board, led by Explosives R&D Manager Dr Jeff Gore.

"The team is thrilled to be collaborating with the some of the brightest minds in Australia on this project including Associate Professor Brian Hawke, Professor Gregory Warr, Associate Professor James Beattie, and Professor Roger Tanner at the Key Centre for Polymer Colloids at Sydney University," Dr Gore said.

"Partnering with these world-class experts is an exciting step forward in addressing the challenges global miners face in operation in higher temperature ground."

Research into emulsion explosives for rock blasting in extreme geothermal environments aims to understand the underlying mechanisms behind the physical and chemical breakdown of ammonium nitrate-based emulsion explosives used for mining in geothermally active regions.

"We want to progress our learnings and apply this knowledge to develop a new class of emulsion explosives for use at higher temperatures," Dr Gore said.

"Our findings will also benefit the Australian mining industry by allowing mining of resources at depth, where the ground temperature is very high due to geothermal heating or other factors associated with high temperature ore body and, importantly, extract these resources safely and with improved productivity."

## Partnering with Murdoch University to design safer, low NOx explosives for mining

A research project to tackle one of the major safety and environmental concerns for the mining industry is the focus of a three year project at Murdoch University with the support of global explosives manufacturer and supplier, Dyno Nobel.

This Australian Research Council Linkage project, worth \$570,000 with a further \$390,000 cash and further in kind support from Dyno Nobel Asia Pacific is investigating ways to reduce emissions of NOx gas during blasts, which can arise in certain conditions.

DNAP Research and Development Manager Dr Jeffrey Gore says Dyno Nobel has worked for several years with Professor Dlugogorski from Murdoch University to identify suitable explosive technologies to minimise the generation of post blast fumes for application in soft and wet ground.

"An example is the Titan 9000xero® product which was developed by the DNAP Explosives R&D team in 2014. To date, in more than 200 blasts, no orange post blast fume, which may contain NOx (nitrogen dioxide), has been observed during use," Dr Gore said. This project aims to include the development of new blends of no-fume high-bulk energy strength explosives and to develop better methods to sample gases from detonation fumes. The work will be completed by Professor Dlugogorski and Dr Mohammednoor Altarawneh from Murdoch University and Dr Gore.

"Working with Murdoch University allows access to world class researchers and facilities with the right experience that can significantly shorten the development and commercialisation times for new products and technologies," said Dr Gore.



## SUSTAINABLE EXPLOSIVES PRODUCTS & SERVICES

### CUSTOMER HEALTH & SAFETY

We provide support to our explosives customers to assist them in choosing the right product and blast plan to minimise environmental impacts and our Dyno Consult team regularly conduct audits at customer sites to ensure that drill and blast procedures, standards and product application are safe and follow best practices. In addition to providing information about the technical aspects of the use of our explosives products, our technical support teams and our Dyno Consult business provide documentation and advice to our customers about:

- Product content, particularly with regard to substances that might produce an environmental or social impact.
- Safe use, storage and handling of the product.
- Disposal of the product as required by applicable law.

This advice is supplied on our websites, on the product label, in the Safety Data Sheet (SDS) or directly to the customer via training sessions. Our Australian labelling complies with the requirements of the SafeWork Australia Code of Practice for Labelling of Workplace Hazardous Chemicals and our Australian SDS comply with the requirements of SafeWork Australia. Our North American labelling meets the requirements of the Globally Harmonized System of Classification and Labelling of Chemicals (GHS) and our North American SDS comply with the Mine Safety and Health Administration (MSHA) for products destined for the mining industry.

#### Assessments for new explosives products

New or modified explosives products are typically developed by our research and development team in conjunction with specific customers as directed by the North America and Asia Pacific Product Management teams. As such, the life cycle stages in which health and safety impacts of those products are assessed are dependent upon

the customer's requirements. For explosives products, typically this would be focused on the impact of product use, with the assessment included in trials. Dyno Nobel's product development protocol requires all products to be blasted at our R&D test sites prior to being fired in the ground. Minimum booster testing and Velocity of Detonation (VoD) measurement provide important information on the performance of the explosive product and blast chamber testing is also conducted at our R&D test facility in the US to verify the gas components generated.

#### Site and distribution security

Many of the explosive products we manufacture, and some of the fertilisers we manufacture and distribute are classified as security-sensitive and/or dangerous goods and as such, their storage, distribution and sale is regulated by Federal, State and sometimes local governments in North America, Europe, Asia Pacific and Australia. We meet our regulatory compliance and licensing obligations surrounding those products, with internal procedures and training in place for our employees. We keep abreast of regulatory developments in this area and are committed to working with government and key stakeholders to ensure ongoing security.

Our Dyno Nobel business in North America has worked closely with the Institute of Makers of Explosives (IME) on the Safety and Security Guidelines for Ammonium Nitrate, promoting best industry practices for minimising security and safety risk. Our Dyno Nobel business in Asia Pacific is a founding member of the Australian Explosives Industry and Safety Group (AEISG), which is an associate member of the IME. The Group produces Codes of Practice that promote best industry practices regarding safety and security, and has a seat as an NGO at the Committee of Experts on the Transport of Dangerous Goods of the United Nations Economic and Social Council (ECOSOC). Our sites are also managed under our own strict health, safety and environmental management system.

### CUSTOMER SUPPORT & ENGAGEMENT

IPL's explosives business continues to work closely with our mining, quarry and construction customers at their sites to deliver high-performance solutions tailored to their needs. The business participates in specialist customer sustainability questionnaires, holds customer focused technical workshops and has dedicated Customer Relationship Managers.

Our Explosives Engineers' Mobile Phone App shares information with our customers about the most sustainable ways to utilise our products. The app equips current and potential customers with a full range of blasting tools that help optimise the blasting experience in the field. It also provides an electronic method to research product information, reducing the amount of documentation printed in the field. The Explosives Engineers' Mobile App includes eight critical blasting calculators, access to our technical library and a comprehensive set of Dyno Nobel product information, including product specs and application uses. Users can also receive real-time updates that feature Dyno Nobel news, recent innovations and new videos. Moreover, worldwide remote accessibility to the app caters to the fact that remote mine sites often experience difficulties connecting to mobile services. In its first six months of operation, our App was downloaded by more than 8000 people.



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In North America, our Dyno Nobel business and Sandvik Mining and Rock Technology have worked together for more than a decade to provide the Quarry Academy and, more recently, the Mining Academy. These popular educational seminars, taught by experts in the industries, focus on best practices to improve process efficiency. Each company has expertise in particular areas of mineral extraction, drilling, blasting, crushing, sizing, and processing. By sharing this knowledge and working together to understand the relationship and impact of one process to the other, we add significantly more value for our customers together than independently.

More than 100 attendees convened in San Antonio, Texas in November 2019 for our 14th Quarry Academy, and our 2nd Mining Academy™ Seminar was held in Louisville, Kentucky in October 2019.

### Reducing the impacts of blasting with Delta E

DeltaE is a proprietary explosives method which allows blasters to accurately vary the density of chemically gassed emulsion as it is being loaded into the blast hole, allowing the operator to load multiple densities of gassed emulsion into the same hole in order to match the unique geological characteristics present in the ground.

Because the explosives energy is precisely targeted to match the rock properties, the amount of energy loaded into the blast hole will match only what is required for an optimal blast, reducing total energy and therefore vertical movement at the surface, air overpressure and noise from the blast event.

The use of Differential Energy continues to result in reduced NOx emissions, reduced energy use and GHG, less dust, noise and ground vibration and increased productivity while reducing overall costs for our mining customers.

A surface molybdenum mine in the United States found that by switching to Differential Energy (DeltaE) with TITAN® 1000 DeltaE, they were able to improve safety, air quality, productivity, fragmentation, and dig-ability. This technology enabled the mine to redistribute the explosive energy in the borehole, putting energy where it was needed by varying the detonation pressure, while using a single truck to load both wet and dry holes. Up to this point, fragmentation, oversize, and hard toes had all been occasional issues for our customer. In addition, some blast events had produced NOx, limiting the size of their blast events.

We worked with our customer to organise a formal three month trial of our Differential Energy technology. The primary goals established for the trial were to:

- Improve safety with consistent product performance;
- Improve air quality by reducing NOx after blast fumes; and
- Improve productivity of the loading process, i.e. faster turnaround times of bulk truck;
- Improve fragmentation and dig-ability; and
- Lower the overall costs of operating mine and mill.

This particular surface mine blasts in a variety of geologies. As a result, the blast crew pushed TITAN 1000E to density extremes in order to extract the greatest value from the technology and the trial was extended to six months, over which time there were 109 blasts.

#### Safety

Prior to the trial, the mine had reported incidents of undetonated blasting agent in their muck piles. TITAN 1000 DeltaE proved to be a reliable and resilient product that provided dependable results. No undetonated blasting agent was found in the muck piles during the trial.

#### Air Quality

Due to the excellent water resistance of TITAN 1000 DeltaE, the number and severity of NOx incidents was significantly reduced. This has allowed the mine to consider revising their air quality permit to allow for larger blast events. Water resistance also limits the dissolution and run off of nitrates.

#### Productivity

The success and versatility of the Titan DeltaE has allowed the mine to go from two bulk trucks to a single truck that can load both wet and dry holes. The Titan DeltaE truck not only has a faster turn-around time than the blend truck, but it also has a larger capacity and can load more holes per cycle.

#### Fragmentation & Dig Ability

Oversize and floor grade problems were noticeably reduced during the trial period. There were no physical measurements of fragmentation and dig ability during the trial, but shovel operators and drill and blast management observed a significant improvement in dig times.

The use of Differential Energy continues to result in reduced NOx emissions, reduced energy use and GHG, less dust, noise and ground vibration and increased productivity while reducing overall costs for our mining customers.



# Sustainable Fertiliser Products & Services

## 2019 Highlights



**Commercialisation of a new patented ammonium phosphate enhanced efficiency fertiliser**



**Research project completion: 'New fertiliser technologies for sustainable food security'**



**Upgrading our Nutrient Advantage customer decision support software**



**504 tonnes of fertiliser bags and farm plastics recycled**



**New packaging & online videos to improve customer safety**



To provide food for our growing global population, farmers are seeking to increase production on their land while minimising environmental impacts. We partner with them by working collaboratively with researchers and by developing new technologies such as enhanced efficiency fertilisers.

During 2019, we continued to focus on increasing our capacity to analyse specific farming customer issues relating to soils, crops and crop nutrition, and aiming to solve these issues through the development of innovative products and services. We operate one of the largest commercial plant nutrition research and development programs in Australia, with more than 30 replicated research trials per annum, often in conjunction with customers, independent organisations and agronomists.

Our long term experiments aim to produce insights that benefit Australian farmers and allow them to improve fertiliser use efficiency and adopt sustainable fertiliser practices. One example is our collaboration with CSIRO at our "Colonsay" nitrogen and phosphorus experiment on the Darling Downs, Queensland, where we have soil tested for phosphorus applied over 35 years.

We are also committed to helping farmers in ways that may assist them to improve productivity and profitability through expanding and developing our range of products and services. The development of new fertilisers is driven by the needs of farmers and is focused on improving nutrient use efficiency, flexibility and environmental performance.

**eNpower** In 2019 we commercialised a new patented enhanced efficiency ammonium phosphate fertiliser which aims to reduce nitrogen losses to the air as GHG and to waterways through leaching. Developed in IPF's own research laboratories, eNpower™ 18:20 contains the nitrification inhibitor DMP in IPF's patented DMP-G formulation. DMP works by inhibiting nitrifying bacteria in the soil to slow down the conversion of ammonium N to nitrate, which is more prone to losses to waterways or to air as GHG.



• Entec® is a treatment that retains nitrogen in the stable ammonium form for an extended period, also reducing the likelihood of losses to the air as GHG and to waterways. Both trials and customer use continue to demonstrate the potential for significant reductions in GHG as well as yield increase with the use of Entec.



• Green Urea NV™ is a top dressing fertiliser, recommended where volatilisation losses of ammonia are likely. Green Urea NV products contain urea treated with the urease inhibitor, N-(n-butyl) thiophosphoric triamide (NBPT) which are designed to delay hydrolysis of urea into unstable forms that may be lost to the atmosphere, thereby reducing GHG emissions related to fertiliser usage. Green Urea NV is recommended for:
 

- intensive dairy and beef pasture production;

- irrigated cotton where urea is applied mid-season;
- forestry situations; and
- field crops where urea is applied to bare soil or soon after crop germination.

## PROMOTING BEST PRACTISE IN FERTILISER USE

Fertilisers are essential to productive farming, allowing farmers to grow more food on smaller areas of arable land than would otherwise be required. High yields are necessary to support the world's growing population. To optimise food and fibre production per unit of nutrient input and return on investment, attention must be paid to how, when and where fertilisers are applied.

It is also important that fertilisers are applied at appropriate rates. Too little, and crop and pasture yields may be sacrificed and produce quality affected. Too much, and the nutrients applied in excess of crop demands may be lost, either to the atmosphere as GHG or to waterways.



**To optimise production per unit of nutrient input and protect our waterways, it is important that fertilisers are used at appropriate rates and in a responsible manner. To support this, our analytical laboratory, Nutrient Advantage, offers specialist soil, plant and water testing to advisors and farmers, and tests approximately 100,000 soil, plant and water samples each year.**

Our Laboratory Service is NATA accredited, ASPAC certified, and operates in accordance with the international standard ISO/IEC 17025. Testing, together with professional advice from our team of agronomists and our computerised decision-support system, Nutrient Advantage Pro, provides the diagnostic data, best practice information and advice farmers need to choose the right fertilisers and apply them correctly, in order to optimise outcomes from the use of nutrients.

Read about how two of our customers reduced their fertiliser use while increasing their yields in our case studies on the next page (27).

Our Nutrient Advantage Pro system is also audited by Fertilizer Australia every two years to ensure it complies with their fertiliser management best practice recommendations.



## RESEARCH & DEVELOPMENT PROJECTS IN 2019

### SUSTAINABLE FOOD SECURITY

- Continued work on a joint research project with the University of Melbourne into new fertiliser technologies for sustained food security.
- Completion of our Australia-China Joint Research Centre of Healthy Soils for Sustainable Food Production & Environmental Quality research.
- A new partnership with the University of Adelaide & CSIRO to develop novel urea coatings for use in arid cropping zones where a particular nutrient deficiency is common.

### INCREASING EFFICIENCY & REDUCING NUTRIENT LOSSES

- Support for a joint project with the University of Adelaide & CSIRO to investigate trace element impact on functional microbes in cropping soils.
- Continued work on nutrient use efficiency to assist our customers to increase their yields while reducing their costs and environmental impacts
- The testing of silicon fertilisers which have been shown to increase stress resistance in crops & replace silicon lost from soils through certain crops.

### PRODUCT QUALITY & PRODUCT LCA

- Research and development support for the extension of IPL's quality standards throughout the fertiliser distribution business, including the assessment of innovative ways of reducing and reusing waste.
- Research and development support for the implementation of our fertiliser product lifecycle management procedure.

## Case Study: Entec use means peace of mind, less nutrient losses to waterways & more gain in cane

In wet or dry seasons, Robert Silvini likes the peace of mind that comes with using ENTEC treated fertilisers in his sugarcane.

"By using urea blends treated with ENTEC, I know the nitrogen is staying on my farm and there's a much lower risk of losing it in runoff after a downpour," he said. "I'm also doing my bit to make sure our industry is protecting the Great Barrier Reef."

Mr Silvini grows cane on a range of soil types between Forrest Beach and Taylors Beach, east of Ingham. He feels more confident that his cane is benefiting from the nitrogen supplied by ENTEC urea blends and there's a much lower risk of nitrogen leaching from the sand hills or floodprone blocks he farms.

"I like the idea that by using urea blends treated with ENTEC, the nitrogen stays in the soil for longer and whether the cane is cut early or late, I am giving the crop the best possible chance to make the most of the nitrogen," Mr Silvini said.

Sibby Di Giacomo, branch manager at Ingham Farm Centre, described ENTEC as a welcome development for the district's cane growers.

"Nitrogen management is a constant challenge for cane growers who have to cope with the most unpredictable weather conditions and with the Reef close by, there's increasing pressure on growers to improve nitrogen use efficiency," he said. "ENTECC keeps nitrogen stable in the soil for longer, giving it more staying power so the crop can use the nitrogen more efficiently."

**"We like ENTEC because it means growers like Robert have a better alternative for enhancing the efficiency of their nitrogen applications while protecting the environment."**



On the Kolan River north of Bundaberg, cane farmers Glenn and Susy Robertson are taking steps to change their fertiliser management for the better.

In addition to long-standing best management practices like soil testing, trash blanket farming and banding fertiliser into the soil, they have recently started using ENTEC and split fertiliser applications.

They are finding the changes especially good for protecting against leaching losses and keeping nitrogen available to the crop for longer on their lighter soils. The farm has a mix of soil types, with river loam, grey forest country and sandy soils. According to Glenn, the most difficult soils to manage are sands, with leaching a real problem.

"To get yields to lift on the sandy soils normally takes a wet year or a lot of watering, but with that comes leaching," he said.

That's why three years ago, they trialed ENTEC with their cane fertiliser blend on half a block of sandy soil. At the same time, they cut the fertiliser rate by about 20%.

"I figured I could cut rates because I would be getting more than 20% extra from the fertiliser if it wasn't leaching away," Glenn said.

The result was a difference of around 35 cm of cane growth and around 15% extra yield, which was enough to see him adopt ENTEC on all the sandy country.

"I use it on all the sandy soils now and have started using it in the grey forest country as well with similar results," he said.

**"I'm already using less than the local cane board's recommended fertiliser rates and I'll be going further this year," he said. "With ENTEC we're getting better use of the nitrogen, so I don't have to put as much on."**



## SUSTAINABLE FERTILISER PRODUCTS & SERVICES

### CUSTOMER HEALTH & SAFETY

Our Zero Harm priority extends beyond our Company to our customers and our local communities. Our Australian fertiliser products comply with Fertilizer Australia Codes of Practice, including the National Code of Practice for Fertilizer Description and Labelling. This code of practice aims to achieve uniform description and labelling of fertilisers across Australia. The label provides advice on the product's nutrient content, and the maximum concentration of impurities that may impact on soil concentrations of the element, plant growth, the health of grazing animals, food safety, and the marketability of farm produce.

During 2019 we won a [Safe Work Award](#) for our safety campaign to raise awareness and improve handling behaviours for anyone storing and managing our 1 tonne bags across our supply chain. We developed an [online video](#) to promote safer product handling and designed a new safe bag handling decal to clearly demonstrate the correct lifting procedures for the bags.

Safety Data Sheets (SDS), which comply with the Globally Harmonised System of Classification and Labelling of Chemicals (GHS) and meet the requirements of the Australian Dangerous Goods Code and Safe Work Australia criteria, are available for all range products. The SDS include advice on the safe use, storage and handling of the product, and its disposal. Labels are attached to the package, or the Delivery Docket for bulk deliveries. Label information and SDS can also be accessed on the Incitec Pivot Fertilisers website, along with other technical information, including advice on Farm Safety when handling Bulk Bags and storing fertiliser in silos, information on product density and sizing, and the company's [Quality Policy](#), which is included for use in our farming customers' Quality Assurance programs.

### PRODUCT QUALITY

[IPL's Fertiliser Quality Policy](#), through its Incitec Pivot Fertiliser business, outlines its commitment to providing products and services that meet customers' needs. Fertiliser manufacturing is monitored by IPL's own Quality Control Laboratories and our Ammonia (Big N), Urea and GranAm products are quality assured to AS/NZS ISO9001:2000 standards.

All product imports are sourced in compliance with the Fertiliser Australia National Code of Practice for Fertiliser Description and Labelling. Certificates of Analysis are sought from suppliers to ensure they are within set product specifications that meet statutory limits and market needs. The delivered products are then analysed through our own Quality Control Laboratories to ensure they are within specification, e.g. maximum limits of heavy metal impurities such as cadmium, lead and mercury. We declare the impurity content of fertilisers on the product label.

Through our Customer Complaints Data Base, we track the percentage of our fertiliser product sold (imported or manufactured) which has quality control issues and we set targets to improve/maintain this KPI each year.

During 2019, the IPF Quality Assurance Council continued to drive improvement through the extension of IPL's manufacturing quality standards to the fertiliser distribution business, resulting in a 15% reduction in customer complaints, a 12% reduction in product handling losses and a 7% reduction in costs associated with treating dusty products. In 2019, the percentage of fertiliser sales with quality control issues which were compensated for was just 0.03%.

### Case Study: New fertiliser technologies for sustained food security

With society facing the triple challenges of food security, environmental degradation and climate change, we recognise the need for fundamental research to develop next-generation fertiliser products that will improve nitrogen use efficiency to feed a growing population while reducing nitrogen losses from food production systems to the environment.

As part of the Australia-China Joint Research Centre of Healthy Soils for Sustainable Food Production and Environmental Quality, IPL is partnering with the University of Melbourne and experts in fields including chemistry, chemical engineering and soil science to apply a novel multidisciplinary approach to develop and test new, highly-efficient fertilisers. This is not only critical for addressing the triple challenges, but also for the competitive advantages of the Australian fertiliser industry.

The Centre of Healthy Soils for Sustainable Food Production seeks to investigate the practical challenges of understanding the sustainable limits for the productive use of soil, freshwater, river flows and terrestrial and marine systems better and the reducing impacts on soil, fresh and potable water, urban catchments and marine systems

from agricultural systems. A key aim of the Centre is to reduce the footprint of agriculture production systems by retaining nutrients in food, reducing wastes, developing climate resilient systems and remediating soils. As Australia's largest fertiliser manufacturer, IPL is a key partner in the work of the Centre in regard to introducing new technologies and management practices that will improve farming productivity and sustainability, which has broad social implications for national food security and the sustainability of rural communities.

This project aims to produce innovative and cost-effective fertiliser products, which will have a significant impact on the profitability and sustainability of food production. The project provides excellent research training opportunities in a multidisciplinary high-quality environment and will not only advance Australia's reputation as a "clean and green" producer, but also create opportunities for market expansion nationally and internationally.

### CUSTOMER SUPPORT & ENGAGEMENT

We foster strong ongoing relationships with our customers through collaborative research and product development, the promotion of best practice use of our products to reduce environmental impacts and increase safety, and through a range of customer support and education technology applications.

Our agronomy forum guest speakers have included leading agronomists, scientists, researchers and fertiliser advisers.

Our Agronomy in Practice course focuses on the practical aspects of making credible fertiliser recommendations to farmers, whether they're involved in cropping, pasture, summer crops, sugar cane or horticulture. The course is aimed at training the next generation of agronomists as well as current advisers who want to enhance their skills in soil and plant nutrition. This year's participants include a cross-section of commercial and private agronomists, and government extension agents.

Nutrient Advantage Advice is Incitec Pivot Fertilisers' Fertcare accredited decision support software system. Fertcare is amongst the leading programs addressing the issue of expanding food production to feed and clothe a growing global community through judicious use of fertiliser, while limiting the potential for off-site nutrient impacts such as eutrophication of waterways.



### LIST OF RESEARCH ORGANISATIONS FUNDED

As reported from page 22 to this page, IPL works with a range of research partners to create shared knowledge in areas relevant to our fertiliser and explosives customers and markets. The research institutions and projects that we funded during 2019 are listed below.

Organisation and Project Funded	Period of Funding
<b>University of Melbourne</b>	
New fertiliser technologies for sustained food security	2018-2020
<b>CSIRO &amp; University of Adelaide</b>	
Increasing nitrogen use efficiency with micronutrient coatings for urea fertiliser	2019-2023
<b>LaTrobe University</b>	
Research into the mechanisms by which plants uptake phosphorus and deal with phosphorus deficiency	2017-2022
<b>Queensland Department of Science &amp; Environment (DES), Australia</b>	
Smart blending of enhanced efficiency fertilisers to maximise sugarcane profitability	2018-2020
<b>Various major customers under Partner Program, Australia</b>	
Various projects ranging from product evaluations through to farming systems trials to reduce nutrient runoff to waterways	2014 onwards
<b>University of Sydney</b>	
Emulsion Explosives for Rock Blasting in Extreme Geothermal Environments	2018-2021
<b>Murdoch University</b>	
Low fume explosives for critical areas	2017-2020



# Working with our Suppliers

## 2019 Highlights

**100%** of major materials suppliers screened (top 20% of spend)



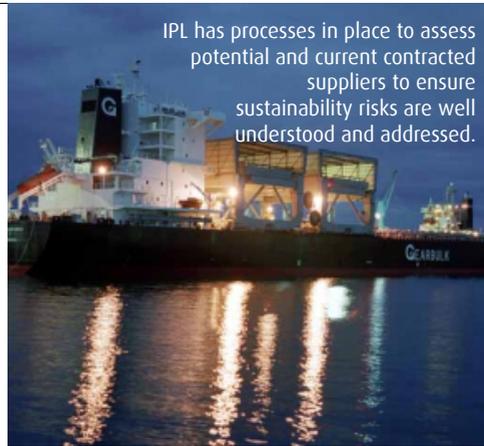
Publication of the IPL Supplier Code of Conduct



Publication of IPL Modern Slavery Policy and the development of tools and procedures to assess this risk in our supply chain



504 tonnes of fertiliser bags and farm plastics recycled



IPL has processes in place to assess potential and current contracted suppliers to ensure sustainability risks are well understood and addressed.

## OUR APPROACH

Potential and current contracted suppliers are assessed using a questionnaire that covers environment, social and governance aspects and our Americas and Asia Pacific Procurement teams work with suppliers on gap closing action plans where required. Contracts between IPL and materials suppliers also contain clauses that are consistent with IPL's expectations of suppliers' workplace health, safety and environmental performance. The assessment of suppliers and close out of assigned actions is monitored through regular reporting.

We will deliver best cost commercial outcomes aligned with stakeholder requirements through a sustainable, systematic sourcing process and active management of supplier spend.

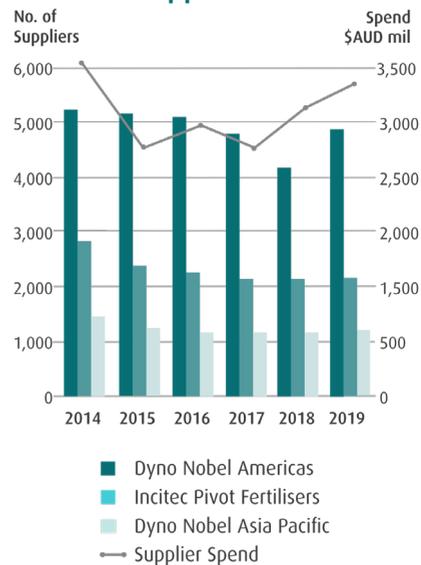
Our Asia Pacific procurement team assesses the effectiveness of IPL's supplier management processes through the IPL Supplier Relationship Management (SRM) program. Suppliers included in the SRM program are determined by segmentation analysis. The aim of the program is to create value from existing supplier relationship for both parties through discussion and delivering improvements. Regular supplier meetings are held and SRM actions are recorded in the SRM database and tracked by the Procurement Manager. Completed and overdue actions are tracked on the IPL SRM dashboard, which includes targets and KPI's based on the number of meetings held, their timing and Contractor TRIFR & TRIs. A similar program is followed in the Americas.

## SUPPLIER CONDUCT AND MODERN SLAVERY

During 2019, the [IPL Supplier Code of Conduct](#) was developed and published. In addition, as reported under 'How We Operate', the IPL Modern Slavery project team was formed and the [IPL Modern Slavery Policy](#) was published. In addition to inclusions in the IPL Supplier Code of Conduct, a set of tools and procedures is being developed to enable the identification and mitigation of any risks associated with human rights in the IPL supply chain, and to ensure due diligence in IPL's own operations.

In line with our commitment to develop the sustainability of our supply chain, we continued to work with suppliers, customers and industry bodies on a range of initiatives in 2019 to reduce our impacts and bring positive change. Two of these are outlined in the case studies on the following page.

## IPL Supplier Profile

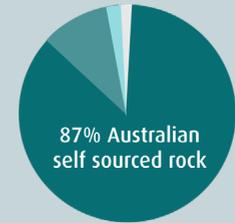


## 87% SELF-SOURCED AUSTRALIAN PHOSPHATE ROCK

Phosphate rock, a naturally occurring mineral rock, is used in the production of both Ammonium Phosphate (AP) fertilisers and Single Super Phosphate (SSP) fertilisers. APs are produced at Phosphate Hill, Queensland, using phosphate rock from the mine adjacent to that plant. We also import phosphate rock to make SSP at our Geelong and Portland (through to its closure during 2019) plants in Victoria.

SSP is manufactured using a blend of imported phosphate rock because the composition of phosphate rock varies according to the place of origin, with varying levels of phosphorus, cadmium, odour and reactivity which must be balanced to produce a product that meets with Australian regulations.

IPL purchases phosphate rock from several countries, after undertaking a detailed review of each supply source having regard to social, environmental and economic factors. During 2019, 9% of our phosphate rock was imported from Togo, 2.3% was from Vietnam and 1.7% was from China, with 87% mined at our Phosphate Hill site in Australia.



- Australian IPL Phosphate Rock - 87%
- Togo Import - 9%
- Vietnam Import - 2.3%
- China Import - 1.7%

## In 2019, IPL continued to work with suppliers, customers and industry bodies to collect and recycle our fertiliser packaging through the Farm Waste Recovery initiative.

In any given year, over 80% of our fertiliser sales are bulk sales which require no packaging. However, approximately 15% of our fertilisers are transported to customers in one tonne FIBCs (Flexible Intermediate Bulk Containers) and 5% is sold in small packs. Prior to 2015, we used reusable FIBCs to reduce our packaging impacts. With the move to single trip plastic packaging, in order to improve customer safety and reduce the risk of potential spills to the environment, we worked with our fertiliser packaging suppliers, plastics reprocessing companies, 23 local councils, the Queensland Department of Environment and Heritage Protection, and 'Farm Waste Recovery', a subsidiary of the Australian agricultural industry body, AgStewardship, to establish the Sugar Cane Fertiliser Bag Recovery Trial. The key objective of the trial was to develop a sustainable model for the collection of fertiliser bags and the reuse of the recovered materials.

Due to its success, we have extended the bag collection and recycling program across eastern Australia through providing financial and promotional support to encourage growers to tie the bags in bundles and drop them at local council and private farm collection centres, where they are bailed for transportation to Brisbane for recycling.

Now in its fifth year, the Farm Waste Recovery program continues to grow, with 18% more plastics collected than last year and a 121% increase from the pilot year - more than double the amount of bags recycled. In total, 1,791 tonnes of plastics have been collected for recycling since the program began. This amount includes all types of recyclable farm plastics, as well as our fertiliser bags. The success of this program demonstrates the commitment of our customers to a sustainable recycling option for our fertiliser packaging.

Not only was the volume of plastic collected in 2019 enough to make 2,592 park benches, it means tidier farms, less material going into landfill sites and less likelihood of the plastic packaging ending up in the environment.



## Working with RightShip to reduce, quantify and offset Scope 3 carbon emissions associated with our global shipping

During 2019 we continued to minimise the emissions associated with our global shipping contractors in the performance of their services for us. By using the RightShip Greenhouse Gas (GHG) Emissions Rating to find more efficient shipping vessels, we are using our influence to bring change in the maritime industry by rewarding ship owners that prioritise energy efficiency in line with our values, our commitment to minimise environmental impacts, and our drive to improve our financial performance.

The relative performance of a vessel is rated from A through to G, the most efficient being A, the least efficient being G. Selecting more efficient ships means less energy used as fuel, lowered fuel costs and reduced Scope 3 carbon emissions. The Rightship GHG methodology uses the standard European energy efficiency scale and allows emissions to be benchmarked and tracked per journey and over time. The methodology has been verified according to an internationally recognised standard (EN16258:2012).

Since we began using the Rightship GHG emissions rating system in 2016, we have reduced our emissions per tonne of cargo by 12%.

In 2019, 32% of our ships were rated A or B, and 88% were rated D and above. We used no F or G rated ships in 2019.

During 2019, the Scope 3 emissions associated with our global shipping were 83,980 tCO2e. We offset the portion of emissions associated with voyages that loaded in at our Townsville Port facility in Australia through the purchase of 6,603 verified carbon credits (VCCs).

# Ensuring a Talented, Engaged & Diverse Workforce

## 2019 Highlights

-  **Inclusion in the Bloomberg Gender Equality Index for the second consecutive year**
-  **Year-on-year increase in female employees and 4% increase in female Senior Managers**
- 3%** **Indigenous employees across IPL's Australian businesses**
-  **Launch of the 'One IPL' Leadership Framework**
-  **Meaningful improvement in employee engagement**



Our People Strategy is focused on developing a diverse and inclusive business with the right people in the right roles, who are inspired and engaged.

We remain committed to expanding the diversity of our workforce and have set a stretch target to increase gender diversity by 10% year-on-year to reach 25% by 2022.

IPL believes that a diverse and inclusive business with the right people in the right roles inspired to deliver, will provide an engaging workplace and enable achievement of our business objectives. Our aim is for a workforce that is representative of our markets and communities across our global organisation.

## ENGAGING OUR EMPLOYEES

Our employee engagement strategy includes building people focused leaders across our organisation with the skills and capabilities to coach, develop and inspire. All leaders are responsible to implement local action plans to ensure an engaging experience for all employees. Employees at all levels of our business are encouraged to think laterally, to share their experiences and ideas, and to participate in implementing improvements, resulting in outcomes which are highly valued by both the business and our employees.

Using last year's 'Your Voice' employee survey results as a benchmark, our 2019 global survey showed a meaningful improvement in employee engagement. Consistent with 2018, the IPL Zero Harm Culture and our Corporate Values are important factors in engaging our employees.

## 2019 diversity actions & outcomes:

- 25% increase in female attraction rate in our US business.
- Review & amendment of sourcing approaches & diversity profile in all regions.
- Introduction of front line Manufacturing trainee programs to reduce reliance on experienced candidates & increase the gender diverse candidate pool.
- First female recipient of our annual US Quarry Academy scholarship.
- Introduction of the One IPL Diversity Talent Expectations to support sourcing and selecting diverse teams and avoid bias in all talent management decisions.
- Revised monthly monitoring & reporting to improve visibility of progress.
- Introduction of the American Australian Association Veteran's Scholarship program.
- Achievement of key stakeholder common objectives for gender & Indigenous Australian employment.



## DIVERSITY

Diversity of people and perspectives is an essential enabler of innovation and collaboration across IPL and is important to many of our stakeholders. Diversity at IPL is led by the Executive Team. The Board maintains oversight and responsibility for the Diversity Policy and management's development and implementation of the Diversity Strategy, which is summarised in the graphic below, along with key outcomes in 2019.

Our inclusion in the global Bloomberg Gender Equality Index (GEI) for the second consecutive year demonstrates publicly the Company's commitment to diversity and inclusion in the workplace. During 2019, we continued to progress toward IPL's measurable objectives in relation to gender – to achieve a participation rate of 25% women by 30 September 2022 – and to Indigenous Australians, achieving the goal of a 3% employment rate.

In 2019, the percentage of women across our global workforce increased by 1% to 17% globally. Our Australian workforce was 23% female and notable increases were made in our US business, where gender diversity has seen a 9.5% improvement during 2019, and in our Indonesian business, where female participation has risen from 8.4% to 13.4% over the last 2 years. Global diversity data by management level is reported in our Scorecard on page 8, and by region in [GRI Index and Data](#).

## TALENTED AND ENGAGED PEOPLE - STRATEGIC THEMES

### ENGAGING LEADERS

Building engaging leaders across our Company who create a One IPL culture and target strategic results.



### TALENTED PEOPLE

Attracting, retaining and developing the right people in the right roles, both now and for the future.



### DIVERSE & INCLUSIVE

Ensuring a diverse & inclusive environment is the everyday experience for our employees.



### COLLABORATION

Achieving strong business outcomes together as One IPL.



## ACTIONS IN 2019

- Launch of the One IPL Leadership Framework to clarify expectations for our leaders.
- The inaugural One IPL Leadership Forum was held in Melbourne and brought the company's global leaders together to build our leadership community and align our leaders to our Company Strategy.
- Using last year's results as a benchmark, our 2019 global 'Your Voice' employee survey showed a meaningful improvement in employee engagement.

- Review and refining of the IPL Talent Management Process.
- Completion of the global One IPL Learning and Development platform, bringing consistency and standardisation to the learning and development of our people across the Americas and Asia Pacific.
- Continuation of our Australian Manufacturing Graduate Program and our Dyno Nobel community and align our leaders to our Company Strategy.
- Using last year's results as a benchmark, our 2019 global 'Your Voice' employee survey showed a meaningful improvement in employee engagement.

- Executive Team review of the IPL Diversity & Inclusion strategy.
- Introduction of the American Australian Association Veteran's Scholarship program.
- Promotion of the IPL Family & Domestic Violence policy.
- Recruitment through Work180.
- Continued involvement with the National Association of Women in Operations, the Australian Women in Resources Alliance, Diversity Council Australia and Women in Mining & Resources WA and QLD.
- Facilitation of Australian Indigenous cultural awareness through promoting and participating in Reconciliation Week and NAIDOC Week.

- A focus on collaboration between senior leaders across the Company at the One IPL Leader Forum, with the provision of tools to promote collaboration and innovation among our employees.

## FOCUS IN 2020

- Embed the One IPL Leadership Framework into everyday leadership practice.
- Ongoing local engagement plans & pulse checks on progress.

- Integrate the One IPL Leadership Framework into all aspects of talent acquisition and development.

- Targeted hiring & training in our highly skilled employment categories, a market which is typically low in gender diversity

- Measurement & benchmarking of collaboration competencies to ensure pipelines are robust in collaboration.

## IPL INDIGENOUS EMPLOYMENT PROGRAM

In line with our commitment to Value People – Respect, Recognise & Reward, IPL's Indigenous Employment Program aims at increasing the number of opportunities for Indigenous Australians by providing access to employment, education and training as well as focusing on developing cultural understanding and respect within its workforce.

The IPL Australian Indigenous Relations Policy provides guidance to the organisation as to how to strategically increase engagement opportunities with Indigenous Communities so as to benefit Indigenous Australians as well as IPL. The Policy provides a valuable opportunity for IPL to work in genuine partnership with Indigenous Australians and live the IPL Values of "Care for the Community and our Environment" and "Challenge and Improve the Status Quo".



# Caring for Our Communities

## 2019 Highlights



100% compliance with required community safety communications

80%

increase in community giving - our 2nd consecutive year-on year increase



Supporting Australian communities impacted by drought and flood



Continuing our BLAST school safety program and extending our Mental Health awareness to local schools



Building 3 shelter houses for tsunami and earthquake impacted families in our local Indonesian communities



We believe we have a responsibility to make a positive social & economic contribution to our local communities.

## COMMUNITY ENGAGEMENT

We are committed to building long term and meaningful relationships with the communities in which we operate in accordance with our Value of "Care for the Community & our Environment". We actively engage with community members and representatives of national and international charities, regulators, Governments and grass-roots community organisations including resident groups, councils, farmers, sporting clubs and environmental groups.

We aim to have a positive impact by providing local employment, selecting local suppliers wherever possible and creating shared value for our mining and farming communities. We empower our people to engage with their local communities and seek to mitigate negative impacts and create positive perceptions and outcomes for our business.

Our [Sustainable Communities Policy](#) defines our approach to community relations, including commitments to:

- Listen to and work with the community;
- Strive to be a valued corporate citizen; and
- Respect our neighbours, their values and cultural heritage, and be considerate of them in carrying out our operations.

Day-to-day responsibility for assessing our community impacts and implementing community engagement programs rests with local management at each of our sites, as our site managers best understand their needs and concerns. Local priorities are informed by our Community HSEC Standard, which sets our minimum requirements for engagement. Governance of our community investment programs is overseen by the Executive Team.

## COMMUNITY SAFETY

Our commitment to Zero Harm is our leading priority. Due to the nature of industrial and agricultural chemicals, our operations have the potential to impact on local communities.

IPL has measures in place to monitor, manage and prevent potential negative impacts on local communities which may arise. Due to the nature of our business, many sites are required by law to communicate regularly with the community regarding Community Safety Plans which describe the emergency procedures that should be followed to keep them safe in the unlikely event of a potential incident. In addition, potential impacts are also assessed and addressed. For example, where there is any risk of the release of fumes associated with ammonia, purpose built gas detectors are used. These are permanently located near the perimeters of sites that have ammonia storage tanks, ensuring that any potential leaks can be responded to. The detectors

set off an alarm to response teams at any time of the day or night if gas is detected.

In North America, 53% of IPL's sites handle materials which have the potential to impact on local community safety and are required to communicate with first responders in the community. Many of these sites are required to actively participate on Local Emergency Planning Committees (LEPCs) as part of the Emergency Planning and Community Right-to-Know Act (EPCRA). For example, our Cheyenne, Wyoming manufacturing site in the USA participates in the Mutual Aid Emergency Response Group along with the local Fire Department, Holly Frontier Refining and Warren Air Force Base. LEPC membership must include (at a minimum):

- Elected state and local officials
- Police, fire, civil defense, and public health officials
- IPL facility representatives
- Environment, transportation and hospital officials
- Representatives from community groups and the media

LEPCs measure their effectiveness against the EPA recommended guideline 'Measuring Progress in Chemical Safety: A Guide for Local Emergency Planning Committees and Similar Groups'.

In the Asia Pacific region, 21% of sites have been identified as either 'Major Hazard Facilities' or sites which are required to provide specialised communications to their communities regarding safety. These sites follow 'Safe Work Australia' guidelines and local regulations in developing emergency plans, establishing and evaluating a Safety Management System, and creating and distributing communications to their communities. Major Hazard Facilities are required to hold regular Emergency Response drills which include site personnel and Emergency Services. Copies of the Emergency Response Plans must be lodged with regulatory agencies, and information in relation to the site's activities and emergency response is provided to local community libraries. A 24 hour emergency contact number must be displayed at each facility, and the name of a contact person provided, from whom information may be obtained, and with whom concerns can be raised. We also publish [IPL Community Safety Reports](#) on our website to provide information and advice for neighbours of our facilities who may be impacted by our activities.

In addition, IPL has a continuous improvement management approach in response to incidents such as gas sensor alarm responses and the IPL Issues Response Manual assists crisis management teams to effectively manage communication and engagement in the event of an incident.

## 2019 COMMUNITY INVESTMENT



## COMMUNITY INVESTMENT

Our Community Investment Framework helps us to build meaningful community relationships and has enabled us to further support our people in their endeavours to make a difference within their local communities. The framework sets minimum standards all businesses and sites within the Group are required to uphold when administering community programs and spend, ensuring funds are issued consistently and fairly across our operations. Importantly, the Framework preferences local approaches, enabling each IPL business and site to respond to the distinct needs of their communities.

Our Dollar for Dollar program, a key component of our Community Investment Framework, matches employee donations and site based fundraising efforts that are aligned to our Principles for Giving to a total of A\$2000 per initiative. Our Workplace Giving program offers Australian employees a voluntary Workplace Giving scheme whereby they can donate to one or more of the company's nominated not-for-profit charities. The process is simple and streamlined, it offers a choice to employees as to how their contributions are directed, and allows them to influence where some of IPL's community giving is focused. IPL matches our employees' Workplace Giving to \$20,000 each year.

During 2019, \$885,541 of community investment was made globally through IPL's Dollar-for-Dollar program, the Australian Workplace Giving program and various site-based initiatives. This is an increase of more than 80% on last year's community contribution, and included \$100,000 in emergency aid for those affected by the Queensland floods and \$142,000 of fertiliser donated for auction to assist drought affected farmers.

100 percent of both local and Group donations were made in line with our Principles for Giving, with approximately 17% going to health initiatives (including sport), 38% going to education and 45% to local community development, which includes disaster relief. Amsyah Sebayang and Willy Dasrul from our DNX Indonesia team are shown below handing over one of three shelter houses built in Palu with donations from our global employees in response to an earthquake and tsunami in central Sulawesi, Indonesia.



# About the Data

## Scope

This Report covers wholly owned subsidiaries of Inctec Pivot Limited ACN 42 004 080 264.

The Company is a public company, trading on the Australian Securities Exchange as IPL.

In accordance with Global Reporting Initiative (GRI) 'G4' Sustainability Reporting Guidelines, our reporting covers all entities that generate significant sustainability impacts (actual and potential) and over which we exercise control or significant influence with regard to financial and operating policies and practices.

The financial year ending 30 September 2019 is indicated as '2019' in our reporting.

The statistics in our reporting are for global sites wholly owned by IPL during 2019. Joint ventures are not covered in our reporting, unless indicated, nor are the activities of suppliers, customers or outsourced operations.

The Company participates in many joint ventures with varying levels of ownership interest. A list is provided on page 69 of our 2019 Annual Report.

All financial figures in the Report are in Australian dollars, unless otherwise indicated.

## Data measurement and calculations

**Financial data:** Financial figures are derived from our audited accounts, which are prepared according to the International Financial Reporting Standards (IFRS).

**Greenhouse Gas Emissions data:** Scope 1 and 2 greenhouse gas emissions are calculated based on the Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition).

### Australian Scope 1 and 2 GHG emissions:

- National Greenhouse and Energy Reporting (Measurement) Determination 2008

- National Greenhouse Accounts (NGA) Factors (2016).

### Americas Scope 1 and 2 GHG emissions:

- US Electricity: eGRID2012 (2015 Version) Year 2012 GHG Annual Output Emission Rates

- US Fuels: IPCC, Guidelines for National Greenhouse Gas Inventories (2006)

- Canada Fuels: Default CO<sub>2</sub> Emission Factors: Environment Canada, National Inventory Report, 1990-2007: Greenhouse Gas Sources and Sinks in Canada (2009), Annex 12: Emission Factors, Table A12-5 (1998-2007 data); Default Heat Content: Statistics Canada, Report on Energy Supply-demand in Canada, 2007 (2009)

- Canada Electricity: Canadian Energy Issues: <http://canadianenergyissues.com/ontario-power-stats/>

- Mexico Electricity: Ecometrica Technical Paper: Electricity-specific emission factors for grid electricity (2011) Brander, Sood, Wylie, Haughton, and Lovell at <https://ecometrica.com/assets/Electricity-specific-emission-factors-for-grid-electricity.pdf>.

### European Scope 1 and 2 GHG emissions:

- 2011 Guidelines to DEFRA/DECC's GHG Conversion Factors for Company Reporting – Produced by AEA for the Department of Energy and Climate Change (DECC) and the Department for Environment, Food and Rural Affairs (DEFRA) in the UK. Version: 1.2

## Changes during the period

There were no significant changes to the organisational structure or size of the Company during the reporting period.

## Restatements

IPL's 2017 and 2018 TRIFRs have been restated due to the finalisation of classification of incidents pending at the time of previous publication dates. Our global SOx for 2018 has been restated due to improvements in calculation methodology.

## Assurance and data integrity

We aim to ensure that the information we publish is accurate, complete and material and therefore contributes to building trust and credibility with stakeholders. To achieve this we have improved our internal processes for verifying non-financial management information and for reviewing and approving the content of our reporting.

Deloitte provided a limited assurance statement on our Australian greenhouse gas emissions, energy consumption and production figures for the period 1 July 2018 to 30 June 2019. (Deloitte is an independent auditor who also audit the company's financial statements. See pages 60 and 100-104 of the 2019 IPL Annual Report.) IPL is not currently seeking an extension in the scope of assurance for this annual online Sustainability Report.

# Glossary

**Acute physical risks** are physical risks that are event-driven, including increased severity of extreme weather events, such as cyclones, hurricanes, floods and coastal storm surges.

**Agricultural extension** is the application of scientific research and new knowledge to agricultural practices through farmer education. The field of 'extension' now encompasses a wide range of communication and learning activities organised for rural people by educators from different disciplines, including agriculture, agricultural marketing, health, and business studies.

**Chronic physical risks** refer to longer-term shifts in climate patterns such as permanent increases or decreases in average or seasonal rainfall at a particular region, sustained higher temperatures that may cause sea level rise or chronic heat waves, changes in seasonal periods of frost, etc.

**Climate:** The weather conditions prevailing in an area/region in general or over a long period.

**Climate Risk Index (CRI):** Global Index which analyses to what extent countries have been affected by the impacts of weather-related loss events (storms, floods, heat waves etc.). It demonstrates that less developed countries are generally more affected than industrialised countries. Regarding future climate change, the Climate Risk Index may serve as a red flag for already existing vulnerability that may further increase in regions where extreme events will become more frequent or more severe due to climate change. While some vulnerable developing countries are frequently hit by extreme events, for others such disasters are a rare occurrence.

**Climate Change Scenario:** A scenario describes a path of development leading to a particular outcome. A climate change scenario describes a path of development leading to a set degree of rise in temperature above pre-industrial global average temperatures. Scenarios are not intended to represent a full description of the future, but rather to highlight the central elements of a possible future and to draw attention to the key factors that will drive future developments, or in the case of climate change scenarios, financially material climate-related risks and opportunities. Scenarios are hypothetical constructs; they are not forecasts or predictions, nor are they sensitivity analyses.

**Carbon dioxide equivalent (CO<sub>2</sub>e):** The universal unit of measurement to indicate the global warming potential (GWP) of each of the six greenhouse gases, expressed in terms of the GWP of one unit of carbon dioxide. It is used to evaluate releasing (or avoiding releasing) different greenhouse gases against a common basis

**Extensive agriculture** (as opposed to intensive agriculture) is an agricultural production system that uses small inputs of labour, fertilisers, and capital, relative to the land area being farmed.

**Global Reporting Initiative (GRI):** a leading organization in the sustainability field, promoting the use of sustainability reporting as a way for organisations to become more sustainable and contribute to sustainable development. GRI has pioneered and developed a comprehensive Sustainability Reporting Framework that is widely used around the world. To see the GRI indicators covered by our sustainability webpages and publications, see [GRI Index and Data](#).

**Group:** The IPL group, collectively comprising IPL and its subsidiaries.

**Material:** In the context of the GRI Reporting Framework, 'material' topics for a reporting organization are those topics that have a direct or indirect impact on an organisation's ability to create, preserve or erode economic, environmental and social value for itself, its stakeholders and society at large

**Near miss:** An unplanned event that did not result in injury, illness, or damage – but had the potential to do so. The aim of the investigation of each 'near miss' event is to identify and mitigate root causes, providing a focus of improvement

**NOx:** a generic term for the mono-nitrogen oxides NO and NO<sub>2</sub> (nitric oxide and nitrogen dioxide)

**N<sub>2</sub>O:** Nitrous oxide (di-nitrogen oxide), listed as one of six greenhouse gases covered by the Kyoto Protocol and the Greenhouse Gas Protocol

**Paris Agreement:** A global climate agreement that was reached under the United Nations Framework Convention on Climate Change (UNFCCC) at the 21st Conference of the Parties (COP21) in Paris (30 November to 12 December 2015) to limit average global temperature rise this century well below 2 degrees Celsius above pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius.

**Physical risks** resulting from climate change can be event driven (acute) or longer-term shifts (chronic) in climate patterns. Physical risks may have financial implications for organisations, such as direct damage to assets and indirect impacts from supply chain disruption. Organisations' financial performance may also be affected by changes in water availability, sourcing, and quality; food security; extreme temperature changes impacting organizations' premises, operations, supply chain, transport needs, and employee safety.

**Plant:** The equipment used to manufacture a specific product e.g. ammonia. There may be several plants on a single IPL site

**Direct GHG emissions** occur from sources that are owned or controlled by the Group, for example, emissions from combustion in owned or controlled boilers, furnaces, vehicles etc., emissions from chemical production in owned or controlled process equipment

**Scope 2 emissions** are GHG emissions which arise from the generation of purchased electricity emissions consumed by the Group. Purchased electricity is defined as electricity that is purchased or otherwise brought into the organisational boundary of the Group. Scope 2 emissions physically occur at the facility where this electricity is generated.

**Scope 3 emissions:** a GHG emissions reporting category that allows for the treatment of all indirect emissions emissions (other than Scope 1 and 2 emissions). Scope 3 emissions are a consequence of the activities of the Group, but occur from sources not owned or controlled by the Group. IPL does not currently collect data on Scope 3 emissions

**Significant Environmental Incident:** Environmental Incidents as assessed against IPL's internal risk matrix with potential consequences of 5 or higher on a 6-level scale. A category 5 incident is 'a major event or Environmental repeat non-compliance with regulatory, licence or permit conditions leading to prosecution or restriction Incident of operations' and a Category 6 incident is one which results in 'permanent or long-term impacts to water, land, biodiversity, air or ecosystems and requires significant remediation, rectification or investment in mitigation'.

**Site:** A single geographic location where IPL operations take place.

**Supply chain:** a sub-set of our value chain, referring to the companies who supply the inputs to our operations, such as raw materials for manufacturing, service providers and providers of other inputs such as electricity and water.

**Transition Risk:** Transitioning to a lower-carbon economy may entail extensive policy, legal, technology, and market changes to address mitigation and adaptation requirements related to climate change. Depending on the nature, speed, and focus of these changes, transition risks may pose varying levels of financial and reputational risk to organisations.

**TCFD:** The Financial Stability Board Task Force on Climate-related Financial Disclosures (TCFD) is a market-driven initiative, set up to develop a set of recommendations for voluntary and consistent climate-related financial risk disclosures in mainstream filings Task Force on Climate-related Financial Disclosures.

**TRIFR:** Total Recordable Injury Frequency Rate: the number of recordable injuries per 200,000 hours worked; includes contractors unless otherwise indicated.

**Value Chain:** Our value chain includes our suppliers (and potentially their suppliers), our operations, our distribution channels, and our customers, who are the end users of our products. Our supply chain (described above) is a subset of this.

