IPL CLIMATE CHANGE REPORT **2021**

Incitec Pivot Limited
INNOVATION ON THE GROUND

DYNO Dyno Nobel

Incitec Pivot Fertilisers

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MESSAGE FROM MANAGING DIRECTOR & CEO

We owe it to future generations to show leadership on climate change. We will do our part – working with all our stakeholders – to take action to create a greener, more sustainable world.

Our products and services are vital to providing food for the world's growing population, along with the raw materials required to shape our cities and create renewable energy infrastructure critical to a decarbonised future. The challenge for us at Incitec Pivot Limited (IPL) is to continue to unlock the world's natural resources while reducing our environmental footprint and working towards a long-term Net Zero future.

We are committed to achieving Net Zero operational emissions by 2050, or as soon as practicable, and in this - our first stand-alone IPL Climate Change Report – I am pleased to provide you with information on what we have achieved to date as well as our future strategy.

We acknowledge the mainstream science on the existence of climate change and have been increasing our disclosures against Task Force on Climate-Related Financial Disclosures (TCFD) guidelines since 2018. This report aims to provide the next step of disclosure of our approach to address the challenge of climate change.

The risks and opportunities we face, including the physical risks associated with climate change, have informed our climate change strategy. Like other business risks and opportunities, those associated with climate change and the global energy transition require strong governance and strategic management and, alongside our strategy, this report also sets out the comprehensive governance structures we have in place.

We have detailed our plans to reduce operational emissions, including our commitment to execute projects that materially reduce greenhouse gas emissions (GHG), as part of our pathway to Net Zero.

We have also set out how we will deliver products that improve efficiency and reduce life cycle GHG emissions.

As we grow our Incitec Pivot Fertiliser business from a leading fertiliser company to a sustainable soil health company, our innovative products will play an increasingly important role in assisting the agriculture sector achieve carbon neutrality. Our focus on soil health and precision agriculture aims to help farmers increase yields of food and fibre on their existing cleared land. This includes our Enhanced Efficiency Fertiliser (EEF) range, which helps increase plant nutrient uptake and reduce GHG for our farming customers.

In our Dyno Nobel explosives business, our products and services will be crucial in providing our customers with efficient access to the minerals and resources necessary for renewable energy infrastructure and new technologies. Our premium technology solutions aim to help our customers reduce their carbon footprints.

We know our world-class blasting technology DeltaE is more efficient in use and have a customer partnership underway to quantify the GHG reductions associated with the use of this technology.

We're also excited by the opportunities presented by renewable hydrogen for our business and our customers. Given our world class hydrogen and ammonia handling expertise and our ammonia assets capable of converting to renewable hydrogen, there's many opportunities for us and our customers in the medium term as we assess new technologies to deliver these longer-term benefits.

As we move towards Net Zero, it is crucial that we take our people and our communities with us. As we transition, our plan to decarbonise our manufacturing assets over time seeks to protect and sustain the employment opportunities we provide, along with the communities we work and operate in.

I welcome your interest in our Climate Change Report and invite your feedback as we continue to provide transparent reporting on our progress and work with our customers and all our stakeholders to better care for our people, our communities and the environment.

Jeanne Johns
Managing Director & CEO
Incitec Pivot Limited

HIGHLIGHTS ON OUR JOURNEY

2010

IPL Leadership conducts an initial assessment of the risks and opportunities associated with climate change.

IPL joins the Australian Industry Greenhouse Network.

2014

Setting of our first GHG intensity reduction target: a 1.5% reduction in GHG emissions per tonne of Australian manufactured product by 2015.

2015

Setting of our first global greenhouse gas reduction target linked to executive remuneration: a 2% global reduction in tCO_2e/t ammonia produced by 2017.

2016

Completion of the Waggaman, Louisiana Ammonia Plant, which uses the industry's leading technology and is among the most efficient plants of its kind in the world. This increases our production, and therefore our global operational GHG emissions, but reduces our global emissions per tonne of ammonia.

2018

Creation of IPL specific 2° and 4° future climate-related scenarios and completion of our second climate specific risk and opportunity assessment with TCFD reporting adopted in our 2018 Sustainability Report.

2019

The IPL Climate Change Policy is adopted by the Board. The IPL Board Charter and the Audit and Risk Management Committee Charter are updated to formally enshrine Directors' roles in relation to the strategic management and oversight of climate change-related issues.

IPL joins the Carbon Market Institute.

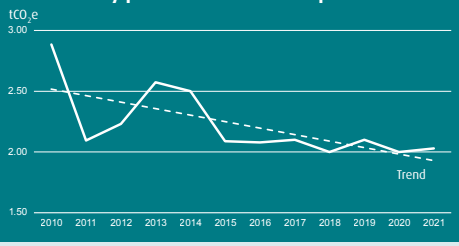
2020

Completion of the AU$2.7m Moranbah Solar Hydrogen Feasibility Study, supported by AU$0.9m from the Australian Renewable Energy Agency (ARENA).

Setting of our first absolute GHG reduction target of 5% by 2026 against our 2020 baseline.

IPL becomes a founding member of the Australian Climate Leaders Coalition (CLC), a group of cross-sectoral Australian corporate CEOs supporting the Paris Agreement commitments and setting public decarbonisation targets.

GHG intensity per tonne of ammonia produced



2021

5% absolute GHG reduction target brought forward to 2025

25% medium-term target set for 2030

Long-term Net Zero Ambition set for 2050

Formation of the IPL Decarbonisation and Energy Transition Steering Committee, chaired by our CEO, to develop our Net Zero Pathway and oversee the incorporation of climate-related risks and opportunities into company strategy.

Updating of our 2018 IPL specific 2° and 4° future climate-related scenarios and addition of 1.5° and Delayed Action (Inevitable Policy Response) scenarios.

NEXT STEPS:

To support our short and medium-term targets, as shown to the right, IPL has developed a pipeline of decarbonisation initiatives to materially reduce GHG emissions from our major manufacturing facilities.

These initiatives are at varying levels of development, but are all considered technologically ready. Commercial readiness is being continuously evaluated, as demonstrated by the feasibility study for green ammonia production at Moranbah in 2019 and the recently announced partnerships with Fortescue Future Industries to investigate green ammonia production at our Gibson Island manufacturing site, and with Keppel Infrastructure and Temasek to investigate green ammonia production at Newcastle and Gladstone in Australia.

2025
SHORT TERM TARGET: 5% absolute reduction (1)

2030
MEDIUM TERM TARGET: 25% absolute reduction (2)

2050
LONG TERM AMBITION: NET ZERO (3)

These initiatives include:

- CO_2 sequestration at our Waggaman, Louisiana ammonia manufacturing facility;
- Abatement of nitrous oxide emissions from the nitric acid plants at our Moranbah and Louisiana, Missouri ammonium nitrate manufacturing plants; and
- Feedstock conversion from natural gas to renewable hydrogen at our Gibson Island and Moranbah ammonia and ammonium nitrate manufacturing plants.

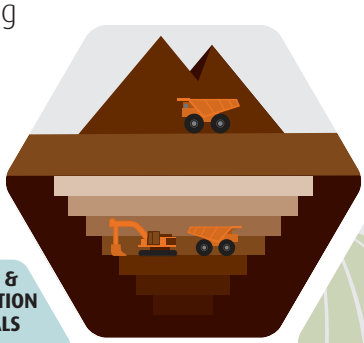
(1) Our short and medium-term targets are absolute reductions against our 2020 baseline year operational (Scope 1 and Scope 2) emissions of 3,961,222 tCO_2e.
(2) Subject to economic feasibility of CCUS at Waggaman, Louisiana.
(3) Our ambition to achieve net zero operational emissions by 2050 is based on the assumptions that; green hydrogen reaches economic parity with natural gas for hydrogen production by 2040; US grid decarbonisation is achieved by 2035-2040; Australian grid decarbonisation is achieved by 2040; and carbon offsets are available for residual emissions that are not practical to abate.

OUR BUSINESS AND OUR MARKETS

The natural resources our products unlock are central to modern life and essential nutrition.

We are committed to unlocking the potential in the Earth to help people grow, by sustainably delivering these products to our mining, quarry & construction and farming customers into the future.

During 2021, our explosives and fertiliser products were used by our customers to help them unlock approximately:



QUARRY & CONSTRUCTION MATERIALS
673 million tonnes

IRON ORE
499 million tonnes

THERMAL COAL
160 million tonnes

METALLURGICAL COAL
110 million tonnes

GOLD
9.6 million ounces

DIAMONDS
11.8 million carats

COPPER
721 kilotonnes

WHEAT
12.4 million tonnes

BARLEY
4.8 million tonnes

OTHER BROADACRE GRAINS
1.8 million tonnes

PASTURE
6.2 million tonnes

SUGAR CANE
3 million tonnes

HORTICULTURE
0.9 million tonnes

COTTON
0.2 million tonnes

IPL is a recognised world leader in supplying the resources and agricultural sectors. With 60 manufacturing facilities and joint ventures across five continents, including Australia, North America, Europe, Asia, Latin America and Africa, we manufacture ammonium nitrate-based explosives and initiating systems, nitrogen and phosphorus fertilisers, and nitrogen related industrial and specialty chemicals.

We have two customer facing businesses, Dyno Nobel based in the Americas and in Asia Pacific and the largest fertiliser business in Australia, Incitec Pivot Fertilisers.

Through these two businesses, we make people's lives better by unlocking the world's natural resources through innovation on the ground. In addition to the increased yields of sugar cane, cotton, grains, beef, lamb, milk and vegetables grown using our fertiliser products, our explosives products and services unlock the iron ore, copper and quarry & construction materials used to build electric vehicles, wind turbines and critical infrastructure.

Our advanced and premium technology, manufacturing excellence and world class services are focused 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.

DYNO NOBEL

Dyno Nobel is IPL's global explosives business. It is the second largest industrial explosives distributor in North America and the second largest industrial explosives distributor in Australia by volume.

Americas: Dyno Nobel Americas (DNA) provides ammonium nitrate, initiating systems and services to the Quarry & Construction sector primarily in the Southern US, Northeast US and Canada; the Base & Precious Metals sector in the US mid-West, US West and Canada and the Coal sector in the Powder River Basin, Illinois Basin and Appalachia.

Asia Pacific: Dyno Nobel Asia Pacific (DNAP), provides ammonium nitrate based industrial explosives, initiating systems and services to the Metallurgical (MET) Coal and Base & Precious Metals sectors in Australia, and internationally to a number of countries including Indonesia, Papua New Guinea and Turkey through its subsidiaries and joint ventures.

INCITEC PIVOT FERTILISERS

Incitec Pivot Fertilisers (IPF) is IPL's fertilisers business. With an unrivalled position across Eastern Australia, it is the largest domestic manufacturer and supplier of fertilisers by volume produced from its strategically positioned manufacturing facilities, including the ammonium phosphate fertiliser plant in Phosphate Hill, complemented by the world scale sulphuric acid plant at Mount Isa. Internationally, the fertilisers business sells to major offshore agricultural markets in Asia Pacific, the Indian subcontinent, Brazil and the United States. It also procures fertilisers from overseas manufacturers to meet domestic seasonal peaks for its customers' diversified crops.

GLOBAL MANUFACTURING

Americas: In North America, Dyno Nobel manufactures ammonium nitrate at its Cheyenne, Wyoming and Louisiana, Missouri plants. The Cheyenne, Wyoming plant is adjacent to the Powder River Basin, strategically placed for both the Base & Precious Metals Base sector and North America's most competitive thermal coal mining region. The Louisiana, Missouri plant has a competitive logistic footprint from which to support the Quarry & Construction sector and mining in both the Illinois Basin and Appalachia.

Initiating Systems are manufactured at Dyno Nobel's facilities in Connecticut, Kentucky, Illinois, Missouri, Chile and Mexico, and are also sourced from DetNet South Africa (Pty) Ltd (DetNet), an IPL electronics joint venture.

Asia Pacific: In Australia, Dyno Nobel manufactures ammonium nitrate at its Moranbah plant, which is located in the Bowen Basin, the world's premier MET coal region. It also operates its fully integrated, state of the art joint venture ammonium nitrate facility near Moura in Central Queensland.

Initiating Systems are manufactured at Dyno Nobel's Helidon facility in Queensland and are also sourced from IPL facilities in the Americas and its joint ventures.

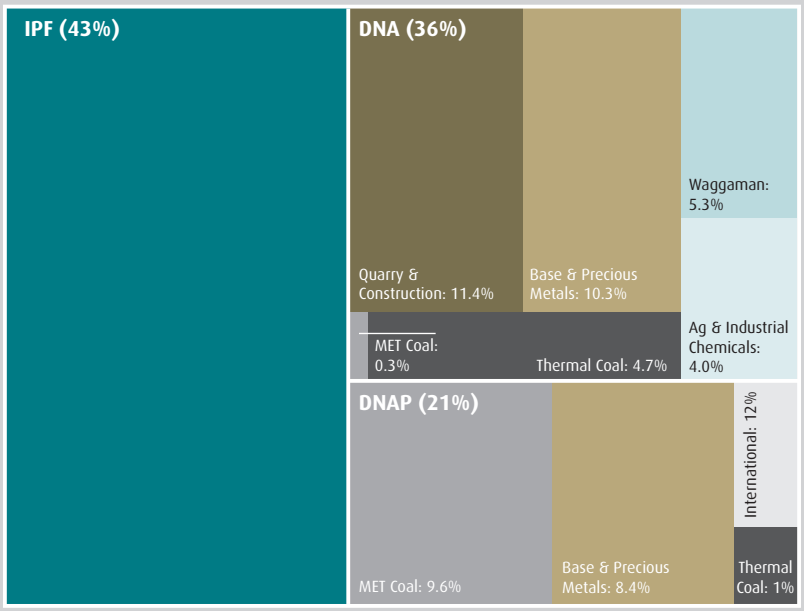
The business also produces nitrogen-based fertilisers and industrial chemicals across four locations including its state of the art ammonia plant in Waggaman Louisiana. These industrial chemicals and fertiliser products are delivered to end markets via an integrated supply chain.

2021% REVENUE BY BUSINESS & SECTOR

Incitec Pivot Fertilisers (IPF): 43%

Dyno Nobel Americas (DNA): 36%

Dyno Nobel Asia Pacific (DNAP): 21%



IPL acknowledges the mainstream scientific direction on the existence of climate change

OUR POSITION ON CLIMATE CHANGE

We believe our existing and developing fertiliser products will play an increasingly important role in reducing land clearing and assisting the agriculture sector towards carbon neutrality by increasing yields of food and fibre.

We believe carbon pricing can be an effective tool in reducing greenhouse gas emissions and advocate for a global, technology-neutral approach which delivers real reductions fairly and equitably.

We support the international climate agreement developed at the 2015 Paris Conference of Parties, as well as the Nationally Determined Contributions of the countries in which we operate.

We recognise that innovative explosives products and services will be important in order to efficiently and effectively access the minerals and aggregates required for new technologies and infrastructure rebuilding in a world impacted by climate change.

We recognise the challenge of reducing our own emissions while continuing to provide products which help people grow by unlocking the potential in the Earth.

We believe that our partnerships with customers will be increasingly important in providing solutions to help them minimise their impact regarding climate change.

WE ARE COMMITTED TO:

Advocating for global cooperation on climate change for an equitable global transition to a sustainable future.	» Our CEO is a founding member of the Australian Climate Leaders Coalition. » IPL is a member of the Australian Industry Greenhouse Network (AIGN) and the Carbon Market Institute (CMI).
Reducing our contribution to climate change through manufacturing excellence, energy efficiencies and abatement opportunities.	» 5% absolute reduction by 2025. » 25% absolute reduction by 2030. » Net Zero by 2050 ambition.
Monitoring and partnering in the development of new technologies which bring climate change solutions.	» 2020 completion of the AU$2.7m Moranbah Solar Hydrogen Feasibility Study, supported by AU$0.9m from ARENA. » Continued investigation into renewable hydrogen for manufacturing at our Gibson Island and Moranbah sites.
Working with our customers to develop leading technology solutions which reduce their greenhouse gas emissions.	» Our Enhanced Efficiency Fertiliser (EEF) range. » Our DeltaE explosives technology, with a customer partnership to quantify the GHG reductions planned for 2022.
Strategically managing the risks and opportunities associated with climate change to deliver sustainable value.	» 2018 2 & 4 degree scenarios refreshed in 2021 with 1.5 & Inevitable Policy Response scenarios added.

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OUR CLIMATE CHANGE STRATEGY

We recognise the challenge of reducing our own emissions while continuing to provide products which help people grow by unlocking the potential in the Earth. We believe that innovative fertiliser and explosives products and services will play an increasingly important role in reducing GHG while increasing yields of food and fibre, and efficiently and effectively accessing the minerals and aggregates required for new technologies and infrastructure rebuilding in a world impacted by climate change.

Our Climate Change Policy describes how the management of 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.

Together with our policy commitments, these strategic driver components form the four pillars of our Climate Change Strategy.

1 ENSURING STRONG GOVERNANCE

Talented and Engaged People: The right people in the right roles, within a culture of innovation, with climate change management roles, responsibilities and accountabilities clearly defined.

2 REDUCING OPERATIONAL EMISSIONS

Manufacturing Excellence: Reduce emissions, increase efficiencies and explore new technologies.

3 DELIVERING PRODUCTS THAT REDUCE CUSTOMER EMISSIONS

Leading Technology Solutions: Develop and deliver products and services which reduce customer GHG.

Customer Focus: Partner strategically for customer solutions and sustainable product use.

4 MANAGING STRATEGIC BUSINESS RISKS AND OPPORTUNITIES

Profitable Growth: Manage climate-related financial risks and opportunities strategically.

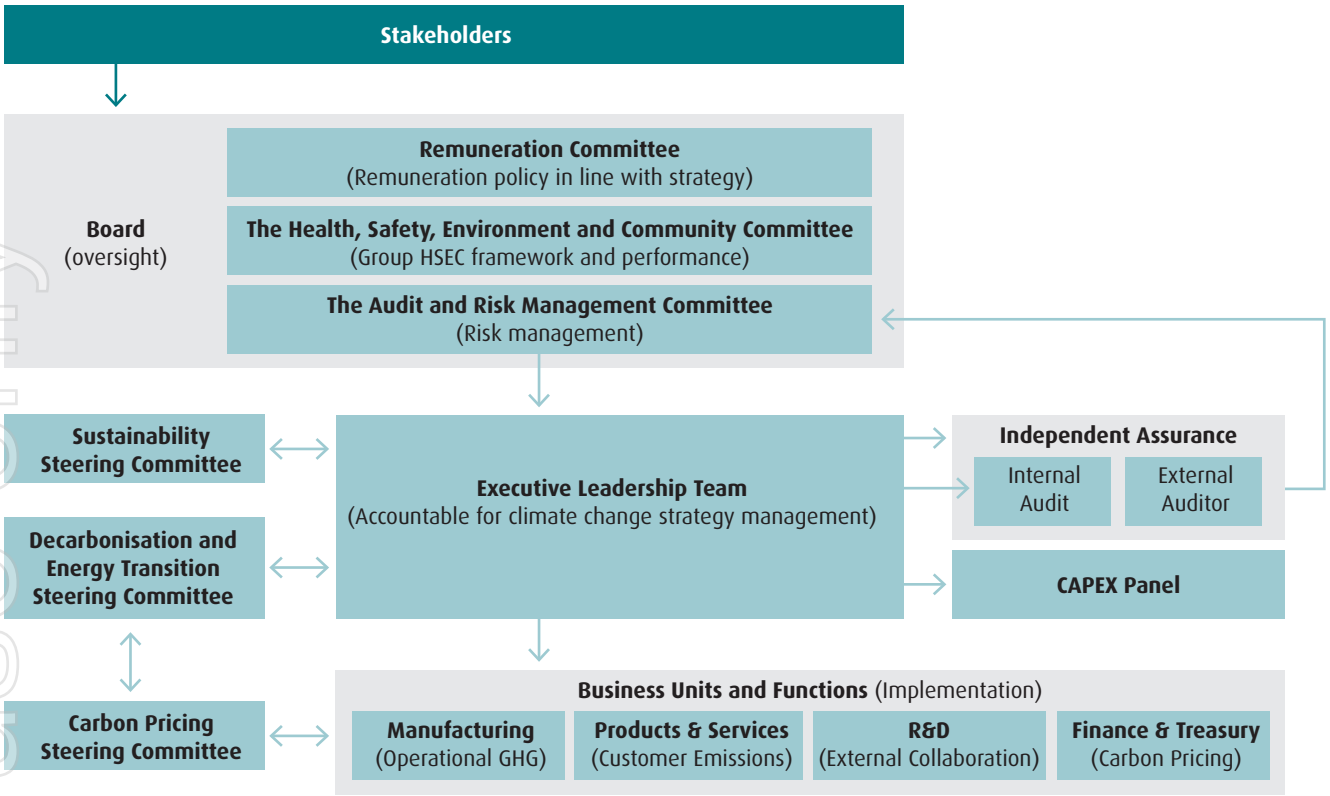
Zero Harm: Build resilience to physical climate change risks & advocate for a just transition.

OUR AMBITION:

NET ZERO 2050

1 ENSURING STRONG GOVERNANCE

Climate change is a material and strategic issue for our business and is part of ongoing discussion and analysis at the most senior levels of management and the Board. Climate change considerations are included in strategy discussions, investment decisions, risk management oversight and monitoring, and performance against our commitments. Our approach to managing climate change is also a key topic in our regular discussions with investors, and our communications with sustainability ratings companies and other stakeholders.



OUR CLIMATE CHANGE GOVERNANCE

The IPL Board oversees IPL's climate change strategy, performance and governance responsibilities. 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 formally enshrine Directors' roles in relation to the strategic management and oversight of climate change-related issues. Climate-related issues are integrated into the Board's review and guidance of business strategy, major plans of action, risk management policies, major capital expenditures and acquisition and divestiture decisions. This includes oversight of the application and use of IPL's internal carbon pricing model.

The Board has taken a number of measures to ensure that its decisions are informed by climate change science and by expert advisers.

The Board is also committed to transparency in reporting progress on IPL's climate change strategy, and intends to put IPL's climate reporting to a non-binding, advisory vote to shareholders at its 2022 Annual General Meeting. This non-binding, advisory vote will complement IPL's continued engagement with shareholders and other stakeholders about the risks and opportunities climate change presents for IPL's business.

The Audit and Risk Management Committee (ARMC) of the Board has oversight of climate-related risk management, although the Board retains overall accountability for IPL's risk profile. The ARMC reviews risk scenarios, analyses and mitigation strategies, and also how climate change-related risks are integrated into IPL's risk management processes. There are three key ways that the ARMC receives reporting on climate change-related risks and opportunities:

1. Via standard risk reporting, which is undertaken at each of the five ARMC meetings per year;
2. The annual Risk Review process with the Executive Team (ET) that informs the ARMC on the Group's strategic risks and mitigation plans; and
3. By exception, other significant events and progress related to the management of climate change-related risks are reported to the ARMC as required.

In addition, the Charter of the ARMC requires the updating of IPL's future climate-related scenarios every three years with a report to the ARMC following. The most recent update has taken place during 2021 as described in Chapter 4.

The Remuneration Committee of the Board supports the Board in relation to the determination of remuneration policy and its application for senior executives, performance evaluation, the adoption of incentive plans, and various governance responsibilities related to remuneration. The Board has linked the delivery of aspects of IPL's environmental, social and governance (ESG) outcomes to executive remuneration for several years now. For FY21, performance against GHG intensity targets and KPIs related to achieving IPL's 5% absolute GHG reduction target (announced in 2020) were included in the Short Term Incentive objectives of Executive Team members with direct impact on this area, including the Managing Director & CEO (MD&CEO).

For FY22, KPI's related to achieving IPL's GHG reduction targets will be incorporated under a separate Environmental, Social & Governance (ESG) category to be included in the Short Term Incentive objectives of all Executive Key Management Personnel. In addition, IPL's Long Term Incentive Plan for 2021/24 will have a new 10% ESG component that will target IPL achieving its 2025 and 2030 targets on climate change. Further details can be found in the Remuneration Report, within the 2021 IPL Annual Report.

The Health, Safety, Environment and Community (HSEC) Committee of the Board assists the Board in overseeing the Group's health, safety, environment and community (HSEC) performance and governance responsibilities, and the adequacy of the Group's HSEC framework. This includes the management and governance of climate change issues relating to employee health and safety, such as heat stress and risks to our people associated with extreme weather events; emergency planning and response procedures for our operations relating to extreme weather events; and the management of risks to the environment which are likely to be exacerbated by climate change, such as procedures to monitor and plan for an increasing risk of pond overflows and other releases to the environment due to increasing or shifting rainfall patterns over time.

Below the level of the Board, key management decisions are made by the MD&CEO, her Executive Team and management, in accordance with their delegated authority.

MANAGEMENT ROLES AND RESPONSIBILITIES

The MD&CEO and her Executive Team develop the Group's business strategy, planning, investment decisions and risk management processes. The MD&CEO is responsible for delivering the climate change strategy approved by the Board.

Energy Transition and Decarbonisation Steering Committee

The MD&CEO is Chair of the IPL Decarbonisation and Energy Transition (DET) Steering Committee, which comprises selected executives and other senior management. The MD&CEO and the DET Steering Committee are responsible for the development of IPL's Net Zero Pathway and the strategic management of business risks and opportunities related to climate change, including the incorporation of opportunities and key trends into business strategy.

The DET Steering Committee provides ongoing focus and executive sponsorship of projects and strategic opportunities as we seek to leverage key decarbonisation megatrends to exploit new profitable markets in our core geographies. We recognise that the global energy transition associated with climate change is increasingly impacting on our two customer facing businesses. For example, long term growth trends in the mining sector are shifting away from thermal coal towards the metals required for the transition and this is reflected in industry forecasts of commodities demand. These trends have been incorporated into our business strategy through aligning our explosives business growth with predicted customer demand profiles by segment and the delivery of technology solutions to leverage these.

Trends in agricultural markets include not only high efficiency, low GHG fertilisers and soil carbon solutions, but a broader focus on more sustainable growing practices, precision agriculture and soil health. Following the strategic review of the fertilisers business undertaken in 2020, our long term strategy is to grow our IPF business from a leading fertiliser company, manufacturing and distributing a range of domestic fertilisers, to a sustainable soil health company providing sustainable plant nutrition solutions to improve soil health. This strategy will be leveraged through our expansive distribution footprint to drive new growth products and services towards soil health.

The energy transition also presents new opportunities for business growth for IPL. Australia's abundant renewable resources make it a prime location for the rapid development of renewable hydrogen. IPL has a core competency in the manufacture, storage and transportation of ammonia and is well placed to play a role in 'green hydrogen', and green ammonia for a low-carbon economy. We aim to be an early participant in these new industry opportunities, and we will achieve this by proactively identifying projects, products and partnerships that align with our existing competencies and enhance our core business. We recognise that the development of these growth opportunities is unpredictable due to direct linkages with government carbon policy and international trade, and see opportunities to build partnerships throughout the supply chain with credible counterparties as key to success.

In addition to the MD&CEO, the DET Steering Committee comprises:

The Chief Strategy and Sustainability Officer has significant experience in strategy and sustainability, and is responsible to oversee the integration of climate-related issues into company strategy.

The Chief Financial Officer (CFO) is responsible for the management of the financial aspects of climate change. The CFO is the Executive Team member with oversight of the management and mitigation of principal risks, including the assessment and management of climate related financial risks, that could materially impact the Group's business objectives and exceed its risk tolerance. The Chief Risk Officer reports to the CFO.

The CFO is also responsible for the application of IPL's internal carbon pricing model. Internal carbon pricing has been included in capital expenditure assessments for projects at our major manufacturing sites in Australia since Australian Carbon Credit Units (ACCUs) were introduced in 2012, with the price reflecting the market price of ACCUs. During 2021, the Board formally approved the application of this carbon price to all future growth capital and investment decisions. The price is currently AU$20, and is projected to increase to AU$50 by 2025, AU$65 by 2030 and $140 by 2050. A range of carbon prices are also included in our scenario analyses (see section 4).

The Chief Technology Officer is tasked with overseeing the development of the IPL Net Zero Pathway, including the development of low carbon products and services, the evaluation and prioritisation of developing technologies to decarbonise IPL's manufacturing operations.

The President Dyno Nobel Asia Pacific and the **President Dyno Nobel Americas** oversee the manufacturing maintenance shutdown schedules required to implement new technologies to reduce emissions. As such, these positions are assigned the responsibility of implementing measures to achieve GHG emissions reductions at the manufacturing facilities within their regions.

The VP Strategic Project Development has significant experience in IPL's global manufacturing facilities and CAPEX approval process and is tasked with the assessment of the technical and commercial readiness of emerging technologies required for IPL's decarbonisation. The VP Strategic Project Development also works with operations based project teams to provide the DET with an additional level of oversight regarding the progress of specific projects related to IPL's Net Zero Pathway.

The Corporate Sustainability Manager (CSM) is an Environmental Geoscientist with postgraduate research in palaeoclimate reconstruction. As a subject matter expert in the fields of climate change and sustainability, the CSM has been assigned the responsibility of working with the Chief Risk Officer to oversee climate-related scenario risk assessment. The CSM also engages with investors and other stakeholders, in conjunction with the Company Secretary and Investor Relations Manager, during discussions on IPL's Climate Management Strategy.

Carbon Pricing Steering Committee

The IPL Corporate Sustainability Manager chairs the Carbon Pricing Steering Committee (CPSC). The CPSC comprises manufacturing, strategy, finance, treasury, legal, environmental and energy contract management personnel across our global sites.

The CPSC, through the Sustainability Manager and VP Strategic Project Development, who is also a member, continually monitors emerging carbon pricing developments and informs the CFO, the Decarbonisation & Energy Transition Steering Committee and the Board of relevant compliance requirements and market opportunities. For example, the emerging carbon cap and trade regulation in Oregon, a result of the Governor's Executive Order, is currently being tracked by the CPSC. Corporate legal and site-based personnel at our St Helens, Oregon site are engaging with the relevant regulatory body and report back to the CPSC.

In Australia, three of our major manufacturing sites are captured under the Direct Action Safeguard Mechanism, which has essentially established a Cap and Trade scheme for any site which exceeds its emissions baseline within a June year-end period, with an exceedance requiring the surrender of one Australian Carbon Credit Unit (ACCU) for every tonne above the baseline. The CPSC oversees the processes which ensure that emissions against baselines are monitored and any regulatory requirements are met. Our compliance procedure for the ERF Safeguard Mechanism is set out in the IPL Carbon Accounting Policy (Australia).

Under the Direct Action Emissions Reduction Fund, ACCUs can be credited for certain projects which reduce emissions. Our strategy for maximising opportunities related to carbon pricing schemes is managed by the VP Strategic Projects and the Sustainability Manager, as members of both the CPSC and the DETSC. The strategy includes examining our exposure to current, emerging and likely future carbon pricing schemes and incentives, and regular reporting of opportunities to the DETSC for consideration.

The IPL Board recognises that climate-related risks should be identified and managed in the same way as any other strategic risk

2 REDUCING OPERATIONAL EMISSIONS

The MD&CEO and the DET Steering Committee are responsible for the development of the Company's Net Zero Pathway and the strategic management of business risks and opportunities related to climate change, including the incorporation of opportunities into business strategy

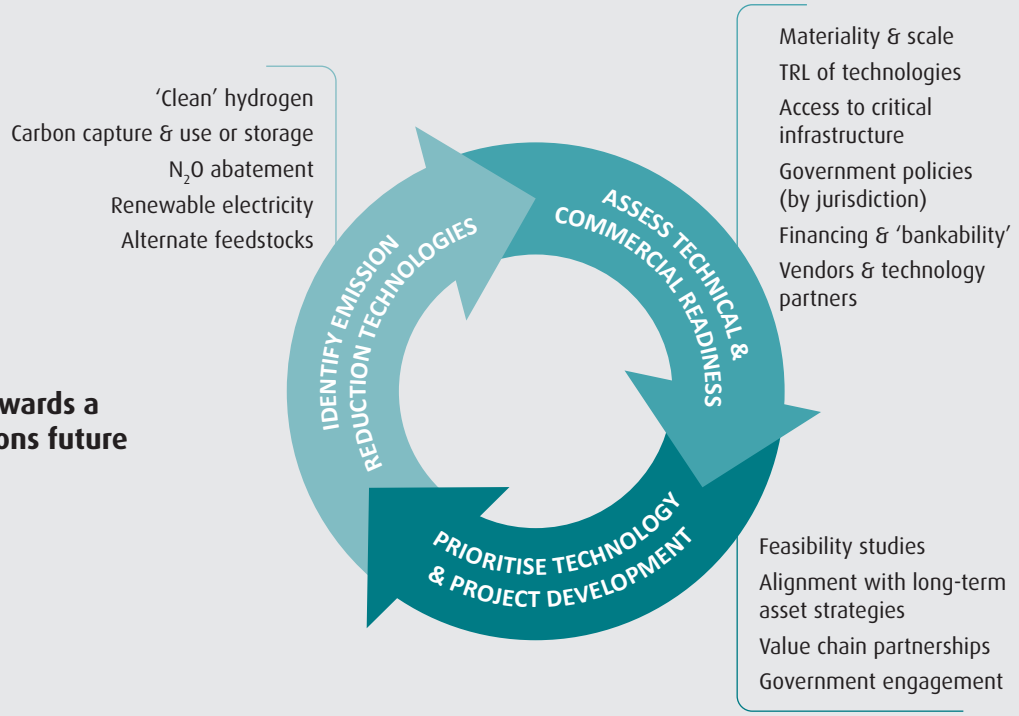
The strategy being applied by the DET Steering Committee to progress the development of IPL's Net Zero Pathway and reach our reduction targets, includes the following core pillars:

1. The identification of emissions reduction technologies required to reduce each of IPL's emissions sources. These technologies include renewable hydrogen (hydrogen obtained from splitting water using renewable energy, rather than natural gas) Carbon Capture and Storage/ Use, N_2O abatement technologies, renewable electricity and other alternate feedstocks.

2. The ongoing assessment of the technical and commercial readiness of each of these technologies at the scale required to decarbonise IPL's manufacturing facilities, including an assessment of materiality & scale, technology readiness levels, access to critical infrastructure required for each, the government policies which may support these in IPL's different operation regions, financing and 'bankability' considerations and vendors & technology partners.

3. The prioritisation of appropriate technologies and project development through feasibility studies such as IPL's AU$2.7m 2020 Solar Hydrogen Feasibility Study, assessment of alignment with long-term asset strategies, the strategic formation of value chain partnerships and engaging with Governments across our operating jurisdictions.

Long Term Climate Change – Pathway to Net Zero Emissions



Working towards a low emissions future

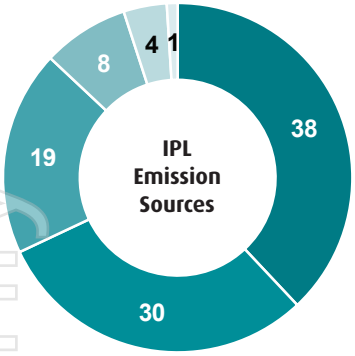
OUR CURRENT OPERATIONAL EMISSIONS AND REDUCTION OPPORTUNITIES

To reach our current short and medium-term GHG reduction targets, our priority is to invest in reducing our operational emissions, with limited use of carbon offsets. In setting this target, we assessed abatement opportunities that have low capital intensity and are technologically mature. We also committed to the installation of advanced measurement technologies to more accurately quantify the nitrous oxide (N_2O) GHG emissions from our Louisiana, Missouri (LOMO) nitric acid plant in the US. Although this required capital investment beyond the regulatory requirements for N_2O reporting in the US, the installation of Continuous Process Emissions Monitoring (CPEM) in 2021 has enabled better quantification of our GHG inventory(1) and supports us in the development of our Net Zero Pathway.

Our emissions sources and the emissions reduction technologies identified to reduce these are represented below, along with the assessment of their technological readiness and their relative capital requirement.

(1) Our 2018, 2019 and 2020 operational GHG emissions have been restated by taking the average GHG intensity measured (from the 5 months of data we have collected since installing CPEM at our LOMO plant) and applying it to the tonnes nitric acid produced at that plant in those years. CPEM is a vastly improved measurement technology compared to the previously used method of stack testing emissions annually and applying the GHG intensity per tonne of nitric acid measured on the stack testing day to total annual production. Although a US EPA approved method, single day stack testing is a less reliable measurement method because emissions can vary significantly throughout a year as catalysts age and are replaced.

Our Baseline Year (2020) GHG emissions sources by %



- Natural Gas for H_2 (Ammonia Feedstock)
- Natural Gas for Energy
- Nitric Acid N_2O[(1)] Process Emission
- Scope 2 electricity[(2)]
- Scope 1 Electricity[(3)] (Natural Gas)
- Other

(1) Nitrous oxide.

(2) Scope 2 greenhouse gas emissions are the emissions released to the atmosphere from the indirect consumption of an energy commodity.

(3) Scope 1 greenhouse gas emissions are the emissions released to the atmosphere as a direct result of an activity, or series of activities at a facility level. Scope 1 emissions are sometimes referred to as direct emissions.

(4) Technology readiness levels (TRLs) are a method for estimating the maturity of technologies during the acquisition phase of a program. The use of TRLs enables consistent, uniform discussions of technical maturity across different types of technology.

IPL Emissions Profile and decarbonisation opportunities/technologies

IPL Activity	Ammonia manufacture		Nitric acid manufacture	Electricity		Other
Emissions Source	Natural gas for H_2 feedstock	Natural gas for energy	Nitric acid manufacture (process GHG)	Purchased electricity	Self generated gas fired electricity	Transport Rock acidulation
Current emissions & reduction potential (%)	-100%	-100%	-85%	-100%	-100%	-67%
	Feedstock Gas	Energy Gas	N2O	Purchased Electricity	Gas Fired Power	Other: Diesel, Rock Acidulation
Emissions Reduction Technology	CCU/CCS	Renewable Hydrogen	Other alternative Feedstocks	Secondary & Tertiary abatement	PPA /Grid decarbonisation	PPA / On-site renewables	Fuel cells, electric vehicles
Technology Readiness							
Capital Intensity							

OUR NET ZERO PATHWAY

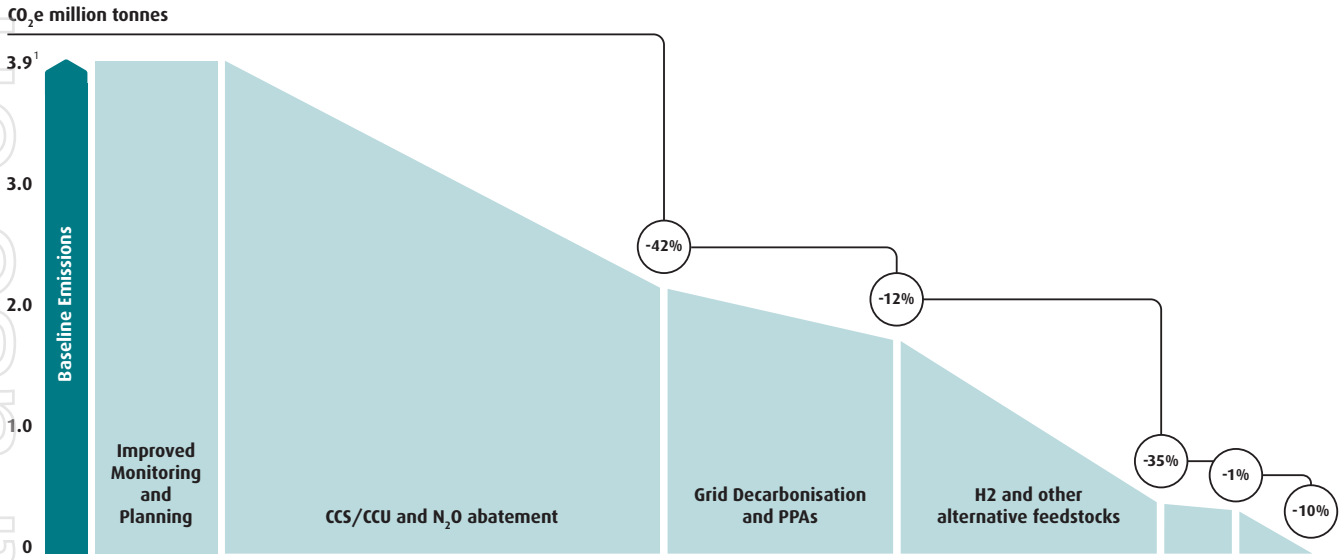
Potential Pathway to Net Zero by 2050

» Secondary and/or tertiary abatement of nitrous oxide and carbon capture & storage/utilisation are the first steps in decarbonisation of our operations.

» Grid decarbonisation is expected in the US by 2030 under current US National Determined Contributions (NDCs), while Australia is expected to be later.

» Renewable hydrogen for ammonia manufacture has been projected to be competitive with natural gas at or around 2040.

» While our Net Zero by 2050 ambition is aligned with the Paris Agreement, our emissions reduction trajectory is unlikely to be linear due to the variable time frames and key enablers associated with the development of the technologies required.



Key Enablers

Project Investigation Capex Planning	CCS/CCU and N_2O abatement	Grid Decarbonisation and PPAs	Renewable Hydrogen (and other alternative feedstocks)	Other	Offsets
» Installation of CPEM in 2021 to better quantify process emissions of N_2O at LOMO	» Policy incentives » Securing CCU/CCS offtake contracts, primarily in the US » Implementation of N_2O abatement requires plant shutdowns at specific sites, which are only available in certain years due to 4 year plant maintenance schedules	» Sufficient firming capacity in Australia to deliver reliable renewable energy supply » Securing renewable energy through Power Purchase Agreements » Construction of behind meter renewable energy installations where grid connectivity is limited	» Reductions in electrolyser capital costs through increased research and development spend and value manufacturing at scale » Large amounts of low-cost solar and wind supplied from the grid » Well designed policy incentives		

Our ambition is to achieve Net Zero GHG emissions as soon as practicable, and before 2050 if possible, without carbon leakage, where emissions are merely shifted from our operations (Scope 1 & 2) to our upstream value chain (Scope 3).

We will achieve this by implementing projects that materially reduce GHG and deliver return on invested capital above weighted average cost of capital.

Our approach seeks to **protect and sustain** the employment opportunities we provide, and the communities which depend on these, for a **just transition**.

Key mitigations include active monitoring of new policy developments and having "shovel ready" emission reduction projects.

We will also **identify and prioritise** initiatives that are necessary to achieve a **Net Zero Pathway** in preparation for policy and market changes.

The Decarbonisation and Energy Transition (DET) Steering Committee provides ongoing focus and executive sponsorship. A dedicated team is being established in 2022 to support ongoing evaluation and development of opportunities.

(1) Restated due to improved measurement of N_2O process emissions from our nitric acid plant at Louisiana, Missouri (LOMO) as a result of the installation of Continuous Process Emissions Monitoring (CPEM) technology in 2021.

3 DELIVERING PRODUCTS THAT REDUCE CUSTOMER EMISSIONS

We believe our existing and developing fertiliser products will play an increasingly important role in reducing land clearing and assisting the agriculture sector towards carbon neutrality by increasing yields of food and fibre.

We recognise that innovative explosives products and services will be important in order to efficiently and effectively access the minerals and aggregates required for new technologies and infrastructure rebuilding in a world impacted by climate change.

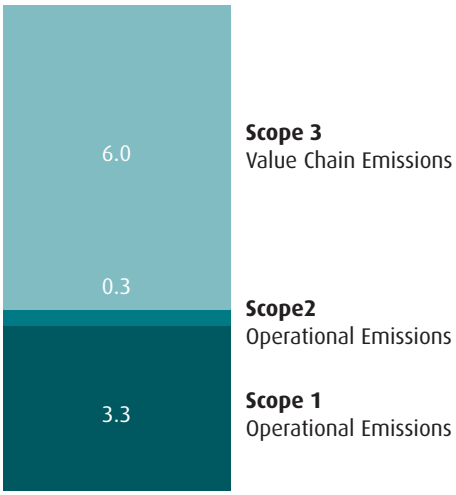
Opportunities for Sustainable Solutions

OUR SCOPE 3 EMISSIONS

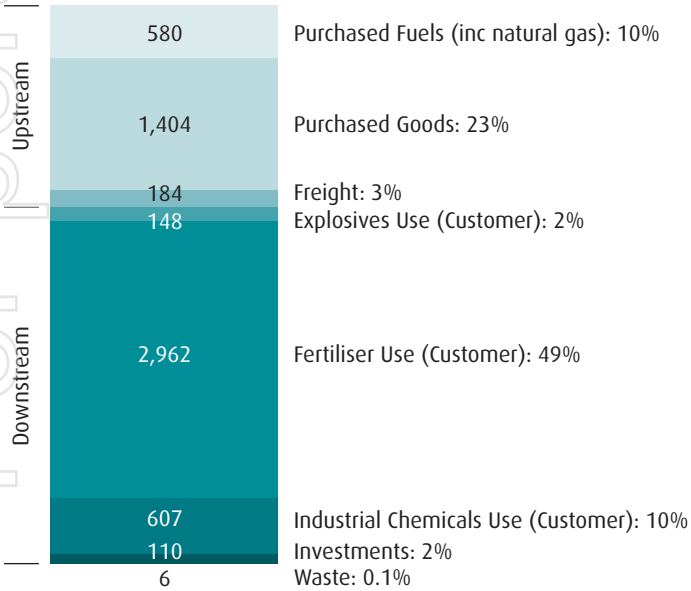
Scope 3 emissions are indirect emissions from value chain activities both upstream and downstream of our business. These emissions are beyond our operating perimeter and operational control, making them more difficult to influence and requiring us to make some assumptions to calculate them, such as the use of Scope 3 emissions factors specific to each tonne of material purchased. Our calculation methodology uses the *GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard* and is reported according to this standard as described in Appendix 3 'Our Scope 3 GHG Calculation Methodology'.

Our 2020 Baseline Year Scope 3 (Value Chain) emissions are shown below in relation to our 2020 Baseline Scope 1 & 2 (Operational) emissions.

2020 Baseline Year Value Chain GHG - Scope 1,2 and 3 (million tonnes CO_2e) (1)



2020 Baseline Year Scope 3 (Value Chain) GHG by Source (kt CO_2e) (1)



OUR SCOPE 3 EMISSIONS REDUCTION OPPORTUNITIES

During 2021, we investigated opportunities to reduce our Scope 3 emissions. Our ability to set quantified, time bound reduction targets for these depends on their source (i.e., where they arise in our value chain), the development of the technologies required to reduce them, the policy settings required to incentivise their adoption, and in some cases, the development of recognised methodologies to measure the reductions.

Some of our Scope 3 emissions will disappear as we transition to alternative feedstocks. For example, the upstream emissions associated with the extraction and processing of the natural gas we currently purchase will be eliminated by a switch to hydrogen or other alternative feedstocks. The same is true as we replace diesel fuels for transport. Reducing our other Scope 3 emissions will require decarbonisation of our upstream suppliers, to reduce the emissions associated with the products we purchase, and reductions in the emissions that arise from the use of our fertiliser and explosives products. Most of our purchased chemical products will also require the use of alternative feedstocks, such as green hydrogen. We will be able to set time bound quantified reduction targets for these once we can secure partnerships with suppliers who can access these new technologies.

Product use by our customers is our major Scope 3 emissions source and provides the most significant opportunity to reduce our Scope 3 emissions. Our DeltaE explosives technology can be used in hard rock applications and is estimated to reduce CO_2e emissions in a typical blast by between 5 and 20%. We are currently partnering with a mining customer to quantify the reductions associated with the use of DeltaE across a three month period and the results will be assured by an independent third party. We will be able to set quantified, time bound reduction targets associated with this product once we are able to verify and measure the reductions associated with its use. Read our DeltaE Case Study below, which describes additional environmental, social and economic benefits for our customers.

Our Enhanced Efficiency Fertiliser (EEF) range is specially formulated to retain nitrogen in more stable forms for longer periods, increasing plant nutrient uptake and reducing volatilisation losses to the atmosphere as N_2O (a GHG) and to waterways as leaching. In addition to reducing the direct nutrient losses, less fertiliser needs to be applied because more of the nitrogen is held in the soil for plant uptake, further reducing potential GHG losses and leaching to waterways. Trials of EEFs have been shown to reduce GHG emissions by up to 73%. (2)

Uptake of these products to date has been greatest in the sugarcane farming regions near the Great Barrier Reef, where the reduction in nitrogen lost to waterways can be measured. We continue to work with regulatory bodies and voluntary carbon credit certifiers to develop methods by which the GHG reductions from the use of our EEFs can also be quantified, recognised and allow the generation of carbon credits for our farming customers. We will be able to set quantified, timebound Scope 3 reduction targets once a recognised methodology exists to quantify these reductions. Read about one of our EEF's Entec®, in the Case Study below.

(1) Our 2020 Scope 3 emissions have been restated due to the inclusion of products traded by Quantum Fertilisers, a wholly owned subsidiary.
(2) Results from a field trial conducted in a ryegrass pasture system in south-western Victoria show the application of EEF with the inhibitor DMPP reduced N_2O emissions by 73 per cent when compared to urea application alone. See the Australian Government Department of Agriculture, Water and the Environment *Climate Research Program: Reducing Nitrous Oxide Emissions*, p.5 at http://www.naturalresources.sa.gov.au/files/78984243-0fc0-487e-8f64-a35d00d2f3dd/reducing-nitrous-oxide-emissions-gen.pdf

CASE STUDY: Reducing the impacts of blasting with DeltaE

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 explosives products and services that:

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

Differential Energy (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 DeltaE 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 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 the customer to organise a formal three month trial of our DeltaE 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 geologies. As a result, the blast crew pushed TITAN® 1000 DeltaE 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.

CASE STUDY: ENTEC® use means peace of mind, less nutrient losses as GHG and to waterways, and 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 in the soil for crops 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 losses 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. "ENTEC® keeps nitrogen stable in the soil for longer, giving it more staying power so the crop can use the nitrogen more efficiently. This means the amount applied can be reduced as well.

"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 trialled 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 35cm 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."

CASE STUDY: Reducing GHG and improving soil health with precision agriculture

Climate change presents all businesses with significant challenges. For our farming customers, these include finding ways to feed a growing population by increasing yields of food and fibre on less cleared land while reducing GHG emissions and nutrient losses to waterways. Precision agriculture allows growers to grow more using less fertiliser, and soil testing is the key - soil sampling allows productivity differences within a field to be considered and a variable rate application designed for optimising seeding and fertiliser applications. Less fertiliser application means less GHG emissions and less nutrient losses to waterways.

Incitec Pivot Fertiliser's (IPF) Nutrient Advantage Laboratory has been widely regarded as one of Australia's leading nutrient testing laboratories for over 50 years and has a broad range of National Association of Testing Authorities (NATA) accredited nutrient tests in Australia. In 2020, IPF entered into long-term partnership which sees its Nutrient Advantage Laboratory become the exclusive supplier of laboratory services to Precision Agriculture Pty Ltd.

Precision Agriculture collects, curates and interprets spatial soils data and provides nutrient mapping and spatial application solutions, including through its innovative geo-spatial information system (GIS) platform Soli, for agronomists, consultants and farmers throughout Australia. Its methodology for intensive soil management enables a more advanced understanding and management of paddocks.

The partnership will include the development of a Soil Health Test, which will include carbon content and inform growers on ways to improve soil structure, water holding content and carbon capacity.

Stephan Titze, President, IPF, said the company is excited about the partnership which will add to the agronomic data and tools available to dealers, agronomists and consultants to help farmers achieve better and more sustainable outcomes in their paddocks.

"As a business, we are committed to providing our customers with market leading products and services that improve plant nutrition and soil health and lead to better and more sustainable plant nutrition for Australian farmers," Mr Titze said.

4 MANAGING STRATEGIC BUSINESS RISKS AND OPPORTUNITIES

OUR SCENARIOS

Scenario A | 1.5° Fast Action

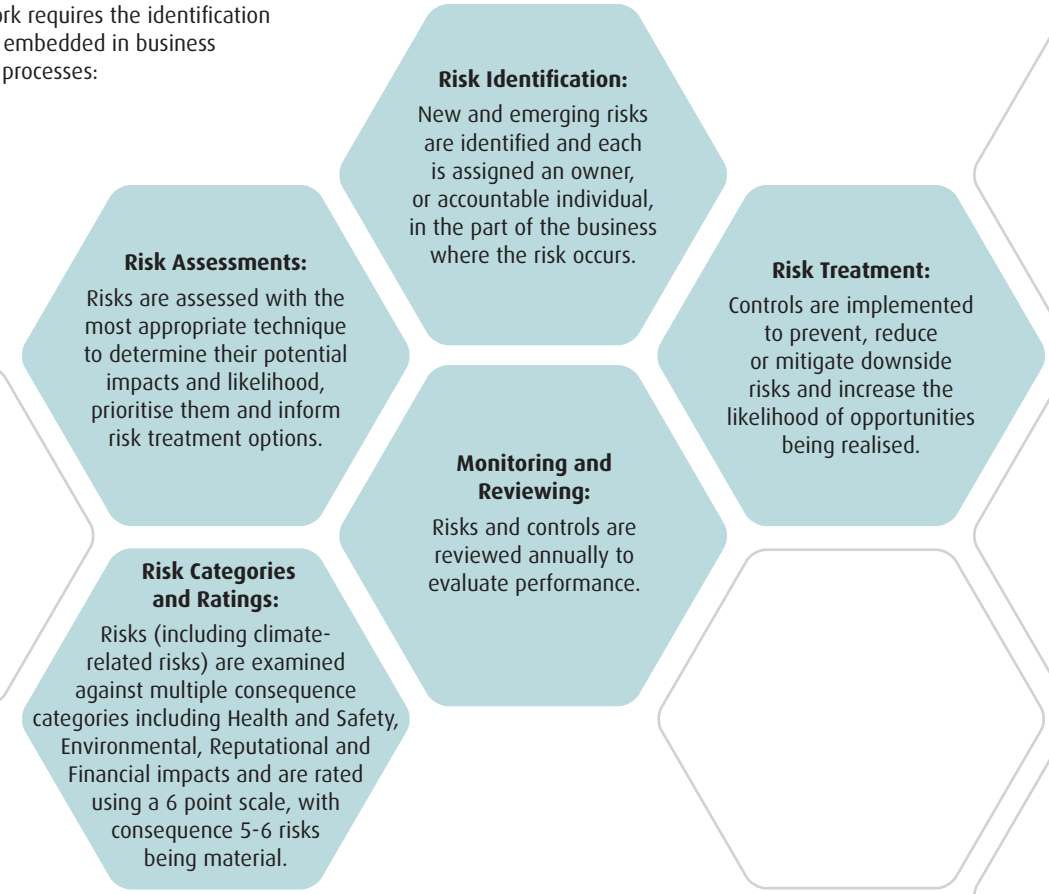
Scenario B | 2° Required Action

Scenario C | Delayed Action followed by Rapid Action (Inevitable Policy Response – IPR)

Scenario D | 3°+ Current Trajectory (Reviewed version of IPL's previous 4 degree)

The IPL Group Risk Policy and Risk Management Framework ensures that risk is managed within a comprehensive risk management process 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.

Our Risk Management Framework requires the identification and management of risks to be embedded in business activities through the following processes:



OUR SCENARIOS

During 2018, IPL strengthened its integrated risk assessment process with the engagement of an expert third party to conduct a comprehensive assessment of IPL's physical and transitional (market-based) risks and opportunities associated with climate change. This assessment was conducted using two future climate related scenarios created specifically for IPL: a two-degree scenario (2D) and a four degree scenario (4D). The Climate Change Scenario Methodology and descriptions of the 2 and 4 Degree Scenarios used are reported in our 2020 Sustainability Report on page 24.

In 2021, these scenarios were updated and two new scenarios were created, using the most recently available climate related information including Assessment Reports and Representative Concentration Pathways (RCPs) from the Intergovernmental Panel on Climate Change, New Energy Outlooks from BloombergNEF and Shared Socioeconomic Pathways (SSP), along with a range of scientific and consultancy papers relevant to our businesses and geographical locations (see Appendix 1).

The overlaying of this information has resulted in four scenarios that achieve the TCFD five principles of plausible, distinctive, consistent, relevant and challenging. They each describe how physical climate change and efforts to reduce emissions would impact on areas including carbon pricing and carbon market development; the overall economy; the development of technology; people's consumption patterns and social structures; the physical environment and localised weather patterns; energy and power; agriculture and land use; mining and industry; infrastructure; and transport.

The existing risks and opportunities for IPL were then re-assessed against these scenarios through a comprehensive assessment process including interviews, workshops and validation sessions across our global business.

Our scenarios are described on the following pages. They are not predictions, but are descriptions of potential future scenarios associated with each degree of warming, using the most recently available information. For example:

- The 1.5° *Fast Action* and 2° *Required Action* scenarios describe the policies, energy transitions and technology shifts that would be required to limit global temperature increases to 1.5° and 2° respectively, as well as the physical impacts that would occur with these degrees of warming;
- The *Delayed Action Scenario* (Inevitable Policy Response Scenario) describes a future in which there is an initial period of inaction, leading to severe physical impacts, followed by rapid government action to mitigate these physical impacts. This delayed response would require an abrupt and disorderly transition to low carbon practices, resulting in rapid and unprecedented changes to the economy;
- Finally, the 3.0°+ *Current Trajectory Scenario* degree scenario is an update of our previous 4 degree scenario and describes a future in which the current, business-as-usual policies continue with limited further action. This leads to significant global warming and increased exposure to extreme acute and chronic physical risks.

SCENARIO A | 1.5° Fast Action (1.5 Degrees)

Rapid, far-reaching and unprecedented transition across all sectors of the economy are required to achieve 1.5 Degrees. International cooperation is essential to achieve prompt decarbonisation.

The changes required to avoid 1.5 degrees of warming (when the world is already 1 degree above pre-industrial levels) are extreme. Rapid, far-reaching and unprecedented transitions would occur in energy, land, food, urban, infrastructure, transport, buildings and industrial systems.

International cooperation is a critical enabler for developing countries and vulnerable regions to strengthen their action towards meeting decarbonisation targets. Education, information and community approaches, including those informed by Indigenous knowledge, will accelerate the changes consistent with mitigation and adaptation.

The widespread adoption of new and disruptive technologies and enhanced climate-driven innovation will be required to avoid 1.5 degrees of warming, including Carbon Capture and Storage (CCS). Significant economic incentives for companies to invest rapidly and at scale will assist decarbonisation efforts.

Rapid and ambitious changes to food systems as well as non-food agricultural sectors. A global switch to a plant rich diet, and away from animal products, reducing food waste and greater farming efficiency will be required.

The decarbonisation of the power system will involve rapid uptake of renewable electricity generation, the expansion of the hydrogen market and expanding the use of bioenergy.

2020

A global carbon price is rapidly introduced. By 2030, the global price on carbon is ~US$300/t CO_2 and by 2040 is ~US$550/t CO_2 **A10**

Deforestation is halted by around 2030, while rapid global reforestation occurs simultaneously. Food waste is increasingly reduced and new, low GHG cultivation methods are adopted **A2**

2030

Global net anthropogenic CO_2 emissions decline by about 45 percent from 2010 levels by 2030, reaching net zero by 2050 **A1**

Coal-fired electricity generation will decrease by nearly 80 percent by 2030 and will be reduced to close to zero percent of electricity by 2050 **A9**

2040

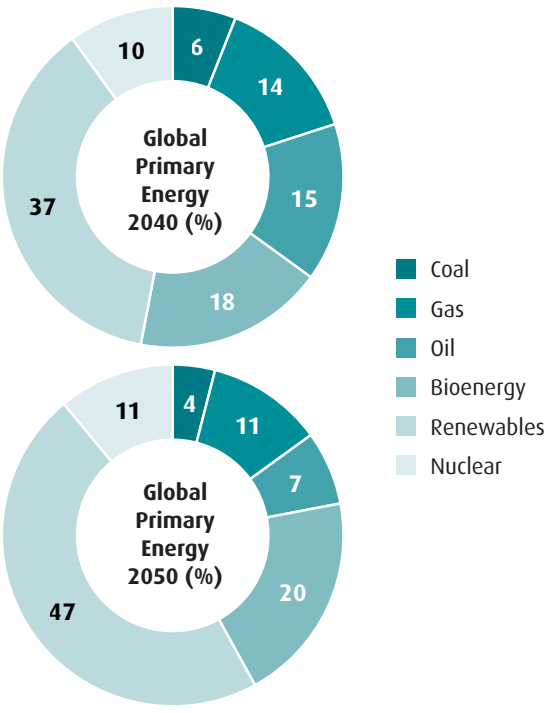
Significantly increased demand and use of sustainably sourced bioenergy – e.g., biokerosene, biogas, biodiesel. This requires the deployment of large-scale bioenergy cropland **D2**

CO_2 emissions from industry are 65-90 percent lower in 2050 relative to 2010. This is achieved through existing and new technologies including electrification, renewable hydrogen, CCS & CCU **A1**

2050

Global Primary Energy Mix

- The global energy mix experiences a fast but measured decline in fossil fuel consumption for all energy uses except transport, which sees a rapid shift away from fossil fuels. No new coal or gas power stations are built from 2021.
- Gas is still utilised in non-energy goods in the US, however where possible CCUS technology is applied. Hydrogen replaces gas for industry in Australia. **A11**
- There is a rapid decline in fossil fuel exploration and extraction, and the fossil fuel market prices collapse in response to a strong carbon market. **A12**
- By 2050 renewables supply 80% of electricity, while gas with CCS will account for 8% of electricity generation. Coal as a primary energy source will decrease by 78% (from 2010 levels) by 2030 and will account for less than 1% of electricity generation by 2050. **A11**
- Energy efficiency improves significantly, with final energy demand reducing to 30% of 2010 levels by 2050. **A11**
- A rapid transition of the energy mix away from fossil fuels occurs from 2040 to 2050 as technology becomes more readily available. **A12**



SCENARIO A | Implications for IPL

Because the 1.5° Fast Action scenario assumes rapid global action is taken to reduce GHG emissions, acute and chronic physical risks associated with a greater degree of warming are not as severe. While extreme weather events, droughts and floods are expected to continue to increase in this scenario, the risks associated with these impacts were not identified as individually material by the IPL Risk Matrix. The material financial risks identified are associated with the rapid transitioning of the economy towards decarbonisation and include policy and legal risks, including carbon pricing, market risks such as reduced demand for explosives due to shrinking thermal coal, and later, metallurgical (MET) coal markets(A9) and reputational risks which may arise were IPL not to report transparently on its efforts to manage the rapid transition. There is also a risk that natural gas for manufacture would become difficult for IPL to source in this scenario, as recent reports suggest that there can be no new gas exploration or extraction if global warming is to be limited to 1.5° (A9).

Identified opportunities are also associated with the rapid transition to a low carbon economy and include increased demand for low carbon products and services in the mining, quarry & construction and agriculture sectors, as well as business opportunities associated with the development of renewable hydrogen.

SCENARIO B | 2° Required Action (2 Degrees)

Globally coordinated, government-led rapid deployment of climate policy where the worst physical impacts of climate change are avoided.

This scenario involves a high degree of government, 'penalty-led' regulation, with global population peaking in 2050.

A significant amount of investment is deployed to transition to a decarbonised economy, including renewable energy (including biomass, solar and wind) and storage, energy efficiency and Carbon Capture and Storage (CCS). Future global primary energy will lean heavily on renewables, bioenergy and nuclear, with oil demand peaking by 2028.

The world shifts toward a more sustainable path. Development is inclusive and respects environmental boundaries, education and health investments accelerate and economic growth shifts to a focus on human wellbeing. This has the flow on effect of reducing inequality and lowering global mass consumption.

Deforestation is halted and afforestation becomes widespread, as the agriculture, forestry and land use sectors transition from net positive to net negative CO_2 emissions.

As industries decarbonise, major shifts in commodity demand are experienced. All industries face increasing pressure from government, investors and society to reduce emissions, with stakeholders pulling away from capital investments in high emissions industries which refuse to abate.

2020

Emissions are projected to decline by 25 percent from 2018 levels by 2030 and reach net zero by 2070 **B2**

In OECD countries, the use of coal and oil as primary energy sources decreases steadily from now. Gas for energy increases to 2040, after which it falls **A2**. Globally, crop demand for energy sources doubles before 2030 **B17**

2030

A global carbon price is implemented rapidly, reaching US$32.7/ tonne in 2030, increasing to US$71.8/ tonne in 2040 and US$100/ tonne in 2050. The carbon price peaks in 2080 before dropping **B2**

Global food production increases from now until 2050. The agriculture, forestry and land use sector shifts from net positive to net negative GHG emissions. This drop is due to changing practices, including increasing forest cover **B17**

2040

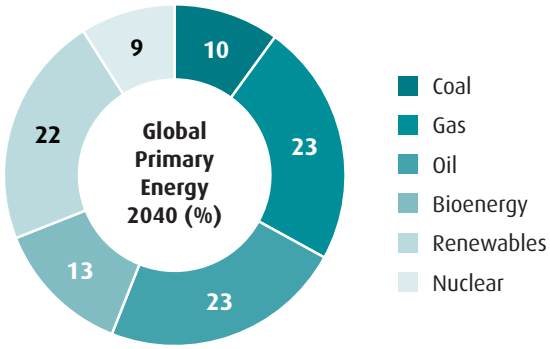
CCS is especially applicable in the chemicals industry, delivering 14 billion tonnes of abatement to 2060 **B5**

Total global population peaks at 8.5 billion in 2050, before declining. By 2070, global population has dropped to 8.2 billion **B17**

2050

Global Primary Energy Mix

- 2050 global primary energy will lean heavily on renewables, bioenergy and nuclear (see chart). A clean-energy and green-hydrogen pathway will lead to peak oil demand by 2028. **A10**
- Electrification will play a leading role in increasing demand for electricity globally while reducing emissions from primary energy consumption. **A10**
- In 2050, electricity will provide 45% of final energy (up from 20% in 2020). Hydrogen will provide 25% of final energy by 2050, with oil and gas supplying energy to only those industries where electricity and hydrogen are not viable substitutes (such as aviation and select industrial processes). **A10**



SCENARIO B | Implications for IPL

Like the 1.5° Fast Action scenario, the 2° Required Action scenario also assumes rapid global action is taken to reduce emissions, however there is a greater impact associated with physical risks due to a greater degree of warming. The risks identified include some supply chain disruptions associated with an increased incidence of extreme weather events. As in the 1.5º scenario, risks associated with carbon pricing and reduced demand for explosives in the thermal coal, and later, MET coal sectors also have potential to be financially material, although the transition occurs more slowly.

Identified opportunities are associated with the transition to a low carbon economy and include increased demand for low carbon products and services in the mining, quarry & construction and agriculture sectors, as well as business opportunities associated with the development of renewable hydrogen: IPL is an expert in the manufacture and handling of hydrogen/ammonia and is well placed to capitalise on new markets.

SCENARIO C | Delayed Action followed by Rapid Action (Inevitable Policy Response – IPR)

Delayed government action leads to a forced policy response that will be abrupt and disorderly, causing rapid and unprecedented changes to the economy.

Global action to tackle climate change has so far been highly insufficient to achieve the commitments made under the Paris Agreement. In this scenario, as the realities of climate change become increasingly apparent, there is an 'Inevitable Policy Response' as governments are forced to act more decisively than they have so far.

The beginnings of this response are expected by 2025, with the full extent of rapid change occurring from 2030. Key events will include a greater global increase in net zero commitments and firming of mid-term targets to achieve their net zero commitments. Lagging countries will be forced to improve or face carbon border adjustment mechanisms. Leading countries will increase their action over time, in line with the Paris Agreement's rachet mechanisms.

Key points within this scenario include:

- Climate action will create substantial shifts in global investment needs, driving down demand for assets that increase emissions, and driving up demand for assets that avoid or reduce them.
- Trade conditions and restrictions related to carbon will increasingly become adopted policy options, forcing developed nations to adopt a carbon price as early as 2030, increasing in price sharply soon after 2030.
- Carbon policies will include agriculture, with methane and nitrous oxide emissions taxes or cap-and-trade systems, subsidies for low-emissions agricultural practices and technologies, and farmer education and technical assistance programs. **C1**
- Industry will be forced to ensure new plants are highly emissions efficient and retrofit existing infrastructure to reduce emissions intensity.

2020

Global GHG emissions continue on current trajectories until 2030. Between 2030 and 2050 there is a rapid decline in global emissions **C1**

The US, Canada, Australia will have comprehensive mitigation policies in place by 2025 to reduce emissions from agriculture. Major tropical forest countries will end deforestation by 2030 **C1**

2030

All major economies will have carbon pricing schemes covering emissions in power and industry by 2030. Policy ambition and backstop signal prices of US$60-85 by 2030 in leading countries **C2**

Early coal phase-out for first mover countries by 2030. Steady retirement of coal-fired power generation after 2030 in lagging countries, with no thermal coal use by 2040. Bioenergy crops play a significant role in the transport sector **C3**

2040

Countries with ambitious net-zero targets end the installation of new unabated (no CCS) fossil-based industrial plants by 2040 **C3**

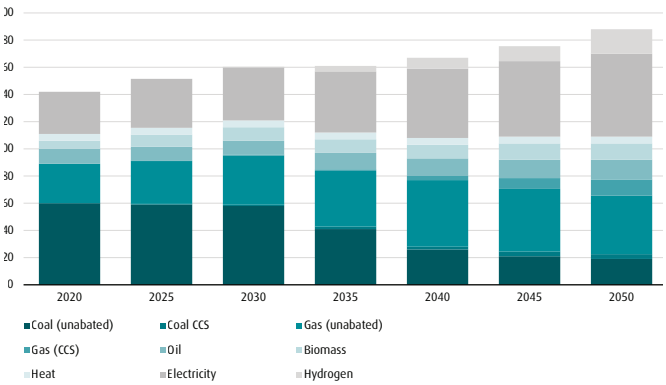
By 2050, hydrogen contributes at least 20 percent of energy and feedstock demand in hard-to-abate sectors, such as iron and steel, non-metallic minerals and chemicals **C3**

2050

Global Primary Energy Mix

- The global energy mix to 2030 trends in line with current stated policies, with coal maintaining a 20% share of primary energy, and oil and gas holding 25% share each. **C3**
- From 2030 to 2050, this mix rapidly shifts to align with a 1.5 degree scenario. Coal fired generation decreases to 4% (with all remaining plants fitted with CCS), oil is 7% of the energy market share, and renewables make up close to 50%. **C3**
- For industrial uses in 2050, coal accounts for 10% of consumption and natural gas accounts for 20%. Electricity accounts for 25%, and hydrogen 10%. **C3**

Industry Energy Mix, EJ Per Year



Source: Vivid Economics and Energy Transition Advisors, The Inevitable Policy Response: Forecast Policy Scenario (2019)

SCENARIO C | Implications for IPL

The Delayed Action scenario describes serious physical impacts followed by a forced policy response that will be abrupt and disorderly, causing rapid and unprecedented changes to the economy. Both physical and transitional risks have been identified for IPL. These include carbon pricing schemes which may be localised, rather than global, causing competition risks for emissions intensive trade exposed industries (EITE), such as IPL. Market risks associated with a less orderly and sudden transition away from fossil fuels, including thermal and MET coal, would present material financial risks to IPL, including stranded assets and loss of revenue, if this transition were not managed in advance.

Physical risks include acute physical impacts associated with extreme weather events such as hurricanes, storms and floods on IPL's operations, supply chains and customers. Chronic physical impacts present risks to product demand, such as reduced demand for fertilisers due to increasing periods of drought. Chronic risks for IPL operations include water shortages in some locations due to drought, and an increased risk of inundation at some sites due to sea level rise and increased storm surges.

SCENARIO D | 3°+ Current Trajectory (Reviewed version of IPL's previous 4 degree)

Business as usual, with limited climate regulation and a growing global population leads to devastating physical impacts and a decline in economic growth.

This scenario involves continuing under current, business-as-usual policies with limited further action leading to significant global warming and increased exposure to extreme physical risks. Transition risks are not as prevalent under this scenario due to the limited global action taken to combat climate change. In some leading countries, climate policies may be rolled back to limit impact on their own economy.

The climate goals set out in the Paris Agreement are not met, leading to substantial physical impacts over the medium to long term which are socially and economically devastating. Acute impacts from extreme weather events lead to business disruption and damage to property and infrastructure, significantly impacting global supply chains. These impacts result in high demand for quarry and construction materials for rebuilding.

Chronic impacts from increased temperatures, sea level rise and precipitation affect labour, capital and agricultural productivity, as well as operational and raw material disruptions to key industries. Biodiversity loss under this scenario is catastrophic, leading to mass extinctions, coral bleaching and ocean acidification.

Geo-political conflict increases on a global scale due to resource depletion and growing inequalities. There is an increase in premature deaths from environmental factors such as poor air quality, and there are large global movements of displaced people.

Agriculture is significantly impacted, with global crop yield failure, an increase in extreme weather events and significant loss of global forest cover.

2020

A global carbon price is negligible, if it emerges at all. Carbon pricing is applied only in some geographies **D1, D2**

Wind and solar will match global gas capacity by 2022. Renewables accounted for 90 percent of new electricity generating capacity added globally in 2020 and will meet the same share in 2021 and 2022 **D12**

2030

By 2030, there is a global 100 percent increase in the frequency of extreme heat events over land and by 2040 severe weather systems become significantly more intense **D5**

Water stress begins to impact cities and industrial processes & sectors which rely on water, yet operate in scarce environments **D5**

2040

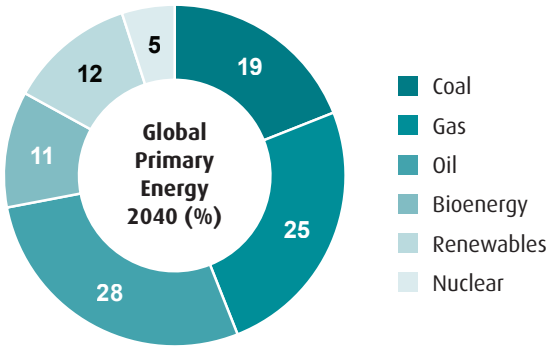
Carbon emissions do not peak globally until around 2050. Lack of action results in an estimated median temperature rise of over 2°C by 2050 and close to 4°C by 2100 **D1**

Physical impacts cause massive disruptions to global supply chains and economies **D9**. Extreme weather combined with sea-level rise will damage industry and infrastructure located near coastlines **D5**

2050

Global Primary Energy Mix

- Recent trends in renewable electricity generation uptake continue, however fossil fuels remain the dominant source of primary energy. **D12**
- Gas and oil demand remain steady out to 2040, however coal consumption decreases by 0.1% each year to 2040. Fossil fuel share of total power energy decreases to 48% in 2040. **D12**
- The transport sector continues to rely heavily on oil, with 82% of transport energy being derived from oil. **D12**
- In the US, from 2021 to 2050 there are no new coal generation plants established with almost half of current generators retiring. US natural gas production and consumption also grows, increasing by 25% from 2025 to 2050. **D13**
- In Australia, trade in LNG continues to grow and increased competition causes governments to reconsider possible shortfalls in supply. **D13**



SCENARIO D | Implications for IPL

The lack of effective progress to reduce emissions in this scenario results in a continuation of the current trajectory and 'business as usual' regarding carbon regulation. As a result, the transitional risks for IPL associated with market shifts and carbon pricing are limited to those which IPL is currently managing, including a shrinking thermal coal explosives market in the US and small regional carbon pricing schemes.

Because carbon emissions continue to rise in this scenario, the material risks identified for IPL are associated with 'chronic' physical risks (e.g. creeping changes in climate which cause drought and sea level rise) and 'acute' physical risks (e.g. more severe and more frequent extreme weather events such as hurricanes, drought and flooding from intense rain events and storm surges) which impact on IPL's operations, supply chain logistics and customers.

RISKS AND OPPORTUNITIES

Summary of Material (1) Climate-related Risks and Opportunities

This section summarises the risks and opportunities for IPL as assessed against the 1.5° Rapid Action, 2° Required Action, Delayed Action (IPR) and 3°+ Current Trajectory scenarios described in the previous section. Therefore, the descriptions of risks, opportunities and resilience are not forecasts, but describe what could happen if the world's development progressed as described in each of these scenarios.

Global temperature records indicate that we have already surpassed a global average temperature increase of 1°C above preindustrial average temperatures, indicating that there is an appreciable prospect that the world will experience more than 2 degrees of warming. However, the transitional risks identified through the use of the 1.5° and 2° scenarios could still occur because nations may still introduce rapid market, technological and regulatory changes, regardless of the actual degree of warming, to try to reduce emissions as quickly as possible.

The climate-related risks and opportunities specific to IPL's businesses that were assessed during the 2021 risk workshops are summarised on the page to the right. Each risk or opportunity is categorised according to the TCFD definitions (shown below the table) and as they relate to IPLs' value chain. Also included are the relevant climate scenarios and the estimated timeframes they describe for the impact of the risk or opportunity. Where impacts are already being realised, these are described as 'Current'.

(1) IPL defines a 'material' financial impact as an AU$20m impact or greater on EBIT. In addition to this financial threshold, IPL considers risks and management strategies based on an assessment of likelihood, with lower consequence risks that have a higher likelihood of occurring receiving an elevated level of management attention.
IPL's risk management process also reviews the appropriateness of controls and management strategies for climate related-risks with impacts of less than AU$20m on EBIT.

Current

RISK

Loss of revenues due to decreased demand for thermal coal mining

Transitional: Market

Climate Scenarios:

1.5° 2° DA

OPPORTUNITY/RISK

Increased demand for new world minerals & reduced demand for base metals

Transitional: Market

Climate Scenarios:

1.5° 2°

RISK

Physical impact of severe weather events on supply chain logistics

Physical: Acute risk

Climate Scenarios:

1.5° 2° DA 3°+

Short Term <1-3 Years

RISK

Regional carbon pricing schemes create a competition risk

Transitional: Legal & policy

Climate Scenarios:

2° DA 3°+

RISK

High baseline water stress may lead to water shortages at some IPL operations

Physical: Chronic

Climate Scenarios:

1.5° 2° DA 3°+

RISK

Reputational risk impacts access to capital and investors

Transitional: Market & reputation

Climate Scenarios:

1.5° 2°

RISK

Physical impact of severe weather events on operations & personnel

Physical: Acute risk

Climate Scenarios:

1.5° 2° DA 3°+

Medium Term <3-6 Years

OPPORTUNITY

Development of green ammonia and renewable hydrogen market

Transitional: Market and technology

Climate Scenarios:

1.5° 2°

OPPORTUNITY

Increased demand for specialist fertilisers due to harsher growing conditions

Physical: Chronic

Climate Scenarios:

DA 3°+

OPPORTUNITY

Partnerships for soil carbon sequestration in agriculture sector

Transitional: Market & policy opportunity

Climate Scenarios:

1.5° 2°

OPPORTUNITY

Demand for low GHG emitting fertilisers and explosives

Transitional: Market & policy opportunity

Climate Scenarios:

1.5° 2°

Long Term 6+ Years

OPPORTUNITY

Growth in Quarry & Construction sector to rebuild infrastructure due to physical impacts

Transitional: Market

Climate Scenarios:

DA 3°+

OPPORTUNITY/RISK

Shifting growing regions leads to fertiliser demand shifts

Physical: Chronic

Climate Scenario:

DA 3°+

RISK

Stranded asset or long term contract risk due to late sudden transition

Transitional: Market

Climate Scenarios:

DA

RISK

Socio-economic downturn/ disruption leads to supply chain interruptions & reduced product demand

Physical: Acute & chronic

Climate Scenarios:

3°+

Climate Scenarios: 1.5° Fast Action 2° Required Action DA Delayed Action (IPR) 3°+ Current Trajectory

TCFD definitions

The Task Force divided climate-related risks into two major categories:

1. Risks related to the transition to lower-carbon economy; and
2. Risks related to the physical impacts of climate change.

Translational risks

Transitioning to a lower-carbon economy may entail extensive policy, legal, technology, reputation and market changes to address mitigation and adaptation requirements related to climate change.

Physical risks

Physical risks resulting from climate change can be acute or longer-term shifts (**chronic**) in climate patterns.

Acute Risks: Acute physical risks refer to those that are event-driven, including increased severity of extreme weather events, such as cyclones, hurricanes or floods.

Chronic Risks: Chronic physical risks refer to longer-term shifts in climate patterns, eg. sustained higher temperatures and changes to rainfall patterns which may cause heat waves, sea level rise and/or increasing periods of drought.

Managing our Risks and Opportunities

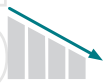
The following table provides a more detailed summary of the material climate-related risks and opportunities identified in our 2021 climate risk and opportunity review and assessment. The table includes a description of the risk or opportunity, the strategic approach we are taking to maximise the opportunity or mitigate the risk, and the residual risk assessment.

Risk or Opportunity	Description	Strategy and mitigating actions	Residual Risk assessment and KPIs
Current			
 RISK **Loss of revenues due to decreased demand for thermal coal mining** Transitional: Market Climate Scenarios: 1.5° 2° DA Impact: Medium	Decline in demand for thermal coal first, then also metallurgical coal is described in both the 1.5° and 2° Fast and Required Action scenarios. This will reduce demand for bulk explosives across thermal coal in the short term and MET coal in the long term. The USA business has seen a decline in demand from the thermal coal market since the 2018 risk assessment.	» We monitor the global environment, conduct detailed assessments of our markets and regularly update our supply and demand forecasts so that we can quickly respond to change. We seek to maintain competitive cost positions in our chosen markets, whilst maintaining quality product and service offerings. This focus on cost and quality positions our business units to compete over the medium to longer term in changing and competitive environments and we prefer to engage in long term customer and supply contractual relationships. » The 1.5° and 2° scenarios describe the reduction in demand for explosives in the thermal coal market being partly offset by the mining of new world commodities required for renewable technologies, which could be higher margin activity. In the 3°+ scenario, the physical impacts of climate change are expected to increase demand for materials, and therefore explosives, in the quarry & construction sector.	Considered a significant and ongoing business risk. Due to low cost of gas as an alternative for electricity generation, the USA business has seen a more rapid decline in demand from thermal coal markets than was projected by the 2018 risk assessment. The business has been able to remain resilient through shifting supply to other sectors (quarrying & construction and metals) and maintaining a competitive advantage over peers across both manufacturing and supply chain. **KPI: Annual % revenues from thermal coal mining vs other sectors over time in our Dyno Nobel Americas and Dyno Nobel Asia Pacific businesses**
 OPPORTUNITY/RISK **Increased demand for new world minerals & reduced demand for base metals** Transitional: Market Climate Scenarios: 1.5° 2° Impact: Medium	Both the 1.5° Fast Action and 2° Required Action scenarios describe a significant increase in the mining of primary metals due to increased demand for the 'new world minerals' required for new low-carbon technologies. However, they also describe increased recycling trends which will lower the need for primary metals, especially steel, with scrap steel being utilised in electric arc furnaces. This would reduce the demand for both virgin iron ore and bulk explosives for MET coal mining.	» This risk/opportunity has begun to be realised since 2018, with strategic action taken at Dyno Nobel Americas to shift operations and supply into emerging new world mineral markets in both south America and western USA, and increase revenues from the quarry & construction sector. » IPL's Moranbah manufacturing plant supplies explosives for mines in Queensland's Bowen Basin. This region produces some of the world's highest quality MET coal, with low ash content and low/medium volatile matter. These hard-coking coals are recognised by steelworks as prime coking coals used in steel manufacture, and Australian hard-coking coals are regarded as the industry benchmark. Queensland has 3.75 billion tonnes MET coal with volatile matter less than 25 percent, which is enough to sustain production for many years. As IPL's competitors are likely to see demand drop in line with thermal coal decline, the Moranbah facility will retain the unique competitive advantage of being located close to these MET coal mines. » IPL may be at a competitive advantage due to its ability to relocate production through disassembly and reassembly of facilities in a short timeframe (3 years) as has been demonstrated with the relocation of the Moranbah plant from the US in 2012.	IPL's active management of demand changes has minimised losses to date. However, there remains a risk that the opportunity in this space may not be as financially material as the risk due to new world minerals requiring less explosives volumes due to their smaller mine size. The business continues to manage this risk. **KPI: Annual % revenues from coal mining vs other sectors over time in our Dyno Nobel Americas and Dyno Nobel Asia Pacific businesses**

Risk or Opportunity	Description	Strategy and mitigating actions	Residual Risk assessment and KPIs
Current (cont.)			
 RISK **Physical impact of severe weather events on supply chain logistics** Physical: Acute risk Climate Scenarios: 1.5° 2° DA 3°+ Impact: High	An increase in the severity and/or frequency of extreme weather events as a result of climate change may cause more frequent disruption to IPL's supply chain and logistics including transportation of raw materials and finished product via road, rail and water. Interruptions to logistics from extreme weather events could result in financial loss if product cannot be stored effectively and degrades, or cannot be transferred off-site, resulting in production losses once site storage has reached capacity. All scenarios describe these events as increasing in the short term (1-3 years). Under these scenarios, insurance premiums would be expected to increase along with a possibility that some events may be excluded from cover.	» The COVID-19 pandemic tested the ability of IPL's supply chain function to respond to a global crisis, showing a high degree of resilience. » Physical impacts (flooding) on logistics at both Louisiana, Missouri (LOMO) and Phosphate Hill, Queensland have been realised since the 2018 assessment. At LOMO, the impact was immaterial, but at Phosphate Hill, a one-in-one hundred year flooding event in north Queensland during 2019 damaged third party rail infrastructure and interrupted rail services to the site for an extended period, resulting in a material impact. Contingency plans have been put in place at this site. » At some other sites, additional storage, both onsite and at strategic locations along transport routes, may be necessary along with contingency plans to use alternative forms of transport to access these. » Domestic co-location of critical products and diversification away from single source suppliers, already being managed, will assist in managing supply chain interruption. » The location of the Moranbah facility close to high quality metallurgical coal producers would provide IPL with a strategic advantage over its competitors in the event of supply chain disruption due to extreme weather events.	While still considered a material risk which requires ongoing management, residual risk has been greatly reduced due to work since 2018 to reduce reliance on single source suppliers and mitigation strategies for future climate-related rail interruptions to Phosphate Hill. Had these been in place prior to the 2019 Phosphate Hill flooding event, it is estimated that the impact would have been reduced from AU$115m to ~AU$30m. See the Case Study for this site under 'Building Our Resilience to Physical Climate Risks' **KPI: Annual financial impact of acute weather events causing supply chain disruptions**
Short Term: <1-3 years			
 RISK **Regional carbon pricing schemes create a competition risk** Transitional: Legal & policy Climate Scenarios: 2° DA 3°+ Impact: Low	Carbon pricing will materially impact IPL if it is not applied uniformly across global markets and cannot therefore be passed on in the cost of goods. Further, a carbon price on transport may impact the price of receiving products. The 2° Required Action scenario describes this impacting IPL until 2025, when most shipping and trucking options will be retrofitted with zero or low carbon mobility options.	» IPL's Decarbonisation and Energy Transition Steering Committee (DETSC) is developing the IPL Net Zero Pathway, which will progressively reduce IPL's exposure to carbon pricing. » IPL has a large, diverse supplier group, which would assist in avoiding carbon pricing pass through from suppliers in the short-term. » IPL customer agreements provide for the pass through of carbon pricing where possible. » Domestic co-location of critical products will reduce carbon costs associated with transport. Diversification away from single source suppliers, already being managed, will also assist in managing the potentially volatile/variable costs associated with increased regulation, including carbon pricing.	Considered a material risk requiring ongoing management. **KPI: Proportion of operational (Scope 1+2) emissions covered by carbon pricing schemes** **KPI: Percentage emissions reductions at sites covered by carbon pricing schemes**
 RISK **High baseline water stress may lead to water shortages at some IPL operations** Physical: Chronic Climate Scenarios: 1.5° 2° DA 3°+ Impact: Low	Cooling water is a key raw material for ammonia manufacturing. In all scenarios, average annual rainfall across the lower half of Australia will be reduced and longer periods of prolonged drought will be created, especially in eastern Australia. While this may be offset somewhat by increased 1 in 20-year flooding events at some locations, and up to 15% more rainfall than historical averages in each single rain event, water restrictions may become more frequent in some areas.	» IPL uses the World Resources Institute (WRI) Aqueduct Tool analysis annually as part of its water risk analysis to identify high-water-use sites located in catchments with high current or emerging baseline water stress. One high use water site, Gibson Island in Brisbane, Queensland, is in a catchment identified by the tool as currently experiencing high baseline water stress (40-80%) and this is projected to double by 2030. During 2021, we concluded an agreement and completed laying a pipeline to bring around 6,000 kL per day of recycled water into the site. For more details on this management plan, see the Case Study under 'Building our Resilience to Physical Climate Risks'.	The risk associated with our single high water use site in a high baseline water stress catchment has been greatly reduced. Future water scarcity concerns could prompt the need for additional water storage at some other sites. The cost of creating additional storage (dams) in these locations would not be material and would avoid an otherwise material impact on production. **KPI: % of freshwater withdrawn in regions with current or future 'high' or 'extremely high' baseline water stress**

Risk or Opportunity	Description	Strategy and mitigating actions	Residual Risk assessment and KPIs
Short Term: <1-3 years (cont.)			
 RISK **Reputational risk impacts capital markets and investors** Transitional: Market & reputation Climate Scenarios: 1.5° 2° Impact: Medium	Both the 1.5° Fast Action and 2° Required Action scenarios describe increased pressure from capital markets and investors to improve climate disclosure, worsening lending conditions, and risk of divestment in the short term.	» IPL recognises that climate-change is a material issue for our business, our people, our customers, our investors and our other stakeholders. We are committed to reducing our impact, to assessing and managing the strategic and operational risks and opportunities, to transparently reporting in line with TCFD recommendations and to engaging in other communications with our stakeholders. » IPL secured a Sustainability Linked Loan in 2020 which ties financing to our current emissions reduction target and actions.	Considered a material risk requiring ongoing management. **KPI: Number of face to face engagements with investor groups annually**
 RISK **Physical impact of severe weather events on operations & personnel** Physical: Acute risk Climate Scenarios: 1.5° 2° DA 3°+ Impact: Medium	Some of IPL's manufacturing plants are in areas that are susceptible to extreme weather events, such as hurricanes, electrical storms, tropical storms and tornadoes. An increase in the severity and/or frequency of these extreme weather events as a result of climate change may cause more frequent disruption to IPL's operations and increase and/or amplify health and safety risks for personnel.	» IPL's own manufacturing facilities are considered resilient to the anticipated acute physical impacts of climate change, with measures currently in place to manage exposure where sites are in tornado, electrical storm or hurricane zones. See the Case Study under 'Building Our Resilience to Physical Climate Risks' for the measures taken at our Waggaman, Louisiana plant. » Some of our smaller explosives Initiating Systems (IS) manufacturing sites must cease production during electrical storms. These sites could potentially be relocated closer to emerging markets if such interruptions increase. » Safety and evacuation plans are in place for all personnel and sites. » We endeavour to include force majeure clauses in agreements where relevant and insurance policies are in place across the Group.	Considered a material risk requiring ongoing management. **KPI: Annual financial impact of acute weather events on operations**
Medium Term: <3-6 years			
 OPPORTUNITY **Development of green ammonia and renewable hydrogen market** Transitional: Market and technology Climate Scenarios: 1.5° 2° Impact: Medium	Both the 1.5° Fast Action and 2° Required Action scenarios describe the development of green ammonia and renewable hydrogen in the medium term. IPL is an expert in the manufacture and handling of hydrogen (H_2) and ammonia (NH_3).	» IPL has a core competency in the manufacture, storage and transportation of ammonia and is well placed to play a role in the 'green hydrogen', and green ammonia for a low-carbon economy. Though the DETSC, feedstock and energy options including solar hydrogen and other alternative feedstocks are constantly being assessed for viability as part of IPL's overall capital management framework, supported by two of our strategic values drivers, Leading Technology Solutions and Manufacturing Excellence. » Read about our AU$2.7m Solar Hydrogen Feasibility Study on page 22 of our 2020 Sustainability Report.	IPL is currently highly dependent on the availability of affordable natural gas, both as a feedstock for hydrogen and as a fuel source. The development of green ammonia and renewable hydrogen is considered to be a material opportunity requiring ongoing management. **KPI: Number of low carbon hydrogen projects being investigated annually**
 OPPORTUNITY **Increased demand for specialist fertilisers due to harsher growing conditions** Physical: Chronic Climate Scenarios: DA 3°+ Impact: Low	The Delayed Action and 3°+ Current Trajectory scenarios describe heat stress, and in some locations, water stress impacting on agricultural production globally, particularly in the mid-latitudes, in the medium term. This may result in increased demand for specialist fertilisers to maintain yields in harsher growing conditions in the medium term.	» Our long term strategy is to grow IPF from a leading fertiliser company, manufacturing and distributing a range of domestic fertilisers, to a sustainable soil health company providing sustainable plant nutrition solutions to improve soil health. Our strategy will be leveraged through our expansive distribution footprint to drive new growth products and services towards soil health and changing growing conditions. » In line with our Leading Technology Solutions strategic driver, we continue to invest in a range of research projects with topics including new fertiliser technologies for sustained food security, healthy soils for sustainable food production, the development of novel urea coatings and the testing of silicon fertilisers which have been shown to increase heat stress resistance in crops.	The development of fertiliser products which provide solutions for our customers is a core business driver. This is considered a material opportunity requiring ongoing management. **KPI: Number of climate-related research projects funded**

Risk or Opportunity	Description	Strategy and mitigating actions	Residual Risk assessment and KPIs
Medium Term: <3-6 years (cont.)			
 OPPORTUNITY **Partnerships for soil carbon sequestration in agriculture sector** Transitional: Market & policy opportunity Climate Scenarios: 1.5° 2° Impact: Low	The 1.5° Fast Action and 2° Required Action scenarios describe the development of carbon sequestration opportunities in the agriculture sector which provide IPL with commercial partnership opportunities, such as soil carbon measurement. Demand for sequestration-aiding products, including fertilisers for biofuels, timber or which assist in soil carbon sequestration, may also arise.	» Our long term strategy is to grow IPF from a leading fertiliser company, manufacturing and distributing a range of domestic fertilisers, to a sustainable soil health company providing sustainable plant nutrition solutions to improve soil health. Our strategy will be leveraged through our expansive distribution footprint to drive new growth products and services towards soil health and changing growing conditions. » As part of this strategy, IPL owns and operates an analytical laboratory, Nutrient Advantage (NA), which offers specialist soil, plant and water testing to advisors and farmers, and tests more than 150,000 soil, plant and water samples each year. During 2021, NA launched a new soil health package to provide farmers with precise objective analysis and industry leading agronomic advice to help build healthier soils. The package includes tests for total carbon (C), total nitrogen (N), C:N ratio, aggregate slaking and dispersion, active (labile) carbon and microbial respiration (activity estimation).	The development of fertiliser products and services which provide solutions for our customers is a core business driver. Considered a material opportunity requiring ongoing management. **KPI: Number of soil and plant tests per annum**
 OPPORTUNITY **Demand for low GHG emitting fertilisers and explosives** Transitional: Market & policy opportunity Climate Scenarios: 1.5° 2° Impact: Medium	The 1.5° Fast Action and 2° Required Action scenarios describe increased demand for low carbon fertilisers and explosives products and services in the medium term. Products that are lower carbon and environmentally friendly (e.g. slow release fertilisers) will have a significant competitive advantage in this scenario.	» We aim to provide leading technology solutions to meet our customers' needs. In 2020, we saw 28% growth in the sales volumes of our third high efficiency fertiliser, eNpower™, which was released to market in 2019. 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 DeltaE proprietary explosives method reduces both energy use and GHG emissions associated with blasting for our mining and quarry and construction customers. » See 'Products that reduce Customer Emissions' for more details.	The development of fertiliser products and services which provide solutions for our customers is a core business driver. Considered a material opportunity requiring ongoing management. **KPI: Annual revenues from high efficiency fertilisers (Green Urea, Entec, eNpower)** **KPI: Compound annual growth rate: premium gassed emulsions (including DeltaE)**
Long Term: 6+ years			
 OPPORTUNITY **Growth in Quarry & Construction sector to rebuild infrastructure due to physical impacts** Transitional: Market Climate Scenarios: DA 3°+ Impact: Medium	The scenarios in which global warming surpasses 1.5° describe domestic adaptation and rebuilding due to physical impacts. In these scenarios, demand for quarry & construction materials, and therefore explosives demand from this sector, increases in the medium term.	» Our Dyno Nobel Americas business is the second largest industrial explosives distributor in North America by volume, providing ammonium nitrate, initiating systems and services to the Quarry & Construction sector in the southern US, northeast Midwest US and Canada. In 2019, 40% of DNA revenue was generated from this sector, and this increased to 43% in 2020, with strong growth due to both market and share growth. » We have a leading position in this end market, which benefits from a favourable mix of our high grade explosives, proprietary initiating systems and services. We continue to leverage our premium technology platform throughout and beyond the sector, including our proprietary Differential Energy offering. DeltaE has been in operation across the USA over the last three years and is well established in the quarry & construction and hard rock segments where customers value its safety, environmental, and efficiency benefits, including reduced GHG emissions due to reduced energy use. » DNA also operates a Quarry Academy training centre for stone quarry operators	We monitor the global environment, conduct detailed assessments of our markets and regularly update our supply and demand forecasts so that we can quickly respond to change. Considered a material opportunity requiring ongoing management. **KPI: % Revenues - supply of explosives to Quarry & Construction sector: Americas**

Risk or Opportunity	Description	Strategy and mitigating actions	Residual Risk assessment and KPIs
Long Term: 6+ years (cont.)			
 OPPORTUNITY/RISK **Shifting growing regions leads to fertiliser demand shifts** Physical: Chronic Climate Scenario: DA 3°+ Impact: Low	All scenarios which describe greater than 1.5° of global warming also describe changes to local climates that result in growing regions shifting poleward due to changes in soil temperatures in almost all agricultural zones, as well as changes in soil water content and water availability. This would result in increased fertiliser demand in new regions and decreased or changing demand in current growing regions in the long term.	» IPL currently operates in all four major climatic zones in Australia, including far North Queensland where some conditions are similar to those which may be experienced further south in the very long-term. Along with our strategy to grow IPF from a leading fertiliser company to a sustainable soil health company, this presents a strategic opportunity for IPL to partner with customers to develop and trial new suitable products that match the kinds of volatility that is likely to be experienced by farmers. » In line with our Leading Technology Solutions strategic driver, we continue to invest in a range of research projects with topics including new fertiliser technologies for sustained food security, healthy soils for sustainable food production, the development of novel urea coatings and the testing of silicon fertilisers which have been shown to increase heat stress resistance in crops. » IPL also has a strong competitive advantage in its existing distribution networks, enabling it to roll out new products quickly and easily to a range of affected customers, from Cairns in north Queensland, to Tasmania and South Australia.	Considered a material risk and opportunity requiring ongoing management. **KPI: Number of climate-related research projects funded**
 RISK **Stranded asset or long term contract risk due to late sudden transition** Transitional: Market Climate Scenarios: DA Impact: Low	The delayed, abrupt and disorderly transition away from carbon emitting assets described in the Delayed Action scenario presents a risk associated with long-term contracts or offtake agreements from 2030 (customers or suppliers may close before end of contract). Assets which are still emissions intensive or support an emissions intensive industry at this time may become stranded.	» IPL's Decarbonisation and Energy Transition Steering Committee (DETSC) is developing the IPL Net Zero Pathway, which will progressively reduce IPL's exposure to the risk of stranded assets, should the Delayed Action scenario eventuate. » IPL uses an internal carbon price to test capital investments in assets against a range of scenarios. » IPL is developing a management strategy for long term contracts, including a review of contracts which extend towards 2030 in order to assess exposure to transition risks. » IP is developing a process to consider climate risks within any new long term contracts.	Due to IPL's management strategies, the residual risk in the long term is considered to be greatly reduced. **KPI: Proportion of long-term contracts reviewed.**
 RISK **Socio-economic downturn/disruption leads to supply chain interruptions & reduced product demand** Physical: Acute & chronic Climate Scenarios: 3°+ Impact: Medium	The Delayed Action and, to a greater extent, 3°+ Current Trajectory scenarios describe severe acute and chronic physical impacts which lead to infrastructure destruction, famine, competition for food and water, increased geo-political conflict and mass population displacement. In the 3°+ scenario, this results in severe disruption to global trade and economic down turn.	» IPL's commitments to finding new ways to reduce our emissions and to continue to develop and deliver products and services which reduce our customers' emissions will ensure that we contribute to the global aim of limiting global warming and reducing the physical, socio-economic and geopolitical impacts of climate change to those described in the 1.5° and 2° scenarios. This will require global action.	Considered to have severe impacts in affected regions. While IPL operates primarily in wealthy countries with good governance which may be more resilient than most, the long-term future described in this 3°+ world would not be conducive to operating a business regionally and/or globally.

Non-Material Risks and Opportunities

IPL defines a 'material' financial impact as an AU$20m impact or greater on EBIT. In addition to this financial threshold, IPL considers risks and management strategies based on an assessment of likelihood, with lower consequence risks that have a higher likelihood of occurring receiving an elevated level of management attention. IPL's risk management process also reviews the appropriateness of controls and management strategies for climate related-risks with impacts of less than AU$20m on EBIT. In order to fully disclose the risks and opportunities identified, the table below includes those risks which are not expected to result in a material financial impact, but which IPL continues to monitor and manage.

Risk or Opportunity	Description	Strategy and mitigating actions	Materiality assessment
 OPPORTUNITY **Financial incentives associated with carbon pricing schemes, grants or other policy support for decarbonisation** Physical: Chronic Climate Scenarios: 1.5° 2° DA	Carbon pricing and other policy support for transitioning to the low carbon future described in the 2D scenario may create opportunities for IPL related to funding for investment in new technologies which reduce GHG emissions.	» The IPL Carbon Pricing Steering Committee (CPSC) oversees the management of existing carbon pricing schemes, monitors those which are emerging and reports to the DETSC regarding management strategies. » IPL has successfully registered one project to earn Australian Carbon Credit Units (ACCUs) under the current Australian Federal Government Emissions Reduction Fund. » IPL received AU$0.9m from the Australian Renewable Energy Agency (ARENA) to support its AU$2.7m Solar Hydrogen Feasibility Study. We continue to seek opportunities to partner with research organisations to develop emerging technologies. » IPL's strategic focus on Leading Technology Solutions and Customer Focus as two of our six value drivers also positions us to leverage our premium technology platform throughout all our geographies and sectors, and we continue to develop and provide products and services which reduce our customers' energy use and GHG emissions, as well as monitor schemes which may provide our customers with financial incentives.	While this opportunity is currently providing small amounts of funding which may improve the IRR for low carbon projects, is not expected that financially material amounts will be made available. IPL continues to monitor opportunities and partnerships which may financially assist us and our customers to decarbonise.
 RISK **Impact on workers' health & safety** Physical: Chronic Climate Scenarios: 2° DA 3°+	All scenarios which describe greater than 1.5° of global warming also describe an increase in heat stress and fatigue risks. This would be exacerbated by increased humidity in some regions, especially in Queensland, Australia.	» IPL currently manages worker health and safety in a range of extreme environments, from polar mining in the DNA business to very hot environments in Australia and Indonesia. » A global fatigue management procedure will be implemented from 2022 which will assist in monitoring the impacts of chronic changes in temperature on employee health and safety.	IPL is committed to the ongoing management of worker health and safety through our Zero Harm strategic driver. While we continue to monitor our processes in regards to heat stress and fatigue, we do not consider this to be a material risk to our business.
 RISK **Increased rainfall leads to an increased risk of dam overflows** Physical: Acute & chronic Climate Scenarios: DA 3°+	Four sites with on-site storm-water ponds have been identified as being in regions where the incidence of high intensity rainfall events is expected to increase. These are in Moranbah, Phosphate Hill and Gibson Island (all in Queensland) and Graham, Kentucky. This presents a risk of non-compliance with licence conditions should the dams overflow.	» Ongoing and long-term water management strategies are in place to ensure overflows of storm water ponds due to higher intensity rainfall events are avoided	This risk is being actively managed by IPL operations. The cost of increasing storm water pond capacity, should it be required, is not expected to be material.
 RISK **Sea level rise increases inundation risk during coastal storm events** Physical: Acute & chronic Climate Scenarios: DA 3°+	One IPL manufacturing site and several distribution sites are located on coasts and are very close to sea level. A significant rise in sea level combined with a king tide may cause inundation events at these sites in the long term, particularly with increased storm activity causing storm surges to become more frequent and intense.	» The construction of sea-level management infrastructure (levies, etc.) will be considered in the long-term for the identified sites where it may be required to manage the risk of inundation due to storm surges and sea level rise. » For small distribution sites, relocation opportunities will also be assessed.	This risk is being actively managed by IPL operations. The risk is not considered to be financially material due to the non-material costs of building sea-level management infrastructure and/or relocating small sites.

BUILDING OUR RESILIENCE TO PHYSICAL CLIMATE RISK

Due to the nature of climate change, which results in a permanent shift in local weather conditions that is not uniform across the globe, the physical impacts will be different at different locations. For this reason, our scenario based risk assessments considered the physical impacts on IPL's customer markets, and on our 12 major manufacturing operations on an individual and detailed basis. We recognise that due to the impacts of climate change on agriculture, new fertiliser technologies will be required for sustained food security and we partner with a range of research institutions and customers on research and trials.

With exception of our Waggaman, Louisiana site, which is located in a hurricane zone, IPL's own manufacturing facilities are in areas considered to be relatively resilient to the anticipated acute physical impacts of climate change, with the most material physical impacts relating to supply chain and logistics interruptions.

The changes in local weather conditions associated with climate change can also act as an amplifier of other risks across IPL's risk profile. For example, a greater risk of extreme weather events increases both the likelihood and potential impact of risks to the integrity of IPL's assets and may increase the risk of accidental releases to the environment. Higher temperature and humidity, as well as an increasing incidence of extreme heat events increases the risk of heat stress for our people at some of our sites.

For this reason, we have incorporated the future climate scenarios developed for each of our 12 major manufacturing sites into Climate Change Risk Review Packs to drive climate-related risk assessment throughout our risk management framework. The aim is twofold:

1. to ensure that the climate change-specific risks identified for each site during our 2021 scenario risk analyses have been incorporated into site risk registers and are being managed; and
2. to assist sites in identifying any existing operational risks which may be amplified by the expected changes in prevailing weather conditions at each site and ensure that any additional controls required are identified and assigned to risk control owners.

CASE STUDY: Developing silicon fertilisers for a warming climate

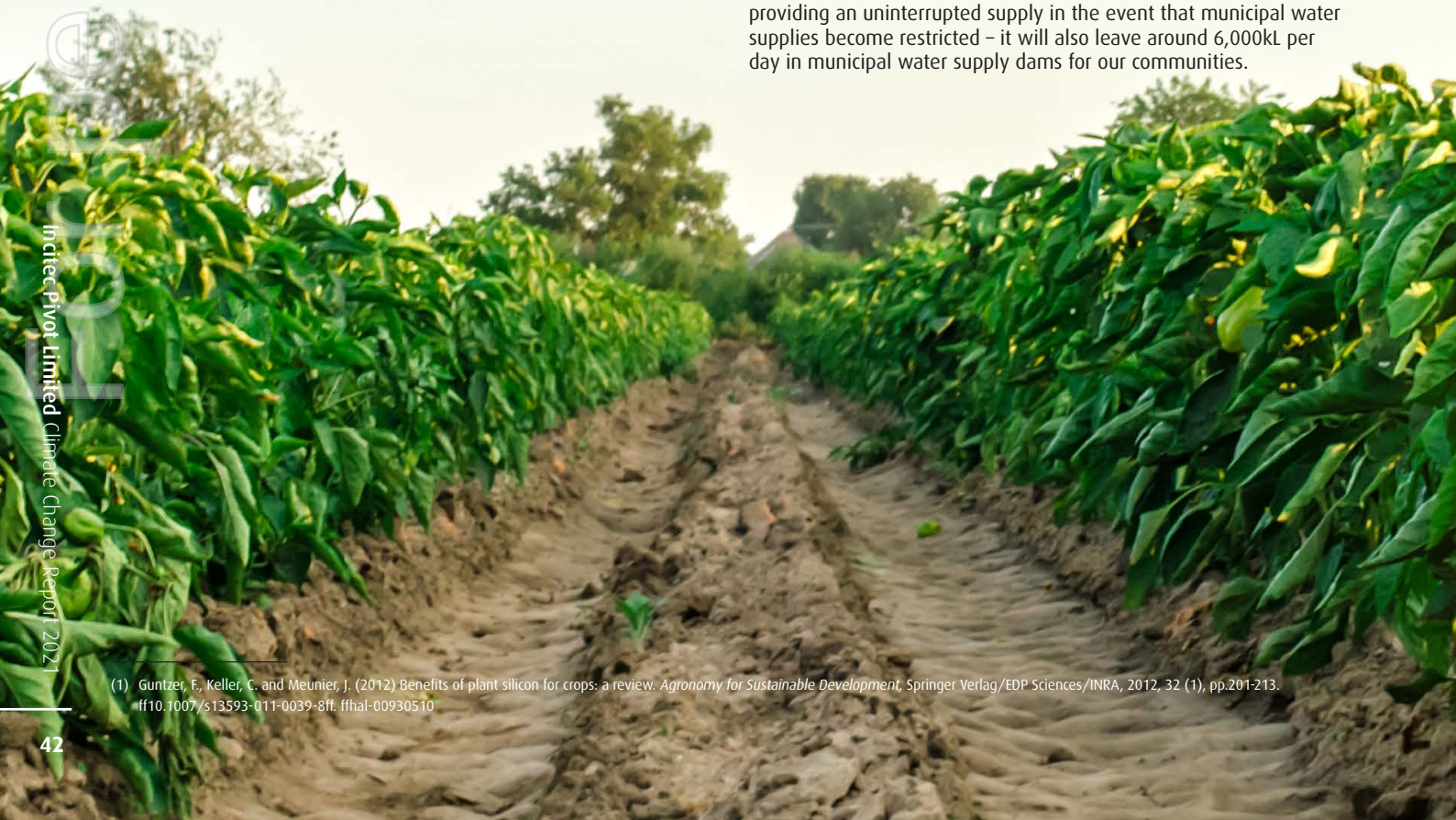
During 2021, we continued the testing of silicon fertilisers which have been shown to increase stress resistance in crops and replace silicon lost from soils through certain crops. Although silicon is generally not considered as an essential element in agriculture, the use of natural silicates may improve use efficiency of a range of nutrients including phosphorus for maintaining sustainable agriculture, especially if drought stress begins to impact on crop production due to climate change.

Natural silicates have been shown to increase biomass yield and/or grain yields where water is scarce and, in the case of rice, has increased resistance to typhoons.(1) Our results to date indicate that crop tolerance of abiotic stresses, such as those related to drought conditions, can be increased and we continue to investigate the ways in which silicon may future proof agriculture in a world impacted by climate change.

CASE STUDY: Future proofing water supplies in Brisbane, Queensland

Our scenarios describe long term changes to rainfall patterns as a result of climate change in some geographies. For this reason we complete an annual review of our manufacturing sites to identify those at high risk in relation to water use using the World Resources Institute (WRI) Aqueduct Tool. This tool has identified our Gibson Island ammonia manufacturing site, which uses high volumes of cooling water, as being located in a catchment currently subject to high (40-80%) baseline water stress and high 'Physical risk – Water Quantity' due to a relatively large local population and high inter-annual variability in rainfall. The Tool also predicts that baseline water stress in the catchment will double by 2030 due to climate change and a growing population.

During 2019 and 2020, IPL worked with Seqwater, the Queensland Bulk Water Supply Authority, and Urban Utilities to enable the supply of recycled water to the IPL Gibson Island site. During 2021, we invested AU$4M in the infrastructure required, including a dedicated pipeline, to enable around 6,000kL per day of recycled water to be used in process applications on the site. This will not only assist in providing an uninterrupted supply in the event that municipal water supplies become restricted – it will also leave around 6,000kL per day in municipal water supply dams for our communities.



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CASE STUDY: ARC RESEARCH HUB FOR SMART FERTILISERS

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, especially as greenhouse gases (N_2O).

The *ARC Hub for Smart Fertilisers* (funded as the Hub for Innovative Nitrogen Fertilisers and Inhibitors) is funded by the Australian Research Council under the Industrial Transformation Research Program (ITRP), in partnership with industry – Incitec Pivot Limited, Elders Rural Services and universities – the University of Melbourne and La Trobe University.

The Hub aims to transform agriculture by delivering a new class of nitrogen (N) fertilisers and inhibitors designed to stem N losses to the environment when using current products. Losses to the environment typically occur as leaching of nutrients to waterways and losses to the air as ammonia (NH_3) and N_2O, a potent GHG. The Hub is intended to generate new knowledge and valuable intellectual property in controlled released and coated N fertiliser products using a novel co-design process involving representatives of the whole value chain, from product design through to validation and adoption.

The Hub estimates up to 20% gains in efficiency of N use are possible, delivering large costs savings, improved productivity and increased profitability for growers. Because more N is retained in the soil for crop uptake, environmental impacts are also reduced. These include reductions in GHG emissions to air and reduced nutrient run off to waterways, helping the Australian food and agribusiness sector to reach its 2030 target of $100B value added while reducing GHG emissions and protecting environmental assets, such as the Great Barrier Reef.

Purpose and vision

The Hub's vision is to support sustainable intensification, farm profitability, environmental quality and soil health by developing the next generation of high efficiency fertilizers.

We aim to achieve this by:

- Generating new knowledge about soil and plant interactions to inform farming practices and the development and application of new fertilisers;
- Creating new smart fertilisers designed to reduce the significant losses of nitrogen to the environment associated with conventional fertilisation;
- Working with industry experts, farmers and agribusinesses to develop practical tools to support farmers in making decisions about using the new smart fertilisers; and
- Developing evidence-based the social (environmental and health) costs of nitrogen losses and the social benefits of new fertilizers to inform government policy, industry and the community.

The Hub is a partnership between academic researchers and industry partners and will operate under the following core principles:

1. **Collaboration** – the Hub will use a co-design approach to integrate industry and academic knowledge, supported by governance structurers that facilitate regular interactions and information sharing.
2. **Transparency** – Hub governance and information management will provide transparency in decision making, planning and communication of progress.
3. **Engagement** – the Hub will involve representatives of industry, government, farmers, retailers and consumers throughout the research process to inform the development of new products and facilitate knowledge exchange.
4. **Interdisciplinary** – the Hub will establish a range of mechanisms to support interdisciplinary collaboration and knowledge exchange.

The Hub design brings together 5 interconnected, multi-disciplinary research themes:

1. **Fertilisers with engineered coatings**
2. **Urease and nitrification inhibitors**
3. **Soil and plant microbiome interactions**
4. **Agronomic, environmental, and social benefits**
5. **Maximising sector wide value**

Themes 1, 2 & 3 provide underpinning knowledge and a range of new products for validation, Theme 4 provides opportunities to quantify the gains made in nitrogen use efficiency and reducing GHG emissions, and Theme 5 provides a framework to drive commercialisation of new products developed by the Hub and the adoption of those products by producers.

CASE STUDY: Managing supply chain risks due to flooding at LOMO

Our Louisiana, Missouri ammonium nitrate manufacturing facility site supplies explosives to the iron range in the US northern mid-west, up into Canada (Ontario and Quebec) and sometimes into eastern US Pennsylvania and the Appalachian area. This site was identified by our scenario risk assessment as being at risk of supply chain interruptions due to an increased incidence of flooding, beginning in the short-term. This risk is closely monitored by site personnel from February to April each year with site monitoring processes ensuring 7 to 10 days' notice of heavy rainfall in the north that will come down the river, or blockages downstream which will cause local flooding. Once triggered, significant cross functional collaboration between our supply chain, finance, manufacturing, nitrogen sales, logistics, and environmental teams is set in motion, with twice weekly meetings to implement the site's risk mitigation plan.

In 2019, this site experienced a Mississippi high-water event which damaged the rail line and interrupted rail services, which are used to transport product out of the site, from mid-March to the end of June. The risk mitigation plan was triggered in early March and product loadout from the site was transferred to trucks. Deals with third party transloading facilities along the rail line were put in place to transfer the product from truck to rail beyond the flood damaged section. A number of vendors along the rail line were used as the flooding progressed, increasing the affected area and a number of supply points across our supply network were shifted to maintain supply to customers. Although a short plant outage resulted, the mitigation response was extremely successful, with a total EBIT impact of less than $US10m and no customers left short of product.

CASE STUDY: Managing supply chain risks due to flooding at Phosphate Hill

Our Phosphate Hill ammonium phosphate fertiliser manufacturing site is located in remote northern Australia, near a natural phosphate deposit and manufactures ammonium phosphate fertilisers for use along the eastern Australian coast and internationally. All of IPL's future climate-related scenarios describe hotter, wetter weather conditions in the short term, with an increase in the incidence and magnitude of flooding events due to climate change. While the site itself is not located in the flood zone, a single third-party operated rail line is used for supply in, and product transport out, of the site.

Disruptions to this rail line have increased in recent years due to flooding associated with the summer monsoon. In 2016, flood waters caused a derailment of sulphuric acid supply to the site, resulting in an AU$10m impact on EBIT, and in 2019, a one-in-one hundred-year flooding event damaged third-party rail infrastructure, interrupting rail services to the site for 3 months. This rail outage required a change from rail to road transport of product for the three months. Production was also halted once product storage was at capacity, with a total EBIT impact of AU$115m.

Following this event, a detailed review of contingency plans for rail interruptions at the site was completed. As a result, AU$3.6m was invested in building additional on-site and contingency storage so that future events will not lead to production interruptions. A dry truck unloading chute-conveyor and telehandler are hired for wet seasons, and a number of other process changes have been implemented which will allow IPL to better prepare for, manage and mitigate the risks associated with future rail interruptions, both minor and major. Had these contingencies been in place before the 2019 flooding event, it is estimated that the impact would have been reduced from AU$115m to approximately AU$30m.

CASE STUDY: Preparing WALA for extreme weather events

Our 800,000 metric tonne per annum Waggaman, Louisiana ammonia plant was commissioned on 19 October 2016. The plant was built utilising the industry's leading technology and is among the most energy efficient plants of its kind in the world, employing gas purifier technology and recapturing steam for reuse. The plant is also fitted with Selective Catalytic Reduction technology in the reformer flue to reduce emissions of NO_2 and captures a portion of its CO_2 emissions for use by a neighbouring plant to make melamine.

Due to its location in a hurricane zone, the plant was built to comply with wind codes set out by the International Building Code Design Standard IBC 20 and Minimum Design Loads for Buildings and Other Structures ASCE 7-05 which include the relevant standards for wind load, occupancy categories, basic wind speed and exposure. The design was signed off by a Louisiana based certified Professional Engineer with experience in these design standards for the region, where the impacts of future hurricanes must be considered. The required permits also included ensuring that the plant was built at a height above Louisiana's expected future inundation levels.

As part of its emergency response plan, the facility has a hurricane procedure which details the preparations that are made at various times prior to hurricane strike. Preparations include:

- Management of the hurricane staffing crew;
- Housekeeping checks to remove or tie down materials that could become airborne;
- Ensuring the back-up power generator has adequate fuel;
- Ensuring the site has adequate supplies for the hurricane staff and for recovery post-storm;
- Communication with logistics on the status and coordination of final shipments prior to the event; and
- Internal Company updates on plant status and readiness for the event.

If the expected hurricane is of a high intensity, the plant may be required to shut down. This decision has Zero Harm as the primary goal, and is made in consultation with Cornerstone Chemical Company (the overall site Owner), St. Charles and Jefferson Parish Emergency Operations Centers, and with the support of IPL senior management. When this decision is made, a process is followed to shut down the plant in a controlled manner, with steps to cool and purge the system of hydrocarbons, block in major reactors under nitrogen purge and install additional securing of the cooling tower fans to prevent wind damage. Staff remaining on site are required to be housed in the control building which is rated for hurricane-strength winds and was built at an elevation where risk of flooding is negligible. The procedure also calls for the storage of adequate supplies of food and water for the expected duration of the event and the release of staff early to make personal arrangements then return to site 16 hours in advance of the event to make final preparations and begin monitoring. The procedure references emergency evacuation routes which limit direction of travel on the major highways in the New Orleans metropolitan area. Additional safety buddies are required when performing work in the plant and employees are to remain inside when winds rise above 60 miles (100km) per hour.

Post storm, the procedure requires an assessment to be conducted prior to start-up to ensure Zero Harm. The assessment targets hazards such as potential chemical loss of containment, downed power lines and compromised structures and, where required, forms the basis of a recovery plan. Once plant repairs are completed, the plant is restarted using procedures which include functional checks of systems.

Since commissioning, the facility has experienced seven tropical storms and hurricanes with zero injuries to our people and only one financially material impact to date:

- 2017 – Hurricane Nate (Cat 2) with no injuries to people, zero days of production losses and less than US$100,000 in total costs.
- 2019 – Hurricane Barry (Cat 1) with no injuries to people, zero days of production losses and less than US$100,000 in total costs.
- Tropical Storm Olga with no injuries to people, zero days of production losses and less than US$100,000 in total costs.
- 2020 – Tropical Strom Cristobal with no injuries to people, zero days of production losses and less than US$100,000 in total costs.
- 2020 – Hurricane Marco (Tropical Storm) with no injuries to people, zero days of production losses and less than US$100,000 in total costs.
- 2020 – Hurricane Zeta (Cat 3) with no injuries to people, 14 days of production losses and an estimated financial impact of US$6m. Production losses were the result of loss of power to the site from our electricity supplier.
- 2021 – Hurricane Ida (Cat 4) with 23 days of production losses and a financial impact of US$28m. Production losses were the result of loss of power to the site from our electricity supplier.

WALA Co-generation Project

To further reduce the financial impacts of future power outages associated with storm events, the site is currently investigating the installation of natural gas-fired boilers to generate the extra process steam required for restarting the facility. Once the facility is restarted, this steam will be used to generate electricity, fully offsetting the site power demand from the grid and avoiding future production losses associated with extended local power outages.

In addition to reducing our Scope 2 emissions, potential exists to increase the capacity of this project to ensure sufficient power is available to compress our process CO_2 stream in preparation for geologic sequestration.

APPENDICES

1. SCENARIO REFERENCES

Scenario A: Fast Action (1.5 Degrees)

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Scenario B: Required Action (2 Degrees):

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B4: Bjorn Lomborg, *Welfare in the 21st Century: Increasing development, reducing inequality, the impact of climate change, and the cost of climate policies* (2020)

B5: Global CCS Institute, *Global Status of CCS 2020* (2020)

B6: CarbonBrief, Explainer: *How 'Shared Socioeconomic Pathways' explore future climate change* (2018)
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D14: Integrated System Plan 2020, *Australian Energy Market Operator* (2020)

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2. TCFD DISCLOSURES TABLE

TCFD Recommended Disclosure	Location of Disclosure
Governance:	
Disclose the organization's governance around climate-related risks and opportunities	'Ensuring Strong Governance' p.12-15
a) Describe the Board's oversight of climate-related risks and opportunities.	'Ensuring Strong Governance' p.12-13
b) Describe management's role in assessing and managing climate-related risks and opportunities.	'Ensuring Strong Governance' p.14-15
Strategy	
Disclose the actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning where such information is material.	'Management Roles and Responsibilities' p.14 'Reducing Operational Emissions' p.16-19 'Managing Strategic Business Risks and Opportunities', p.34-41
a) Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term.	'Managing Strategic Business Risks and Opportunities', p.34-41
b) Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning.	'Management Roles and Responsibilities' p.14 'Reducing Operational Emissions' p.16-19 'Managing Strategic Business Risks and Opportunities', p.34-41
c) Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.	'Management Roles and Responsibilities' p.14 'Reducing Operational Emissions' p.16-19 'Managing Strategic Business Risks and Opportunities', p.34-41
Risk Management	
Disclose how the organization identifies, assesses, and manages climate-related risks.	'Managing Strategic Business Risks and Opportunities', p.24-45
a) Describe the organization's processes for identifying and assessing climate-related risks.	'Managing Strategic Business Risks and Opportunities', p.24-33
b) Describe the organization's processes for managing climate-related risks.	'Managing Strategic Business Risks and Opportunities', p.36-45
c) Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management.	'Management Roles and Responsibilities' p.14 'Managing Strategic Business Risks and Opportunities', p.36-45
Metrics and Targets	
Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.	'Managing Strategic Business Risks and Opportunities', p.36-41 (column 4)
a) Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process.	'Managing Strategic Business Risks and Opportunities', p.36-41 (column 4) 'Metrics Used to Assess and Manage Climate Related Risks and Opportunities' p.50
b) Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.	'Reducing Operational Emissions' p.16-19 'Our Scope 3 Emissions', 'Reduction Opportunities' and Case Studies, p.21-23
c) Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.	'Next Steps' p.5

Metrics Used to Assess and Manage Climate Related Risks and Opportunities				
Physical Risks	**2018**	**2019**	**2020**	**2021**
Financial impact due to weather-related events	AU$19.8m (Drought – Australia)	AU$148.6m (Flood & drought – Australia)	$0	AU$37.3m (Hurricane Ida – US)
Percentage of freshwater withdrawn in regions with high or extremely high baseline water stress	8.3%	4.5%	4.8%	5.2%
Percentage of withdrawals where water management is considered to be a material issue	22%	23%	23%	27.3%
Water withdrawal intensity (kL/t product manufactured for sale)	12.6	13.0	11.5	11.6
Net water use intensity (kL/t product manufactured for sale)	5.1	4.4	3.8	4.5
Physical Opportunities - Explosives	**FY16 to FY19**	**FY16 to FY20**		**FY17 to FY21**
Increasing demand for climate adaptation products - Compound annual growth rate: premium gassed emulsions (including DeltaE)	DNA – 28% DNAP – 16%	DNA – 23% DNAP – 26%		DNA – 26% DNAP – 27%
Physical Opportunities - Fertilisers	**2018**	**2019**	**2020**	**2021**
Increasing demand for climate adaptation products – Revenues from high efficiency fertilisers (Green Urea, Entec, eNpower)	AU$20.7m	AU$19.0m	AU$17.6m	AU$20.1m
Transition Risks	**2018**	**2019**	**2020**	**2021**
GHG intensity per tonne ammonia produced (tCO_2e per t ammonia) (1)	1.95	2.13	1.99	2.03
% reduction in GHG intensity per tonne ammonia produced since 2015	12%	3%	10%	8%
Proportion of operational (Scope 1+2) emissions covered by carbon pricing schemes	42%	41%	41%	47%
Number of major manufacturing facilities included in regional or national carbon pricing schemes	3	3	3	3
Number of major manufacturing facilities financially impacted by regional or national carbon pricing schemes	1	1	1	1
% Revenues – supply of explosives to thermal coal mining: Americas	27%	26%	21%	18%
% Revenues – supply of explosives to thermal coal mining: Asia Pacific	3%	4%	5%	5%
Transition Opportunities	**2018**	**2019**	**2020**	**2021**
Number of climate-related research projects funded	3	4	3	4
Number of patents held for reduced carbon products/technologies	10	10	10	10

(1) Restated due to restatement of Scope 1 emissions resulting from improved measurement technologies installed during 2021.

3. ENERGY AND GHG EMISSIONS DATA

Energy Use (GJ)				
	2018	**2019**	**2020**	**2021**
Energy Use (GJ) [1]	73,733,847	64,995,630	70,071,149	60,629,371
Operational GHG Emissions (tCO_2e)	**2018**	**2019**	**2020**	**2021**
Scope 1 emissions (tCO_2e) [2]	4,037,930	3,469,004	3,663,898	3,112,182
Scope 2 emissions (tCO_2e)	327,536	307,161	297,324	299,838
Operational GHG Emissions	**4,365,466**	**3,776,165**	**3,961,222**	**3,412,020**
Value Chain GHG Emissions (kt CO_2e)	**2018**	**2019**	**2020**	**2021**
Total Scope 3 emissions (kt CO_2e)	**7,717**	**6,289**	**5,996**	**6,278**
Category 1. Purchased goods and services	1,970	1,827	1,404	1,608
Category 2. Capital goods		(Not material. Not calculated)		
Category 3. Fuel and energy related activities	602	535	580	516
Category 4. Upstream transportation and distribution	213	171	184	328
Category 5. Waste generated in operations	6	6	6	6
Category 6. Business travel		Not material. Not calculated		
Category 7. Employee commuting		Not material. Not calculated		
Category 8. Upstream leased assets		Not applicable		
Category 9. Downstream transportation and distribution		Included in Category 4		
Category 10. Processing of sold products		Not material. Not calculated		
Category 11. Use of sold products				
Fertilisers	3,942	2,853	2,962	3,110
Explosives	211	198	148	121
Industrial Chemicals	671	600	602	483
Category 12. End of life treatment of sold products		Not applicable		
Category 13. Downstream leased assets		Not applicable		
Category 14. Franchises		Not applicable		
Category 15. Investments	102	99	110	106

(1) Our global energy use has been restated due to improved measurement of natural gas use at our Waggaman Louisiana ammonia manufacturing site.

(2) Our 2018, 2019 and 2020 Scope 1 GHG emissions have been restated due to improved measurement of nitrous oxide emissions. To back calculate these for previous years, we have taken the average GHG intensity measured (from the 5 months of data we have collected since installing CPEM at our LOMO plant) and applied it to the tonnes nitric acid produced at that plant in those years. CPEM is a vastly improved measurement technology compared to the previously used method of stack testing emissions annually and applying the GHG intensity per tonne of nitric acid measured on the stack testing day to total annual production. Although a US EPA approved method, single day stack testing is a less reliable measurement method because emissions can vary significantly throughout a year as catalysts age and are replaced.

4. SCOPE 3 EMISSIONS CALCULATION METHODOLOGY

'Scope 3' is the term used to describe the indirect GHG emissions resulting from activities in our value chain but outside of our operational control. They include 'upstream' emissions related, for example, to the extraction of the natural gas we use and the production of the materials we purchase for use at our operations, and 'downstream' emissions which arise from customer use of the products we supply. They also include the emissions arising from operations in which IPL owns an interest but does not have operational control (see category 15 in the table below). The GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard further categorises Scope 3 emissions into fifteen distinct categories. We have calculated Scope 3 emissions for our business according to these categories.

The table below describes the calculation boundaries (including any exclusions of particular emissions sources within a category), methodologies, assumptions and references used to calculate the emissions estimate for each relevant Scope 3 category for the years 2019, 2020 and 2021. In categories where Scope 3 emissions have not been calculated, the basis for excluding the category is provided under 'Explanation'.

Scope 3 Standard Emissions Category	Scope 3 Emissions in 2020 (million tonnes CO_2e)
Category 1: Purchased goods and services (excluding capital goods)	
Category description	Upstream (i.e. cradle-to-gate) emissions from the extraction, production & transportation of goods & services purchased or acquired by the reporting company in the reporting year, where not otherwise included in categories 2-8.
Calculation Status	Material. Calculated.
Calculation Boundary	This category covers emissions generated upstream of IPL's operations associated with the manufacture of purchased fertilisers, explosives and chemical products. The manufacture of many of these products, such as ammonia based fertilisers and explosives, are classified as Emissions Intensive Trade Exposed (EITE) activities under the Australian National Greenhouse and Energy Reporting (NGER) system and are the most material contributors to this category.
Exclusions	For 2018, 2019 and 2020, only the emissions associated with purchased chemical products (and the proportion of expenditure and volume they represent) are included. Due to the high emissions intensity of these products, these sources are estimated to include the majority of IPL's Scope 3 emissions in this category.
Calculation methodology	Total tonnes purchased of each material is extracted from IPL's internal purchasing system for each financial year period. A Scope 3 emissions factor specific to each material was then applied per tonne (see 'References' below).
Data sources	'Annual tonnes purchased' data is extracted from the IPL internal system that tracks all external spend.
References	» GHG Protocol Technical Guidance for Calculating Scope 3 Emissions (v1): Supplement to the Corporate Value Chain Scope 3) Accounting and Reporting Standard; WRI/WBCSD; 2013; https://ghgprotocol.org/scope-3-technical-calculation-guidance » National Greenhouse Accounts Factors: Australian National Greenhouse Accounts, October 2020; Australian Government Department of Industry, Science, Energy and Resources; 2020; https://www.industry.gov.au/sites/default/files/2020-10/national-greenhouse-accounts-factors-2020.pdf » National Inventory Report 2018, Volume 1; Australian Government Department of Industry, Science, Energy & Resources; 2020; https://www.industry.gov.au/sites/default/files/2020-05/nga-national-inventory-report-2018-volume-1.pdf » LCI data for the calculation tool Feedprint for greenhouse gas emissions of feed production and utilization: GHG Emissions of N, P and K fertilizer production, Blonk Consultants 2012; https://www.blonkconsultants.nl/wp-content/uploads/2016/06/fertilizer_production-D03.pdf
Category 2: Capital goods	
Category description	Upstream (i.e. cradle-to-gate) emissions from the extraction, production and transportation of capital goods purchased or acquired by the reporting company in the reporting year.
Calculation Status	Not material. Not calculated.
Explanation	Based on industry intensity factors applied to IPL's annual capital goods expenditure, emissions from this category are not considered to be material.

Scope 3 Standard Emissions Category	Scope 3 Emissions in 2020 (million tonnes CO_2e)
Category 3: Fuel and energy related activities	
Category description	Emissions related to the extraction, production, and transportation of fuels and energy purchased or acquired by the reporting company in the reporting year, not already accounted for in Scope 1 or Scope 2.
Calculation Status	Material. Calculated.
Calculation Boundary	This category covers emissions arising from the extraction, production, and delivery of fuels, including diesel, gasoline, LPG, greases, oils and lubricants) and electricity purchased by the operations over which IPL has operational control. Due to IPL's use of natural gas as both an energy source and a feedstock for hydrogen to make ammonia, the emissions associated with the upstream extraction, processing and pipeline delivery of natural and coal seam gas, including fugitive emissions, are material contributors to this category.
Exclusions	The diesel fuels used for offsite transport of product in North America by trucks owned and operated by IPL have not been included in our Scope 3 or Scope 1 calculations. Although these are Scope 1 emissions, fuel use data is presently unavailable and materiality is very low, with Scope 1 emissions from this source estimated to be less than 1% of IPL's total Scope 1 emissions.
Calculation methodology	Total energy and fuels purchased (volumes) have been multiplied by a Scope 3 emission factor specific to each fuel.
Data sources	For natural gas (GJ) and electricity (kWh) purchased, data is collected from invoices. For all other fuels, 'annual volumes purchased' data is extracted from the IPL internal system that tracks all external spend.
References	» GHG Protocol Technical Guidance for Calculating Scope 3 Emissions (v1): Supplement to the Corporate Value Chain (Scope 3) Accounting and Reporting Standard; WRI/WBCSD; 2013; https://ghgprotocol.org/scope-3-technical-calculation-guidance » National Greenhouse Accounts Factors: Australian National Greenhouse Accounts, October 2020; Australian Government Department of Industry, Science, Energy and Resources; 2020; https://www.industry.gov.au/sites/default/files/2020-10/national-greenhouse-accounts-factors-2020.pdf » National Inventory Report 2018, Volume 1; Australian Government Department of Industry, Science, Energy and Resources; 2020; https://www.industry.gov.au/sites/default/files/2020-05/nga-national-inventory-report-2018-volume-1.pdf » World Resources Institute Greenhouse Gas Inventory Manual, Category 3: Fuel and Energy-Related Activities; https://www.wri.org/sustainability-wri/dashboard/methodology#category-3
Category 4: Upstream transportation and distribution	
Category descripti¬on	Emissions from the transportation and distribution of products purchased by the reporting company in the reporting year between a company's Tier 1 suppliers and its own operations (in vehicles & facilities not owned or controlled by the reporting company); transportation and distribution services purchased by the reporting company in the reporting year, including inbound logistics, outbound logistics (e.g. of sold products); and transportation and distribution between a company's own facilities (in vehicles & facilities not owned or controlled by the reporting company)
Calculation Status	Not material. Calculated.
Calculation Boundary	This category includes the Scope 3 emissions associated with the shipping, rail, and trucking of our purchased goods from Tier 1 suppliers by third parties. (It should be noted that natural gas used as feedstock for the chemical manufacture of ammonia is delivered via pipeline - Scope 3 emissions associated with the delivery of this raw material are reported under Category 3).
Exclusions	None.
Calculation methodology	For marine cargoes to and around Australia, RightShip – a leading maritime risk management and environmental assessment organisation, provided an accurate Scope 3 emissions estimate based on its EN16258:2012 certified methodology. For marine cargoes associated with our subsidiary Quantum fertilisers, and for road and rail freight, the 'distance-based' method as described in the Scope 3 Guidance was used: emissions were calculated by applying the appropriate emissions factor to the 'mass x distance' multiplier for each mode of transport.
Data sources	Tonnes shipped and transported by road and rail were collected from a range of sources including the IPL internal system that tracks all external spend, internal logistics support software and third party reports from logistics suppliers such as RightShip and several road transport contactors.

Scope 3 Standard Emissions Category	Scope 3 Emissions in 2020 (million tonnes CO_2e)
Category 4: Upstream transportation and distribution (cont.)	
References	» RightShip Carbon Accounting; https://www.rightship.com/products/sustainability-products/ » GHG Protocol Technical Guidance for Calculating Scope 3 Emissions (v1): Supplement to the Corporate Value Chain (Scope 3) Accounting and Reporting Standard; WRI/WBCSD; 2013; https://ghgprotocol.org/scope-3-technical-calculation-guidance » United States Environmental Protection Agency Center for Corporate Climate Leadership, Emission Factors for Greenhouse Gas Inventories (2020), Table 8 - Scope 3 Category 4: Upstream Transportation and Distribution and Category 9: Downstream Transportation and Distribution; https://www.epa.gov/sites/production/files/2020-04/ghg-emission-factors-hub.xlsx » Guidelines for Measuring and Managing CO_2 Emissions from Freight Transport Operations; European Chemical Transport Association; https://www.ecta.com/wp-content/uploads/2021/03/ECTA-CEFIC-GUIDELINE-FOR-MEASURING-AND-MANAGING-CO2-ISSUE-1.pdf
Category 5: Waste generated in operations	
Category description	Emissions from third-party disposal and treatment (in facilities not owned or controlled by the reporting company) of waste generated in the reporting company's operations in the reporting year.
Calculation Status	Not material. Calculated.
Calculation Boundary	This category includes Scope 3 emissions associated with all of the waste generated by the operations over which IPL has operational control.
Exclusions	None.
Calculation methodology	This is not a material source of Scope 3 emissions in IPL's value chain, however detailed waste data was available due to the annual collection of global, site-by-site waste tonnes for sustainability reporting from the operations over which IPL has operational control. For wastes generated by our Australian sites, the supplier-specific method was used, whereby a national waste contractor supplied waste-specific emissions factors. For wastes in Australia disposed of by other waste contractors, and for sites outside of Australia, the average-data method was used. This involves estimating emissions based on total tonnes waste going to each disposal method (e.g., landfill) multiplied by an average emission factor for each disposal method.
Data sources	Annual reports from Australian waste management provider; the internal SAI Global data base used by IPL to collect and manage data associated with monthly site reports on energy use, water use and waste; relevant emisisons factors (see references below).
References	» GHG Protocol Technical Guidance for Calculating Scope 3 Emissions (v1): Supplement to the Corporate Value Chain (Scope 3) Accounting and Reporting Standard; WRI/WBCSD; 2013; https://ghgprotocol.org/scope-3-technical-calculation-guidance » National Greenhouse Accounts Factors: Australian National Greenhouse Accounts, October 2020; Australian Government Department of Industry, Science, Energy and Resources; 2020; https://www.industry.gov.au/sites/default/files/2020-10/national-greenhouse-accounts-factors-2020.pdf
Category 6: Business Travel	
Category description	Emissions from the transportation of employees for business-related activities during the reporting year (in vehicles not owned or operated by the reporting company).
Calculation Status	Not material. Not calculated.
Explanation	This source is not considered to be material. (Hire car use in Australia is included in IPL's Scope 1 emissions reporting in order to comply with National Greenhouse and Energy Reporting legislation, and made up 0.04% of Australian Scope 1 emissions in 2020.)
Calculation Boundary	This category includes flights taken by employees for business-related activities and travel outside of Australia in vehicles not owned or operated by IPL. Emissions associated with employee travel by hire car within Australia are defined as being under IPL employee operational control under Australian National Greenhouse and Energy Reporting legislation, and are therefore calculated and reported as Scope 1 emissions.

Scope 3 Standard Emissions Category	Scope 3 Emissions in 2020 (million tonnes CO_2e)
Category 7: Employee commuting	
Category description	Emissions from the transportation of employees between their homes and their worksites during the reporting year (in vehicles not owned or operated by the reporting company).
Calculation Status	Not material. Not calculated.
Explanation	This source is not considered to be material.
Category 8: Upstream leased assets	
Category description	Emissions from the operation of assets leased by the reporting company (lessee) in the reporting year and not included in scope 1 and scope 2 reported by lessee.
Calculation Status	Not relevant.
Explanation	IPL has very few upstream leased assets. In Australia, where properties are leased and electricity use is included in the lease (rather than invoiced directly to IPL) an estimate of electricity use is made in accordance with the National Greenhouse and Energy Reporting legislation, ensuring that this energy use is included in IPL's Scope 2 emissions.
Category 9: Downstream transportation and distribution	
Category description	Emissions from transportation and distribution of products sold by the reporting company in the reporting year between the reporting company's operations and the end consumer (if not paid for by the reporting company), including retail and storage (in vehicles and facilities not owned or controlled by the reporting company).
Calculation Status	Not material. Calculated.
Calculation Boundary	This category includes emissions associated with the transport of products sold by IPL in vehicles not owned or controlled by IPL. Due to the nature of shipping, in which a single voyage may include delivery of a supplier's product to a port for unloading to an IPL facility, then also load product manufactured by IPL for distribution to ports further along the voyage in addition to purchased product, Category 9 emissions are included in Category 4 calculations.
Exclusions	» Emissions associated with third party road delivery of fertilisers (from ports and IPL distribution facilities to third party distributors and farming customers) have not been included due to unavailability of data. » Emissions associated with storage at third party distributors have not been included due unavailability of data.
Category 10: Processing of sold products	
Category description	Emissions from the processing of intermediate products sold in the reporting year by downstream companies (e.g. manufacturers) subsequent to sale by the reporting company
Calculation Status	Not material. Not calculated.
Explanation	IPL primarily manufactures and supplies fertilisers and explosives which are typically consumed during their use by the customer.
Exclusions	» IPL sells some industrial chemicals which may be used in the manufacture of other products, however data has not been obtained to calculate any emissions which may arise if, and where, this occurs. » IPL sells approximately 27% of its manufactured ammonia for 'industrial use'. This may be used in the manufacture of other products, however data has not been obtained to calculate any emissions which may arise if, and where, this occurs.
Category 11: Use of sold products	
Category description	Emissions from the end use of goods and services sold by the reporting company in the reporting year.
Calculation Status	Material. Calculated.
Calculation Boundary	This category includes the calculation of Scope 3 emissions associated with the end use of fertilisers, explosives and industrial chemicals sold by IPL, whether the end user is a direct customer or, in the case of some fertilisers, the customer of a third party distributor. This category is a material source of emissions in IPL's value chain.

Scope 3 Standard Emissions Category	Scope 3 Emissions in 2020 (million tonnes CO_2e)
Category 11: Use of sold products (cont.)	
Exclusions	IPL sells some industrial chemicals which have not been included, as their downstream uses, and the emissions factors associated with these, are unavailable. These emissions are not considered to be material and are estimated to be less than 1% of IPL's Scope 3 emissions.
Calculation methodology	The scope 3 emissions associated with customer use of IPL's products are Direct Use-Phase Emissions: products that contain or form greenhouse gases that are emitted during use, as defined in the Scope 3 Guidance. Tonnes sold of each product were obtained and a product specific Scope 3 emissions factor was applied (see 'References' below).
Data sources	Tonnes sold are sourced from the IPL internal system that tracks IPL's sales. Fertiliser application volumes are estimated by end market and geography, based on IPL sales data.
References	» GHG Protocol Technical Guidance for Calculating Scope 3 Emissions (v1): Supplement to the Corporate Value Chain (Scope 3) Accounting and Reporting Standard; WRI/WBCSD; 2013; https://ghgprotocol.org/scope-3-technical-calculation-guidance » National Inventory Report 2018, Volume 1; Australian Government Department of Industry, Science, Energy & Resources; 2020; https://www.industry.gov.au/sites/default/files/2020-05/nga-national-inventory-report-2018-volume-1.pdf » 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 4: Agriculture, Forestry and Other Land Use, Chapter 11: N_2O Emissions From Managed Soils, and CO_2 Emissions From Lime And Urea Application; https://www.ipcc-nggip.iges.or.jp/public/2019rf/pdf/4_Volume4/19R_V4_Ch11_Soils_N2O_CO2.pdf » LCI data for the calculation tool Feedprint for greenhouse gas emissions of feed production and utilization: GHG Emissions of N, P and K fertilizer production, Blonk Consultants 2012; https://www.blonkconsultants.nl/wp-content/uploads/2016/06/fertilizer_production-D03.pdf
Category 12: End-of-life treatment of sold products	
Category description	Emissions from the waste disposal and treatment of products sold by the reporting company in the reporting year at the end of their life.
Calculation Status	Not relevant.
Explanation	IPL manufactures and sells fertilisers and explosives which are typically consumed during their use by the customer.
Category 13: Downstream leased assets	
Category description	Emissions from the operation of assets owned by the reporting company (lessor) and leased to other entities in the reporting year, not included in Scope 1 and Scope 2 reported by lessor.
Calculation Status	Not relevant.
Explanation	Leasing of downstream assets is not a material part of IPL's business.
Category 14: Franchises	
Category description	Emissions from the operation of franchises in the reporting year, not included in Scope 1 & 2 reported by franchisor.
Calculation Status	Not relevant.
Explanation	IPL does not have franchised operations.
Category 15: Investment	
Category description	Emissions associated with the operation of the reporting company's investments (including equity and debt investments and project finance) in the reporting year, not already included in scope 1 or scope 2.

Scope 3 Standard Emissions Category	Scope 3 Emissions in 2020 (million tonnes CO_2e)
Calculation Status	Not material. Calculated.
Calculation Boundary	This category includes the scope 1 and 2 emissions (on an equity basis) from our assets that are owned as a joint venture but not operated by IPL. (The Scope 3 Standard categorises this as a downstream category as the provision of capital or financing is framed as a service provided by IPL.) IPL's non-operated joint ventures relevant to the 2020 reporting year are described on page 105 the IPL 2020 Annual Report.
Exclusions	Only joint ventures engaged in emissions intensive manufacturing activities have been included in the 2018, 2019 and 2020 calculation of emissions from this category.
Calculation methodology	The accounting approach for 'equity investments' as described in the Scope 3 Guidance is used to calculate these emissions.
Data sources	Estimates of scope 1 and 2 emissions for each investment (which form the basis of scope 3 emissions in IPL's value chain) are sourced from publicly available information, including the most recently available government-published data from mandatory or voluntary reporting programs in place in the country, state or region; the most recent reports published by the operating entity e.g. sustainability and annual reports; and other sources if identified through desktop research.
References	» GHG Protocol Technical Guidance for Calculating Scope 3 Emissions (v1): Supplement to the Corporate Value Chain (Scope 3) Accounting and Reporting Standard; WRI/WBCSD; 2013; https://ghgprotocol.org/scope-3-technical-calculation-guidance » 2019 IPL Annual Report; https://investors.incitecpivot.com.au/static-files/2eddba76-2047-4d13-ae66-60a9315d4f12 » 2020 IPL Annual Report; https://investors.incitecpivot.com.au/static-files/ae193d4c-d2c5-4bf8-a37e-f570c0e19c0d

FORWARD LOOKING STATEMENTS

This Report contains forward looking statements, including, but not limited to: statements regarding trends in commodity prices and supply and demand for commodities; plans, strategies and objectives of management; assumed long-term scenarios; potential global responses to climate change; regulatory and policy developments; the development of certain technologies; the potential effect of possible future events on IPL and the plans, strategies and objectives of management. Forward looking statements may be identified by the use of terminology, including, but not limited to, 'intend', 'aim', 'project', 'see', 'anticipate', 'expect', 'estimate', 'plan', 'objective', 'believe', 'expect', 'may', 'should', 'will', 'would', 'continue' or similar words. These statements discuss future expectations concerning the results of assets or financial conditions, or provide other forward looking information. In particular, such statements may include, but are not limited to, statements that relate to the purpose, goals, targets, plans and objectives of IPL, assumptions made in energy, and other forms of environmental transition scenarios, as well as statements about how we run our business. The forward looking statements in this Report are based on the information available as at the date of this Report and/or the date of the Group's planning processes or scenario analysis processes.

There are inherent limitations with the use of forward looking statements and in particular where they relate to scenario analysis, and it is difficult to predict which, if any, of the scenarios might eventuate. Scenarios do not constitute definitive outcomes for IPL. Scenario analysis relies on a range of assumptions that may or may not be, or prove to be, correct and may or may not eventuate, and scenarios may be impacted by additional factors to the assumptions disclosed. Additionally, forward looking statements are not guarantees or predictions of future performance, and involve known and unknown risks, uncertainties and other factors, many of which are beyond our control, and which may cause actual results to differ materially from those expressed in the statements contained in this Report.

IPL cautions against reliance on any forward looking statements or guidance and to the extent permissible by law, disclaims all liability to any third party who uses or relies on any forward looking statements or guidance in this report. For example, future decarbonisation opportunities identified and described in this Report will be based, in part, upon the availability and reliability of alternative and developing technologies, and incentives and support from government bodies and the industry, which may significantly vary to current estimates and forecasts. These variations, if materially adverse, may affect the timing or the feasibility of the development of a particular technology or project, and their subsequent adoption and use by IPL or the broader industry more generally.

Except as required by applicable regulations or by law, IPL does not undertake any obligation to publicly update or review any forward looking statements, whether as a result of new information or future events. Forward looking statements are current only as at the earlier of the date of this Report or the date the planning process assumptions or scenario analysis assumptions were adopted, as relevant and applicable. Past performance cannot be relied on as a guide to future performance.

The views expressed in this Report contain information that has been derived from publicly available sources that have not been independently verified. No representation or warranty is made as to the accuracy, completeness or reliability of the information. This Report should not be relied upon as a recommendation or forecast by IPL.

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