



AUSTRALIAN PORK LIMITED

National Environmental Sustainability Strategy for the Pork Industry

2010-2015



PROJECT TITLE:

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Environmentally friendly pork, the meat of the future...

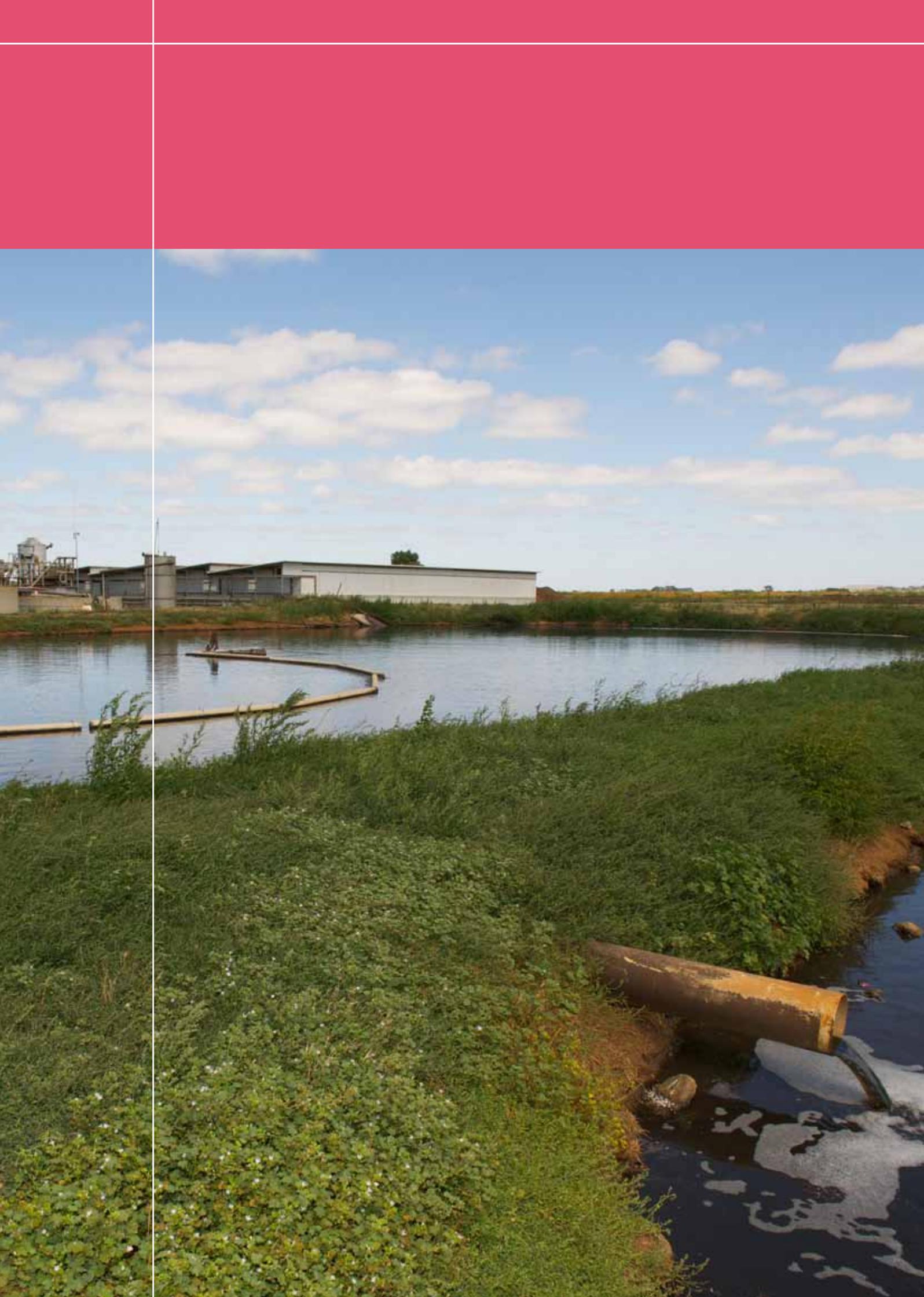


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Strategy Overview

The Australian pork industry is dedicated to producing environmentally sustainable pork, which involves fostering a long-term competitive pork industry in Australia while maintaining our natural resources and the environment for future generations.

The Australian pork industry is so much more than just a commodity producer. Pork has the potential to be the most emission friendly animal protein source of the future.

As well as producing a safe and tasty protein, the pork industry is also a responsible player in managing its environmental impact, but in ways that constantly underpin value in the final product. By becoming better environmental stewards, the pork industry can create new sources of value and economic opportunities for everyone in the supply chain.

Australian Pork Limited (APL) has a vision of a sustainable, competitive Australian pork industry that actively integrates sound environmental practices throughout the entire supply chain, from the piggeries to the abattoirs/boning rooms and processors ('processors').

The main environmental opportunities and challenges facing the Australian pork industry include:

- **resources and services**—water usage, energy usage, transport and feed grain supply
- **soil and catchment health**—optimising reuse of by-product nutrients, healthy soils and enhancing catchment health
- **climate change**—effectively managing and utilising gaseous emissions, renewable energy and climate variability and drought, and
- **community interactions**—amenity impacts, community perception of industry and regulatory environment.

APL's *National Environmental Sustainability Strategy for the Pork Industry 2010–2015* is a detailed plan for realising new opportunities while addressing environmental challenges. Its purpose is to drive the integration of sound environmental practices throughout the Australian pork supply chain through the provision of programs and services that will enable the industry:

- to be environmentally sustainable
- to demonstrate that it is environmentally sustainable, and
- to use this achievement to meet future consumer expectations for environmentally sustainably produced food, therefore, supporting a competitive and financially viable industry.



The following strategies will be used to achieve the vision:

- resources and services
 - investigation and measurement of the usage of key inputs
 - identification of opportunities for improvement, reducing inputs, costs, resources and value-adding, and
 - promotion of these opportunities to industry.
- soil and catchment health
 - investigation and promotion of environmentally sustainable by-product reuse practices within the Australian industry, and
 - promotion of the benefits of pork industry by-products as a fertiliser and soil conditioner to the broader community.
- climate change
 - identification of cost-effective ways that the Australian pork industry can respond to climate change, and
 - promotion of these tools to industry.
- community interactions
 - promotion of sustainability, sustainable practices and natural resource management
 - identification of community perceptions regarding the environmental performance of the Australian pork industry, and
 - fostering the industry-wide uptake of best management practices (BMPs) to address these concerns.

When APL's *National Environmental Sustainability Strategy for the Pork Industry 2010–2015* is implemented, targeted key programs will be developed for each of these strategies. Desirable, broad outcomes have been outlined and key performance indicators will be developed to measure the success of the key programs.

1.0 Introduction

APL aspires to have an Australian pork industry that is dedicated to producing environmentally sustainable pork in a way that creates value for the industry. This renewed focus on maintaining our natural resources and the environment can foster a long-term competitive pork industry in Australia.

Historically, the pork industry has approached environmental sustainability proactively and has a record of significant investments into research and innovation in this area. Extending this approach is increasingly important as community interest in environmental issues and perceptions of its value to consumer choice continues to grow. Consumers have an appreciation for how their food is produced and whether it is produced sustainably, and at a competitive price.

APL's *National Environmental Sustainability Strategy for the Pork Industry 2010–2015* is a detailed plan for ensuring that the Australian pork industry continues its proactive approach to sound environmental management, building an environmentally sustainable industry that creates value-adding opportunities, as Australian pork is promoted on this basis.

The pork industry's key stakeholders are:

- Pig producers
- Pork processors and distributors
- Feedstuff producers
- Industry service providers
- Government regulatory bodies
- Research and educational institutions
- Pork retailers, food service businesses and butchers, and
- Pork product consumers.

For the pork industry, an **environmentally friendly product** is one produced in an environmentally sustainable way. **Environmentally sustainable** is defined by the pork industry as: meeting current production needs without compromising the ability of future generations to meet their needs by:

- reducing resource inputs
- appropriately managing by-products and emissions, and
- preventing adverse impacts to natural resources and amenity.

Environmental footprint is defined as the burden or impact that pork production, from the piggery through to the processing works docking gate, has on resource usage, natural systems and the community. It could be measured by energy usage, water usage, greenhouse gas emissions, land use, acidification, eutrophication, salinity and amenity impacts.

1.1 The Australian Pork Industry and the Environment

The Australian pork industry is an important producer of domestic and export meat products. The pork supply chain, including the pig production and the abattoirs/ boning rooms and processing ('processing') sectors, seeks to proactively capitalise on related opportunities and address environmental challenges.

These environmental opportunities and challenges interact with the economic, social, policy and regulatory settings in which the industry operates.

The Australian pork industry faces ongoing economic challenges through rising production costs and low returns for producers, reducing the competitiveness of the industry both domestically and internationally.

For example, Australia is a significant importer of frozen pork legs from Canada and the United States and frozen pork middles from Denmark. These imports are not always required to meet the same environmental standards as Australian pork, further eroding the industry's competitiveness.

More significantly, these challenges reduce the industry's *adaptive capacity* to respond to emerging sustainability challenges by limiting its ability to invest into (additional) environmental management measures.

However, the pork industry acknowledges the importance of achieving environmental sustainability and of key stakeholders recognising this achievement in ensuring the long-term future of the industry. The challenge for the industry is to achieve this interaction in a way that fits with industry targets for productivity and profitability.

While the pork industry supply chain is defined in APL's *National Environmental Sustainability Strategy for the Pork Industry 2010–2015* as pig production and processing, there is a range of key stakeholders beyond the farm and processing plant gates. These stakeholders also contribute to meeting the environmental goals of the industry.

*APL believes the Australian pork industry can offer consumers **environmentally friendly** goods, produced with minimal impacts on the environment.*

There are four reasons for this:

- i. **Australian pork has a small environmental footprint per unit of production.** Because pigs and pork processing are predominantly produced and processed in well-controlled, intensive systems, the industry can achieve good control over resource inputs, waste and emissions production and impacts to natural resources and amenity.
- ii. **Australian piggeries play an important role in the broader waste cycle by using agricultural and food processing by-products as feedstuffs.** Low value products and by-products can be beneficially reused, which avoids these becoming wastes for disposal. A major constituent of pig feed is grain that has fallen below milling standards. Agricultural and food processing wastes like whey, brewer's yeast, tallow, milling by-products and oil seed pressings are commonly fed. Some

piggeries also utilise food processing wastes that meet the relevant regulatory requirements. The pig industry is well suited to fill this role because:

- Australian piggeries are located close enough to many agricultural and food processing facilities to make reuse of by-products economically viable.
- Feed systems used by Australian piggeries can efficiently handle these by-products.
- Pigs can safely consume meat meals and tallow that cannot be fed to ruminants.
- Pigs are highly efficient at converting by-product feedstuffs into valuable meat.

- iii. **Australian pig producers and pork processors can operate with low direct impact to the environment and amenity.** A life cycle assessment (LCA) study covering two Australian pork supply chains was completed in 2009¹. It identified that water and energy usage and greenhouse gas (GHG) emission rates from the supply chains studied were favourable compared to other studies in the literature, though it is important to note that the results could not be considered an ‘Australian average’ because of the narrow scope of the project. The study identified that supply chains incorporating deep litter housing had significantly lower GHG emission rates than those with only conventional housing. However, it is possible to significantly reduce GHG emissions from conventional systems by covering ponds and flaring the gases. Further studies in the future that investigate more supply chains and a number of other mitigation methods would help pork producers to further reduce GHG emissions. APL’s *National Environmental Guidelines for Piggeries (2nd Edition, 2010)* clearly identify the elements of siting, design and management needed to prevent direct environmental and amenity impacts from piggeries. The National Saleyards Quality Assurance (NSQA) Program² provides broad environmental standards in this context. AUS-MEAT accreditation standards provide requirements for the processing sector.³
- iv. **Pigs are naturally low emitters of greenhouse gases.** Most of the greenhouse gases produced by piggeries are emitted from effluent and manure. As a result, they are easily controlled and may even be used to generate green energy for the piggery, processor or the community. *Based on the findings of the Australian pork supply chains Life Cycle Assessment (LCA), pork has the potential to be the most greenhouse friendly animal protein source of the future.*

1.2 The Importance of Environmental Stewardship

Since the early 1980s, community interest in environmental issues and protection of Australia’s natural resources has grown at an increasing rate. This heightened interest has led to close community scrutiny of the environmental performance of industries and individual businesses. The pork industry can capture this heightened interest by recognising that environmental sustainability can be a practical area to improve the value proposition of Australian pork in the minds of everyday consumers.

1 Weidemann, S., McGahan, E. and Grist, S. 2009 “Energy, Water and Carbon Footprinting for two Australian Pork Supply Chains”, Australian Pork Ltd, Deakin.

2 www.ausmeat.com.au/auditing--accreditation/sale-yards.aspx

3 [www.ausmeat.com.au/industry-standards/national-accreditation-standards-\(nas\).aspx](http://www.ausmeat.com.au/industry-standards/national-accreditation-standards-(nas).aspx)



Implementing a program of continuous environmental sustainability improvement into day-to-day business operations makes good business sense. The pork industry can continually improve its environmental performance in a way that ensures the long-term viability of the Australian pork industry. From this platform, the pork industry can promote its sustainability, and particularly its environmental achievements, to the wider Australian community. Rather than being just ‘another thing to do’, environmental sustainability is an over-arching concept that involves doing it better and more efficiently to minimise the impact on the environment and/or improve the environment. Integrating this business philosophy of holistic continuous improvement improves long-term competitiveness.

APL is actively supporting this focus on environmental stewardship. Improving the long-term environmental performance of the Australian pork industry is a major priority for APL⁴ and is a key program in the *APL Strategic Plan 2010–2015*. Through its research and innovation activities, APL has always fostered the identification and adoption of best management practices (BMPs) and the integration of sustainability principles into all business operations throughout the Australian pork industry.

To that end, APL has developed:

- the *National Environmental Guidelines for Piggeries (2nd edition, 2010)* to provide a consistent environmental regulatory approach that can be adopted across the states, provide a mechanism for influencing future regulatory changes, provide industry with a framework for managing key environmental issues and to demonstrate the industry’s commitment to environmental sustainability
- EnviroCheck, which is a tool for assessing the performance of individual piggeries against the *National Environmental Guidelines for Piggeries (2nd edition, 2010)*
- an Environmental Risk Assessment tool
- an Environmental Management Plan template, and
- the Environmentally Sustainable Piggeries Environmental Management System.

The Australian pork industry faces a range of key environmental sustainability challenges, involving:

- availability and use of land, water, energy and efficient transport
- security of feed grain supply for piggeries
- sustainable reuse of by-product nutrients to enhance soils and catchment health
- carbon abatement—effectively managing gaseous emissions
- climate change—managing for the expected climate variability and drought
- environmental regulation, and
- community interactions—amenity impacts and community perception of industry.

The environmental performance of industries and businesses has been given new prominence with the Government’s commitment to introduce a carbon price. APL’s *National Environmental Sustainability Strategy for the Pork Industry 2010–2015* recognises

4 APL is a producer-owned organisation that is unique to rural industry service body for the Australian pork industry. It delivers integrated services—marketing; research and innovation; and policy—to enhance the viability and sustainability of Australian pork production.

the link between industry performance in environmental stewardship and the related value-adding opportunities borne from an emissions trading scheme or an alternative mechanism for a carbon price.

Under any carbon price mechanism, the agricultural sector will still incur higher production costs due to increased fuel, grain and energy costs. However, environmental sustainability does not present only challenges; it also creates business opportunities. There is a need to manage environmental sustainability challenges and community and regulatory relationships, whilst also building opportunities to create value, enhance pork's competitiveness and maximise growth opportunities for the Australian pork industry.

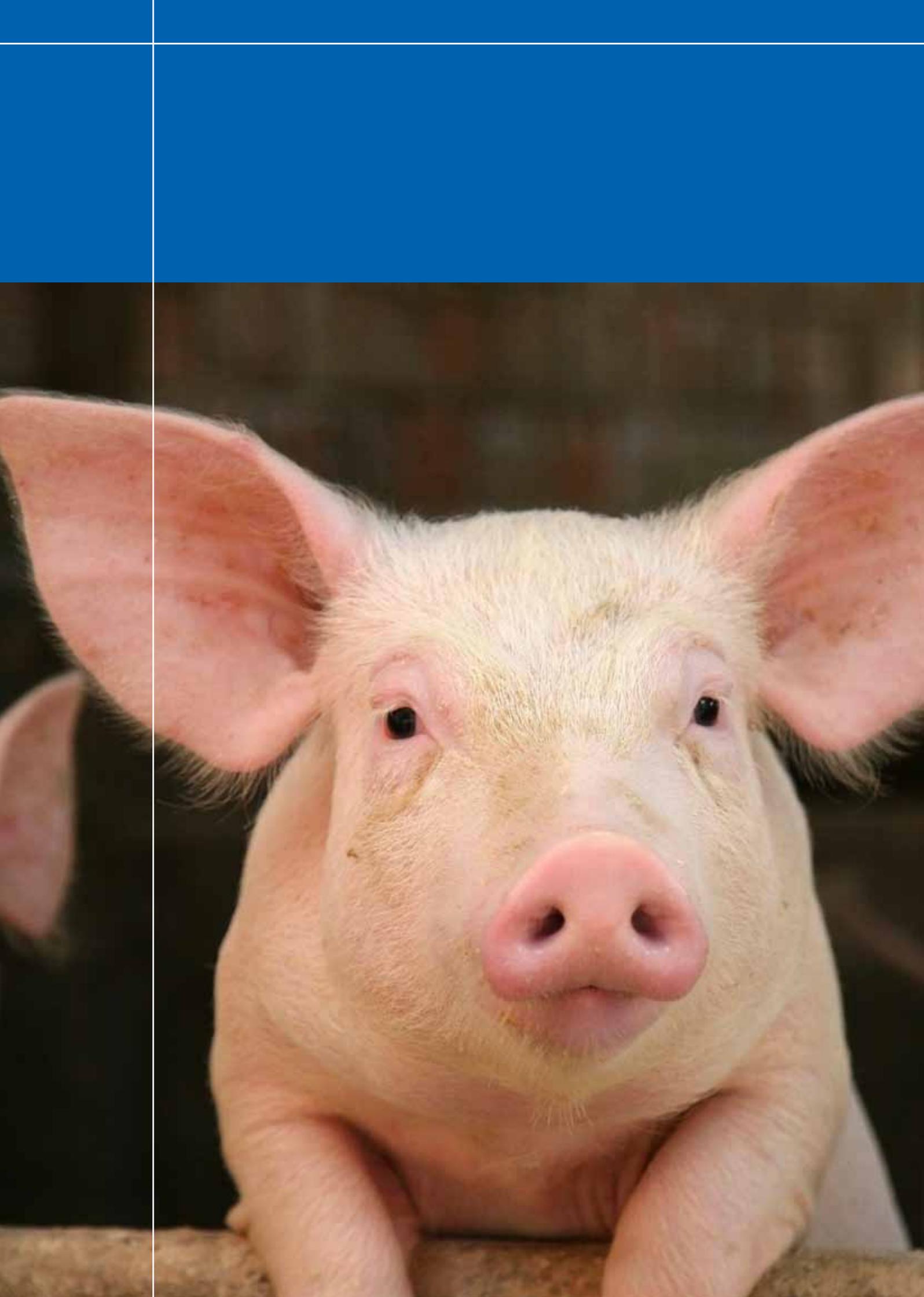
APL has an important role to play in measuring the Australian pork industries environmental performance—fostering ongoing improvement in environmental management, and promoting this accomplishment to position Australian pork as an environmentally friendly meat in the minds of consumers and regulators.

1.3 Why have a Pork Industry Environmental Strategy?

There are seven main reasons why APL has developed the *National Environmental Sustainability Strategy for the Pork Industry 2010–2015*. These are:

1. To enable and foster the industry-wide adoption of best practice in environmental management.
2. To maintain access to the natural resources needed to produce pork, most importantly water and land.
3. To enable the industry to address new and on-going challenges and opportunities through coordinated research, development and extension. This will be driven by strategic policy development towards planned, achievable performance targets and outcomes.
4. To build partnerships between different sectors of the pork supply chain, and develop joint projects that will assist producers and processors meet their productivity objectives whilst reducing their environmental footprint.
5. To build consumer and community trust that Australian pork is produced in an environmentally sustainable way.
6. To reduce the environmental regulatory burden on the Australian pork supply chain, by using evidence-based environmental performance monitoring to demonstrate to the community and regulators that the pork industry consists of environmentally responsible operations.
7. Alignment with government policy, as pig producers and pork processors face increasing environmental regulation.

APL's National Environmental Sustainability Strategy for the Pork Industry 2010–2015 builds on previous APL environmental strategies and current pork industry BMPs. It provides a five-year plan for fostering continuous improvement in environmental management throughout the Australian pork industry; finding solutions to environmental challenges; and measuring and promoting the industry's achievements in this area to the wider community and to regulators.



2.0 Key Environmental Challenges and Opportunities

2.1 Introduction

There is a wide range of environmental challenges facing the Australian pork industry, and at the same time, there are some key opportunities to enhance environmental performance whilst maintaining or improving productivity. By taking advantage of opportunities and making environmental gains on-farm and in the processing sector, the industry will also be contributing to improved environmental management at the catchment and nation-wide level.

Environmental impacts rarely operate in isolation. This can be seen at the farm level, where most environmental impacts can be traced to by-product management and reuse. As an example, nitrogen is fed to pigs in the form of protein for pig growth, and some of this nitrogen is excreted. This nitrogen is a valuable nutrient for pasture or crop production if it can be managed well. If not, it may contribute to atmospheric acidification, global warming, soil health decline (acidification) and changes in water quality through nitrate leaching and runoff. By targeting challenges at the source, the industry can improve performance at many levels at the same time to provide wins for producers and the environment. For this reason, APL's *National Environmental Sustainability Strategy for the Pork Industry 2010–2015* takes a **holistic approach** to environmental management, targeting opportunities that will improve performance across a range of inter-related issues.

Significant environmental challenges and opportunities facing the industry lie in the following areas:

- resources and services
- soil and catchment health
- climate change, and
- community interactions.

A supply chain approach to each of these areas has been adopted throughout APL's *National Environmental Sustainability Strategy for the Pork Industry 2010–2015*, to allow both piggeries and processors to recognise their role in addressing environmental challenges and contributing to environmental performance gains. However, it is recognised that piggeries and processors have different challenges and needs when it comes to research; development and extension; and policy services. APL proposes to work with the Australian Meat Industry Council (AMIC) and through the APL Processor Referral Group to identify opportunities for joint projects that will produce specific environmental benefits for the whole pork supply chain.

For the Australian pork industry to show that it is environmentally sustainable, and to demonstrate ongoing improvement in this area, there is a need to accumulate robust supporting data. Performance data that summarise practices, attitudes, involvement in training, contribution to catchment management groups, implementation of whole farm environmental management plans, and use of nutrient budgets for reuse areas

can be a powerful way for the industry to demonstrate its commitment to sustainability over time. However, this data can also identify areas where further improvements could be made and provide direction for future research and training. Feedback from pork industry consultation confirmed the importance of benchmarking.

2.2 Resources and Services

Productivity gains can be achieved by more efficiently using inputs like water, energy, transport and feed. This improves profitability and is a powerful way to optimise the environmental footprint.

2.2.1 Water Usage

Australia has the largest and most regulated water market in the world. An entitlement, or water license, gives the owner an ongoing right to a share of water from a river system or an aquifer. However, the amount that can be accessed depends on water availability. The current water crisis throughout the Murray Darling catchment highlights the need for efficient and responsible water use. The effects of climate change may also have further implications for future supply.

The pork industry needs a reliable supply of good quality water to operate. Piggeries need water for drinking, cleaning and cooling pigs. The water usage of a piggery depends on its size and the type of production system. An intensive indoor piggery typically uses considerably more water for cleaning and cooling than a deep litter system. However, water use reductions can be achieved in these piggeries through improved shed design, installation of low-waste drinkers and reuse of treated effluent for flushing effluent channels.

Water is used by pork processors for general processing, equipment cleaning, operating utilities like boilers, cooling towers and pumps and for ancillary uses such as toilets and washing facilities. Processing applications include washing raw ingredients, rinsing, blanching, cooling, cooking, conveying and using water as an ingredient in food products. Optimising water use without compromising processing or strict food safety standards may produce considerable savings. Savings can be made by installing water efficient equipment, reducing leakages and adopting water efficient processing operations.

Improvements in water efficiency reduce both production costs and the environmental footprint of businesses. Some improvements are easy to achieve. Measuring water usage throughout piggeries and processing plants helps in identifying areas where significant efficiencies are possible.

2.2.2 Energy Usage

The low-cost of coal-based energy has meant that piggery and processing plant operators have often not focussed on improving energy efficiency. However, with rising community awareness of global warming, there is mounting interest in the type/s and amount of energy used by Australian businesses. The introduction of an emissions trading scheme or a carbon price would drive up the price for energy, providing an incentive for improvements in energy efficiency.

Piggeries use energy to provide lighting, operate office facilities, process and deliver feed and drive pumps. It is a crucial input for meat processing with significant quantities needed to operate chillers, freezers and cookers. Hot water is also needed to sterilise plant and equipment for strict food hygiene standards.

Energy is an area where easy savings are possible and should be seriously considered by the industry. Improving energy efficiency reduces the environmental footprint. Measurement of energy usage throughout piggeries and processing plants is necessary to identify where savings are possible.

2.2.3 Transport

Transport is an integral component of the Australian pork supply chain. It is needed to bring feed and pigs to piggeries; move pigs to saleyards and/or processing plants; remove by-products off-farm; transfer pork products; and remove by-products/biosolids from processing plants. Recent increases in fuel prices have significantly increased the Australian pork industry's transport costs. Further fuel price increases are expected when a carbon price is introduced. This will put the competitiveness of Australia's pork industry at risk, because Australia's major competitors—Canada, the United States and the EU—have no stated intentions of introducing an emissions trading scheme or an equivalent carbon price that would similarly increase the cost of production for their respective pig industries. Hence, there is an incentive for the pork industry to seek opportunities to improve supply chain efficiency in the transport area.

2.2.4 Feed Grain Efficiency

Australia has experienced severe drought conditions since 2003. Available grain stocks are at an all-time low, while world market prices for wheat, soybean and corn reached all-time highs in September 2008. Drought conditions across Australia have highlighted the importance of the security of feedgrain supply to the livestock industries. The effects of climate change may increase the duration and land area affected by drought in the future. Global demand for grain remains very strong, driven by growing demand for food in emerging economies (such as India and China) and biofuel production encouraged by Australian and international government policies.

Optimising dietary energy yield, reducing feed wastage, improving feed efficiency and utilising low-protein diets may effectively reduce carbon emissions from piggeries, while also limiting the impact of a carbon price on the industry.⁵

To improve economic sustainability and competitiveness domestically and globally, the Australian pork industry requires access to feed grain at world competitive prices. Using government and participants' funds, the Pork Cooperative Research Centre (CRC) identifies, contracts and manages research projects to, *"...enhance the international competitiveness of the Australian pork industry by providing and adopting new and novel technologies that reduce feed costs, improve herd feed conversion efficiency and increase the range and functionality of pork products."*⁶

The outcomes are delivered through new knowledge, products and services to ensure feed security.

5 Van Barnevald, .R.J. (2009), Implementation of a carbon pollution reduction scheme— implications for raw material use and nutritional management of pigs in Australia. *Recent Advances in Animal Nutrition—Australia*, 17: 19-26

6 Pork Cooperative Research Centre, (2010), About us, [Online], Last Accessed 2 February 2010: http://porkcrc.com.au/html/about_us.html

2.3 Soil and Catchment Health

Piggeries and processors need land to:

- site their operations
- manage by-products
- reuse treated by-products, and
- provide separation distances to sensitive land uses.

Some piggery and pork processing by-products can be rendered into protein meals (mortalities, offal). However, many are best reused as a nutrient and carbon source for cropping systems. There are environmental challenges and also significant opportunities pertaining to this land use.

2.3.1 Optimising Reuse of By-Product Nutrients

By-product avoidance should be the priority, followed by reuse, then recycling, with disposal a last resort. Nutrients in by-products represent nutrients that pigs could not convert to meat or that processing plants did not recover as pork products. The nutrients to piggery by-products should be optimised through good pig nutrition, feeding and cleaning practices. In processing plants, nutrients to by-products can be optimised through effective and well-maintained process control and initiatives like dry cleaning, the elimination of spills and repair of leakages, and the installation of drip trays, catch baskets and drainage screens. Supply chain management and improving process design are important management measures to reduce wastes.

However, it is inevitable that significant quantities of nutrients will be present in by-products. Depending on how they are managed, they can provide additional income or cost-savings to a piggery or processing plant, or they can represent a significant cost. For processors, there are opportunities to recover nutrients by rendering some by-products (such as offal). Other pork supply chain by-products can be used as fertilisers, reducing costs if used on-farm or creating an income stream off-site. Their value can be maximised by optimising nutrient losses and applying them to meet plant needs. Many operations are failing to use their by-products to gain the full benefit of the nutrient and organic content. In particular, nitrogen volatilisation can represent a significant nutrient wastage. While effluent management tools are available (for example, MEDLI, Pig-Bal, Wastload), the sophisticated management systems used in pork production (such as APIQ) are not always extended to by-products and farm management.

There are opportunities to further research and promote BMPs for optimising reuse of nutrient by-products within the Australian pork industry and to other by-products users.

2.3.2 Healthy Soils

Piggeries and processing plants can use or sell their by-products as a valuable nutrient and carbon source for crop production. With careful management, this can significantly improve farming system productivity and soil health, as these elements are essential for plant growth. Organic carbon plays an important role in soil structure, microbial activity and health. There are opportunities to use solid by-products (in particular) on-farm or to market them as soil conditioners.

However, soil degradation can occur if by-products are over-applied or unevenly spread. In serious cases, the reuse areas become unsuitable for particular uses due to salinity, sodicity, nutrient imbalances and acidification. Over-application of nutrients increases the likelihood of soil structure issues that affect productivity and nutrient movement out of the system. This may pose a risk to groundwater, surface waters and to nearby native flora that is intolerant of elevated nutrient levels.

Soil health can be maintained or improved by following good agronomic practices, like the management measures outlined in APL's *National Environmental Guidelines for Piggeries (2nd Edition, 2010)* and other best management practices (BMPs).

2.3.3 Enhancing Catchment Health

As described in section 2.3.2, the by-products of the Australian pork industry can play an important role in building soil health. Managed well, by-products can enhance soil fertility and structure, contributing to more productive farming systems. Well-managed, structurally stable soils are less prone to soil structure issues such as erosion, which transports sediment and nutrients to waterways. However, mismanagement can lead to on and off-site impacts through nutrient leaching to groundwater, nutrient and sediment movements to surface waters, and the potential effects of nutrient movements to adjacent areas on native flora species that have a lower tolerance for nutrients.

Increasingly, piggery and processing plant by-products are being used off-site. Those paying for by-products may be more inclined to use them at agronomic rates. However, because more farmers are using by-products there is a need to promote BMPs more widely. It is in pork industries' best interests to encourage sustainable and responsible use of by-products by recipients.

2.4 Climate Change

2.4.1 Effectively Managing GHG Emissions

Australian agriculture will be significantly impacted both directly and indirectly from the effects of climate change. In response, the Australian pork industry is taking a proactive approach to continue to reduce its impact on climate change, and also the impacts of climate change on the industry.

The main challenge is reducing global warming caused by man-made emissions of GHGs, such as carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O). The livestock sector is responsible for 66 per cent of GHG emissions from agriculture in Australia, which amounted to about 16 per cent of Australia's total GHG emissions in 2006.⁷ However, the relative share of national GHG emissions (excluding deforestation) produced by pigs (0.4%) is significantly smaller than other agricultural sectors—sheep (3.4%), dairy cattle (2.7%) and beef cattle (11.2%).⁸ Most of the GHG emissions associated with pork production relate to emissions of methane from effluent ponds and nitrous oxide following spreading of by-products.

⁷ Garnaut, R 2008, The Garnaut climate change review — final report, available at: <http://www.garnaut-review.org.au/index.htm>

⁸ <http://www.climatechange.gov.au/publications/carbon-price/green-paper/carbon-price-greenpaper.aspx>

Adaption to climate change, which is already underway in pork production, is part of the solution. However, mitigation and utilisation of GHG emissions (carbon abatement) needs to be broadly adopted to address the effects of climate change in the long term. Hence, the adoption of GHG mitigation measures has serious implications for the environmental credibility of the Australian pork industry.

Agriculture has an opportunity to be involved in a price on carbon by offsetting industry emissions. In particular, for pig producers, there are opportunities pertaining to manure management and fertiliser use. However, there may be direct obligations for pork processors under a carbon price and consequently significant costs for abattoirs/boning rooms and processors. The National Carbon Offset Standard identifies opportunities for piggeries and pork processors to develop offset credits for voluntary carbon markets. These opportunities include offsets from increased soil carbon and from other land-based emissions sources. Further research is needed to identify practical, cost-effective ways that the Australian pork industry can optimise its GHG emissions and voluntary carbon offset opportunities.

The Australian Farm Institute has modelled direct and indirect impacts of the Carbon Pollution Reduction Scheme on the Australian pork industry. Under the conservative scenario, by 2030 emissions permit costs are projected to account for 5.5 per cent of the farm-gate price for pork. These costs could not be easily passed on to consumers and so would be borne by the producer. Their projections include:

- an increase in electricity prices of 28–32 per cent by 2030 and 45–51 per cent above baseline level by 2050.
- an increase in the price of petroleum and coal products of 20–22 per cent by 2050, with an increase in the gas price of 4–5 per cent above business as usual by 2050.
- by 2030 fertiliser prices will have increased 7.6–8.5 per cent above baseline level, while they will be 18.7–20.8 per cent above baseline level by 2050.
- by 2030, transportation prices will have increased by 4.6–5.3 per cent from business as usual levels, while they will be 8.7–9.9 per cent higher than baseline levels by 2050.

Australian pork producers would experience reduced profitability due to the impact of the Carbon Pollution Reduction Scheme or any carbon price on farm input costs. Hence, there is a need to identify practical ways the industry can limit its future exposure to risks associated with operating in a carbon constrained economy, while positioning it to maximise savings from energy generation and carbon credit schemes.

2.4.2 Renewable Energy

The introduction of emission trading via a Carbon Pollution Reduction Scheme or via an alternative carbon price would make renewable energy (such as bioenergy production) more attractive, however more research is required to determine how much more attractive this will be. Over 60 per cent of the GHGs from piggeries originate from manure or effluent management, and there are opportunities to produce bioenergy from these emitted GHGs. Anaerobic digestion of by-products could effectively halve the emissions from intensive piggeries and create an income stream. A track record of low GHG emissions per unit output could be used to differentiate pork products from their competitors and create niche market opportunities.

However, commercialisation of on-site bioenergy projects is currently flawed because:

- significant capital investment is needed to install a system for a small or large operation
- there is a low rate of return on investment
- there are challenges associated with selling generated power back into the grid, and
- bioenergy production on-farm was not an approved mitigation measure under the proposed Carbon Pollution Reduction Scheme, but may be an offset opportunity for producers in a voluntary carbon market.

Further research is needed to identify cost-effective ways that the Australian pork industry can convert gaseous emissions to energy. There may also be opportunities to use by-products as a nutrient source for growing non-food crops for biofuel production.

2.4.3 Climate Variability and Drought

The Bureau of Meteorology and CSIRO have identified long-term trends and predicted the challenges faced by Australian agriculture.⁹ These include a rapid increase of the area, extent and frequency of exceptionally hot years; increasing variability in rainfall patterns; an overall increase in exceptionally low rainfall years; and increasing area, extent and frequency of exceptionally low soil moisture years.

Australian pork producers are severely affected by drought; yet in the last drought, most were unable to access assistance due to Exceptional Circumstances (EC) eligibility criteria. Consequently, the pork industry has had to develop a self-help approach and greater efficiency. While drought preparedness is essential and self-reliance should be the aim of all good managers, it is essential that some form of assistance under exceptional circumstances be available as a welfare safety net.

APL has been actively monitoring the impacts of the current drought on the Australian pork industry and has been providing various mitigation strategies, particularly in the areas of feed and water management. The pork industry has made significant investments in improving on-farm drought preparedness, risk management and self-reliance. These include:

- Collaboration of APL and the Pork CRC to develop strategies and identify further research potential to enhance Australia's competitive position. The work of the Pork CRC is a medium to long-term investment in risk management to improve industry competitiveness.
- APL's membership in the Feed Grain Research & Development (R&D) Partnership established in 2006–07. This provides a forum to integrate and identify collaborative R&D initiatives across participating R&D funding agencies involved with the feed grain and livestock supply chain.
- APL's Producer Risk Management Training Program, which gives pork producers access to comprehensive risk management training.

⁹ CSIRO & BoM 2008, An assessment of the impact of climate change on the nature and frequency of exceptional climatic events, available at: http://www.daff.gov.au/agriculture-food/drought/national_review_of_drought_policy/climatic_assessment/drought-impact-report

- A specialised *Cost of Production Calculator* developed by APL in conjunction with Queensland Department of Employment, Economic Development and Innovation (DEEDI) and Intensive Agribusiness Solutions (IAS) to assist producers with the on-farm decision-making process.
- A computer based decision support system (AUSPIG) that models a herd's unique performance characteristics so that more profitable management strategies can be determined and implemented.
- A FEEDCHEQUE 'kit', developed by APL as a group-training package that contains a manual and simple tools to assist pork producers to improve their on-farm diet mixing practices, as well as maintaining the quality of mixed feed prepared on-farm in the long term.

Various recently published reports on the impact of climate change on rural industries and communities in Australia highlights the need for Government to broaden its of understanding of drought events in relation to the long-term impacts of climate change. Government drought assistance to Australian farmers must reflect the bigger picture of climate change to allow for sustainable agricultural production, and equally as important, eligibility criteria and assistance measures must be updated to reflect modern day farming practices and business structures.

2.5 Community Interactions

Positive interactions between the community and the Australian pork industry are very important. Community perceptions about the industry's environmental performance play a vital role in the regulation of the industry. They may also play a role in consumer purchasing behaviour. Hence, fostering ongoing improvement in environmental performance and the promotion of successes to the broader community is important.

2.5.1 Amenity Impacts

Amenity is the comfortable enjoyment of life and property. Most amenity complaints regarding the Australian pork industry pertain to odour, although complaints are sometimes made about nuisance or impacts from visual aesthetics, dust, flies, noise, effluent management—such as run-off or build-up, and road or traffic issues.

In some cases, inappropriate planning has led to encroachment of rural residential developments on traditional farming land. This has led to increased pressures from communities to regulate and minimise odour, even when odour levels have not changed from what 'they always were'.

Piggeries and processing plants can generate offensive odours due to processes within the piggery or plant and due to the treatment and reuse of by-products. Providing an adequate separation distance between odour sources and areas of sensitive land use can prevent odour nuisance, but it should not be a substitute for good design and management. Odour emissions can be reduced through improved design and management, which may also improve financial performance and reduce the environmental footprint. For example, measures to reduce feed wastage decrease the load of by-products for treatment and hence the potential for odour creation; but will

also reduce input costs. Other emerging technologies, like impermeable pond covers, reduce odours whilst also potentially bringing cost savings or income streams through opportunities to generate green energy.

2.5.2 Community Perception of Industry

Community perception of the environmental performance of the Australian pork industry may partly influence purchasing decisions by individuals. Piggeries and processing plants may impact positively with the community through supply of a high quality product; enhanced local employment prospects; opportunities to sell products (such as grain); and opportunities to purchase by-products that can be used as nutrient sources in cropping systems or as a feed source for the pigs. It is important to foster positive aspects and interactions. However, it is also important to identify and address negative perceptions, since these may affect consumer purchasing decisions and environmental regulation of the industry. The identification of positive and negative community perceptions is important in addressing these.

2.5.3 Regulatory Environment

Environmental regulation is necessary to achieve responsible environmental management by individuals, businesses and industry. Mitigating risk by operating in different geographical areas will become increasingly important as the Australian pork industry continues to rationalise and consolidate. However, differences in environmental processes and outcomes between states, unnecessary double regulation and interference with other regulation contribute to the regulatory burden on businesses and can significantly increase cost of compliance. Harmonisation of environmental regulation, nationally, would benefit businesses with enterprises extending across state borders.

The Productivity Commission: Annual Review of Regulatory Burdens on Business—Primary Sector in 2007 identified that the agriculture sector¹⁰:

- carries a disproportionate share of the cost of pursuing national objectives, such as meeting climate change objectives, preservation of native vegetation or improvements to water market efficiency—all of which benefit the community as a whole
- is often compensated for less than the regulatory cost impost
- is burdened by the regulations formed through popular opinion that are not risk-management or evidence-based
- is disadvantaged by regulatory differences across jurisdictions where the enterprise operates in more than one state
- is disadvantaged when regulators do not make timely interim and end-date decisions for policy development and implementation, such as environmental approvals
- faces differences in how state and council/shire administer laws
- faces overlaps and inconsistencies between jurisdictions for definitions, timing and instruments, and
- is affected by poor communication of regulations to those affected by it.

¹⁰ www.pc.gov.au/_data/assets/pdf_file/0018/74115/primarysector.pdf

Environmental regulation often does not consider whether industry BMPs and relevant management systems (for example, EMP or EMS) have been implemented, unnecessarily duplicating reporting requirements and increasing costs without reducing the environmental footprint. Mindful planning in compliance with government development regulations, and an industry co-regulation approach, can lead to improved environmental outcomes at least-cost for pork producers. Joint industry action to reduce the environmental risk of pork production also presents an opportunity for the Australian pork industry to address negative community perceptions concerning the environmental performance of the industry.

The development and release of the *National Environmental Guidelines for Piggeries in 2004* was a first step towards co-regulation. *The National Environmental Guidelines for Piggeries (2nd Edition, 2010)* clearly identify the elements of siting, design and management needed to prevent direct environmental and amenity impacts from piggeries and will be distributed to all stakeholders. However, before co-regulation can occur, regulators will need to be satisfied that the industry is capable of operating at a satisfactory level.



3.0 Industry View of Key Environmental Challenges and Opportunities

APL undertook an industry consultation to understand the environmental challenges and opportunities regarded as ‘most important’ to industry. This was conducted through discussions at the APL Climate Change Forum (March 2009) and presentations at industry roadshows (September–October 2009) and the APL Annual General Meeting (AGM) Delegates Forum (November 2009). Participants at the roadshows and the AGM were asked to nominate the top three environmental challenges. *Figure 1* provides a summary of the results.

The strongest interest was in the areas of:

- water usage
- feed grain supply
- community perception of the industry, and
- optimising reuse of by-product nutrients.

Water usage, community perception of the industry and optimising reuse of by-product nutrients is relevant to both the piggery and processing sectors. There may be opportunities for joint APL–AMIC projects to deliver supply chain benefits in these areas.

Figure 1 Most important Environmental Challenges and opportunities for the Pork Industry

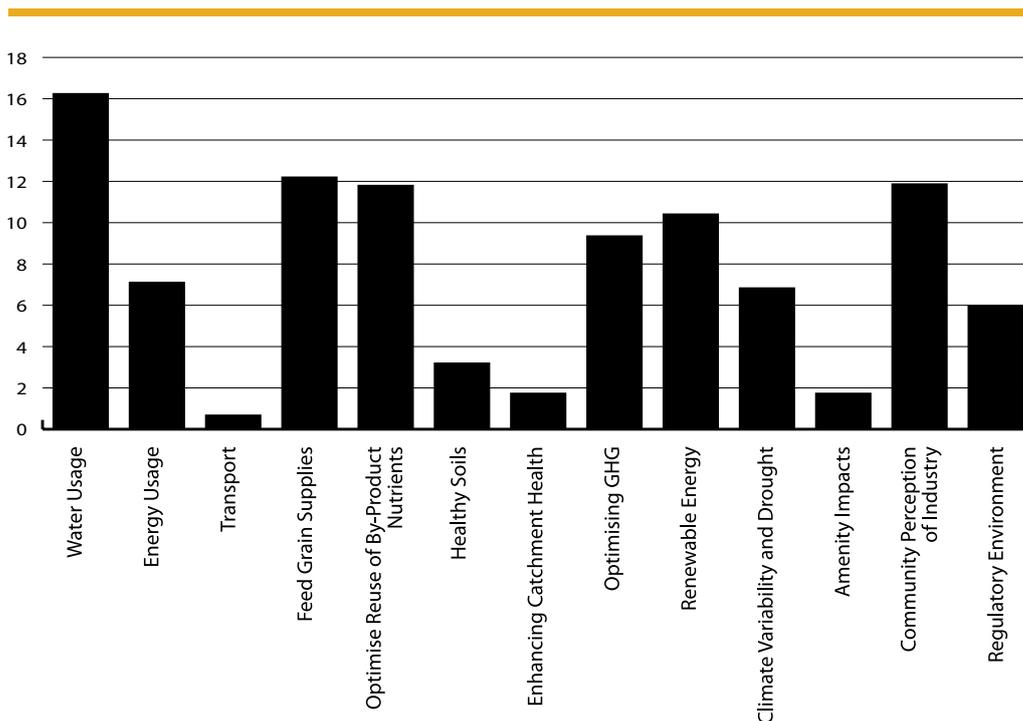
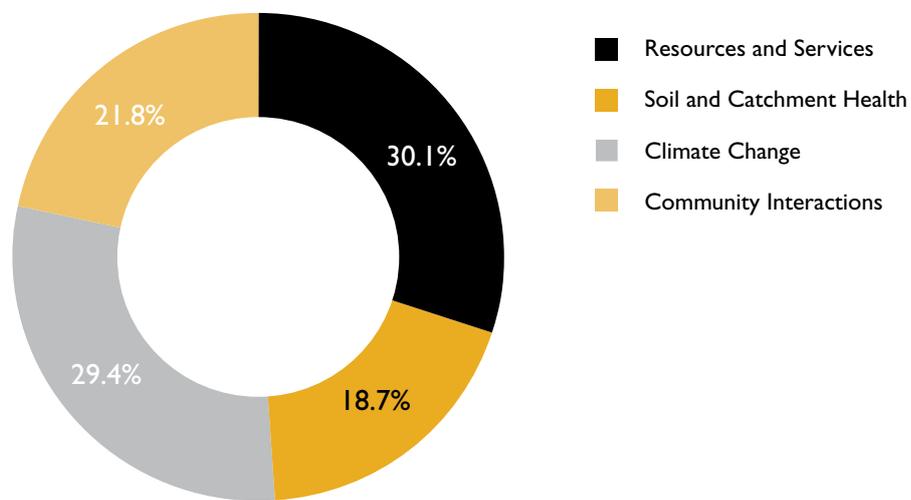


Figure 2 provides a summary of the mean number of responses per objective group from the roadshows and the AGM Delegates' Forum (for example, the sum of all responses for a given objective divided by total number of items for that objective). From this feedback, there is more interest in the resources and services and climate change areas than in the community interactions and soil and catchment categories.

Figure 2 Most important Environmental Objectives for the Pork Industry



4.0 APL's National Environmental Sustainability Strategy for the Pork Industry 2010–2015

4.1 Strategic Approach

APL has defined a comprehensive range of the industry's environmental challenges and opportunities to be addressed in APL's *National Environmental Sustainability Strategy for the Pork Industry 2010–2015*. This will maximise the rate of overall improvement in key areas by enabling integrated research, development, policy making and marketing opportunities, without overlooking issues that are important but may receive less community and media attention.

Climate change and sustainability issues are being driven both domestically and internationally via public policy, regulatory changes and community interest. Inaction by the Australian pork industry may result in climate change adaptation, mitigation and utilisation being driven by government policies that become burdens and not opportunities for the industry.

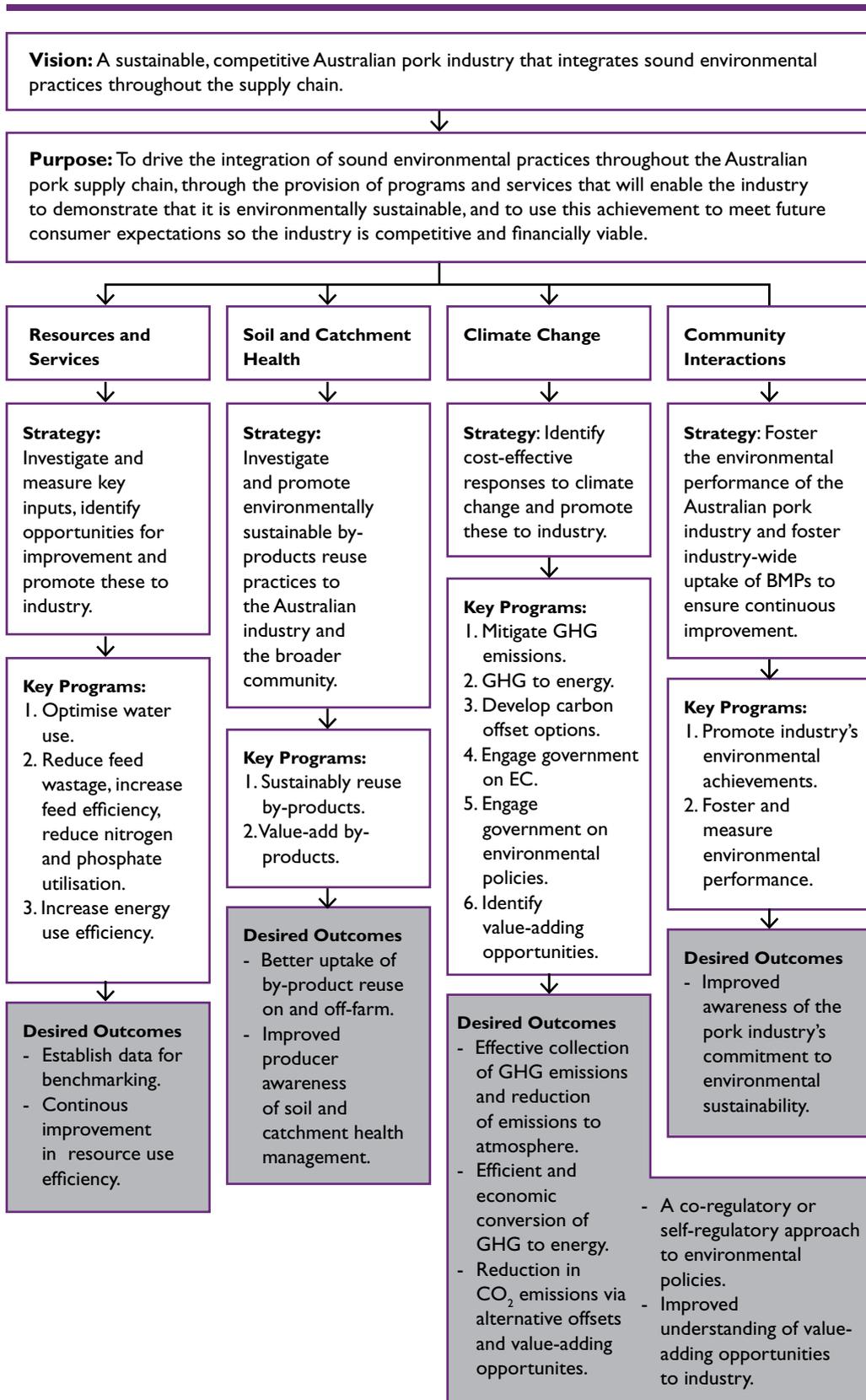
APL's *National Environmental Sustainability Strategy for the Pork Industry 2010–2015* reflects an industry need to be proactive in influencing the climate change policy environment, safeguarding its own interests and positioning the industry to meet future consumer demand for environmentally sustainable food.

The key strength to this approach comes from the integrated nature of many environmental issues, particularly at the farm level. For instance, nutrient and soil management is closely linked to GHG production, and these issues are most efficiently dealt with at the same time.

4.2 The Environmental Strategy Framework

The framework of APL's *National Environmental Sustainability Strategy for the Pork Industry 2010–2015* and the implementation strategy is summarised in *Figure 3*.

Figure 3 Format of APL's National Environmental Sustainability Strategy for the Pork Industry 2010–2015



4.3 APL's Vision for Industry

4.3.1 Vision Statement

Through APL's *National Environmental Sustainability Strategy for the Pork Industry 2010–2015*, APL has a vision for:

“A sustainable, competitive Australian pork industry that integrates sound environmental practices throughout the supply chain”.

This vision will be realised by all industry participants incorporating best practice environmental management throughout all business operations and by APL promoting achievements in this area to the broader community.

4.3.2 Purpose

The purpose of APL's *National Environmental Sustainability Strategy for the Pork Industry 2010–2015* is:

“To drive the integration of sound environmental practices throughout the Australian pork supply chain through the provision of programs and services that will enable the industry to demonstrate that it is environmentally sustainable and to use this achievement to meet future consumer expectations so the industry is competitive and financially viable”.



5.0 Strategies and Key Programs

5.1 Resources and Services

5.1.1 Strategy

Investigate and measure key inputs, identify opportunities for improvement and promote these to industry.

5.1.2 Key Programs

1. **Optimise Water Use:** Benchmark water usage throughout the Australian piggeries and processing plants, identify opportunities for improving water use efficiency to improve the environmental footprint of the pork industry and cut cost of production and promote these opportunities to industry.
2. **Reduce Feed Wastage and Increase Feed Efficiency:** Investigate and promote opportunities for piggeries to access less expensive feed (on an energy basis) and improve herd feed efficiency and sow productivity through the Pork CRC. **Note:** *This program will not be specifically pursued under this strategy because the Pork CRC, using government and participants' funds, identifies, contracts and manages research projects in this area.*
3. **Optimise Energy Use:** Measure energy usage throughout piggeries and processing plants to identify where savings are possible.

5.2 Soil and Catchment Health

5.2.1 Strategy

Investigate and promote environmentally sustainable by-products reuse practices to the Australian pork industry and the broader community.

5.2.2 Key Programs

1. **Sustainably Re-use By-products:** Identify and promote best management practices for sustainable reuse of by-products.
2. **Value-add By-products:** Identify and promote the value of by-products as fertilisers and soil conditioners.

5.3 Climate Change

5.3.1 Strategy

Identify cost-effective responses to climate change and promote these to industry.

5.3.2 Key Programs

1. **Mitigate GHG Emissions:** Develop cost-effective ways to mitigate the Australian pork industry's GHG emissions.
2. **GHG to Energy:** Develop cost-effective methods for converting gaseous emissions into energy.
3. **Develop Carbon Offset Options:** Develop cost-effective voluntary carbon offset opportunities for the Australian pork industry.
4. **Engage the Government on EC:** Liaise with the Federal Government to update its exceptional circumstances (EC) eligibility criteria and assistance measures.
5. **Engage the Government on Environmental Policies:** Liaise with the Federal Government in relation to environmental policies and obtain key funding for research and development in this area.
6. **Identify Value-adding Opportunities:** Identify opportunities and programs that value-add to pig production.

5.4 Community Interactions

5.4.1 Strategy

Foster the environmental performance of the Australian pork industry and enhance industry-wide uptake of BMPs to ensure continuous improvement.

5.4.2 Key Programs

1. **Promote Industry's Environmental Achievements:** Identify community perceptions of the Australian pork industry; promote the industry's environmental achievements to the broader community; and address negative perceptions.
2. **Foster and Measure Environmental Performance:** Foster the uptake of best management environmental practices throughout the Australian pork industry and measure performance through regular surveys.

6.0 Implementation and Continual Improvement

The strategy will be implemented through the development of key performance indicators (KPIs) for each key program.

6.1 Measuring our Success

From an industry perspective, the benefits of environmental management measures need to be scientifically defensible in terms of optimisation of the environmental footprint via co-regulation within auditable management systems.

Auditing and benchmarking are key tools for evaluating benefits from the implementation of environmental management measures. The data obtained from recurring auditing procedures can be used for ongoing industry benchmarking, which assists with identifying potential opportunities for further improvement. Benchmarking against industry best practice allows evaluation of environmental performance in order to demonstrate continuous improvement. Hence, auditing and benchmarking are key programs under this strategy.

The first survey will provide a benchmark against which future changes can be measured and allow industry to report to government departments, catchment bodies, consumers and their immediate community in which pork operations reside. It will form the basis for an Australian pork industry environmental health check.

6.2 Implementation

APL's *National Environmental Sustainability Strategy for the Pork Industry 2010–2015* complements APL's *Strategic Plan 2010–15* and will be implemented via a research, development, policy and knowledge transfer program. APL's *National Environmental Sustainability Strategy for the Pork Industry 2010–2015* will be reported against KPIs for each key program. APL will report progress against the strategy annually to the APL Board.

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