



A 'whole of life' approach to the production and use of polypropylene

LyondellBasell Australia embeds sustainable business principles and benefits from its Sustainability Covenant with EPA Victoria and PACIA.

New business opportunities and improved business processes are just some of the benefits that LyondellBasell Australia has gained through a pioneering Sustainability Covenant with the Environment Protection Authority (EPA) Victoria and the Plastics and Chemicals Industries Association (PACIA). The Covenant has enabled LyondellBasell Australia to drive sustainability principles and whole of life thinking across its extended supply chains.

"As a leading petrochemical manufacturer, our long term business requires a commitment to sustainability principles and this agreement has provided an opportunity to understand, address and improve the impacts our products and processes have on the environment." said Barry Kelly, Managing Director, LyondellBasell Australia.

It has also supported product innovation to deliver greater resource efficiency by applying life cycle approaches to the production of polypropylene.

"The Covenant provided us with direct links to expertise within PACIA and EPA, which was most beneficial. This helped guide us through the process of how to implement a life cycle project and how to engage with our customers." said Katherine Simmons, LyondellBasell Australia's Sustainability Project Manager.

"If you had asked me three years ago, I couldn't have believed that we would get this far with all the life cycle work."

Barry Kelly,
Managing Director,
LyondellBasell Australia

Part of the **LyondellBasell** family of companies, **LyondellBasell Australia** is the sole manufacturer of polypropylene in Australia with its headquarters in Melbourne, Victoria.

The polypropylene resins are manufactured in Australia at two sites, Geelong, Victoria, and Clyde, New South Wales. Both sites obtain propylene and ethylene gas feedstock from local refineries and petrochemical plants.

Polypropylene is supplied into many supply chains and customer applications including automotive and building industries, housewares and furniture, whitegoods, carpets and fibres, rigid and flexible packaging and Australian polymer banknotes.

LyondellBasell Australia signed the Sustainability Covenant with EPA and PACIA in April 2008 – the first polymer manufacturer to sign such a Covenant. The life of the Covenant was for three years.





LyondellBasell Australia
Geelong Polypropylene Plant

A Covenant to embed sustainability principles

The Sustainability Covenant was a voluntary agreement between all three participating organisations. A steering committee was established to oversee the implementation of the Covenant activities, capture learnings and quantify outcomes.

"While it was bold to publicly commit to going beyond compliance, we also saw it as a great opportunity. It gave us a great push forward and kept us focussed on our priorities over the three year timeframe," said Katherine Simmons.

Staff education and awareness, resource efficiency and supply chain interaction were major themes of LyondellBasell Australia's efforts under the Covenant.

A detailed survey of all LyondellBasell Australia's staff was conducted at the commencement of the Covenant.

"We were surprised how aware and interested in sustainability all of our people were. But we also realised that sustainability means different things to different people," said Katherine Simmons.

The survey was followed up by a series of information sessions for staff, with the emphasis on how sustainability applies directly to LyondellBasell Australia's business operations. The sessions also educated employees on the importance of sustainability principles and how to incorporate them into their working environment.

Other activities included:

- creating a sustainability statement for LyondellBasell Australia
- developing a whole-of-business sustainability action plan
- pursuing opportunities to reduce environmental and material impacts at LyondellBasell Australia's manufacturing operations, particularly energy efficiency and waste management
- boosting in-house capabilities by undertaking Life Cycle Thinking training for sales and manufacturing teams
- analysing existing and new markets to assess sustainable business growth opportunities
- seeking opportunities to promote 'whole of life' thinking to LyondellBasell Australia's supply chains, including a workshop with supply chain partners to open up dialogue
- communicating the initiatives, outcomes and benefits of the Covenant to broader audiences via presentations at Conferences, industry forums and life cycle training sessions

Furthermore, LyondellBasell Australia's commitment to 'whole-of-life' thinking established through the Covenant has stretched their goals beyond simple recycling targets. Focusing on recycling only considers the environmental impact at the 'end-of-life' and ignores the effects from manufacture and use. It is these effects which were shown to represent most of the impact on consumption of energy, water and materials.

Understanding a product's 'whole-of-life' impact

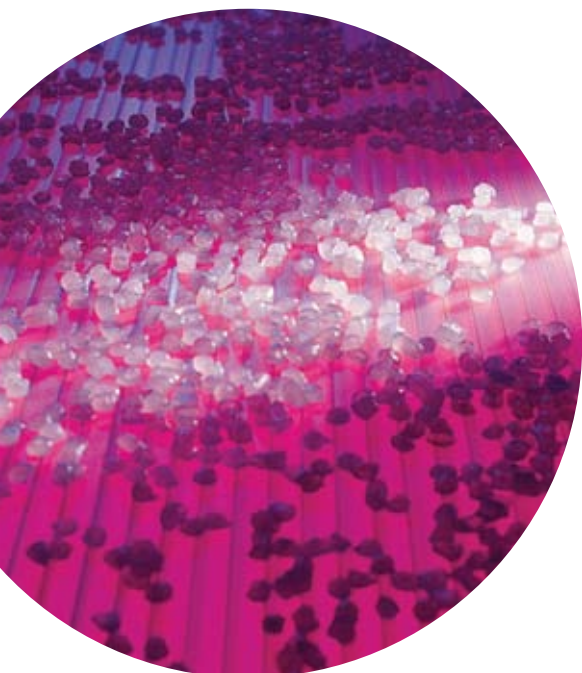
The initial focus for LyondellBasell Australia was on developing the organisation's internal capabilities including an understanding of key life cycle and mass balance principles.

A number of staff were trained in life cycle thinking and key members of the leadership team have also completed specialist life cycle assessment (LCA) training using SimaPro.

This training has been a catalyst for a range of improvement activities at the Geelong and Clyde value adding operations. LyondellBasell Australia has identified a range of opportunities to reduce consumption of energy, water and materials, and completed a detailed internal life cycle assessment of the manufacturing processes.

"Much of the value from completing this life cycle inventory was in the process itself - which increased the level of communication and our understanding of our processes, not just the final answer." said Katherine Simmons.

Polypropylene pellets
ready for customers





New Cryovac meat tray

Engaging with the supply chain

As a result of the Covenant activities, LyondellBasell Australia began to look at product development opportunities from a life cycle perspective. This has already enabled them to build new markets and new customers. *"We can help make our customer's business a better business."* said James Harrington, Rigid Packaging Technical Manager for LyondellBasell Australia.

LyondellBasell Australia now has the data and capability to educate and inform its customers about the life cycle impacts of their materials inputs. This strengthens their position in the local supply chain.

One example of customer engagement undertaken through the Sustainability Covenant resulted in the development of a new market for the business. The LyondellBasell Australia team worked with an existing customer, Cryovac, to develop an alternative meat tray made from polypropylene.

"A detailed life cycle assessment showed us that more than 80% of the embodied energy in a meat tray is in the production stages of the resin and less than 20% is in the extrusion and forming stages of our customer's processes. The selection of resin is therefore critical when considering the overall environmental impact of this particular product." said James Harrington.

By designing and selecting an alternative meat tray made from polypropylene with a reduced weight, the carbon emissions in the annual production of 170 million supermarket meat trays has been cut by 23% and water use by 71%.

"Another project has demonstrated that using polypropylene in place of the existing packaging material will minimise product degradation and extend shelf life significantly. This will avoid waste at retailers that runs into millions of dollars every year." said James Harrington.

"The close working relationships that we have developed with PACIA and EPA have shaped and influenced our thinking and understanding of life cycles and sustainable packaging solutions."

Katherine Simmons,
Sustainability Project Manager,
LyondellBasell Australia

Changing perceptions of polypropylene

The Covenant has also provided new opportunities to collaborate with the research community. Until now, the best available life cycle data relating to the production and use of polypropylene is based on European production.

By incorporating LyondellBasell Australia's internal life cycle assessment data into the AusLCI Australian database, it will become available to product designers and engineers. This will help them to make informed decisions about the long term environmental impact of material selection when specifying manufacturing and packaging solutions.

"Material selection can be based on merit and using sound science. The perception is that high recycling rates equate to lowest environmental impact, but our life cycle assessment data show that this is not always the case." said James Harrington.

Many of the activities as a result of the Covenant have been successful in changing the perception of the use of polypropylene.

"The pilot projects completed in the past few years will be a great template for future projects. They clearly demonstrated the use of life cycle thinking and benefits from the use of a new and improved packaging design, which reduces resource consumption. We have now identified a range of other projects that have similar opportunities to reduce carbon emissions, water consumption and other environmental impacts."

"We now have clear evidence that reducing the overall consumption of plastic by improved design and processes is a more sustainable alternative to simply focusing on recycling – a valuable input to our next round of engagements within the Australian Packaging Covenant." said Katherine Simmons.

These initiatives demonstrate LyondellBasell Australia's commitment to the industry goals **'taking a life cycle view of materials, processes and products'**, and **'a healthy, skilled and engaged workforce, able to meet the needs of the industry'** and the Framework action strategy **'activities in the market and supply chain'**.



PACIA's sustainability services

PACIA delivers a range of proactive and leading sustainability services to assist members position their business for long term growth in an increasingly competitive and constrained market.

PACIA's Sustainability Leadership Framework is the recognised flagship platform for PACIA's Sustainability Programs. It covers the three fundamentals of sustainability – social, financial and environmental. PACIA and member companies use the Framework to drive sustainability through three action strategies relevant to business and across 11 priority areas (including energy, waste, workforce and health and safety). The 3 practical action strategies are:



Operations in the Workplace



Activities in the Market and Supply Chain

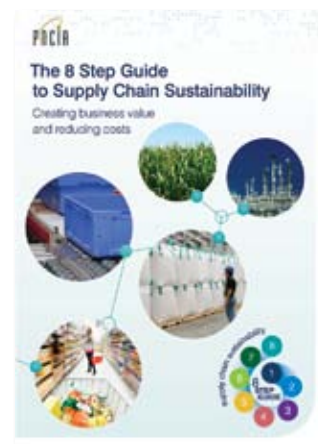


Transformation

Over 40 company CEOs have signed up to the Framework's vision and goals, and are taking real action. Also most PACIA members have availed themselves of PACIA's sustainability services, through Network Meetings, expert advice and more.

More information on these sustainability services and leading companies is available on PACIA's website pacia.org.au.

Helpful resources



PACIA has a range of useful resources to support the Australian chemistry industry meet the challenges of the future including:

- Sustainability Leadership Framework
- Case Studies on sustainability leaders and projects
- Design for Sustainability guides
- 5 Minute Guides on water efficiency
- 8 Step Guide to Supply Chain Sustainability
- Responsible Care® National Report
- Health and Safety Performance Report
- Plastics Recycling Survey

For further information:

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Strategic partnerships

PACIA has many strategic partners who contribute to the value and success of PACIA's sustainability programs. EPA Victoria has been PACIA's most significant partner over many years with two Sustainability Covenants, the first which was signed in 2004. These Covenants have enabled the creation and management of the Sustainability Leadership Framework, the Rewards grant program, Carbon Solutions energy efficiency and a host of other programs that have been of great benefit to PACIA members and industry generally, as well as delivering significant environmental outcomes.

Plastics and Chemicals Industries Association

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