

Greater Bendigo's

# Manufacturing & Mining Industries

*Showcasing economic development in Bendigo through innovation and diversity*





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**Right:** Moira Mac's Poultry and Fine Foods produce a diverse range of preservative free ready-prepared food and snacks using the latest High Pressure Preserving (HPP) technology at its Bendigo food processing facility.



## Message from the CEO

*"The financial rewards of this can be seen in the manufacturing and mining sector's annual financial output of \$2.8 billion or 27.5% of Greater Bendigo's total economic output."*

Innovation, quality and diversity are the driving forces behind Bendigo's highly successful manufacturing and mining sectors.

This has seen the emergence of a wide variety of small to medium sized businesses in Bendigo, many of them operating internationally in niche markets. The financial rewards of this can be seen in the manufacturing and mining sector's annual financial output of \$2.8 billion or 27.5% of Greater Bendigo's total economic output.

This success did not happen overnight. In fact its early beginnings can be traced as far back as the Gold Rush days in the middle of the 19th Century.

Today careful attention to areas like education, the recruitment of a highly skilled workforce and a focus on lifestyle attractions ensures the City's ongoing prosperity.

Gold is still mined. One enterprise, the Fosterville Gold Mine, located just 20kms outside the city centre, successfully mined over half a million ounces of the yellow metal in a six-year period.

And while they were about it Fosterville invented a revolutionary solution to

a problem that has plagued similar mining concerns worldwide, a solution that is about to be launched on the international market.

There are many other examples locally of companies that have gone global, aggressively seeking and identifying opportunities across a broad range of industries, everywhere from South America to the Middle East, from South Africa to Asia.

For any mining or manufacturing concern considering a change of location, or seeking its first home base, Bendigo has much to offer, apart from its obvious lifestyle attractions.

A supportive Council will assist with planning issues, recruitment of a skilled workforce, infrastructure issues and business services. With the recent emergence on the market of fully serviced industrial sites just 3kms from the CBD, there has never been a better time to decide on a move to Bendigo.



Craig Niemann  
CEO

## Message from the Chair

*"Contributing to this success is the strong customer-focus adopted by many local businesses who are widely recognised as 'solutions-providers' in these highly competitive markets."*

The Bendigo manufacturing sector continues to occupy an enviable position compared with the rest of Australia due to its skilled and highly qualified workforce, its ability to innovate and its diverse capabilities. This is due, in no small measure, to the wide range of companies operating within the sector, and their success in accessing national and global markets.

Contributing to this success is the strong customer-focus adopted by many local businesses who are widely recognised as 'solutions-providers' in these highly competitive markets. Equally the city's stable, cost effective and skilled workforce has gained a deserved reputation both in Australia and offshore.

Bendigo-based manufacturing companies are spreading their wings to attract new business outside their traditional customer base, and are succeeding in winning work. Information within this document provides both an overview of the manufacturing and mining sectors as well as a number of case studies of how businesses are embracing change and investing in their future.

A key strength the region enjoys is the Bendigo Manufacturing Group (BMG), which celebrated its tenth anniversary recently.

The BMG is an amalgam of company senior managers who meet regularly to consider and act on issues impacting on the manufacturing sector and its supply chain. Finding new business opportunities is also a high priority for the BMG,

which has evolved into a highly successful action orientated group capable of engaging the attention of local and State Government administrators and decision makers.

Another vital focus for the BMG is the strengthening of links between education and industry. An example of this is a project known as Goldfields Career Horizons, which helps students at all levels of education choose a career path through work experience across all 19 sectors of the Bendigo labour market. Every economy, however prosperous, is only as good as its next generation. Horizons helps ensure Bendigo's youth are well placed to demonstrate the truth of this maxim.

The latest initiative has seen the establishment of an alliance of 14 Bendigo-based companies offering a variety of skills and expertise. The alliance, begun in 2012 and known as the Bendigo Manufacturing and Mining Equipment Project, combines the diverse and innovative capabilities of 14 companies servicing the mining sector, nationally and globally. The Project's aim is to allow much of this fiercely competitive sector to source products, equipment and expertise in one location - Bendigo.



Ken McCulloch,  
Chairman, Bendigo Manufacturing Group.

# Introduction

Many of Greater Bendigo's manufacturing and mining businesses are now widely recognised across Australia and internationally. Whether these businesses are headquartered locally or have Bendigo as a key base, all demonstrate diversity, innovation and / or high-level capability as they compete in markets outside our region.

The manufacturing and mining industries are collectively by far the largest economic contributor to Greater Bendigo's economy with their combined estimated annual economic output of \$2.8 billion (REMPAN based on 2011 Census data) or 27.5% of the City's total annual economic output.

Of equal importance is the sector's contribution to the local jobs market. A total of 6,936 jobs (REMPAN) were attributed to manufacturing comprising 3,548 direct and 3,388 indirect jobs. When the total of 1,040 jobs (REMPAN) within the mining sector (536 direct, 504 indirect) is added to this figure, the true significance of these industries to the Bendigo region emerges.

Locals are often unaware of the economic contribution of the two sectors, but more readily appreciate their impact on the area's jobs market. And this is where Bendigo comes into its own – it's easy to see why a skilled mining employee would choose the life-style comforts of the region over the often hostile and remote environments in, for instance, Western Australia, where much of the nation's mining industry operates.

Bendigo-based manufacturing businesses provide a diverse range of products for national and international markets such as armoured vehicles, residential, commercial and industrial turntables, diesel locomotives, mill shells, drill rigs, stone crushers, conveyor systems, vacuum trucks, heavy ferrous castings, animal pharmaceuticals, ceramics, body armour, fresh and processed food products and wine to list a few.

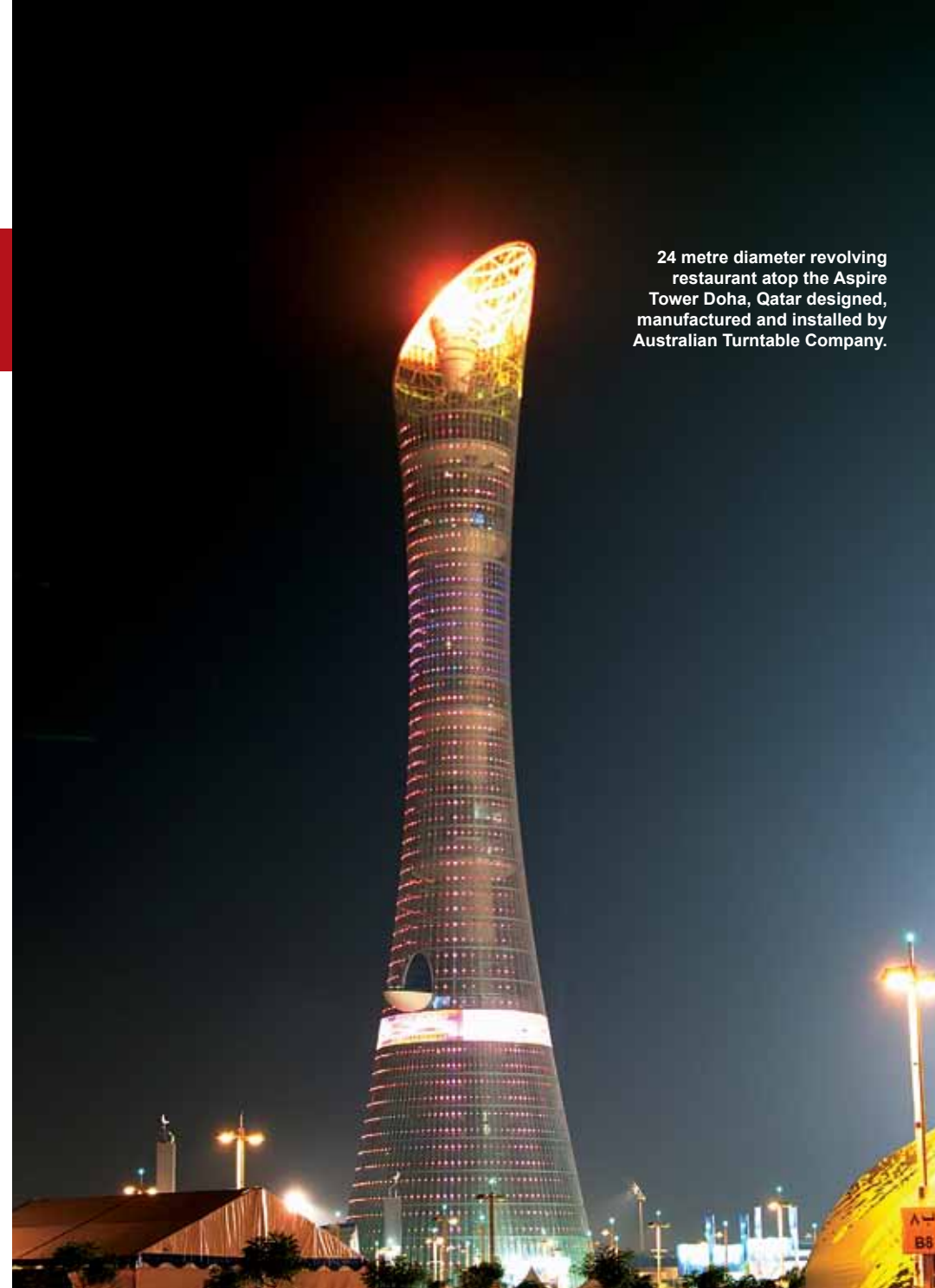
To stay ahead of the opportunities presented by increasingly competitive national and overseas markets, manufacturing and mining have embraced change, to invest in a highly skilled workforce and cutting edge technologies.

How well this has succeeded can be seen in the transformation of the local manufacturing workforce over a brief period, from an army of unskilled, blue collar workers to a highly qualified body of technically innovative specialists.

The alliance of 14 local manufacturing companies, known as the Bendigo Manufacturing and Mining Equipment initiative, is an example of Bendigo telling international markets that the region has become a one-stop solution to most of their needs.

The growing reputation of these 14 companies, and many others in the region, bodes well for the future of the manufacturing and mining sectors and their massive contribution to Bendigo's ongoing prosperity and growth.

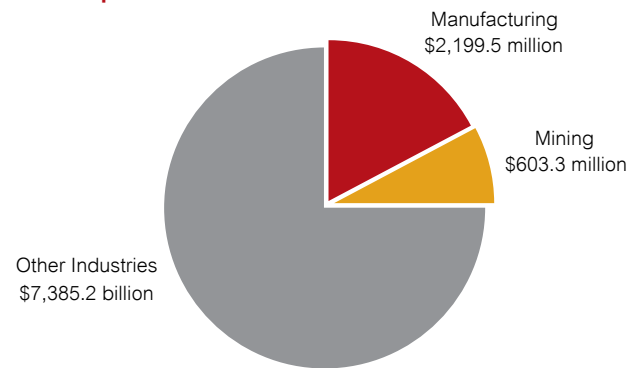
24 metre diameter revolving restaurant atop the Aspire Tower Doha, Qatar designed, manufactured and installed by Australian Turntable Company.



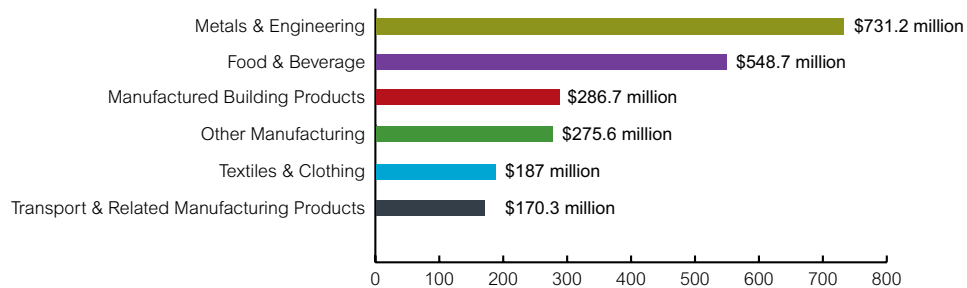


# At a Glance

## Annual Economic Output



## Selected Manufacturing Sectors Annual Economic Output



**Top Right:** MSD Animal Health's Bendigo facility employs 40 scientists who develop a diverse range of animal vaccines for national and export markets.

**Bottom Right:** Mill Shells manufactured by Hofmann Engineering Bendigo enroute to Port Hedland in Western Australia. Weight - 85 tonne. Diameter - 5.5 metres. Length - 12.7 metres.





One of two high-hygiene tub filling production lines running dairy desserts at Parmalat's Bendigo plant.







## Food & Beverage

The sector is dominated by the poultry industry whilst other major manufacturers produce a range of dairy produce and bread related products. Greater Bendigo also has many niche businesses such as wineries, bakeries, coffee roasters, olive oil processors, honey producers, preserves and sauce manufacturers and craft beer producers. Many of these businesses export from the region to national and international markets.

### Some notable companies include:

- Balgownie Vineyards
- Connor Park Winery
- Dalhousie Foods
- Hazeldenes Chicken Farm
- Heathcote Estate
- Heathcote Winery
- Jasper Hill Vineyard
- Moira Macs Poultry & Fine Foods
- Parmalat
- Prestige Fresh Foods
- Sanguine Estate
- Sandhurst Ridge
- Tip Top Bakeries

The food and beverage sector contributes an estimated annual output of \$548.7 million (REMPAN) to the local economy. A total of 1,222 people are employed in the sector.



**Top:** Handcrafting Bendigo wine - Sandhurst Ridge's Paul Greblo plunging the cap on fermenting shiraz.

**Bottom Left:** Range of unique handmade breads baked by a Bendigo specialist sourdough bakery, The Good Loaf Sourdough Bakery & Cafe.

**Bottom Right:** Brewhouse Coffee Roasters, Bendigo – one of a number of niche local businesses supplying a growing market across Australia (photo courtesy of the Bendigo Magazine).

# Hazeldene's Chicken Farm

**“Evolving for fourth generation owners”**



**“We have always done something different and been innovative, and that has always worked out well.”  
- Vicki Gaudion, Manager, Corporate Affairs.**

In the middle of the last century, when Sydney Hazeldene conceived the retirement vision of starting a cattle stud in Lockwood, he could never have envisaged the way in which that vision would evolve.

Mr Hazeldene didn't live long enough to find out, sadly passing away in 1966. His son Dick and daughter-in-law Mavis took over the property to move and grow their poultry business, which needed to move further afield from the urban growth of Kangaroo Flat.

Today, three generations later, the Hazeldene name is known across Australia as the leading and most innovative producer of chickens for the nation's ovens and dining tables. The company employs 680 people directly, and several hundred more indirectly through the spin-off enterprises essential to its ongoing growth.

It has moved its base from Kangaroo Flat to nearby Lockwood, and is half way through the biggest investment the company has ever made, which will see it become the southern hemisphere's most advanced chicken producer.

Two of Dick and Mavis' children, John (Managing Director), and Vicki Gaudion (Manager, Corporate Affairs), are guiding the company's growth, and four of the grandchildren make up the family's fourth generation involved in the business. The evolution from cattle stud to mass producer of oven-ready chickens has not been without its setbacks – in 1985, a devastating outbreak of avian flu threatened to end progress once and for all. At that time the company was producing both eggs and meat, but with typical resilience the Hazeldenes transformed the outbreak into a catalyst for change, and began producing only meat.





**Left:** Inspection of birds on the production line.

**Above:** Operation of primary processing equipment being discussed with Marel-Stork's Australian representative.

**Top Right:** Hazeldene's Head Office in Lockwood.

**Middle Right:** Fork lift transporting birds to the production line.

**Bottom Right:** Expansion plans under discussion with equipment supplier Marel-Stork.



Innovation has always been the focus of the company's corporate philosophy, and the current investment in cutting edge Dutch technology is ensuring that focus stays in place. When complete, the new technology will give the company the capacity to double output from 500,000 to one million processed birds a week, if desired. Around \$40 million has already gone on a primary processing section, or holding area for live birds. Breeder rearing and production facilities are under construction. The addition of new hatching equipment and some contract broiler farms will complete this stage. The second stage will enhance packaging and stock control within the modernisation of the original processing building.

Vicki Gaudion explains: "We have always done something different and been innovative, and that has always worked out well."

Hazeldenes is constantly on the lookout for improved systems and technology to minimise its impact on the environment. Typical of this is a process, the only system of its type in the southern hemisphere, known as aero scald, introduced recently to minimise water usage and maximise food safety. The company operates its own sewage plant, including a recycling element, and manages as much of its own waste streams as is feasible. The company's decision to remain in the Bendigo region – despite the necessity to move from Kangaroo Flat to Lockwood for environmental reasons – has been a tremendous economic driver for the area. Operating in a highly competitive arena, the Hazeldene family is determined to grow its company through the use of cutting edge technology. The family sees a bright future for its industry, and is confident it will continue to be a significant and ongoing contributor to the local economy.





Pre-cast bridge beams up to 35 metres and weighing a massive 90 tonnes manufactured by Fulton Hogan's Precast Division, Bendigo for Melbourne's Regional Rail Link project.







# Manufactured Building Products

Diversity and competitive manufacturing, achieved by investment in new technology and innovation has resulted in an annual economic output of \$286.7 million from this sector which employs a total of 577 people.

Local manufactured building products include wood and steel wall frames and roof trusses, bridge beams, tilt slabs, box culverts, bricks and pavers, structural steel and engineering products such as lintels and balustrading, furniture and a range of residential / commercial modular buildings plus cabinet related products such as kitchens.

## Major local manufactured building product companies include:

- Adbri Masonry
- Admarco
- ASQ Precast Concrete
- Aussie Steel House Frames
- BB Truss & Timber
- Bendigo Kitchen Centre
- Bendigo Truss Plant
- Bourke's Kitchens
- BRB Modular
- Central Kitchens
- CV Benchtops and Hardware
- Ezy Tilt Panels
- Fulton Hogan (Precast Division)
- Jimmy Possum Furniture
- McKern Steel
- Ortech Industries
- Selkirk Bricks
- Tucks Windows



**Top:** Ultra modern award winning kitchen designed, manufactured and installed by Bourke's Kitchens, Bendigo.

**Bottom Left:** Jimmy Possum Furniture, Bendigo craft a range of locally designed, high quality products for the Australian market.

**Bottom Right:** McKern Steel manufactures a range of high quality steel components for the construction industry.

# BB Truss & Timber

**“Award winner helps to build dreams”**



**“We wanted to create the best factory of its kind in the world,” - Geoff Baxter, co-founder and joint owner.**

Ingenuity is the key factor behind the success of BB Truss and Timber, Bendigo's award winning manufacturing company.

A combination of this ingenuity, plus considerable research, drove the company's construction of its new factory in Piper Road, East Bendigo, in 2005.

It is here, in a computer controlled, fully automated manufacturing facility, that the company produces its three main products – roof trusses, wall frames and multi-strut floor joists for double storey homes.

Virtually all output is custom made in specific shapes and sizes for the individual home, requiring in-house design capability of the highest order.

“We wanted to create the best factory of its kind in the world,” co-founder and joint owner, Geoff Baxter, says. “So we checked 25 truss and timber factories in Australia for the most efficient equipment, and did similar research overseas before starting construction.”

The factory boasts a 6,000 square metre facility on a 3.5 hectare site which has set the standard for similar facilities around Australia.

Judging for the industry's national awards began in 2007 and since then, the factory has taken out awards in all major divisions, plus the 2012 Frame and Truss Manufacturers Association best overall frame and truss plant.





**Above:** Extensive research and careful design provide a free flowing factory layout.

**Top Right:** Information at your fingertips; the factory management system provides up-to-date information to all work stations.

**Middle Right:** Computer controlled saws ensure accuracy of all cut components.

**Bottom Right:** BB Truss & Timber providing quality Roof Trusses, Wall Frames and Floor Trusses to the building industry Victoria-wide.



Mr Baxter estimates that more than 10,000 Melbourne homes have utilised his company's products in the past 20 years, representing around 90 per cent of output. Everything from small extensions to multi-million dollar mansions have been built with BB Truss and Timber products.

A recent innovation is turning a waste by-product into a lucrative part of the business operation. Earlier in 2013 the company purchased two state of the art machines, a shredder and a briquette press, from Germany to process off-cuts and sawdust into briquettes. An order has already been received for as many as the company can produce.

BB Truss and Timber was founded as a family business in Castlemaine 25 years ago, and is now co-owned by Mr Baxter and his wife Tania.

The company's Piper Road site employs around 60 staff; with another 12 people employed in Keilor Park on design and preparing quotes.

A skilled workforce combined with efficiency and innovation provides the foundations for the company's longer term operations in a competitive market place.

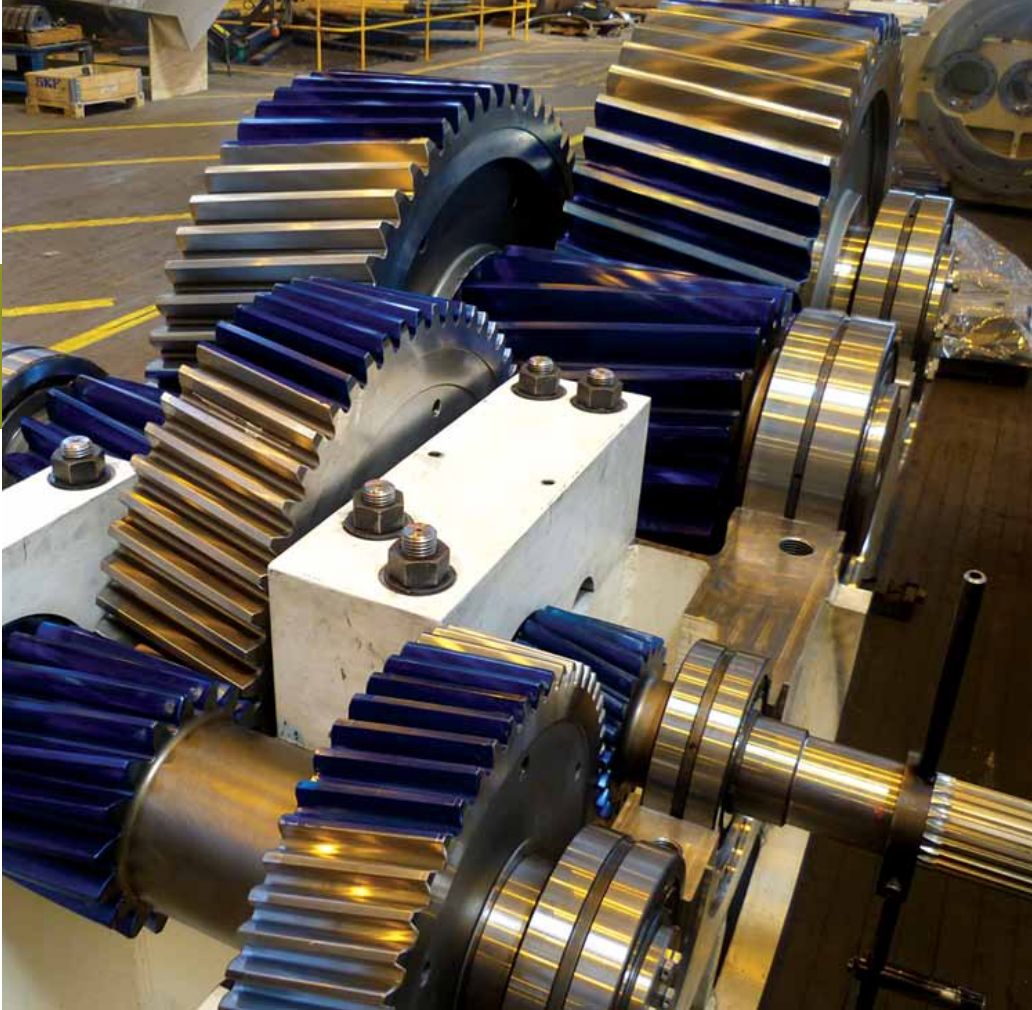




Helix Tree at Federation Square, June 2013.  
Designed by Ramus Illumination.  
Manufactured by Universal Manufacturing  
Australia at Hattam St, Bendigo.  
Height 13.2 meters. Width 15.66 meters. Weight 12 tonnes.







# Metals & Engineering

Metals and engineering is the largest manufacturing sector, contributing an estimated economic impact of \$731.2 million to the region, and employing 843 workers. Ingenuity, innovation and advanced manufacturing technologies have combined to help companies in this sector move into international markets. The resurgence in mining and its demand for products and services has provided a significant boost for local metals and engineering concerns.

This sector produces a diverse range of products for the agricultural, mining, construction, infrastructure and transport sectors. Businesses pride themselves on being customer focused, often designing customised products and being recognised widely as 'solutions providers' in a competitive market place.

## Major local metals and engineering companies include:

- Australian Turntable Company
- B Keogh and Sons Manufacturing
- Bendigo Engineering Services
- Bendigo Sheetmetal
- East End Engineering
- Easytow Australia
- Gordon Brother Industries
- Hofmann Engineering
- Industrial Conveying (Australia)
- Keech Australia
- Mancala Mine Services
- Masfield Manufacturing
- McCullochs Hydraulic Engineers
- McKern Steel
- QME Quarry and Mining Engineering
- Spoutvac Industries
- Strathfieldsaye Engineering and Sheet Metal
- Thales Australia
- Universal Manufacturing Australia

**Top:** Hofmann Engineering Bendigo can manufacture new and also refurbish gearboxes for many industries including mining, power generation and wind energy sectors.

**Bottom Left:** Long established specialist plant and equipment manufacturer B Keogh and Sons Manufacturing Pty Ltd have recently invested in the latest high capacity plasma cutting and machining technologies.

**Bottom Right:** Multi-purpose exploration drilling rig with a depth capacity of 1,350 metres - designed and manufactured by McCullochs Hydraulic Engineers.







## Keech Australia

**“Innovation and adaptability is key to success”**

**“To change is difficult, but not to change can be fatal.” - Herbert Hermens, CEO.**

Keech Australia was established 80 years ago in Mascot, Sydney, as a jobbing foundry, employing around a dozen workers. According to Mr Hermens the company progressed satisfactorily for years manufacturing small hand tools and little else.

“They worked according to well-established, proven methodology, which was all well and good, but the world changes,” he says. Initial change for Keech came in the mid 1990s, when the value of the land occupied by the foundry increased out of all proportion to its use. This, and environmental factors, led to the decision to move to Bendigo. But the real change came for Keech Australia with the Global Financial Crisis.

“We were always able to compete in our niche markets from Bendigo, but after the GFC we realised we had to compete against the rest of the world, and the best of the world,” Mr Hermens says.

So change came in every aspect of the business, and with it the need to invest heavily in research and development, innovation and new technology.

“Innovation must be part of the being of the company, it must be involved in how you do things, how you think, part of the supply line, management, communications, everything,” Mr Hermens says.

Turning any process around takes time and involves a massive leap of faith and new thinking by the owners and everyone who works here,” he explains, “But I think we are headed in the right direction.”





**Left:** The Keech Moonlock™ crusher and ore bin quick changeover wear protection system is extremely flexible.

**Above:** Innovative design for excavation buckets has greatly improved customers productivity.

**Top Right:** Engineers involved in R&D to solve customer's needs - a key to Keech's success.

**Middle Right:** Investment in new plant and equipment has improved productivity and sustainability.

**Bottom Right:** Keech is a global exporter of high integrity steel castings from its Bendigo operations.



"We are already in a new world marketplace and as a company we embrace that concept. If we come through this downturn, to be here in good shape when things recover, we will have planned well for the future. We understand the cycles of business and staying in good shape means we have to plan well and invest in the future."

The company currently spends seven per cent of its revenue stream annually on research and development, and has already spent \$3.5 million on improved technology for its second foundry.

Over the next two years an additional \$10 million to \$15 million will be expended on the original foundry to incorporate clean technology and lean manufacturing that involves recycling and more resource efficient production.

When the company moved to Bendigo in the mid 1990s it was employing about 40 workers. The figure today is around 150, peaking at 200, and Keech has diversified its business to add new divisions such as Keech Mining Supplies and BPM 3D Technologies.

"We were receiving massive incentives to go to other states at the time we chose to come here," explains Mr Hermens. "What decided us was the hands-on attitude of the Council and its Economic Development Unit. We went to look at an existing foundry, and they were right there beside us. It's that kind of support that sets Bendigo apart as a place to do business."





Allstone Quarries - Newbridge Primary Upgrade: 90% of the project was completed by local Bendigo companies including QME and Gordon Brothers Industries.







# Mining & Quarrying

Fosterville Gold Mine (gold) and Mandalay Resources (antimony and gold) have on-going plans for longer term mining operations locally which have the potential to generate significant additional economic benefits for the wider community. Quarrying (clay, sand and crushed rock) also continues to be an important industry. These sectors are estimated to have a workforce in excess of 530 and an annual economic output of \$603 million.

## Major local companies include:

- Allstone Quarries (ASQ)
- Axedale Sands and Gravel
- Fosterville Gold Mine
- Hansons Quarry Materials (Axedale)
- Mandalay Resources (Costerfield)

Indirect benefits from both these sectors have also been accrued by local companies that value-add and / or provide support services. A number of these companies also do business nationally and internationally.

## Some of these companies include:

- Andy's Earthmovers
- Australian Turntable Company
- Bendigo Engineering
- Deepcore Drilling
- East End Engineering
- Gordon Brothers Industries
- Hofmann Engineering
- Industrial Conveying
- Keech Australia
- Keogh & Sons Manufacturing
- Mancala Mine Services
- McCullochs Hydraulic Engineers
- Motherson Elastomers
- Quarry and Mining Engineering (QME)
- Southern Shorthaul Railroad
- SpoutVac
- UME Australia
- Universal Manufacturing Australia

**Top:** Andy's Earthmovers (Asia Pacific) Pty Ltd provides earthmoving equipment solutions to the civil, construction and mining industries Australia wide.

**Bottom Left:** Stockpile of crushed ore at the Fosterville Gold Mine (story on page 20).

**Bottom Right:** Hopper designed, manufactured and installed by Industrial Conveying (Aust) for the Limestone Mill feed system at Fosterville Gold Mine.





# Fosterville Gold Mine

**“Good science to impact mining globally”**



**“We came up with a retrofit heated leach circuit which went through a pilot process and was then fast tracked within one year at a cost of \$7 million.” - Ian Holland, General Manager.**

A unique process, invented and developed in a long established gold mine 20 kms from the centre of Bendigo, is to be marketed world wide. The new process will help solve a problem plaguing mining companies across the globe.

Ian Holland general manager, Fosterville Gold Mine, describes the process as “good science” and explains how it is likely to impact on mining worldwide.

His company leases its production process, known as bacterial oxidation, from a company in South Africa. Initial recovery levels were hindered by native carbon present around the Fosterville mine. The problem occurred in a leaching process which followed on from the bacterial process.

And this is where Ian Holland’s “good science” was introduced. “We came up with a retrofit circuit which went through a pilot process and was then fast tracked within one year at a cost of \$7 million. We are still the only mine in the world using this process,” he explains.

It involves a staged heating program at 80 degree temperatures, and the use of caustic soda to counteract the effects of the carbon. Already the South African suppliers of the bacterial process are seeking a licensing agreement to market Fosterville’s solution worldwide.

“Our investment in this cutting edge technology was paid back within 18 months,” Mr Holland says. So anything made from overseas licensing is pure profit.

Apart from the innovative skills of its workforce, the most significant competitive edge Fosterville enjoys over other Australian mining companies is its proximity to Bendigo.

“Many mining operations are in remote, even hostile environments,” says Mr Holland. “Contrast this with the lifestyle choices in Bendigo and it’s no contest.”

The mine’s total workforce has stabilised at 400 (330 direct employees and another 70 contractors) for the past five years. Most of them live in Bendigo or nearby towns.

“We have sourced, largely in Bendigo, a skilled work force of miners and processors; tradesmen including electricians, fitters and mechanics, and key technical people like metallurgists, geologists and engineers,” Mr Holland says.





**Left:** Monitoring of the Heated Leach boiler.

**Above:** Inspecting the flotation concentrate.

**Top Right:** The grinding circuit which reduces the ore to 75 microns in size.

**Bottom Right:** Stockpile of crushed ore.



A total of 580,643 ounces of gold was won from Fosterville between April 2005 and December 2011 using the sulphide method.

Fosterville gold is contained in sulphide minerals. The ore is crushed and ground to a slurry with the sulphides floating to the top and forming the feed stock for the bacterial process. This involves six swimming pool sized tanks where the slurry concentrate remains for five to seven days, while a live colony of bacteria feeds on it as an energy source, attacking and oxidising it, until it is ready for leaching with cyanide.

Fosterville is currently owned by Crocodile Gold Corporation, a Canadian gold mining and exploration company. CGC acquired the current sulphide plant in 2012. The plant was established in 2004/5 by Perseverance, an ASX-listed company.

Apart from five underground ore bodies, scheduled for further work in the near future, CGC has an enveloping exploration lease covering an area of land around Fosterville measuring 60 kms in length by 10 kms wide.

"We are hopeful of finding further gold in this area," says Mr Holland. "Exploration will take place over a number of years."





Ring spinning carded sliver fibres to form a yarn at Victoria Carpets Bendigo.





## Textiles & Clothing

Textiles recorded an estimated annual financial output of \$187 million, achieved by a workforce of 310. Regional exports totalled \$100.9 million. Australian Defence Apparel's ongoing commitment to diversity and innovation has seen the company move into a number of international markets with its ceramic body armour.

### Major local textile and clothing companies include:

- Australian Defence Apparel
- Bendigo Woollen Mills
- Victoria Carpets Bendigo



**Top:** Attaching side pocket to Disruptive Pattern Camouflage Uniform (DPCU) trouser at Australian Defence Apparel (story on page 24).

**Bottom Left:** Vibrant designs are utilised in-house to upholster Jimmy Possum Furniture.

**Bottom Right:** Carding to disentangle, clean and intermix fibres ready for spinning at Victoria Carpets Bendigo.



# Australian Defence Apparel

**“Ceramic technology providing global recognition”**



**“Our traditional markets, for combat and ceremonial uniforms, have reduced, so to continue to prosper we had to invest heavily in technology in new areas like ceramics,” - David Giles-Kaye, CEO.**

Next time you see old newsreel footage of a digger serving in some foreign theatre of war, check out his clothing. And then start to wonder what it must feel like trying to operate in a sweltering combat zone with over 20 kgs of cumbersome body armour and equipment with all manner of attachments draped across your torso.

“It’s hot and tiring, contributes to stress and impairs mobility,” says David Giles-Kaye, CEO of Bendigo company Australian Defence Apparel (ADA).

And he should know. For the past four years his company has developed and perfected a new form of ceramic breast plate weighing roughly half that of the previous equipment supplied to Australian Defence Force (ADF) troops.

The body armour, together with something known as the Christmas Tree effect – everything a soldier could possibly need from bullets to first aid kit dangles from its various pouches and compartments – has been in use by ADF personnel, men and women, since the middle of 2012.

Apart from its light weight, the ceramic material can be formed into tight curves, allowing women to be afforded the protection of comfortable body armour for the first time.

The ceramic technology behind this invaluable aid to our fighting men and women is typical of the focus on innovation at ADA. The company spends five per cent of its budget annually on research and development to stay ahead of fierce international competition for the astounding \$1.7 trillion global market for military hardware and software.

ADA had its conception prior to the First World War as the Commonwealth Government clothing factory in South Melbourne, where uniforms were made both for the Department of Defence and the Post Master General. By 1971 the factory had moved to Coburg, and, in 1988, had become the Clothing Division of Australian Defence Industries, manufacturing combat and ceremonial uniforms.

By 1989 manufacture had diversified across three locations, Coburg, Bendigo and Leichhardt in NSW. Three years later the Bendigo plant took over the entire manufacturing process, and in 1995 the ADI Clothing Division was privatised to become Australian Defence Apparel Pty Ltd.





**Left:** Attach waist band to Disruptive Pattern Camouflage Uniform (DPCU) trouser.



**Above Right:** Sew pocket on DPCU trouser.



**Right:** Fit DPCU and TBAS vest with pouches.

In June, 2011, ADA was taken over by a joint venture between fabric wholesaler Charles Parsons and a Canadian firm called Logistik Unicorp.

ADA had been seeking to build its capability to deliver its product through online systems, so with Logistik's successful business model in that field, the marriage was a happy one all round.

Mr Giles-Kaye explains that the expertise and innovative talents of Bendigo's skilled workforce made ADA a natural choice when the Parsons Logistik joint venture was considering the take-over. ADA now employs 190 workers, 105 of them in Bendigo.

Since the breakthrough with its ceramic armour the company has continued to diversify and explore new opportunities.

"Our traditional markets, for combat and ceremonial uniforms, have reduced, so to continue to prosper we had to invest heavily in technology in new areas like ceramics," David Giles-Kaye explains.

His company's focus on innovation has attracted considerable interest from overseas. Already the UK's Ministry of Defence and Metropolitan Police Force have become customers for the ceramic body armour, and further export opportunities are being pursued in Southeast Asia, particularly PNG, Thailand and Vietnam, with the Middle East the next territory to be targeted.

ADA takes part in Government trade missions and trade shows, but is finding that potential customers are coming to them, such as the growing global recognition for their products.





1000 Bushmaster protected vehicles have been manufactured by Thales Australia in Bendigo, supplied to the Australian Defence Force and exported to European Defence Forces.





## Transport & Related Manufacturing Products

The local manufacture of transport and related auto components operates in a highly competitive market, much of it involving large overseas suppliers. The sector contributes \$170.3 million (\$53.6 million in regional exports) to the local economy, and employs a workforce of 253 people.

Transport and related auto component manufacturing is an extremely competitive industry with most competition for local businesses coming from large overseas suppliers.

### Major local transport and related manufacturing products companies include:

- Andy's Earthmovers
- Bendigo Engineering
- Harrower Carline Mufflers
- Keech Australia
- Motherson Elastomers
- Southern Shorthaul Railroad
- Thales Australia



**Top:** World Class Moulding Equipment and Machinery at Motherson Elastomers Pty Limited.

**Bottom Left:** Hawkei, Thales's next generation protected vehicle, manufactured in Bendigo, currently under consideration by the Defence Materiel Organisation.

**Bottom Right:** Multi-functional off road water tank for the mining and quarrying industry, designed and manufactured by Bendigo Engineering.



# Southern Shorthaul Railroad

**“First locomotives constructed in regional Australia”**



**“In the ten years since its establishment SSR has built its successful growth on a corporate philosophy of impeccable customer service, safety and reliability” - Brent Nally, Director.**

Manufacturing and building a multi-million dollar, diesel locomotive isn't something that can be achieved without considerable experience, expertise and muscle. So much so that the two locomotives built in 2012 by Southern Shorthaul Railroad (SSR) at its Bendigo manufacturing facility are the first ever to be constructed anywhere in regional Australia.

The two 3000 hp locomotives were built at the company's large factory on the 14 hectare, former railway workshop site in East Bendigo. Dual 20-tonne double girder overhead cranes provided the muscle, and SSR's highly skilled workforce and experienced management team provided the brain power.

According to Brent Nally, Director, Workshops and Finance, in the ten years since its establishment SSR has built its

successful growth on a corporate philosophy of impeccable customer service, safety and reliability.

SSR is an accredited rail freight operator, manufacturer and maintenance provider running freight trains in Victoria and NSW, supported by round the clock 'LiveRun' teams based in Sydney, Lithgow and Newcastle. The company has two workshops in Bendigo, with the main one located in East Bendigo.

At these workshops the company builds, reconditions, upgrades and services locomotives and rolling stock, including performing component changes and overhauls. The company also focuses on prototype development of wagons. A round-the-clock emergency call-out service is another arm of the business meeting customer expectations.





**Left:** Large fully compliant state of the art heated spray booth installed in 2012 at the Bendigo facility.

**Above:** The large site and facilities provides the capacity for rail specific and non rail specific maintenance & manufacturing work.

**Top Right:** Locomotive bogies being overhauled under the dual 20 tonne overhead cranes.

**Middle Right:** The specialised bogie overhaul production line ensures a high quality, cost effective end product.

**Bottom Right:** The brand new EMD 3000hp BRM class locomotive manufactured at the Bendigo facility.



The company owns 21 locomotives ranging from 875 to 3000 horsepower; operates another seven 4400 horsepower locomotives on coal haulage services for other companies, as well as leasing a further seven to meet customer demand.

SSR was formed in 2003 by three men, Milton Bromwich, Jason Ferguson and Brent Nally's father, Vin Nally, after a successful management buy-out of the former Great Northern Rail Services business.

The company's entirely domestic customer base has benefited from the company's practise of working closely with clients to ensure their satisfaction.

To that end SSR has doubled its permanent, skilled workforce of boiler makers, fitters and electricians from ten to twenty in Bendigo over the past five years, and on occasions has contracted additional labour for specific project requirements.

As a result of the comparatively high Australian dollar and a downturn in demand for coal, SSR has diversified its operations to secure its future. This involves more emphasis on refurbishment and servicing of locomotives and rolling stock.

Diversity, varied skills and experience, well maintained plant and equipment and accreditation as a rail operator combine to promote the company's manifesto for continually improved performance.





The world's finest catamarans manufactured by  
Australian High Performance Catamarans, Bendigo.







## Other Manufacturing

In addition to the sectors already outlined, Bendigo-based manufacturing comprises a number of companies producing a wide range of manufactured products including animal vaccines, high value industrial ceramics, world class yachts, recycled materials and printing. The Other Manufacturing sector contributes \$275.6million to the local economy and employs 342 people.

### Major companies include:

- ASQ Recycling
- Australian High Performance Catamarans
- Bart 'N' Print
- Bendigo Pottery
- Ceramic Oxide Fabricators
- Espress Printers
- Hopley Recycling
- Mulqueen Printers
- MSD Animal Health
- Peerless Products



**Top:** Bendigo Pottery, Australia's oldest working pottery, have an extensive ceramic manufacturing facility making customised products for restaurants, hotels, and resorts in addition to the large range of Bendigo Pottery branded products.

**Bottom Left:** Rainbow Rock' produced by ASQ Recycling from recycled bricks is used for garden landscaping.

**Bottom Right:** MSD Animal Health's Bendigo modern biological manufacturing facility produces Companion Animal vaccines that are sold throughout Australia. The facility includes a high speed labeling suite.



# Ceramic Oxide Fabricators

**“Small business supplies the world”**



**“There would be no commercial advantage to be gained from moving into a big city, and our employees love living here. Some of us walk to work, and you couldn’t do that in a big industrial centre.” - Mr Walker, Manager.**

When Harold Kanost and his wife Aune started Ceramic Oxide Fabricators (COF) in Bendigo 40 years ago manufacturing laboratory crucibles, they could scarcely have envisaged how their influence would spread world wide. Today, almost anybody driving a car manufactured in Australia, Europe, the USA, China or Japan will be benefiting from the expertise of the Kanosts’ company, COF, and its workforce.

The company still makes laboratory crucibles and other ceramic based materials, but by far its most successful product over the past 25 years has been an oxygen sensor. Automobile components within the engine, gear box and bearings require steel hardened at high temperatures to give them their necessary long life. The furnaces used world wide by car manufacturers are controlled by oxygen sensors made by Ceramic Oxide Fabricators at their California Gully (Bendigo) factory.

“The sensors are by a long way our most successful product and have been for the past 25 years,” says company manager Alan Walker. “We started manufacturing them soon after CSIRO completed its research into ceramic oxygen sensors and continuous research and development has enabled us to become the preferred supplier for the automotive and aerospace industry.”

COF products, and not just the oxygen sensors, are sold world wide and exports account for two thirds of the company’s revenue stream.

“Our customers range from the big car manufacturers to a biscuit maker in Fiji who uses our insulators” Mr Walker explains.

When Harold and Aune started the company there was just the two of them. Today there are 12 employees including machinists, welders, kiln operators and extruder operators.

Aune passed away some years ago, but Harold, although semi-retired, remains very much hands-on. The company uses nine kilns of different sizes and shapes and fires them up to temperatures of either 1000 or 1600 degrees centigrade, depending on the materials. The main raw materials the company uses are high purity aluminium oxide and rare oxides of yttrium and scandium. “We import our raw materials from Japan and sell the finished product back to Japan”, says Mr Walker, “which is fairly unusual for an Australian manufacturer.”

The 12-strong workforce is occasionally augmented by extra staff for unusually large orders. A recent example was Melbourne company Ceramic Fuel Cells, which converts natural gas directly into electricity through a one-step process.





**Left:** A diamond saw cuts through a 90 mm tube for a university laboratory.

**Above Left:** Great care is needed to handle these fragile 8 mm diameter tubes.



**Above Middle:** Checking an oxygen probe in our test and calibration facility.

**Above Right:** Preparing tubes for the next step in production requires precise manual skills.



**Bottom Right:** A variety of laboratory ware used for chemical analysis, growing crystals and electrical insulation.

"We supplied them with high temperature precision materials with which they made their ceramic components. We had to hire extra staff for months to complete the order," Mr Walker says. "We also sub contract a degree of our work to around six companies here in Bendigo, and have done for years."

Although many of COF's customers have been with them since the early days, the company's international sales took off when they set up their first web site in 1996. The challenges presented by customers ranging from a manufacturer of medical lasers in Moscow to Boeing aircraft corporation in the USA keeps the company on its toes, with continuous research and development to refine its products and processes.

"It's through the internet that we get by far the majority of our new customers," says Mr Walker. "We also advertise in trade magazines and specialist publications catering to the scientific and engineering companies that make up the majority of our customer base."

The main reason COF has remained in Bendigo throughout its history is the lifestyle.

"There would be no commercial advantage to be gained from moving into a big city, and our employees love living here. Some of us walk to work, and you couldn't do that in a big industrial centre." Mr Walker explains.

COF does all its recruiting in Bendigo – "We've always hired locally. The basic skills are here, and then, because we specialise to such an extent, it's a question of people learning on the job," he says.





Bendigo's magnificent cityscape from the observation tower at Rosalind Park.





# Be Part of Our Story

If you're looking to live or do business in a progressive, yet cultured city that boasts an unrivalled quality of life then Bendigo could be just what you're looking for.

Bendigo is a thriving regional Victorian city boasting a population of over 105,000 people and located north of the Great Dividing Range in the exact geographic centre of Victoria. This means it has great weather and is easily accessed via the Calder, Midland, McIvor and Northern Highways. Alternatively it is only a short 90 minute drive to Melbourne via the freeway or the express rail service.

Bendigo is the main service centre for the central and northern Victorian region and features a catchment population in excess of 165,000 people.

Bendigo's rate of growth continually exceeds that of other major centres in Victoria and of the state as a whole. Much of this population is the result of people moving to Bendigo from more remote rural areas and former Melbourne residents seeking new career and lifestyle opportunities.

The local economy continues to grow with the establishment of new businesses, expansion of existing businesses and the relocation of others to the region. Bendigo offers a strong labour force across a diverse and productive industry and professional base.

Bendigo is home to the largest regional hospital in Victoria and boasts an abundance of allied health and wellbeing providers. It also offers a full range of educational facilities and options through La Trobe University Bendigo, Bendigo TAFE and a large range of private and public primary and secondary schools including Victoria's largest VCE college, Bendigo Senior Secondary College.

Bendigo proudly boasts some of the finest examples of Victorian architecture in the country and features a superb range of housing from quaint miner's cottages, large turn of the century mansions to modern contemporary homes. On average Bendigo's housing costs are 30% less than Melbourne, but it will not always be this way. New and modern housing set in natural bushland is very popular and wherever you choose to live in Bendigo, you are only a walk or a short drive away from the Bendigo CBD making commuting time virtually zero.

Greater Bendigo offers a fantastic regional lifestyle with a great climate, clean air, quality water and no noise pollution. It is a lifestyle that makes you time rich and affords plenty of opportunities to spend more time with your family or pursue a large range of other recreational activities.

Bendigo is also recognised as a major Victorian centre for arts and culture featuring the Bendigo Art Gallery which is widely recognised as regional Australia's best art gallery, award-winning museums, the Bendigo Pottery, Golden Dragon Museum, The Capital - Bendigo's Performing Arts Centre and Australia's oldest ongoing festival - the Bendigo Easter Festival to name just a few.

The region is also well known for its abundance of fabulous wineries, quality restaurants, al fresco dining, informal cafes, and some great pubs, wine bars and clubs.

Bendigo and the surrounding region offers an enviable lifestyle, the people are warm and welcoming and the unique combination of businesses, recreational and cultural attractions combine to make it a great place to live, work, play and visit.







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