

The Australian Industry Group

ENERGY SHOCK: NO GAS, NO POWER, NO FUTURE?

FEBRUARY 2017



About Ai Group

The Australian Industry Group (Ai Group) is a peak industry association acting on behalf of business for more than 140 years. We are a truly national employers' organisation.

Ai Group represents the interests of more than 60,000 businesses employing more than 1 million staff. Our longstanding involvement with diverse industry sectors including manufacturing, construction, transport, labour hire, mining services, defence, airlines and ICT means we are genuinely representative of Australian industry.

With more than 250 staff in offices across NSW, QLD, SA, VIC and WA, we have the resources and the expertise to meet the changing needs of our members. We provide the practical information, advice and assistance you need to run your business more effectively.

Ai Group offers members a voice at all levels of government through our policy leadership and influence. Our deep experience of industrial relations and workplace law positions Ai Group as the leading advocate on behalf of enterprises large and small across Australia.

We intrinsically understand the challenges facing industry and remain at the cutting edge of policy debate and legislative change – and strategic business management.

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Key points

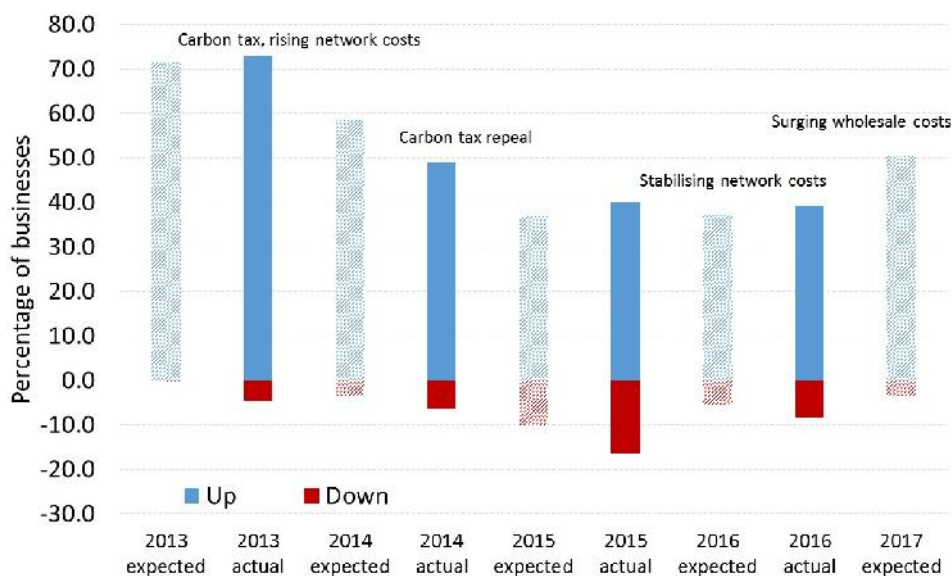
- Ai Group's recent survey findings add to the multiple lines of evidence that confirm that energy prices are rising fast across the National Electricity Market and Eastern Australian gas market. Business and households are going to see severe increases in their costs.
- Wholesale electricity prices are roughly doubling. Wholesale gas prices are at least doubling and may well rise much further. Spot prices are becoming more volatile.
- Business expect their energy prices to worsen. When surveyed in late 2016 over half (51%) of businesses expected price increases in the coming year and only 4% expected a decrease. In the past year 39% of businesses had retail energy price increases, while 9% had price decreases. Most businesses sign energy contracts of more than one year, and price increases take time to filter through. Wholesale prices have continued to worsen since the survey.
- Once fully passed through, the current electricity and gas price increases will cost energy users \$10-\$12 billion per year. Households will pay up to an extra \$3.6 billion a year, and business up to \$8.7 billion a year. Within business, more energy intensive manufacturers will be particularly hard hit, paying up to \$4 billion a year. This will worsen margin pressures for business, with some manufacturers questioning their ongoing viability as a result.
- Companies in primary metals manufacturing, food manufacturing, basic chemicals and non-metallic mineral products (including building products) are particularly exposed to a double hit to their profitability from steep electricity and gas price increases.
- Long-term gas contracts are getting harder to obtain (worsened by a non-transparent market) and onerous take-or pay provisions mean more risk for users (especially large ones).
- Several factors are driving up wholesale electricity and gas prices including the closure of some baseload electricity generators, the unprecedented LNG developments placing strain on both the gas market and the cost and availability of gas-fired electricity generators, record electricity demand related to the pumping of LNG gas, the recovery of global coal prices, and the restriction on the development of additional on-shore gas supplies.
- Achieving lower energy prices will not be easy: gas faces international price parity and rising production costs, while all new electricity generation looks expensive and new investment is needed. Easing production, an import terminal and pro-competitive market reform will help in gas. More available gas will help electricity, as will meeting the existing RET and settling national coherent energy and climate policy reforms to ease transition and reward low-cost flexibility. Energy efficiency and productivity and demand response will help with affordability and reliability for all.

What is going on with energy prices?

Businesses are reporting higher existing & expected energy prices

Ai Group’s 2017 National CEO Survey shows energy prices are heading up again for Australian businesses, with many increasingly concerned about spiraling energy costs. Prices for electricity and gas are made up of wholesale costs for the energy; charges for the networks that bring the energy to users; fees for retailers’ costs; and costs related to government policies and levies. Energy costs have been a persistent issue over the much of the last decade, with enduring price hikes caused by surging network costs, and a brief spike from the former carbon tax. Now changes in wholesale markets are bringing fresh pressure to energy prices.

Chart 1: Percentage of businesses with increasing/decreasing energy prices – actual and expected



Source: Ai Group

Rising energy prices (and reliability of energy supply) are again emerging as a key risk for Australian businesses. For 2016, 39% of businesses experienced energy price increases, only 9% experienced price decreases and around half (52%) experienced no change. Of those businesses that had flagged energy price increases, the average increase was 9%.

It should be noted since the time of the survey (late 2016), wholesale and energy futures prices have increased significantly. It would be reasonable to expect these results to be more pessimistic in early 2017.

Prices are rising for a broad range of businesses, although manufacturers seem to be feeling the most pain:

- 47% of manufacturers experienced price hikes in 2016. Of those with increased prices, the average increase was 14%.
- 39% of services businesses experienced increasing prices in 2016. Of those with increased prices, the average increase was 7%.
- 36% of construction businesses experienced price increases in 2016. Of those with increased prices, the average increase was 19%.

Expectations for energy prices in 2017 are much more pessimistic, with over half (51%) of businesses expecting price increases and only 4% expecting a decrease. Around 46% of businesses will expect no change, which may reflect that their supply contracts are not due for renewal in 2017, or that their energy prices are already elevated. Increasing costs appear to be a common theme across industries for 2017:

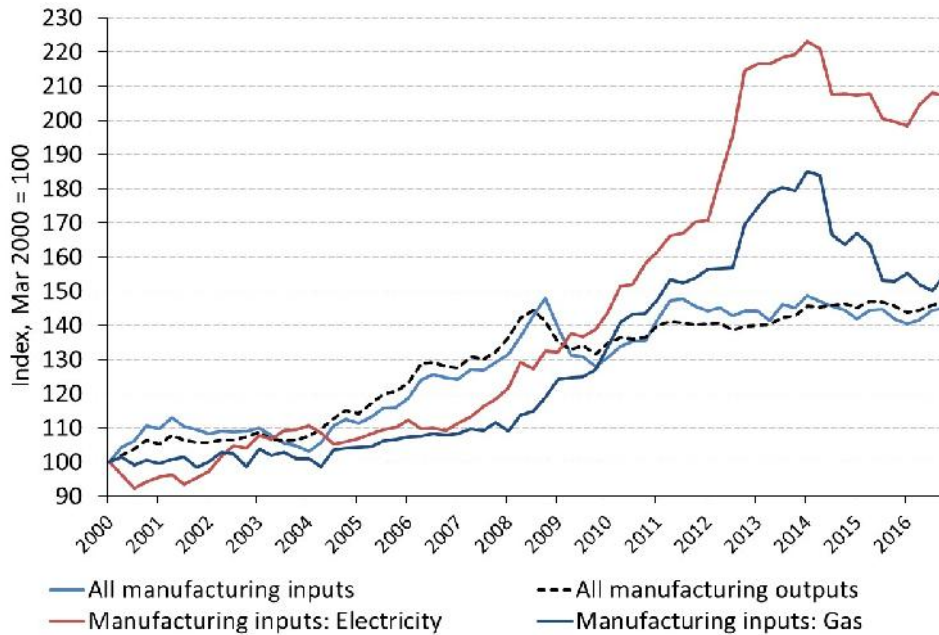
- 57% of manufacturers expect an increase energy prices, with only 6% expecting reductions.
- 48% of services businesses expect an increase in energy prices and only 3% expect a decline in prices.
- A large 63% of construction businesses expect an increase in energy costs while 7% expect a decrease.

Several businesses reported a doubling in energy prices over 2016, while others reported a staggering 200% increase (or tripling) in energy costs. Much evidence collected by Ai Group (particularly in the **Australian PMI**[®]) suggests that energy costs for businesses have been rising over much of 2016 and some businesses considering reducing their workforce or even questioning their ongoing viability as a result. Initially this evidence mostly came from South Australian businesses, but such reports have become commonplace across New South Wales, Queensland and Victoria. At a time when margins are already under pressure in an increasingly competitive business environment and limited ability to pass on rising costs, rising energy prices are causing businesses further pain.

Recent data from the Australian Bureau of Statistics (ABS) confirms that manufacturing margins are under pressure, with data from the December quarter (Q4) Producer Price Index (PPI) showing manufacturing input prices increasing 2.2% p.a., doubling the rate of increase in manufacturing output prices (+1.1% p.a.). The ABS PPI indicates that electricity input prices for manufacturers increased by 3.9% in the year to Q4 and gas prices increased by 1.1% over the same year. Although gas price increases look relatively modest, the pricing picture presented by the PPI is somewhat muddled by the inclusion of 'industrial gas manufacturing', which includes Liquefied Natural Gas (LNG) production. LNG producers now use two thirds of the gas produced in Eastern Australia, and more in the West and North, and often produce the gas themselves. Since they tend to pay a lower wholesale or imputed price than other gas consumers, the

inclusion of LNG may overwhelm the price trends experienced by other consumers.

Chart 2: Manufacturing PPI – input & output price indexes



Source: ABS

Aside from pricing pressures, reliability is also becoming a significant issue. There have been serious outages in South Australia and more recently Victoria, and in New South Wales industrial loads were curtailed during the recent heatwave. With significant amounts of valuable production at risk (or lost in some recent cases) reliability is a particular concern for manufacturers.

Wholesale electricity prices spiraling up

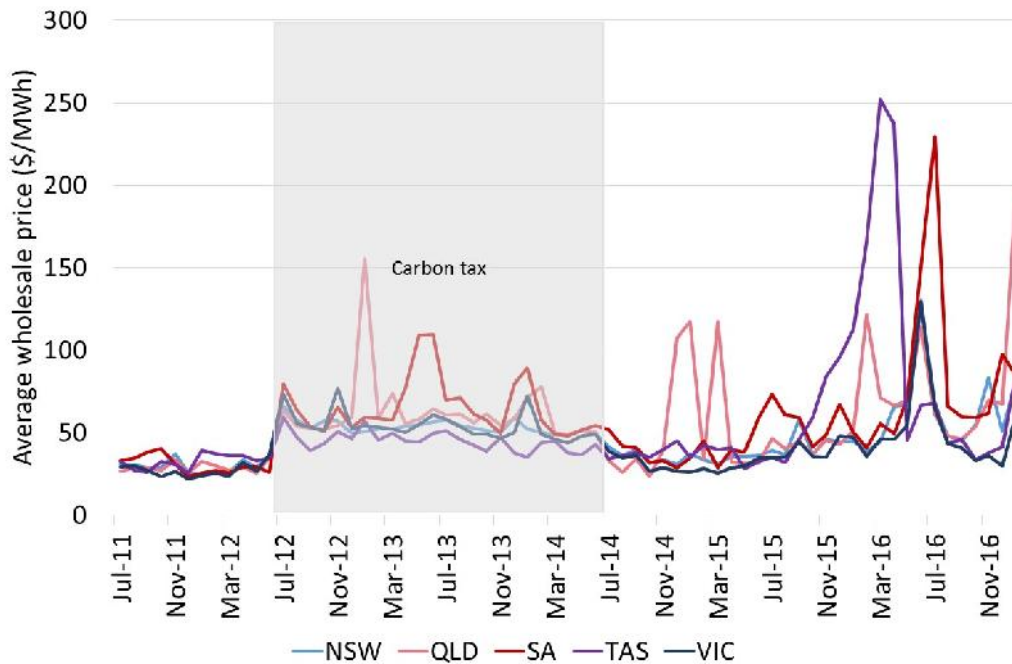
Some forecasters expected electricity prices to decline over the next few years¹, as network costs eased and wholesale electricity prices kept low to 2020 by a loose market with significant amounts of renewable generation added under the RET. Instead, electricity prices are surging, driven mainly by wholesale electricity prices.

As chart 3 shows, wholesale electricity prices rose through 2016 and they have become more volatile in recent years. This is translating into higher retail prices for users, particularly for larger business users (as wholesale electricity costs make up a higher share of their bills). Over 2016, average wholesale electricity prices increased 47% in New South Wales, 52% in Victoria, 14% in Queensland and 57% in South Australia. Spot prices appear to be surging in 2017 as well, with average monthly prices for January increasing 194% in Queensland (likely due to the combination of hot weather and significant new LNG-related electricity

¹ [Retail electricity price history and projections, Jacobs, May 2016](#)

demand), 108% in Tasmania, 107% in Victoria, and 60% in New South Wales.

Chart 3: Average monthly wholesale electricity prices

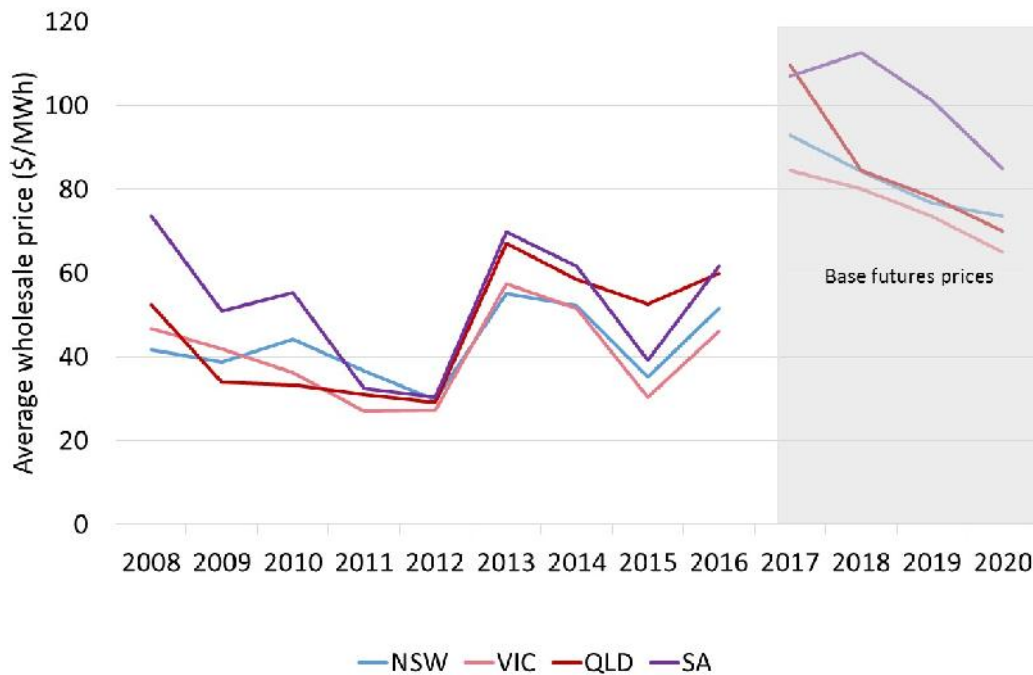


Source: AEMO

Alongside the increase in spot prices over the past year, base futures prices² for 2017 have almost doubled over 2016 levels for all major National Electricity Market (NEM) regions. This increase reflects a growing expectation among market participants of higher wholesale prices. Although futures prices are somewhat lower for the years beyond 2017/2018, they remain significantly above recent levels. The decline after 2017 may reflect the expected addition of significant amounts of generation capacity through 2020 under the Commonwealth’s Renewable Energy Target.

² Futures prices are financial contracts for a specified amount of electricity at a forward date. These represent the prices that can be contracted by retailers, generators, large users of electricity and financial market participants. Note that base futures prices are not directly comparable to historical electricity prices. Cap prices are usually added to the base futures price to reflect the total cost of wholesale electricity to the retailer. Caps are financial products designed to protect retailers from periods of very high prices in the wholesale market.

Chart 4: Average wholesale electricity prices – historical and futures



Source: AEMO, ASX Energy

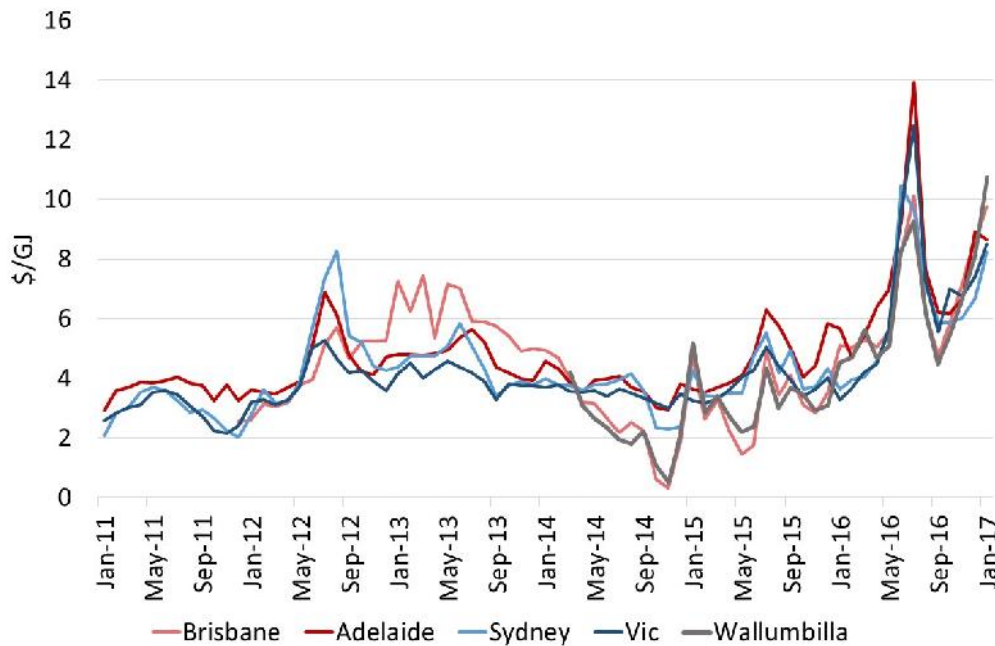
Gas prices are also surging

Business gas users (particularly large ones) are heavily exposed to wholesale gas prices – which have been surging.

The past three years have seen huge change in Australia’s gas markets. The unprecedented scale of LNG projects has drastically changed market dynamics and has generally sent prices higher, as Eastern Australia’s gas demand triples with the completion of LNG export terminals across the country. LNG was expected to link Australian domestic gas prices to higher international prices. Instead, the massive LNG developments have created supply shortages in the domestic markets and, absent the development of other gas reserves, regions such as New South Wales are facing impending gas shortages in the coming years.

The gas market remains much more opaque than the electricity market, and pricing is often difficult to determine because most gas is sold through confidential bilateral contracts. However, AEMO operates several balancing markets in Sydney, Brisbane, Adelaide and across Victoria, as well as a gas trading hub at Wallumbilla (Queensland). This allows some observation of trends in wholesale gas prices through recent years. Over 2016, average prices in the Brisbane, Adelaide and Sydney short-term trading markets have increased by 103%, 60% and 49% respectively. In Victoria, Declared Wholesale Gas Market prices have increased by 68% and at the Wallumbilla trading hub, prices have increased 86% over the year. Clearly prices are increasing in the wholesale gas markets.

Chart 5: Monthly average wholesale gas prices

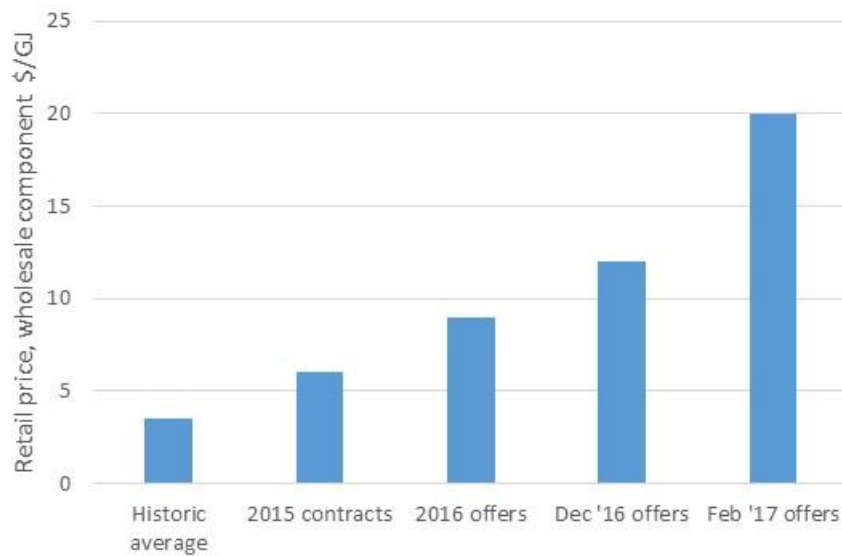


Source: AEMO

Tightness of supply was particularly evident in winter 2016, where prices more than doubled across most markets. Prices again appear to be skyrocketing in the gas markets, as the last of the LNG trains reach completion. In January 2017, prices at the Wallumbilla trading hub increased 33%, Sydney prices increased 23%, Brisbane prices increased 12% and Victorian prices increased 15%.

The low transparency of the gas market makes it difficult to measure how these wholesale prices translate to consumer outcomes, particularly given the noted inadequacy of the producer price index for gas. However, Ai Group receives many reports from Ai Group members who are taken aback by what they find when they look for gas contracts. The chart below illustrates the anecdotal experience of numerous medium sized businesses. Retail gas contracts signed in the last few years included a wholesale energy component well above historic levels (\$6 per gigajoule versus \$3-\$4). Over 2016 contracts and bridging arrangements were struck at even higher prices (\$8-\$9), and by the end of the year offers were higher again (\$11-\$12). In mid-February 2017, shortly before publication of this report, Ai Group began to receive reports that Victorian manufacturers are being offered one- and two-year contracts including wholesale gas prices of \$20 or more – four times higher than recent prices, and more than five times the historic average. It is too early to tell how widespread or lasting these extreme prices may be.

Chart 6: Anecdotes show rapid rise in gas prices offered at retail



Source: Ai Group

Why are energy prices important?

Aside from the impact on household budgets and the resulting impacts on the economy through reduced household consumption, rising energy prices directly affect businesses and the economic output they contribute to the economy. Businesses are generally more exposed to the wholesale prices for gas and electricity than households, and as such they are more exposed to the factors driving up prices recently.

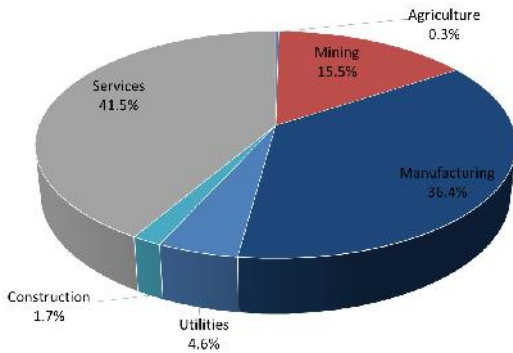
Businesses face various and complex pricing structures from retailers that vary by the size and characteristics of their energy use, as well as the distribution area the business is located in. Nevertheless, wholesale price increases are at least fully passed on to business energy users³. Also, if wholesale electricity prices are indeed becoming more volatile, retailers' costs to hedge and manage their price risk will increase and this will be passed on to customers.

Energy intensive manufacturers are among the businesses hardest hit businesses by rising energy prices. For 2014-15, manufacturers used 36% of all electricity consumed by businesses and 41% of all gas consumed by business. While most manufacturers are not energy intensive,⁴ there are many significant activities for which energy is a significant portion of input costs. This includes some, like chemical manufacturers, for whom gas is also a feedstock. Manufacturers are typically highly trade exposed with little ability to pass through cost increases to customers.

³ Usually with a percentage margin from the retailer, meaning if prices increase, so does the margin.

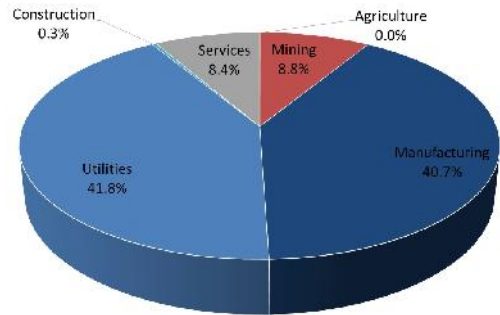
⁴ Ai Group, [Energy shock: pressure mounts for efficiency action \(July 2012\) p12](#)

Chart 7: 2014-15 Business electricity use



Source: ABS

Chart 8: 2014-15 Business gas use



While the effects extend to all sectors, the impacts of rising energy prices on manufacturers are particularly large. Manufacturing output represents around 6% of GDP, adding close to \$100 billion to the economy in 2015-16⁵, and employing over 900,000 people⁶. In 2014-15 manufacturers paid over \$4 billion for electricity and around \$2 billion for gas⁷.

In the eastern energy markets (which exclude Western Australia and the Northern Territory), the impacts from expected price increases will be large. It can be reasonably expected that any wholesale price increases will at least be passed on in full by energy retailers and these increased costs will likely run into the billions for consumers.

Table 1: Estimated price energy impacts

	\$40-\$50/MWh electricity price impact (\$billion)*	\$4-\$5/GJ gas price impact (\$billion)*	Total (\$billion)
Manufacturing businesses	2.2 - 2.7	1.0 - 1.3	3.2 - 4.0
Non-manufacturing businesses	3.2 - 4.1	0.6 - 0.6	3.8 - 4.7
Total businesses	5.4 - 6.8	1.6 - 1.9	7.0 - 8.7
Residential	2.1 - 2.6	0.6 - 0.8	2.7 - 3.6
Total	7.5 - 9.4	2.2 - 2.7	9.7 - 12.1

*Price impacts are based on 2014-15 energy demand in NSW, Vic, QLD, SA and Tas and the assumption of 100% wholesale price increase pass-through

Source: Department of Industry, Innovation & Science; Ai Group estimates

⁵ [Australian National Accounts: National Income, Expenditure and Product, Sep 2016, ABS](#)

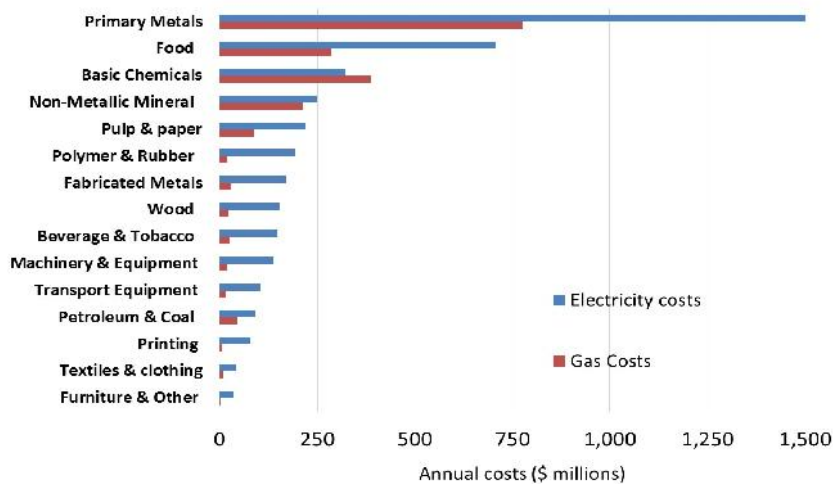
⁶ [Labour Force, Australia, Detailed Quarterly, Nov 2016, ABS](#)

⁷ [Energy Use, Electricity Generation and Environmental Management, Australia, 2014-15, ABS; Counts of Australian Businesses, including Entries and Exits, Jun 2011 to Jun 2015, ABS](#)

For electricity, if prices increase by \$40-\$50/MWh as expected, this may translate into \$5.4 to \$6.8 billion per year in extra costs⁸ for all businesses in eastern energy markets, including between \$2.2 to \$2.7 billion per year in extra costs for manufacturers. Households in these regions may also face substantial cost increases (\$2.1 to \$2.6 billion per year).

For gas, if prices in the eastern markets increase between \$4-\$5/GJ, costs may increase by \$1.6 to \$1.9 billion per year for businesses in these regions. Manufacturers would bear the brunt of this increase, with additional costs of around \$1.0 to \$1.3 billion per year. Households would be relatively less affected, although still likely to face significant increases of \$600 to \$800 million in extra costs per year.

Chart 9: 2014-15 Manufacturing energy costs



Source: ABS

Either the electricity or gas price increases would have a severe impact on their own, but they are occurring simultaneously for many businesses. Companies in primary metals manufacturing, food manufacturing, basic chemicals and non-metallic mineral products (including building products) are particularly exposed to a double hit to their profitability from both steep electricity and gas price increases. This impact will encourage increased efficiency where possible, but is also likely to make some businesses non-viable in their current form.

Further, obtaining long-term supply contracts for major gas users is already proving difficult, which may further exacerbate pricing issues. On top of this, there is the issue of increasingly common and onerous take-or-pay provisions in gas supply agreements. These provisions specify that if over a defined period the business does not use the contracted quantity of gas, they will pay for a set level of the contracted amount (usually around 80-90%, but increasingly 100%). Therefore, not only do large gas users face pressures from increasing prices directly, they also bear the risk of paying for expensive gas that they may not use.

⁸ Estimates are derived from 2014-15 electricity demand for NSW, Vic, QLD, SA and Tas from [Australian Energy Statistics, 2016, Department of Industry, Innovation & Science](#)

What is driving prices upwards?

Electricity price drivers

The current picture of Australia's electricity markets is complicated. Unfortunately, several factors have combined to send wholesale prices soaring well above historical levels and even recent expectations for future prices. The biggest are rising gas prices; the growing role of gas fired generators; and the tightening of the market as old generators retire and demand grows.

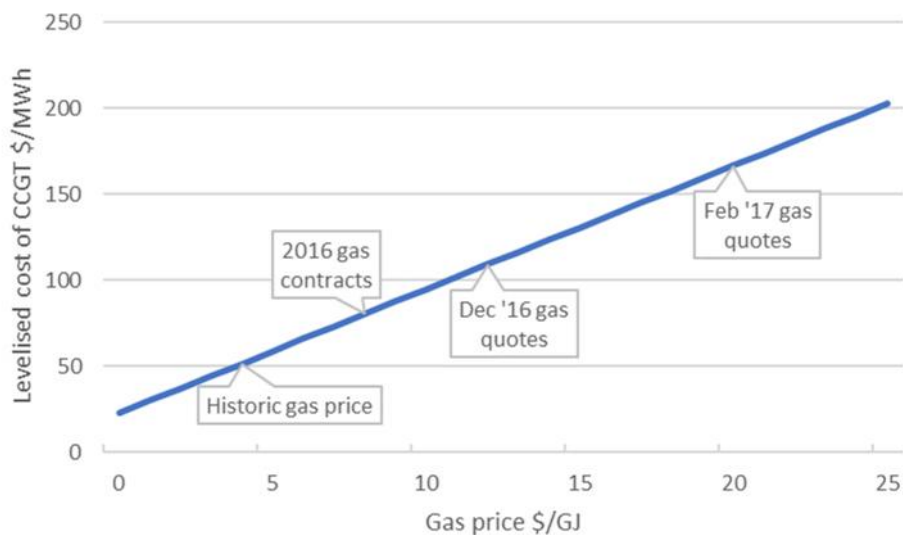
Rising gas prices are in turn having a big impact on the electricity markets, given the substantial role of gas fired generators. That role is growing alongside the increasing supply of variable renewable energy. Renewables are taking market share away from fossil fuel generators, and the remaining load to be met by fossil fuel generators is increasingly variable. Baseload coal generators are unable to respond quickly to changes in demand through the day and increasingly often must accept prices below their costs in order to keep generating. These factors, along with weak demand growth, are causing some coal generators to reassess their ongoing profitability and even decommission some of their older capacity. This further increases the role of gas generators, who can step in quickly to fill the gaps between variable renewable generation and consumer demand – particularly when demand peaks due to extreme weather.

Once built, generators have short run costs, including fuel and variable operational expenses, that they only incur if they choose to generate. The short run marginal cost of an existing black coal generator is around \$20-40/MWh. The high and rising price of gas means that existing gas powered generators will be significantly more expensive. The electricity market's design means that gas generators often set the price for the whole market. And as they generate more often with more expensive fuel this is translating into higher average prices. When a typical gas generator could get gas for \$5/GJ, the short run cost of their power was around \$60/MWh⁹. If gas prices rise to \$10/GJ, as they appear to be doing, generators' short run cost increases to around \$120/MWh. Overall, an increasing role for gas and higher gas prices are significantly pushing up average electricity prices.

The following chart shows the relationship between gas prices and the levelised cost of new efficient combined cycle gas generators. It also indicates the recent anecdotal gas prices offered to industrial users, noting that gas generators with larger demand may be able to negotiate better prices. Older or less efficient gas generators would find their costs rising faster as their gas prices rise. Gas generators will be more or less exposed to wholesale gas price movements depending on whether they have long term gas supply contracts and when they expire.

⁹ Assuming a heat rate of 12MWh/GJ.

Chart 10: Gas prices drive gas-fired electricity costs



Source: Ai Group

The closure of Hazelwood power station in Victoria (due in March 2017) will also have a significant impact. Victoria’s existing coal fired generators are among the cheapest sources of power in the National Electricity Market (NEM) and Victoria often exports to NSW, SA and Tasmania. Thus the average price across all NEM regions is likely to increase as 1.6GW of cheap generation is withdrawn from the market. As a case in point, South Australian power prices have increased significantly since the removal of the Northern coal fired power station from the grid in May 2016 (see chart 2).

Along with some supply withdrawal, we have also seen record peak demand levels reached in Queensland as the LNG industry comes fully on line. Thus the supply demand balance across the NEM is becoming tighter. This is contributing to higher wholesale prices, as well as generally more bullish expectations for electricity prices in future.

Another part of the story is the rebound in coal prices, particularly for black coal generators in the Hunter Valley in NSW. With export opportunities looking far better than in previous years, this is driving up running costs (and opportunity costs) for black coal generators and therefore adding further upward pressure to electricity prices.

Gas price drivers

The Queensland LNG projects have placed enormous pressure on the Eastern Australian gas market. International buyers of LNG on spot markets have recently been paying considerably lower prices than have Australian buyers of domestic gas¹⁰. This is somewhat counterintuitive, given general expectations that Australian gas markets would become more internationally linked with the commencement of LNG exports. But LNG exporters are contractually bound to export huge volumes of gas, twice the size of all Eastern domestic demand combined. With gas production growth lagging hopes and exporters snapping up whatever they can to meet their obligations, domestic supply has come under strain.

In addition to this, the NSW, Victorian and Northern Territory governments have placed bans, exclusion zones or moratoria on onshore gas field developments in response to intense concerns from parts of the community and campaigning by activist groups.

Thus, a combination of restricted supply and increasing demand is serving to push up prices for the Australian gas markets, in many cases even higher than expected under export parity. In NSW in particular, future gas supply adequacy is also in doubt. Higher gas prices force many large businesses to re-evaluate their long-term viability in Australia, and the possibility of supply disruptions has the potential to cause economic loss.

In addition, the underlying cost of producing new gas resources has increased. ‘Unconventional’ gas production from coal seams, ‘tight’ low-permeability geologies and shale formations require more drilling and more frequent replacement of wells, often using hydraulic fracturing (‘fracking’). Australian unconventional gas production lacks both the economies of scale and the co-produced oil of the American shale gas industry. Thus even if international prices were to stay suppressed and local supply were to improve, the ‘floor’ under Australian gas prices is significantly above historic levels.

The situation in Australia’s gas markets is grim. With a lack of transparency and price certainty, both suppliers and users are reluctant to sign long-term contracts that could underpin the development of other sources of supply. And oil and gas businesses have responded to low global prices and financial pressure by reducing their worldwide and Australian investment in exploration and development. The price for gas is certainly under no downward pressure for the foreseeable future.

¹⁰ <http://www.abc.net.au/news/2016-08-01/gas-prices-higher-in-australia-than-in-export-destinations/7680106>

What are the options?

Electricity prices

There are several angles from which to approach lower electricity prices. Electricity demand (and prices) can be moderated by greater efficiency and productivity in how we use energy. Price response will deliver some of this; many were surprised by how strongly consumers responded to the last major burst of electricity price hikes in 2010-13. Further reductions can be driven through well-designed policies, including State efficiency schemes, support for audits, product standards and more, that have benefits both for direct participants and the wider market. However, it is also possible that other factors increase electricity demand, including through fuel switching from gas to electricity if supply challenges persist, or through growing use of electric vehicles and plug-in hybrids. Efficiency measures could still leave demand lower than it otherwise would be, but are not a complete solution.

On the supply side, some mothballed generation capacity can be returned to service, and new generation can help. But plants like Hazelwood and Northern are retiring for strong reasons, including age and reinvestment requirements, and the physical and financial difficulties inflexible generators face in a market marked by frequent oversupply and occasional shortage.

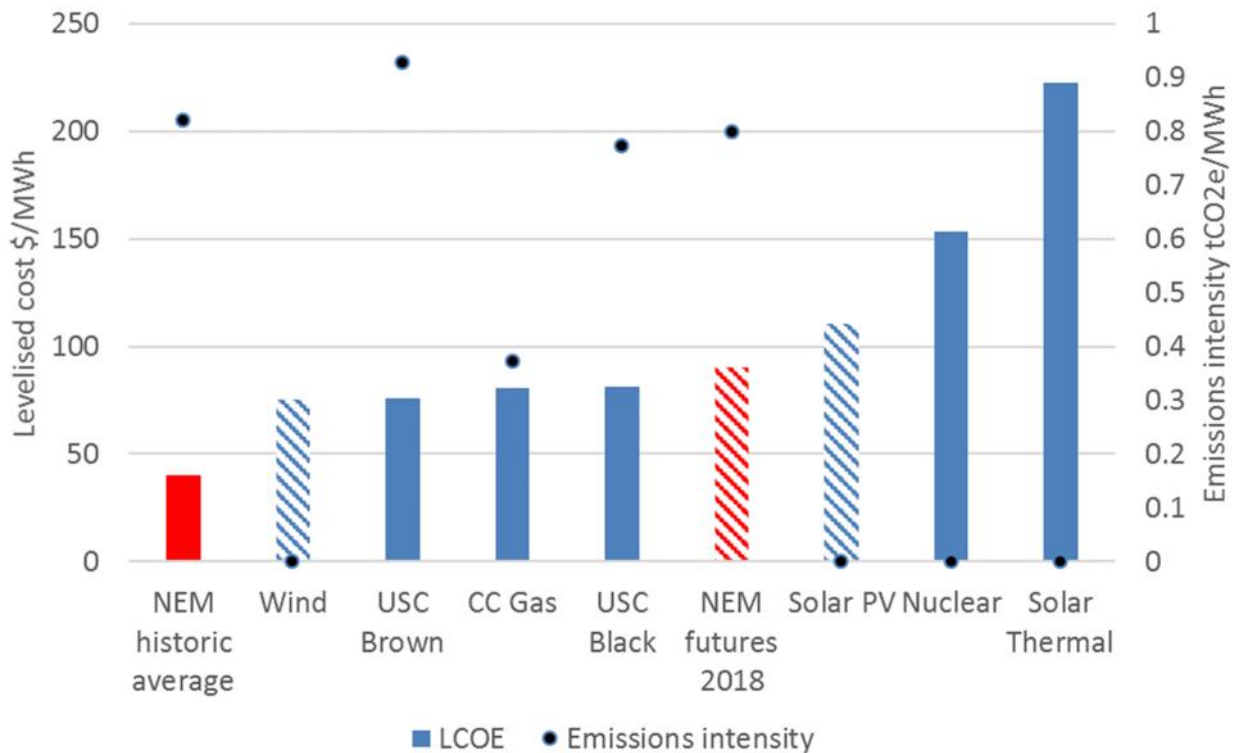
Substantial new renewable capacity is planned under the Commonwealth RET and will put some downward pressure on wholesale prices. Further renewable capacity driven by various State proposals could increase this pressure. But there are limits to the suppression of prices through cramming in extra supply, since this eventually pushes out vulnerable incumbents and returns prices to an equilibrium. Looking to the longer term, market forces and climate goals are likely to make conventional coal and, eventually, gas power unviable, and bring on lots of renewables. But renewables remain variable and intermittent. Low-cost ways must be found to turn an intermittent abundance of energy into a dependable resource when we need it. And the underlying cost of generating electricity needs to be pushed as low as possible if we are to be competitive.

The emerging electricity system depends on flexibility and multiple reforms must encourage and reward that flexibility. Demand side response can reduce demand at critical periods to deliver several energy services and limit wholesale prices. Energy storage can time-shift supply, stabilise the system and substitute for investment in peak capacity for generation or networks. Technologically and geographically diverse generation and stronger interconnections can reduce the impact of intermittency.

Recent projections suggest the levelised cost of all Australian options for new-build generation is at least twice to three times the typical market prices of the past two decades. Contracted prices for actual new builds in Australia, and even more so overseas, suggest we could do much better than this. While technology costs for solar, wind and batteries are being driven down every year, urgent work is needed to determine whether Australia faces structurally higher costs to build new energy than other economies

– and if so, how we can close the gap. Finance costs and construction productivity seem an important focus for improvement.

Chart 11: Estimated levelised costs of new build generation



Source: combines Australian Power Generation Technology 2015 levelised cost estimates (combined cycle gas, ultrasupercritical black and brown coal, nuclear and solar thermal), recent Australian levelised costs for new wind projects (ACT wind auction) and solar projects (ARENA large scale solar round), AER data on historic wholesale electricity prices, and ASX Energy base futures contracts as at February 2017. Note that wind and solar costs have been falling rapidly and estimates have a notoriously short shelf life.

Gas prices

In easing the pressure from the tight supply-demand balance in gas markets (and prices), two steps may help:

- Encourage lower demand through energy productivity and fuel-switching away from gas.
- Encourage greater supply through easier production and perhaps an import terminal.

These all have some potential to ease the current tightness in our market, with benefits for price and ability to get workable supply contracts. There are many ways to use gas more efficiently in homes and businesses; high prices will push some to invest in productivity, and policies like New South Wales’ Energy Savings Scheme can assist others to do so.

Eastern Australia has substantial identified gas reserves that could be developed if blanket bans on coal seam gas and fracking were replaced with firm regulation of water impacts and fugitive emissions. And

an import terminal could ensure access to large new volumes of gas at the going international rate in a world awash with supply.

Still, there are limits on what these steps can achieve. Domestic supply and demand are significant price determinants now, but a sustained recovery in global oil prices would lift East Asian gas prices and restore the relevance of export parity prices. The rise in the underlying cost of producing local gas puts a floor under sustainable prices. Large reductions in domestic gas demand would also put pressure on gas network infrastructure to charge higher prices to recover their costs on lower volumes; beyond a certain point, either commercial and regulated network assets lose their value, or higher network charges outweigh lower wholesale prices. It is important to note that a 'death spiral' where reduced demand raises network charges, leading to more reduced demand and more price rises, is much more plausible for gas networks than for electricity.

Higher investment in local production will need investors with deep pockets, which is more likely if and when global oil prices rise – which will in turn support high prices here. An LNG import terminal would cost several hundred million dollars, which would need to be recovered from consumers, and would forge an even tighter link to international prices.

All told, even with these positive steps, much more expensive gas seems likely to become the new normal, with prices unlikely to fall below \$8-\$10 per GJ again.

Gas will continue to play a significant role in the electricity market, and over the medium term that roles will grow as old coal plants retire and renewable energy generation increases. Sensible steps to contain gas price rises and bolster supply will have benefits for electricity.

Appendix: CEO Business Prospects survey 2017 participants and questionnaire

Responses were received from the CEOs of 285 private-sector businesses across Australia in October and November 2016. Together, these businesses employed around 38,000 people (130 people each on average) and had an aggregate annual turnover of around \$26 billion in 2016.

All Australian states and territories, and all major non-farm private-sector industries are represented in this year's CEO survey. The manufacturing sector contributed the highest proportion of respondents (58.3%). Manufacturing's share of this sample is higher than its share of national production (6.0%). Victoria was somewhat over-represented in the sample, relative to other states.

The data presented in the summary section of this report were weighted by industry (based on ABS estimates of their value-added contribution to GDP in 2016) in order to adjust for these characteristics of the sample. The analysis for each of the industry groups is not affected by the sample composition.

CEO Survey: Business Prospects 2017			ABS data (2015-16)
Industry	Number of respondents	% of respondents	Value added output, % of GDP
Mining services	9	3.2	0.5
Manufacturing	166	58.2	6.0
Construction	36	12.6	8.1
Services	74	26.0	52.9
Total	285	100.0	64.5*

CEO Survey: Business Prospects 2017			ABS data (2015-16)
State	Number of respondents	% of respondents	Gross state product, % of GDP
NSW	78	27.4	32.5
Vic	122	42.8	22.6
Qld	42	14.7	19.1
WA	4	1.4	14.5
SA	24	8.4	6.1
ACT	10	3.5	2.2
NT	2	0.7	1.4
Tas	3	1.1	1.6
Total	285	100	100

The services sectors represented in this sample include: IT, communications and media services; transport, post and storage services; wholesale trade; retail trade; finance and insurance; real estate and property services; professional services; administrative services; health and welfare services; education; hospitality (food and accommodation services); arts and recreation services; and personal services.

* These industries do not sum to GDP due to the exclusion of utilities (2.5% of GDP), public administration and safety services (5.4%), agriculture (2.1%), mining other than mining services (6.5% of GDP), ownership of dwellings (9% of GDP) and other additional statistical items that are included in GDP.

3. In which industry does your business mainly operate? Please tick one box only, for your main activity

Mining and/or mining services (e.g. exploration, mining engineering or mining processing)

Manufacturing (e.g. making food, beverages, chemicals, equipment, building materials, metals, textiles, furniture)

- Construction (e.g. engineering, infrastructure, commercial, residential construction or contracting)
- Services (e.g. retail, wholesale, transport, professions, real estate, IT, media, health, education, cafes, hotels)
- Other industry (please specify): _____

4. What was your approximate annual turnover in 2016? \$ _____

5. How many people did you employ in 2016? _____ people

6. If exporting, what was the total value of exports for your business in 2016? \$ _____

7. Approximately what percentage of all your inputs (by value) were imported in 2016? _____%

8. By what percentage did the following factors change in your business in 2016, compared to 2015?

<i>Please complete one box only for each of:</i>	Down (write in %)	No change (tick if applicable)	Up (write in %)
Annual turnover	_____ %	<input type="checkbox"/>	_____ %
Gross profit margin	_____ %	<input type="checkbox"/>	_____ %
Number of employees	_____ %	<input type="checkbox"/>	_____ %
Spending on staff training & development	_____ %	<input type="checkbox"/>	_____ %
Spending on physical capital (e.g. buildings)	_____ %	<input type="checkbox"/>	_____ %
Spending on research & development	_____ %	<input type="checkbox"/>	_____ %
Spending on new technology	_____ %	<input type="checkbox"/>	_____ %
Export income	_____ %	<input type="checkbox"/>	_____ %
Input prices	_____ %	<input type="checkbox"/>	_____ %
Energy prices (inputs)	_____ %	<input type="checkbox"/>	_____ %
Selling prices	_____ %	<input type="checkbox"/>	_____ %
Labour productivity (output per hour worked)	_____ %	<input type="checkbox"/>	_____ %
General business conditions in your sector	<input type="checkbox"/> Worse	<input type="checkbox"/> No change	<input type="checkbox"/> Better

9. If your labour productivity changed in 2016 (up or down), what were the main factors? Please list factors

10. Did you change any parts of your business model, plan or strategies in 2016 due to business conditions?

- Yes No we don't have a formal business model, plan or strategy

If yes, what did you change in 2016? _____

11. IF your business was EXPORTING in 2016 or is planning to export in 2017, at what AUD/USD exchange rate do your exports become uncompetitive with products from other countries? _____ US cents

12. IF your business was competing with IMPORTS in the Australian market in 2016, at what AUD/USD exchange rate do your products become uncompetitive with imported products from other countries? _____ US cents

13. Do you expect the following factors to change in your business in 2017, compared to 2016?

<i>Please tick one box only for each of:</i>	Down	No change	Up
Annual turnover	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Gross profit margin	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Number of employees	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Spending on staff training & development	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Spending on physical capital (e.g. buildings)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Spending on research & development	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Spending on new technology	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Export income	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Input prices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Energy prices (inputs)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Selling prices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Labour productivity (output per hour worked)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
General business conditions in your sector	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

14. What key growth strategies do you plan to implement in your business during 2017?

Please rank all relevant strategies, starting with 1 as your most important strategy

Introduce new products/services _____	Downsize / reduce operational costs _____
Improve sales of current products/services _____	Increase online presence / capability _____
Develop new domestic markets _____	Increase advertising / marketing _____
Develop new overseas markets _____	Other (please specify): _____

15. What factors do you expect will inhibit your business growth in 2017?

Please rank all factors that are inhibiting your business, starting with 1 as your most important inhibiting factor

Lack of customer demand _____	Government regulatory burden _____
High and/or variable exchange rate _____	Competition from imports / internet sellers _____
Flexibility of industrial relations _____	Wage pressures or high wage costs _____
Skills shortages _____	Other (please specify): _____

