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Dear Sirs

NSW Energy Security Taskforce

Introduction

CSR Limited, headquartered in North Ryde is a manufacturer of building products and sits in the Top 100 ASX index. The company operates a number of divisions including, CSR Bradford™, PGH Bricks, Monier Roofing, CSR Lightweight Systems which includes Gyprock™ Plasterboard, fibre cement sheeting, ceiling tiles, Hebel and the glass division, Viridian™. The company employs approximately 3700 people across all states and territories. It manufactures or processes product in every state and territory. On the east coast the company purchases over 6 Pj of gas per annum and 300 GWh per annum of electricity. In addition, CSR has an effective interest in the Tomago Aluminium smelter of 25.2%.

In New South Wales the company employs circa 2,000 people across 20 factory sites and 40 distribution & trade centres. The major energy consuming sites are Bradford glass wool insulation at Ingleburn, Gyprock plasterboard and fibre cement sheeting production at Wetherill Park and PGH bricks at Horsley Park, Schofields, Cecil Park, Bringelly and Albury. Gas usage for NSW is about 2.5 Pja and electricity consumption is approximately 150,000 MWh. (Excluding the more significant usage at the Tomago Joint Venture aluminium smelter).

Several of the company's facilities are treated as Emissions Intensive Trade Exposed (EITE) for the purposes of RET exemption. In NSW, this includes the Bradford glass wool insulation factory at Ingleburn.

CSR is strongly impacted by energy and carbon policies, market structures, and reliability of supply. Energy was a competitive advantage against import competition for many years. Recently this has turned to a competitive disadvantage for both power and gas. Furthermore, the company's brick facility has been impacted by power outages in South Australia and production was curtailed at the Tomago smelter near Newcastle in February 2017 when AEMO issued alerts due to a lack of generating capacity in NSW and potential gaming of the system.

Expenditures on Energy in NSW

- CSR Building Products national energy expenditure increased by $20m to $90m in the last two years.
- This is projected to increase by 25% in the next 12 months, with higher increases in electricity where commodity charges are the main reasons for the increase.
- Reliability has declined, where the Tomago smelter was required to curtail pot lines in early February 2017.
- Some years ago, production was temporarily closed at Wetherill Park plasterboard due to a gas shortage.

Key messages

- Improvement is required in the communication and implementation of electricity load management procedures during periods of electricity system security events for manufacturing sites such as our Bradford glass wool factory in Ingleburn, that are reliant on electricity on an uninterruptible continuous process to prevent major material damage to plant. The network provider should be in regular contact with these sites during these periods.
- These emergency procedures should then be practised regularly. We recommend this occur in October each year prior to the summer months so that participants are aware of what needs to happen and systems both at state and factory level can be improved.
- Natural gas is important and needs to play a key role in electricity generation to provide capacity as a base generator and flexible generation to compensate for the variability in wind and grid scale solar generation.
- The NSW generation fleet is ageing and in need of replacement.
- NSW as an importer of gas is vulnerable economically, with increasing dependence on decisions made elsewhere and not necessarily in the interests of the State.
- Cybersecurity has received insufficient focus in Australia, particularly as it relates to the electricity network and is another risk to the resilience of the NSW electricity system that would be compounded in extreme weather events.

Case Study

Glass wool is produced by converting raw materials into glass in an electrically heated furnace and spinning glass fibres which, using a binder, are formed into insulation blankets and batts. These are used to insulate houses and factories. Insulation is compressed into bales and transported in quantity by containers. CSR Bradford manufactures glass wool insulation products in Brendale, Queensland and Ingleburn in New South Wales. These are modern factories and they consume 90 GWh and 0.3 Pj of gas.

Glass wool is produced in electric furnaces. For instance, the Ingleburn furnace is rated at 4MW. The site employs 92 people and electricity comprises about 8.5% of the cost of goods sold. The factory contributes about $15-20m pa to the local community. The glass furnaces require stable operating conditions. To produce specification product and avoid coating the furnace refractory walls with glass it is critical that power is provided to the facility 24/7 every day of the year. These furnaces are only shut down for a complete re-build every 8 years. In an unplanned power outage, it becomes a race against time for the operators to cut production, and introduce gas on an emergency basis to prevent the furnace going cold thus stopping the product from solidifying in the furnace. If the temperature drops below 850°C the furnace lining loses electrical conductivity and the glass solidifies. Any instability in electricity supply can cause this to occur in a power

outage. The consequence is that a new furnace is required and this has a 6-month delivery time and a $3m replacement cost, not to mention the cost of lost sales, estimated at $24m. Unstable power can lead to loss or degradation of product, causing additional costs to the business through the costs of producing unsaleable product and missed sales. The business is evaluating whether to install back up emergency power to protect both the asset and market supply capability. Confidence that the gird in NSW can reliably deliver is low.

On the 10 February 2017, CSR received notification from its electricity retailer that AEMO has notified market participants of the potential shortfall of generation capacity in NSW that could result in power outages across the state. CSR was informed that this would occur at the network level and our retailer would have no visibility or control over the area or the restoration times. The glass wool factory did not receive any communication from the network provider on the likelihood of this impacting the site and this made it difficult to plan contingencies such as bringing on-site a diesel back generator which would require additional labour and result in additional cost.

CSR would strongly recommend that during these periods, network providers should be in regular contact with these sites that are reliant on electricity to run on an uninterruptible continuous process to prevent material damage to the plant. Emergency procedures should be practised regularly prior to the summer months so that participants at all levels are aware of what needs to occur and what systems can be improved. This needs to involve not only the large electricity generators and retailers, but also sites that are reliant on electricity and where the impact on a loss of power could result in business closure.

Other Impacts on CSR Manufacturing in NSW.

- **Brick Production:**
  In relation to the bricks and roof tile business the energy costs of manufacturing will see an accelerated decline in competitiveness of bricks in the market for building products. While bricks are not currently imported, increasingly there are some imports of terracotta roof tiles from Europe. The competition for bricks will not be imports, which unlike insulation are heavy and difficult to transport by container. Other imported light weight products will substitute for bricks. This will include Hebel autoclaved aerated concrete blocks, light weight cement sheeting and cladding and other walling systems. Where products are less subject to imports e.g. plasterboard and other products, the higher cost of energy is passed through to builders and ultimately to home buyers in the higher cost of housing. Brick factories are subject to similar concerns as insulation. Bricks are baked in gas fired furnaces in NSW. As demonstrated in South Australia, a power failure means that brick production is halted and off-specification bricks are produced. These go to waste and production time is lost.

- **Plasterboard/Fibre Cement Sheeting**:
  These production processes operate at lower temperatures than brick or insulation furnaces and are less impacted physically by a power or gas failure. However, product quality is enhanced by long run stable operating conditions and any energy failure will inevitably be accompanied by off-grade product, disposed to land fill.

Natural Gas Generation plays a Critical Role:

Natural gas based generation plays a critical role as a provider of base line generation and variable generation to support renewable generation such as wind and grid scale solar generation where they are the only affordable form of new power generation. However, renewables come today without services contribution and are intermittent. So far, the market for intermittency and services has not delivered, particularly in South Australia. It is not clear how much higher the commodity price must be to justify coverage of intermittency. Given gas is the most likely short term stop gap electricity prices will need to rise further, based on the high cost and low availability of gas.

Gas is problematic because there is no competition in retail supply and few other options for sourcing. CSR had confidential studies conducted on the future gas market. These conclude that based on 2P probable and proven reserves that shortages are likely to emerge from 2018, increasing over future years as gas discoveries and production declines lag the market demand for LNG contracts.

The situation faced by South Australia when combined with the closure of Hazelwood, increases the pressure on power reliability in New South Wales. The incident in early February this year, demonstrates that NSW is on the precipice on shortage of generation capacity leading to unreliability of supply.

Natural gas is no longer readily available in Australia due to the large volume exported by integrated entities. Due to a deficiency in policy in this area, these entities were not required to ensure the domestic market was capable of meeting their supply needs prior to commencing construction of LNG terminals. The enormous shortfall to meeting the requirements of domestic power and industry is having significant ramifications:

- A handful of economic interests control almost three quarters of current reserves, while a small group of six control almost 90% of Australian gas production (CSR commissioned research). Now, only a small fraction of available reserves is available to the Australian domestic market. The domestic market for gas has become a residual market to exports. The large producers are only interested in filling the LNG trains and using domestic gas which has come out of contract to meet their contractual obligations. Any semblance of competition at the retail level has disappeared with take it or leave it offers.

- **We welcome the recent intervention by the Federal government however this will only be effective at averting a crisis at times of peak demand for electricity and gas. This is unlikely to have immediate impact on the skyrocketing prices.**

More supplies and more suppliers are required. A pre-cursor to this is to share the economic benefits of gas exploration and production. This would involve incentives for landholders, immediate neighbours and the local community. South Australia has taken a lead on this. Under such a scheme, a portion of State royalties or current payments to landholder and communities schemes should be directed to each impacted tier via incentive payments based on proximity to gas developments.

The scheme should be replicable, scalable and able to be localised, but benchmarked against other regions or jurisdictions.

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- Given the apparent community mistrust of gas producers, which will take a long time to remedy, a communications strategy should be led by government and draw in expertise from across government agencies including Health, EPA, Industry, Resources and Energy and Treasury, as well as external, independent experts. This will enable lifting the technology based restrictions on exploration and production.

- The NSW Government should prioritise the most advanced gas projects in the State to develop greater self-sufficiency and reduce reliance on gas imported from other States.

Cybersecurity in Electricity system is Vulnerable

- Cybersecurity has received insufficient focus in Australia, particularly as it relates to the electricity network. Energy assets should have their own computer network segregated from the internet. All equipment and software connected to the segregated network should be thoroughly tested for flaws and bugs. No untested software or devices should be connected.

- There is a strong need to address the impact of aging generation assets, inefficiency, and outages. The current fleet of generation plants are simply no longer up to the job, probably beyond maintenance in many cases, and therefore in many cases in need of wholesale replacement. This is the best form of guarantee of performance reliability.

- As a shareholder in the Tomago smelter we are aware that of regular issues through Liddell. The whole network suffered in February 2017 with some Liddell generation being offline at a critical supply time.

- NSW is an importer of energy, and as aging coal fired generation is taken off line the State will be increasingly dependent and vulnerable to changes in policy in other States. Prices in NSW are driven in reasonable measure by what others decide to do – such as Government support for Portland, but not Tomago, and the policy change decided in Paris to close Hazelwood. NSW energy policy and security is at the mercy of others' decision-making. In the case of Portland Government assistance kept the facility running at the same time as Hazelwood was closing. No additional supplies of power or services have offset this. In other words, the market witnessed Government sanctioned reductions in services and increasing power prices.

- The incident in February demonstrates that NSW is on the precipice of a shortage of generation capacity leading to unreliability of supply. The State urgently needs a strategic review to address the current circumstances of high dependence and vulnerability. It must develop a transformation program to increase performance reliability, reduce economic vulnerability and security, recognising and acting on the importance of generation asset quality. The State must support a program of asset replacement in addition to new clean generation and the increasing interest in NSW own home generated supply and storage.

Conclusion

In conclusion, improvements need to be made in the way the electricity network provider communicates load management practise to sites that rely on electricity on an uninterruptable basis where sudden loss of power would lead to major equipment damage and risk site closure resulting in loss of highly paid skilled jobs. These emergency procedures should also be regularly tested and involve a broader group.

As the largest manufacturing state the issue for NSW is acute. Gas which can play a role in electricity generation, grid services and back-up for intermittent renewables, is imported from other states. NSW receives no benefit and only disadvantage from the LNG export facilities via higher prices. If energy intensive manufacturing leaves NSW it is not likely to return – even if prices revert to sustainable levels – because of high costs of project construction, loss of skills and supporting supply chain, and higher risk premiums.

NSW requires a strategic program to deal with the ageing and unreliable generation fleet and loss of control over the supply of power and services, arising from decisions taken by others elsewhere on the grid. NSW must have a plan to deal with its own State interests including self-sufficiency in gas production and supply by developing the resources that currently stand ready to maintain manufacturing in this state.

Yours faithfully

Rob Sindel
CEO and Managing Director
CSR Limited