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Gas and the Wide Bay Burnett Economy

Gas exploration is being undertaken in the Wide Bay Burnett region. Development of gasfields would present a risk to the region's diverse services, tourism, agricultural, and manufacturing economy

Report prepared for Lock the Gate Alliance

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October 2018

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Summary

- Blue Energy is exploring for gas in the Wide Bay Burnett region, a region that features high-value horticulture and sugar cane crops and the World Heritage-listed Fraser Island.
- The Region's economy is a diverse mix of modern education and health services (30% of employment), tourism (10%), agriculture (7%), and manufacturing (6%).
- Gas companies in Australia have a history of exaggerating the economic benefits of gas field development to local regions while ignoring any real economic and social costs.
- Shale gas development in the Wide Bay Burnett region would produce a short-term boom and bust cycle that would alter the Region's industrial structure.
- The short-term economic conflicts during a gas boom include outbidding for housing and workers, which cost other local businesses and can lead to the departure of long-term residents.
- Analysis of previous Queensland gas development estimated that for every gas job 1.8 jobs in agriculture were lost. Surveys also show that the high rents in Miles, which tripled temporarily during the gas boom, forcing many locals to depart for the long-term.
- The $1.2 billion agricultural economy of the region is dominated by sugar ($200m gross value), fruit and nuts ($400m), and vegetables ($210m), which are particularly prevalent in coastal areas subject to gas exploration permits.
- Studies of other gas areas reveal that 155 coal seam gas wells on 11,500Ha of agricultural land reduced output by 7% on average, indicating the potential size of direct externalities on agriculture from gas development in the region.
- Survey results in other gas boom towns show that after the boom and bust the gas industry is generally "tolerated" with only 6% of residents believing the gas industry changed the community for the better.
- Any gas developed in the Maryborough Basin will be for export through the Gladstone port, and thus have no effect on local energy security or affordability.
- Royalties to the state from gas have been be far less than forecast by officials and promised by the gas industry. In 2016, for example, royalties were only 6% of the forecast $561 million.

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Background

Blue Energy have three petroleum exploration permits in the Bundaberg Regional Council and Fraser Coast Regional Council areas (the 'Region') covering 2,984sq.km of the Maryborough Basin which they believe contain coal seam, and deeper shale gas, reserves (Figure 1). At present there is no petroleum extracting activity in the region, though it is expected that substantial gas exists in the Tiaro Coal Measures, Gregory Sandstone, the Maryborough Formation and the Burrum Coal measures. Any gas developed in the Maryborough Basin is proposed to be liquified and exported at Gladstone LNG export hub.[1]

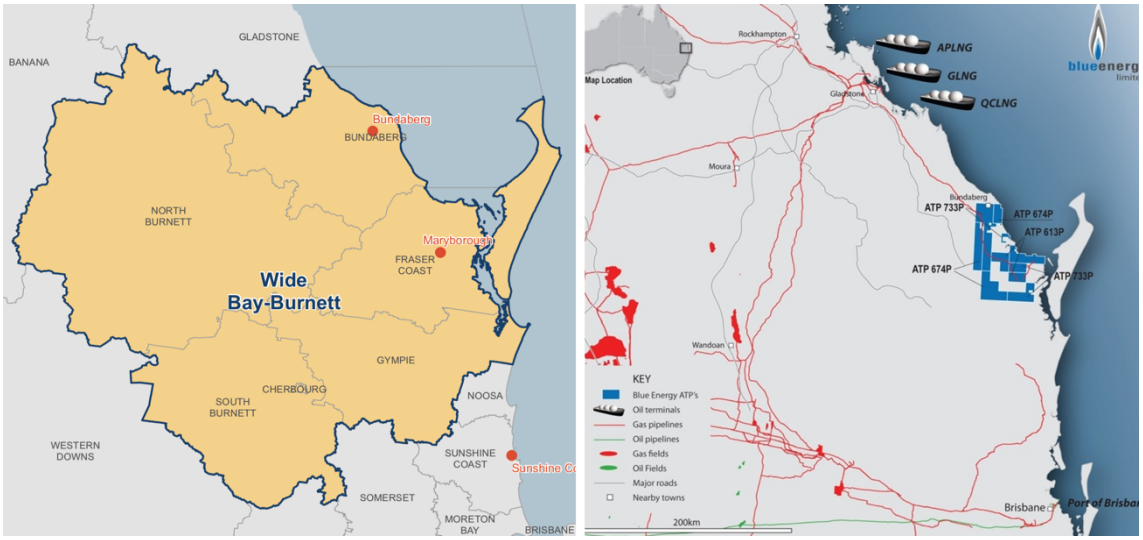

Figure 1: Wide Bay Burnett and councils map, and gas exploration locations[2]

While gas companies often promise that the development of gas fields creates substantial regional economic benefits, the reality of gas development in Queensland has been that the promised benefits are just that, promises. This report serves as a reality check on the likely changes to the economic structure of the Region in the event of coal seam and/or shale gas development. To counteract the positive spin of the gas

[1] Joynson, T. (2010). *Blue energy to start drilling.* Fraser Coast Chronicle. 8 Dec 2010. https://www.frasercoastchronicle.com.au/news/blue-energy-coal-seam-gas-fraser-coast-council/716542/

[2] Blue Energy. (2018). *Maryborough Basin.* https://blueenergy.com.au/project-view/maryborough-basin-5?popup=true and
Department of State Development. (2018). *Wide Bay Burnett Region.* http://www.coordinatorgeneral.qld.gov.au/resources/factsheet/regional/wide-bay-burnett-region-fact-sheet.pdf

industry, this report takes a more considered look at effect of gas development on the established economic and social fabric by first understanding the current economic structure of the Region and drawing on experiences with gas development elsewhere about what sort of changes can be expected.

Economic structure of the Region

EMPLOYMENT AND ECONOMIC VALUE-ADD

Employment in the Region is currently dominated by the service sector, with over 30% of employment in health and education services. The health sector (18%) feature Bundaberg and Maryborough Base Hospitals, while the education sector (12%) features Central Queensland University in Bundaberg and University of the Sunshine Coast in Maryborough. Agriculture and manufacturing are the next biggest employers with 13% of employment combined.

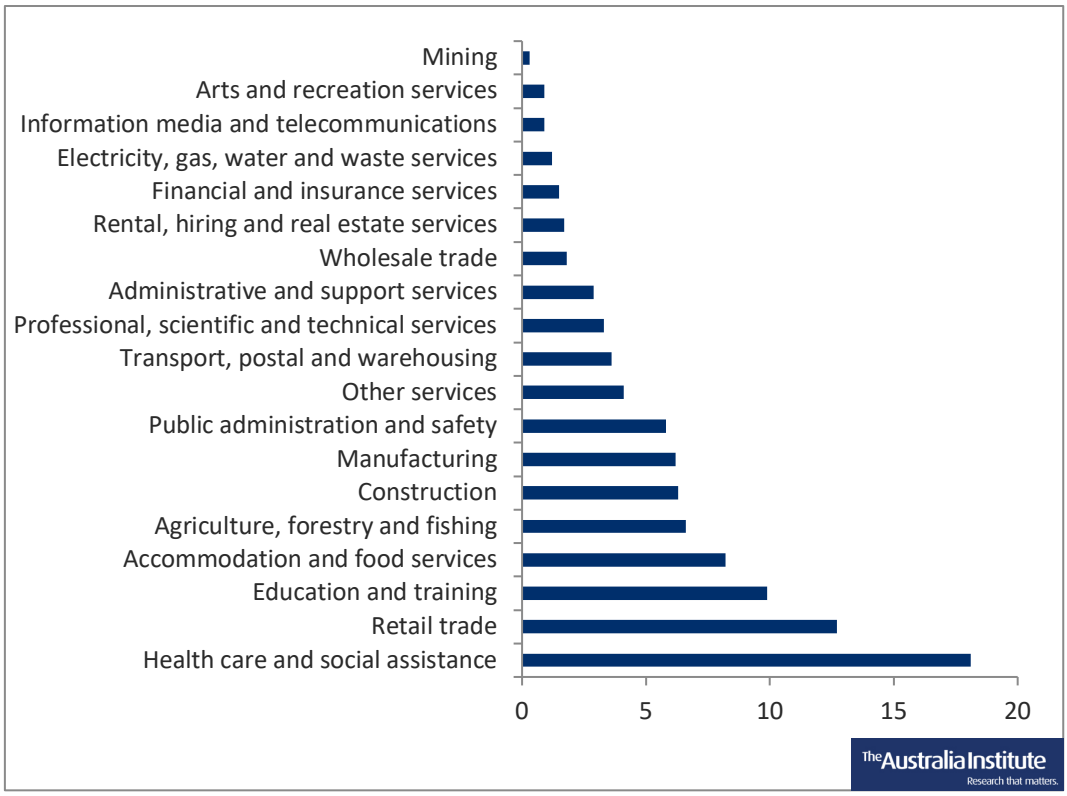

Figure 2: Share (%) of workforce by industry in the Region[3]

In Figure 2 the ranking of major employment sectors in the Region is clearly shown. Notice that mining is at present a negligible employer, covering only 0.3% of the labour

[3] ABS. (2016). *Census of Population and Housing, 2016, Working Population Profile - W09 (place of work).* Custom region via Queensland Government Statisticians Office https://statistics.qgso.qld.gov.au/qld-regional-profiles

force, and implying that the Region's economy is at present not reliant on, or integrated well with, the mining and energy sector.

In terms of the value of economic outputs from the region, rather than the labour inputs, we can see some trends in the composition of output in Figure 3 for the broader Wide Bay Burnett region. Estimates of economic value added are extremely difficult to make for small areas, and these figures are experimental estimates which have been made by slicing larger aggregated economic data points to disentangle the geographic location of the added value. In this case the region is Wide Bay Burnett as a whole, which includes North and South Burnett, as well as Gympie Council areas.

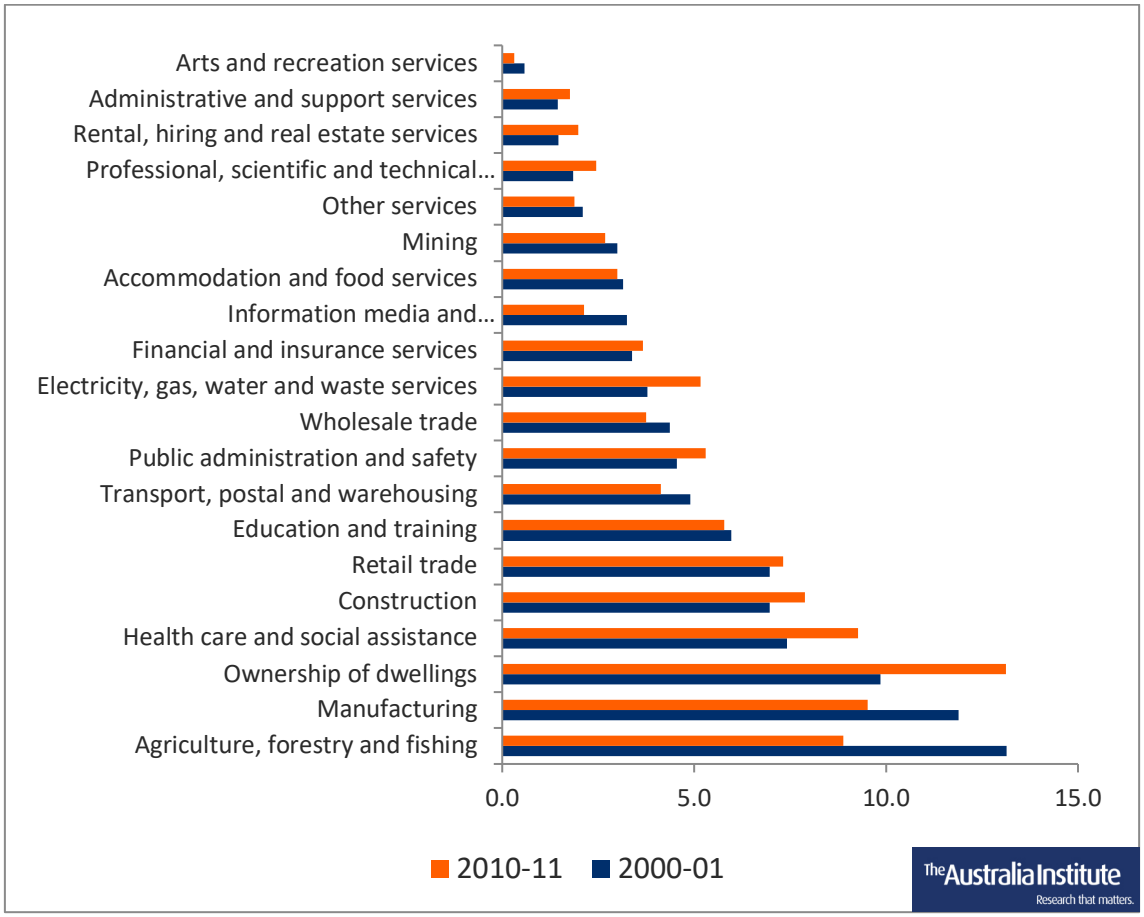

Figure 3: Share of value added by industry (Wide Bay Burnett)[4]

The stand-out industries in terms of value-added are again agriculture and manufacturing. Retail, healthcare, and construction are also dominant, and have seen high relative growth.

[4] Queensland Government Statisticians Office. (2013). *Experimental Estimates of Gross Regional Product 2000-01, 2005-06, 2010-11.* http://www.qgso.qld.gov.au/products/reports/experimental-estimates-grp/

Taken together, the employment and value-added data shows a very diverse regional economy with a substantial modern service economy, and a broad agricultural and manufacturing base.

AGRICULTURE AND TOURISM

However, there are two important elements of the economic structure of the Region that are still not clear from above broad figures— the type of agriculture, and the role of tourism.

The type of agriculture is relevant to this overview of the economic structure of the Region as producing high-value crops (on a per hectare basis) on high-quality agricultural land is usually incompatible with gas field development.

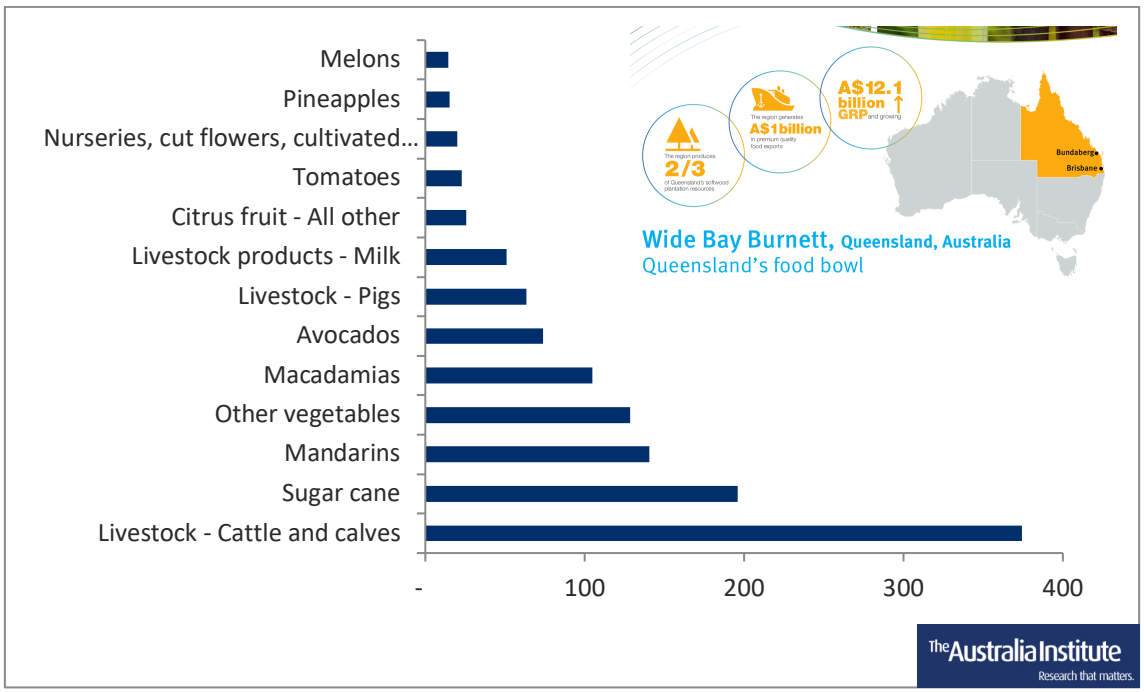

Figure 4: Value-add of major agricultural products Wide Bay Burnett[5]

In Figure 4 the top agricultural outputs in Wide Bay Burnett are shown. While beef cattle is the single largest output by value, in the coastal areas the other agricultural products are more prevalent, like sugar cane, which the region is known for and which

[5] ABS. (2018). *7503.0 - Value of Agricultural Commodities Produced, Australia, 2016-17. SA4 (319).* http://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/7503.0Main+Features12016-17?OpenDocument and
TIQ. (2018). *Wide Bay Burnett, Queensland, Australia Queensland's food bowl.* https://www.tiq.qld.gov.au/download/business-interest/about-queensland/qld-regional-market-profiles/TIQ-16-1182-Regional-Overview_Wide-Bay-Burnett_final.pdf

supplies the famous Bundaberg Rum distillery, as well as vegetable and fruit crops. Indeed, such is the diversity of the Region's agriculture that Queensland's Trade and Investment organisation has labelled the area "Queensland's food bowl".[6]

The location of the gas exploration areas and potential gas field are shown in Figure 5 in relation to the type of land use and agriculture. The northern parts of the permit areas are currently cropping and horticulture, while the western parts are native forest production and cropping. The south eastern parts are a mix of plantation forests and conservation areas. Overall, the potential gas field areas are currently actively used for agricultural purposes, and many high-value agricultural purposes.

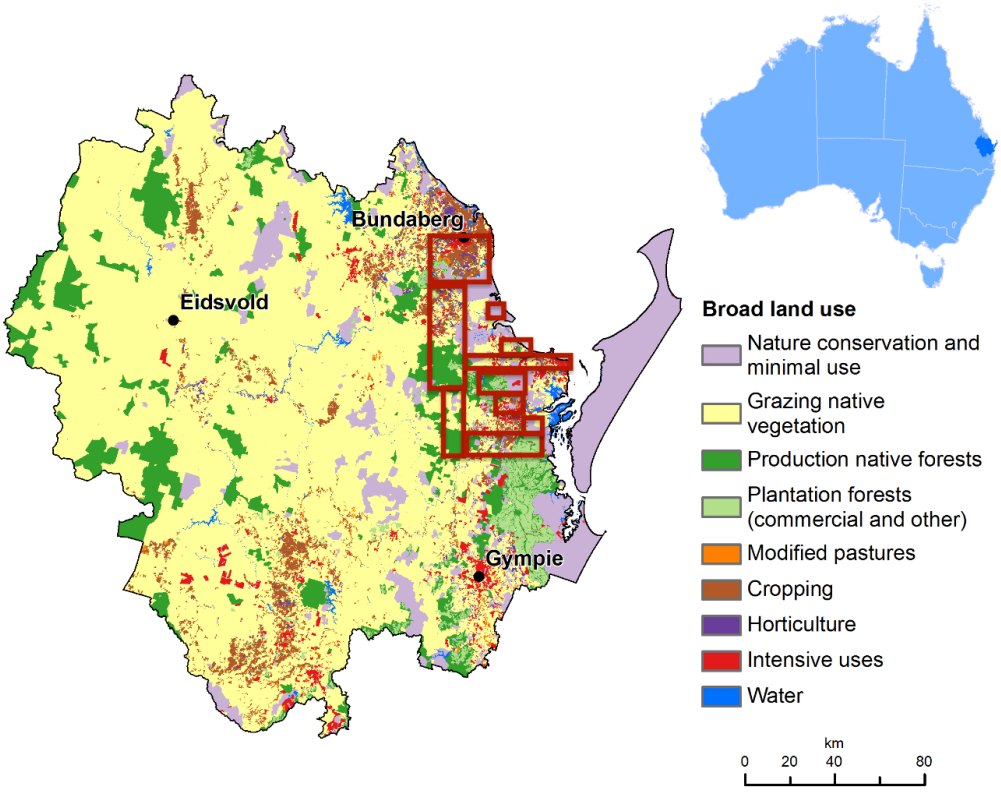

Figure 5: Location of agricultural production and indicative location of gas fields[7]

Finally, the high-quality land and environment, as well as nearby iconic areas like the World Heritage listed Fraser Island, have led to a significant tourism industry developing in the Region.

[6] Ibid.

[7] Gas filed locations are indicative only. Map from ABARES. (2017). *About my region – Wide Bay Queensland. Catchment scale land use.* http://www.agriculture.gov.au/abares/research-topics/aboutmyregion/qld-wide-bay#regional-overview

A limitation of the previous employment and value-added data is that industry classifications do not account for what would commonly be referred to as the tourism industry. If tallied separately, the tourism industry would include part of the economic activity counted in accommodation, retail, transport, construction, and many others.

To understand this important driver of economic activity, 'tourism accounts' are often created for regions that pool activities from other classifications into a new tourism class. According to 2015-16 data, when this reclassification is made, 10.7% of the value-added in the part of the region more well-known for tourism, the Fraser Coast Regional Council area, can be attributed to tourism, accounting to 8.5% of employment.[8] Even in Bundaberg, which is less well-known for tourism, the industry employs 4.6% of the workforce.[9]

While matching tourism data to the Region is difficult, it is likely that when tallied separately, tourism is the second largest industry behind health and social care. In addition, tourism has been growing recently in the Region, particularly with international visitors.[10]

RENEWABLE ENERGY DEVELOPMENT

It is worth noting that the Region is already beginning to see investment in solar energy, which can provide some investment and jobs, but at a much more moderate pace. While large scale solar does need some land, which will be taken from other uses, there will be positive economic spill-overs to the local sectors like manufacturing, who may find it lucrative to participate in electricity demand management to smooth out the solar electricity supply. Gas development in the Region will be purely export-based, unless there is a major change in gas policy. Construction on Childers and Susan River solar farms in now underway, list of proposed and approved solar farms in the Region includes; Munna Creek, Teebar Creek, Aramara, and Lower Wonga.[11] The

[8] Tourism Queensland. (2018). *Regional tourism satellite accounts 2015-16*. https://cdn2-teq.queensland.com/~/media/f27c1cd256b54de39d371c3d09e9866a.ashx?vs=1&d=20170928T091655

[9] Tourism Research Australia. (2018). *Regional tourism satellite account. Bundaberg and North Burnett 2015-16.* https://www.tra.gov.au/ArticleDocuments/245/Bundaberg%20North%20Burnett%20factsheet%2015_16.pdf.aspx?Embed=Y

[10] Reid, E. (2018). *New figures reveal what's driving Bundy's tourism surge. NewsMail. 28 March 2018.* https://www.news-mail.com.au/news/new-figures-reveal-whats-driving-bundys-tourism-su/3372564/ and Fraser Coast Chronicle. (2018). *International tourist numbers on the rise for Fraser Coast.* 14 March 2018. https://www.frasercoastchronicle.com.au/news/international-tourist-numbers-on-the-rise-for-fras/3360183/

[11] NRM. (2018). *Electricity generation map*. https://maps.dnrm.qld.gov.au/electricity-generation-map/#results

investment in these and future solar projects in the Region is likely to build up slowly over time, allowing time for the local economy to adjust and build up skills and commercial relationships and integration with local industry.

Real economic risks

While certainly new investment in a region provides some economic benefits, how this investment affects established industries and communities depends on its type and scale. A number of real risks exist when large scale gas development occurs in region that has a well-integrated and diverse services, agricultural, tourism and manufacturing economy.

RISING COSTS FOR OTHER INDUSTRIES

The first main risk is that boost in investment from large scale gas field development will make it more difficult for established businesses in other industries by raising local prices. Two keys ways this happens are by 1) outbidding other businesses for local workers, temporarily increasing local wages, and 2) outbidding locals for housing and making the costs of living increase for the local workforce.

While development of energy sources like gas would typically also have positive flow-on effects by making energy inputs cheaper, this will not be the case is this export-oriented gas development. Indeed, the flood of new gas in Queensland in recent years has been accompanied by rising prices, not falling prices, as the gas network has become connected to global markets through the establishment of the Gladstone liquefied natural gas (LNG) terminal.

In terms of wage effects, a survey of businesses on the Darling Downs during the coal seam gas boom captured this negative effect on existing businesses from trying to quickly attract a temporary local workforce with responses such as:

> What they're paying for wages [in some towns] is two and half times what the wage should be – just to hold men. That's forcing consumer goods up, to try to cover the costs of those wages... So it's all spinning down the line... [For example] from a hardware perspective, anyone doing renovations to their home, even just the little bits are all getting more expensive because these guys are trying to cover the increase in wages that they've had to pay to retain men. And the [resources] companies are walking into businesses and offering staff – mainly mechanics...huge wages.[12]

[12] Everingham, J. et. al. (2013*). Energy resources from the food bowl: an uneasy co-existence. Identifying and managing cumulative impacts of mining and agriculture.* Project report, CSRM, The University of

For Bundaberg and Fraser Coast, with an economy reliant on services, tourism, agricultural, and manufacturing, this wage competition is likely to be extremely disruptive to established businesses.

Analysis of the effect of previously established CSG fields in Queensland showed that for every job in the gas industry, 1.8 jobs in agriculture were lost because of this competition for local workers and other land-use conflicts with agriculture.[13]

In terms of the housing effect, the price of rents and housing can also quickly inflate, making life difficult for long-term local renters or potentially new long-term residents. The boom and bust cycle in housing in the Darling Downs is clearly seen in the pattern of home prices and rents in Figure 6. Rents in Miles doubled from 2011 to 2013, only to crash back after the gas investment boom was over in 2015. The same pattern happened in Chinchilla.

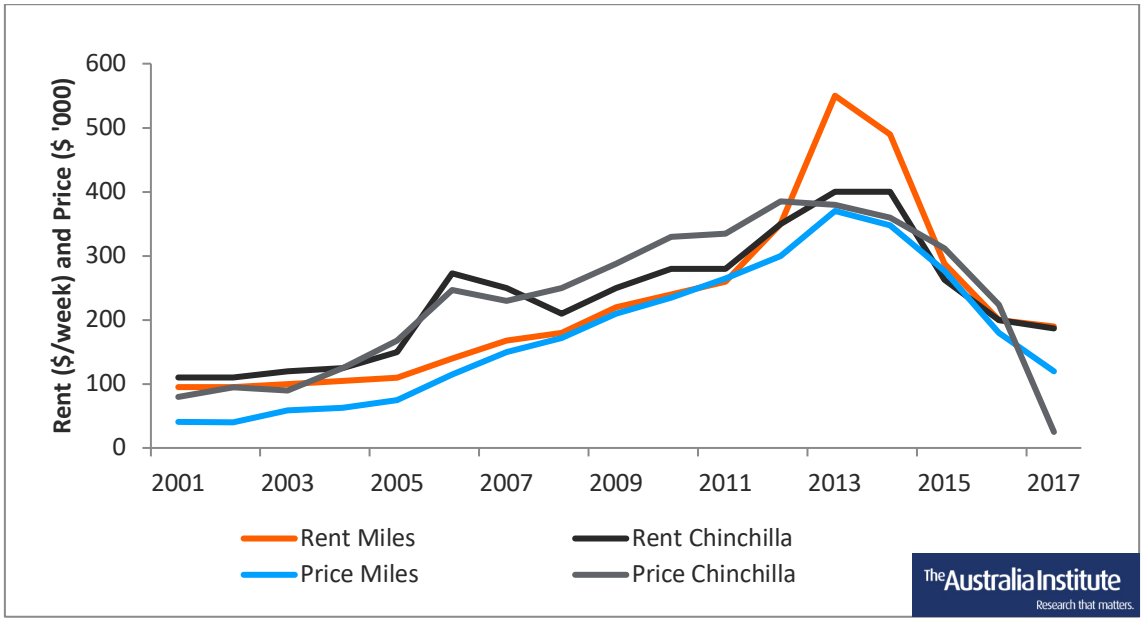

Figure 6: Housing rent and price boom and bust (Miles and Chinchilla)[14]

One effect of the house price boom is outward migration of long-term residents. Renting households who see any wage increase soaked up by higher rents often take the opportunity to leave, while some local home-owners take the chance to make

Queensland. https://www.csrm.uq.edu.au/publications/energy-resources-from-the-food-bowl-an-uneasy-co-existence-identifying-and-managing-cumulative-impacts-of-mining-and-agriculture

[13] Fleming, D., and Measham, T. (2015). *Local economic impacts of an unconventional energy boom: the coal seam gas industry in Australia.* Australian Journal of Agricultural and Resource Economics, 59(1), 78-94.

[14] Centre for Coal Seam Gas. (2018). *Annual Report on Queensland's Gasfields Regions*. University of Queensland. https://boomtown-indicators.org/data-updates/western-downs

money on their home and leave the area to perhaps retire elsewhere.[15] Indeed, this outward migration can lead to an increase in measured average incomes in the region because long-term local low-income households are the most likely to leave.

While boom-time employment in construction of gas fields and associated pipelines and infrastructure are significant, the long-term employment benefits are not. A 2015 study showed that Bunnings retail hardware stores employ more people across the country than the entire oil and gas industry.[16] The industry should thus not be considered one that generates long-term regional activity, but one that generates a short-term boom and bust cycle while incurring costs on other parts of the regional economy.

ENVIRONMENTAL AND AGRICULTURAL RISKS

Conflict with agricultural land uses is a key issue for gas development, particularly shale gas that will require extensive water use for fracking to break the geological structures holding gas. There are significant coastal groundwater tables and surface water rivers used for intensive agriculture in the areas covered by gas exploration permits.

While experience with coal seam gas in Queensland is still quite new, concerns about long term effects of gas on water seem to be growing.

> We were told five years ago that the CSG industry would never have an impact on underground water in any way. And yet we've seen in the last three weeks the independent QLD Water Commission's underground water impact report come out, saying that yes, there will be impacts on the aquifers that we are dealing with in this industry. Now some of those impacts change and vary quite widely, it's still only model-based, so we're still not using the real data that we've got to check against those models that all of these activities were approved upon...[17]

The experience of shale gas in the United States is further progressed than in Australia, and thus the longer-term outcomes from these gas fields is informative.

[15] Ibid.

[16] Ogge, M. (2015). *Be careful what you wish for.* The Australia Institute. http://www.tai.org.au/content/be-careful-what-you-wish

[17] Everingham et.al. p28.

> The most mature shale gas field in the US, the Barnett Shale, has an average of 1.15 wells per square kilometre, but can be as high as 6 wells per square kilometre due to "infill drilling" needed to extract gas as fields deplete.[18]
>
> Every shale gas well needs to be fracked multiple times. Every frack requires 11–34 million litres of water,[19] the equivalent of 360–11,000 truckloads, and 80–300 tonnes of industrial chemicals.[20] This is potentially an enormous increase in truck movements on the Territory's roads and will inevitable impact other road users.
>
> Pennsylvania in the United States has a mature shale gas industry. A gas industry study last year in Pennsylvania found that more than 6% of gas wells leaked, and up to 75% of wells could have some form of integrity failure.[21] In Pennsylvania more than 240 private drinking water wells have been contaminated or have dried up as the result of drilling and fracking operations over a seven-year period.[22] [23]

Any degradation of regional water supplies from shale gas extraction will have both significant environment costs, but also economic costs in terms of its effect on the intensive agricultural activities in the Region.

The best research on the direct effect of gas fields on agricultural output in Queensland's Surat Basin shows that agricultural revenues fall by 7% on average (in a study are of 11,500 Ha with 155 CSG wells).[24] This effect is a direct only and does not include any flow-on effects from potential impacts on water resources or other farm operations. The total value of agriculture in the Wide Bay Burnett region in 2016-17

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[18] Shale Gas Information Platform SHIP. GFZ, accessed 10 November 2015, http://www.shale-gas-information-platform.org/categories/operations/the-basics.html

[19] UNEP Global Environmental Alert Service: Gas Fracking: Can we safely squeeze the rocks?

[20] Hazen and Sawyer (2009). *Impact Assessment of Natural Gas Production in the New York City Water Supply Watershed*. http://www.nyc.gov/html/dep/pdf/natural_gas_drilling/12_23_2009_final_assessment_report.pdf

[21] Davies, R.J. et. al. (2014). *Oil and gas wells and their integrity: Implications for shale and unconventional resource exploitation*. Marine and Petroleum Geology, 56, 239-254. doi:10.1016/j.marpetgeo.2014.03.001

[22] Concerned Health Professionals of New York & Physicians for Social Responsibility (14 October 2015) Compendium of scientific, medical, and media findings demonstrating risks and harms of fracking (unconventional gas and oil extraction) (3rd ed.), http://concernedhealthny.org/compendium/

[23] Quote from Ogge, M. (2015). *Be careful what you wish for.* The Australia Institute. http://www.tai.org.au/content/be-careful-what-you-wish

[24] Marinoni, O., & Garcia, J. N. (2016). *A novel model to estimate the impact of Coal Seam Gas extraction on agro-economic returns*. Land Use Policy, 59, 351-365.

was $1.2 billion.[25] Though the output from the whole Wide-Bay Burnett region would not be directly at risk of conflict with gas well, this does indicate the scale of potential effects, which could be in the order of tens of millions of dollars of reduced agricultural output per year.

SOCIAL CHANGE

The major adjustments that happen when a region experiences a gas boom and bust cycle can also be socially disruptive, particularly with the inflow of temporary workers and departure of long-term residents, alongside the economic tensions of small businesses trying to operate in a rapidly changing economic environment.

A survey funded by gas companies in 2014 showed that communities in the Darling Downs had predominantly negative views about the effect of the gas boom on their region.[26] Only around 6% thought that the community was "Changing to something different, but better", while the majority of respondents said they were "Resisting", "Not coping", or "Only just coping". Most respondents said their attitude to coal seam gas was to "Tolerate" or "Accept" it, or with only 7% saying they "Embrace" it.

Other surveys have shown that there is a general view that the boom and bust cycle has a negative impact on social cohesion and "neighbourliness" due to absentee investors of property, vacant and dilapidated housing during the bust, and rapid change in the population.[27]

Indeed, recent media reports have covered the 'ghost town' outcomes from the unwinding of the gas boom in Miles and the social adjustments that took place.

> "You can see why the community feels like it does," said David. "The gas companies have damaged the very fabric of our town. We were all encouraged

[25] ABS. (2018). *7503.0 - Value of Agricultural Commodities Produced, Australia, 2016-17. SA4 (319).* http://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/7503.0Main+Features12016-17?OpenDocument

[26] Walton, A.et. al. (2014). *CSIRO survey of community wellbeing and responding to change: Western Downs region in Queensland.* CSIRO Technical report: CSIRO, Australia. https://gisera.csiro.au/wp-content/uploads/2018/01/CSIRO-survey-of-Community-Wellbeing-and-responding-to-change-Western-Downs-region-in-Queensland.pdf

[27] Centre for Coal Seam Gas. (2018). *Annual Report on Queensland's Gasfields Regions*. University of Queensland. https://boomtown-indicators.org/data-updates/western-downs

> to gear up to provide for 40 years of partnership with the resource companies. But they only use tier-1 and tier-2 contractors — they don't use the locals."[28]

WEALTH NOT SHARED

One economic promise of gas development in Queensland has been that the gains will be shared widely with the community through royalties to the state government, which may return to the gas regions through, for example, upgrades to local infrastructure.

However, these royalties too have turned out to be mostly empty promises. Figure 7 shows how the expected and budgeted royalties from petroleum in Queensland have been repeatedly unmet, often to an astonishing degree. For example, in 2016 royalties were only 6% of the forecast $561 million.

The exaggerated claims about future royalty incomes from gas are indicative of the degree to which other economic benefits of the industry are overplayed by its advocates, and thus serve as a clear warning about taking modelled or forecast economic benefits from industry sources at face value.

[28] Clarke, G. (2018). *Miles: The Coal Seam Ghost Town*. News.com.au 28 march 2018. https://www.news.com.au/finance/business/mining/miles-the-coal-seam-ghost-town/news-story/3923c38654f0ab9e3e4ed703d1de2d52

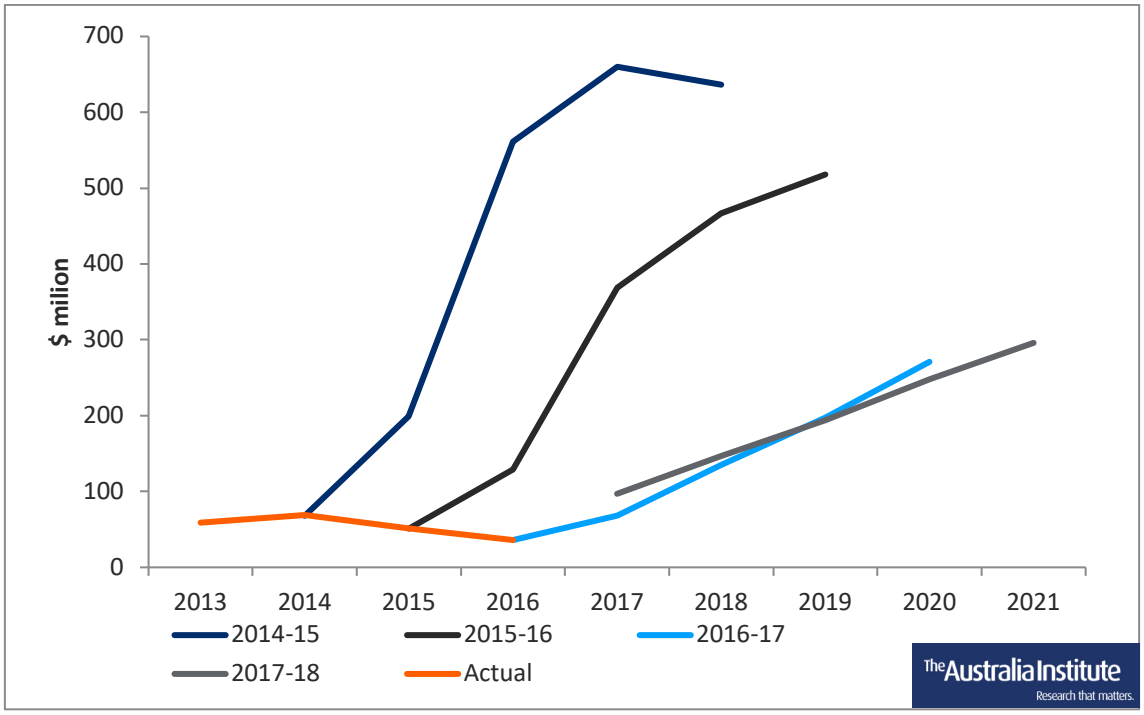

Figure 7: Queensland petroleum (gas) royalties—budget vs reality[29]

[29] Queensland Government. (2018). *Budget Papers* (and historical). https://budget.qld.gov.au

Conclusion

While gas development can bring short term economic gains to certain parts of the local community, these gains come with both short and long-term social and economic costs to other parts of the community. Experience with gas development in other regional Queensland communities shows that significant economic disruption occurs, and very few economic gains persist past the development phase, while environmental risks and potential conflict with agriculture and other water users persist.