



GISERA Project S.13: Assessing and projecting onshore gas effects on regional economic activity in NSW

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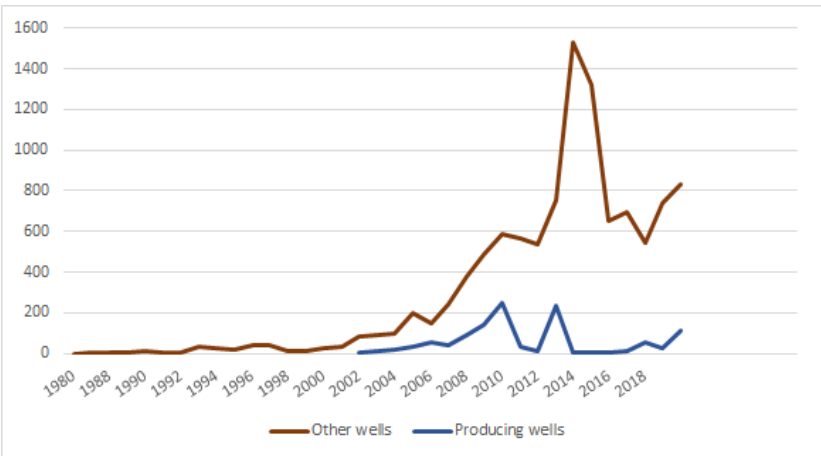
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Presentation overview

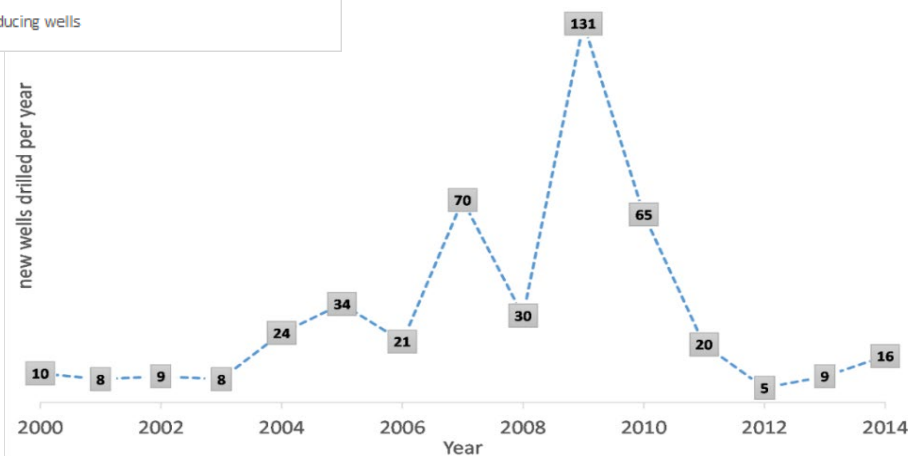
- Introduction and rationale of project
- Methods employed
- Previous research – base for *this* analysis
- Findings from gas expansion
- Findings from manufacturing
- Implications and conclusion

Introduction and rationale

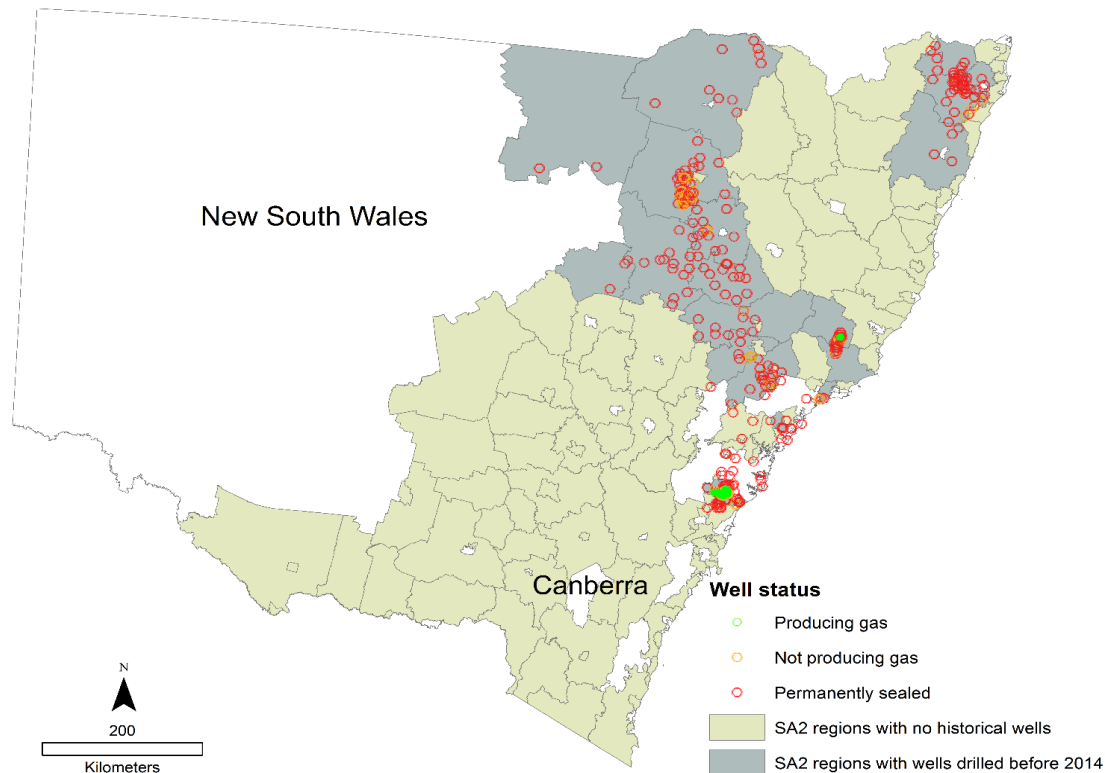


← Queensland
(approx. 1,200
operating wells)

NSW →
(approx. 386
operating wells)

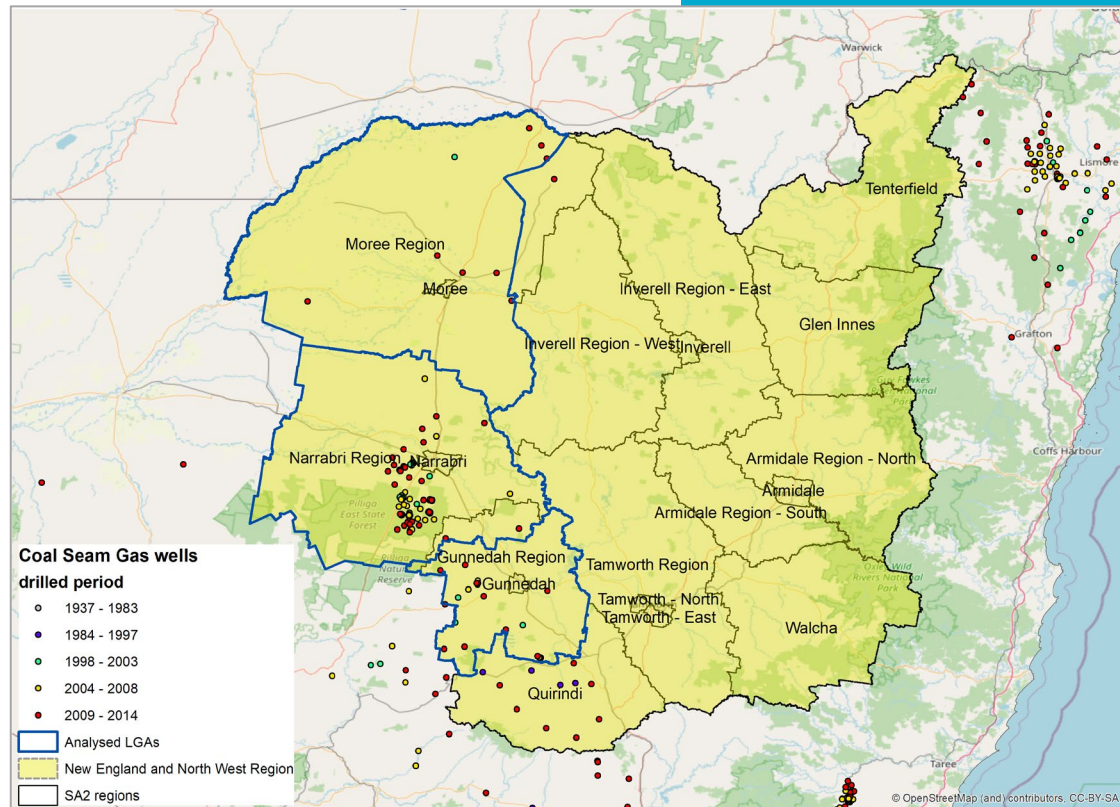


Introduction and rationale



Introduction and rationale

What are the socioeconomic prospects in the Narrabri region, beyond gas activity?



Limited evidence for Narrabri region...

... so we draw on evidence from Queensland,
adapted for the NSW context



Methods - Data

- Data from various sources: Census, NSW government, past studies, Santos (2020)
- We use the local job estimates in the updated report from Santos
- Given the limited experience in the Narrabri region, we also use multipliers derived from the experience in Queensland
- Estimates from *Perdaman* (fertiliser company) are also used



Methods - Modelling

- Statistical specifications
- Econometric models
- Economic Impact (Input-Output) Analysis Tool (EIAM tool from AURIN)

Findings – Comparing regions

Variable	State SA2s (n=556)			Control SA2s (n=145)			Narrabri region (n=7)			T-test Control vs CGS regions
	Mean	Std. Dev.		Mean	Std. Dev.		Mean	Std. Dev.		
Median family income 2006	1,251	432		974	204		995	108		
Median family income 2011	1,507	509		1,166	281		1,197	104		
Median family income 2016	1,784	568		1,411	283		1,491	112		
Proportion of Ag employment 2006	4.66	9.12		13.15	11.41		27.15	17.28		***
Proportion of Ag employment 2011	4.07	8.39		11.44	10.60		25.23	17.96		***
Proportion of Ag employment 2016	4.23	8.50		11.50	10.34		24.02	17.64		***
Prop. of Manufacturing emp. 2006	9.62	4.19		8.46	3.74		5.75	1.98		*
Prop. of Manufacturing emp. 2011	8.53	3.78		7.80	3.72		5.28	1.85		*
Prop. of Manufacturing emp. 2016	5.99	2.77		6.03	3.30		3.40	1.18		**
Prop. of Mining emp. 2006	0.86	2.40		1.68	3.49		0.94	1.09		
Prop. of Mining emp. 2011	1.24	3.02		2.53	4.57		3.53	3.32		
Prop. of Mining emp. 2016	1.23	3.07		2.50	4.55		5.51	5.78		*
Prop. of jobs in basic services 2006	63.04	6.87		59.76	9.07		51.44	13.31		**
Prop. of jobs in basic services 2011	63.94	6.77		61.10	8.87		51.85	12.55		**
Prop. of jobs in basic services 2016	63.32	7.23		60.67	8.56		51.19	12.25		***
Prop. of jobs in skilled services 2006	19.14	5.76		14.47	3.80		11.26	3.09		*
Prop. of jobs in skilled services 2011	19.71	6.12		14.85	3.59		11.21	3.44		**
Prop. of jobs in skilled services 2016	20.54	6.26		15.16	4.02		11.26	3.23		*
Prop. of people with a bachelor's degree 2006	19.41	10.04		13.47	4.17		10.90	1.04		
Prop. of people with a bachelor's degree 2011	22.32	10.87		15.58	4.82		12.04	0.88		*
Prop. of people with a bachelor's degree 2016	25.64	11.47		18.13	5.30		14.13	1.02		**

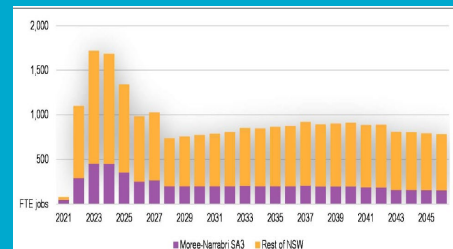
Findings – Gas activity

From econometric models...

- CSG exploration activity is related to lower agricultural jobs
- Slight positive effect income
- Negligible effects on other indicators

Given small effects from exploration, we use the experience of QLD to project impacts

We also consider numbers from Santos (2020), where we assume that gas activity would employ ~170 people, on average, during the life of the project (till 2046)



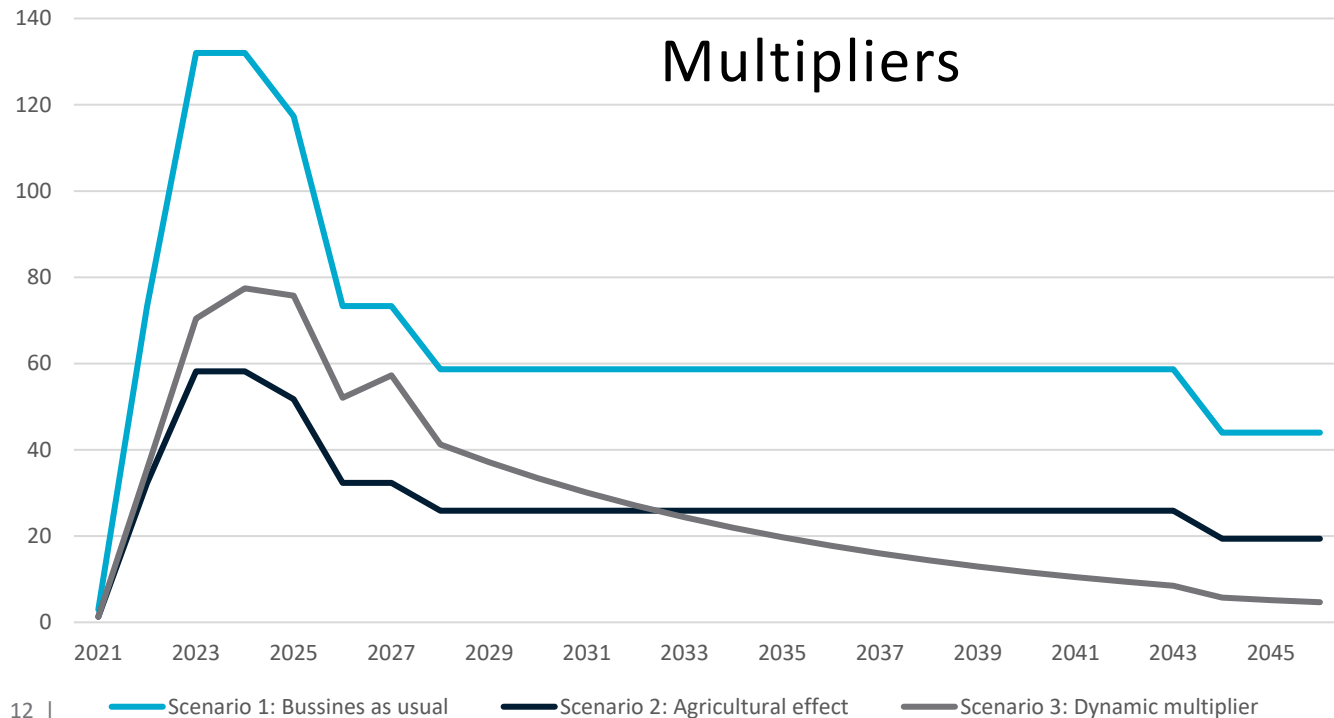
Findings – Gas activity

Sector	Elasticity	p-value	
Manufacturing	0.003	0.951	
Electricity services	0.168	0.008	***
Construction	0.124	0.003	***
Wholesale	-0.053	0.377	
Retail	0.029	0.49	
Accommodation services	0.151	0.002	***
Transport	0.041	0.465	
Media	0.051	0.332	
Finance	0.013	0.823	
Rental	0.101	0.098	
Public	0.014	0.789	
Education	-0.025	0.584	
Health	0.049	0.280	
Recreation and arts	-0.107	0.024	**
Other services	0.114	0.034	**
Scientific professionals	0.001	0.983	
Administration	0.123	0.031	**
Agriculture	-0.069	0.116	

Note: *** $p < 0.01$, ** $p < 0.05$. Source: Adapted from Measham et al. (2019)



Findings – Gas activity



Spillovers into...

Electricity services

Construction

Accomodation services

Recreation and art

Other services

Administration

Agriculture (-)

Findings – Potential fert. plant

- Perdaman projects
“at least 70 jobs during construction, and sustain 100 direct and 100 ongoing indirect jobs during operations”
- Econometric models show the effect of manufacturing could generate multipliers of:
 - 1.42 in basic services
 - 0.4 in skilled services

These number mean that the ‘100 on going jobs’ could generate around 142 basic services jobs and 40 skilled services jobs



Findings – Potential fert. plant

Average effect on employment and gross regional product per million dollar invested in manufacturing:

- Narrabri's GRP could grow \$0.79 million and create around 6 jobs
- ~ 50% of the GRP and employment effect would remain in the manufacturing sector
- The GRP of Retail and wholesale trade could increase 12%. Agriculture, Forestry and Fishing could increase 9%
- Most of the total benefits (60%) will be through indirect increases in GRP and employment
- **These estimates suggest that a new fertiliser industry may need to spend around \$35million per year to generate 200 jobs per year in Narrabri**



Implications for Narrabri region

- Employment spillovers from gas activity could range between 60 and 130 jobs in the peak of the project, and then gradually reduce to zero by 2046.
 - mostly services related to gas, electricity and construction
 - plus some local services: accommodation, recreation and arts
- The economic gains from the gas industry could be increased if gas supply triggers investments in other sectors:
 - e.g. a potential new fertiliser plant in the region would lead to
 - 100 new jobs in the fertiliser industry, potential 180 in other sectors
 - Approx. \$35 m per year to the GRP of Narrabri
- Each new job in the manufacturing sector, could generate 1.4 jobs in basic services and 0.4 jobs in skilled services.

Thank you