

From: Tom.Measham
To: [fracking inquiry](#)
Subject: Submission to the Scientific Inquiry into Hydraulic Fracturing in the Northern Territory - economic impacts of unconventional energy extraction on host communities
Date: Wednesday, 12 April 2017 11:41:23 AM
Attachments: [Framework hierarchical economic effects unconventional fossil fuels.pdf](#)
[Measham et al 2016 Socio-economic impacts of Unconventional Fossil Fuel extraction.pdf](#)

Dear Chair and Panel Members

In response to the call for submissions and to provide science that may help the panel in their task to determine the nature and extent of the effects of unconventional fossil fuel extraction on social, economic and cultural conditions in the Northern Territory, I forward the following overview of economic research conducted by CSIRO on unconventional fossil fuel summarised in 3 categories:

- 1) Key themes from international literature review
- 2) Experience from the Surat basin in Australia
- 3) General principles and conceptual framework.

1) KEY THEMES FROM INTERNATIONAL LITERATURE REVIEW

There is a substantial body of work on how unconventional energy extraction through hydraulic fracturing affects host communities in terms of economic and social effects (both positive and negative). Some common themes from existing literature are:

- Unconventional fossil fuel extraction through hydraulic fracturing does lead to increased employment and income, particularly, but not exclusively, during construction.
- Increased employment involves both direct effects (people working in the energy sector) and indirect effects (e.g. service sector)
- While net employment increases overall, there can be still be reductions in some sectors as people move out of one sector (e.g. agriculture) into another
- Job creation has frequently been over-estimated by industry reports which often use flawed assumptions about multiplier effects
- The number of jobs held by local residents (i.e. located in host regions) varies on a case by case basis.
- Hydraulic fracturing is generally conducted over a wider spatial area compared with conventional energy extraction, and likewise the costs and benefits are generally distributed over a wider spatial area.

Further details on these points are provided in the attached journal article¹.

2) EXPERIENCE FROM SURAT BASIN

The general observations above will be manifest differently in each context. Within Australia, economic analysis of the impact of CSG in the Surat basin provided the following observations^{2,3,4}:

Employment effects

In percentage terms:

In the Surat for the period 2001 and 2011

- Some sectors experienced an increase in employment (mining, construction, professional services)

- One sector showed a decrease in employment (agriculture)
- Overall employment increased by around 32 percent more than in other rural regions of QLD

In terms of actual numbers:

In the Surat for the period 2006-2011 (5 years)

- There were 1400 new jobs held by local residents
- This is after excluding FIFO/DIDO
- Jobs are net values (after accounting for reduced agricultural employment)
- 600 were in the mining/gas sector
- 800 were in other sectors

Income effects in Surat Basin:

- Family income increased by 15% more than in other rural regions of QLD
- This was for locally residing families (i.e. independent of FIFO/DIDO effects)

Income distribution

- Income distribution for Surat region in 2011 was the same as surrounding non-CSG regions

Future employment projections

Employment was forecast under different scenarios:

- Business as usual scenario
- Industry slow down scenario (reduced direct employment due to changes in market conditions)
- Industry slowdown combined with reduced multiplier effects

Across all scenarios, employment forecasts reflect:

- A general **upward trend** from 2014 to 2024 (with some oscillation between periods of increase and periods of decrease)
- A general **downward trend** from 2024 to 2034
- **higher** employment overall in 2034 compared to 2006, prior to the rapid expansion of CSG development.

3) GENERAL PRINCIPLES

CSIRO research has synthesised Australian and overseas research into a conceptual framework of primary, secondary and tertiary effects, presented in the first attachment¹. It is important to clarify that these effects are presented as value-neutral in the framework. For example, 'increased housing values' may be seen as a positive outcome for the owner of a house, but a negative outcome for someone seeking to purchase a house.

There are 3 primary impacts in host communities/regions:

- Labour demand that quickly exhausts local supply
- Increased income (higher wages)
- Compensation for disturbance to land and/or other economic activity

The secondary economic effects were found to be:

- Increased demand for goods and services
- Increased indirect employment and income
- In migration to meet labour demand on a temporary and/or permanent basis
- Strain on existing goods and services
- Strain on existing infrastructure

The Tertiary socio-economic effects were found to be:

- Increased housing values
- Increased rental costs
- Construction of new infrastructure
- Changes to demographic profile (e.g. gender and age)
- Provision of new types of services
- Potential for increased conflict, substance abuse
- Potential changes to income distribution

Effective governance is crucial to managing these issues including a framework to support a more even distribution of benefits and processes to underpin appropriate compensation for negative impacts. The role of genuine dialogue between local governments, resources companies and State governments is important to help prepare for the primary, secondary and tertiary impacts and improve outcomes for host communities¹.

References

- 1 Measham, T.G., Fleming, D.A. and Schandl, H. (2016) A Conceptual Model of the Socioeconomic Impacts of Unconventional Fossil Fuel Extraction. *Global Environmental Change* Vol 36 pp 101-110.
- 2 Fleming, D.A. and Measham, T.G. (2015) Local Economic Impacts of an Unconventional Energy Boom: The Coal Seam Gas Industry in Australia, *Australian Journal of Agricultural and Resource Economics* vol 59 (1) pp 78-94
- 3 Fleming D., Measham T., Graham P. and Cai Y. (2016) Employment scenarios in Queensland CSG Regions 2014–2034: a report to the Gas Industry Social and Environmental Research Alliance (GISERA). July 2016. CSIRO, Canberra.
- 4 Measham, T.G. and Fleming, D.A.(2014) Impacts of unconventional gas development on rural community decline, *Journal of Rural Studies* Vol 36 pp. 376-385

With regards,
Tom Measham

Tom Measham, PhD

Principal Research Scientist – Resources and Communities

Adaptive Urban and Social Systems | Land and Water

CSIRO



EcoSciences Precinct | Dutton Park

GPO Box 2583 | Brisbane | QLD 4001

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