



# Socio-economic impacts and indicators in the Surat Basin, and SME responses

## GasFields Community Leaders Breakfast

Research Team: Dr. Tom Measham | Dr. Andrea Walton | Rod McCrea

15 June 2017

ENERGY  
[www.csiro.au](http://www.csiro.au)

**GISERA** Gas Industry  
Social & Environmental  
Research Alliance



# Natural Gas, the great energy transition?



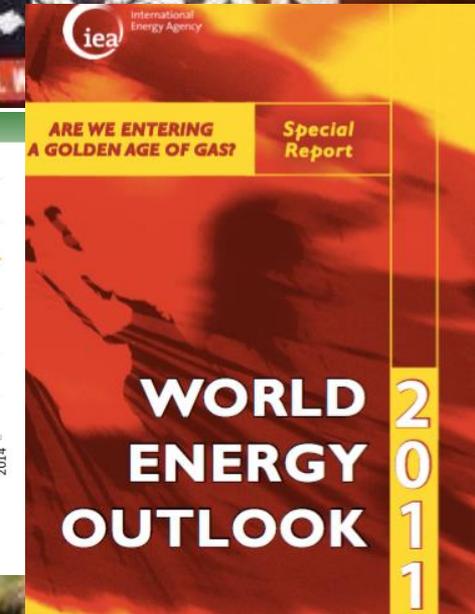
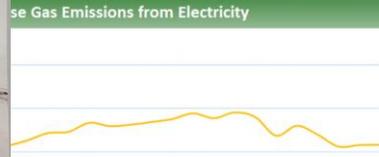
## Independent Review into the Future Security of the National Electricity Market

Blueprint for the Future

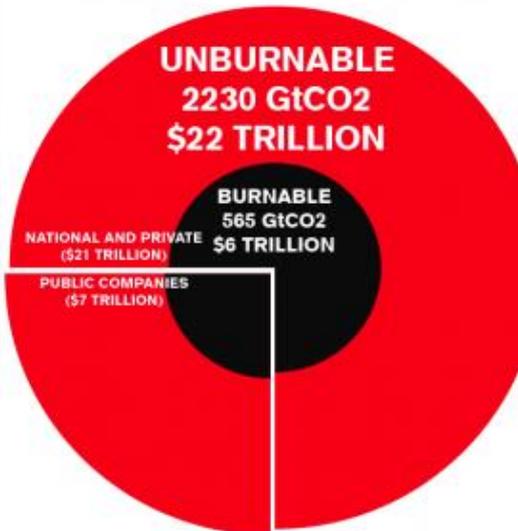
June 2017

Dr Alan Finkel AO, Chief Scientist, Chair of the Expert Panel

Ms Karen Moses FAICD | Ms Chloe Munro | Mr Terry Effeneay | Professor Mary O'Kane AC



**PROVEN FOSSIL FUEL RESERVES**  
2795 GtCO<sub>2</sub>  
\$28 TRILLION



# Primary stakeholder social questions

- Which communities, and who in those communities, are impacted by CSG?
- Are impacts being managed to the satisfaction and acceptance of the impacted communities?
- Does CSG development, and the activities designed to attenuate its imposition such as community investment, align with community aspirations?
- How many landholders are aggrieved by CSG and why?

# Primary stakeholder economic questions

- a. How much money will be spent at in the region because of the development of CSG? Will this expenditure meet community aspirations?
- b. How many jobs will be created?
- c. What are the small and medium business impacts and opportunities?
- d. How are other industries affected?
- e. How are local property values affected?
- f. What happens after project ramp down and we transition from construction to operations?

## GISERA's research portfolio

- **Agriculture:** identifying landscape/development configurations that maximise co-benefits
- **Water:** understanding risks associated with extraction & use of groundwater
- **Biodiversity:** understanding & minimising impacts of development on regional ecological function
- **Marine:** understanding vulnerable components of the marine ecosystem to minimise or offset impacts
- **Socio-economic:** informing & supporting change to enhance regional & community benefit
- **Greenhouse footprint:** identifying sources and profiling the region
- **Health:** understanding exposure pathways and associated risks

# Queensland projects

- **Greenhouse footprint**

- G.1 Methane seepage fluxes (enhancement), Surat Basin
- G.2 Whole of life cycle GHG assessment of exploitation of Surat Basin gas reserve: global benefits and risks

- **Groundwater**

- W.1 Geo-chemical response to reinjection
- W.2 Re-injection of CSG water (clogging)
- W.3 High performance groundwater modelling (feasibility of largescale injection schemes)
- W.4 Geochemical baseline monitoring (groundwater flow systems)
- W.5 HCs in groundwater, Surat & Bowen Basins (defunct)

- **Agricultural land**

- L.1 Preserving agricultural productivity
- L.2 Shared space
- L.3 Gas farm design
- L.4 Making tracks, treading carefully
- L.5 Ag land Without a trace
- L.6 Telling the Story (a communications project)

## **Socioeconomics**

- S.1 Monitoring Regional Transition
- S.2 Community Functioning and well being
- S.3 Economic assessment and forecasting
- S.5 Understanding Community Aspirations
- S.6 Community functioning and wellbeing survey 2

## **Terrestrial biodiversity**

- B.1 Threat identification
- B.2 Fire Ecology
- B.3 Habitat selection by two focal species
- B.4 Translocation research project for *Rutidosia lanata* (an offsets project)

## **Marine**

- M.1 Towards an integrated study of the Gladstone Marine System

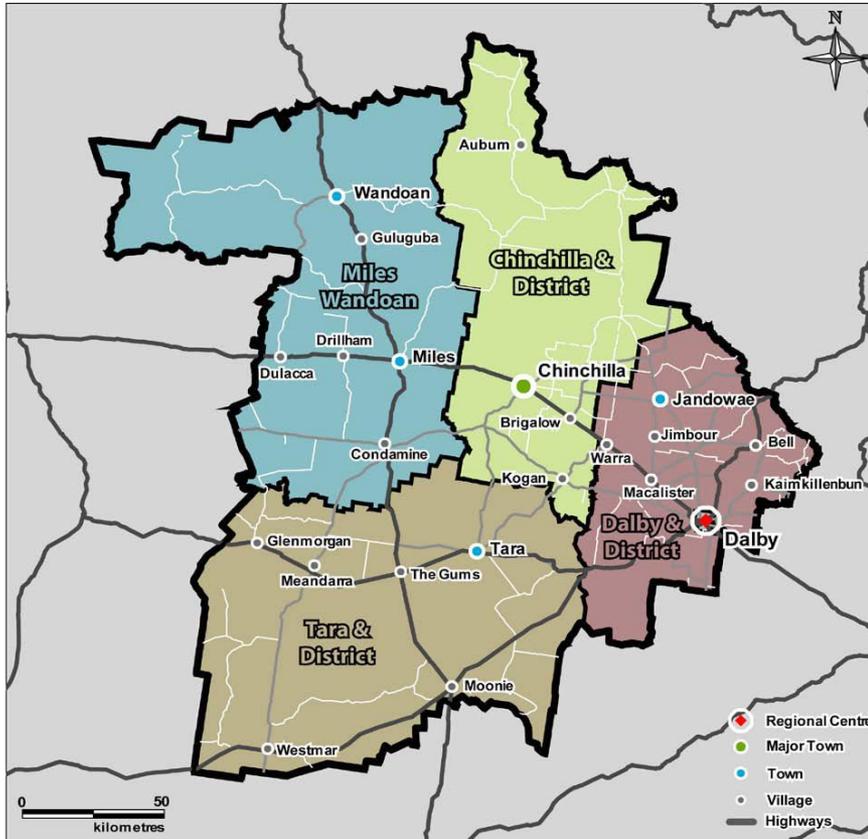
*Others in currently in consideration across:*  
Health; decommissioning, and biodiversity offsets

# GISERA socio-economic projects

REGION	TOPIC	LEAD RESEARCHERS
Queensland	<ol style="list-style-type: none"><li>1. Monitoring regional transition</li><li>2. Community functioning and wellbeing 1</li><li>3. Community functioning and wellbeing 2</li><li>4. Understanding community aspirations</li><li>5. Economic assessment and forecasting</li></ol>	Andrea Walton Rod McCrea Tom Measham
NSW	<ol style="list-style-type: none"><li>6. Analysing economic and demographic trajectories in NSW regions experiencing CSG development and operations</li><li>7. Social baseline assessment of the Narrabri region of NSW in relation to CSG development</li><li>8. Decommissioning pathways for CSG projects</li></ol>	

# Social indicators

# What we did: Repeat CWB survey from 2014



**Feb 2016**

**SAMPLE: N = 500**

100 x

- Dalby
- Chinchilla
- Miles / Wandoan
- Tara
- Roma

In town = Out of town

ABS representative

- age, gender, and employment

# Community Wellbeing: 2016 to 2014

Only five dimensions significantly different

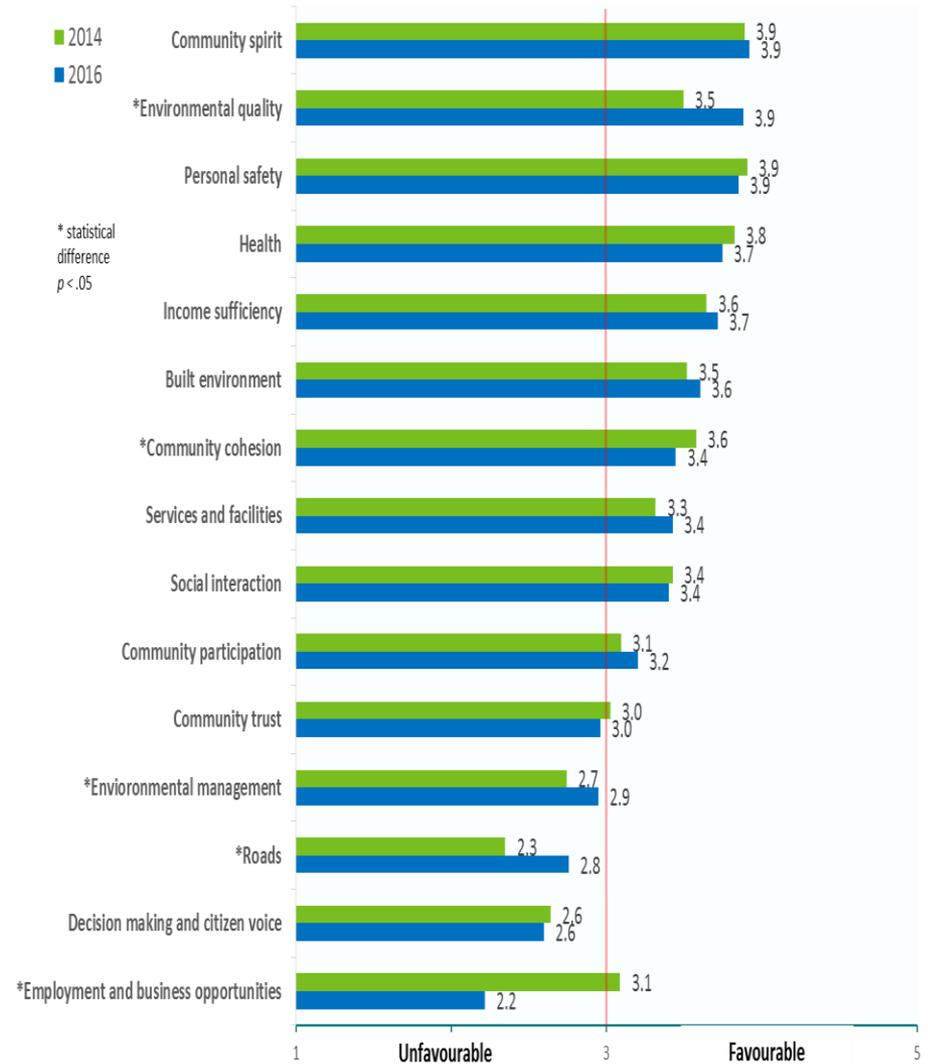
Reduced dimensions

- Employment and job opportunities
- Community cohesion

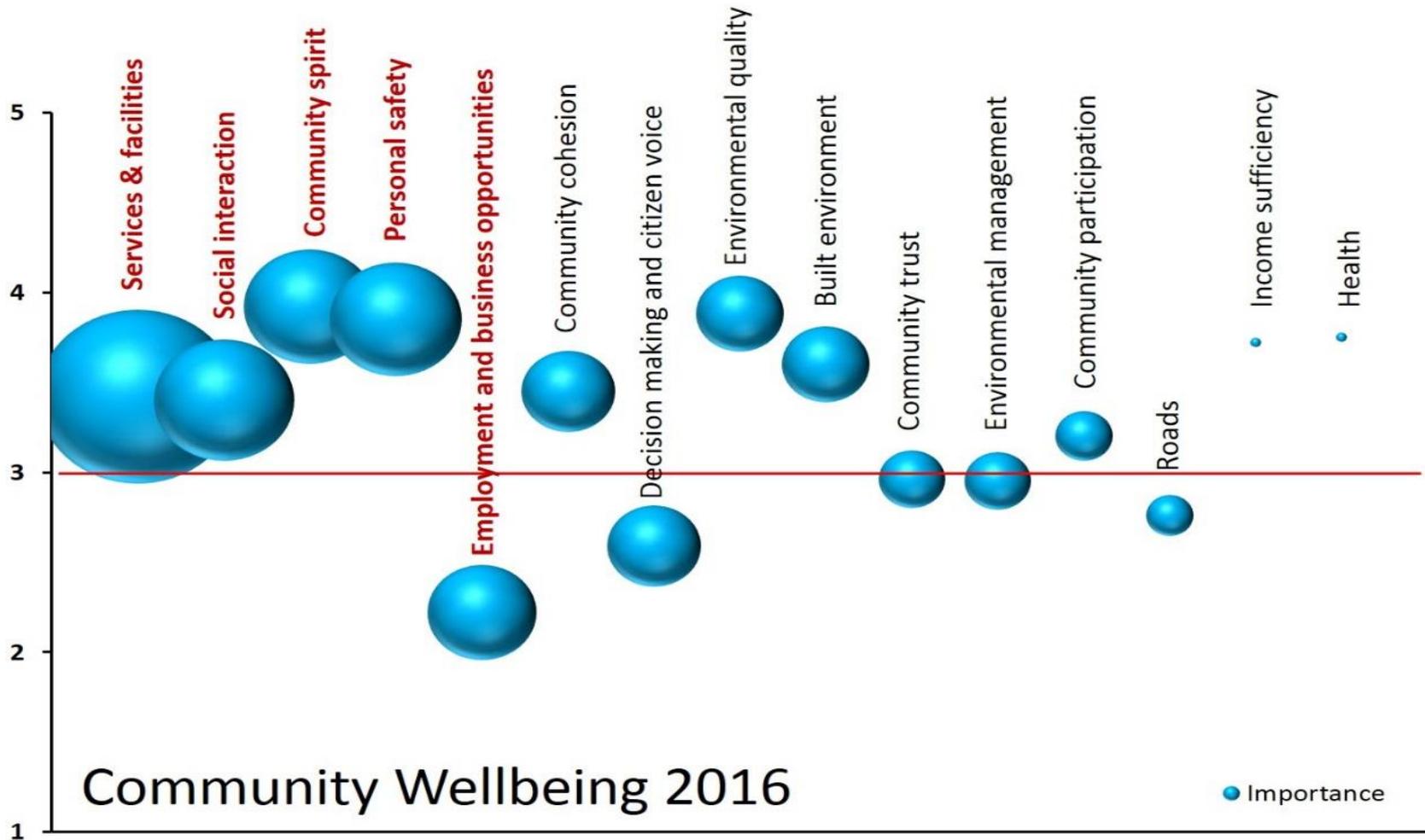
Improved dimensions

- Roads
- Environmental management for the future
- Quality of environment (dust, noise, air)

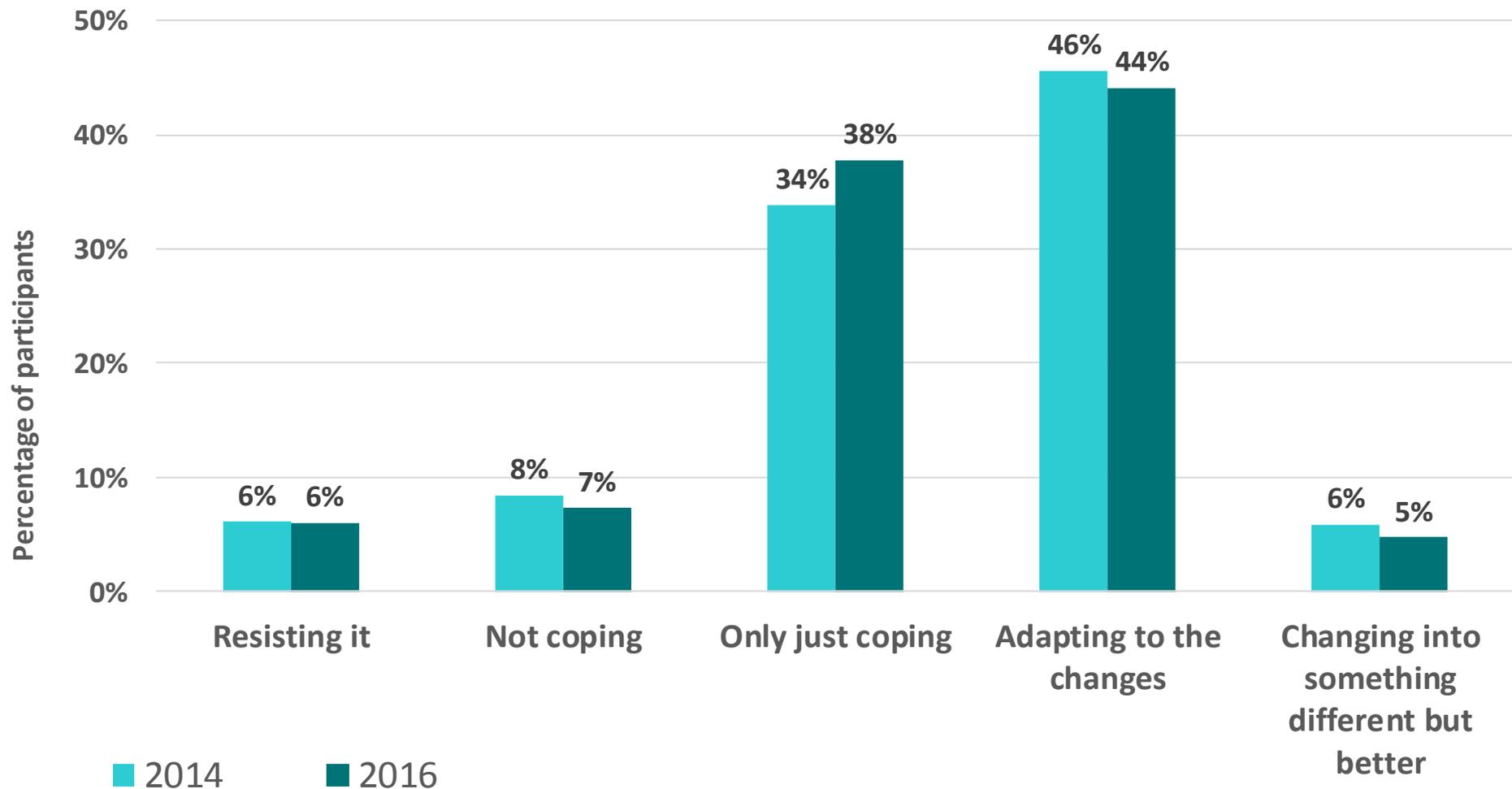
Overall community wellbeing:  
Similar - no real change



# Most important wellbeing dimensions: 2016

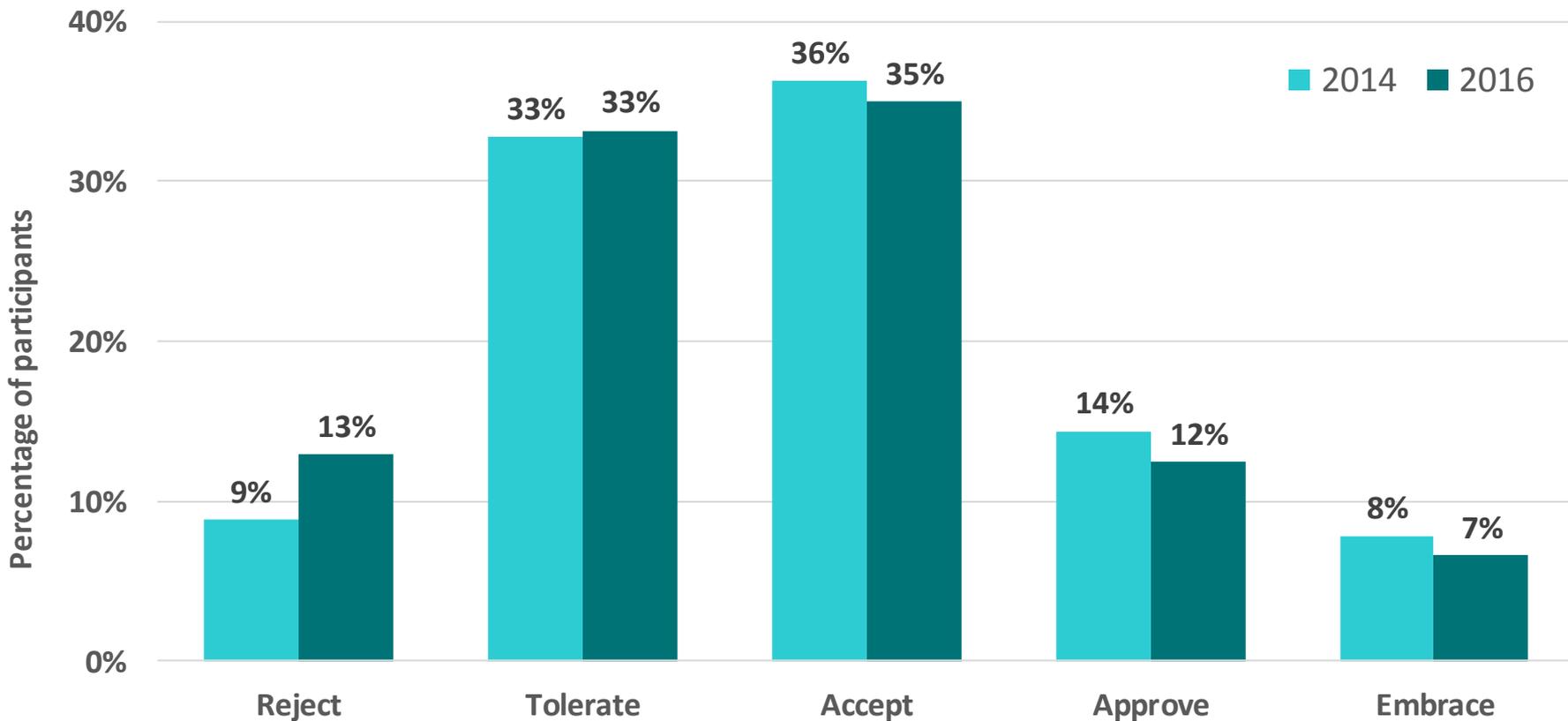


# Community perceptions: Adapting to CSG: 2014 and 2016



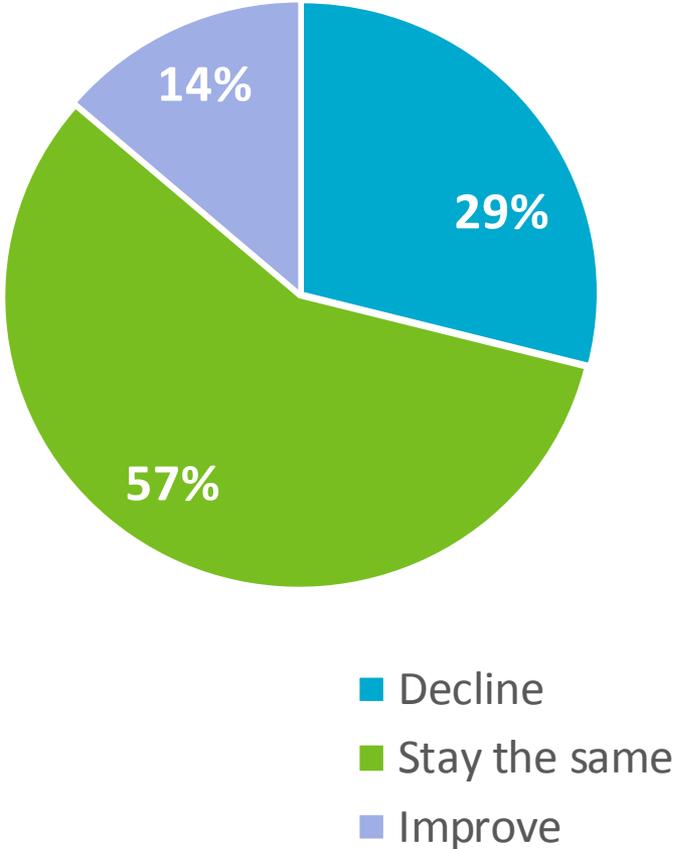
<sup>12</sup>Note: Differences between 2014 and 2016 were not significantly different

# CSG Attitudes – majority tolerate/accept; -ve has grown slightly across all fields

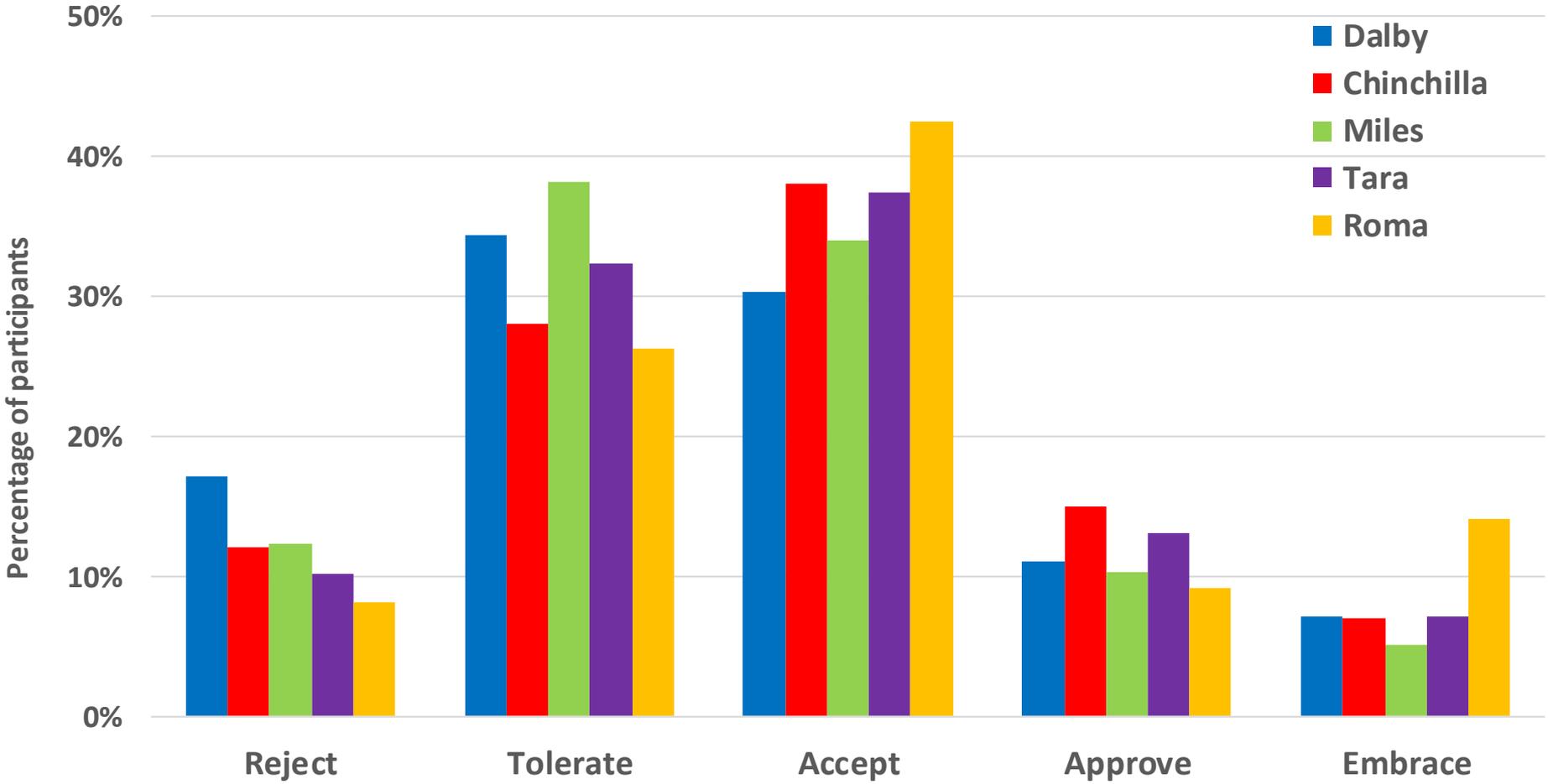


# Most expect Future Community Wellbeing to stay about the same as they did in 2014

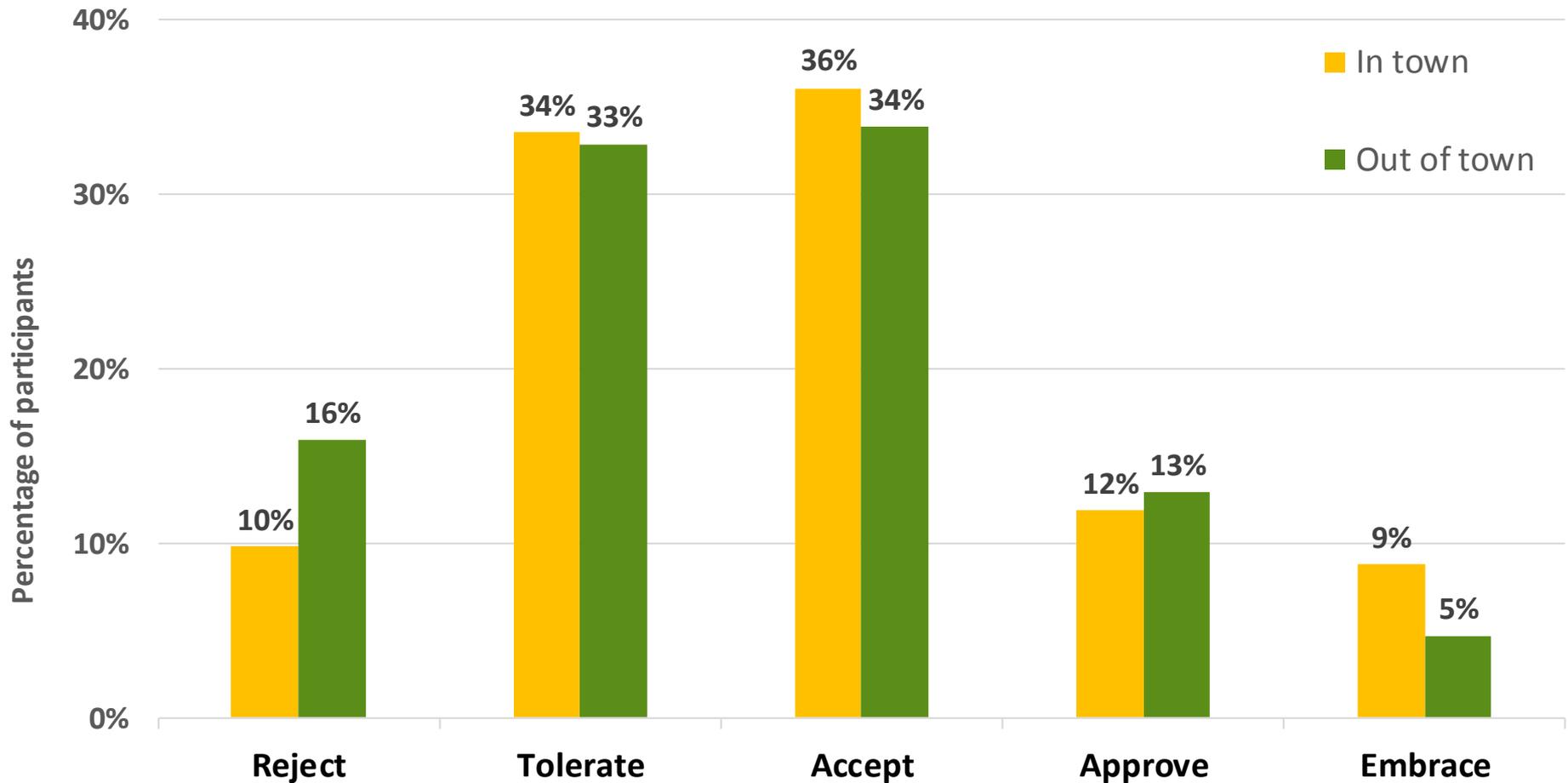
Robust wellbeing to continue for a slight majority; with a negative outlook for many



# 2016: Attitudes toward CSG –still vary across the region



# 2016: CSG Attitudes – Out-of-town residents still less positive



# Coexistence of CSG and agriculture



- Farm: workplace, natural environment, home
- Now also a gas network
- Issues: Difficult for farmers/gas co. to communicate
  - Gas industry and farmers have different value systems
  - Farmers see landscapes in ways that others do not
- Cultural change in gas companies
  - Requires to fully engage with farmers
  - Requires locals in direct communication with farmers
- Environmental impacts are of great concern
  - Groundwater
  - Atmospheric pollution (dust, light and noise)
- Quantifying cost and benefits on:
  - Impacts on crop production, soils, farm operations, water
  - Time, costs, weed management
  - Water flow and erosion threat
- Understanding drilling impacts on agriculture



UNIVERSITY  
OF SOUTHERN  
QUEENSLAND



Gas Industry  
Social & Environmental  
Research Alliance



CSIRO

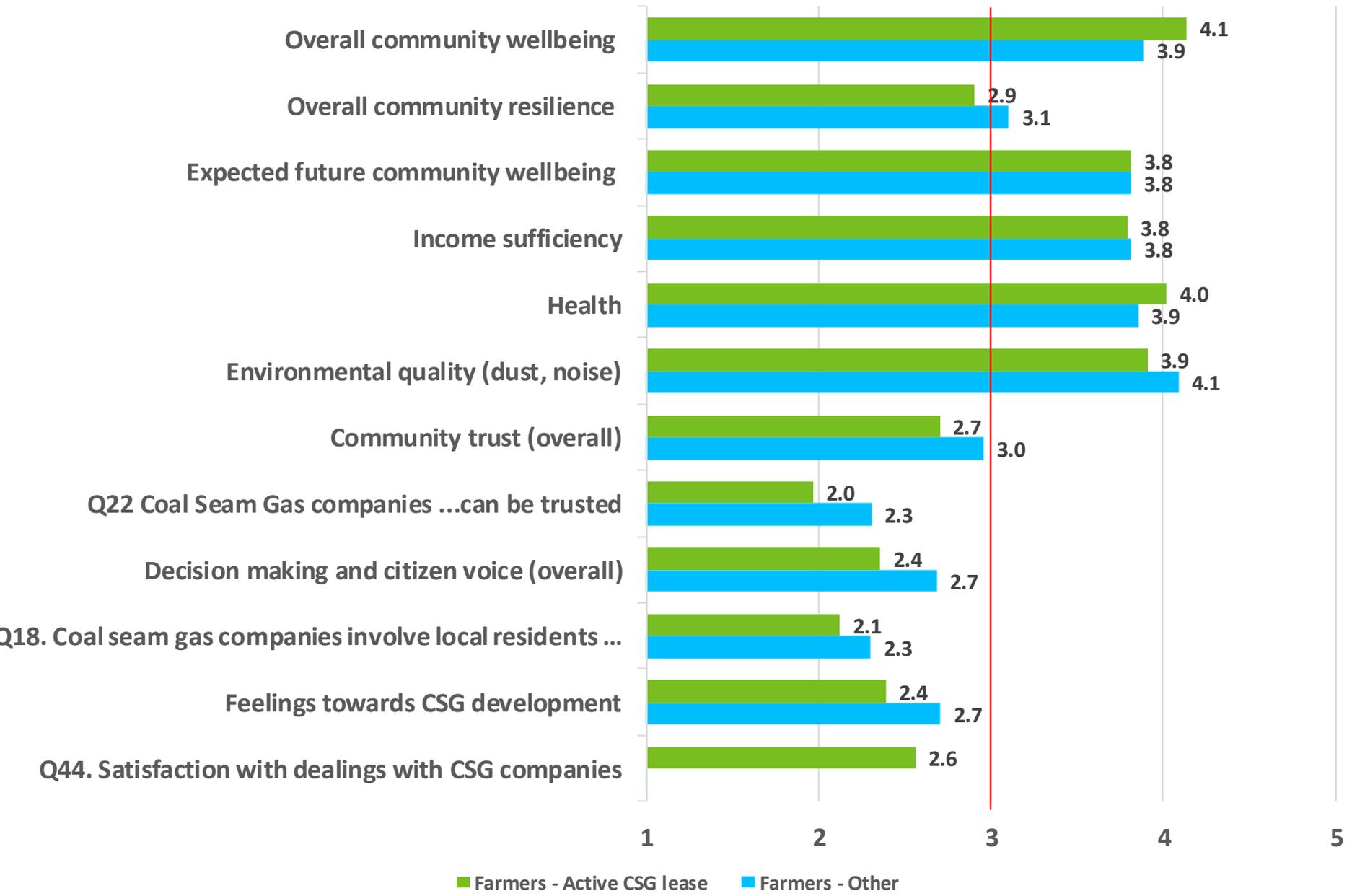
# Farm owners:2016

Community wellbeing dimensions	WD Region	Farm ownership	
		No	Yes
Community spirit	3.92	3.91	3.93
Environmental quality	3.88	<b>3.79<sup>L</sup></b>	<b>4.06<sup>H</sup></b>
Personal safety	3.85	<b>3.73<sup>L</sup></b>	<b>4.10<sup>H</sup></b>
Health	3.75	<b>3.67<sup>L</sup></b>	<b>3.89<sup>H</sup></b>
Income sufficiency	3.72	3.66	3.82
Built environment	3.60	3.64	3.54
Community cohesion	3.45	3.43	3.46
Services and facilities	3.42	<b>3.49<sup>H</sup></b>	<b>3.30<sup>L</sup></b>
Social interaction	3.40	3.44	3.32
Community participation	3.20	<b>3.09<sup>L</sup></b>	<b>3.42<sup>H</sup></b>
Community trust	2.96	3.00	2.88
Environmental management	2.95	2.92	2.98
Roads	2.76	2.74	2.79
Decision making and citizen voice	2.59	2.57	2.64
Employment and business opportunities	2.22	2.25	2.14

# Farmers perceptions: 2014 and 2016

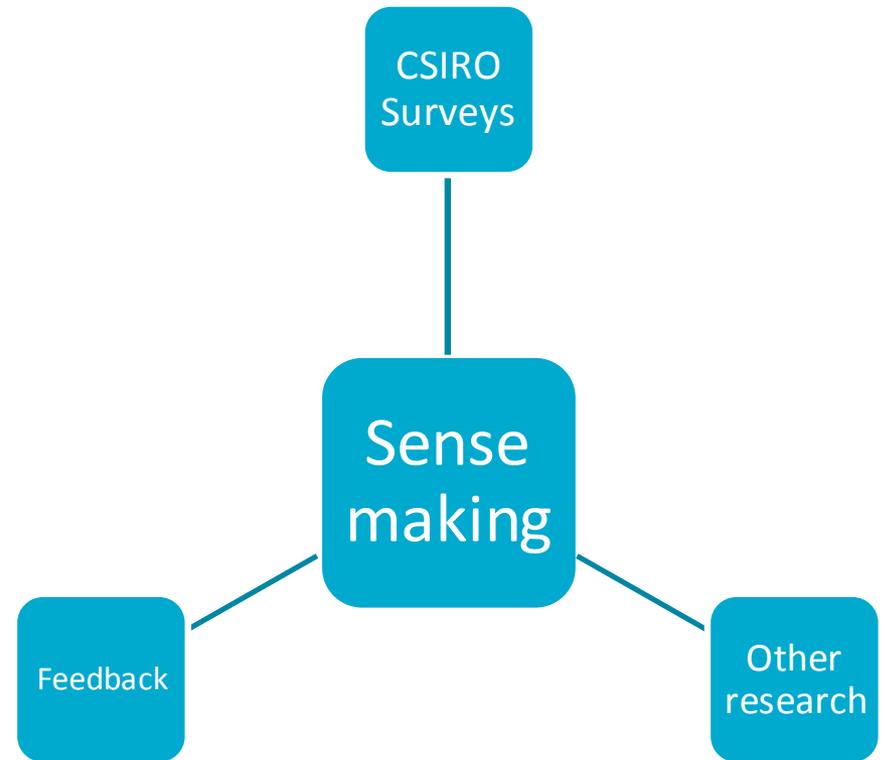


# Farmers with active CSG leases and other farmers, 2016



# Interesting observations ...for Q & A session

- Roma compares favourably to the Western Downs
- Changes in 'in-town' attitudes
- Farm attitudes not shifting
- What's driving the community cohesion decrease
- Information access, 'having a say' – still unsatisfactory



# Areas of significant community concern



- Extensive community engagement suggests most consistent concern about:
  - water
  - negotiation process
  - property values
  - dust, traffic and noise
  - compensation
  - long-term groundwater impacts
  - just another fossil fuel (ghg)
  - fracking chemicals
  - food security
  - community division

# Economic indicators

# Construction period

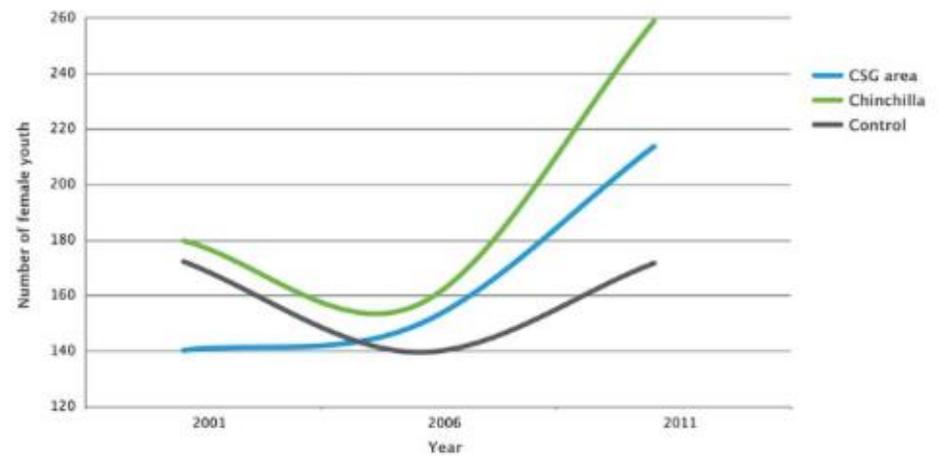
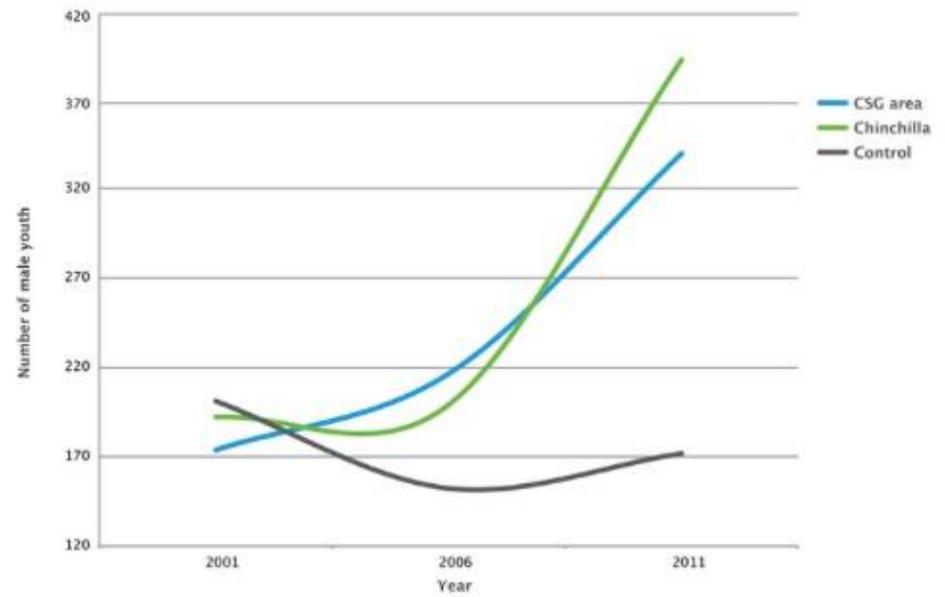


Figure 2: Changes in female youth over time (ABS 2013). The blue line is the average for towns and communities where CSG development occurs. The dark grey line is the average for regions without CSG development (control). The green line represents Chinchilla. CSIRO



# Construction period



- Construction phase (2008 – 2014)
- Family income +15% in CSG region
- ~30% higher 'non-mining' employment growth
- ~100 mining/gas jobs generated per SLA
- 1400 new jobs for residents 2006-2011
  - Excludes FIFO/DIDO in work camps
  - 600 directly in resources sector
  - 800 in other sectors
- Job growth from CSG:
  - Construction and professional services
  - Jobs shift: Agriculture/non-agriculture
- Operational phase TBD (2015 onwards)
- GISERA economic modelling and advising business strategies to maximise opportunities

# Section 1: Economic forecasting

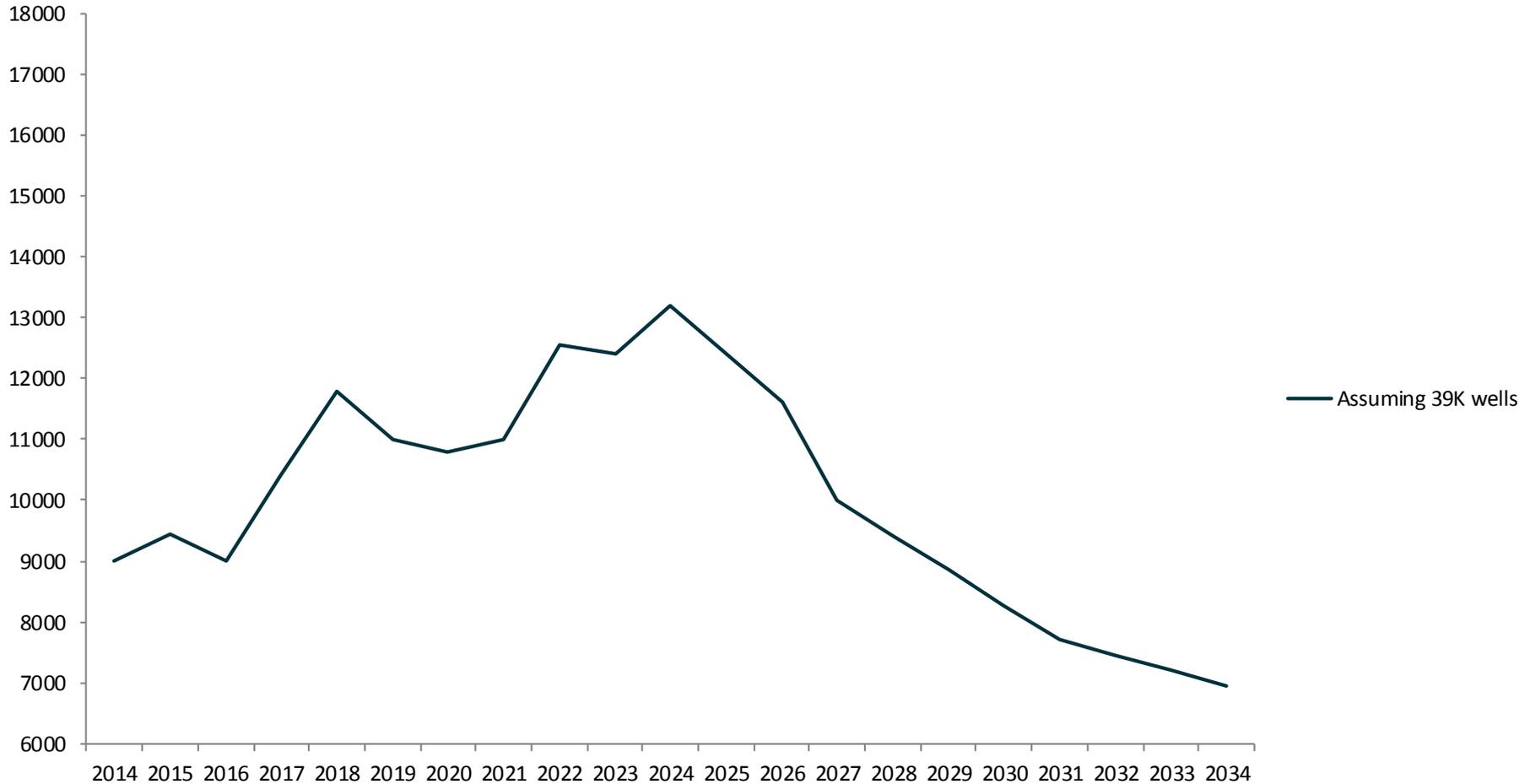
Focus on projecting indirect employment

# Project forecasts indirect jobs

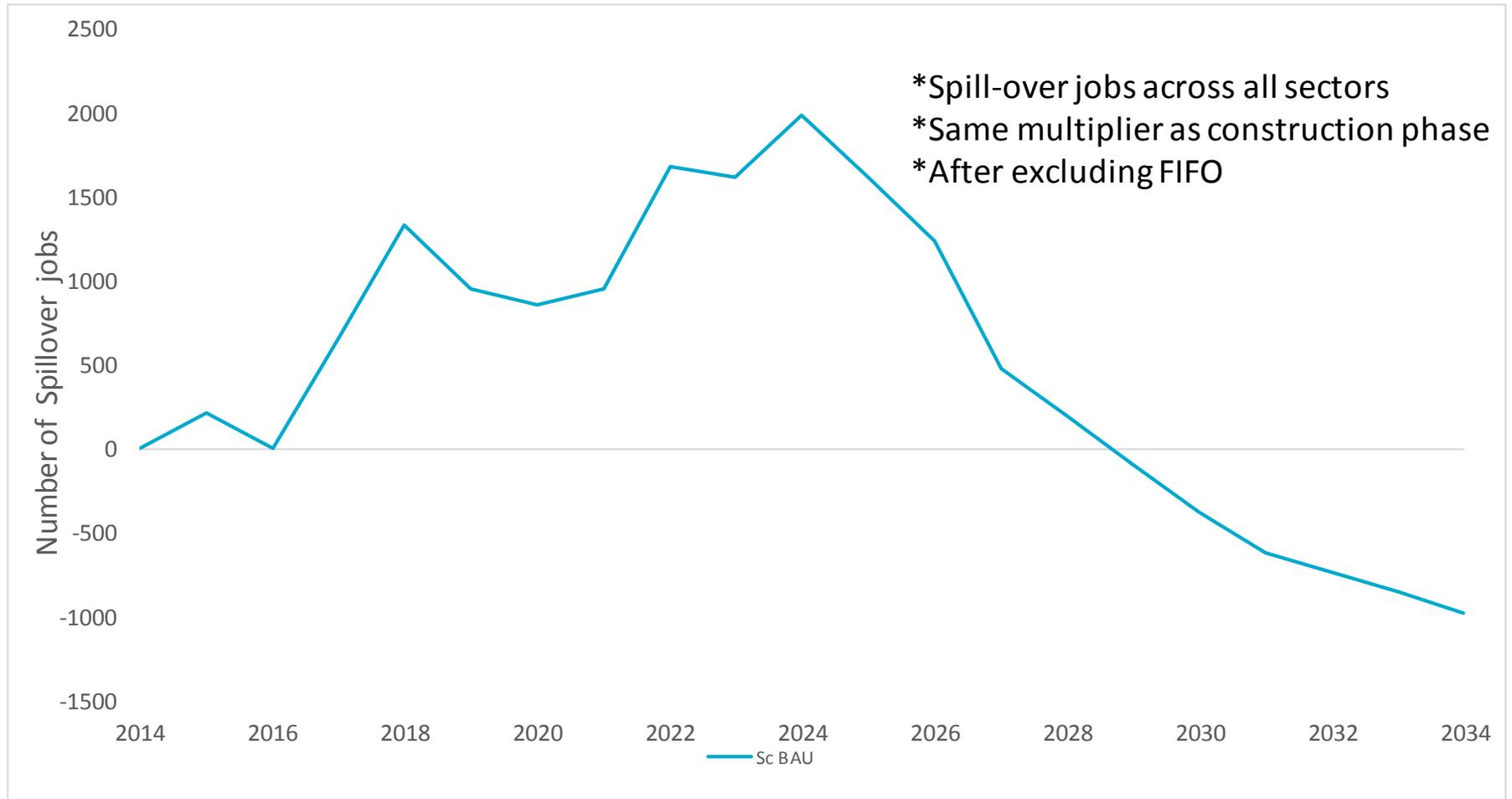
- Started with estimates for Direct jobs supplied by Energy Skills QLD
- Estimated indirect jobs based on methods published in economic journal papers
- Observed multipliers derived for during the period 2006-2011
- These are the most reliable estimates available because they are specific to CSG industry in QLD
- Numbers in Surat and Toowoomba adjusted for FIFO-DIDO
- A total of 10 plausible scenarios were prepared to consider potential reductions in:
  - a) direct employment
  - b) ratio of direct employment to indirect employment

# Direct employment: Energy Skills QLD 2015

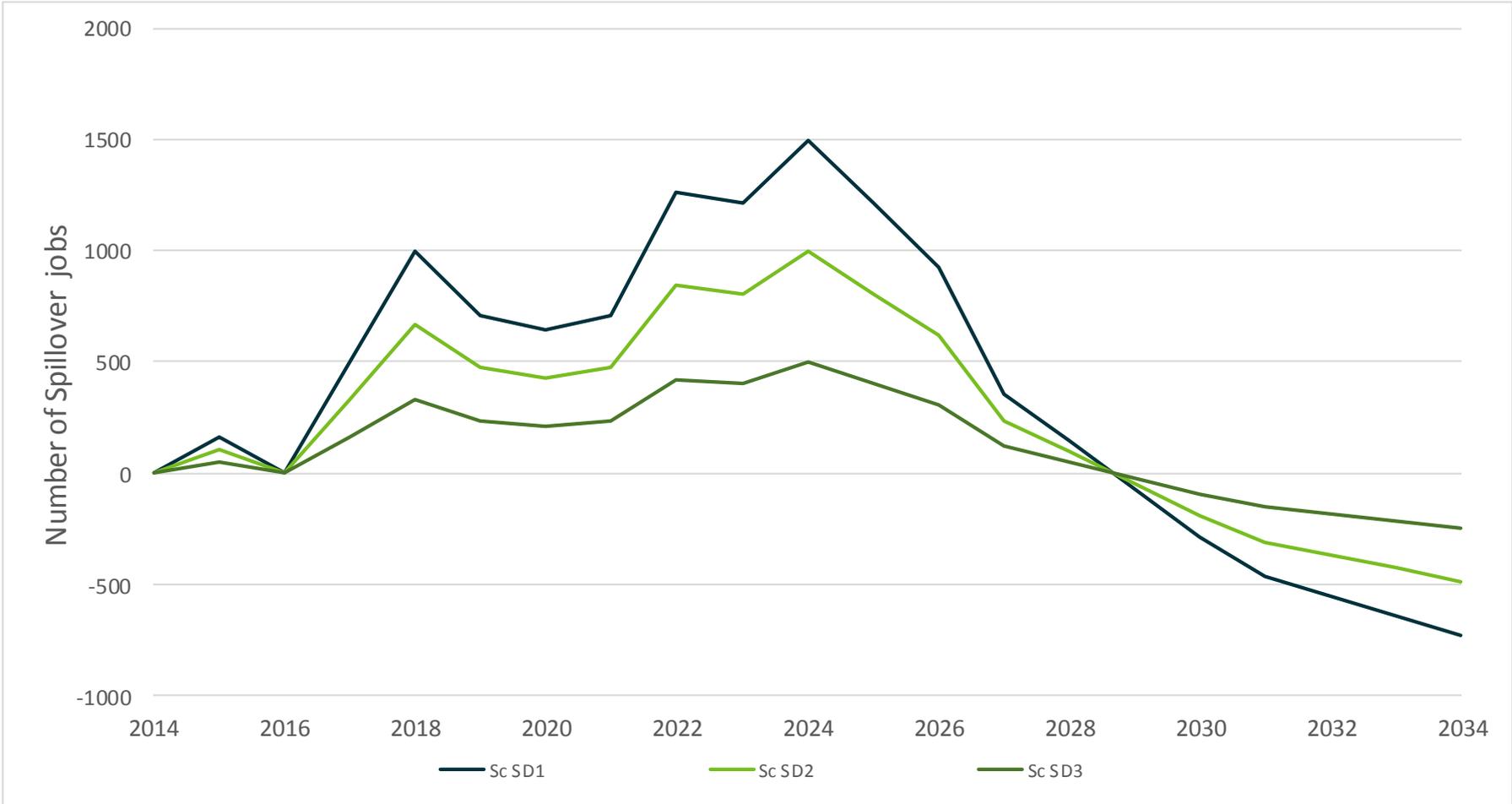
Assuming 39K wells



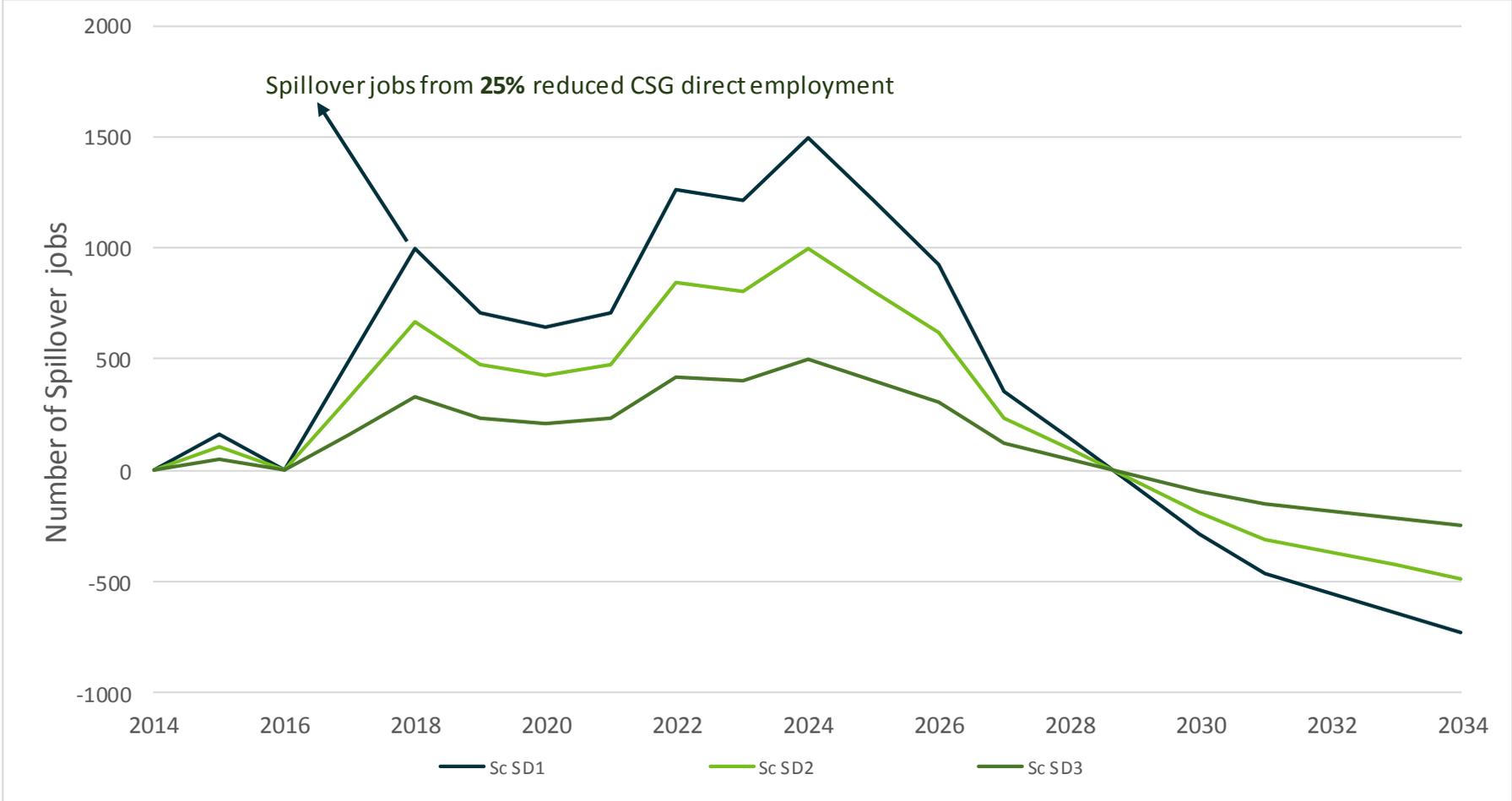
# Business as usual scenario: Surat Basin



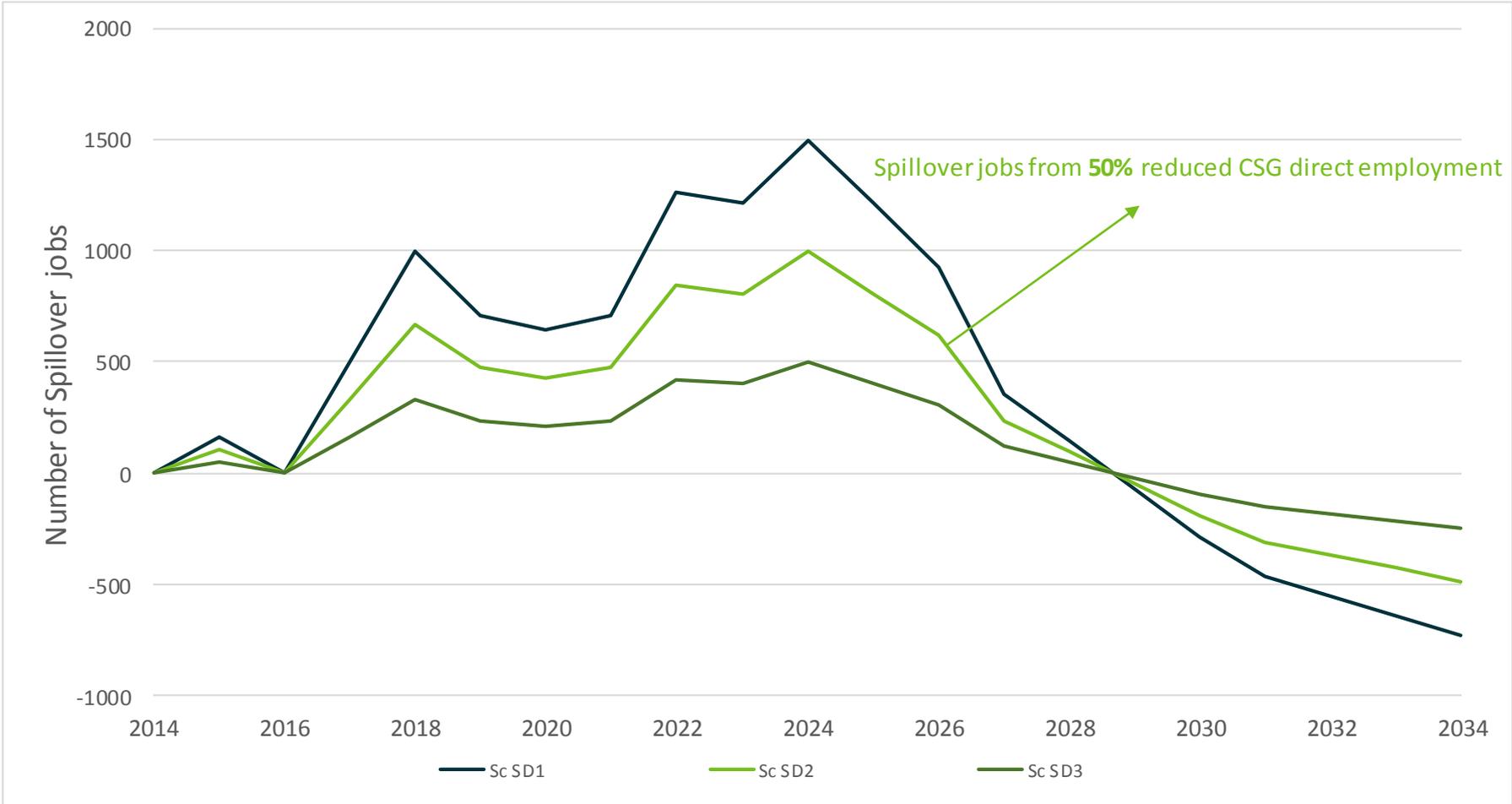
# Slow down scenarios



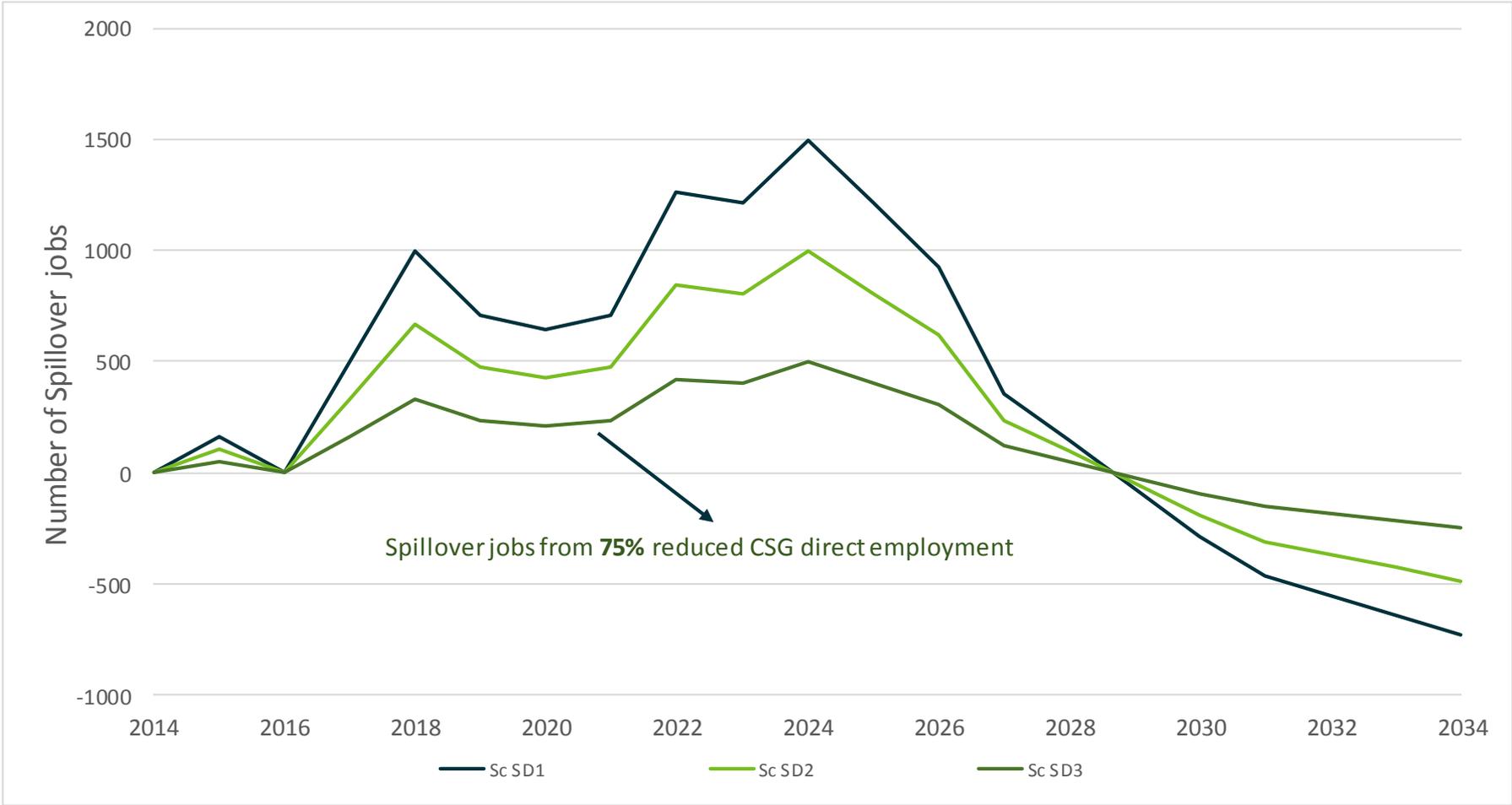
# Slow down scenarios



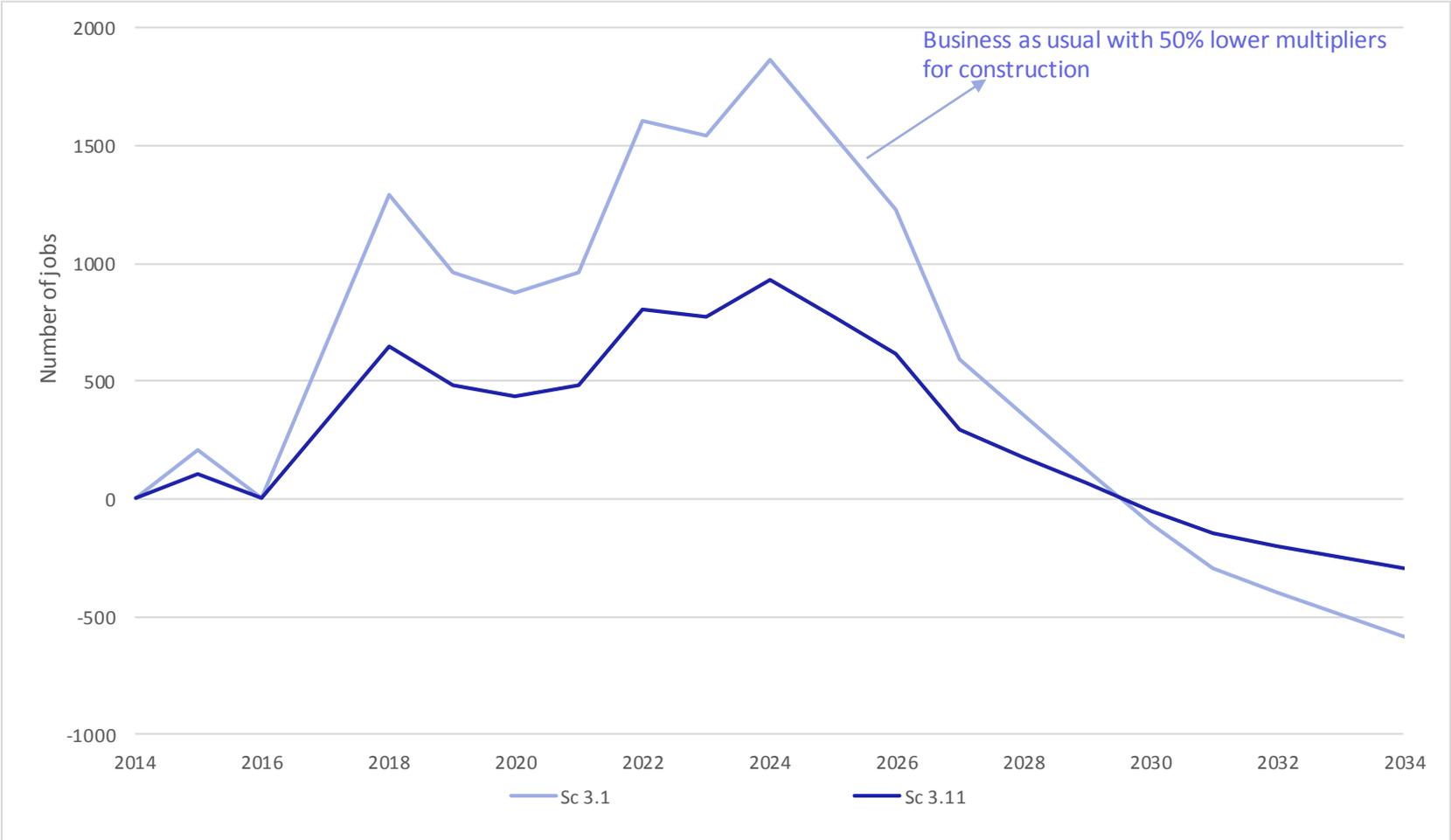
# Slow down scenarios



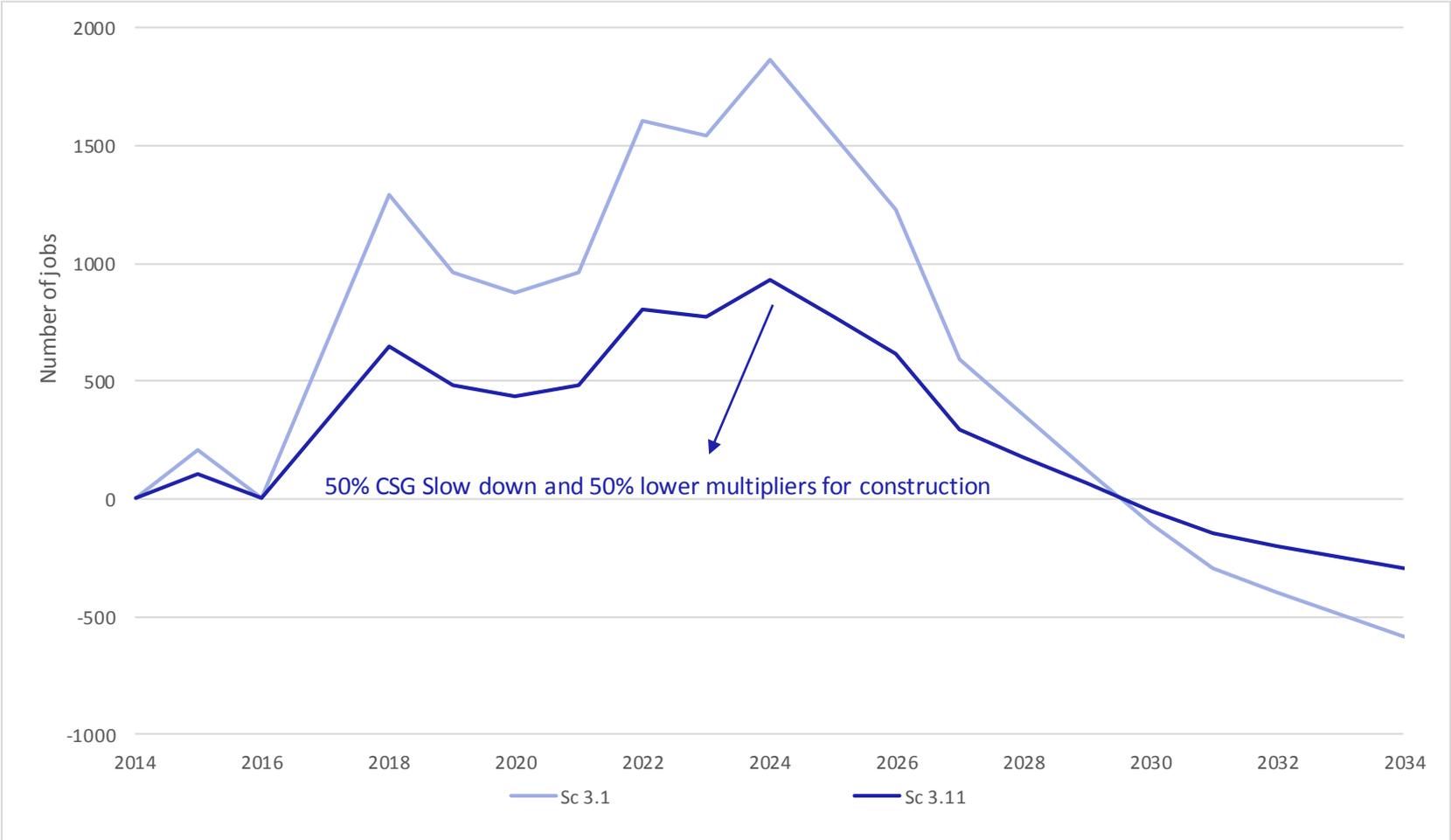
# Slow down scenarios



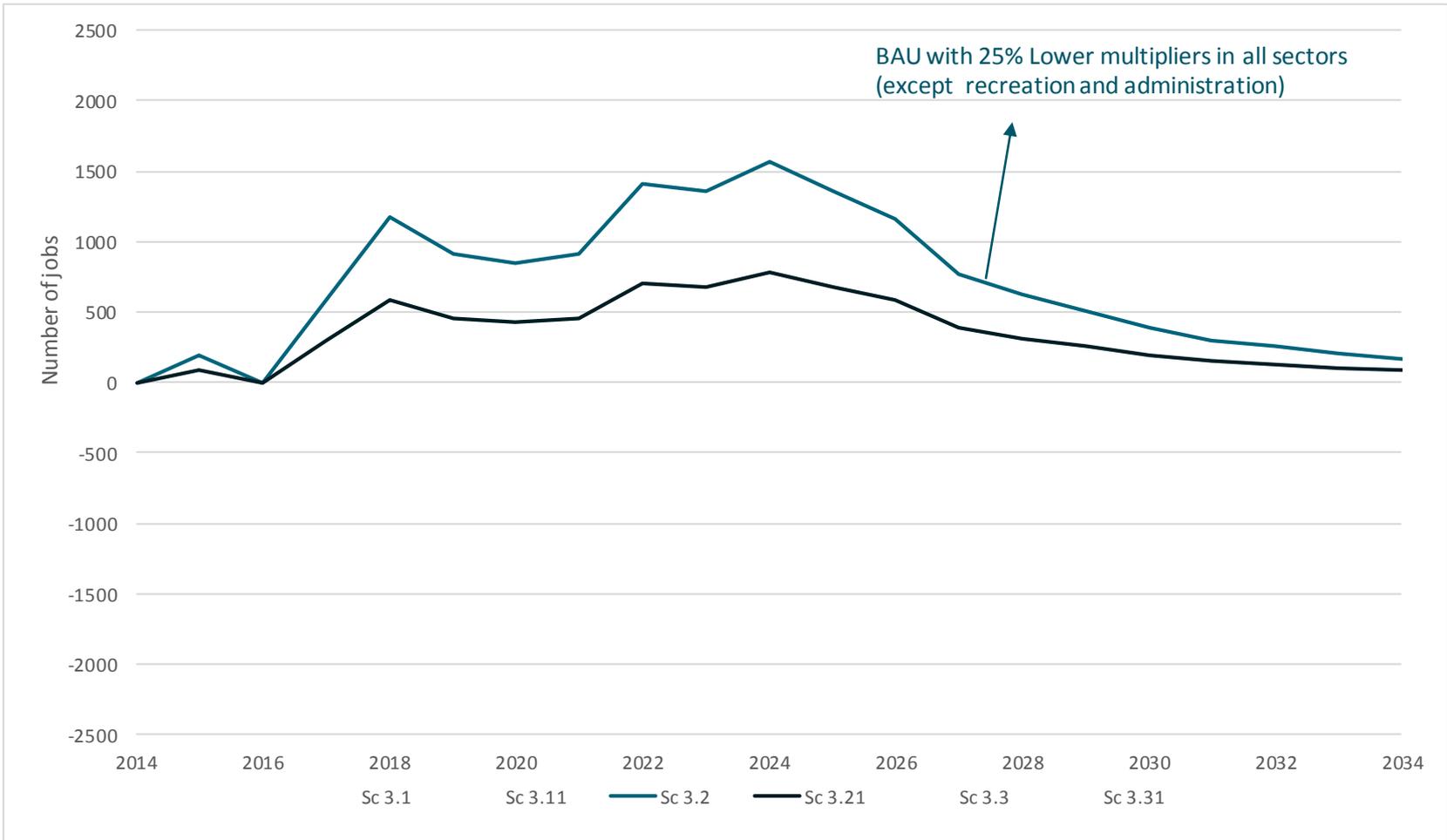
# Scenarios with reduced multipliers



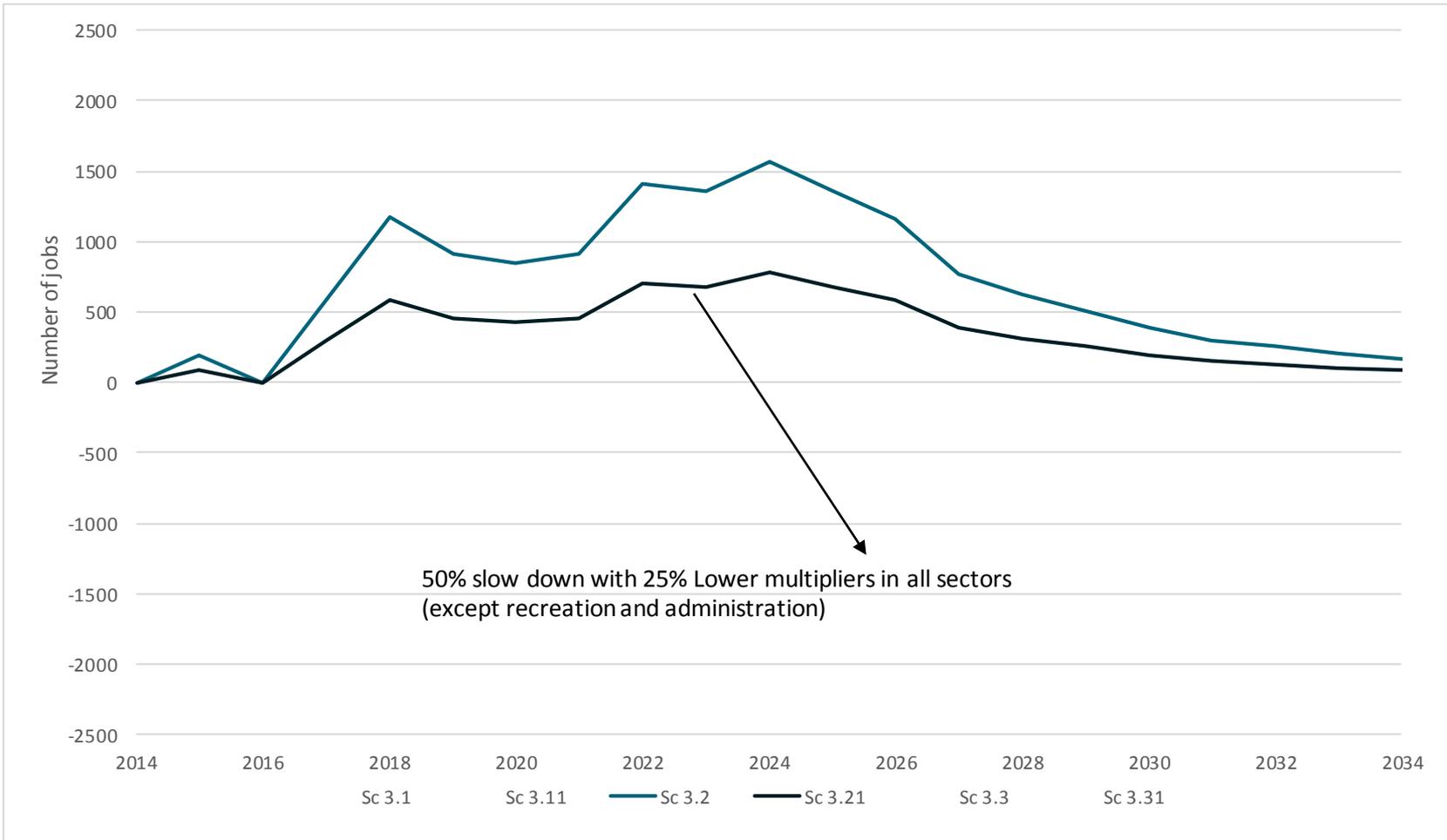
# Scenarios with reduced multipliers



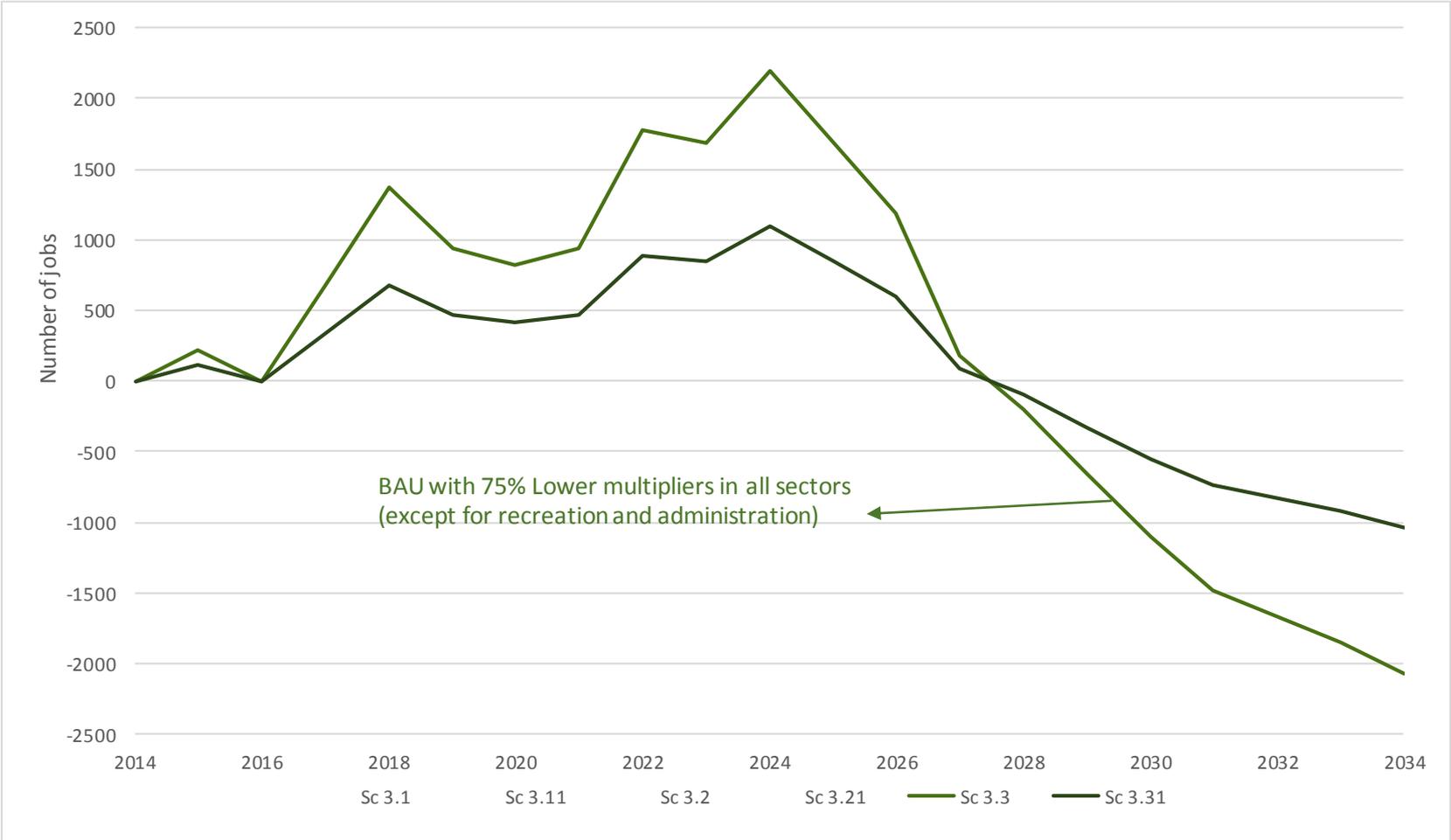
# Gradually reducing dependence on CSG over time



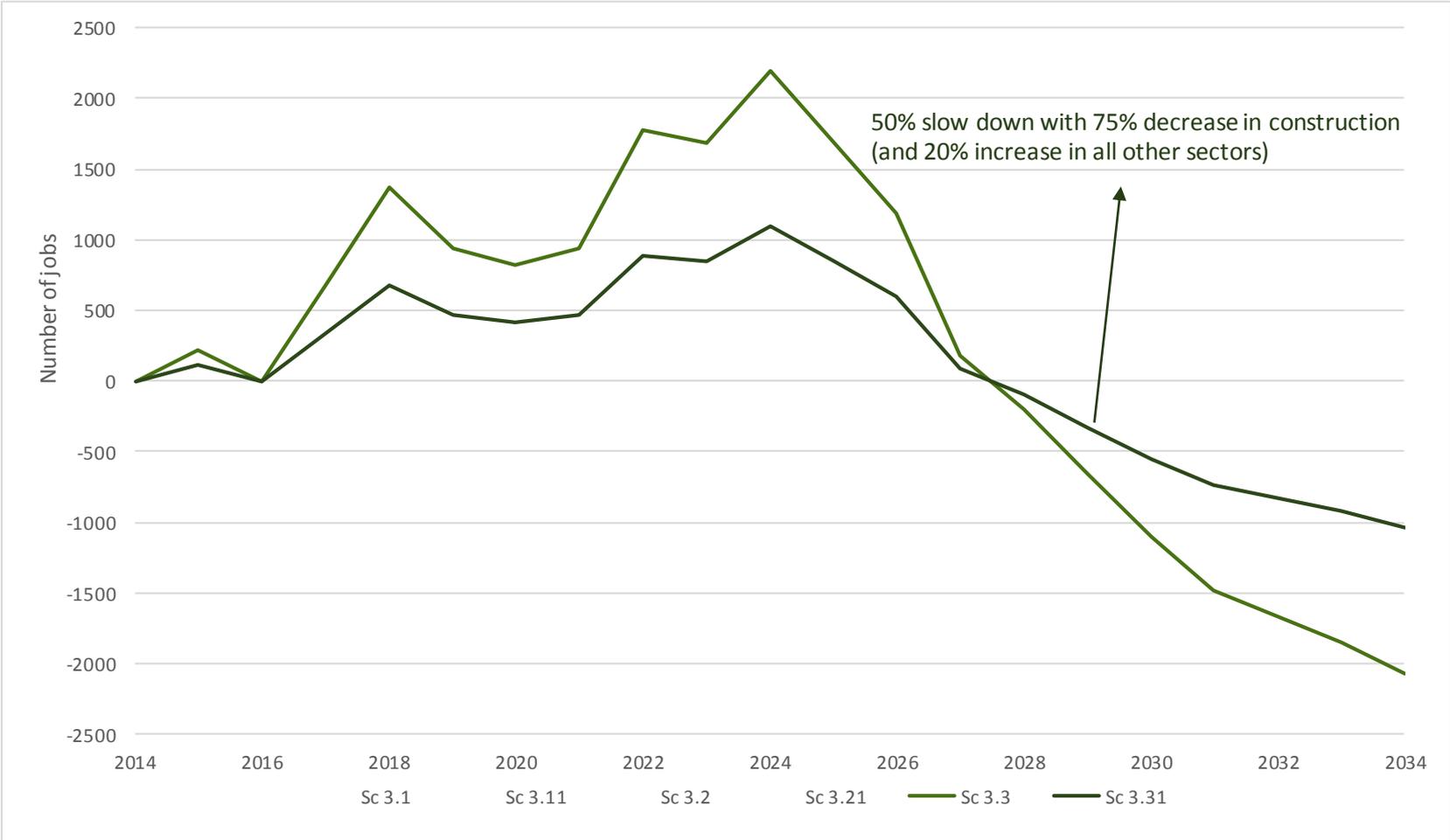
# Gradually reducing dependence on CSG over time



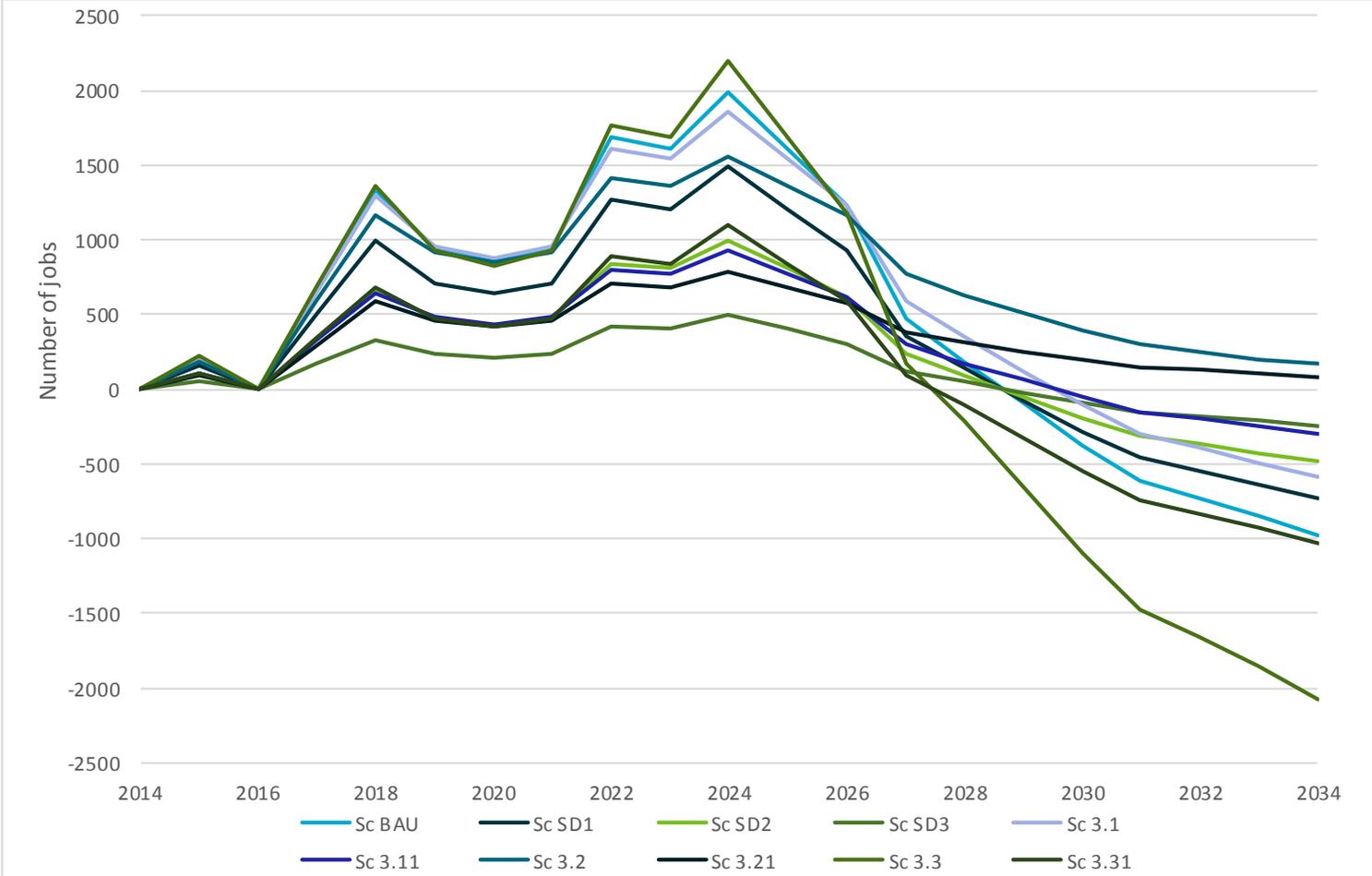
# Abrupt de-link from CSG



# Abrupt de-link from CSG



# All scenarios on same screen



# Projected changes by sector

Industry sector	2006 jobs	2011 jobs	2014 jobs	Jobs from Scenario BAU 2034	Jobs from Scenario SD2 2034	Jobs from Scenario 3.3 2034
Electricity, gas, water and waste management services	591	798	1,250	1,167	1,209	↓ 1,002 ↑
Construction	3,577	4,350	6,650	6,291	6,470	6,769 ↑
Accommodation and food services	2,679	3,215	2,950	2,623	2,787	↓ 1,971
Arts and recreation services	196	303	225	243	234	243 ↑
Other services	1,694	1,919	2,725	2,572	2,649	↓ 1,809 ↑
Administrative and support services	711	847	900	830	865	↓ 830 ↑

# Observations

- Direct industry jobs are forecast to rise and fall
- For indirect jobs (spillovers):
  - the more closely they are tied to direct jobs, the more they rise and fall
- Some sectors are more strongly linked to CSG than others
- Therefore some sectors are more effected by change in CSG than others

# Section 2:

# Implications for local businesses

Based on interviews by small to medium enterprises

Video: <https://youtu.be/uLWouow5ts8>

# 10 Lessons we've learned

## 1. Look after core customers

- throughout the busy times



## 2. Be diversified

- Think carefully about putting all your eggs in one basket.
- Keep a broad base of customers.
- Look for new markets with any new capacity developed

### 3. Understand the industry

- Where you fit in the supply chain
- The ups and downs of activity
- Things change fast
- Prepare for the quieter times
- Big companies think and act differently from SMEs

### 4. Stay connected

- Supply chain, industry bodies, regional development groups, local Chambers, govt programs
  - possible opportunities
  - possible collaborations
  - prepared for what's coming
  - learn



## 5. Keep a close eye on your business

- Manage your costs for project type work,
- Understand your contracts,
- **Beware of possible risks**
  - Bad debts during slow downs
  - External economic factors

## 6. Be careful not to overcapitalise

## 7. Seek business advice early

- Outside advisor, business mentor, accountant
- Tough decisions may be needed
- You may not want to know what you're hearing

## 8. Seek out reliable information

- Be wary of spin

## 9. Personal considerations

- How involved do you want to be?
- Boom times and quieter times can be stressful.
- Consider exiting when you can

## 10. Take opportunities to learn and grow with the CSG industry

- Position yourself for the next increase in economic activity



# What could have helped

- Smoother transition into operations
- Some signals as to when construction finishes
- As much local content in operations as possible
- Clarify the IT systems and platforms
- Not putting wasted investment into compliance training
- Don't overstate benefits: accurate information is most useful
- Correction misinformation wherever possible
- Steps to avoid a housing bubble



# Conclusion

- Forecasting economics is like forecasting the weather
  - = Projections based on best available information (*not predictions*)
- The research considered a range of plausible scenarios
- In 2034, most scenarios indicate:
  - **lower** indirect jobs compared to 2014
  - **higher** indirect jobs compared with 2006
- Oscillating periods of increase and decrease are likely
- Lessons learned from the construction phase are highly relevant for local businesses during the operations phase
  
- Video: <https://youtu.be/uLWouow5ts8>

# Thank you

Dan O'Sullivan  
Onshore Gas Sustainability Advisor

t 0467 813 929

e [Dan.OSullivan@csiro.au](mailto:Dan.OSullivan@csiro.au)

w [www.csiro.au](http://www.csiro.au)

## Lead Researchers

Dr. Andrea Walton

t 07 3833 5675

e [andrea.walton@csiro.au](mailto:andrea.walton@csiro.au)

Dr. Tom Measham

e 07 3833 5677

e [Tom.Measham@csiro.au](mailto:Tom.Measham@csiro.au)