

Briefing

Making a better job of it

Why renewables and energy efficiency are better for jobs than fracking

Central to the case for fracking in the UK made by the industry and its supporters are claims that it will create many thousands of well-paid jobs for local people. In areas like the North West, these claims are the key reason cited by those local people who support fracking¹. But can we take these claims at face value? And would investing in energy efficiency and renewable energy create more jobs?

This briefing concludes that:

- **Fracking job creation claims are over-stated, as has often been the case in the US**

The key report quoted by the industry and its supporters in Government claims that fracking will create over 1,100 jobs per well pad. But peer-reviewed evidence assessing job creation from shale gas extraction in the US (based on how many jobs are created for a given amount of gas extracted) suggests the actual figure could be much lower, with a maximum of around 400 jobs per well pad. In the US, actual job creation from one of the key fields has been less than one-seventh of that claimed in an industry-funded study.

- **Any job creation from fracking is likely to be short-term, whereas the risks posed are long-term**
Despite the several years of disruption to local people from Cuadrilla's proposed test-drilling in Lancashire, each site would only support 11 net jobs. And possible job figures quoted for any production phase are peak figures which fall off rapidly. For example, research for Cuadrilla claimed shale gas production in Lancashire would create 1,700 jobs – but this figure is for one year only, and falls to under 200 only three years afterwards.

- **Renewables and energy efficiency create more jobs than fossil fuels**

Recent analysis by the independent UK Energy Research Centre shows that renewable energy and energy efficiency are a better jobs bet than fossil fuels in terms of both money spent and power generated or saved. They create over six times as many jobs as gas per unit of power generated or saved, and around three times as many jobs for the same investment.

- **Renewable energy and energy efficiency in the North West could support another 24,000 jobs**
Several thousand people are employed in renewable energy in the North West. Further development of renewable energy could support over 14,000 additional jobs (many of them in the region) and bold energy efficiency programme could support nearly 10,000 additional jobs.

1 Why we shouldn't take fracking job creation claims at face value

Several reports have been published by the fracking industry and its supporters making often hugely-hyped claims for job creation. But closer examination reveals that we should be deeply sceptical about the claims made.

1.1 What does the industry claim?

The most often quoted report is 'Getting shale gas working'² produced by the Institute of Directors (IoD), and funded by Cuadrilla. This claimed that UK shale gas production involving 4000 wells at 100 sites would create 74,000 jobs.

Other sources include:

- 'Getting ready for UK shale gas'³ produced by Ernst & Young for the UK Onshore Operators Group (the industry trade association) and supported by the Government claimed that up to 64,500 jobs could be needed to develop shale gas reserves in the UK between 2016 and 2032
- The Environmental Report⁴ produced by Amec for the Government claimed that a new round of onshore oil and gas licensing could create up to 32,000 jobs.
- 'Economic Impact of Shale Gas Exploration and Production in Lancashire and the UK'⁵ produced by Regeneris Consulting for Cuadrilla. This claimed that Cuadrilla's production operations in Lancashire could create 1,700 jobs in the county and 5,600 nationwide.
- 'Potential Economic Impacts of Shale Gas in the Ocean Gateway' produced by Amion Consulting for IGas and Peel Environmental⁶. This claimed that fracking in the so-called Ocean Gateway (covering Liverpool, Manchester, Cheshire and Warrington) could create a peak of 3,500 jobs in the area and 15,500 UK-wide.

The job creation figures above are not simply for people employed directly in oil and gas production. They also include indirect jobs (in supply chains) and induced jobs (created in the broader economy by the additional spending of people in direct and indirect jobs, so including retail, hospitality etc). Of the 64,500 jobs created in the Ernst & Young report, 6,100 (9.5%) are direct jobs on drilling sites; 39,400 (61%) are indirect jobs in the supply chain and 19,000 (29.5%) are induced jobs in other economic sectors.

Fracking advocates have also pointed to the possible benefits from UK fracking through safeguarding jobs in industries such as petrochemicals, which use gas as a feedstock⁷.

1.2 What are the problems with these claims?

There are many reasons to be sceptical about claims made in the UK:

Overstatement of claims

The IoD claims that each well pad would create 1,104 jobs. As well as just being a short-term peak (see below), this figure appears overstated, based on peer-reviewed evidence from the US. In a review of job creation from shale gas, Jeremy G Weber of the US Department of Agriculture found that 18.5 jobs were created for each billion cubic feet (bcf) of gas production⁸. The IoD jobs figure is based on peak production of around 21 bcf a year⁹. Based on Weber's analysis, this would create around 400 jobs.

Experience from the US shows that the shale gas industry has over-predicted its impact. An industry-funded study predicted up to 31 shale-related jobs would be created for each well drilled in the Marcellus Shale¹⁰, but the reality was less than four shale-related jobs per well¹¹.

Cherry-picking by only quoting more optimistic scenarios

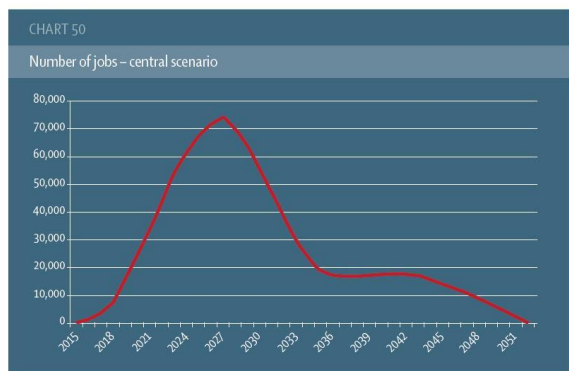
The industry and its supporters tend to quote more optimistic scenarios. The Amec report says that the new licensing round could create 16,000 – 32,000 jobs in a high activity scenario but that, in a low activity scenario, 2,500 – 5,000 jobs would be created.

Short-term employment but long term impacts: how long will the jobs last for?

Cuadrilla’s applications for drilling at its Preston New Road and Roseacre sites say that, despite the several years of disruption to local people, the operations would support only approximately 11 net full-time jobs at each site¹².

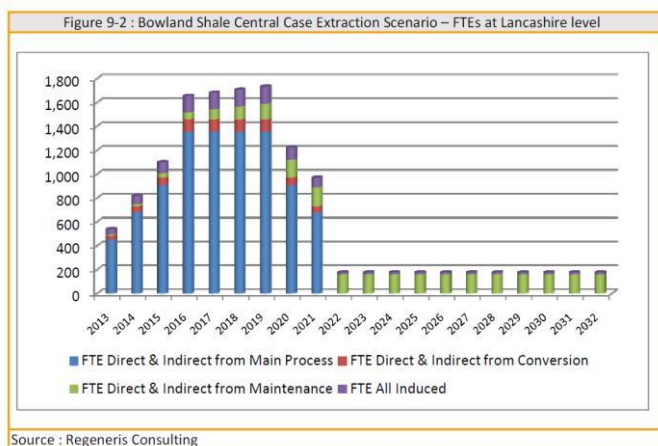
An internal Government report released earlier this year under Freedom of Information regulations, noted that US research on shale gas drilling “highlighted the potential boom and bust scenario in which an expansion of economic activity is followed by a significant contraction as drilling ends and income falls”¹³.

However the impression given is that there will be long-lasting employment in the UK. The IoD report refers to 74,000 jobs, but this figure is a maximum. As the chart below shows¹⁴, there are over 70,000 jobs for only three years (2026-2028) and over 50,000 jobs for only eight years (2023 – 2030):



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The local picture is the same. The Regeneris report for Cuadrilla claimed 1,700 jobs would be created in Lancashire¹⁵ but, as the figure below shows, this for one year only, and the number of jobs falls to under 200 only three years afterwards. This is because the majority of the jobs are in the drilling phase.



Source : Regeneris Consulting

Will local people get the jobs?

It is far from clear how many jobs will go to local people. According to Amec, only 17% of the jobs at Cuadrilla's test-fracking at its Preese Hall site in Lancashire went to local people¹⁶ but these were mainly for non-specialist (and therefore not highly paid) sectors such as *"pad preparation, security, some haulage activities ... and ... hotel and related expenditure on visiting workers"*¹⁷. In the US, it has been claimed that 70% of gas rig jobs in Pennsylvania went to workers from outside the state¹⁸.

Impact on other sectors

In the districts of Blackpool, Fylde and Wyre where Cuadrilla is active in Lancashire, tourism and agriculture are key employers with 10% of total employment¹⁹. Tourism brings spending of around £1.19 billion annually to the area.²⁰ Cuadrilla's assessments of job creation in the region do not address potential negative impacts on these and other economic sectors in Lancashire.

In response to a request by Friends of the Earth Cymru for any reports or research commissioned by the UK Government on the impact of the shale gas industry on other industries or sectors, the Government confirmed *"we have no information relevant to your request"*. An internal Government report on the impacts of shale gas on the rural economy, printed after a Freedom of Information request, contained a large number of redactions including on negative social impacts and house prices²¹.

The National Farmers Union (NFU) is reported to have said that *"farmers had initially seen fracking as a potential opportunity to make money, but were now 'broadly concerned'"*, particularly about loss of land value. The NFU says the Government and industry appear to be *"trying to brush rural economy concerns under the carpet"* and that no-one *"can take support of agriculture and the rural economy for granted"*²². A report from the Cuadrilla-funded lobby group North West Energy Task Force says *"further research is needed on how to ensure farmers benefit from shale"*²³.

Evidence from the US suggests possible problems for agriculture: a report from Penn State University looking at the impact of the development of the Marcellus Shale on dairy farms in Pennsylvania concluded that *"increases in the number of Marcellus shale wells are associated with declines in cow numbers and milk production"*²⁴. Anecdotal evidence suggests farmers are shifting away from dairy production. In California, farmers are among the most vocal opponents of fracking²⁵.

Concerns have been raised about the impact of fracking on tourism. In Australia, the tourism industry in the Northern Rivers area of New South Wales has called for a moratorium on unconventional gas development saying (in a statement which could equally apply to many areas of the UK) *"The Northern Rivers takes a lead from the natural landscapes and rural character in which we live. It is these assets and character which inform our reputation amongst visitors and which generate billions of dollars of tourism income for the region"*²⁶.

A report on the potential impacts of fracking on tourism in three counties in upstate New York concluded that while individual gas wells would likely have little impact, *"cumulatively, however, the regional industrialization associated with widespread drilling could do substantial damage to the region's 'brand', threatening the long-term growth of tourism"*²⁷.

Claims of benefits for sectors such as petrochemicals from domestic shale gas depend on costs, and as has been pointed out above, there is considerable uncertainty about this.

Industry claims assume that shale gas production is economic

The IoD and Ernst & Young reports both assume that shale gas and oil production in the UK will be economically viable, but this is far from given, particularly given recent falls in oil prices. The International

Energy Agency has said that operating costs in Europe will be 30-50% higher than in the US²⁸ and Shell announced last year that it will not be investing in UK shale gas, citing geology and costs as its reasons²⁹.

Are the assumptions used realistic?

The IoD and the Ernst & Young reports both use a scenario developed by the IoD, of shale gas production at 100 sites. Each site would have 10 vertical wells and each vertical well would have 4 horizontal 'arms', so 4,000 'arms' in total. The production rates are based on one US study³⁰ which only analysed data from the so-called 'sweet spots' (the most productive areas) and assumed this could be replicated across the UK. It also ignored other geological studies which sampled a larger number of wells and came up with lower production numbers³¹. Different assumptions used could lead to lower estimates of production and so lower job creation. Nor is there any certainty about how much gas could be extracted commercially: the British Geological Survey has said with reference to the Bowland Shale that extended testing will be needed before commercial viability can be assessed³².

Safe & healthy jobs?

There is little written in the UK on the occupational health risks related to fracking. These include exposures to toxic and carcinogenic substances and the threat of silicosis from silica sands injected into fracking wells as a "proppant" to keep open underground fractures enabling natural gas to flow out. According to 'Hazards', an internationally-recognised health and safety magazine, US experience shows chemical related deaths, a growing fatality rate and widespread over-exposure to dangerous dust³³.

2 Are renewables and energy efficiency a better job creation bet?

Do energy efficiency and renewables offer greater job creation potential than fracking and fossil fuels? This can be looked at in two ways:

- How many jobs could a drive for renewables and energy efficiency create?
- How does job creation compare per pound spent, or per unit of power generated?

2.1 How many jobs could be created in renewables and energy efficiency?

Rapid exploitation of the UK's huge potential for renewables and much faster progress on improving energy efficiency are key components of decarbonizing the UK economy. If the UK's fourth carbon budget were met, GDP would be 1.1% higher than if the budget were not met, and an additional 190,000 jobs would be created³⁴.

Renewables

Renewable energy is already a key UK employer, employing over 100,000 people. As an example, between 11,700 and 14,000 direct and indirect jobs supported in the solar PV industry at the end of 2013³⁵ while a further 15,400 were employed directly in the UK's large scale wind sector, up by more than 2,000 in the last twelve months.³⁶

There are many estimates of potential job creation in renewables:

- The Renewable Energy Association estimated in 2012 that meeting the UK's legally-binding EU target to produce 15% of energy from renewable sources by 2020 could mean over 400,000 jobs supported.
- According to the Government-backed Offshore Renewable Energy Catapult programme, accelerated growth in offshore wind, with 15GW of installed capacity by 2020, could support 34,000 direct jobs and 150,000 jobs in total³⁷.

- Research for the Solar Trade Association estimates that bold ambition on both large-scale and domestic and commercial rooftop solar could support an average of nearly 50,000 jobs a year between 2014 and 2030³⁸.
- The One Million Climate Jobs coalition – supported by Bakers Food and Allied Workers Union, Commercial Workers Union, Fire Brigades Union, National Union of Students, Transport Salaried Staffs Association, Unite the Union and University College Union – advocates a move away from fossil fuels towards renewables and energy efficiency which is estimates could support 400,000 new jobs in renewables and 185,000 in energy retrofitting homes, public buildings and businesses.³⁹

Energy efficiency

How many jobs will be created by a real drive to improve energy efficiency, particularly in UK homes? A recent report by respected consultancies Verco and Cambridge Econometrics for the Energy Bill Revolution campaign found that that investment in energy efficiency as part of a national programme to bring all homes up to Energy Performance Certificate Band C standard would create an additional 108,000 jobs (mainly in construction, manufacturing and services) by 2023, with a long term net increase in employment of around 70,000 jobs by 2030⁴⁰.

2.2 How does job creation compare per unit of power generated and per pound spent?

Comparisons per unit of power generated strongly favour renewables and energy efficiency. UKERC found that evidence from around the world suggests that renewable energy and energy efficiency create on average over six times as many jobs per unit of electricity generated or saved than gas⁴¹:

Technology	Jobs created per GWh electricity generated or saved	Index (gas =1.0)
Gas	0.12	1.0
Renewable energy	0.65	5.4
Renewable energy and energy efficiency	0.80	6.7

Comparisons of job creation for the same amount of money also favour energy efficiency and renewables in UKERC's research⁴²:

Technology	Jobs created per £1 million invested	Index (gas =1.0)
Gas	5	1.0
Renewable energy	16	3.2
Energy efficiency	14	2.8

UKERC concluded that investment in more labour-intensive options “*makes sense*”⁴³ when the economy is depressed. The report's author commented “*When the economy is starting to recover – such as now ... there is a strong case for investment in renewable technologies and efficiency measures as part of the transformational change to a low carbon energy system*”⁴⁴.

2.3 What is the potential for the North West?

Energy efficiency and renewables offer big job creation potential for the North West. Physically the region benefits from a large tidal and on and offshore wind potential – with a strong wind resource and coastline facing the prevailing wind. Shallow waters off the coast and a network of ports also support the offshore industry. The region’s universities have a strong environmental and engineering base and Lancashire in particular has a strong engineering and manufacturing skills base.

A review⁴⁵ of the region’s onshore renewable energy resources in 2010 estimated potential capacity of:

Area	Resource (MW)
Merseyside	3,725
Cheshire	7,459
Lancashire ⁴⁶	9,929
Cumbria	12,139
Greater Manchester	6,871
Total	40,123

In addition to this, there is great offshore potential in the Irish Sea.

There is already a sizeable renewables sector in the North West: in 2012 this was worth £1.2 billion and supported 9,400 people (including over 3,600 in wind and over 2,000 in solar) across over 600 companies⁴⁷. Key elements of the supply chain are already located in the region, such as Cammell Laird on Merseyside which constructs foundations for offshore wind turbines⁴⁸ and Siemens which has a wind technology development centre in south Manchester⁴⁹. When Cammell Laird secured a £5 million wind farm contract in 2011 to provide port and manufacturing facilities for the 160 turbine Gwynt y Môr wind farm off the North Wales coast, it was estimated that this could provide the springboard to £5 billion-worth of work and an extra 2,000 jobs⁵⁰.

Case study: Scout Moor wind farm

Onshore wind farms still struggle to gain planning permission, but where wind has gone ahead there has been a tangible benefit for employment and the local economy. For example the 26 turbine development on Scout Moor, near Rochdale, supported 208 jobs during development and construction⁵¹.

Case study: Cumbria

The 102 turbine Walney offshore wind farm, which opened in 2012, will generate enough electricity for 320,000 homes, and created an employment boost for Barrow⁵². According to a study by the NWDA, by 2050 Cumbria could generate enough renewable energy to meet the needs of 300,000 people – a figure already shown to be conservative following the opening of Walney – through a vibrant mix of wind, hydro, tidal, solar and geothermal. This could create and safeguard in the region of 7,000 jobs. But to reap the rewards from these jobs opportunities for turbine manufacture must be based in the region, building on West Cumbria’s traditional manufacturing sector.

Further development of renewable energy could support many thousands of jobs in the region. If just 10GW of the huge potential resource was developed - including onshore wind, solar and offshore wind - then this could support over 14,000 jobs⁵³. This could be higher still with more ambitious plans.

Technology	Possible jobs
Onshore wind	1,879
Solar	5,125
Offshore wind	7,972
Total	14,975

A bold domestic energy efficiency programme, targeting low income homes first, could create 9,800 jobs in the region by 2020 and 6,700 by 2030 (when the number of homes to be treated is lower than the peak in the early to mid-2020s)⁵⁴.

Other studies have been carried out, assessing the potential at the sub-regional level⁵⁵.

2.4 Can't we have both?

The fracking industry claims that fracking is needed to support the transition to a low carbon economy, that fracking and renewables can co-exist, and thus it is not a case of fracking or renewables. The Government backs this, as does the Labour Party, in calling for an 'all of the above' energy policy encompassing fracking, renewables and energy efficiency.

But a gas-based energy future could delay or inhibit investment in the real solutions to our climate and energy crises. Professor Paul Stevens of Chatham House has written that if the shale gas revolution fails to deliver, *"by the time this is realized it could well be too late to revert to a solution to climate change based upon renewables"*⁵⁶ and the International Energy Agency has warned that *"increased use of gas could muscle out low carbon fuels such as renewables ... from the energy mix"*⁵⁷.

The Government's official advisors, the Committee on Climate Change, warned⁵⁸ in 2012 that *"the apparently ambivalent position of the Government about whether it is trying to build a low-carbon or a gas-based power system weakens the signal provided by carbon budgets to investors"* which risks that *"as a result, the cases for low-carbon business development, capital allocation, innovation and supply chain investment are undermined, damaging prospects for required low-carbon investments"*.

Conclusions

Central to the case for fracking in the UK made by the industry and its supporters are claims that it will create many thousands of well-paid jobs for local people. Obviously there will be job creation – as there would from any multi-million pound investment – but the claims of the fracking industry and its advocates should be viewed with scepticism.

Claims of 74,000 jobs created in the UK depend on a highly optimistic view of geology and costs, and estimate significantly higher levels of job creation per volume of gas produced than that shown in the US. Also they do not mention that this is a short-lived peak, and do not consider the possible negative impacts on other sectors.

Thus claims that fracking in the UK will lead to huge and long-lasting job creation are another part of the shale gas hype, alongside claims of bringing energy prices down and assurances of the safety of the industry based on robust regulation⁵⁹. Fracking is likely to lead to short-term jobs but long-term risks.

And, critically, fracking is not the only way to create jobs in the energy sector - there is huge job creation potential from renewables and energy efficiency

Research has found that hundreds of thousands of jobs could be supported nationwide, given much higher ambition and the right Government support. Research also shows that renewables and energy efficiency create over six times more jobs than gas per unit of power generated / saved; and around three times as many jobs for the same amount of money invested.

A bold energy efficiency programme in the North West could create 9,800 jobs in the region by 2020, and over 14,000 jobs could also be created through the development of renewable energy in the region.

But the Government's 'all out for shale' approach could see it replacing renewables, investment falling and job creation put at risk.

To make sure that the North West does not miss out on the job creation potential from renewables and energy efficiency, the following steps are needed:

- Councils should oppose any further fracking in their area and reject applications for planning permission
- The Government should abandon its 'all out for shale' approach and fully support exploiting the UK's huge renewable energy potential
- The Government should immediately implement a programme to improve home energy efficiency, with a particular focus on the homes of the fuel-poor
- Local Enterprise Partnerships should prioritise the renewables and energy efficiency sectors, and encourage the establishment of key supply chains in their area
- Councils should encourage the development of renewable energy, including supporting schemes such as Friends of the Earth's 'Run on Sun' campaign to fit solar panels to all schools.

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- 15 Cuadrilla Resources website <http://www.cuadrillaresources.com/benefits/jobs-and-investment/>
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- 42 Ibid section 4.2
- 43 Ibid Executive Summary
- 44 UKERC November 5th 2014 'Green jobs debate should look beyond short-term benefits, says UKERC' <http://www.ukerc.ac.uk/news/green-jobs-debate-should-look-beyond-short-term-benefits-says-ukerc-report.html>
- 45 SQW for the North West Regional Development Agency 'North West renewable and low carbon energy capacity and deployment' (2010) <http://www.sqw.co.uk/files/6813/8694/8765/40.pdf>
- 46 Of the Lancashire resource, one-fifth is in Blackpool, Fylde and Wyre – see SQW 'Lancashire sustainable energy study – Fylde renewable energy potential' (2011) <http://www.fylde.gov.uk/assets/files/346/Phase-1-Fylde-renewable-energy-potential-April-2011.pdf>
- 47 Renewable Energy Association 'Made in Britain'
- 48 See <http://www.clbh.co.uk/renewable-energy/offshore-wind-power>
- 49 See <http://www.siemens.co.uk/en/wind/research-development.htm>
- 50 <http://www.liverpooldailypost.co.uk/liverpool-news/regional-news/2011/10/06/cammell-laird-windfarm-deal-could-lead-to-5bn-of-work-and-create-2-000-jobs-at-river-mersey-shipyard-92534-29547214/>
- 51 See case study Appendix F http://www.bwea.com/pdf/publications/Onshore_Wind_Direct_and_Wider_Economic_Impacts.pdf
- 52 <http://www.bbc.co.uk/news/uk-england-cumbria-18476584>
- 53 The calculations assume the 10GW is split 30%:30%:40% between onshore wind, solar and offshore wind respectively. The annual capacity factors used are taken from UKERC 'Low Carbon Jobs' (op cit) and are 30% for onshore wind, 11% for solar PV and 35% for offshore wind. UKERC's overall job creation factor of 0.65 jobs per GWh renewable power has been used.
- 54 Energy Bill Revolution op cit
- 55 For example the Liverpool Local Enterprise Partnership (LEP) estimated in 2011 that there was potential for substantial job creation in the city region from both renewable energy and energy efficiency, including 3000 new jobs in offshore wind, 240 new jobs in onshore wind, 1480 new jobs from microgeneration (such as solar panels), 450 jobs from creating a heat network across the city region and 1540 jobs from retrofitting energy efficiency measures to existing properties The Mersey Partnership, Low Carbon Economy Action Plan 2011-2015 <http://www.liverpoollep.org/docs/tmplowcarboneyconomyactionplan.pdf>
- 56 Chatham House 'The 'Shale Gas Revolution': Developments and Changes' http://www.chathamhouse.org/sites/files/chathamhouse/public/Research/Energy,%20Environment%20and%20Development/bp0812_stevens.pdf
- 57 Oilprice.com 'The Golden Age of Gas, Possibly' <http://oilprice.com/Interviews/The-Golden-Age-of-Gas-Possibly-Interview-with-the-IEA.html>
- 58 Committee on Climate Change 13th September 2012 'Letter: the need for a carbon intensity target in the power sector' <http://www.theccc.org.uk/publication/letter-the-need-for-a-carbon-intensity-target-in-the-power-sector/>
- 59 See Friends of the Earth's critique of regulation 'All that glitters' <http://www.foe.co.uk/sites/default/files/downloads/executive-summary-all-glitters-critique-fracking-regulation-46661.pdf>