Labour Party Conference

Shale Gas and Our Energy Challenges

Funding insulation, reducing oil imports and helping the UK to meet 2020 renewable energy targets

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John Baldwin
Managing Director
CNG Services Ltd

john.baldwin@cngservices.co.uk
www.cngservices.co.uk
07831 241217

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CNG Services Ltd

- We work on projects to make renewable methane and inject into gas grid
  - Poundbury, starts this week
  - Developer of Didcot project for Thames Water, SGN and Centrica
  - Working on 20 further biomethane injection projects in UK

- We are developing a national network of CNG filing stations to fuel trucks
  - Owner of UK's largest CNG station
  - 20% CO_2 saving
  - By 2050 all trucks can run on CNG made from waste, bio-SNG and from excess wind generation (H_2 to CH_4)

- Supporting development of onshore gas fields and gas storage projects
  - Ryedale Gas Project
  - Wingas Saltfleetby
  - Halite Preesall

We are fossil gas people who work in renewable and fossil gas

We have worked on 80 biomethane projects, market going forward looks very good when combined with CCS
Trucks can run on Bio-CNG and that market is growing significantly
The Wingas and Halite gas storage projects got planning consent but no business case given no security of supply obligations for gas suppliers
Next slide is 2021 update of what we do

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CNG Services Ltd

- CNG Services Limited (CSL) provides consultancy, design and build services to the biomethane industry, all focused on reducing Greenhouse Gas (GHG) emissions

- In the past 10 years our efforts have produced a material impact with an estimated 20 year project life reduction in CO_2 emissions of 17,500,000 tonnes through:
  - Biomethane injection into the gas grid
  - Running trucks on Bio-CNG
  - Acting as developer and design and build contractor for the Highlands CNG Project

- Part owner of CNG Fuels Ltd, a company set up to build a national network of Bio-CNG stations on the high pressure grid
  - National network of CNG Stations
  - 84% saving in GHG compared to diesel

- Part owner of Barrow Shipping Ltd, GB's leading shipper of biomethane and a company that only buys and sells biomethane, no fossil gas

- CSL is an ISO 9001, 14001 and 45001 approved company and has also achieved Achilles certification. CSL is GIRS accredited for design and project management and has been certified as a competent design organisation for high pressure UK onshore natural gas works by DNVGL

- Working on a number of H_2 and CCUS innovation projects

Our Energy Challenges

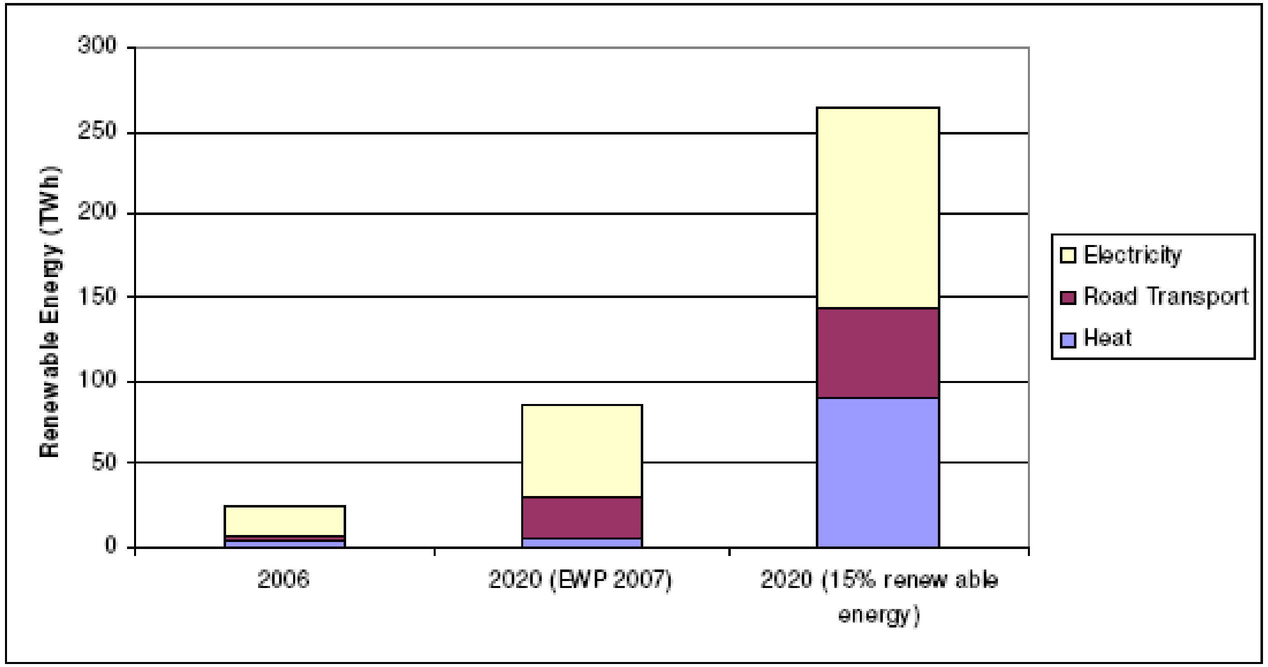
- EU 2020 targets and the closure of coal, nuclear power stations
- The intermittency of wind and solar
  - Gas CCGT has to provide the back-up
- Renewables and insulation
  - The funding challenge
- Decline in UKCS, oil imports
  - Cost of imported oil in 2025
- Decline in UKCS, gas imports
  - The problems with reliance on LNG
  - Lack of UK gas storage
- UK shale potential
- Benefits

Shale gas is a gift from dinosaurs that we must use wisely

Wind, intermittency, funding for renewables and insulation, problems with reliance on LNG, lack of UK storage……looks familiar

UK 2020 Target – 15% renewables

10 fold increase in renewables by 2020



Difficult targets to meet – road transport and heat in particular...

Road transport and heat still finding it difficult to decarbonise

2020 Targets - what about the 85% that is not renewable?

- Nuclear stations closing down
  - New ones delayed and may not be affordable
- Coal plant closing down
  - Good riddance
- CCS not practical
  - Loss of 80% of the energy from coal in the ground
- Wind is good but intermittent
  - Can have an entire winter's month with virtually no wind
  - Not much sun either in Lancashire in January
- Biogas from anaerobic digesters is great but limited in supply and also not 100% available

EU policies are having the effect of having an "Electricity from gas" strategy

Nuclear will mostly be gone before Hinkley Point C comes on line, coal has almost all gone, no CCS but gas CCS is making progress
Dunkelflaute seen as key issue (even though the word had not been invented in 2011!) which it is

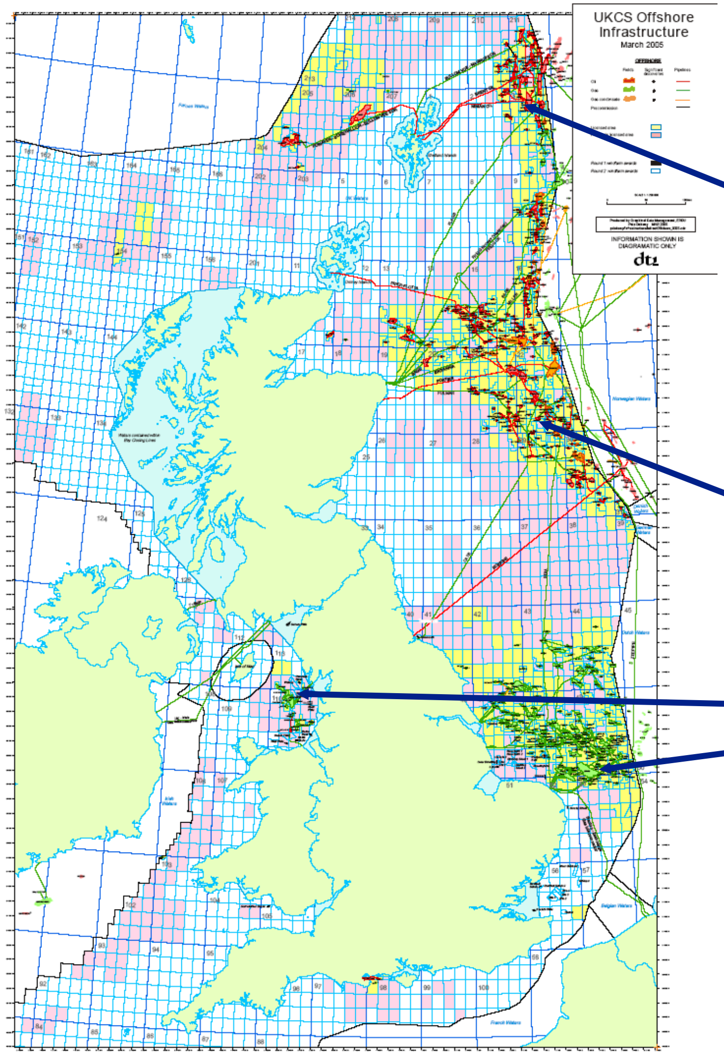
It has to be gas – there is no alternative

- So, electricity will be gas with some nuclear and tiny bit of coal with CCS and a lot of wind
  - No possible alternative to gas fired CCGTs
- Whether UK Govt is breaking its own Climate Change Law is neither here nor there
  - The Energy Suppliers have to keep their customers lights on and the only option they have for a windless day is gas
  - There is no alternative
- Heating will be gas
  - There is no material alternative
- Cars will be diesel-petrol with some electricity (i.e. from gas)
- Trucks will be diesel and natural gas

So, we have to have natural gas – where do we get it from?

Electricity is now from gas and wind as said in 2011 with some support from Interconnectors/nukes
There is no reliable back up electricity option other than gas
Heating remains gas – the Heat Pump-H2 wars only really started in 2020
EV cars are really good (Tesla sorted) but they all use gas as we do not have enough renewable electricity
Trucks are diesel but Biomethane starting to make an impact

Traditional UK oil and gas



Mostly oil - red

Mostly oil with associated gas

Mostly gas - green

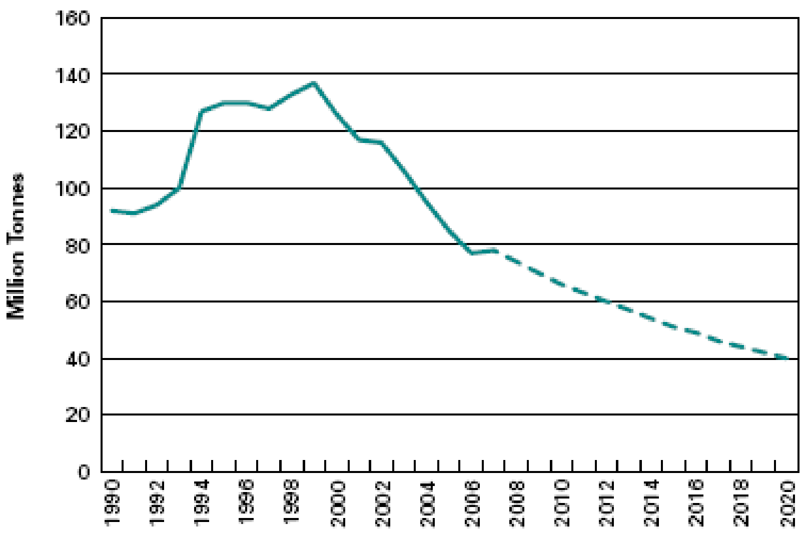
And now, mostly gone….

We will come back to UK gas resources in 3 minutes

Spot on

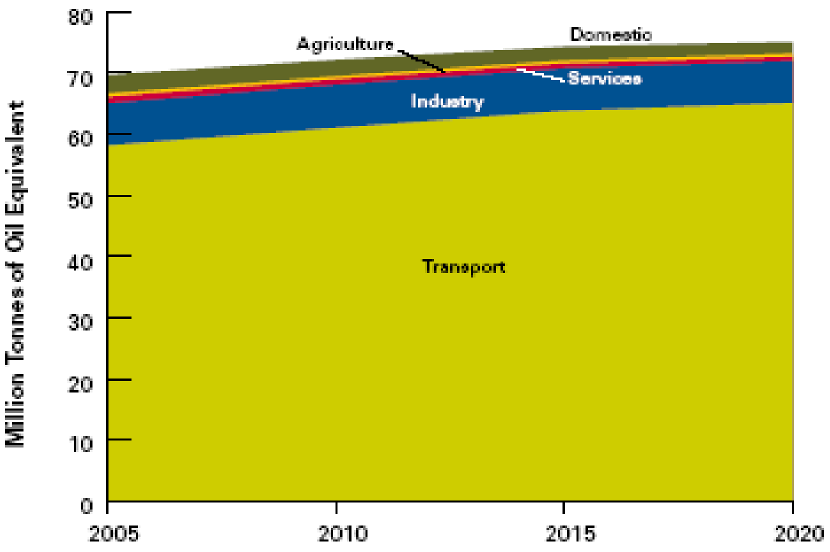
UK oil production and demand 1990 - 2020

UK oil production



Source: BERR

UK oil demand



Source: BERR forecast model

DECC forecasts that by 2025, UK will be importing around 1 million barrels of oil per day, almost all for road transport

This is the Elephant in the room......how do we afford this extra import bill of around £40 billion/year

The big import bill is now gas

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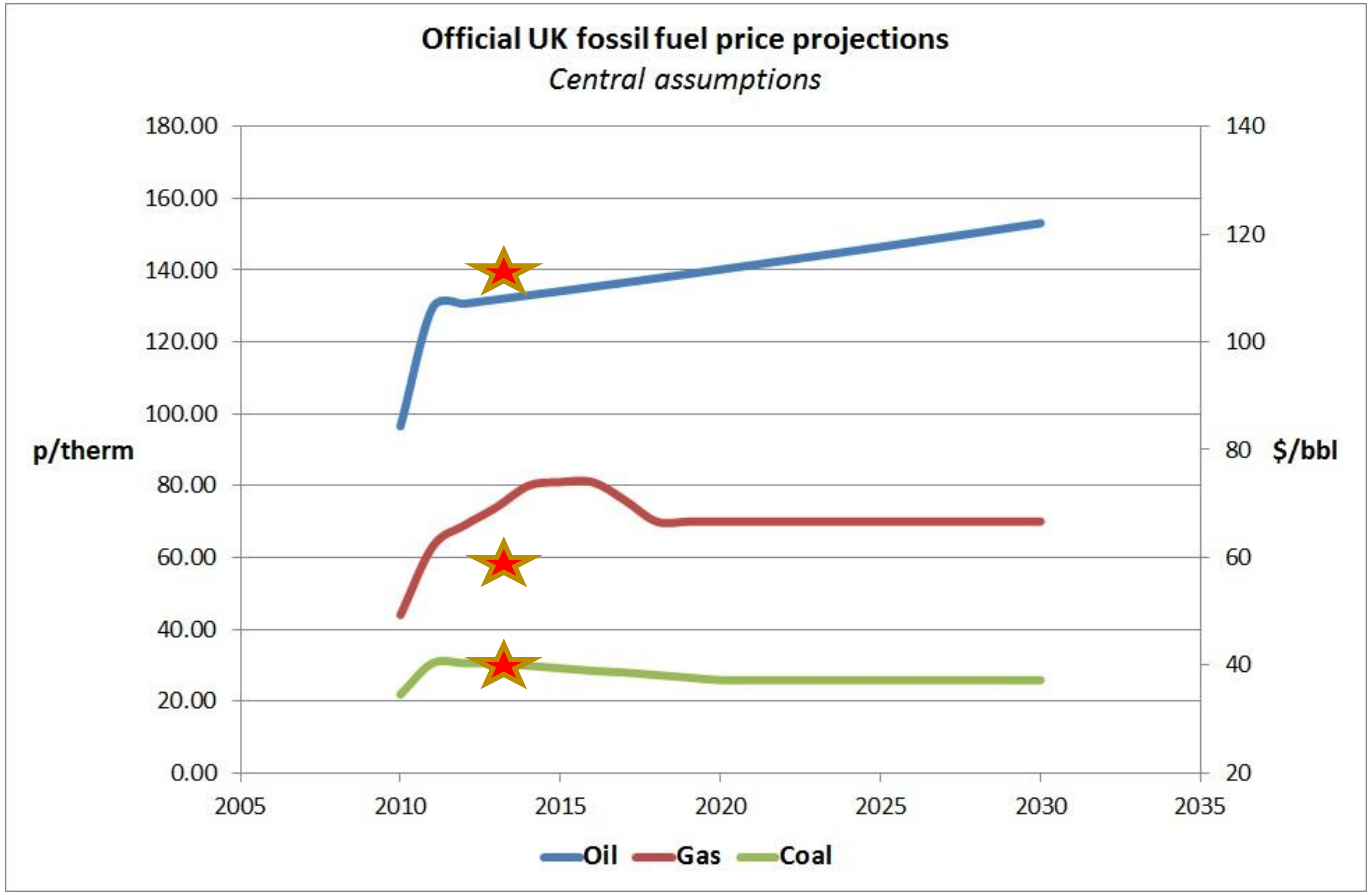
DECC energy price forecasts

Prices today



Can UK plc fund this oil and have funds to finance renewables, nuclear etc?

Question applies to gas as much as oil

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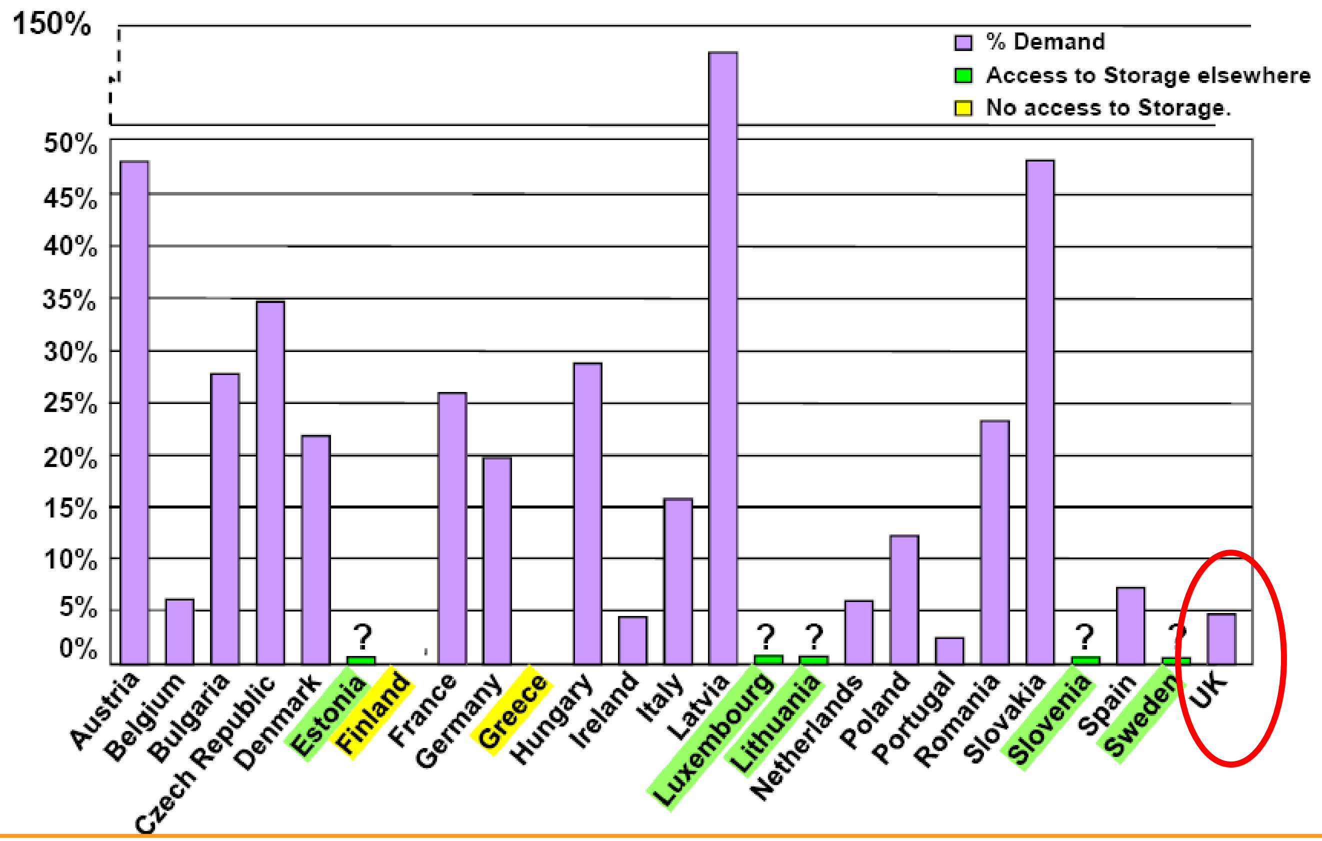
Decline in UKCS, LNG Imports

- The consequence of EU and UK policies is an increasing reliance on LNG imports
  - Main supplier to EU is Qatar
  - Very high CO_2 emissions from making LNG in the desert, 7% CO_2 vented
  - Qatar LNG is only 60 miles from Iranian waters

The good news is that our funding of LNG imports can pay for the first air conditioned World Cup in the desert in 2020

AirCon World Cup in 2022 – Qatar remains big supplier of LNG though US Shale is taking over. The boom in US Shale LNG exports was not forecast. No-one mentions Iran any more, that must have been sorted

UK gas storage



Given reliance on LNG, makes sense to have more domestic gas storage...UK has had negligible new storage in last 20 years even as UKCS has declined

Rough has now closed so this is even worse. It is obvious that if you rely on LNG you must buy it in summer and store it and avoid Winter Bidding war with Asia

Quick Recap

- Strategy for electricity generation is gas
- UKCS oil production is in step decline – additional £40 billion/year import cost from 2025
    - Be afraid, be very afraid
- UKCS conventional gas in decline
- Requirement to import gas from Qatar – expensive, bad for CO_2 and risky in terms of security of supply
- UK policies appear incapable of building gas storage

So, if you want to have an energy policy that is increasing costs to consumers, bad for CO_2 (the planet) and risks bankrupting the country or us freezing to death then we are firmly on track

UK policies incapable of building gas storage – no change there
Qatar CO_2 is ignored as not part of UK GHG. The CCC prefers importing LNG to producing our own gas and they did not accept the Tax/Fund Insulation argument which was a bad error driven by politics not science

Renewables and insulation – the funding challenge

- Offshore wind is very expensive
  - Cost of wind turbines (almost all imported) and grid connections
  - Additional cost to maintain gas CCGT back up
  - Loss of efficiency by having to have flexible CCGT
- All renewables are expensive
  - Anaerobic digestion, solar
- Insulating houses is very expensive
  - Its probably the least cost way to reduce CO_2 but not easy to finance
- We need to encourage new industry in the UK
  - To pay for oil imports
  - To fund renewables and insulation

Now its time to introduce shale gas

Wind mostly imported, missed opportunity
Insulation a great idea but no money, no progress since 2011, not much political interest
Flexible CCGT is becoming gas engines, these are ok but not so efficient
Not much interest on new industry in UK due to NetZero encouraging overseas production

South Morecambe Gas Field

- In 1973, Gulf (now part of Chevron) drilled through the South Morecambe gas field
  - They said it was dry....
- John Bains of British Gas looked at the logs and identified 600 feet of gas bearing rock!
  - Clever chap
- Probably the single most important event in the history of Centrica, BG Group and National Grid
- 6 tcf = 172 BCM of gas = 70 billion therms
- Worth around £50 Billion at today's gas prices

I was graduate trainee on South Morecambe commissioning – Cuadrilla may have a few South Morecambes....

This remains very interesting and not understood by many

Cuadrilla Production Estimates

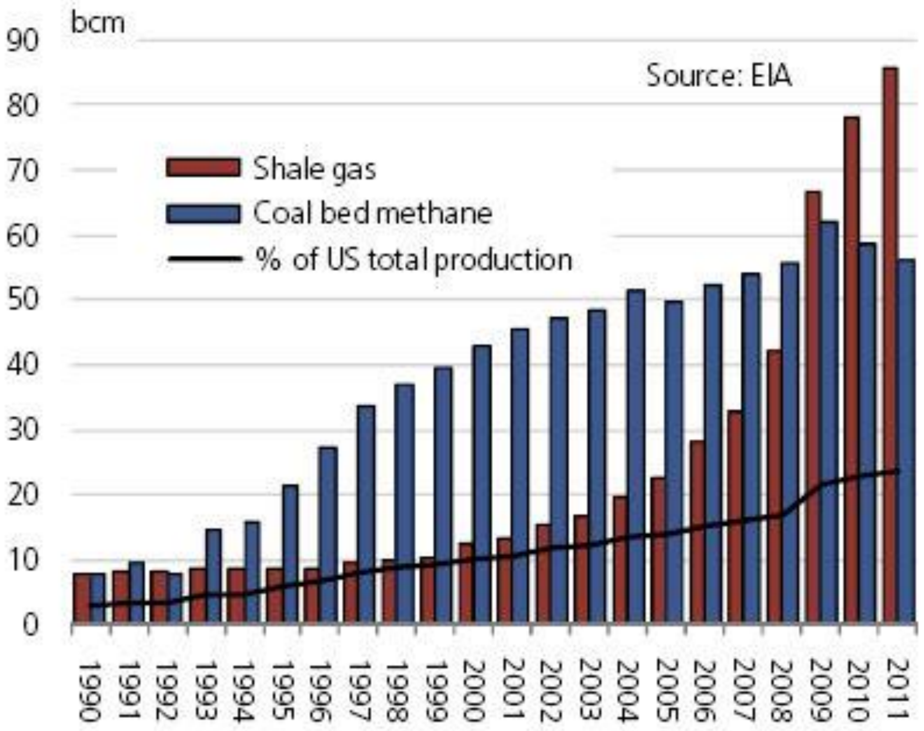
- Cuadrilla's 200TCF is a huge gas reserve
- 20% recovery is 40 TCF = 7 South Morecambe fields
  - Each worth £50 billion in today's money so around £350 billion (that would be paid to buy gas from abroad)
  - Even 10% recovery is OK
- Many other good prospects for shale gas in UK
- Shale gas is transformational, we need to recognise its value to UK plc and use it to fund insulation and renewables

200TCF x 20% recoverable = 1 TCF (28 BCM) per year for 40 years
Around 1/3rd of UK gas demand

Cuadrilla were not allowed to test the flow from any shale gas due to the minor earth tremors so we don't know what potential
All other potential shale gas abandoned with UK Govt ban

US Shale Gas Production
1990 – 2011

Figure 3: US production of shale gas and coal bed methane



Massive growth since 2006 – all us LNG importation projects cancelled, chemical and steel industries relocating to US

US shale gas now keeping Europe from freezing to death (as a cost)
EU and UK Energy Intensive Industries appear doomed

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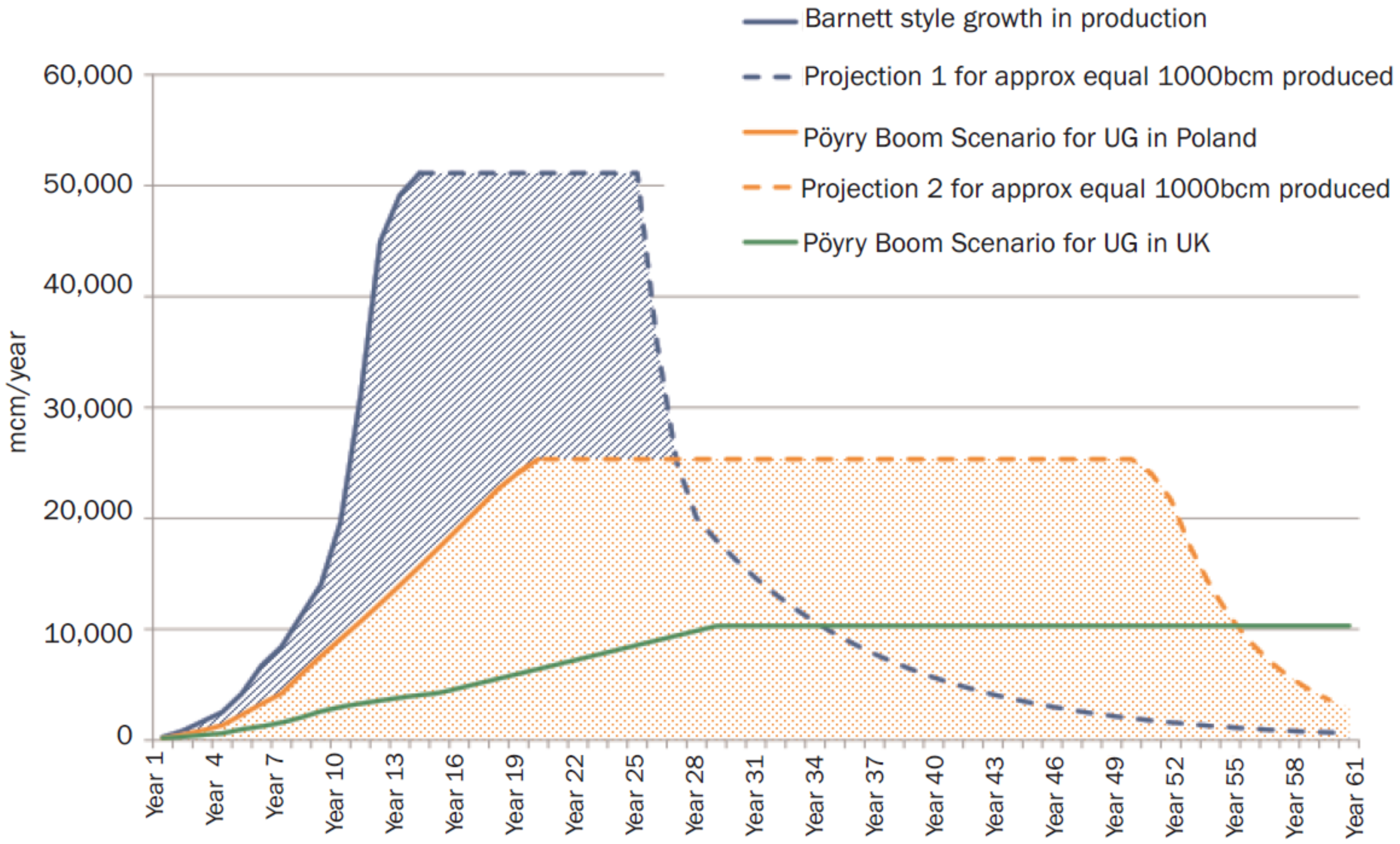
Unconventional Gas Production Profiles



Source: Pöyry

This shows three production profiles. The ‘Pöyry Boom Scenario for UG in the UK’ is Pöyry’s current most optimistic view of UG production in the UK

Who knows what can be achieved? Not one single well drilled, fracked and flow tested

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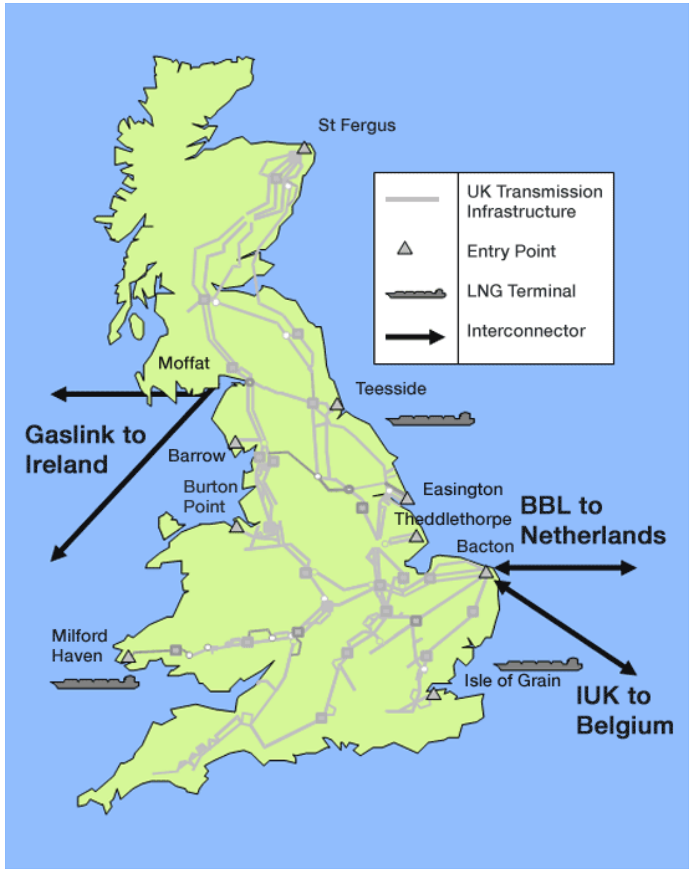
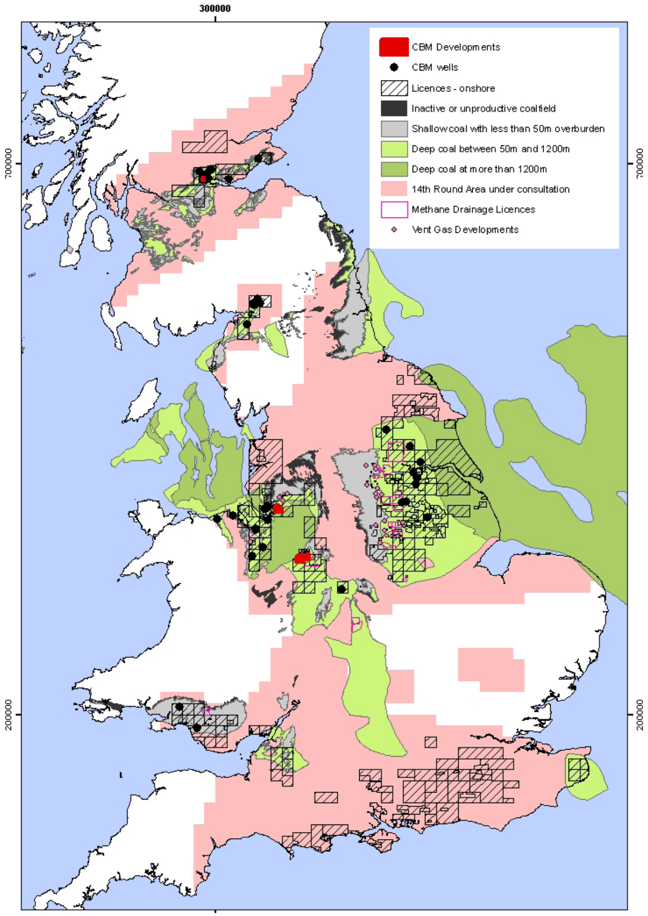
Shale gas locations and the UK gas grid





The National Transmission System appears to be wherever there is shale gas which is a stroke of luck (and saves £10 billion!)

NGG have made it easy to connect to the NTS, less than £1M and less than 12 months

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Opportunities for our young people

- Blackpool-Fleetwood area needs help to improve its economy

‘Get skills now’ to grab new gas jobs

By ALEX ROSS

A PLEA for more training to provide better skilled workers has been issued by councillors.

Wyre councillor and Fleetwood resident Coun Terry Rogers and Coun Alan Marsh, chairman of Fleetwood Town Council, have called better training to be given to unemployed people in the town.

The pair hope to see thousands of jobs secured in Fleetwood if Halite's plans to store gas underground in Over Wyre are given the green light in April.

The number of people claiming jobseeker's allowance in the district currently stands at 1,658, but work is under way to reduce that figure, especially in Fleetwood.

Coun Rogers told The Gazette: “If the Halite planning application is successful then we want to see a broad range of jobs given to people here.

“We have got to take a positive stance and if it's successful, we have got to get on board and make sure the people of Fleetwood are correctly trained to get these jobs.”

the job situation.

“Jobs are going in Fleetwood all the time and a lot of people from the town will lose their jobs when the Department for Work and Pensions move from Norcross.”

Coun Marsh says he is working closely with Blackpool and the Fylde College to ensure the correct training for skilled jobs are secured.

He said: “The benefit system will change whether we agree with it or not.

“I have worked with Blackpool and The Fylde College because we all need to pull together and look at what can be achieved.

“If this goes ahead there will be jobs for road layers, builders, roofers and all sorts of work in manual labour.

“If we don't take this opportunity then others will and I don't want to see thousands of people driving up the M55 to take the jobs.”

alex.ross@blackpoolgazette.co.uk

If there is one way to annoy Lancastrians it is for foreigners from South of England to tell us that we have to import LNG from Qatar in order to pay for the air conditioned World Cup and we should be happy for Blackpool youth to stay on benefits

I major on this, not much interest from Twitter energy people

The Koch Brothers and Shale Gas

- In US, the coal industry is in steep decline due to shale gas
- Coal is leading the anti-shale coalition
  - But losing badly as the truth comes about shale gas
- With UK Environmental and Planning Controls, there are no material issues with shale gas developments
  - Not water quality
  - Not methane leaks
  - Not earthquakes
  - Not planning consent, nothing at all in fact, nothing
- Think Qatar LNG and the regulation of that
- Think coal mining
- Think the risks of Fukishima

The ‘Frack-off’ campaign is not just mis-guided, it is doing the bidding of the Daleks – not too late to join the side of the Doctor

In 2011 it was the Kock brothers who were anti shale gas…I suspect others who supply gas to Europe are happy that Europe has banned shale gas, no need to mention any names!

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Conclusions – it's time to decide

- Renewables are great but intermittent
- We need gas, we must replace Qatar LNG with UK gas
- This provides work for Lancastrians, reduces cost of imports, is more secure and also gives a much lower CO_2 outcome
- It will also generate taxes
  - To fund wind and anaerobic digestion
  - To fund insulation
  - To fund shift to natural gas trucks supplied from high pressure grid

Whose side are you on? The Koch brothers, coal mining companies, the Daleks or good Lancashire folk who want to save the planet and give their kids a job? Its time to decide. Air conditioned World Cup or insulated affordable homes in Blackpool? It's time to decide

Intermittency, security of supply, jobs, taxes to fund renewables and insulation , lower CO_2 (than importing)
All spot on, like reading Nostra – bloody - damus