HYDRAULIC FRACTURING
OR
FRACKING

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HYDRAULIC FRACTURING
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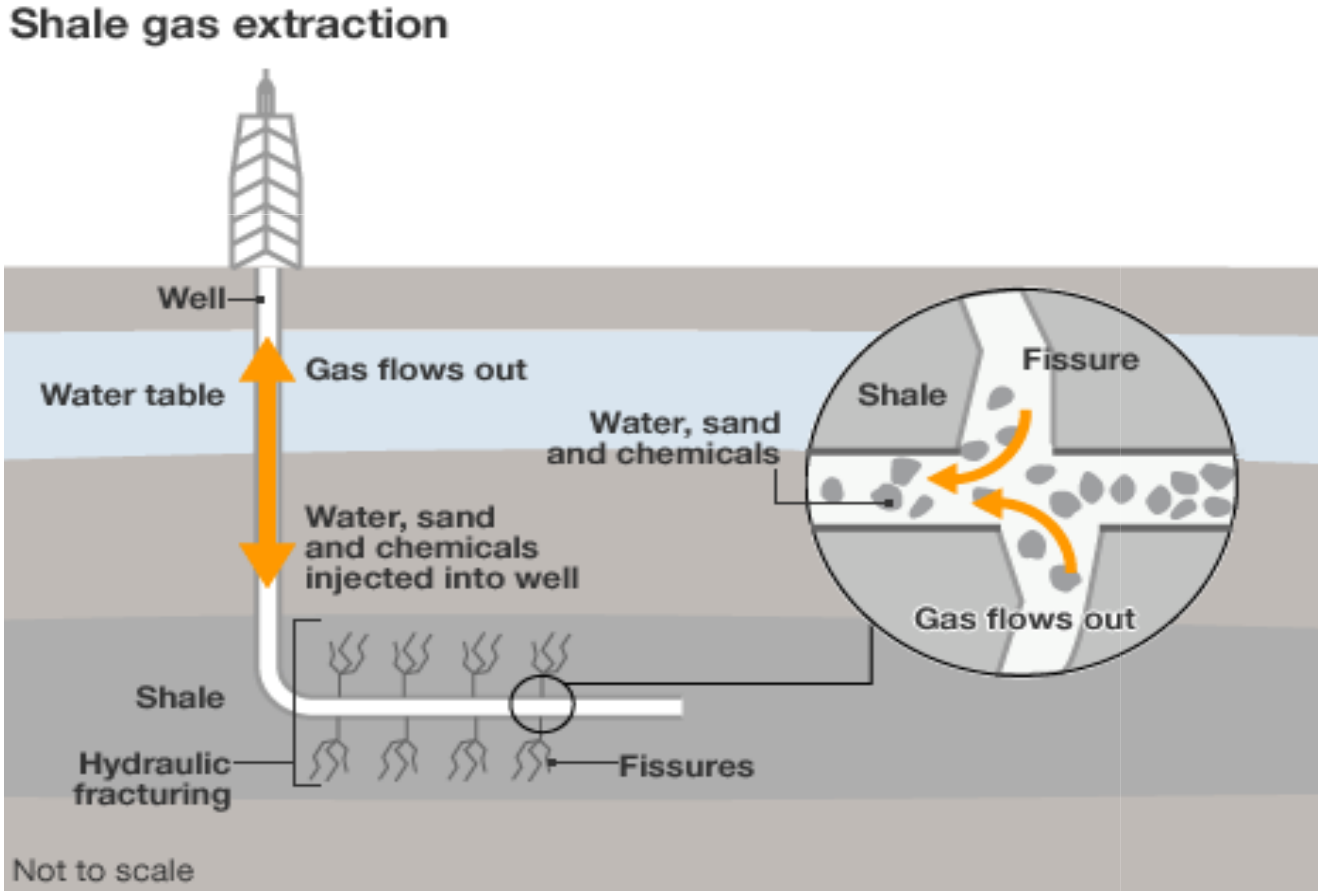
FRACKING

We're going to look at:-

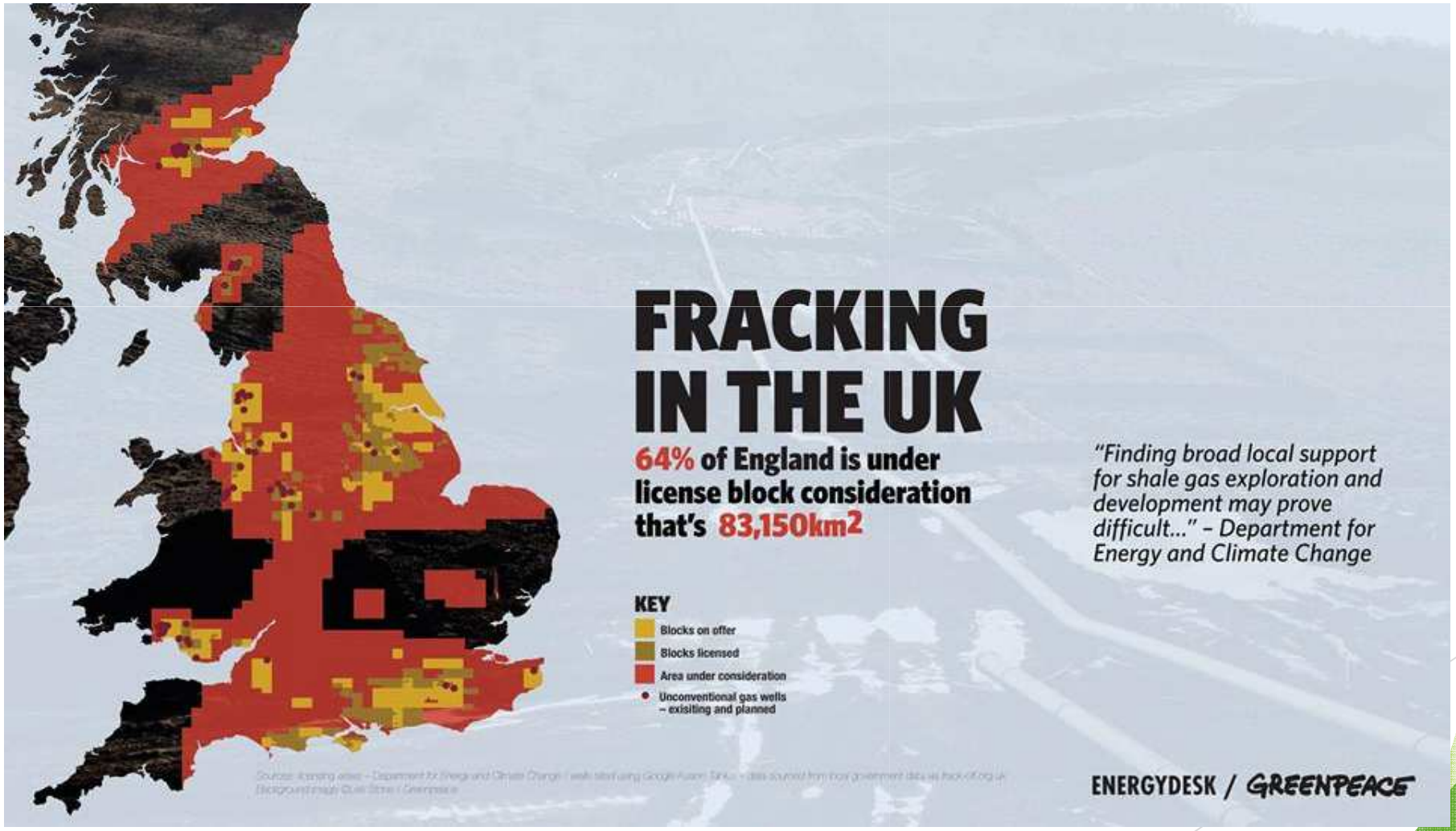
- What is fracking?
- Where could it take place?
- The advantages for the UK
- The problems for the UK and the world
- How fracking in the UK might be different from fracking in the US?
- Will we be fracked in West Berkshire?
- Conclusions

What is Fracking?

- Hydraulic fracturing or Fracking
- Use of high pressure fluid to crack rocks to extract oil and gas
- Different from previous uses of the technique



Where will it take place?



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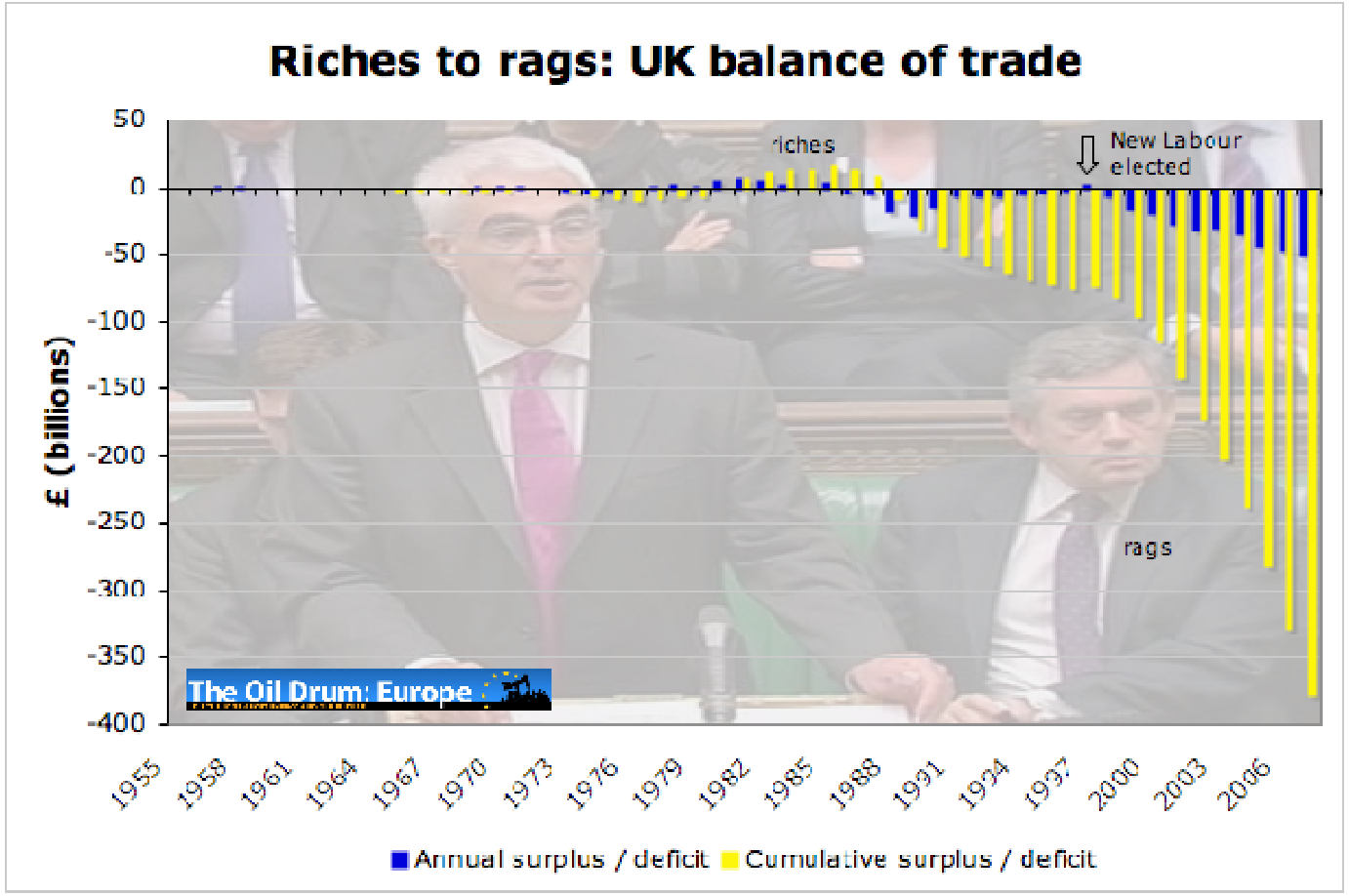

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  - Huge balance of payments deficit & government borrowing
- Jobs
  - 74,000 (IoD report paid for by Cuadrilla)
  - Mostly during the drilling phase

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- Jobs
  - Most for drilling phase only
- Cheap fuel?
  - This will probably not happen

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  - Huge balance of payments deficit & government borrowing
- Jobs
  - Most for drilling phase only
- Cheap fuel?
  - This will probably not happen
- Secure energy supply?
  - International demand for fuel is rising
  - Russia and the Ukraine

What are the advantages for the UK?

- 1% of profits from wells will be paid to the local authority
  - Companies like Starbucks and Amazon trade without profit
  - How much will local authorities have to pay for road maintenance?
  - Clean up costs?
  - In US many “frackers” renege on payments
- £100,000 payment per well
  - Could be swallowed up by additional costs caused by fracking companies

The problems for the UK and the world

- Climate change
  - There are already enough reserves of fossil fuels to cause runaway climate change

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  - If we are to gain the purported advantages must stop mining and using coal
  - We should be thinking about which deposits to lock in, not about using new ones

The problems for the UK and the world

- Climate change
- Depletion rate
  - Well depletion rates as high as 40% in first year
  - Wells can be drained in 5 years

The problems for the UK and the world

- Climate change
- Depletion rate
- Earthquakes
  - Only low level quakes so not really a problem
  - BUT imply movement of faults through which oil and gas migrate
  - Could allow losses of gas to atmosphere
  - Could allow movement of chemicals into aquifers

The problems for the UK and the world

- Climate change
- Depletion rate
- Earthquakes
- Water pollution
  - Not a problem IF properly regulated
  - Could require up to 6 concentric casings
  - Long term corrosion
  - Earthquakes?

The problems for the UK and the world

- Climate change
- Depletion rate
- Earthquakes
- Water pollution
- Airborne pollution
  - Recent independent US research showing methane releases from well heads
  - Other gases are also being detected, some in concentrations that can be harmful.

The problems for the UK and the world

- Climate change
- Depletion rate
- Earthquakes
- Water pollution
- Airborne pollution
- Noise pollution
  - UK is more densely populated country than US
  - 24/7 working
  - Hundreds of very large trucks required to service the wells
  - Hundreds of very large trucks required to frack each well

The problems for the UK and the world

- Climate change
- Depletion rate
- Earthquakes
- Water pollution
- Airborne pollution
- Noise pollution
- Light pollution
  - H&S requirements
  - 24/7 working
  - Denser population than in the US

The problems for the UK and the world

- Climate change
- Depletion rate
- Earthquakes
- Water pollution
- Airborne pollution
- Noise pollution
- Light pollution
- Water shortages
  - Typically 6 to 8 million gallons of fracking fluid required per frack
  - There will be thousands of wells in the SE of England
  - Equivalent to adding another town the size of Basingstoke
  - In most years there is a water shortage in the SE of England
  - In UK most of this will have to be taken away again and disposed of

The problems for the UK and the world

- Climate change
- Depletion rate
- Earthquakes
- Water pollution
- Airborne pollution
- Noise pollution
- Light pollution
- Water shortages
- Local traffic congestion
  - Hundreds of truck movements will be required to maintain wellheads
  - Most wellheads will be away from major roads

The problems for the UK and the world

- Climate change
- Depletion rate
- Earthquakes
- Water pollution
- Airborne pollution
- Noise pollution
- Light pollution
- Water shortages
- Local traffic congestion
- Road damage
  - Hundreds of 44 tonne trucks per well head
  - 10 or 12 wells per well head
  - All on our country roads
  - Is this damage paid for by the 1% royalties

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- Climate change
- Depletion rate
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- Water pollution
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- Light pollution
- Water shortages
- Local traffic congestion
- Road damage
- Erosion of civil rights
  - Changing Law of Trespass
  - Changing laws regarding lobbying
  - Changing laws governing political

How fracking in the UK might be different from fracking in the US?

- Different land rights and minerals ownership

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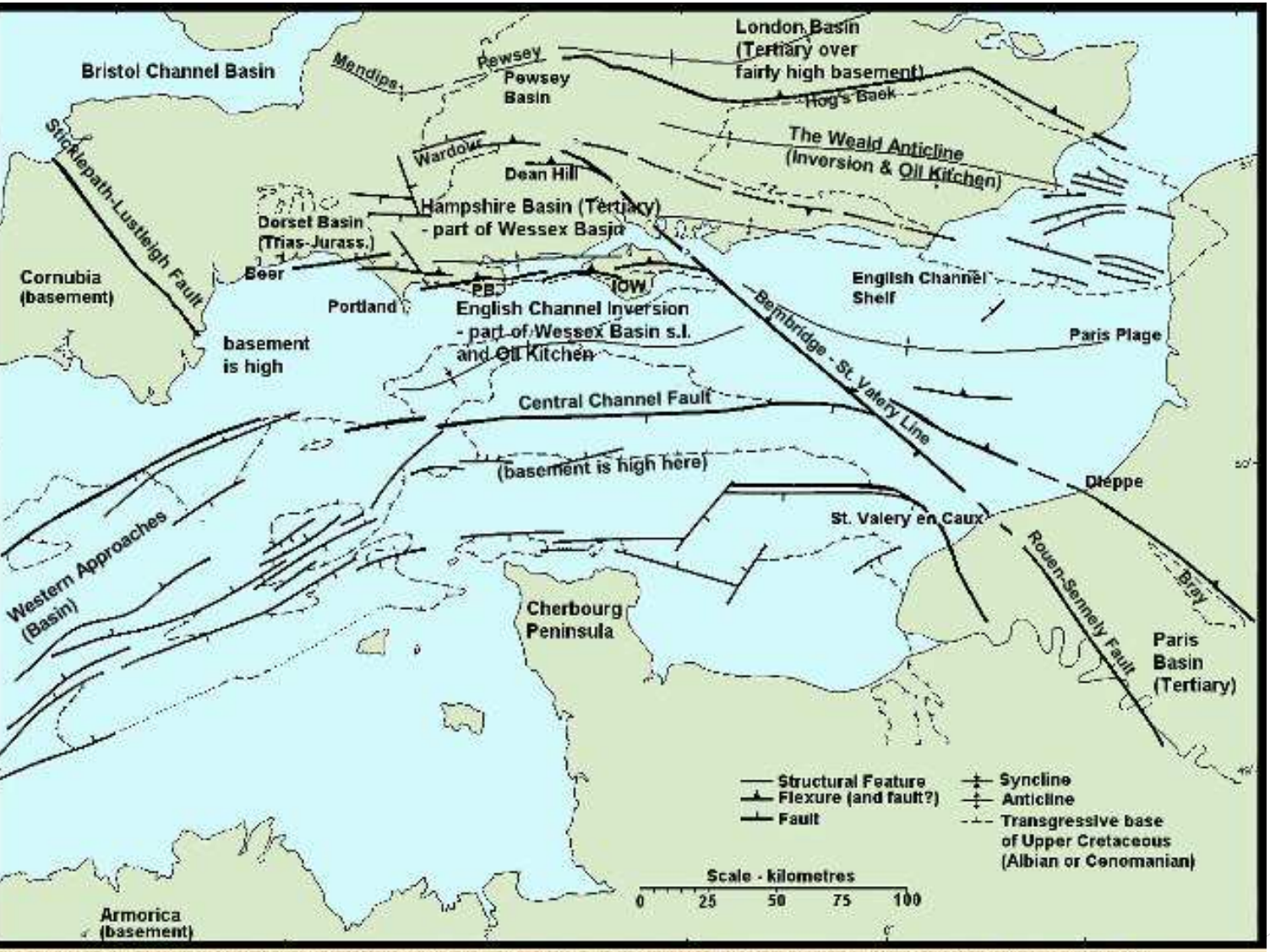

The main tectonic features of the Wessex Basin and adjacent areas, shown on a generalised map. Note that the downthrows of the faults shown are generally the Tertiary directions and some were opposite direction in the Cretaceous extensional phase. This applies particularly to the Purbeck-IOW Disturbance, the

Different geology?

Illustration courtesy of Ian West, ***Romsey, Hampshire*** and Visiting Scientist at: Faculty of Natural and Environmental Sciences, Southampton University,

http://www.southampton.ac.uk/~imw/Oil-South-of-England.htm

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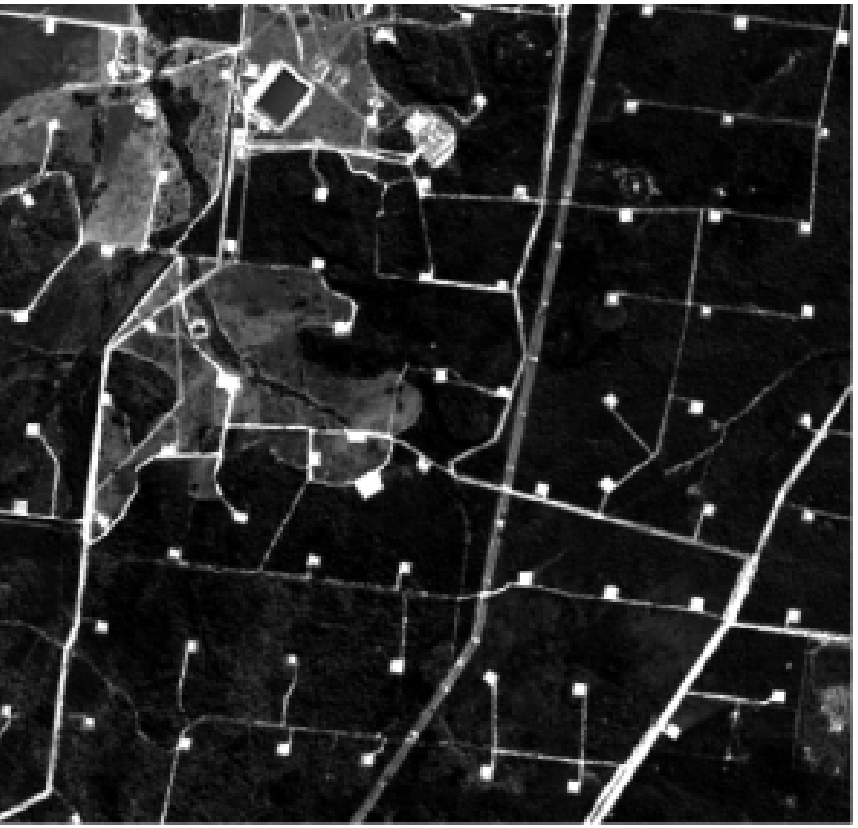

Coal bed methane in Queensland
Similar to that proposed in Somerset

Well heads spaced out on a grid of about 750m with pads about 1 ha in size.

Cuadrilla says that their pads in Somerset will be about 2 ha in size.

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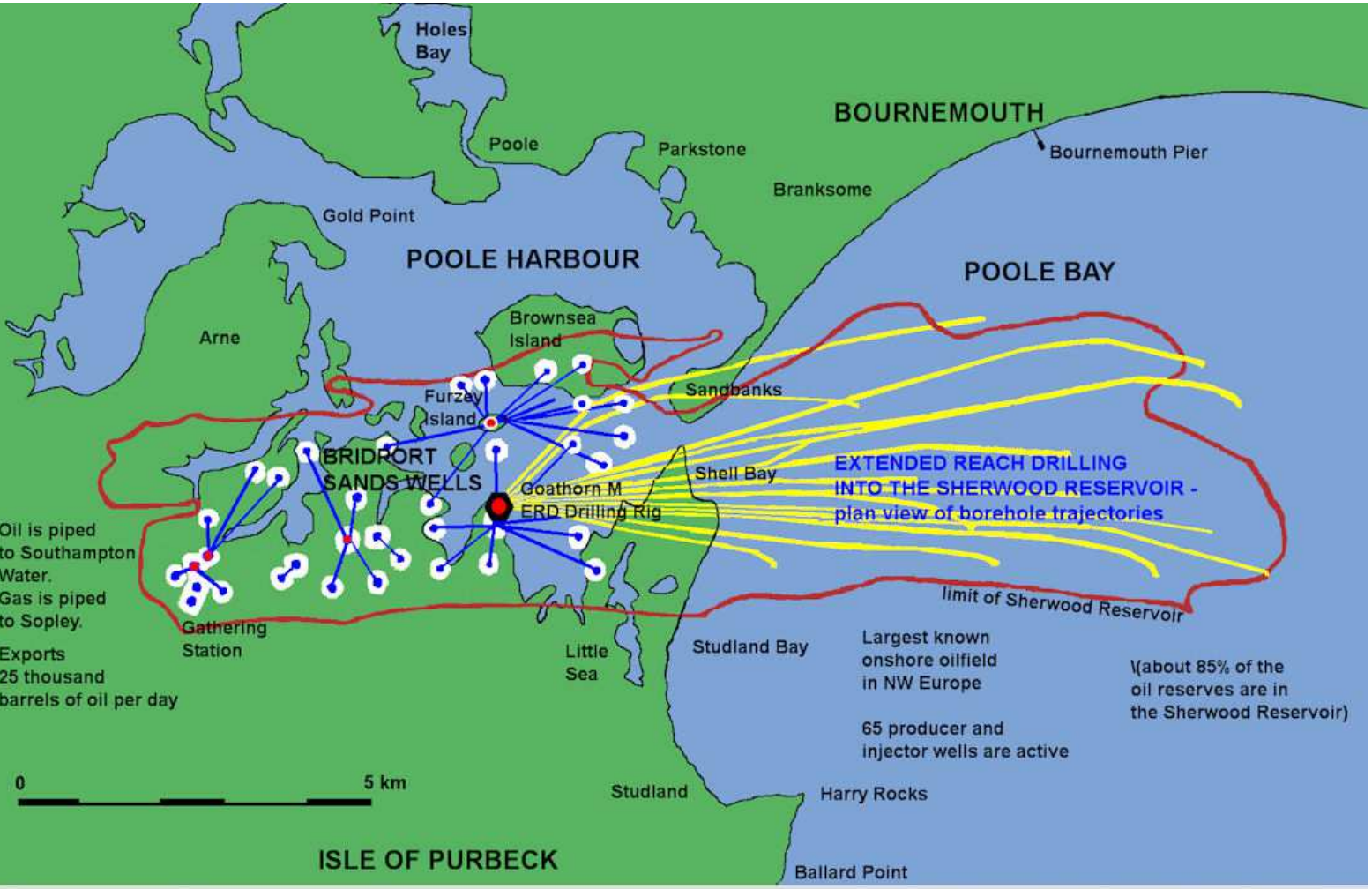

WYTCH FARM OILFIELD - PLAN VIEW OF BOREHOLE TRAJECTORIES, BOTTOM HOLE LOCATIONS AND THE SHERWOOD RESERVOIR. This is to provide a general picture of the borehole drilling operations in relation to Poole Harbour, Poole Bay and Bournemouth. This has been redrawn and modified after a small diagram in Wahidiyat (2010) based on work of BP. This map is merely illustrative for educational purposes and is not claimed to be technically precise. See Wahidiyat (2010) for more data, not shown here, and consult other oil industry reports. Ian West (c) 2011.

EXTENDED REACH DRILLING AT WYTCH FARM, DORSET

Illustration courtesy of Ian West,
Romsey, Hampshire
and Visiting Scientist at:
Faculty of Natural and Environmental Sciences, Southampton University,

http://www.southampton.ac.uk/~imw/Oil-South-of-England.htm

How fracking in the UK might be different from fracking in the US

THE EXTENDED REACH DRILLING RIG AT GOATHORN PENINSULA, LOOKING NORTH, AND BEYOND TO BROWNSEA ISLAND AND POOLE. The viewpoint is a roadside layby near Godlingston Hill and the photograph has been taken with a telephoto lens. Poole is actually four and half kilometres beyond the rig and not so conspicuous to the naked eye. The sail of a yacht, towards the right, indicates the location of a Poole Harbour channel. Photograph: 7th May 2011. Ian West (c) 2011.

Illustration courtesy of Ian West,
Romsey**, **Hampshire
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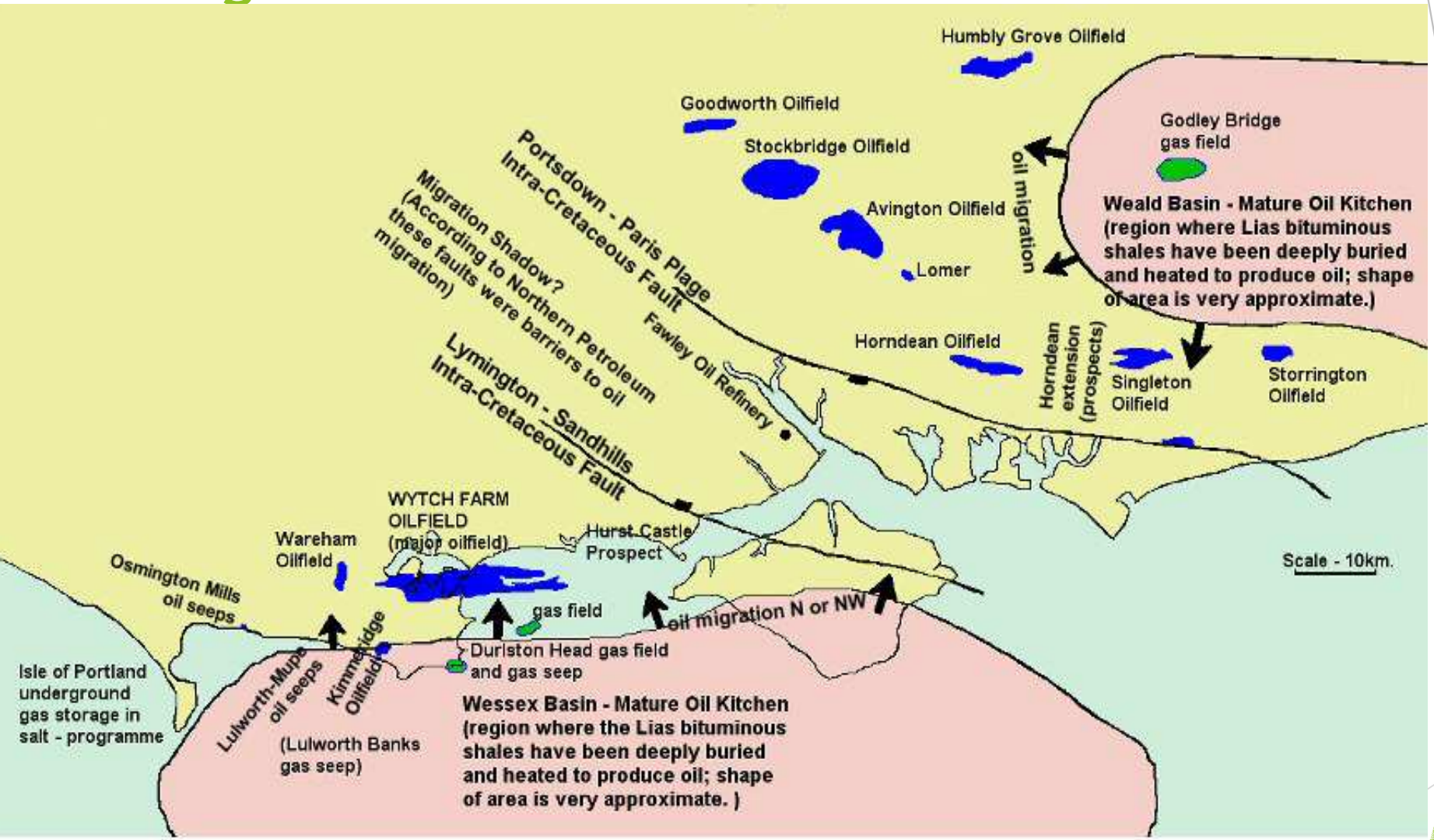
REGULATION???

- Transatlantic Trade & Investment Partnership - TTIP
  http://ec.europa.eu/trade/policy/in-focus/ttip/
- An US – EU trade agreement
  - "It aims at removing trade barriers in a wide range of economic sectors to make it easier to buy and sell goods and services between the EU and the US."
- Contains something called
  - "Investor to State Dispute Settlement (ISDS)"
  - Enables companies to sue governments in closed tribunals staffed by corporate lawyers if they perceive that any proposed legislation might affect their profits
  - ISDS is being used in Australia by Philip Morris, the tobacco giant, to sue the government which is trying to legislate for plain tobacco packaging
  - ISDS is being used in Canada to prevent environmental regulation of tar sands projects
  - EU claims that ISDS will not cause a race to the bottom with environmental and labour protection legislation!

Fracking in West Berkshire?



Oilfields and surface indications of oil in the Wessex Basin and the western part of the Weald Basin. Based on BERR (2008), Marinex Petroleum Limited (1980), Northern Petroleum (website) and other sources. This is schematic and simplified and should not be regarded as geographically precise. Refer to specific publications on individual oilfields for detailed information. *Ian West and Tonya West (c) 2008.*

Illustration courtesy of Ian West,
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CONCLUSION

- If an equal quantity of displaced coal were removed from the market and left in the ground &
- if regulation was guaranteed to be effective &
- if investment in renewables were not affected &
- if a genuine effort was made to displace all fossil fuels with renewables &
- if there are no accidental gas releases
- but ONLY if all those things could be guaranteed
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- but ONLY if all those things could be guaranteed
- Fracked Shale Gas might be a good transition fuel
- BUT
- there is talk of coal bed methane, in situ gasification of coal and methane clathrates being utilised in the UK and elsewhere as well as fracked shale gas and oil
- so
- They are not really being serious about replacing fossil fuels!