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Protecting humans and wildlife from harmful chemicals

Chemical pollution from fracking

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Fracking and Health, Haywards Heath
16th April 2016

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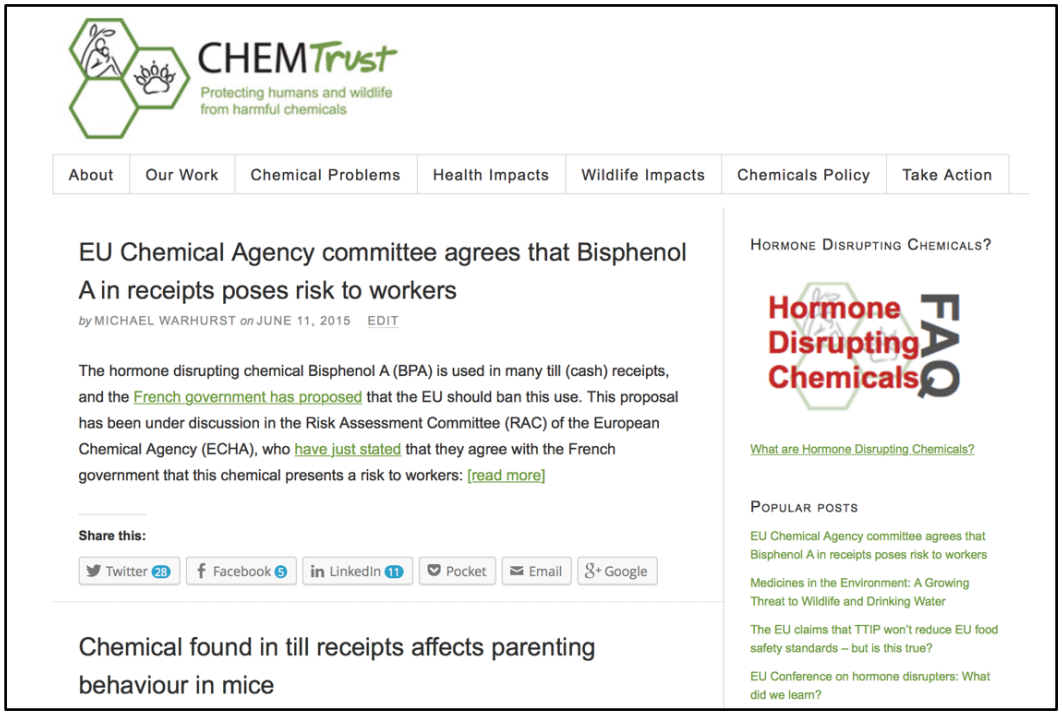
About CHEM Trust

- A charity working at UK, EU & Global levels to protect humans & wildlife from harmful chemicals
- Working with scientists, technical processes and decision makers, in partnership with other civil society groups
- Focus on identification of, and action on, hormone disrupting chemicals
- See our blog & twitter for more: www.chemtrust.org.uk



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What is a hormone disrupter?

- A hormone (or endocrine) disrupting chemical (EDC) is one that can interfere with the sensitive endocrine system
- Examples of hormone action in humans or wildlife:
  - Development of the brain
  - Development of the reproductive system
  - Functioning of the reproductive system
- Disruption of hormone action, particularly during development, can lead to delayed effects which can be serious and irreversible; this can occur at low levels of an EDC.
- CHEM Trust is pushing for EU action to identify and phase out EDCs
  - See our EDC FAQ: http://www.chemtrust.org.uk/edcs
  - & latest stories from our blog: http://www.chemtrust.org.uk/tag/edc/

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Our work on Fracking

- We commissioned a detailed report on "*Chemical Pollution from Fracking*"
  - Triggered by fact that EDCs are used in fracking in the US.
    - NB (1): In the briefing & this talk we use the term 'fracking' to cover the entire process of shale gas exploration and production.
    - (2) We only cover chemical pollution, not e.g. climate impacts
- Report & shorter briefing published in June 2015:
  - http://www.chemtrust.org.uk/fracking
  - Fracking industry not happy, we rebutted their inaccurate claims, see http://www.chemtrust.org.uk/tag/fracking/
- Also have participated in discussions on fracking policies, e.g. at EU level.

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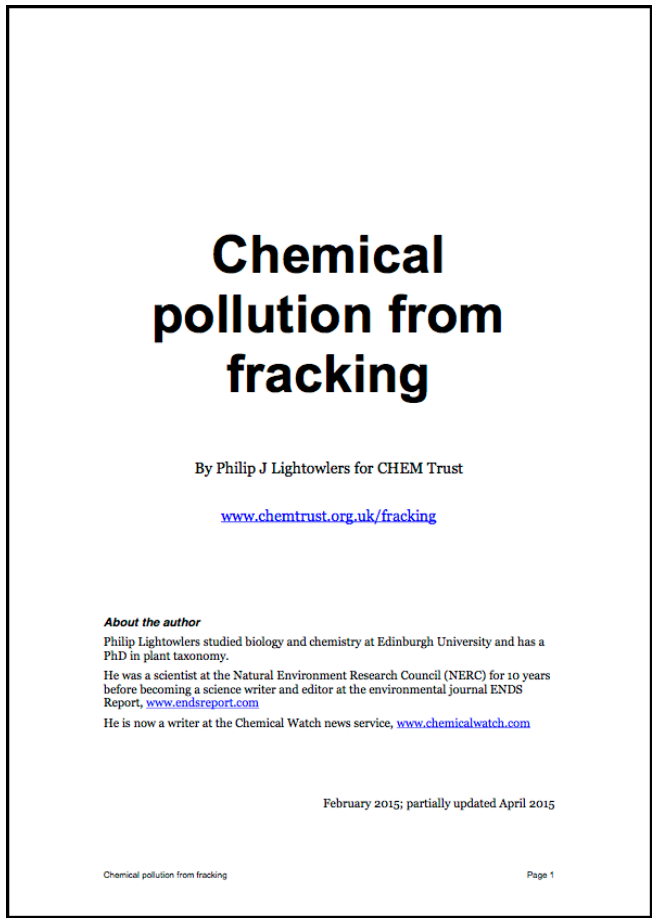
Fracking briefing & report



Chemical pollution from fracking

By Philip J Lightowlers for CHEM Trust

www.chemtrust.org.uk/fracking

About the author

Philip Lightowlers studied biology and chemistry at Edinburgh University and has a PhD in plant taxonomy.

He was a scientist at the Natural Environment Research Council (NERC) for 10 years before becoming a science writer and editor at the environmental journal ENDS Report, www.endsreport.com

He is now a writer at the Chemical Watch news service, www.chemicalwatch.com

February 2015; partially updated April 2015

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BRIEFING

FRACKING POLLUTION: HOW TOXIC CHEMICALS FROM FRACKING COULD AFFECT WILDLIFE AND PEOPLE IN THE UK AND EU

June 2015

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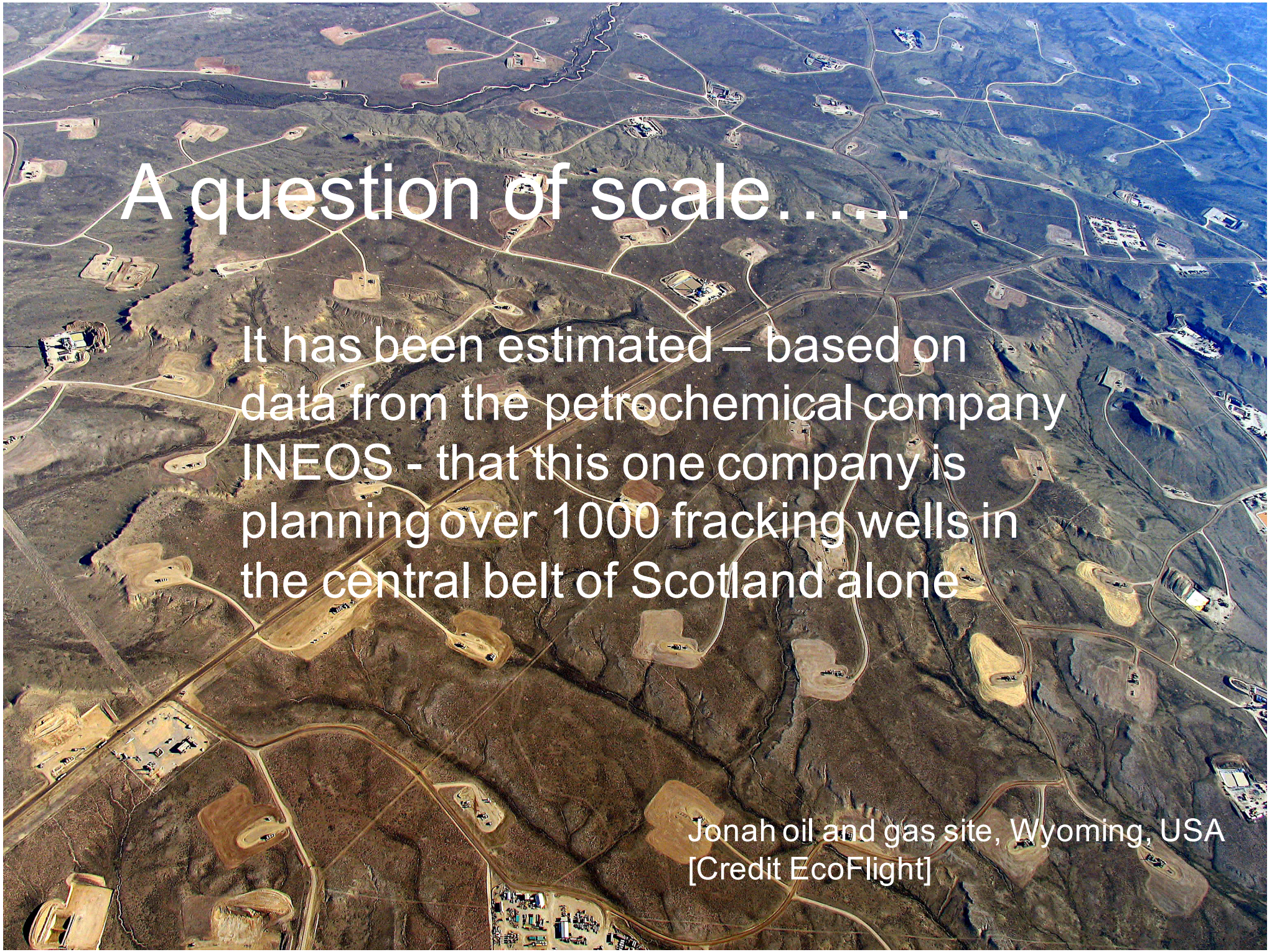
Why is fracking a problem?

- Fracking presents greater cumulative risks to public health and the environment than conventional drilling due to:
  - (i) the chemicals required;
  - (ii) the large volumes of water involved
  - (iii) the additional contaminants in the flow back;
  - (iv) the need for many transport movements; and
  - (v) the larger number of wells needed to reach a similar level of production.



A question of scale……

It has been estimated – based on data from the petrochemical company INEOS - that this one company is planning over 1000 fracking wells in the central belt of Scotland alone

Jonah oil and gas site, Wyoming, USA
[Credit EcoFlight]

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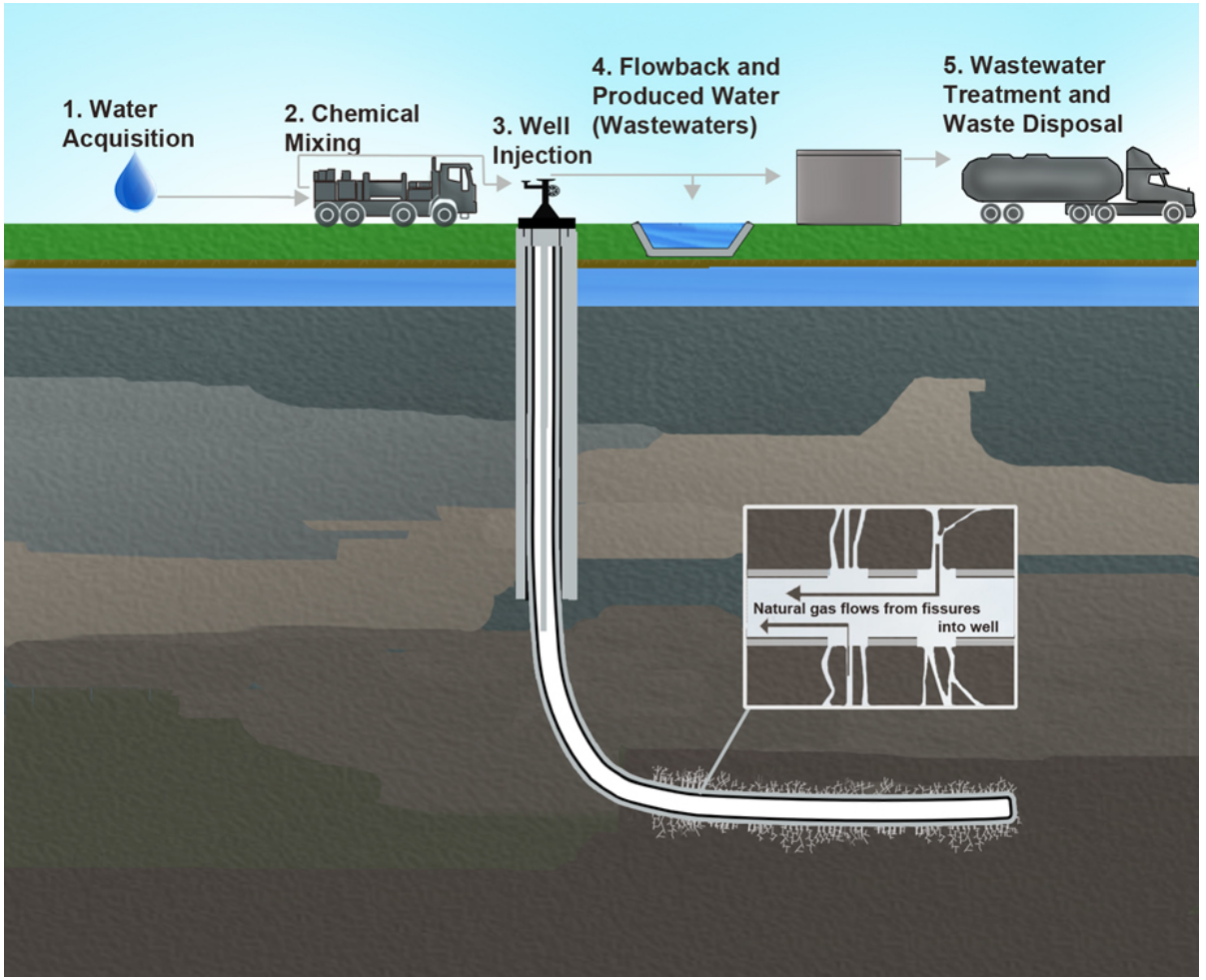
Basic fracking well setup



Credit US Environmental Protection Agency/Wikimedia Commons

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Chemical pollution risks

- Drilling
  - Chemical use (drilling muds etc)
    - Chemicals may not be on list of those used for ‘fracking’
    - Risk of leaks
- Fracking
  - Large volumes of water, with added chemicals
    - Risk of spills on site and in transport of produced water
    - Risk of leaks from top part of well, deep leaks more contested.
- Extraction
  - Potentially still some produced water, with leak & spill risk
  - May be re-fracking
- Closure – how is site monitored & controlled?

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Chemicals used

- In the US
  - Massive range of chemicals used, including quite a few EDCs [1]
    - EDC activity also found in polluted water around fracking sites
- In the UK
  - Initially a limited list of chemicals
  - Less clear what will happen in future, depends on:
    - Effectiveness of regulators
    - Strength of regulations

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The water problem

- Water for fracking
  - Large amounts of water are needed during the fracking process – may be an issue in some areas
- Fracking produces a large volume of "Flow back" or "Produced water"
  - Polluted both by fracking chemicals and pollution from rocks
    - Can leak from well, or above ground equipment
  - Big question is how to dispose of it
    - Sewage works? Industrial treatment works?

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More on flow back

- What's in flow back?
  - The substances added to facilitate fracking
  - Salts, hydrocarbons, heavy metals and naturally occurring radioactive materials (NORM) present in the rock.
- Flow back waters should be treated before any release into the environment.
  - In the UK this has *so far* been done by taking the flow back to a sewage treatment works by tanker. This is expensive.
- **Risk**: A push to re-inject flow back into the ground, as happens in the US
  - This will be much cheaper for the company

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Wildlife damage from leaks

- Wildlife could be severely impacted by leaks of fracking or flow back fluids, e.g. into rivers
- There have been a large number of spills and pollution incidents in the US
  - A study of 43 pollution incidents found that the commonest cause was failure or inadequacy of well casings, followed by surface spills of fracking fluid & flow back.
- Examples from the US:
  - Spills of fracking fluids killing fish, salamanders and frogs.
  - A fracking-related fire and spill in Ohio was estimated to have killed >70,000 fish

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Regulation

- Fracking in the UK is governed by several regulators, and a web of regulation
  - Much of it decided on at EU level
  - There are holes & areas lacking clarity
  - More detail in our full report
- An impact assessment for the EU found that improved EU regulations on fracking would benefit all parties, including industry
  - UK Government pushed against any new EU fracking regulations; none have been proposed

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Worries for the future in UK

- Cuts and deregulation [2]:
  - Ongoing cuts in regulators, such as the Environment Agency
  - Changes in duties, of regulators
    - e.g. a new responsibility to "*have regard to the desirability of promoting economic growth*"
  - Commitment to remove 3x as much 'regulatory cost' every time new regulations brought in ('1 in 3 out') – ignores benefits
- Impacts of a possible Brexit:

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Potential impacts of Brexit

- If Brexit to EEA-like deal (like Norway):
  - EU controls on traded products - e.g. REACH chemicals laws – stay in place
    - Though UK can no longer influence them
  - Uncertainty on regulation of water, air pollution, industrial plants, wildlife protection, as depends on the precise deal
- Brexit to WTO only (like Canada or South Korea)
  - Everything up for grabs
  - Major dislocation of regulation – and the economy
- UK Referendum process has already being used to push for EU deregulation, e.g. in Cameron's 'renegotiation'.

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Priorities for local action

- Full disclosure of all chemicals, including proprietary mixtures
  - In all stages – drilling, fracking etc
- Pressure on regulators (and politicians) to do a good job
  - regulations, licensing, monitoring, enforcement
- Push for proper treatment of recovered water/flow back
  - Impacts of lorry movements, risks of spills?

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Conclusions

- Fracking poses a considerable pollution risk
- We can't know yet how well UK regulations will work
  - Strong monitoring & enforcement is essential
- Ideally regulations would be strengthened at EU level
  - Instead there are risks of weakening at UK level, particularly in event of Brexit
- CHEM Trust position:
  - "*Moratorium on fracking until our recommendations are implemented*"
    - Including: strengthened legally-binding EU legislation; a ban on re-injection; full chemical disclosure; environmental impact assessment of all operations; financial bonds for clean-up

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References

- Most of the information in this presentation comes from our briefing or full report:
  - Briefing: *Fracking pollution: How toxic chemicals from fracking could affect wildlife and people in the UK and EU*
  - Full report: *Chemical Pollution from Fracking*
  - Both available from http://www.chemtrust.org.uk/fracking/
- Other references:
  - [1] Kassotis, C. D., Klemp, K. C., Vu, D. C., Lin, C. H., Meng, C. X., Besch-Williford, C. L. et al. (2015). *Endocrine-Disrupting Activity of Hydraulic Fracturing Chemicals and Adverse Health Outcomes After Prenatal Exposure in Male Mice. Endocrinology*.
  - [2] *BIS Steps up deregulation drive*, ENDS Report, 3rd March 2016 http://www.endsreport.com/article/51798/bis-steps-up-deregulation-drive