



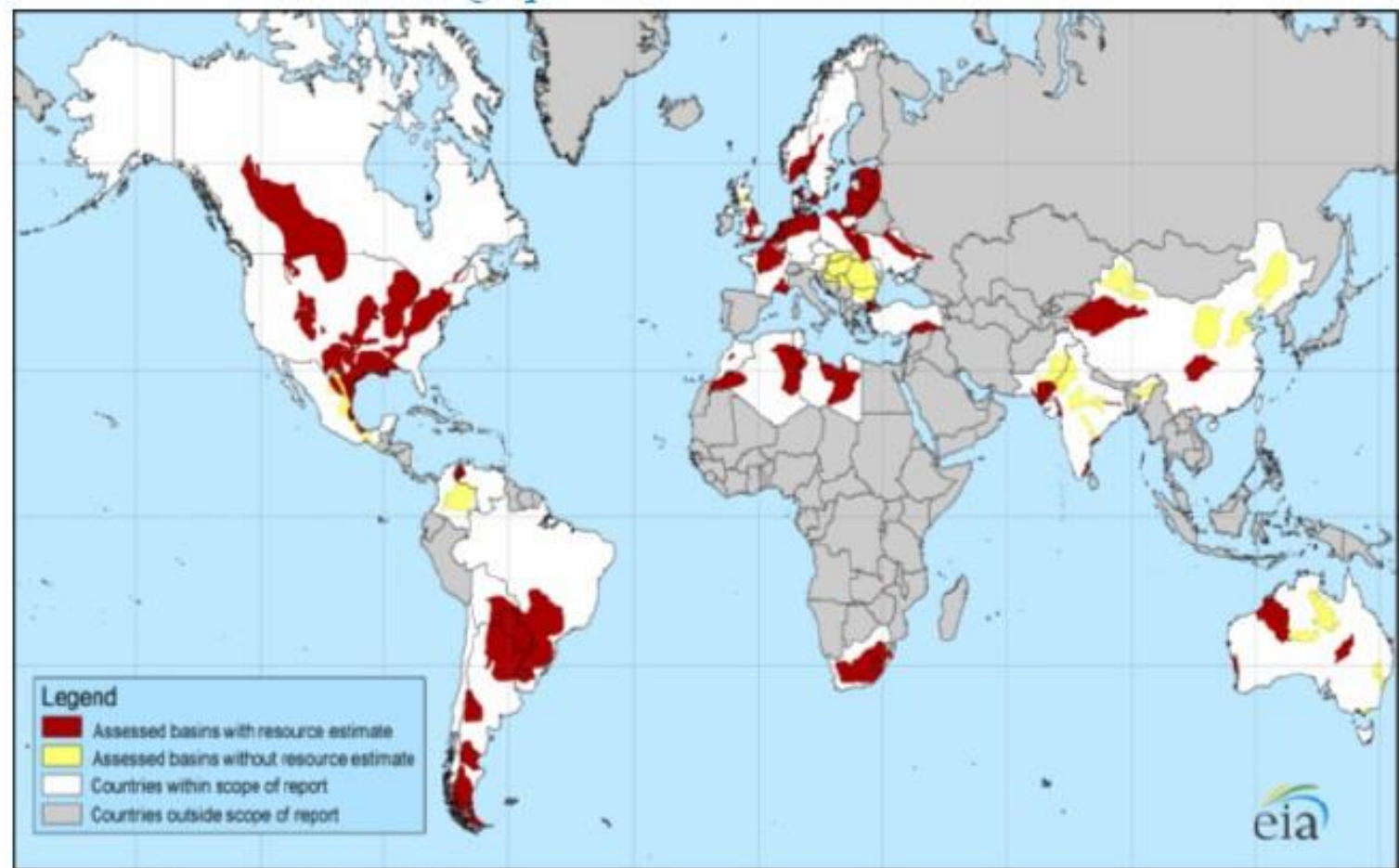
Decision making process on shale gas

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Osaka

7 march 2015

Initial assessment of shale gas resources in 48 major shale basins in 32 countries indicates a large potential

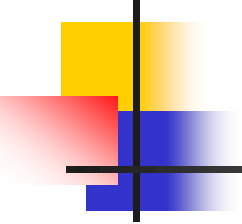


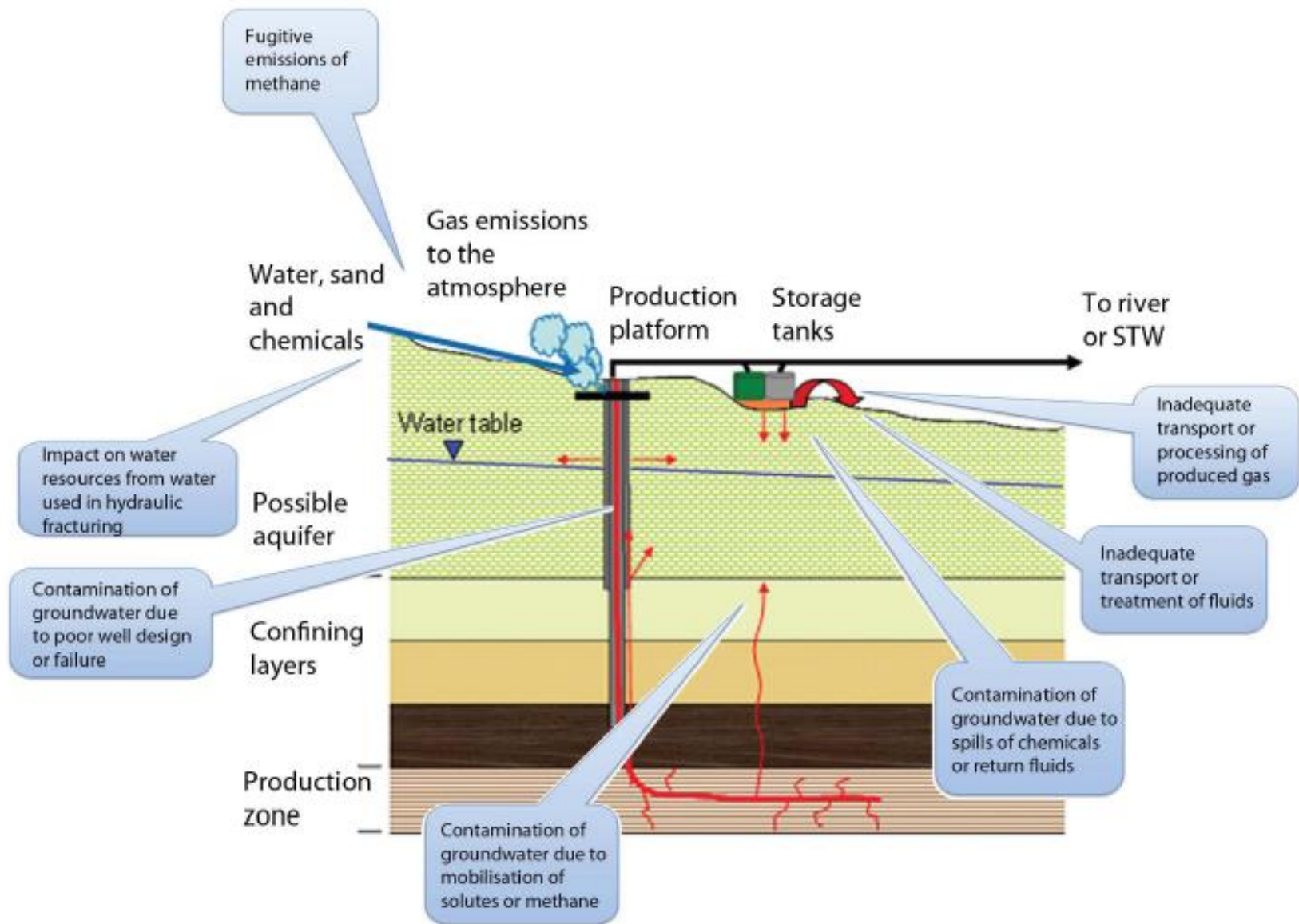
Source: U.S. Energy Information Administration



What is Shale gas?

- Unconventional natural gas extracted from shales, a common type of organic-rich clay sedimentary rock formed of mud, silt, and organic matter. The low permeability leads to trap big quantities of gas
- Exploitation needs deep drilling well and high volume hydraulic fracturing (fracking) involving high pressure injection of fluids (water, sand bauxite, 600 different chemicals) into the shale

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- The drilling of wells is directional/horizontal at depths greater than 2 KM, whereby the horizontal leg of the well follows the geological formation for up to 3 Km or more
 - Once the fracking is completed some 25 to 75% of the initial fracturing fluid (called « flow back » or « waste water ») rises to the surface and must be collected
 - As productivity of shale gas well is lower than conventional wells, more wells need to be drilled




Source: Pollutant pathways associated with hydraulic fracturing. Source: Adapted from Environment Agency (England) (2013) © Environment Agency right



Main risks to the environment

- Surface and groundwater aquifers contamination by chemicals, heavy metals and radioactive materials
- Air pollution and greenhouse gas emission by methane (more than conventional gas but less or comparable than coal), volatile organic compounds, hazardous air pollutants
- Water resource depletion (20 000 m³/well for ten fracking)
- Seismicity risks: microseismic events

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- Land impact, land turned into an artificial surface, landscape impact
 - Road traffic with heavy truck (air pollution , noise)
 - Cumulative impacts due to the large number of wells needed for shale gas extraction
 - Danger of slowing down investment in renewable energies
 - Endanger UN general assembly resolution 64/292 on the right to water as a human right, august 3, 2010
 - Gasland film by Josh Fox in 2010
 - « Nature » 4 december 2014
 - Success of a judicial action for health nuisance in Texas april 2014

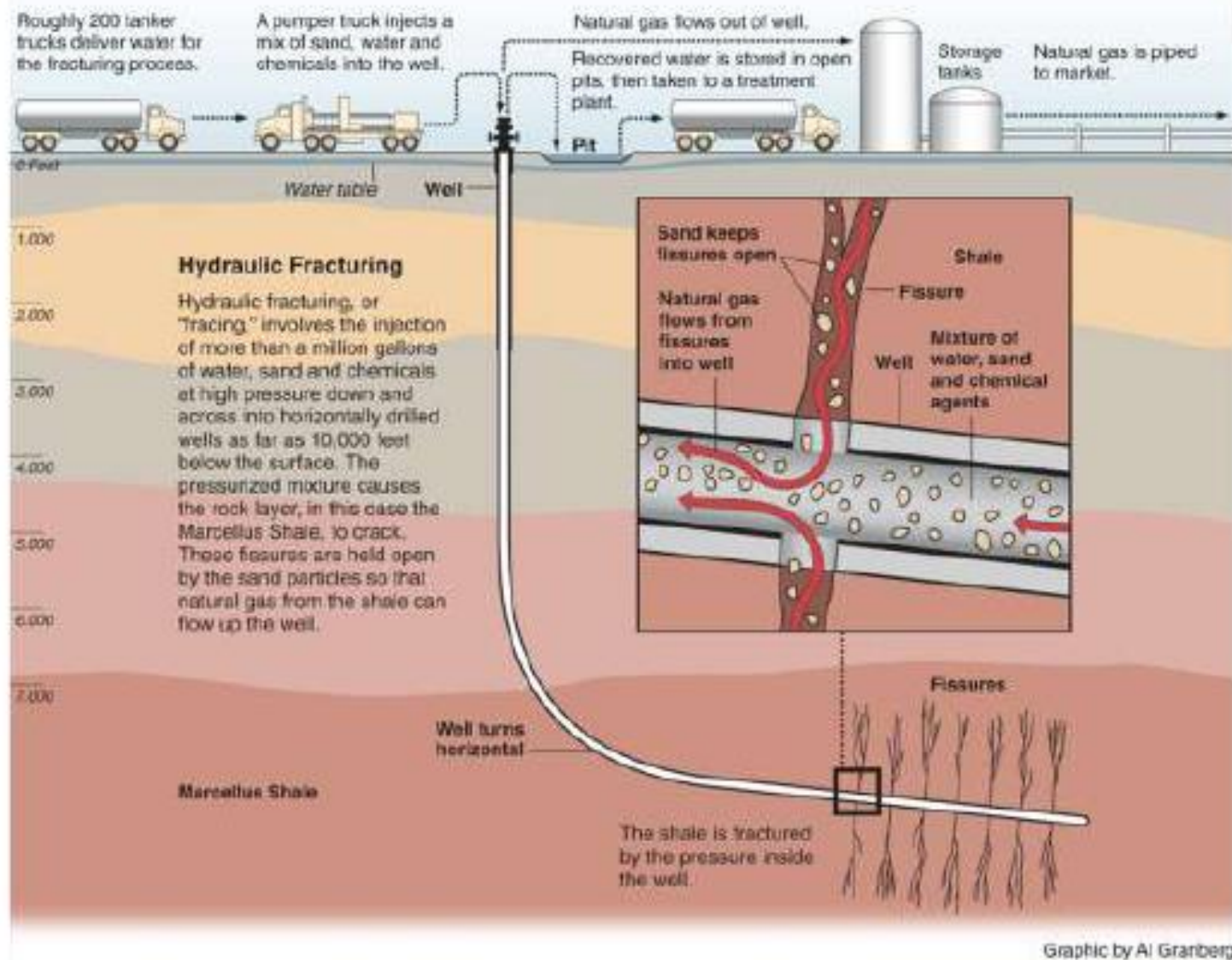


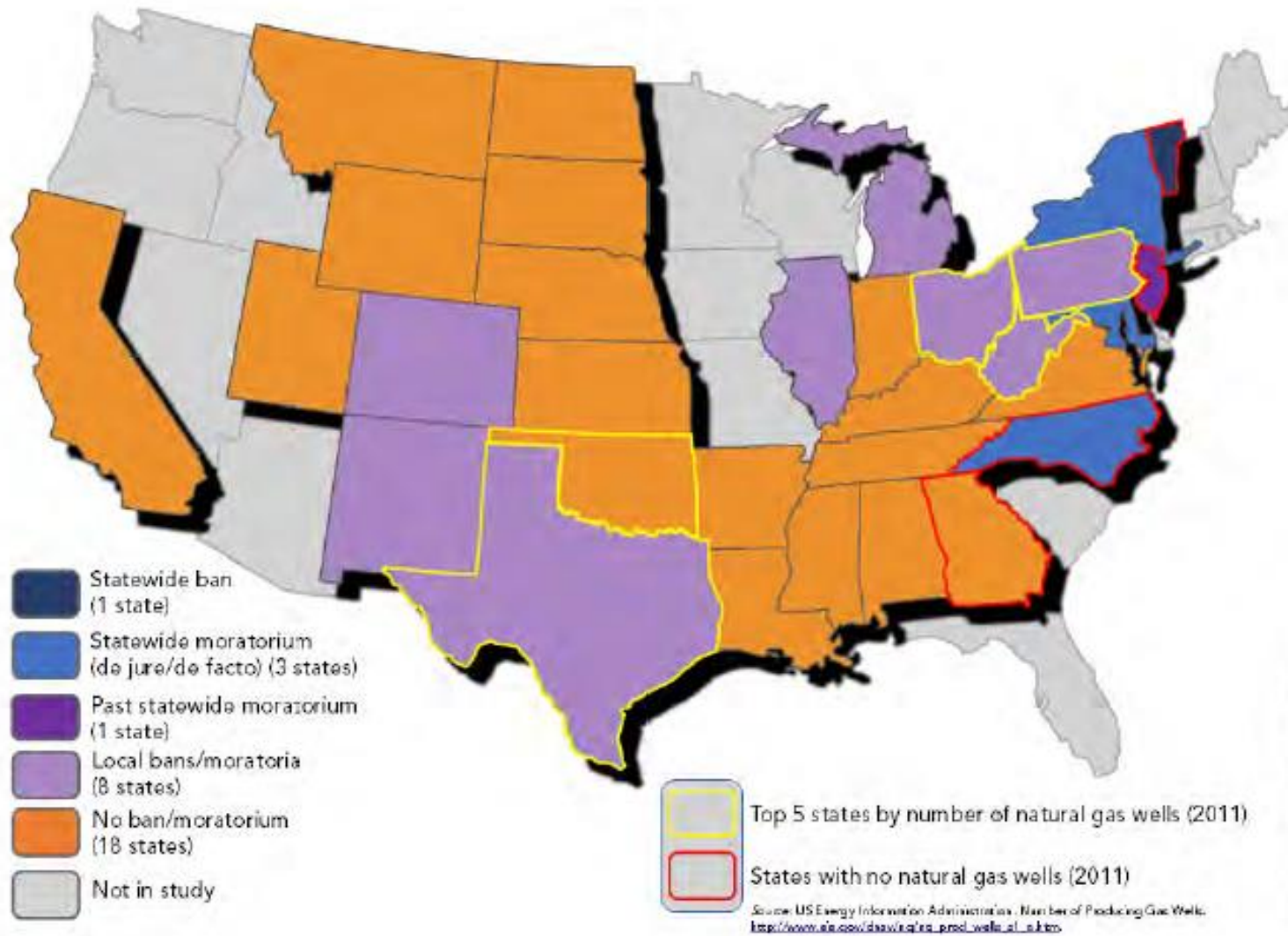
Figure 1. Schematic diagram showing the general features of a fracking operation. Source: ProPublica web site <http://www.propublica.org/series/fracking>.



Shale gas boom in the US

- US, Canada and China are the only countries in 2013 producing shale gas in commercial quantities
- Argentina: vaca muerta - Neuquen since 2014
- In China 50% more than in US
- In US 1% in 2000 of US gas production; 23 % in 2010; 46% in 2035; but estimated resources downward; Shale gas = 60% of the domestic gas production ; 70 000 or 500 000 wells in 27 states (Texas 50%)
- Owner of the land is owner of underground minerals receives in Pennsylvania minimum of 12,5% of royalties
- Lack of federal regulation
- States own shale gas regulation

Fracking Bans and Moratoria







Shale gas wells in the United States

The University of Texas at Arlington



Source : Schuepbach Energy



EPA reactions

- Energy policy Act 2005: deregulation exclude fracking for gas production from permitting; Clean water Act does not require permit for discharge water from drilling
- Obama in 2012 requires environmental safeguards
- EPA reports of 2012 and 2014 on drinking water resources
- After petition by Earth justice, EPA start process in May 2014 on the Disclosure of the chemicals used under Toxic Act (TSCA)
- Proposed rule for shale gas in 2014



US local moratoriums in 8 states

- New York passed a moratorium on drilling permits in 2008 pending review of regulations
- Vermont bill: 3 years moratorium
- Ohio proposed legislation for a moratorium
- Michigan: 2 years moratorium
- August 2013 Pennsylvania Court prohibits discharge of fracking waste water in state waterways



US local fracking bans

- Since 2011 fracking bans in several towns
- December 2014: fracking ban decision in New York state and in 50 NY municipalities
- June 30, 2014 New York court of appeals ruled that local towns can use local zoning laws to ban oil and gas operation by fracking
- Florida and California passed a fracking law requiring to disclose chemical use



Main legal issues

- Lack of EIA or SEA
- Lack of transparency and of informations
- Permitting issue and monitoring
- Setback restrictions from buildings or lakes or wetlands



Rally to Restore Sanity in Washington D.C. on October 30, 2010



Ban expansion

- France : law 2011
- Quebec : law 26 november 2013 forbid shale gas in the Saint Laurent valley
- Hawaii islands: ban on fracking october 2013
- Bulgaria : law on ban and revocation of permit granted to US Chevron 18 january 2012
- Luxembourg : ban on november 2012
- Switzerland: ban in canton of Fribourg oct. 2013
- Spain : Cantabria ban april 2013, Cataluna 2014
- Germany : ban in wetland protected areas 2014



Fracking in the Europe Union

- Based on voluntary commitments
- Guidance note on the application of EIA directive to unconventional hydrocarbon 2011
- European Parliament resolution 21/11/2012 on shale gas
- Stakeholders consultation on line 12/12 - 3/13
- Consultation report oct. 2013: 22 875 responses
- Commission Recommendation and Communication on shale gas 22 january 2014
- Proposal of resolution in EP to ban fracking nov. 2014



This document and any map included herein are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.



European Parliament resolution of 21 november 2012

- Call for full disclosure of all technical and environmental issues
- Shale gas may have a crossborder dimension
- Calls member states to put in place a robust regulatory regime and ensure monitoring, including mandatory EIA
- Stresses the importance of fully consulting the public including application of Aarhus convention
- Urges industry to employ highest environmental and safety standard
- Urges the Commission to include fracking in the environmental liability directive



Environmental impact assessment and shale gas

- On projects : mandatory for extraction of natural gaz exceeding 500 000 m³ per day (annex 1 directive) and case by case bases for deep drilling after a screening procedure (annex2)
- On plans and programs: strategic environmental assessment for energy plans. Only used by UK and Lithuania for shale gas projects. Commission guidance recommanding it
- New directive 2014/52: refusal by EP to make EIA mandatory for fracking



Commission recommendation on minimum principles

- Invite member states applying or adapting their legislation to fracking process
- To carry out SEI to prevent cumulative impacts and conflicts with natural resources
- To carry out a specific risk assessment
- To inform the public
- To ensure applying best available techniques



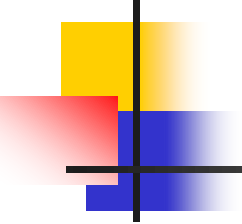
French law to ban fracking

- After local demonstration: Law 13 july 2011
- Referring to the constitutional environmental Charter of 2004, applying prevention principle and corrective action principle
- Forbid exploration and exploitation of shale gas by fracking
- Revocation of three exclusive licences already delivered to prospect shale gas
- Specific national commission, scientific experimentation under public control



Constitutional Council decision of 11 october 2013

- Application by Schuepbach energy
- Admissibility of intervention of FNE and greenpeace France
- No violation of the principle of equality before the law even if hydraulic fracking is permitted for geothermal energy because the drilling procedure differ and it does not entail the same risk for the environment

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- No violation of freedom of enterprise because it is justified by general interest of environmental protection and it is not disproportionate in nature having regard to the objective pursued
 - Violation of the precautionary principle of art. 5 of the Charter is in any case inoperative [because there is no occurrence of unpredictable damage - is this provision a « right or freedom » guaranteed under the constitution?]

Council of State decision 17 july 2013



- Decree of 2 june 2006 submitted works of exploration of hydrocarbures mines to a simple declaration
- Applying general principles of environmental law and considering that any prospection works for hydrocarbur oil or gas may have serious impact on environment, the Court decides to impose to all these works an authorisation permit procedure



Conclusion

- More integration of environmental issues and human rights issues in mining legislation
- Serious environmental impacts of mining exploration and exploitation injuring environment and local populations
- Ecuador case of oil exploitation by Chevron in Yasuni and ACHR decision Sarayaku indigenous people 27 june 2012
- Lack of international conventions but progress of Rio+20 the future we want



Natural-gas operations in areas such as Wyoming's Jonah Field could release far more methane into the atmosphere than previously thought.