Progress on hydraulic fracturing for unconventional hydrocarbons

European Energy Forum - 10 May 2016
OBJECTIVE

Collect - Evaluate - Disseminate

factual information on unconventional hydrocarbons

- Technical
- Environment
- Economics
- Health
### SCIENTIFIC COUNCIL

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TECHNICAL FILES

- SISMICITÉ
- FRACTURATION HYDRAULIQUE
- AQUIFÈRES SUPERFICIELS
- CONSOMMATION ET GESTION DE L’EAU
- EMPREINTE AU SOL AU FIL DE L’ACTIVITÉ
- ADDITIFS ET GESTION DES FLUIDES DE PRODUCTION
- FIN D’ACTIVITÉ : DEVENIR DES SITES
- EMISSIONS DE GAZ À EFFET DE SERRE
- QUESTIONS RELATIVES À LA SANTÉ
HYDRAULIC FRACTURING

HYDRAULIC FRACTURING

WELL CLUSTER
CURRENT CONFIGURATION
R&D AT THE HEART OF SHALE DEVELOPMENT

• Extensive R&D, from early 80’s, led by US Department Of Energy, at the heart of the “shale gas revolution”

• R&D effort continuing (institutes, contractors, operators)

• Operational optimization coupled with lower environmental impact key to public acceptance

• Sharing of industry best practices contributing to progress

• Unconventional developments outside North America bringing new perspectives
EXAMPLES OF PROGRESS

- Operational optimization, leading to higher productivity per well
  - “Sweet-Spot” identification
  - Understanding the “Stimulated Rock Volume”
  - Optimization on fracking fluids (reduction of water usage, proppants and additives)
  - Role of “big data” analytics
WELLS PRODUCTIVITY

Shale Rig Drilling Efficacy, Typical Four-Year Changes

Data Source: Baker Hughes, and Spears & Associates

Data Source: EIA, Drilling Productivity Report, February 2015
EXAMPLES OF PROGRESS

• Lower environmental impact
  • Reduced land footprint (development based on optimized pads, grouping up to 10 horizontal wells, with longer horizontal sections)
  • Reduced water usage (treatment and recycling of produced water)
  • Improved additives (transparency on products used, usage of biodegradable)
  • Lesser emissions (no open lagoons, sealed containment only)
  • Risk management of seismicity (no fracking in faulted zone, no reinjection of produced water)
  • Protection of aquifers (well architecture and minimum depth for fracking)