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**ENERGY STUDIES**

Rice University's Baker Institute for Public Policy



# Trading Securities:

A comparative study of the impact of hydraulic fracturing on water security in Texas (U.S) and Spain

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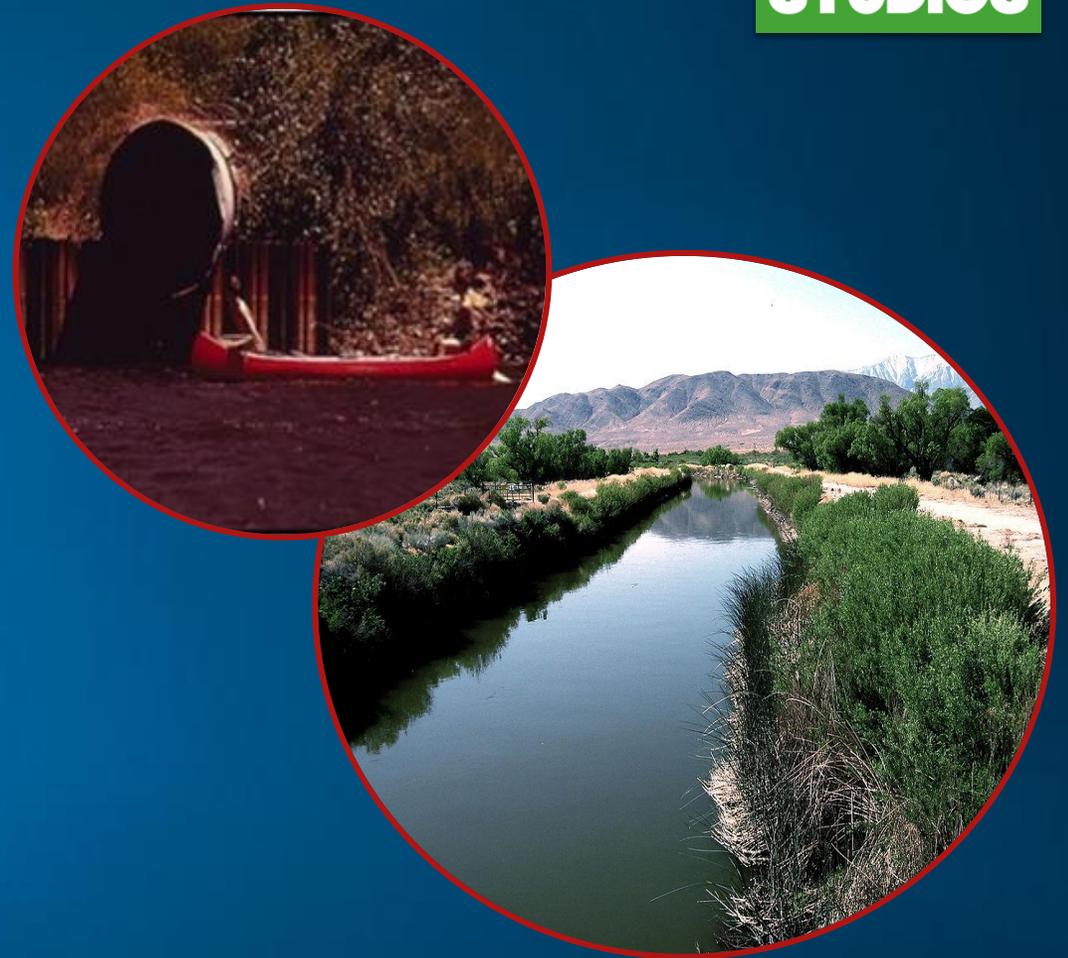
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# How is the quest for energy security impacting water security?

- 💧 Shale is touted as a game-changer in generating affordable energy.
- 💧 Unconventional production in the U.S., including Texas, has made U.S. world's top producer of petroleum and natural gas hydrocarbons
- 💧 2014 Deloitte study: Spain could become independent of gas imports by 2030
- 💧 But at what cost?

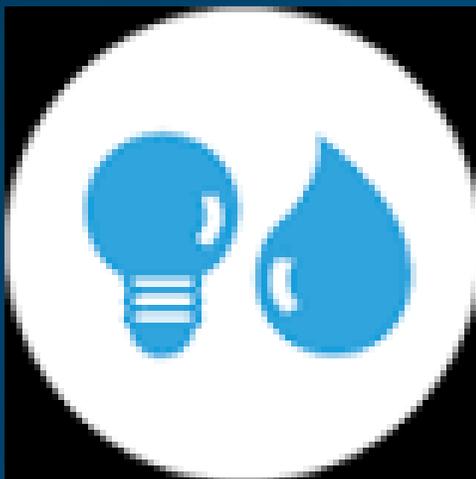
# Agenda

- 💧 Introduction
- 💧 Research Approach
- 💧 Case Studies
  - 💧 Texas
  - 💧 Spain
- 💧 Conclusions/Lessons Learned



# Our Approach

- Case selection:
  - Multi level governance of resources; large economies; often arid climates; both keen on HF
- Methods
  - Review the law and regulatory context and political events/discourse for each case study
  - Stakeholder interviews
- Purpose: Understand implications for water security (trade-offs); identify risks and impacts to water from hydraulic fracturing;



## **ENERGY SECURITY**

“The uninterrupted availability of energy sources at an affordable price” (IEA, 2014)

## **WATER SECURITY**

“The availability of an acceptable quantity and quality of water for health, livelihoods, ecosystems and production, coupled with an acceptable level of water-related risks to people, environments and economies” (Grey and Sadoff, 2007)

## TEXAS

697,000 km<sup>2</sup>

80% shale basins

35 people/km<sup>2</sup>

Almost 44,000 wells



Vinson & Elkins, 2015

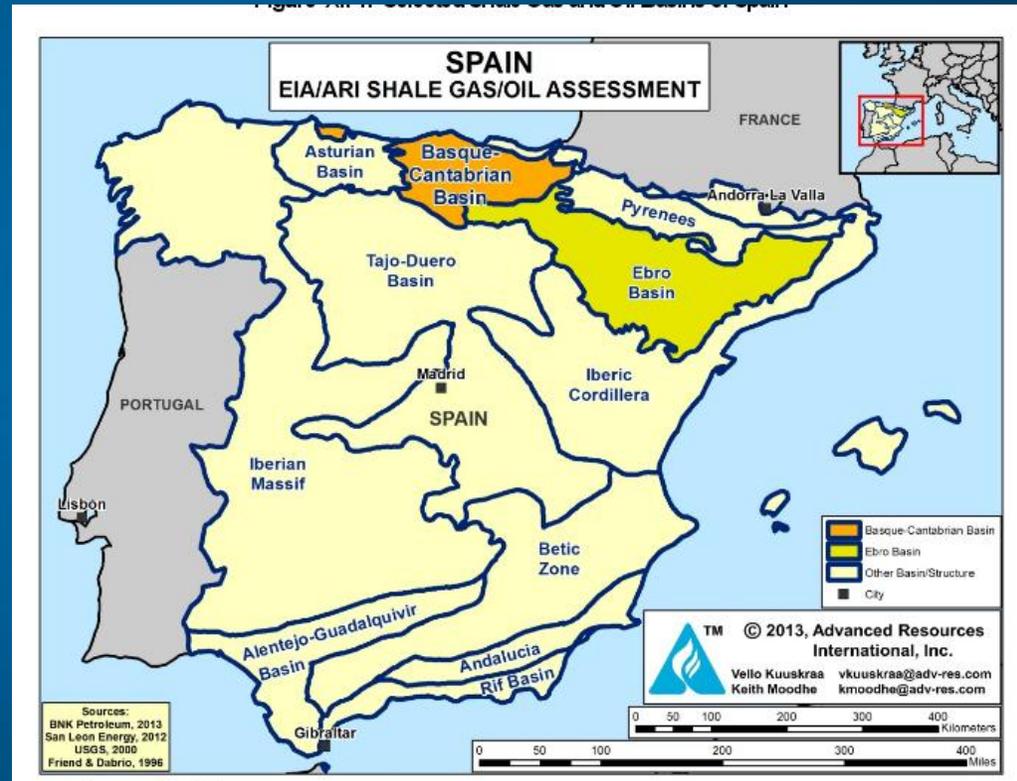
# SPAIN

505,000 km<sup>2</sup>

15% shale basins

94 people/km<sup>2</sup>

< 40 permit applications



U.S. EIA, 2015

	Texas	Spain
<b>Primary Authority over HF Activity</b>	State of Texas	Spanish National Government
<b>Public Reception</b>	Generally accepted; some local resistance, often centered around water	Strong public opposition
<b>Locus of Opposition</b>	Municipalities (NIMBY)	More widespread; organization largely at AC level, municipalities
<b>Disclosure/EIA</b>	Disclosure required; trade secrets protected	EIA applies, but there are questions about who regulates capacity

# Who Regulates Energy?

## Texas

- Substantive regulation of production is at the state level
- Federal energy policy is largely limited to research, etc.
- Feds do regulate HF on federal and Indian lands.
- Texas Railroad Commission
  - Some perceive the agency as industry advocate more than regulator

## Spain

- EU is hands off with HF; member states regulate according to own priorities
- Subject to EU directives, such as Water Framework (2000/60/EC), the Groundwater (2006/118/CE) and Habitats, etc.
- No Spanish law on HF specifically, so falls under law governing conventional oil and gas; controlled by central state
  - Some powers to the autonomous communities

# Who Regulates Water? (Lots of folks!)

## Texas

- State law determines QUANTITY issues (who and for what purpose?)
  - TCEQ regulates water allocation, surface rights
- Texas Railroad Commission governs water used in oil and gas (disposal)
- State gov't also handles water QUALITY issues, w/ standards from Feds (e.g., Clean Water Act; Safe Drinking Water)
- Local governments: groundwater conservation districts
  - Rule of Capture is default; potentially unlimited use ☹️

## Spain

- Water is a public good in Spain (few exceptions)
- Use of water requires a permit from a River Basin Authority (RBA)
- RBAs develop plans in accordance with priorities of National Water Law, National Water Plan

# Public Reception of Hydraulic Fracturing in Texas

- 💧 Texas has long history of resource exploration and production; culture is generally supportive.
- 💧 Private property rights trump nearly everything in Texas.
- 💧 Water a hot topic in recent years
- 💧 HF operations are encroaching on urban and suburban areas.
  - 💧 NIMBY campaigns



# Opposition Manifests at Local Scale

- 💧 2014: municipal ordinances ban fracking within city limits
- 💧 H.B. 40 (2015) – Texas Legislature prohibits cities from interfering in O/G production
  - 💧 Exclusive jurisdiction for oil and gas production to the state
  - 💧 Cities allowed some “commerically reasonable” regulation of surface but cannot “effectively prohibit” the work of a “reasonably prudent operator.”

# Public Disclosure of HF Info in Texas

- RRC Rule 3.29 requires disclosure via Frac Focus of chemical ingredients and water volumes for frac fluid from wells drilled after 1 Feb 2012
- Once uploaded, information is public information unless it is protected as a trade secret.
- FracFocus been criticized heavily by academics for search limitations, inability to customize per state requirement, lots of information withheld
  - Subsequent versions have been improving



HYDRAULIC FRACTURING  
HOW IT WORKS

GROUNDWATER  
PROTECTION

CHEMICAL  
USE

REGULATIONS  
BY STATE

FIND A WELL  
BY STATE

FREQUENT  
QUESTIONS

## Find a Well

Map Search Standard Search

### SEARCH OPTIONS



STATE: Choose a State COUNTY: Choose a State First WELLS IN COUNTY: Choose a County First OPERATOR: Choose One

API WELL NUMBER: \_-\_-\_\*\_\*\_\*\_\* WELL NAME: \_\_\_\_\_

FIND CAS NUMBER: \_\_\_\_\_ [clear](#)

BUILD DATE FILTER: \_\_\_\_\_ [clear](#)

INGREDIENT LIST: \_\_\_\_\_ [clear](#)

**SEARCH** **RESET** (Note: One search option is required to do a search.)

# Public Reception in Spain

- Fracking is FAR more controversial in Spain
- Water a frequent source of political conflict in Spain; mobilizes people
- Opposition organizing at local and regional level (cities, autonomous communities); overruled by national institutions
- March 2016, draft bill bans any activity related to HF, later muted to moratorium for issued and pending permits and licenses for the coming legislative term
- Unclear what will happen after the elections

# Public Disclosure in Spain

- 💧 No obligation for operators to disclose information about fracking activity to the public
  - 💧 EIA includes a public consultation step, but offers no instruction re: what information related to unconventional production projects should be disclosed
- 💧 Some platforms exist (Shale Gas España, Fractura hidráulica en Burgos no) but they are very basic
- 💧 Lack of objective, unbiased information and data about hydraulic fracturing activity and impacts



# Water Security Risks from Fracking

Issue	Risk	Texas	Spain
<b>Water Allocation</b>	Exacerbating scarcity with local impact	Yes	NA (yet)
<b>Pollution</b>	Contamination of groundwater	Yes, cases have been documented	NA (yet)
<b>Wastewater</b>	Induced seismicity from disposal injection wells	Maybe; disputed cases exist	No; external waste mgmt co
<b>Public Reception</b>	Disputes over authority to prevent fracking	Yes	Yes
<b>Public Disclosure</b>	Public concern over health risks, dangerous substances, etc.	Yes; some effort to address with FracFocus	Disclosure not required

# Findings (Tentative)

- 💧 Pursuit of energy security increasingly leading to water insecurity by presenting risks for water quantity and quality.
- 💧 Tension between local communities that bear the impact; higher level policymakers/entities who largely gain from the benefits
  - 💧 Regulatory capture?
- 💧 Spain and Texas would both benefit from more/better data collection and reporting (baseline water quality, recycling, etc)
- 💧 Disclosure – better access to gov't and industry data is needed to promote understanding, assuage fears



# Limitations of the Research



- Texas, though a leader in HF, is a unique culture and governance environment.
  - Wild west mentality; anti-regulation; capitalism
- No actual hydraulic fracturing activity in Spain yet; results therefore limited to exploratory activity.

# Why Valuable?

- Lessons may be learned from a locale that has been through the whole policy process
  - Environmental effects
  - Social experiments
  - Governance lessons
- Instructive on questions of scale, governance power imbalances
- Texas providing data for future study on its approaches to disclosure, recycling, etc.



Thank you!

# Contact Information

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