



Protection of Drinking Water Resources with Oil and Gas Development

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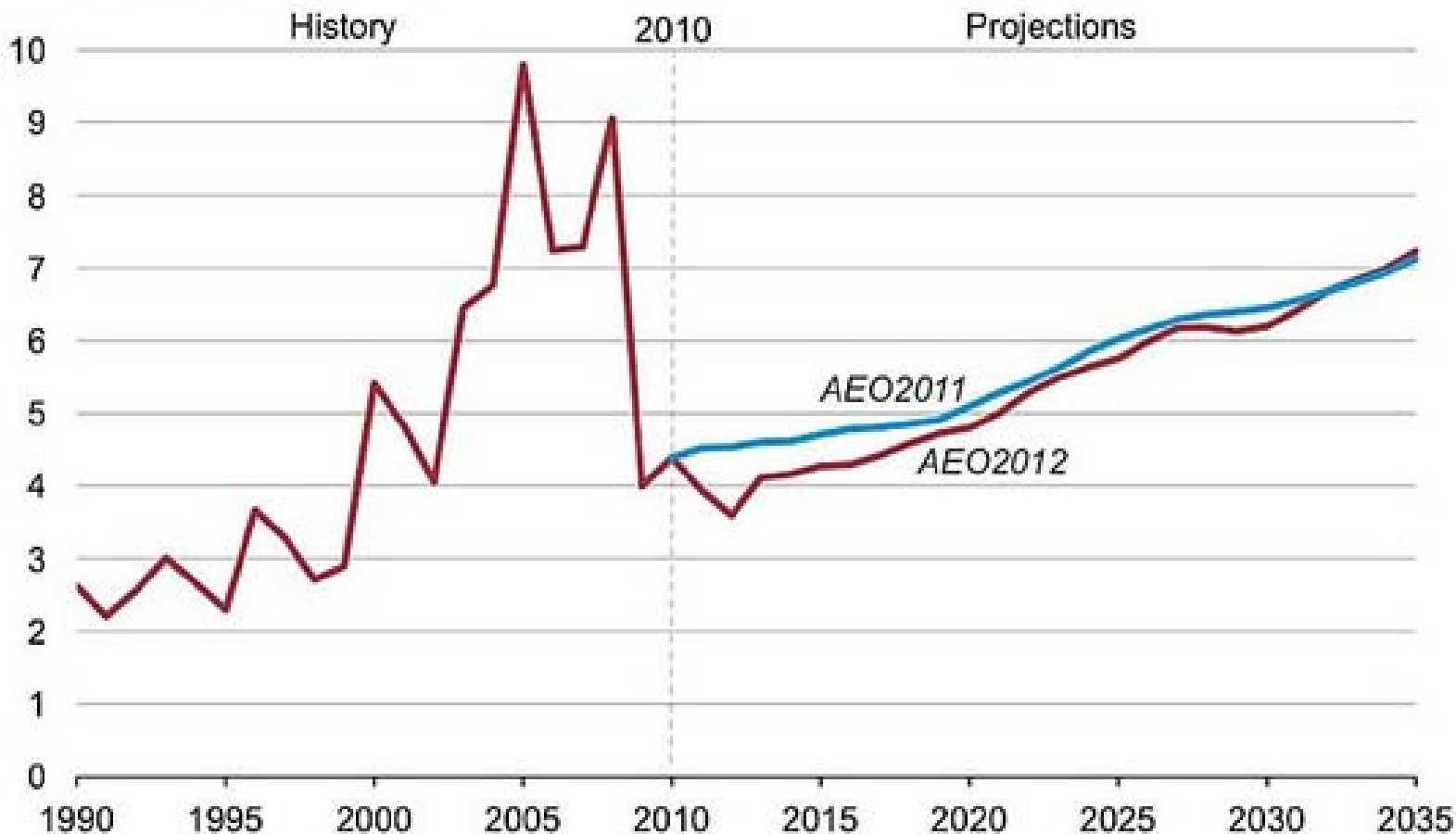
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Natural gas price projections are lower than in *AEO2011*, consistent with recent market developments

natural gas spot price (Henry Hub)

2010 dollars per million Btu

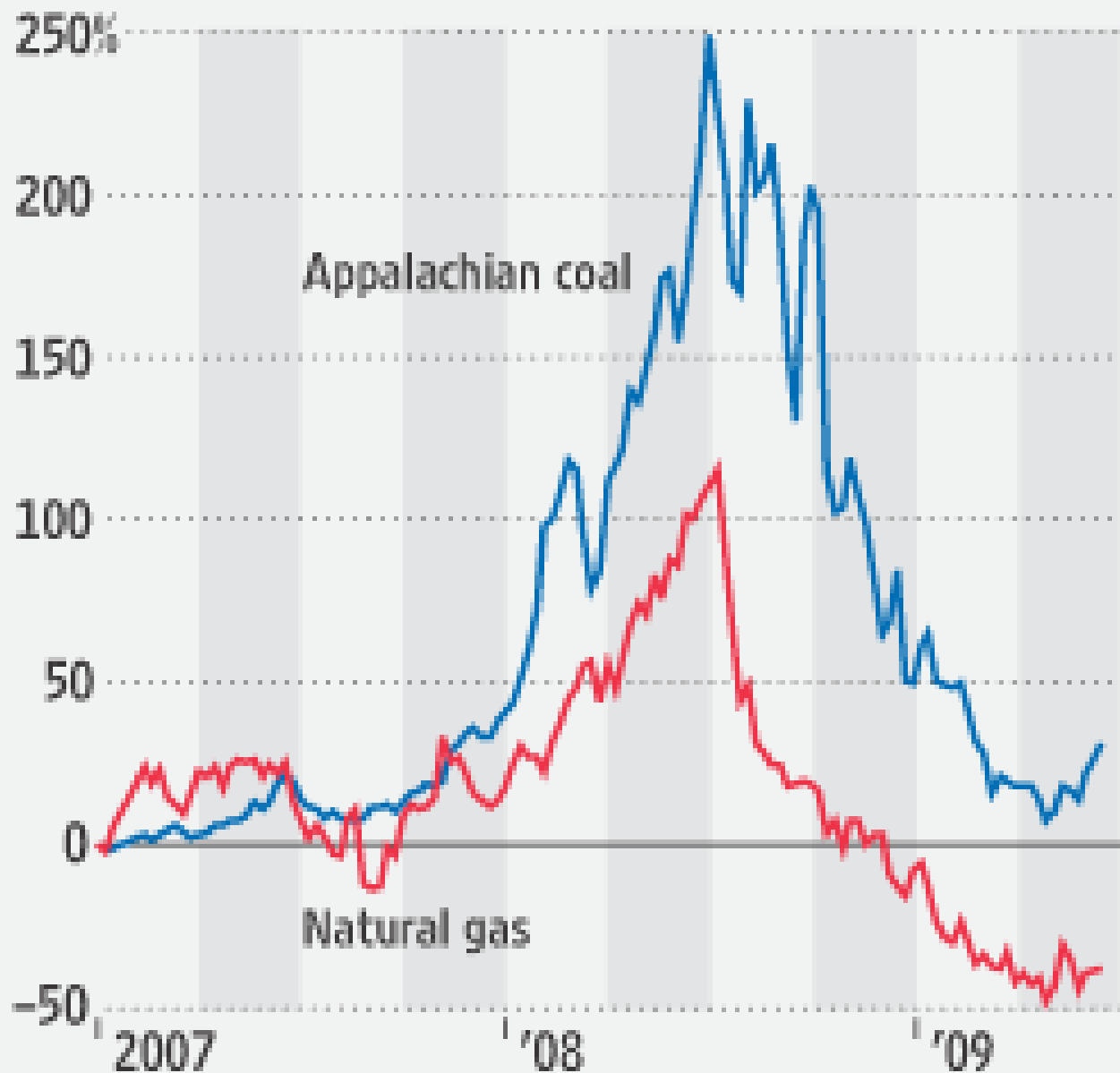


Sources: EIA, Annual Energy Outlook 2012 Early Release and EIA, Annual Energy Outlook 2011

Tighter Competition

Natural gas is trading in a price range well below its 2007 level. This gives it an edge over coal, which is still priced relatively higher. Change since 2006 in weekly prices.

Note: Prices on Nymex front-month contracts for Appalachian coal and Henry Hub natural gas
Source: Nymex via Thomson Reuters

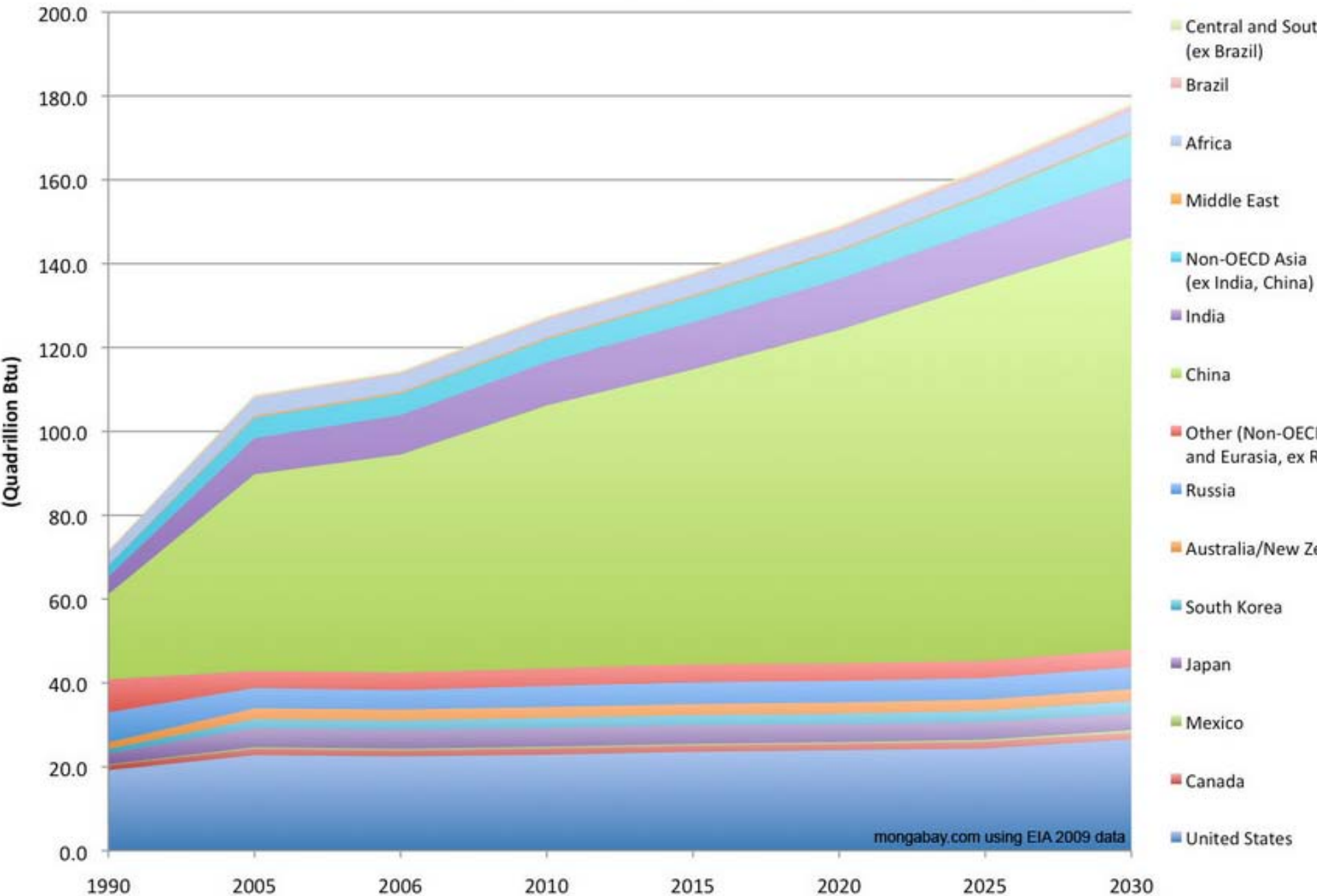




Coal v. Natural Gas

1. VOCs
2. Mercury
3. Lead
4. Cadmium
5. CO₂ (2x as much)
6. NO_x (3x as much)
7. SO_x (100x as much)
8. The List goes on...

World Coal Consumption by Region, Reference Case, 1990-2030





Highest Costs at Drinking Water Utilities

1. Labor

2. Electricity

3. Treatment Chemicals

- Depending on the utility, the order can vary, but these are the top three at the vast majority
- Keeping energy costs low is of major benefit to drinking water utilities and helps keep rates low

A vertical graphic on the left side of the slide showing a dynamic splash of water with various droplets and bubbles, rendered in shades of blue and white.

Domestic Energy

Reliable, domestic supplies of energy are good for drinking water (and wastewater) utilities throughout the country.

- Improved economy → better access to financing
- Greater certainty in energy costs helps utilities set rates appropriately

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Vocabulary Issue

- Hydraulic Fracturing is a technical engineering term for one process, part of the greater development cycle of a well
- “Fracking” is a charged, often political term with many different definitions based on context and who you ask
- Leads to communication problems... Makes it hard to work together

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How can this be?

- As of today, the statement of “there have been no proven cases of groundwater contamination from hydraulic fracturing” **is true.**
- The statement of “there have been instances where ‘fracking’ has impacted drinking water supplies” **is also true.**
- How can both be true simultaneously?

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How can this be?

- They are talking about different things!
- Hydraulic fracturing (fracking and fracing and other terms) have become buzzwords associated in the public's view, and with many outside the industry, with *the entire oil and gas lifecycle process*
 - Siting
 - Drilling
 - Fracturing
 - Production
 - Management of Wastes
 - Well closure and abandonment

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What does this mean?

- Therefore, all problems, *regardless of type or reason*, stemming from oil and gas development are likely to be blamed on ‘fracking’ for the foreseeable future in the public’s eyes.
- This *does not* mean that the water community can’t work together with the oil and gas community to keep drinking water resources safe and affordable, it only means we need to communicate clearly and effectively.



What are drinking water concerns?

- Possibility of groundwater contamination, regardless of reason or intent
- Possibility of surface water contamination
- Improper disposal of wastes
- Volume and timing of water resource use
- Storm water quality degradation from land use change
- All of these include accidents, spills, improper construction, casing, or cementing, and anything else that can go wrong

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Not Unique

- Many of these are not unique to wells using hydraulic fracturing, or even to oil and gas industry.
- To the drinking water community, any and every source of actual or potential contamination is of concern.
- Limited data exist on how to treat many substances not ordinarily found in water supplies. Even when such data do exist, a local utility may not have the necessary infrastructure.

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What is the water community doing?

- Many drinking water utilities already have source water protection programs
 - By far the most efficient and effective way to get contamination out of water is to prevent it from getting in there in the first place
 - Can be enhanced to include coordination with oil and gas development where appropriate.
- Developing research needs and seeking to fill them (as will be explained by the Water Research Foundation)

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What has gone well?

- FracFocus is a strong step in the right direction for chemical disclosure, especially so once planned searching and sorting enhancements are ready
- Some water utilities have collaborated with oil and gas developers – mutually agreeing on necessary testing and protections
- Starting to learn about each other's operations, practices, and terminologies to a degree



What do utilities need?

- From Oil and Gas Regulators:
 - **Disseminate** information on how your regulations protect drinking water sources: which risks are mitigated, and by how much? What (avoidable or unavoidable) risks remain, how likely are they, and what are consequences?
 - **Describe** future enhancements you plan to further reduce known risks and identify currently unknown or uncertain risks
 - **Distribute** critical data such as chemical disclosure and sources and timing of water to be used to drinking water utilities, drinking water regulators, and water resource managers



What do utilities need?

- From Oil and Gas Developers:
- **Cooperate** with local water utilities. “Take our word for it” isn’t good enough for any type of source water protection program; demonstrating how you are protecting against contamination and keeping an open mind to suggestions is preferred
- **Coordinate** emergency response plans in case of accidents, spills, and other problems that could affect water supplies. Do you know how to reach a contact of the utility downstream 24 hours per day?

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What do utilities need?

- From Oil and Gas Developers:
- **Elaborate** as necessary. Water utilities won't pretend they know all the details of the oil and gas industry any more than the other way around. Learn teach other's terminology to communicate.
- **Elect** to have strong safety and water protection standards, exceeding regulatory requirements

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Take- Home Message

- Although the drinking water industry and the oil and gas industry have different missions, we both have critical responsibilities in protecting drinking water resources and the public health.
- We are all professionals and must find ways to work in concert to protect perhaps the most valuable natural resource in the world, clean drinking water.



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