

ME 210 – ME Professional Development Seminar
Project 2
Luke MacDougall
Submitted November 6, 2020

Title: Fracking and Its Impact on World Oil Production and Reserves

Contents: Project 2.1 ethics essay, Project 2.2 ethics presentation slides

Zoom link: <https://drive.google.com/file/d/1g0RQj5FGX7Qw-FFrjvFRhNWZ1CLGgaL4/view?usp=sharing>

ME 210 – ME Professional Development Seminar

Project 2.1

Luke MacDougall

Submitted October 28, 2020

Title: The Ethics Behind Fracking and Its Impact on World Oil Production and Reserves

Problem Statement: Discuss the positive and negative ethical facets of fracking affecting world oil production and reserves.

Response: A popular belief shared in the twenty-first century is that society runs on fossil fuels. Across every major country in the world, a person will discover the presence of coal, oil, and natural gas powering factories and supplying electricity to each nation's respective citizens. These fossil fuels made their debut in the late nineteenth century and have later assumed a pivotal role in shaping the technology and advancements people have today. It is presumably natural then for individuals and companies to want to enhance the production of fossil fuels, with hydraulic fracturing being a major contributor to this process. Hydraulic fracturing is a powerful method that involves injecting high pressured liquids into the Earth to retrieve unconventional sources of fossil fuels for consumption. The ideology and process behind fracturing yields many ethical questions: does the pursuit of additional economic gain through higher fossil fuel consumption outweigh the environmental risks and safety hazards posed by fracking? Are people jeopardizing future oil production and reserves by placing a larger emphasis on fracking and its immediate gains now?

This essay will classify good ethics as actions and intentions that propels overall society further at the minimal expense of the people. Meanwhile, bad ethics will be defined as prioritizing the well-being and prosperity of the few over the many.

According to John Manfreda, some of the first companies to utilize fracking in their business noticed a twelve hundred percent boost in oil production within a week's time from certain wells across the U.S (1). Since then, fracking became a widespread method for oil and natural gas production and has greatly increased profits in that field. This boost has caused the U.S in recent years to become one of the global frontrunners of oil production, only falling behind countries such as Saudi Arabia and Russia. Matt Egan wrote an article that illustrated how in 2016, there were about two hundred eighty thousand more fracking wells pumping about 4.2 million barrels of oil every day compared to the year 2000 (2). This statistic helps explain the falling price of oil, since reaching its peak in price in 2014, as companies began finding themselves with a surplus stock of oil that needed to be sold. Consumers of oil were fairly pleased by the abundance of this cheap oil, which pushed the United States to consuming more than nineteen million barrels of oil every day, accounting for slightly over twenty percent of the world's total daily oil consumption (3). Some could then assert that the United States economy wouldn't be where it is today without utilizing fracking to exploit the untapped regions of oil and natural gas in the Earth.

Proponents of fracking are typically large companies involved in the oil and natural gas industry as fracking is a very lucrative endeavor. Opponents to fracking generally consist of ordinary citizens or organizations that are heavily concerned about the environment and public health. Research has revealed that fracking

has been tied to cases involving water, air, and land pollution and even human health risks through the exposure of toxic chemicals. Joe Hoffman reports that in one such situation, hydrofracking

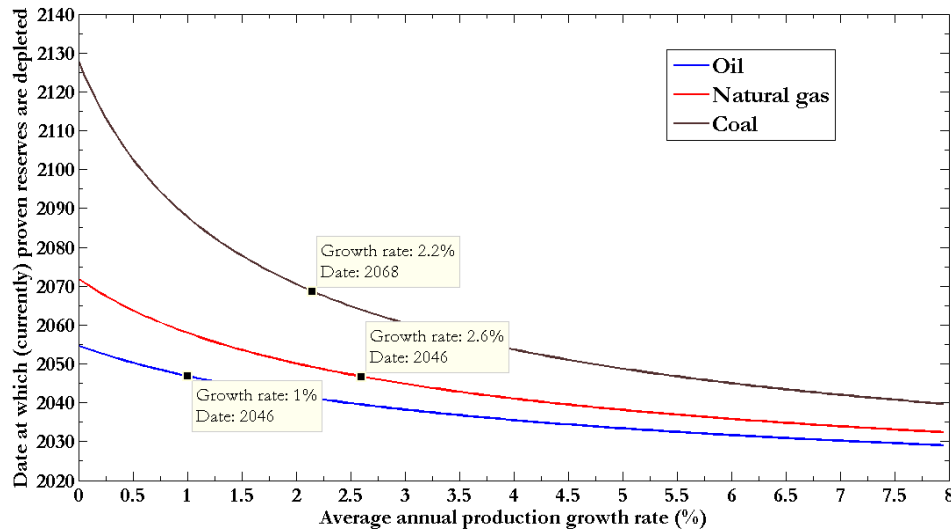


Figure 1 – The expected duration of fossil fuels (5).

caused pollutants to enter the groundwater of residents living in Pavillion, Wyoming, causing the environmental agency to step in and have the oil companies compensate the residents (4). Hoffman also highlights the findings he discovered in a 2011 article that out of a list of six hundred thirty-two chemicals associated with drilling and fracking, about seventy-five percent of the chemicals could affect various sensory organs, forty to fifty percent affect the brain and nervous system, and twenty-five percent are possible carcinogens. Health risk is increased the closer someone lives to on-site fracturing, but it's hard to determine how prevalent the danger is as symptoms begin generally showing long-term versus short-term. Fracking is therefore considered unfavorable by some due to its possible detrimental effects on the environment and people alike.

Regardless of how fracking is currently perceived, many individuals question whether utilizing the natural resources people have now will ultimately be detrimental to society's progress in the future. Fossil fuels are a non-renewable energy source, meaning it's a resource that won't be replenished, not for a million years at least. By exhausting the current supply of fossil fuels now, people are concerned with how future generations will maintain a high energy consumption society down the road. This is one of the reasons why it's hard for people and organizations to switch to renewable energy sources because much of technology and society today is heavily dependent on the energy and accessibility fossil fuels provide (6). The prevailing belief is that with the gradual decrease in the availability of fossil fuels over the years, alongside its steady increase in price, people will become more inclined to make the shift to renewable energy. Current data shows that fossil fuels are projected to be depleted as early as forty years from now if fossil fuel production rate doesn't change tremendously (5). Fracking could therefore become a thing of the past if no suitable and timely changes are made in today's society.

References:

1. Manfreda, John. 2019, October 9, "The Real History of Fracking: Oil, Bombs and Civil War", Retrieved from: <https://oilprice.com/Energy/Crude-Oil/The-Real-History-Of-Fracking.html>
2. Egan, Matt. 2016, March 24, "Oil milestone: Fracking fuels half of U.S. output", Retrieved from: <https://money.cnn.com/2016/03/24/investing/fracking-shale-oil-boom/>
3. Worldometer, 2020, October 28, "United States Oil", Retrieved from: <https://www.worldometers.info/oil/us-oil/#:~:text=Oil%20Consumption%20in%20the%20United%20States&text=The%20United%20States%20consumes%2019%2C687%2C287,of%2097%2C103%2C871%20barrels%20per%20day>
4. Hoffman, Joe. 2019, February 15, "Potential Health and Environmental Effects of Hydrofracking in the Williston Basin, Montana", Retrieved from: https://serc.carleton.edu/NAGTWorkshops/health/case_studies/hydrofracking_w.html
5. Online Calculator Algebra. "Fossil fuel depletion". Retrieved from: <https://vowefawoqazuqumichael Ferris jr.com/fossil-fuel-depletion-15385fv.html>
6. Science in the news. 2012, December 15, "Why We Need Sustainable Energy", Retrieved from: <http://sitn.hms.harvard.edu/flash/2012/why-sustainable/#:~:text=Human%20fossil%20fuel%20use%20is,oceans%20can%20take%20it%20up>

A photograph of an oil drilling rig at sunset. The rig is a tall, complex structure of metal beams and pipes, with a crane arm extending to the right. The sky is a mix of dark blue and orange, with some clouds. In the foreground, there are several large, white, rectangular containers or trailers. The overall scene is industrial and dramatic.

Fracking and Its Impact on Future Oil Production and Reserves

By: Luke MacDougall



Evolution of Fracking



Benefits and Consequences



Implications For the Future



What We Can Do

What is Fracking?

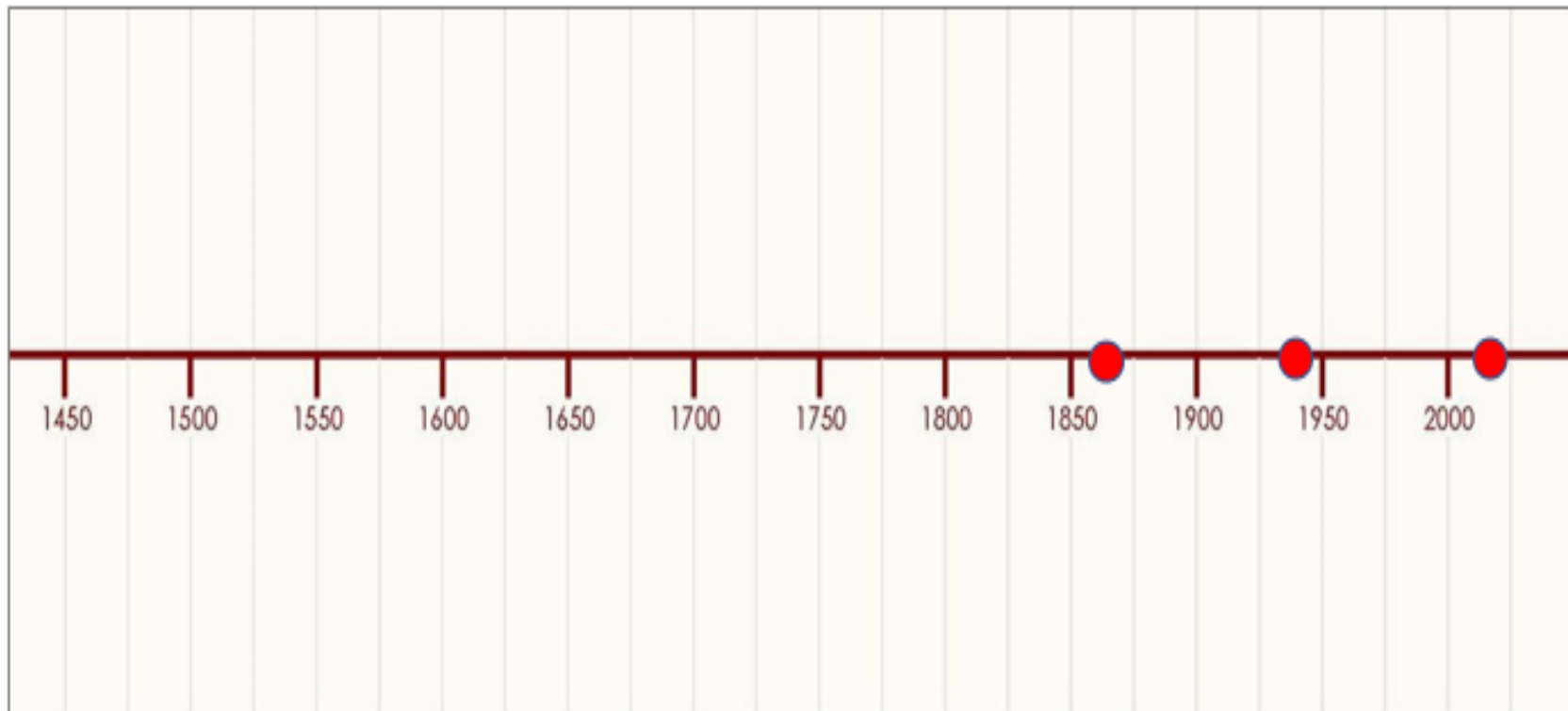
Hydraulic Fracking



Horizontal Drilling



Fracking Over the Years



Ethics Behind Fracking

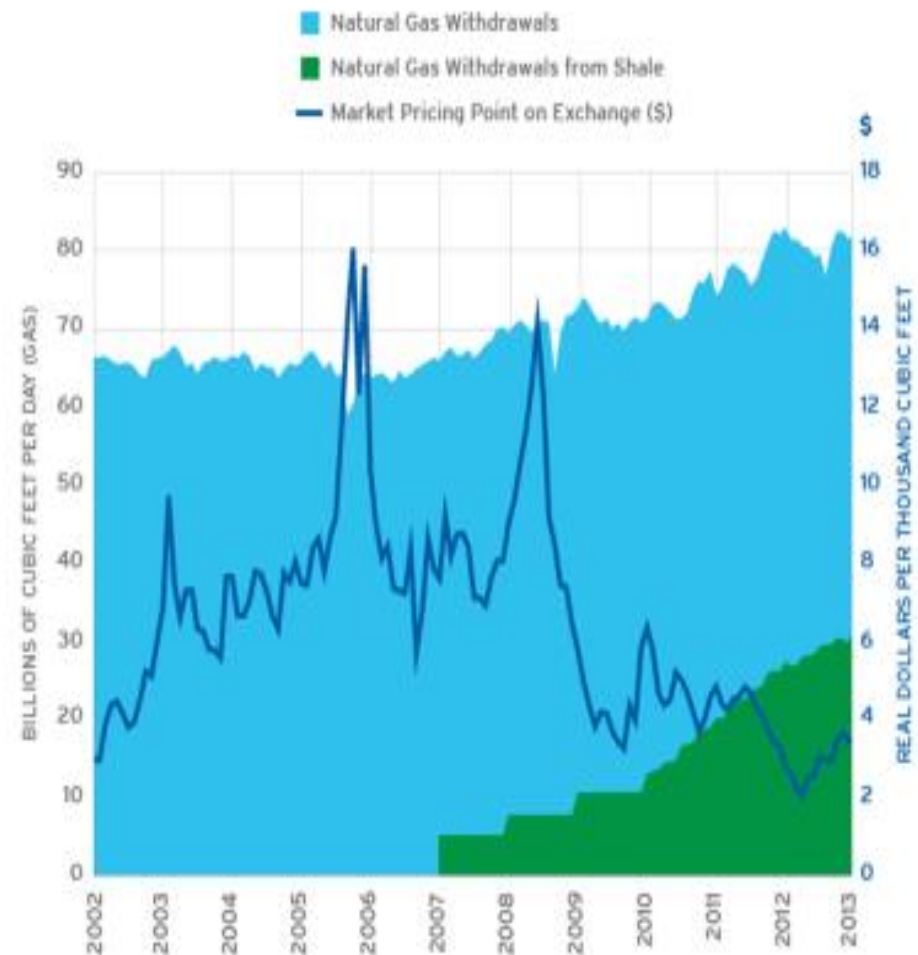
- Why is it such a big issue?
- How does it garner so much attention?
- What do people think about it?



The Benefits

- Cheaper Energy
- Less Air Pollution
- Greater Energy Security
- Less Surface Area Used

AS FRACKING GROWS, NATURAL GAS PRICES ARE DROPPING



Note: Gross withdrawals include not only marketed production, but also natural gas used to repressure wells, vented and flared gas, and non-hydrocarbon gases removed.

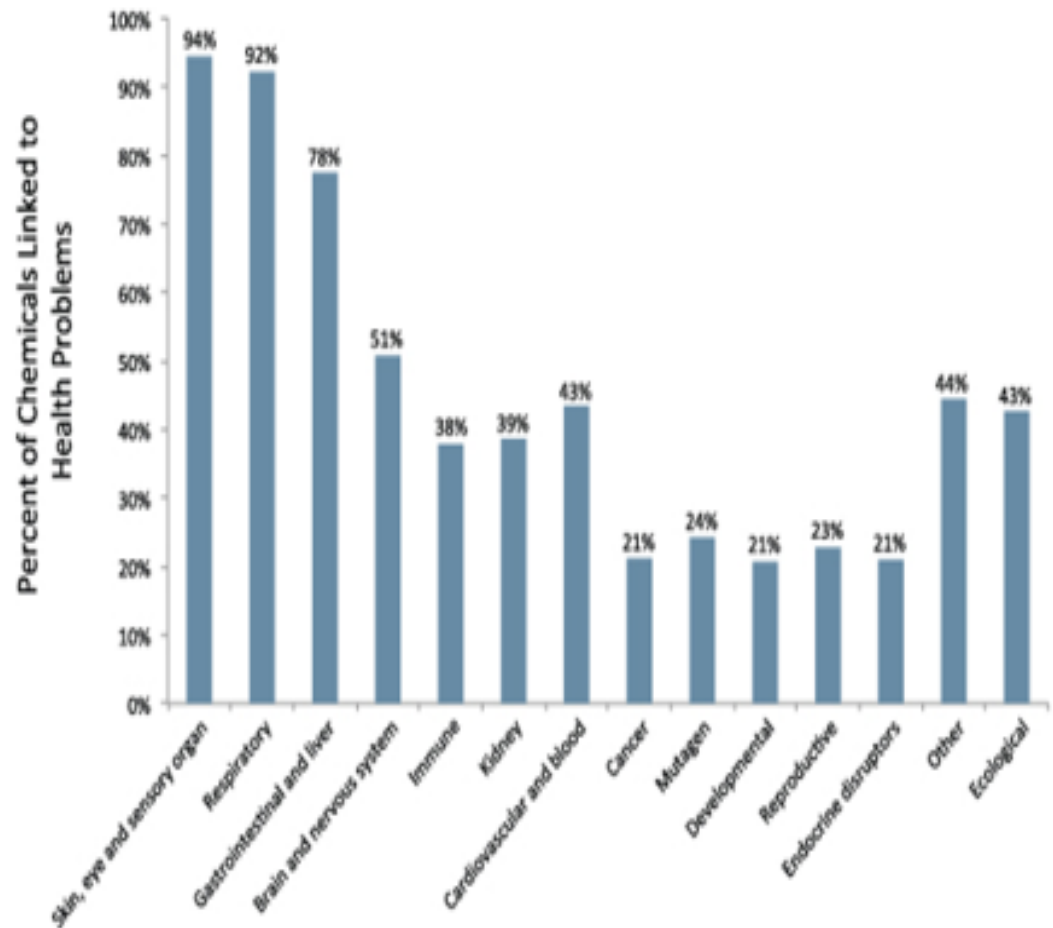
Source: U.S. Energy Information Administration

BROOKINGS

The Consequences

- Possible Health Effects
- Bad For the Environment
- Oversupply of Fossil Fuels
- Drainage of Reserves

Profile Of Health Effects From Fracking Chemicals



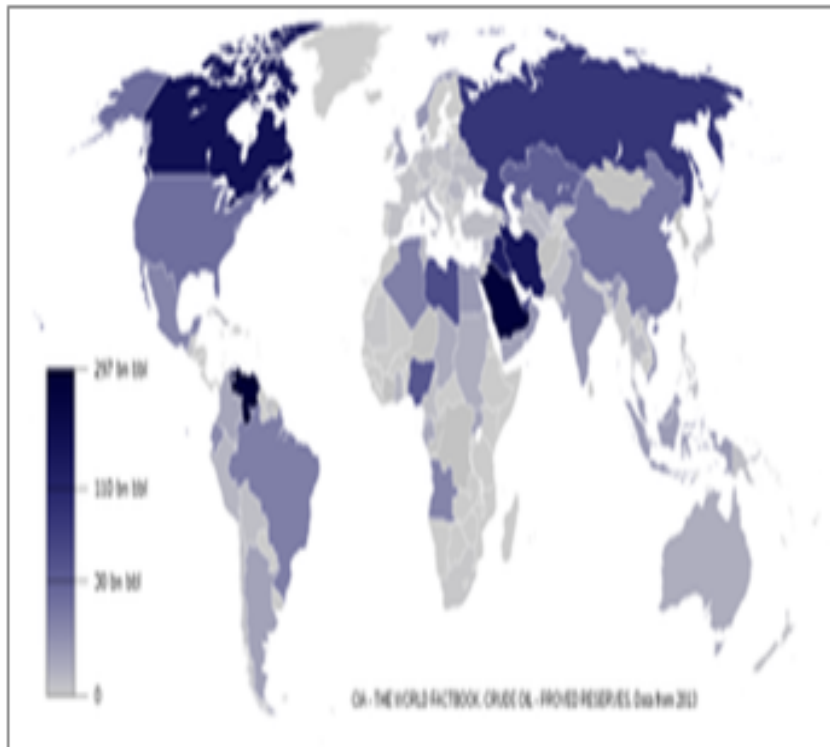
What Does This Mean About Future Oil Reserves and Production?

- Where is the World Heading?
- What Are the Statistics?
- Is the Oil Trend Staying On Course or Changing Patterns?

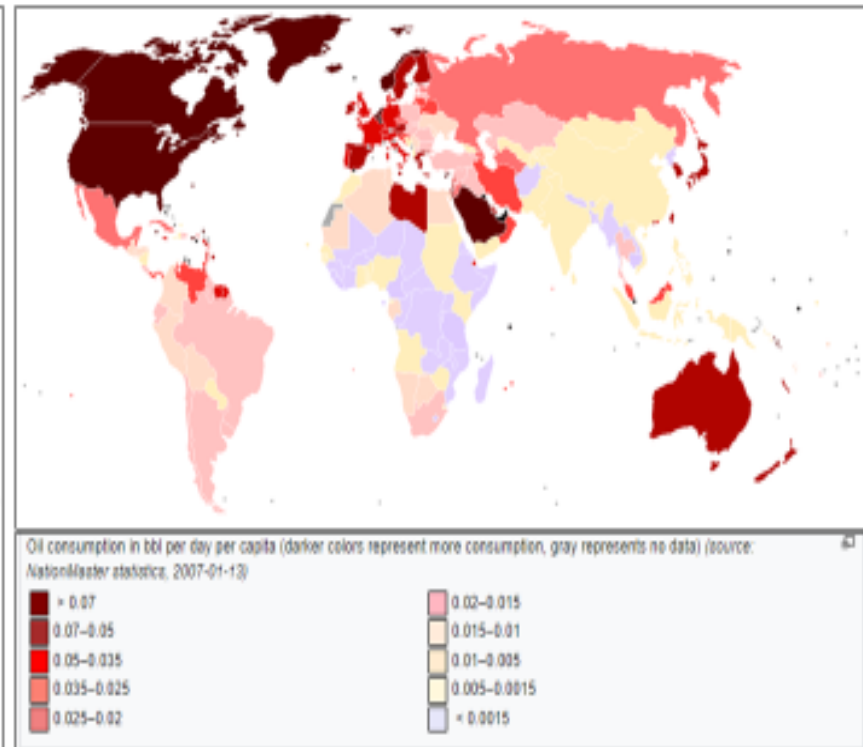


Current Production and Reserves

Supply



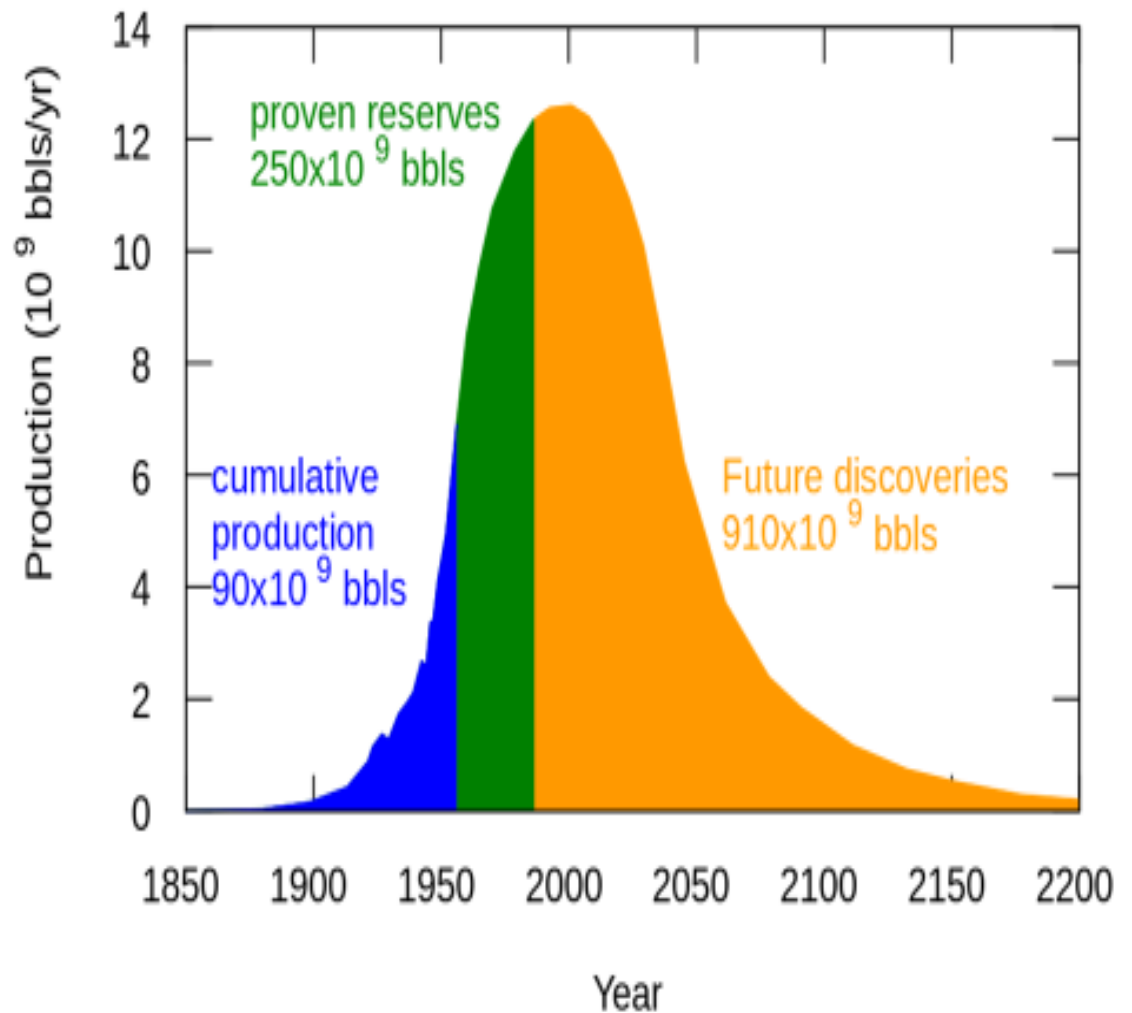
Consumption



Estimated Production and Reserves in the Future

“We produce more natural gas than ever before – and nearly everyone’s energy bill is lower because of it.”

- Barack Obama

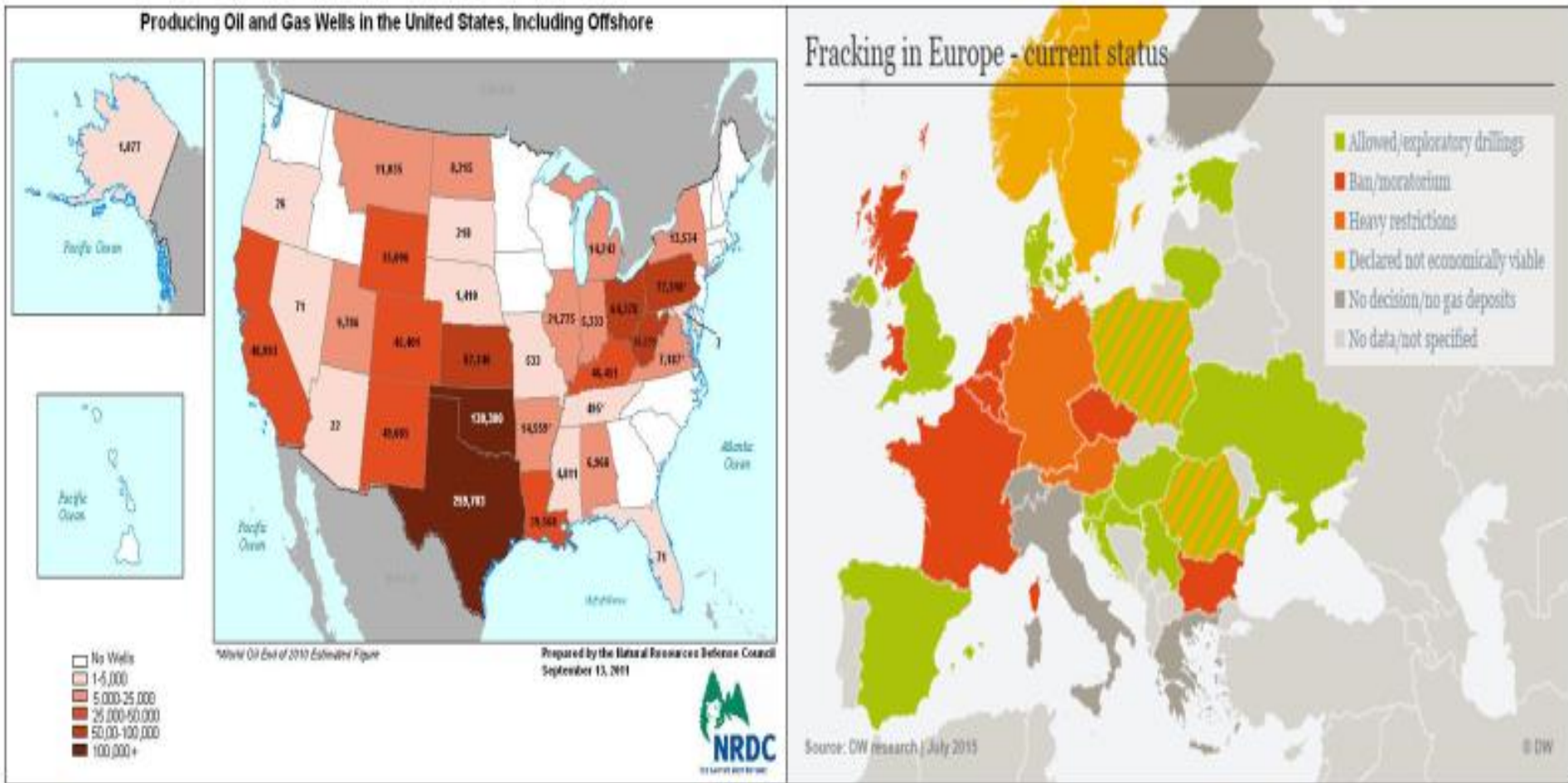


Changes We can Make

- Move to Renewable Energy
- Use Less Fossil Fuels
- Develop Plans to Manage Current Oil Expenditures



How Organizations and Countries Either Promote or Denounce Fracking



Thank You!

Any Questions?

Acknowledgements

- <https://setxind.com/upstream/how-hydraulic-fracking-is-used-and-the-reasons-for-it/>
- <https://www.livescience.com/34464-what-is-fracking.html#:~:text=Most%20fracking%20wells%20in%20use,to%20Columbia%20University's%20Earth%20Institute>
- <https://epic.uchicago.edu/events/event/the-fracking-debate-the-pros-cons-and-lessons-learned-from-the-u-s-energy-boom/>
- <https://www.forbes.com/sites/christopherhelman/2013/02/12/president-obama-gets-it-fracking-is-awesome/?sh=5fe3de51425d>
- <https://www.nrdc.org/issues/reduce-fracking-health-hazards>
- <https://www.shutterstock.com/search/action+changes+things>
- <https://www.nps.gov/subjects/islandofthebluedolphins/timeline.htm>
- <https://www.dw.com/en/what-ever-happened-with-europes-fracking-boom/a-18589660>
- <https://pixels.com/featured/059-the-thinker-philosophy-hall-columbia-university-maryam-mughal.html>
- <https://www.forbes.com/sites/ucenergy/2018/02/20/fracking-has-its-costs-and-benefits-the-trick-is-balancing-them/?sh=425122c19b4c>
- <https://www.nationaldriller.com/articles/90788-maxi-hdd-rigs-designed-for-larger-scale-horizontal-drilling-jobs>