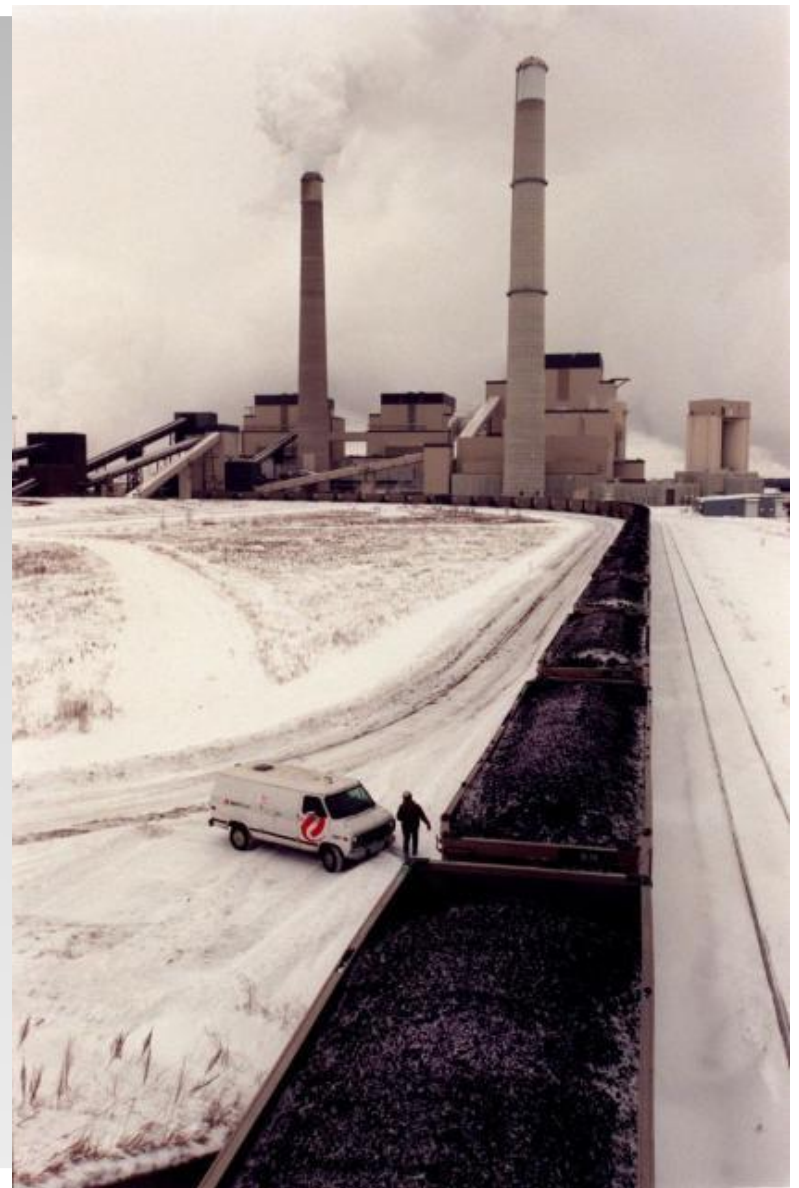


Project Title: Natural Gas Power Generating Plant



**Converting Xcel Energy's Sherco Power Plant in Becker, MN to a Natural Gas power plant.**

- Xcel's largest fossil-fueled plant
- Burns 30,000 tons of coal—3 trainloads every day. More than 9 million tons a year.
- Units 1 & 2 use a wet scrubber system
- Unit 3 has a dry scrubber



## Sherco Power Plant

Biggest natural gas producers: U.S., Russia, Canada and Iran

Top three coal producers: China, U.S. and India

Power plants that run on natural gas emit ...

- Half as much CO<sub>2</sub>
- Less than a third of the nitrogen oxides
- One percent of the sulfur oxides
- Much lower levels of mercury

... than plants that burn coal



- Natural gas produces 21% of the world's power
- It is now the number 1 power source in America
- Very little waste



**Natural Gas plant in St. Paul, MN**

# 1. Project Title: Natural Gas Power Generating Plant

2. Proposer: NRG Energy, Inc.

Contact person: Ed Stoutenburg

Title: Transportation Administrator

Address: 10700 165<sup>th</sup> Avenue Northwest

Elk River, MN 55330

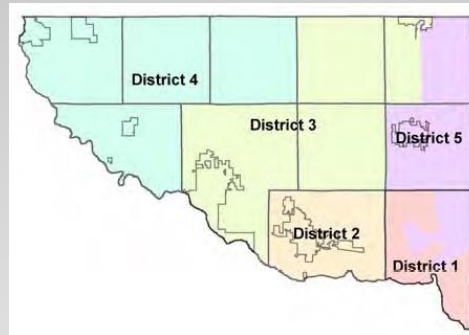
Phone: 612-441-9819

Fax: 612-441-8989

### 3. RGU: Sherburne County Planning & Zoning Department and Sherburne County Board of Commissioners for Becker and Big Lake :



**Ewald Peterson**, Chair  
District 2  
Home: Big Lake Township



**John Riebel**  
District 3  
Home: Becker Township

- Address: 13880 Business Center Drive
- Elk River, MN 55330
- Phone: (763) 765-4450
- Fax: (763) 765-4467

4. Mandatory EAW, because it is a 750 megawatt unit being installed.
5. Project location: NE 1-4 ,N 1-2 OF NW 1-4,  
SE 1-4 & S 1-2 OF SW 1-4  
Section 1 Township 33N Range 28W

GPS Coordinates: N 45.381209  
W -93.896634

Tax Parcel Number: 60-201-1000, 60-201-2400, 60-201-2401, 60-201-2402



- Unit 1
- Cooling towers
- Substation
- Lagoons

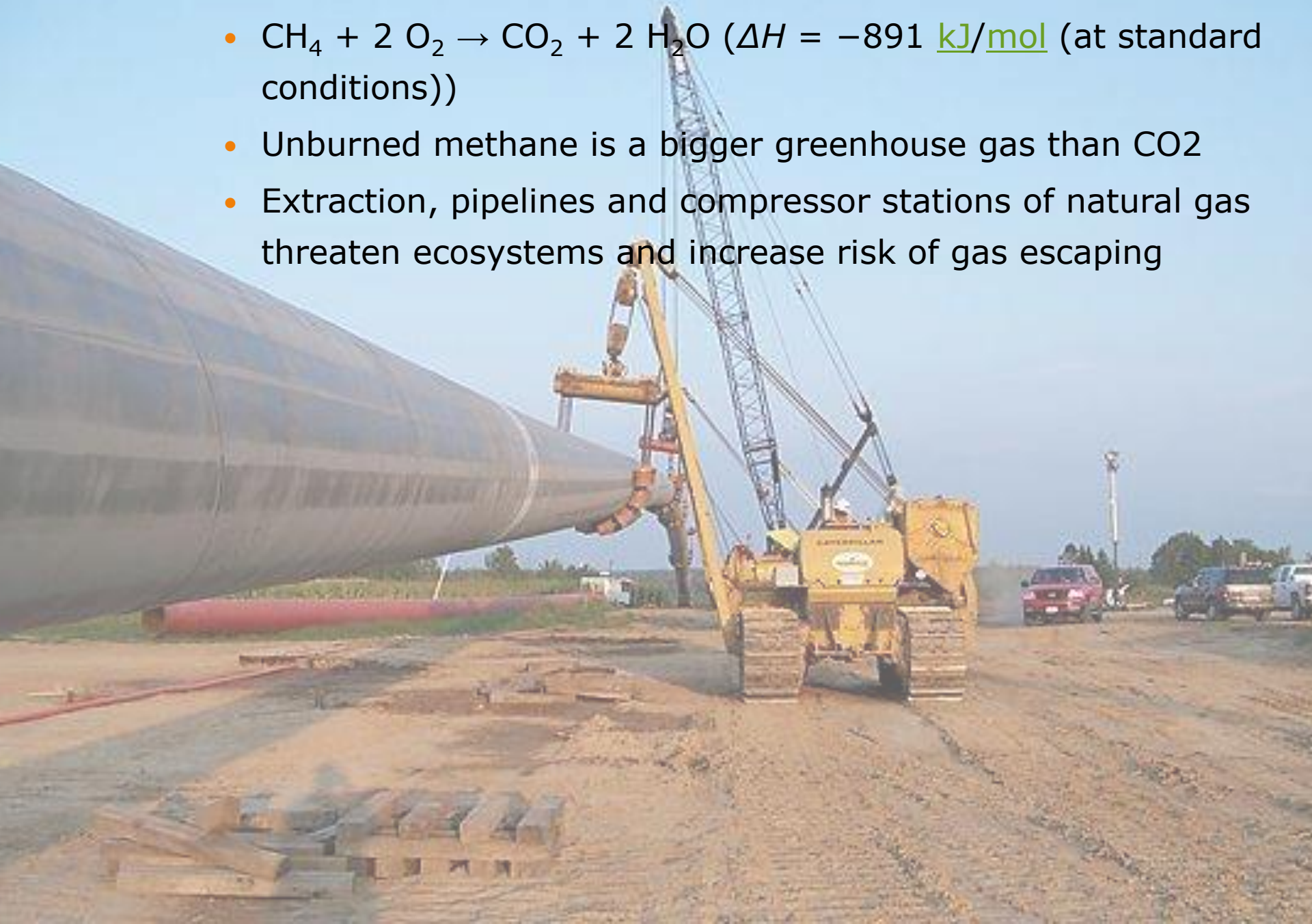


**Sherco Satellite Image**



- 9. The current land has the operating Sherco coal power plant operating on it. The Mississippi river is located on the south and southeast side of the site. All of the land around the plant within  $\frac{3}{4}$  of a mile consists of farm land. The plant is located in the city limits of Becker, MN, which is north of the plant.
- 10. The acreage of the Sherco Power Plant is 4500 acres which was intended for expansion when the plant was first constructed. The land consists of farm land and the Mississippi river on the south and southeast side of the site.

- Natural gas is 85-95% methane
- $\text{CH}_4 + 2 \text{O}_2 \rightarrow \text{CO}_2 + 2 \text{H}_2\text{O}$  ( $\Delta H = -891$  [kJ/mol](#) (at standard conditions))
- Unburned methane is a bigger greenhouse gas than  $\text{CO}_2$
- Extraction, pipelines and compressor stations of natural gas threaten ecosystems and increase risk of gas escaping



- Methane will be the main chemical concern with a natural gas power plant.

- 23. Stationary Source Air Emissions

- -Existing Air pollutants

- \* methane
- \*carbon monoxide
- \*carbon dioxide
- \*nitrous oxide
- \*nitrogen oxides (Nox)
- \*sulfur dioxide
- \*particulate matter
- \*volatile organic compound

## Sherburne County

- Anoka Sand Plain subsection of the Eastern Broadleaf Forest.
- Anoka Sand Plain, much of the peat lands have been drained for sod and vegetable crops, and much of the prairie and savanna have been urbanized.
- Sherburne is ranked 5th in vegetable production, and 2nd in population growth.



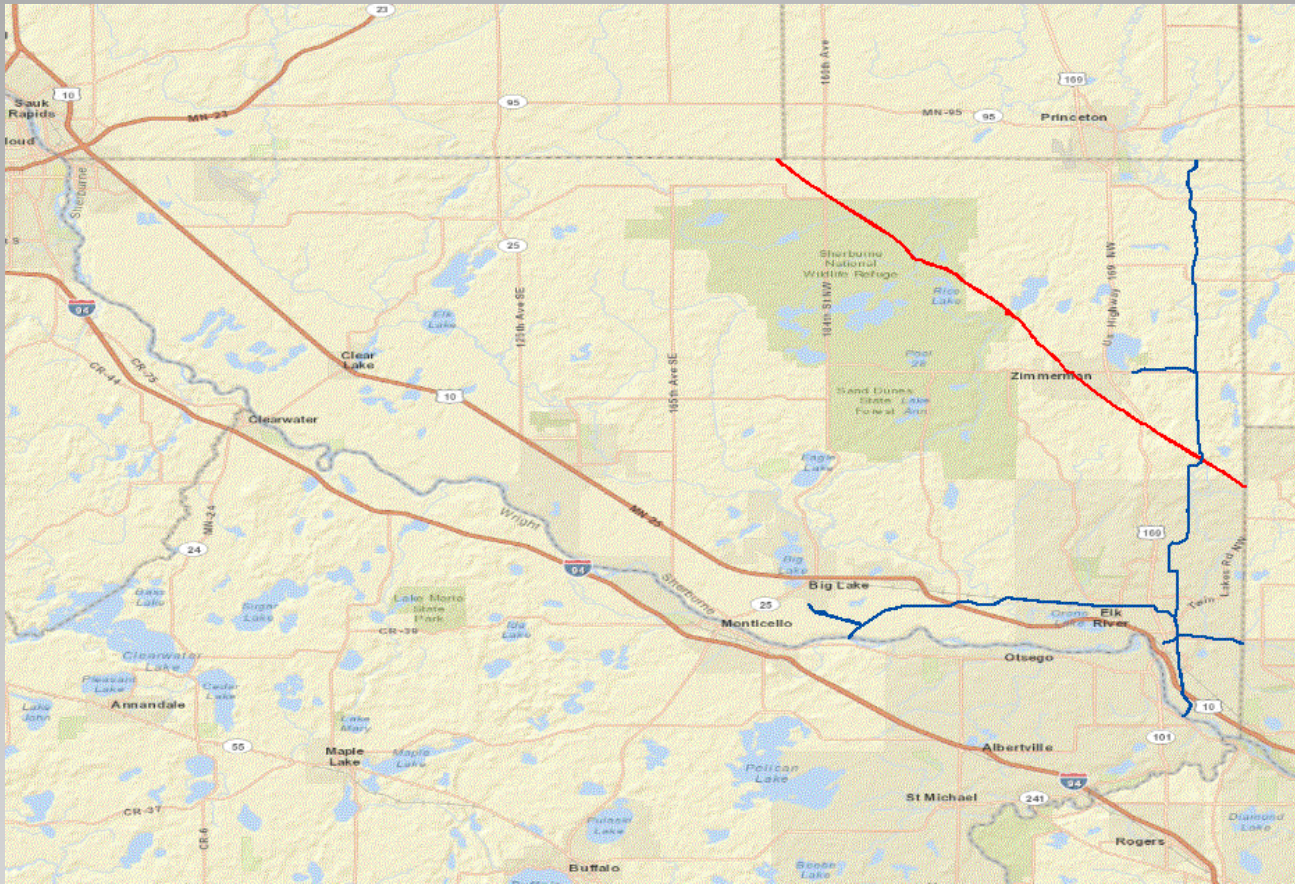


- 11a. Little to no new permanent impacts on wildlife.
- b. There are no new endangered, threatened or special concerns for any species on or near the site.
- 12. No physical impacts on water resources.
- 13. There would be a decrease in the amount of water needed and likely there would not be any dewatering necessary.

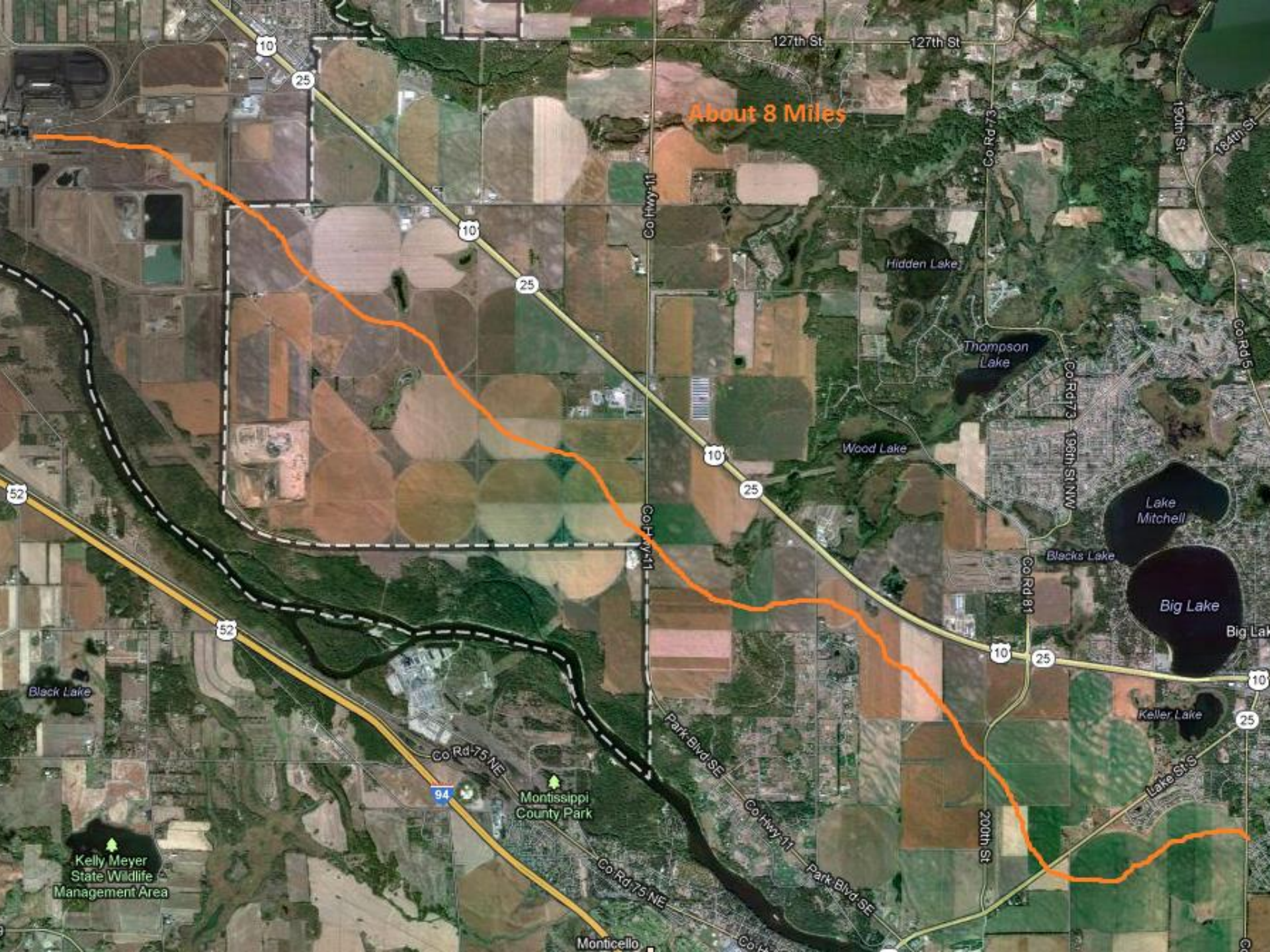
Power Generation Plants consumed an annual average of 20.6 billion gallons of water from rivers & streams, and 377 million gallons from groundwater. Major users include Xcel Energy (Sherco plant) and Great River Energy, both drawing primarily from the Mississippi River for steam power cooling.

- 14. No water-related land use management districts.

- 15. There will be no change in number or type of watercraft.
- 16. Everything excavated will be returned close to its original state. The trench for the natural gas line will be 8' deep. 3 acres will be excavated and backfilled. This equates to 100,000 cubic yards. Erosion control blankets will be used where needed.
- 17. a. This project will use existing runoff handling measures. There will be no change in runoff.
- 17. b. This site will not change its runoff handling measures. The runoff is directed to the city's storm sewer.







About 8 Miles

10

25

10

25

10

25

10

25

10

25

52

94

127th St

127th St

190th St

184th St

Co Rd 73

Co Rd 51

Co Rd 73  
198th St NW

Co Rd 81

200th St

Co Hwy 11

Co Hwy 11

Park Blvd SE

Co Hwy 11

Park Blvd SE

Co Rd 75 NE

Co Rd 75 NE

Monticello

Hidden Lake

Thompson Lake

Wood Lake

Black Lake

Lake Mitchell

Big Lake

Big Lake

Keller Lake

Lake St S

Black Lake

Kelly Meyer  
State Wildlife  
Management Area

Mississippi  
County Park

- 19. The current site is surrounded by agricultural land and open space.
- The soil in Becker is mostly made up of well-drained loam and silt-like clay loam.
- 20.
- a. Natural gas is one of the cleanest fuels but produces Co<sub>2</sub> emissions. Coal creates twice the amount of Co<sub>2</sub> emissions than natural gas which makes natural gas more desirable.



- **b.** Natural gas is made up of mostly methane which is a problem that enables the greenhouse effect. A ton of methane in the atmosphere traps as much radiation as 20 tons of carbon dioxide but it affects the air quality 8 to 40 times less than the carbon dioxide.
- **c.** There are three separate units which generate 2,400 megawatts for the facility. Two units are older (built in 1970) while one unit is newer, and co-owned with Southern MN Municipal Power Agency. The Sherco plant has tried to reduce their emissions but is still guilty of releasing tons of mercury and Co<sub>2</sub> into the air. Sherco is working on meeting the requirements but haven't reached a reliable solution.

- 22. Vehicle related air emission
- It will decrease in tons per year.
- It went from 21 tons of carbon monoxide per year to about 17 tons of carbon monoxide per year.

21. There will not be any additional need for parking because there will be fewer workers and less coal needed.



**Natural gas pipeline  
installation.**

26.

- During the construction of the repowering of the coal plant there will not be any visual impacts that aren't already existing.
- Putting in the pipeline from big lake will have visual impacts during the trenching process.



27. In order to put in our natural gas pipeline we will have to obtain right of way permits from Sherburne county to be able to run a natural gas pipeline from big lake to Sherco power plant in Becker, MN.

## 24. Odors, Noise, Dust

Odors- In order to stop gas leaks, there is a chemical added to the water to make it easier to notice the gas leaks. This chemical is called mercaptan. It has a rotten egg smell to it.

Noise- While the power plant is being converted into a natural gas plant, there may be added noise. The traffic flow should not be as heavy, causing less noise.

Dust- With a natural gas in play, there should not be much dust generated.

The only way it will impact human health is if there is a gas leak in the pipes.

## 28. Major infrastructure impacts

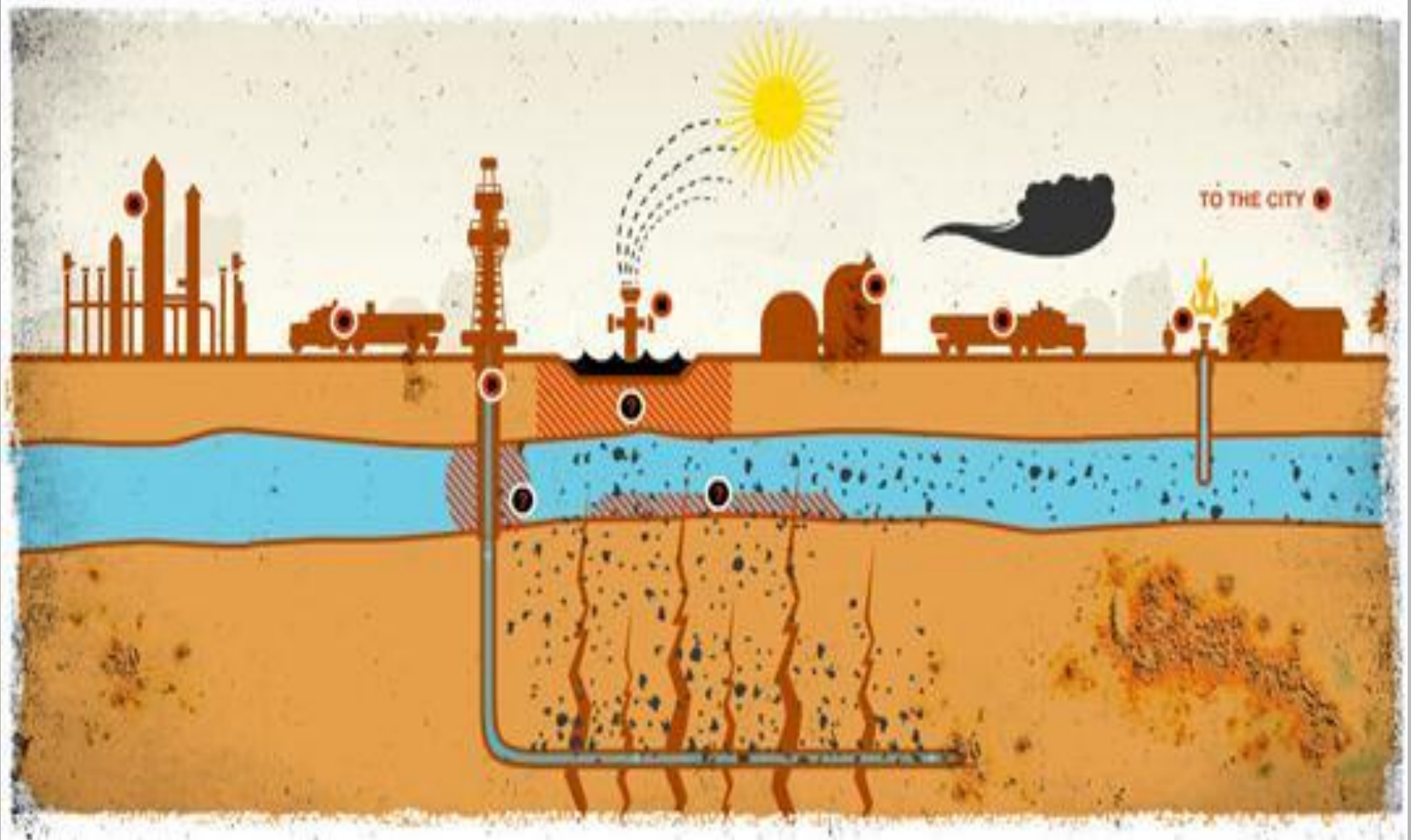
- Remodeling of one unit with combined cycle repowering with natural gas.
- Consist of two generators. One connected to a steam turbine currently there already and one generator connected to a gas turbine.
- This will improve efficiency by 15% and provide a power increase of 70% for future expansion.
- Require a natural gas pipeline to be put in the ground to supply the gas turbine with fuel.

- Hydraulic Fracturing

**Fractures in rocks created by injecting mainly sand and water deep into the Earth's crust to release a natural gas.**







- Procedure

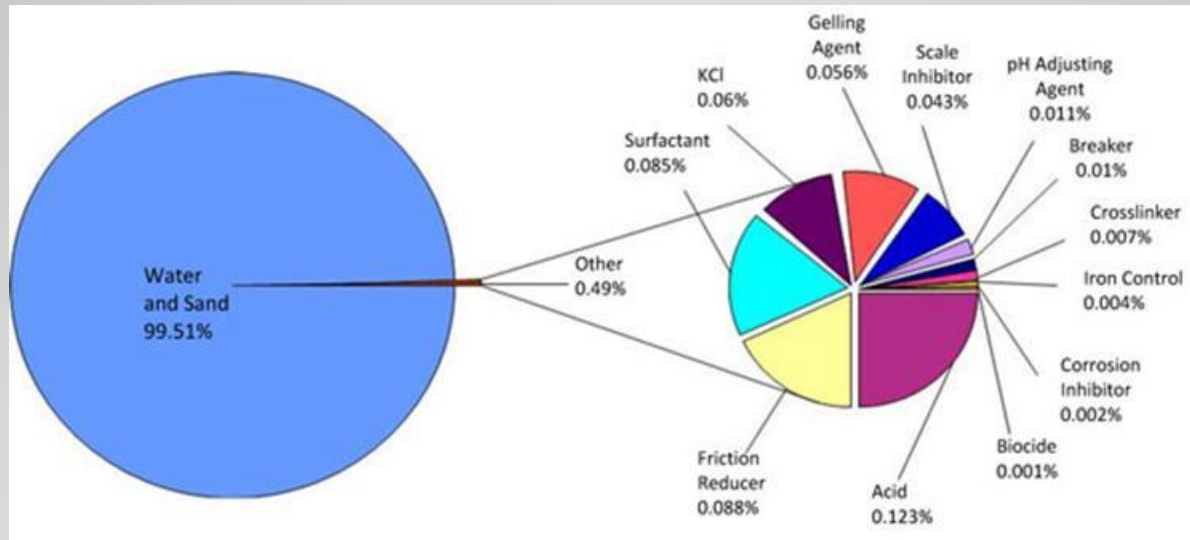
Chemicals are mixed with the water.

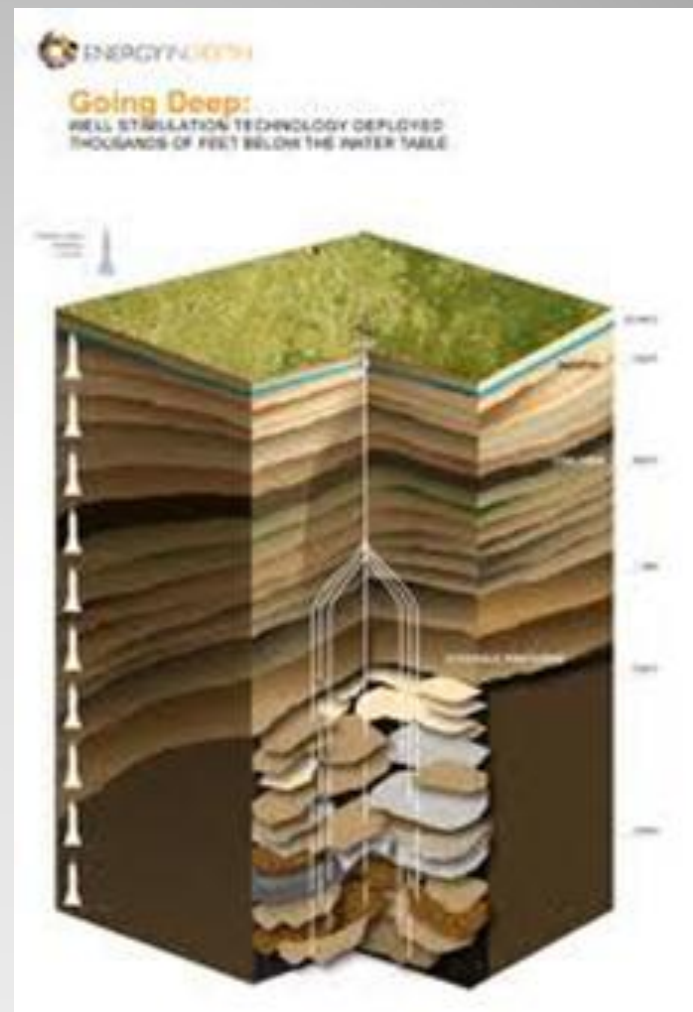
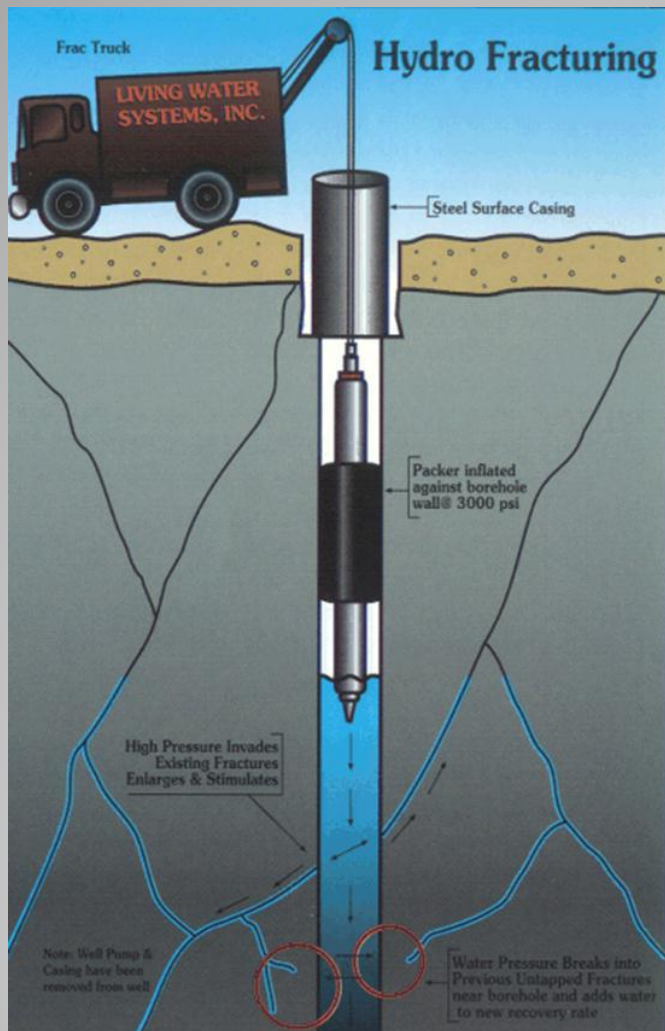
The rock is cracked.

Gas is released.

\*Methane

**There are many chemicals involved, but not all chemicals are used on a daily basis.**





## Social Advantages of Using Natural Gas



- Cleanest burning fuel
- less harmful emissions creates better air quality
- Natural gas is abundant in the U.S.
- Less reliant on foreign sources for our energy
- Natural gas is cheaper
- Natural gas is colorless, tasteless, and odor free
- Reduces the need for coal



## Advantages of Natural Gas for American Consumers

- Reliable
- Affordable
- Cleaner (reduces emissions)
- Produced in United States
- Natural gas industry generated \$380 billion to the U.S. economy
- Created 2.8 million American jobs
- Federal and local governments profit

## **Safety and The Environment**

- Minimize disruption to communities
- Implement safety plans
- Protect Groundwater by isolating where the drilling is being done to reach the gas reservoirs.
- Limit impact on land surface and environment.

## **Key Benefits of Switching to Natural Gas**

- Clean burning
- Less CO2 emissions
- Domestic (U.S. product)
- Economic Growth
- Job creation
- Competitive alternative to coal

- **Why burn natural gas?**

Saves money on imports

Ecofriendly

Opens more jobs



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