



# DAKOTA GASIFICATION COMPANY

*A BASIN ELECTRIC POWER  
COOPERATIVE SUBSIDIARY*



# Great Plains Synfuels Plant



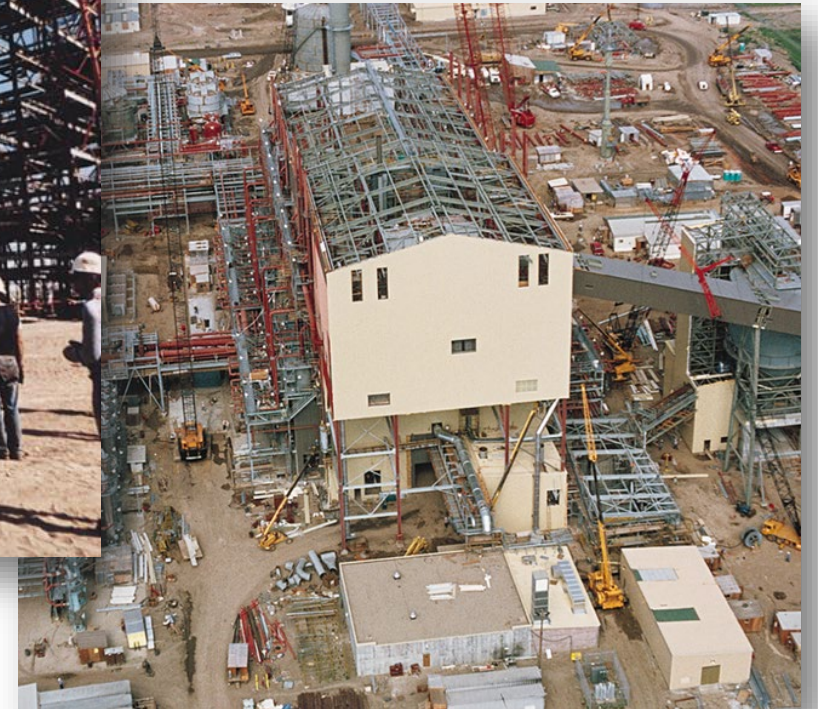
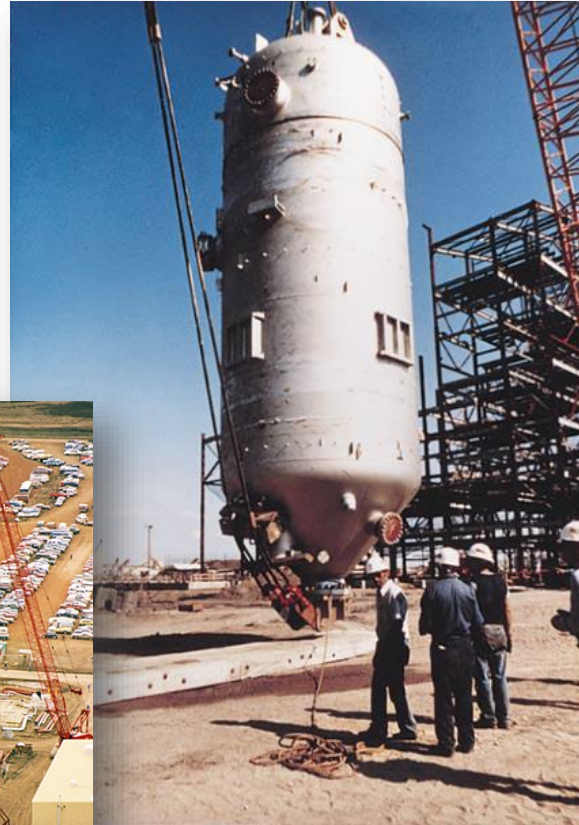


# What happens here?

- ONLY commercial-scale coal gasification plant producing natural gas in the country
  - ONLY other place that uses the same technology is in South Africa
- Convert lignite coal into 13 products, including:
  - Natural gas
  - Fertilizers
  - Liquid fuels
  - More!



# Construction





# Changing Hands

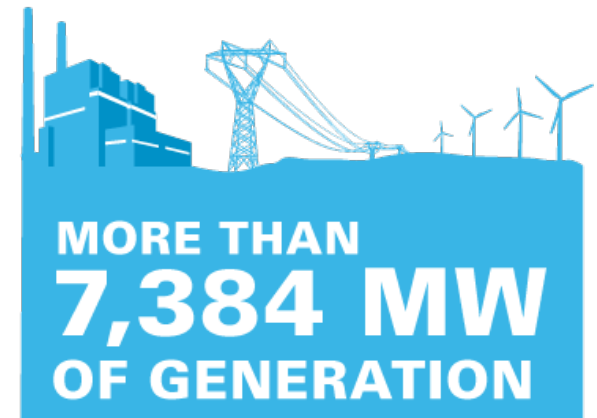
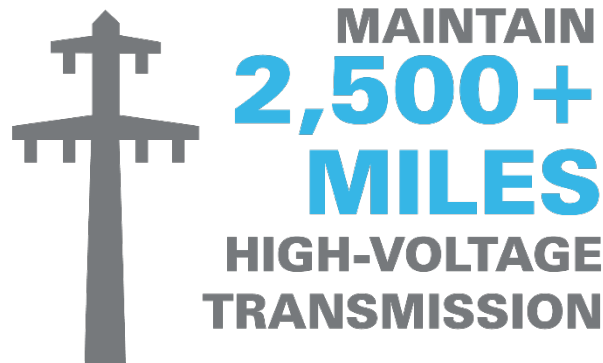
- 1984: First gas to the pipeline
- 1985: Founders leave, turn it over to Dept. of Energy
- 1988: Basin Electric purchases Synfuels Plant to protect member interests
  - Form Dakota Gasification Company as a for-profit subsidiary



# Basin Electric Power Cooperative



SERVING  
**3 MILLION**



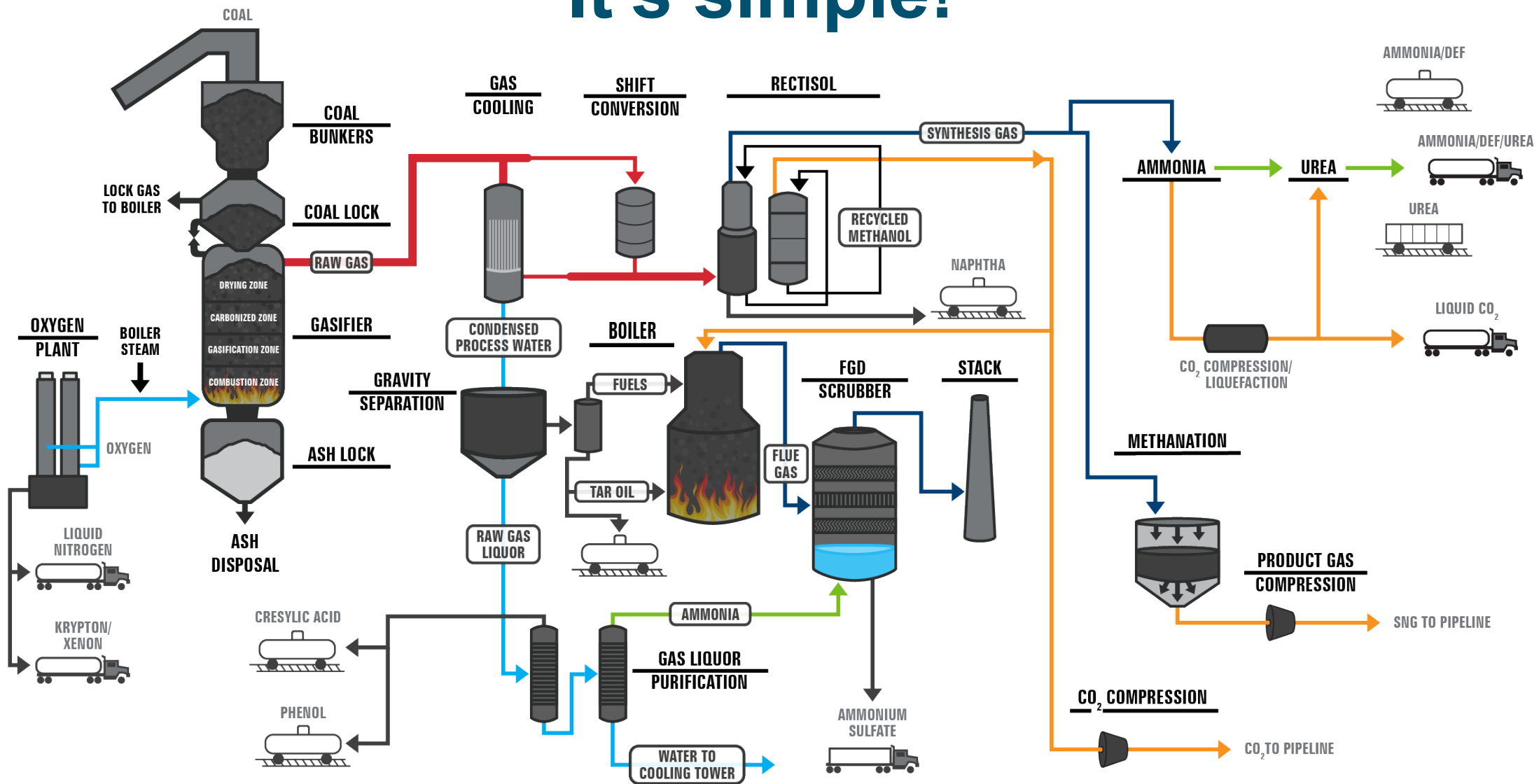
*And the Great Plains Synfuels Plant, too!*

**QUESTION:**  
**WHAT COUNTRY IS HOME TO THE ONLY  
OTHER SYNFUELS PLANT THAT USES THIS  
TECHNOLOGY?**

# HOW TO TURN COAL INTO GAS



# It's simple!



# Three Ingredients

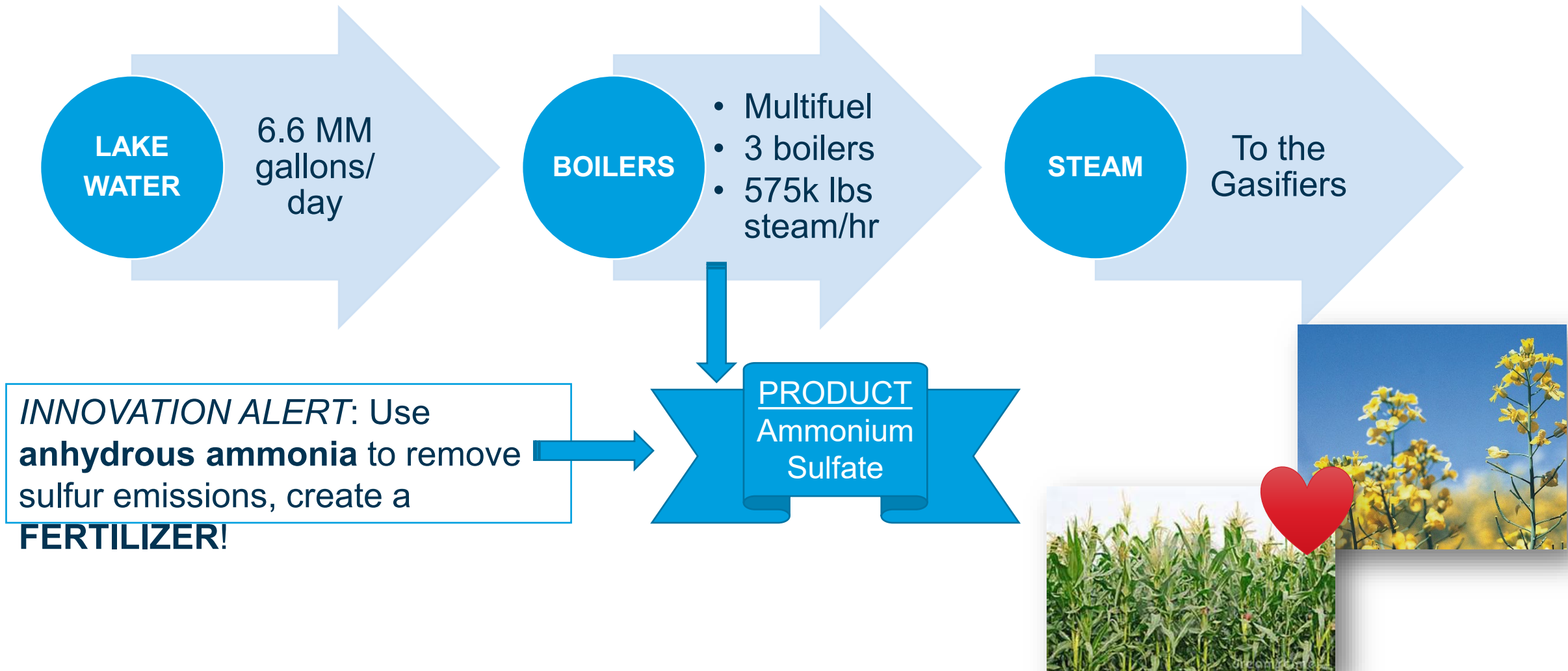


## Products

- Natural gas
- Anhydrous ammonia
- Ammonium sulfate
- Carbon dioxide
- Urea
- Diesel exhaust fluid
- Liquid CO2
- Liquid nitrogen
- Krypton
- Xenon
- Phenol
- Cresylic acid
- Tar oil

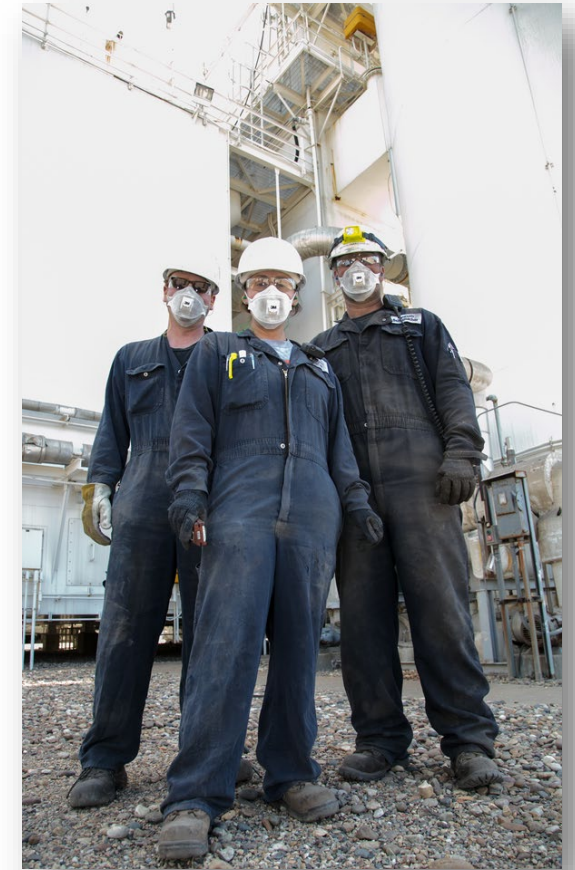
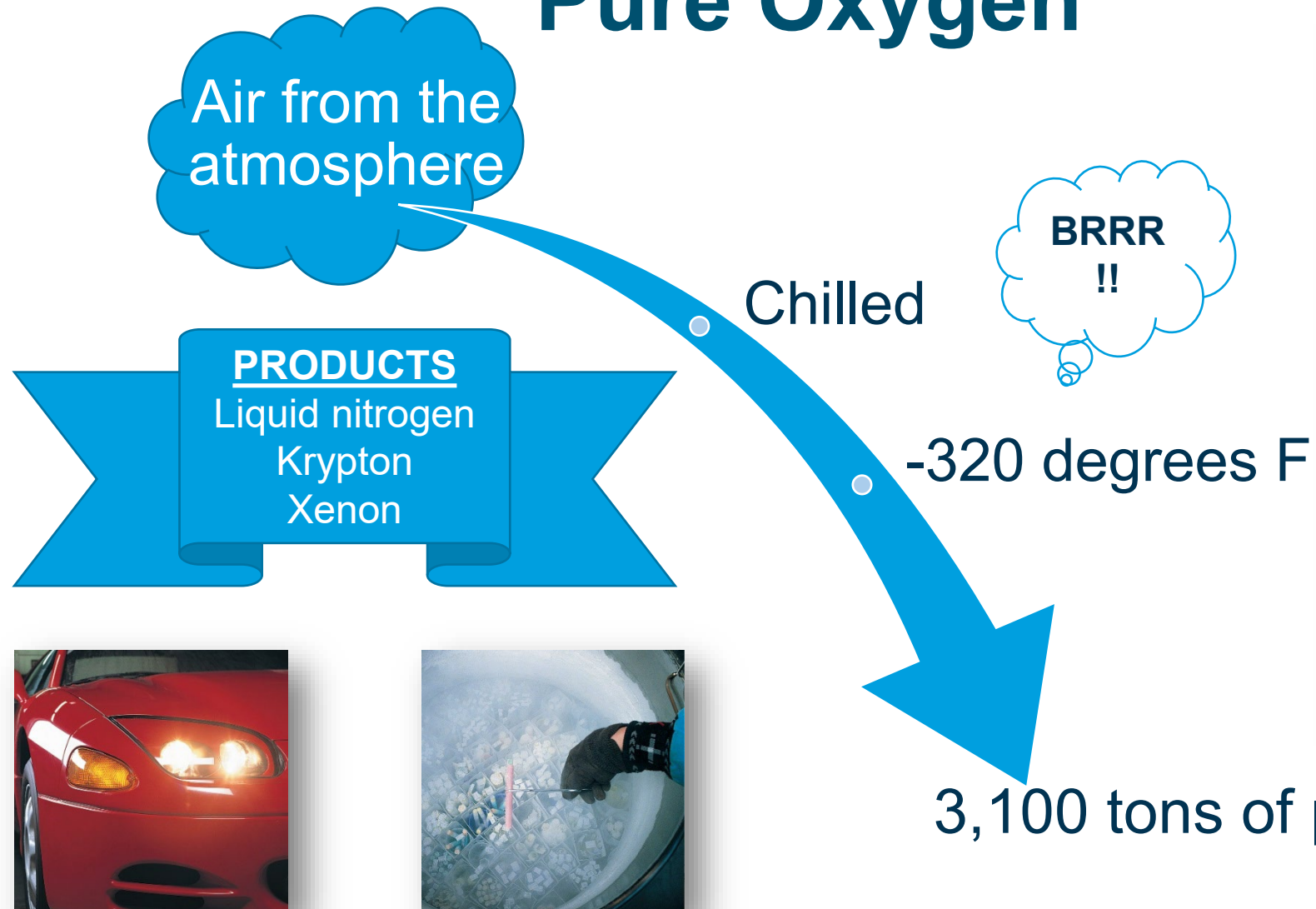


# Steam





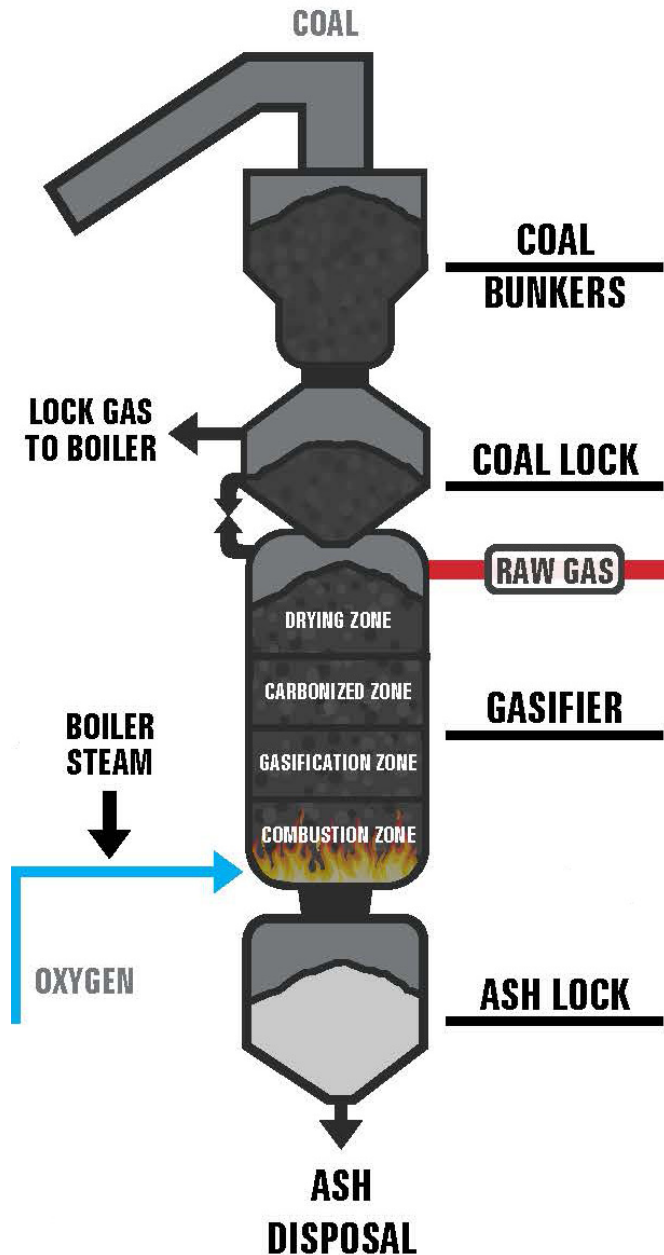
# Pure Oxygen



# Lignite Coal

- 18,000 tons per day
- Brought to plant via conveyor
- Crushed to size of golf balls
  - Smaller goes to Antelope Valley Station power plant





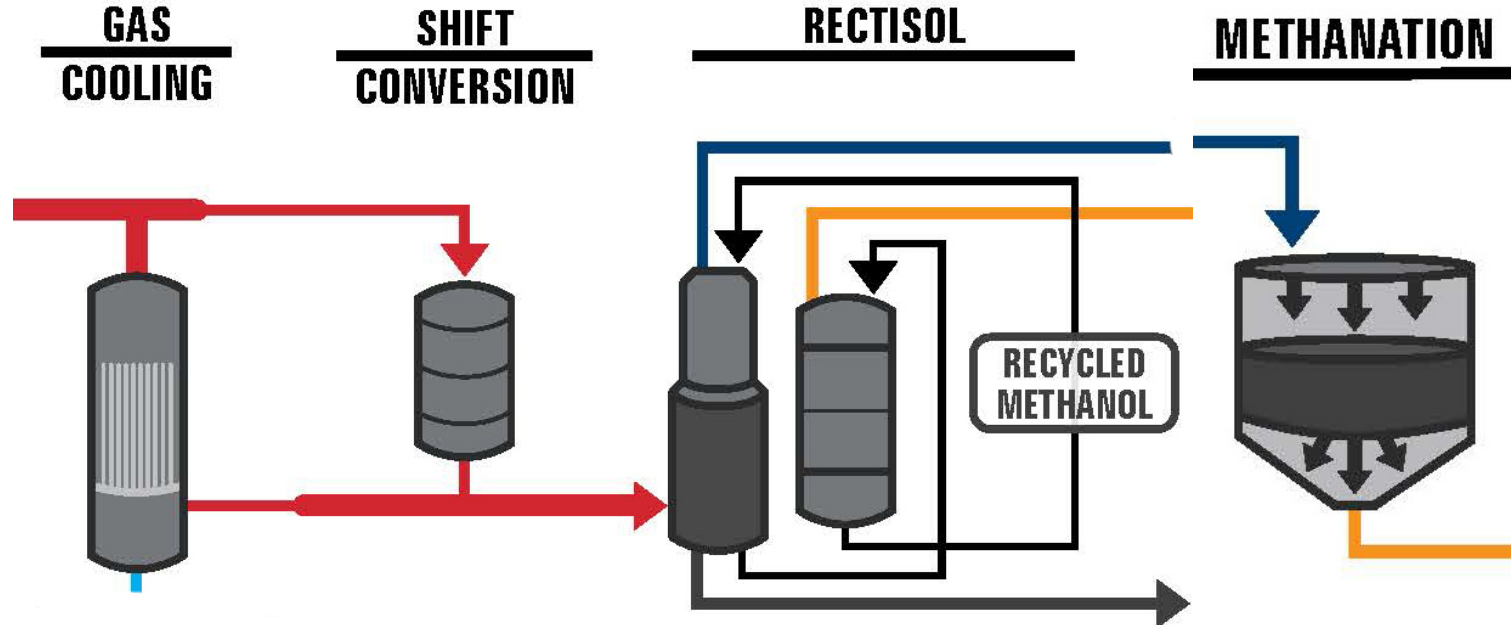
# Gasifiers

- 14 gasifiers
- 13 ft wide, 40 ft tall, 165 tons
- 8 tons of coal fed into the top of the gasifier every 10 minutes
- Hottest point: 2,200 degrees F
- NAMES, not numbers
  - Arnel, Bernice, Candy, Donna, Ethel, Frieda & Gail
  - Albert, Bruce, Charlie, Dave, Ernie, Frank & George

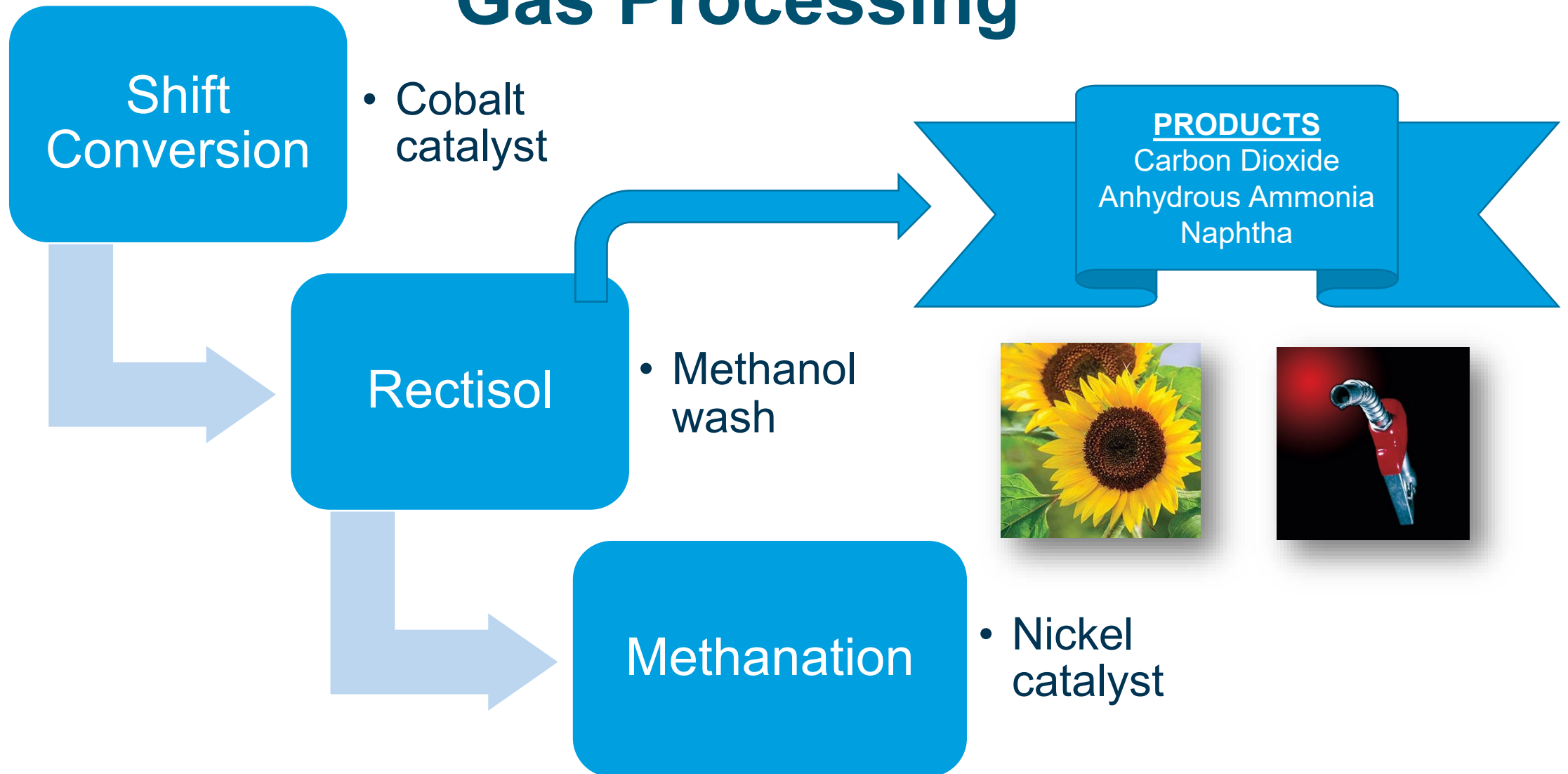


# We've Got Gas!

- Cool raw gas, then move the gas molecules along to work with them
- Liquids settle out as gas liquor; process later



# Gas Processing



# Pipeline-Quality Natural Gas

- 153 million standard cubic feet per day
- Home heating, industrial feedstock
- Northern Border Pipeline to Ventura, IA



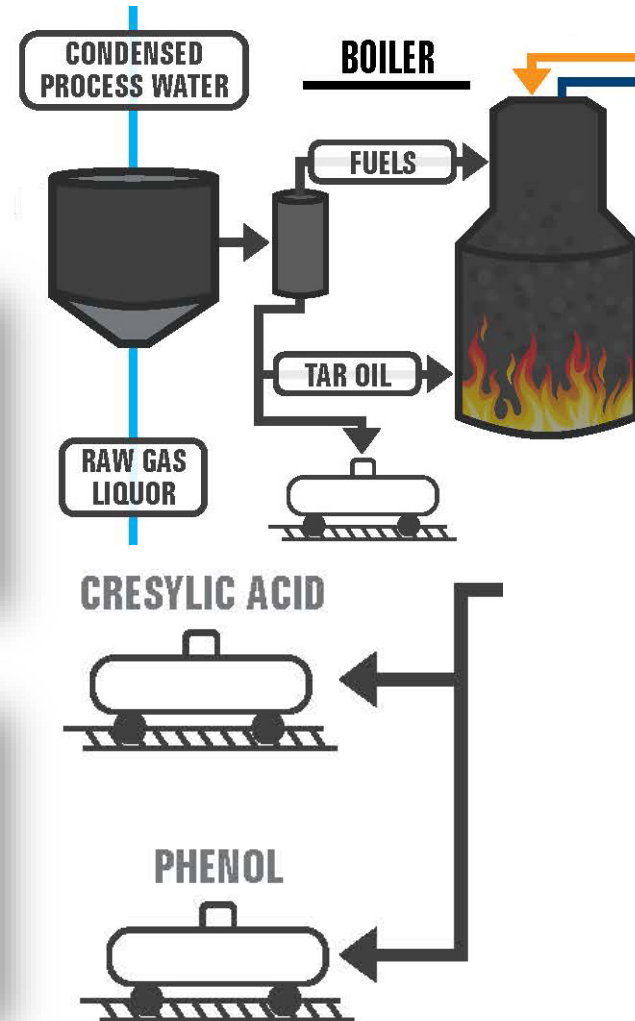
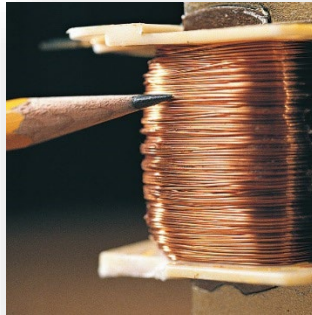


**QUESTION:**  
**WHICH OF THESE IS *NOT* NEEDED FOR  
THE GASIFICATION PROCESS?**

# Liquid Processing

## PRODUCTS

Cresylic Acid  
Phenol  
Tar Oil



# Product Highlights

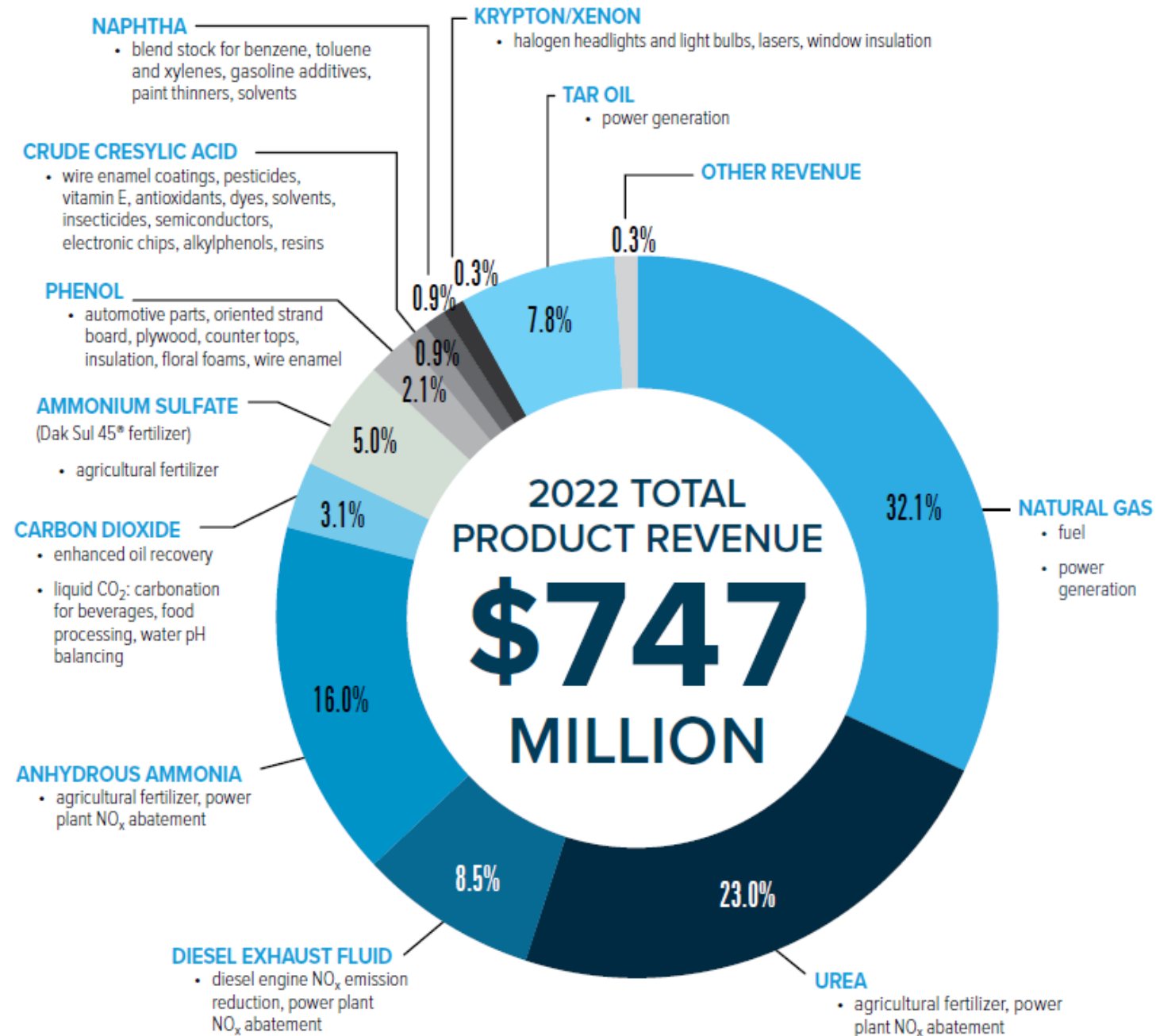
- CO2
  - Enhanced oil recovery
- Urea
  - Granular fertilizer
- Diesel exhaust fluid
- Liquid CO2
  - Well fracking, municipal water supply treatment, dry ice for vaccine storage





# DGC's Revenue Mix is Changing

When Basin Electric purchased Dakota Gasification, only 2% of the revenue was from a product other than natural gas. In 2022, nearly 80% of DGC's revenue was derived from products other than natural gas



# Careers

- Field technicians
  - Process operations, maintenance, machine shop, electrical, instrumentation
- Chemistry lab
  - Chemists, lab technicians
- Engineering
  - Chemical, process, mechanical, electrical, instrumentation, civil, reliability, control systems, environmental
- Safety, security, EMS













