OUR FUTURE WITH NATURAL GAS

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Alison Thompson

ABC Energy

Today we're going to learn more about:

ENERGY & NATURAL GAS

PIPELINES

SAFETY

JOBS

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José’s morning

José woke up before sunrise because of the alarm clock. He turned on the lights in his closet, showered in warm water, put on clothes, poured cereal in a bowl and added milk from the refrigerator. He ate while watching YouTube videos, then placed the dishes in the dishwasher and turned it on. José used his electric toothbrush and fixed his hair with a hair dryer before putting on shoes and grabbing the backpack off the back of the chair. José got on the school bus for the 20-minute ride to school.

How did José use energy this morning?

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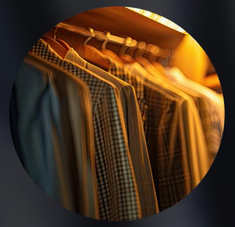
Source: Switch Classroom

José's morning

DIRECT ENERGY USE

ALARM CLOCK

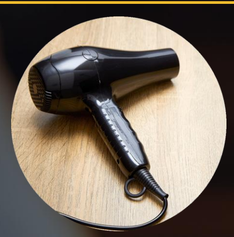

CLOSET LIGHT


HOT WATER


REFRIGERATOR


INTERNET


ELECTRIC TOOTHBRUSH


HAIR DRYER

SCHOOL BUS


SCHOOL

INDIRECT ENERGY USE


BED


HOUSE


CLOTHES & SHOES


CEREAL, MILK & BOWL


SCREEN & BATTERY


SINK, TOOTHPASTE & HAIR PRODUCT


BACKPACK


CHAIR

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Source: Switch Classroom

Renewable energy sources

What are characteristics of renewable energy sources?

SOLAR

WIND

HYDRO

BIOMASS

GEOTHERMAL

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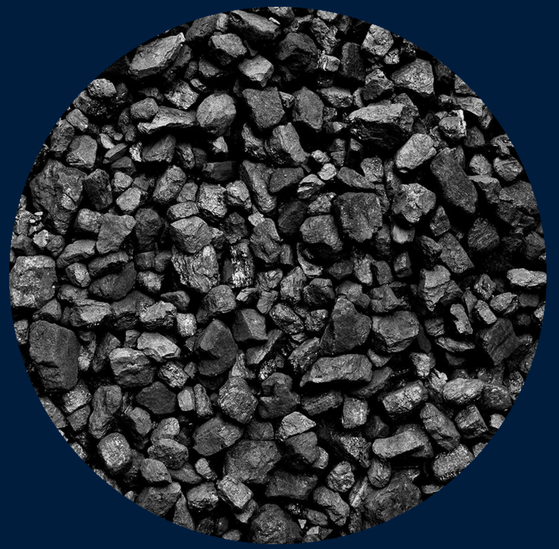
Nonrenewable energy sources

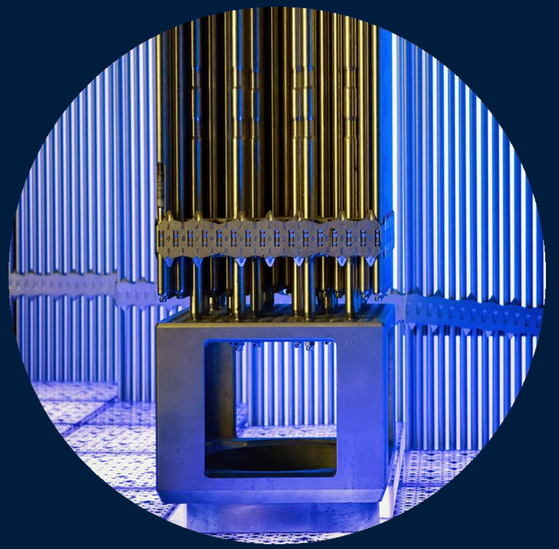
What are characteristics of nonrenewable energy sources?

OIL

NATURAL GAS



COAL



NUCLEAR

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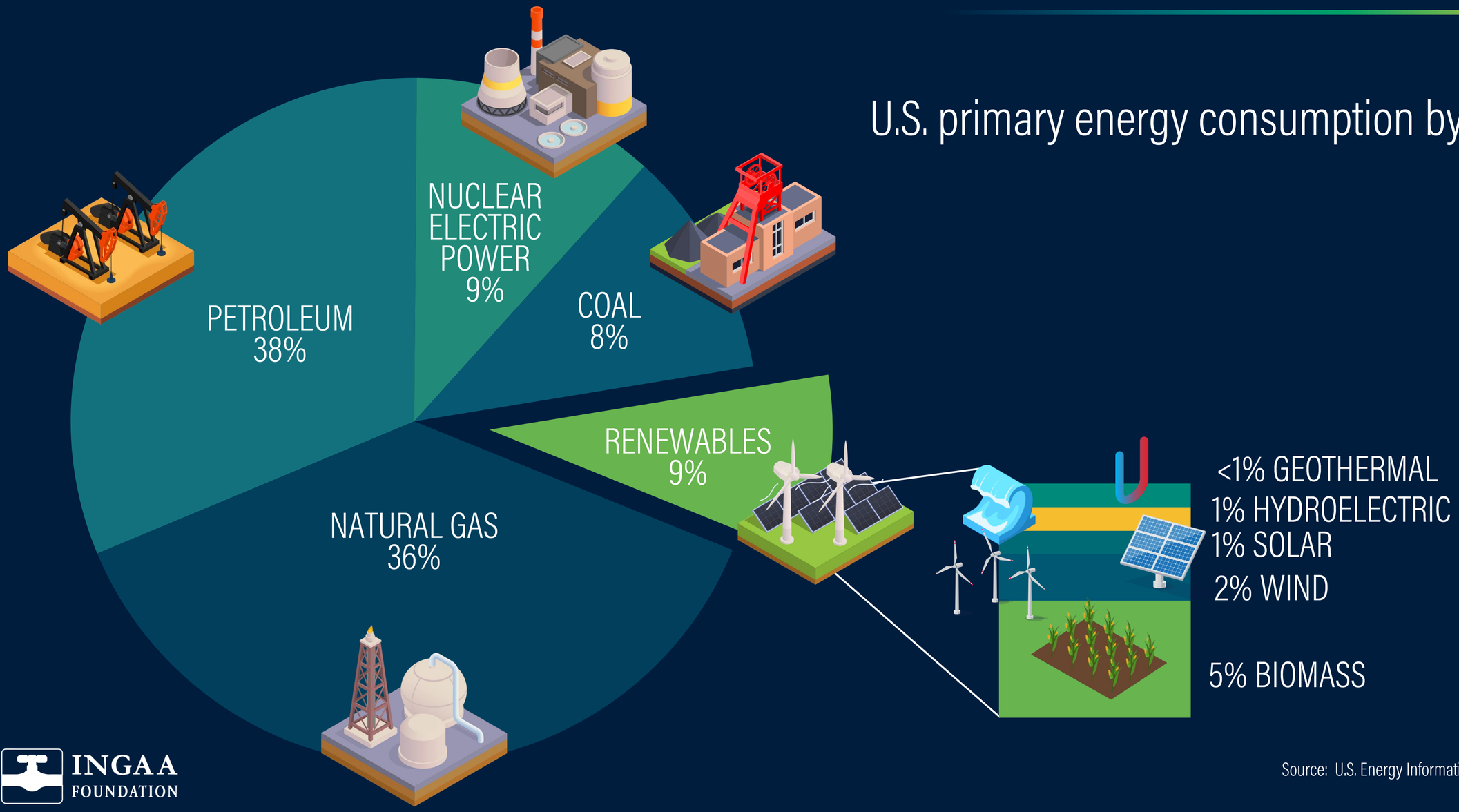
What sources do we use for energy?



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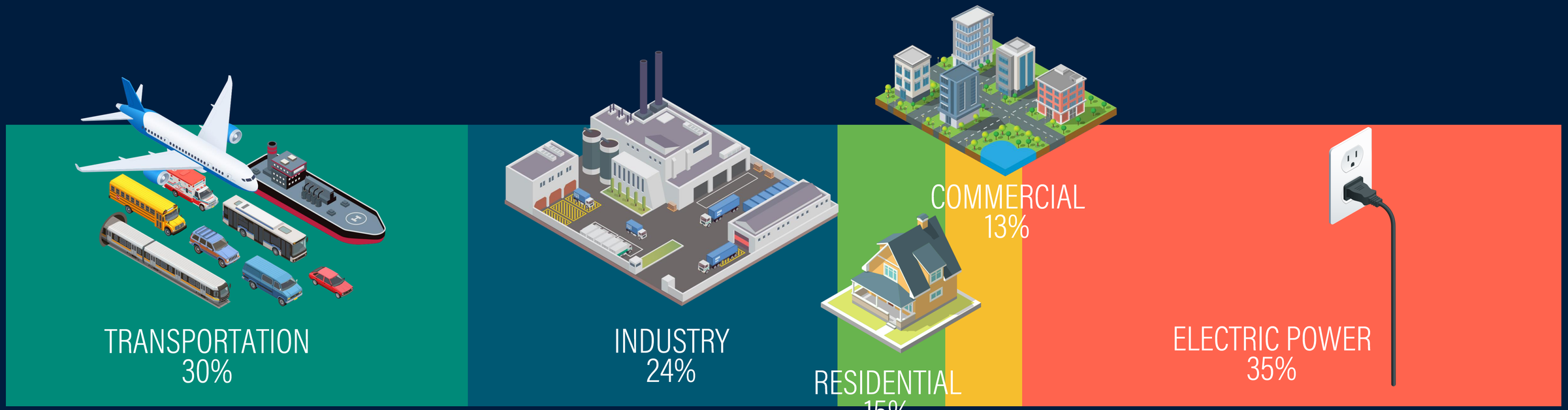
Source: U.S. Energy Information Administration (EIA), 2024

Who uses the energy?

All of these consumers rely on energy.



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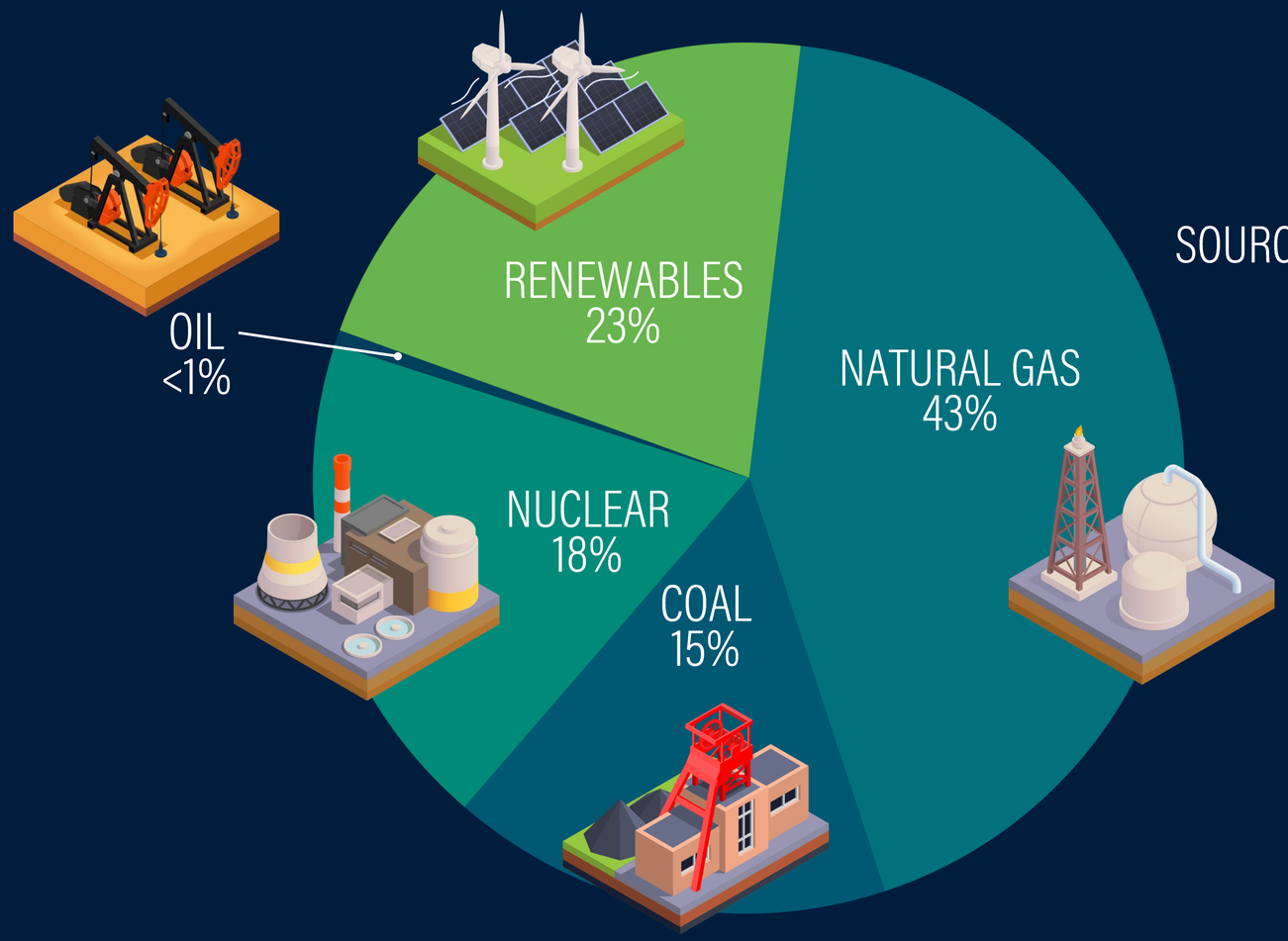
Source: U.S. Energy Information Administration (EIA)

America’s top source for electricity generation

Natural gas generates about 43% of American electricity.



SOURCES OF U.S. ELECTRICITY GENERATION

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Source: U.S. Energy Information Administration (EIA), 2024

Natural gas is important to our daily lives

Natural gas accounts for about **36%** of the energy used in the United States

Natural gas accounts for about **24%** of the world's total energy consumption

More than **60%** of U.S. homes use natural gas

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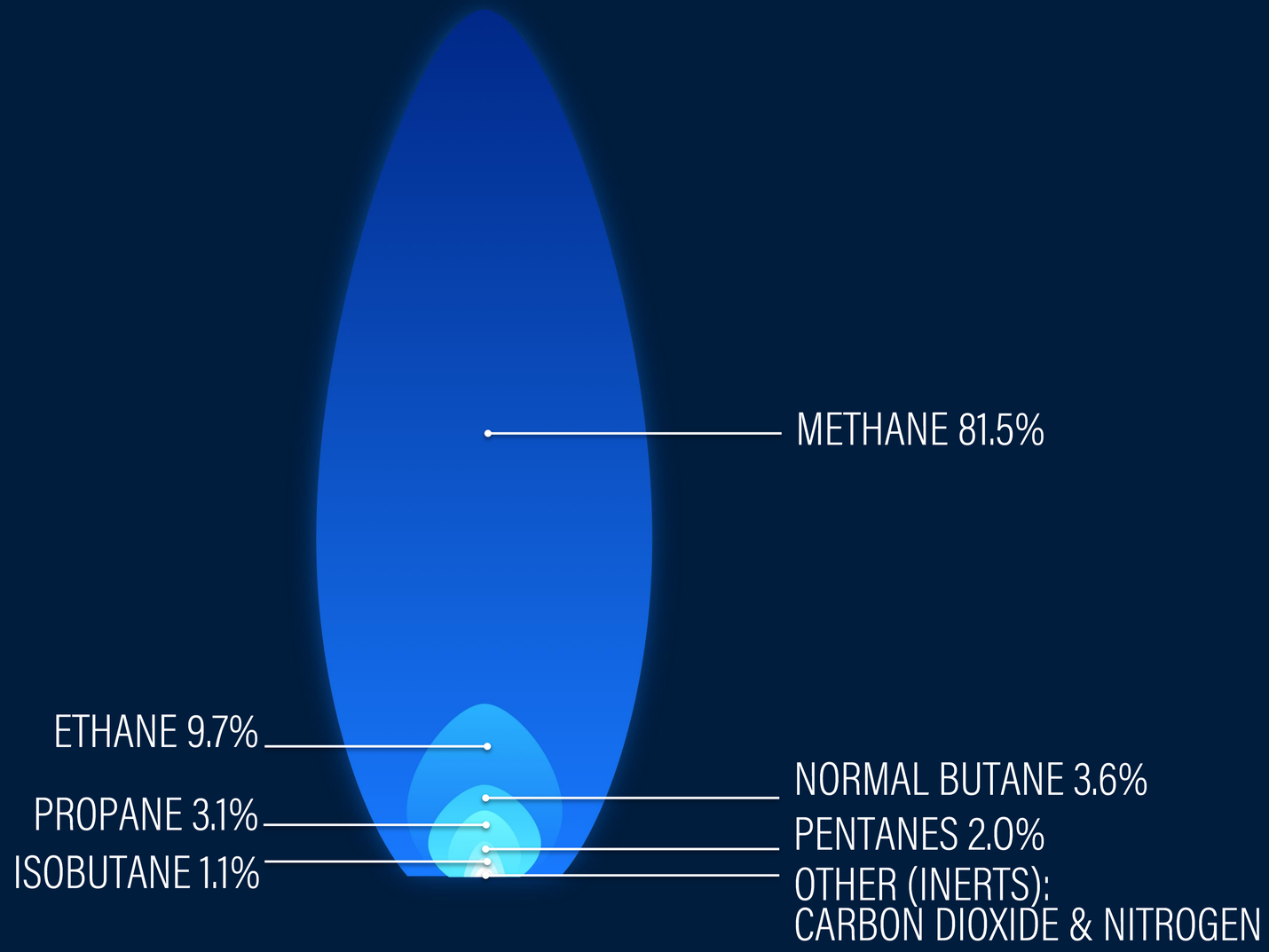
What exactly is natural gas?

Pipeline quality gas is natural gas that has been processed to remove impurities and contaminants, ensuring it meets specific standards for transportation through pipelines.



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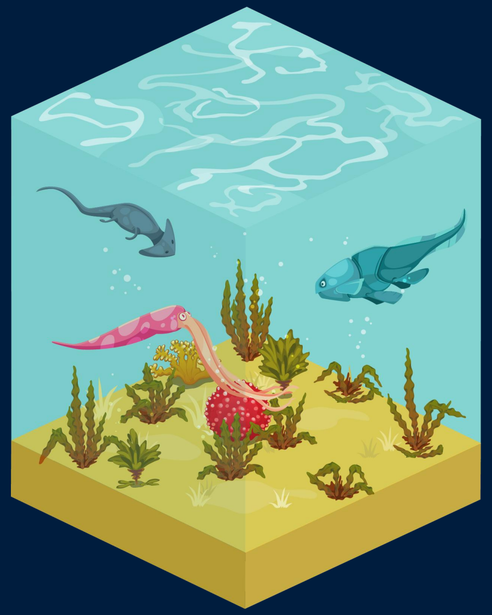
How is natural gas formed?

Natural gas is a fossil fuel.

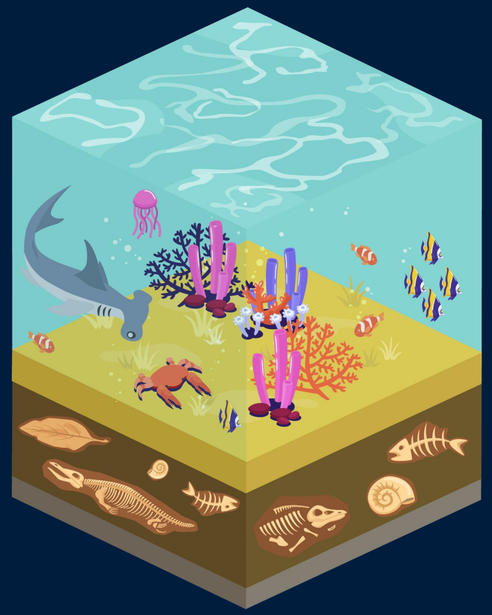
300-400 MILLION YEARS AGO



Ocean

Sand and Silt

50-100 MILLION YEARS AGO



Ocean

Sand and Silt

Plant and
Animal Remains

TODAY

Sand and Silt
Rock

Oil and Gas
Deposits

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Products made with natural gas

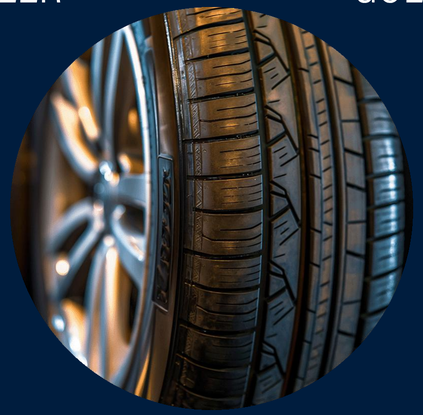
FERTILIZER

GOLF BALLS

MOBILE PHONES

PAINTBRUSHES

PHARMACEUTICALS



TIRES

TOOTHPASTE

WATER BOTTLES

RENEWABLES COMPONENTS

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Key benefits of natural gas

AFFORDABLE

ECONOMIC DRIVER

RELIABLE

NATIONAL SECURITY

VERSATILE

CLEANER-BURNING

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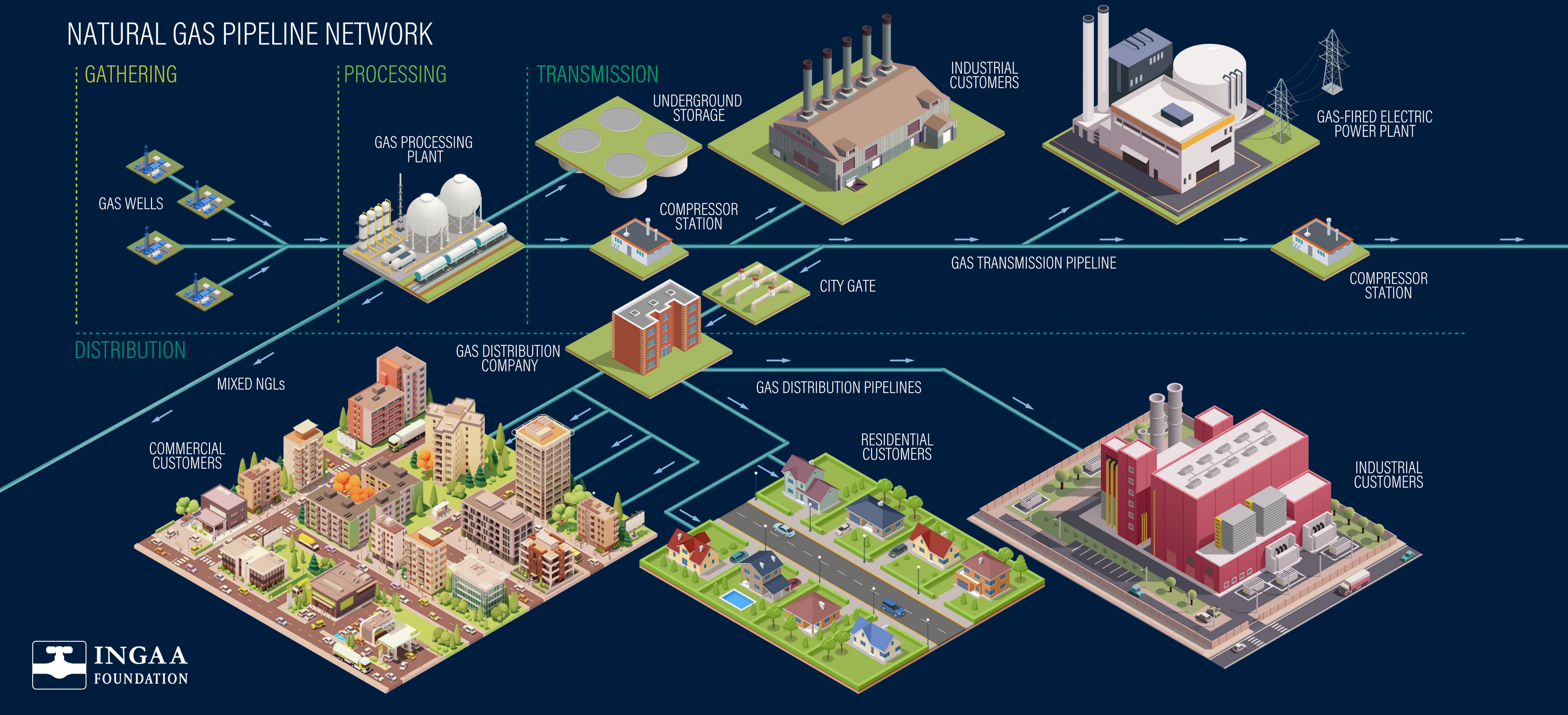
The journey of natural gas



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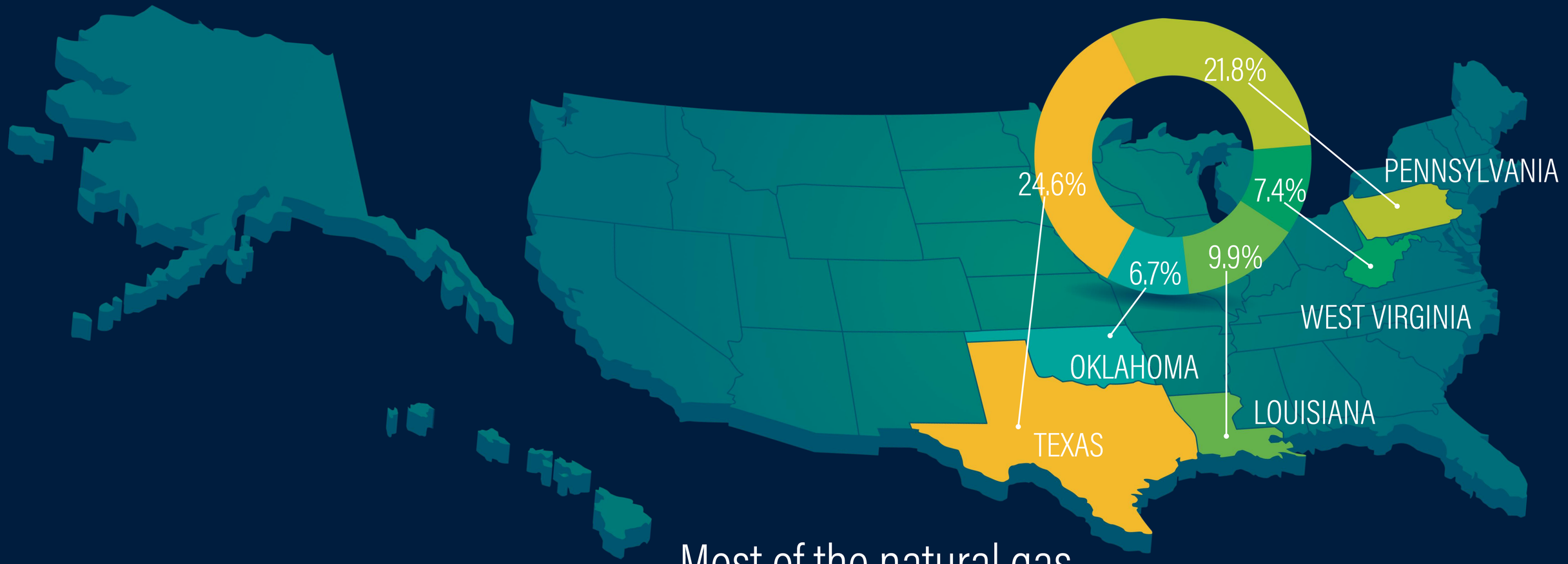
The world's largest producer of natural gas



Most of the natural gas
used in the U.S. is produced in the U.S.

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Natural gas pipelines in the U.S.

America's unseen energy highways.

There are 2.6 million
miles of natural gas pipelines in the U.S.

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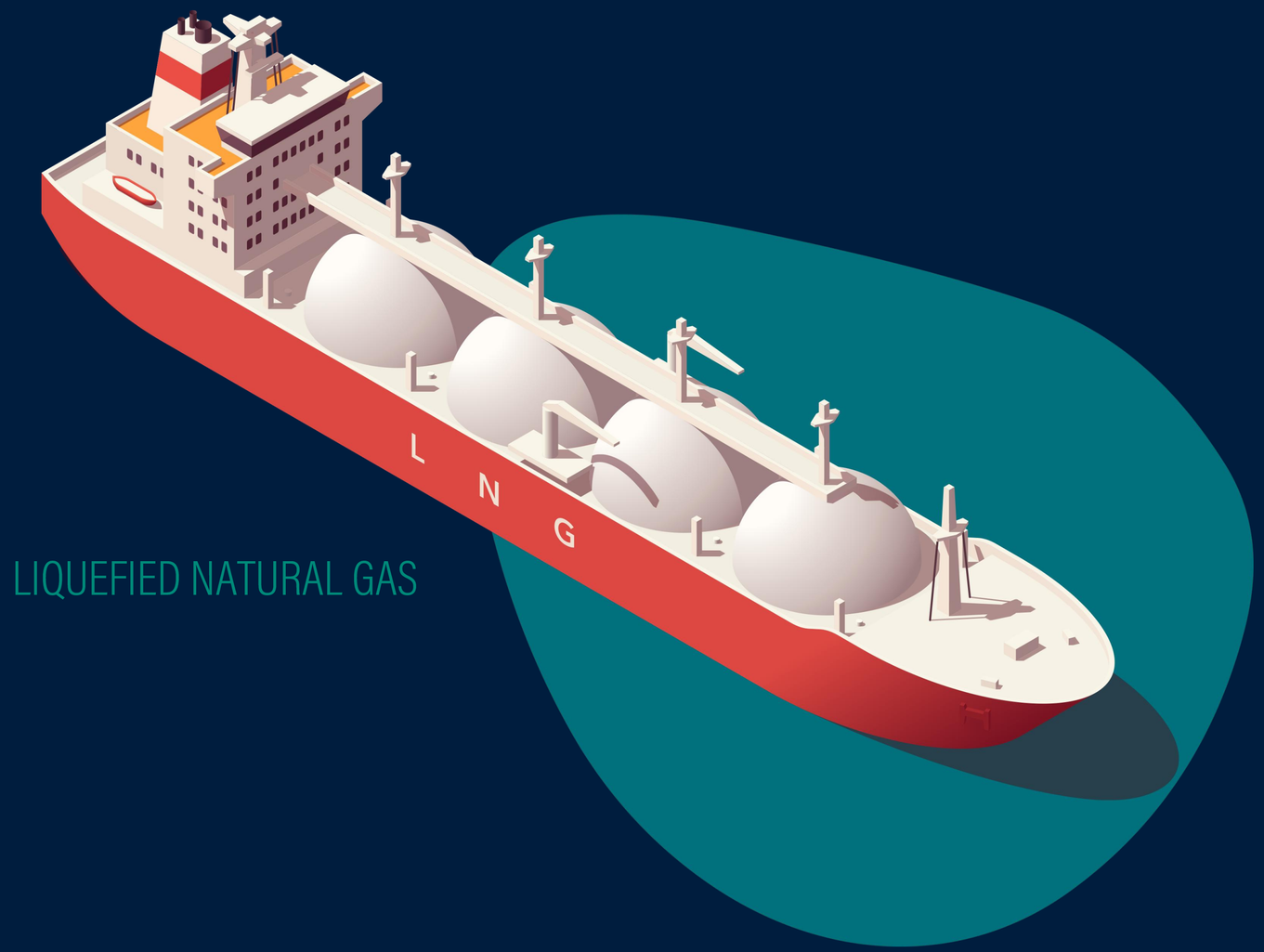
What's America's role with natural gas?

The United States is one of the top exporters of LNG in the world.



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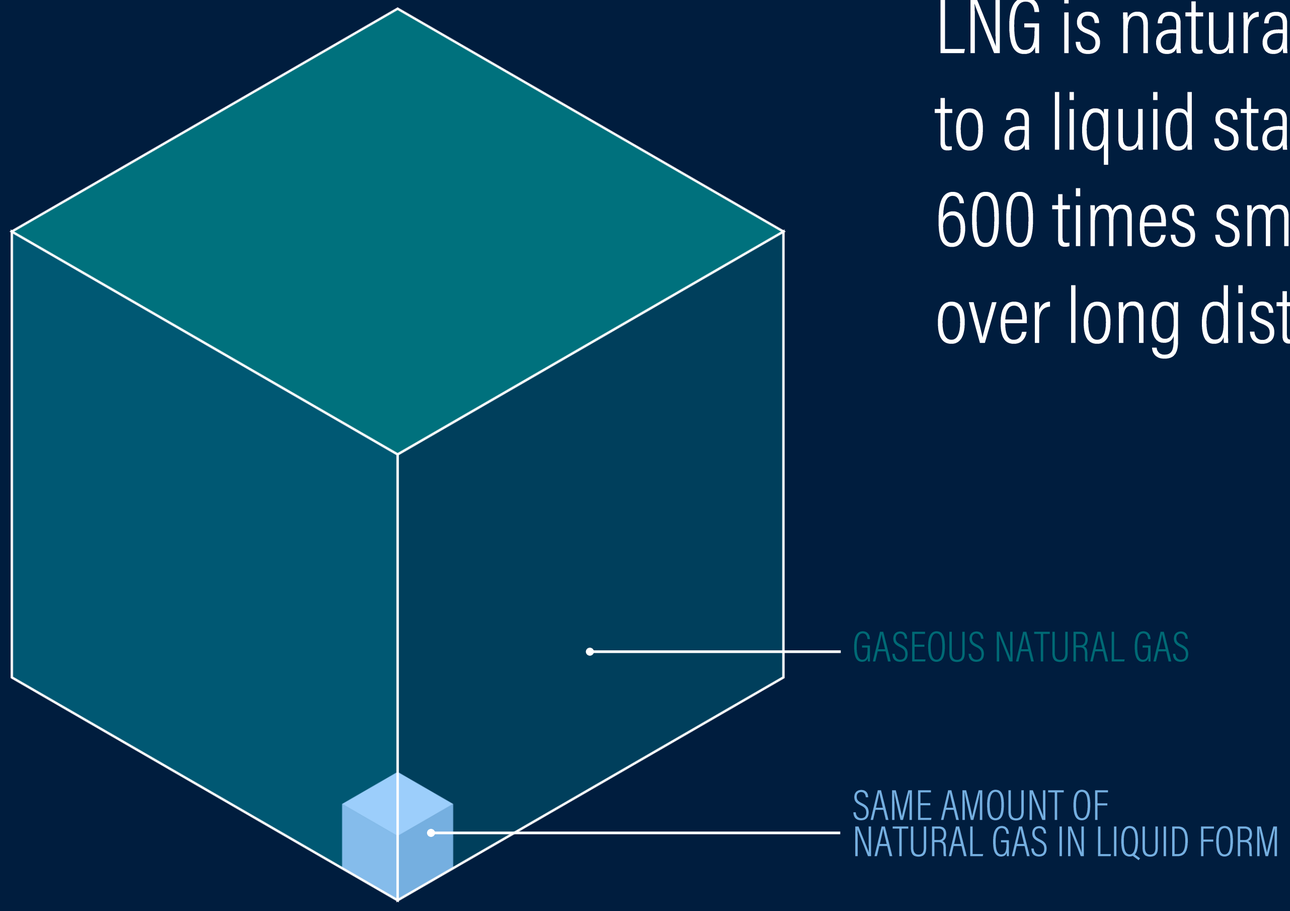
Why liquefy natural gas?



LNG is natural gas that has been cooled to a liquid state, making its volume about 600 times smaller and easier to transport over long distances.

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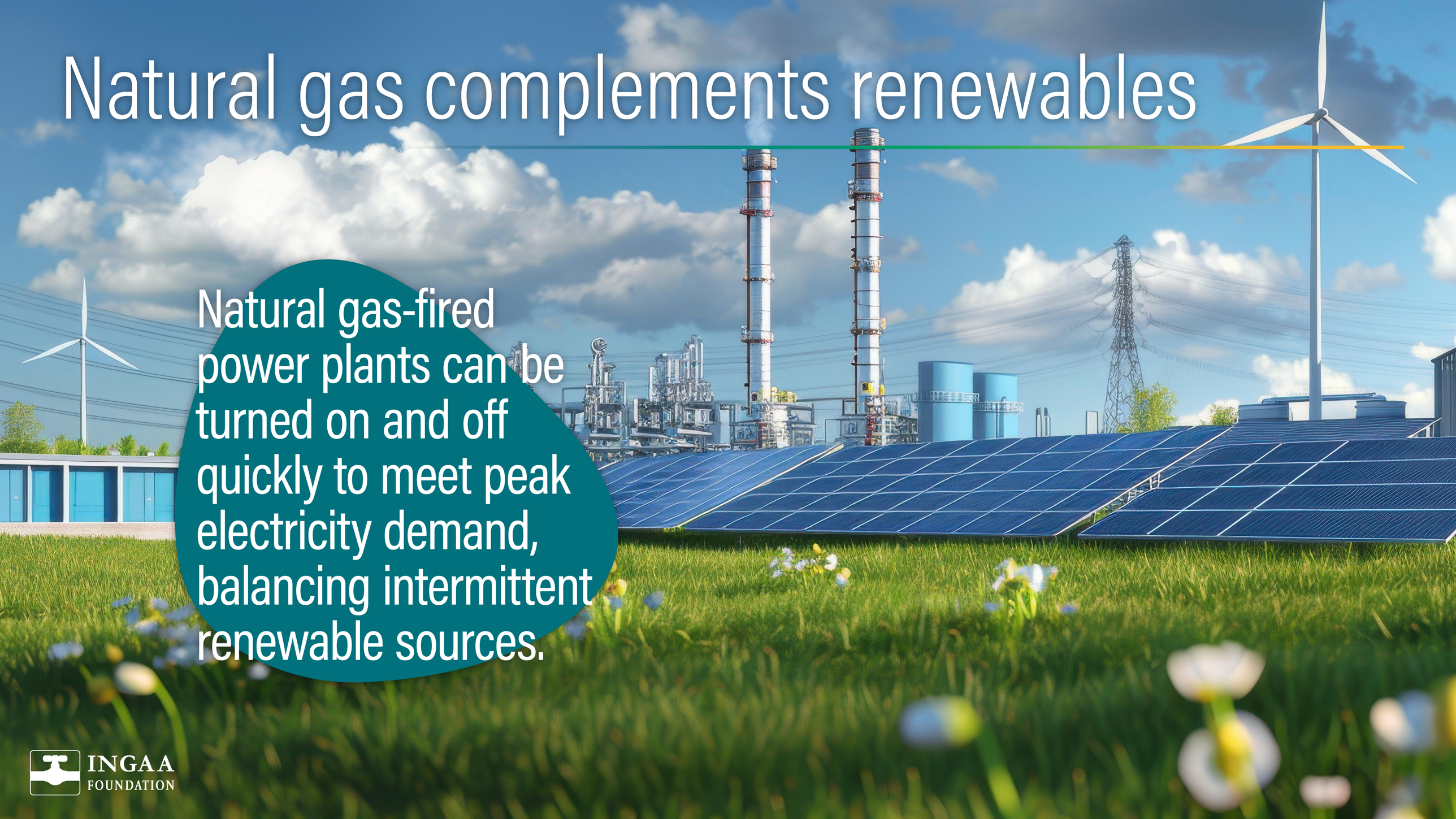
Natural gas complements renewables



Natural gas-fired power plants can be turned on and off quickly to meet peak electricity demand, balancing intermittent renewable sources.

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THE PATH TO A
CLEANER
ENERGY
FUTURE
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A partner in building a cleaner future

Natural gas will play a vital role in meeting energy demands, reducing emissions and supporting renewables.

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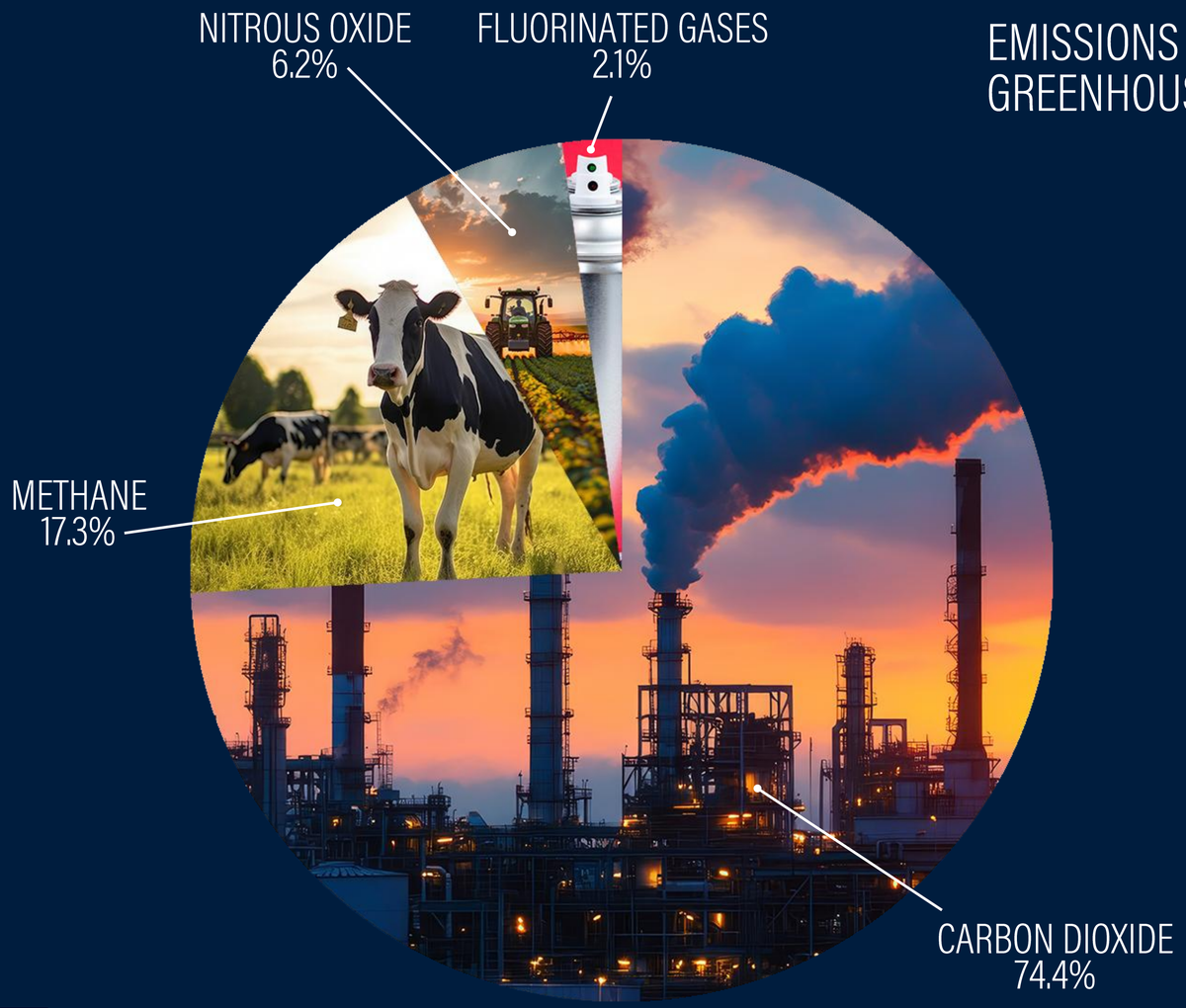
Current emissions challenges



EMISSIONS BY GREENHOUSE GAS

These greenhouse gases come from natural and human activities and contribute to warming of the Earth's atmosphere.

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Source: World Resource Institute

Industry solutions to reduce CO_2 emissions

Innovations align with the global push for decarbonization.

CARBON CAPTURE,
UTILIZATION AND STORAGE

RENEWABLE NATURAL GAS

HYDROGEN

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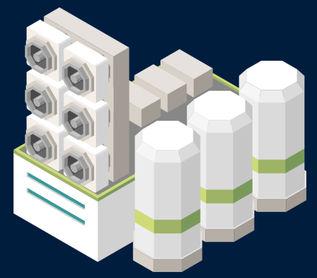
Carbon capture, utilization and storage

Technology can reduce the carbon footprint of natural gas.

Capture

POINT SOURCE CAPTURE



DIRECT AIR CAPTURE

Repurposing

FIZZY BEVERAGES

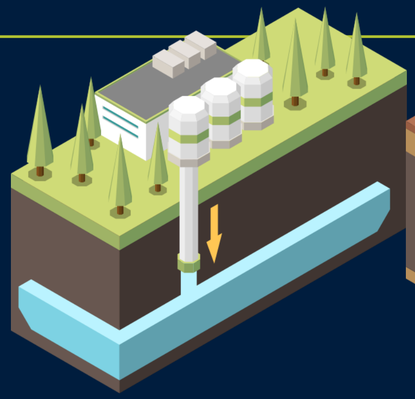
FUELS

FOODS

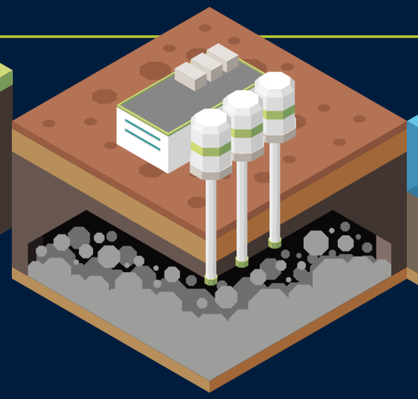
MEDICINE

BUILDING

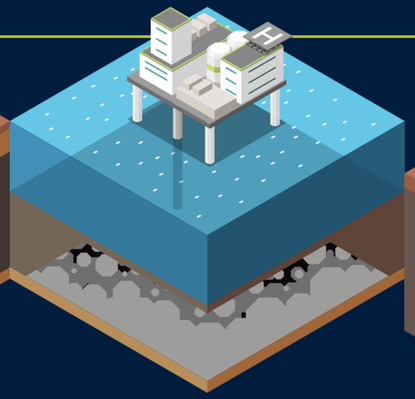
Storage



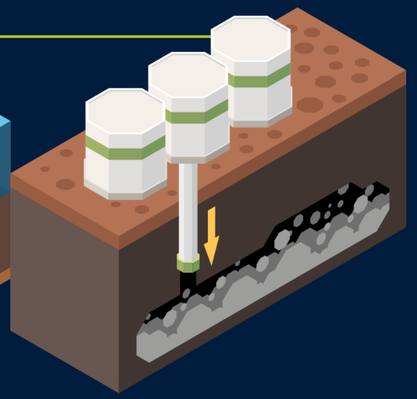
SALINE FORMATIONS



UNMINEABLE COAL SEAMS



ENHANCED OIL RECOVERY



DEPLETED OIL & GAS RESERVES

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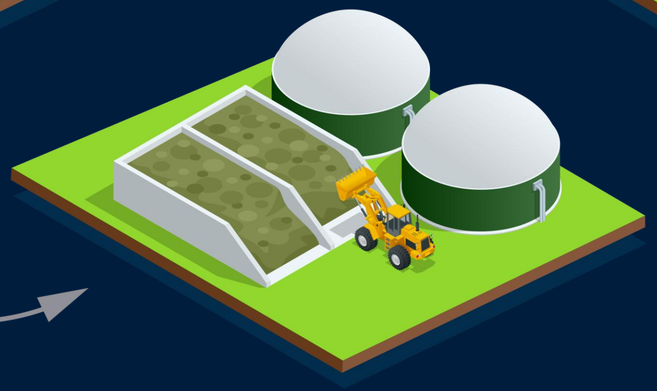
Source: Center for Climate and Energy Solutions

What is Renewable Natural Gas (RNG)?

RNG is chemically identical to natural gas but has a much lower carbon footprint.

1. Collect organic waste from various sources

2. Capture greenhouse gases from organic waste



3. Clean and condition biogas for use in existing infrastructure and appliances

4. Consume in homes, businesses and transportation

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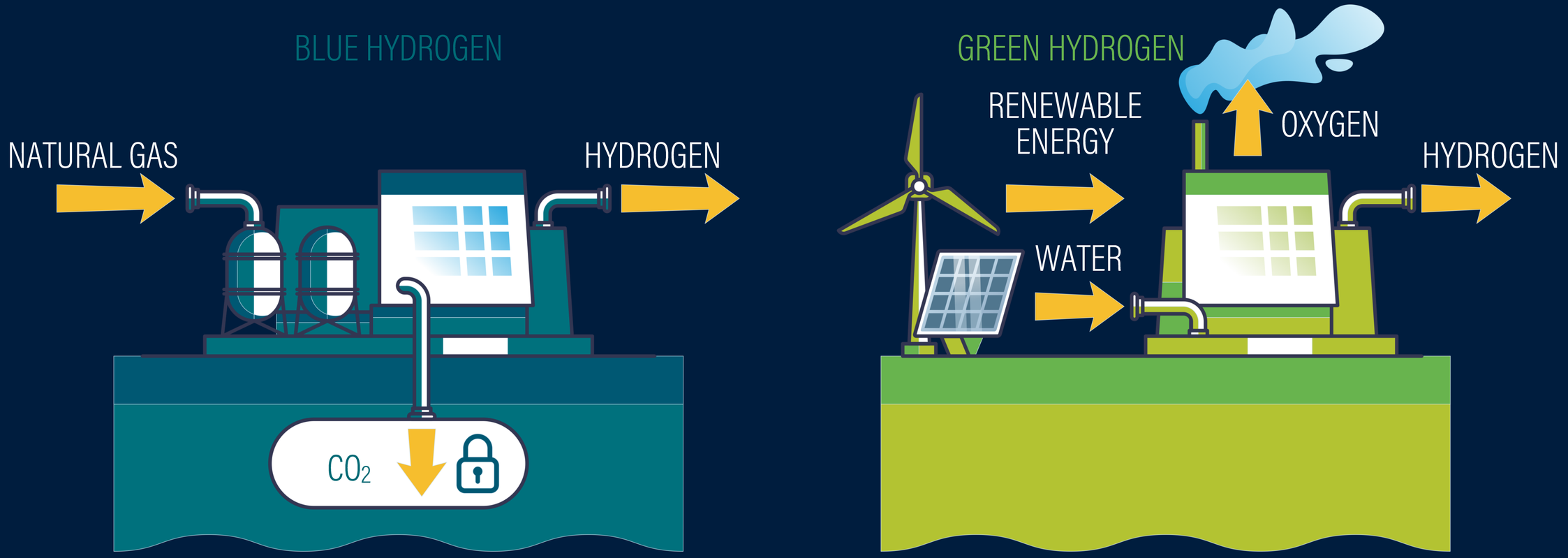
Source: The Coalition For Renewable Natural Gas

Hydrogen is a promising new fuel

When produced using natural gas, it's known as "blue hydrogen."



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HOW
PIPELINES
CONNECT US
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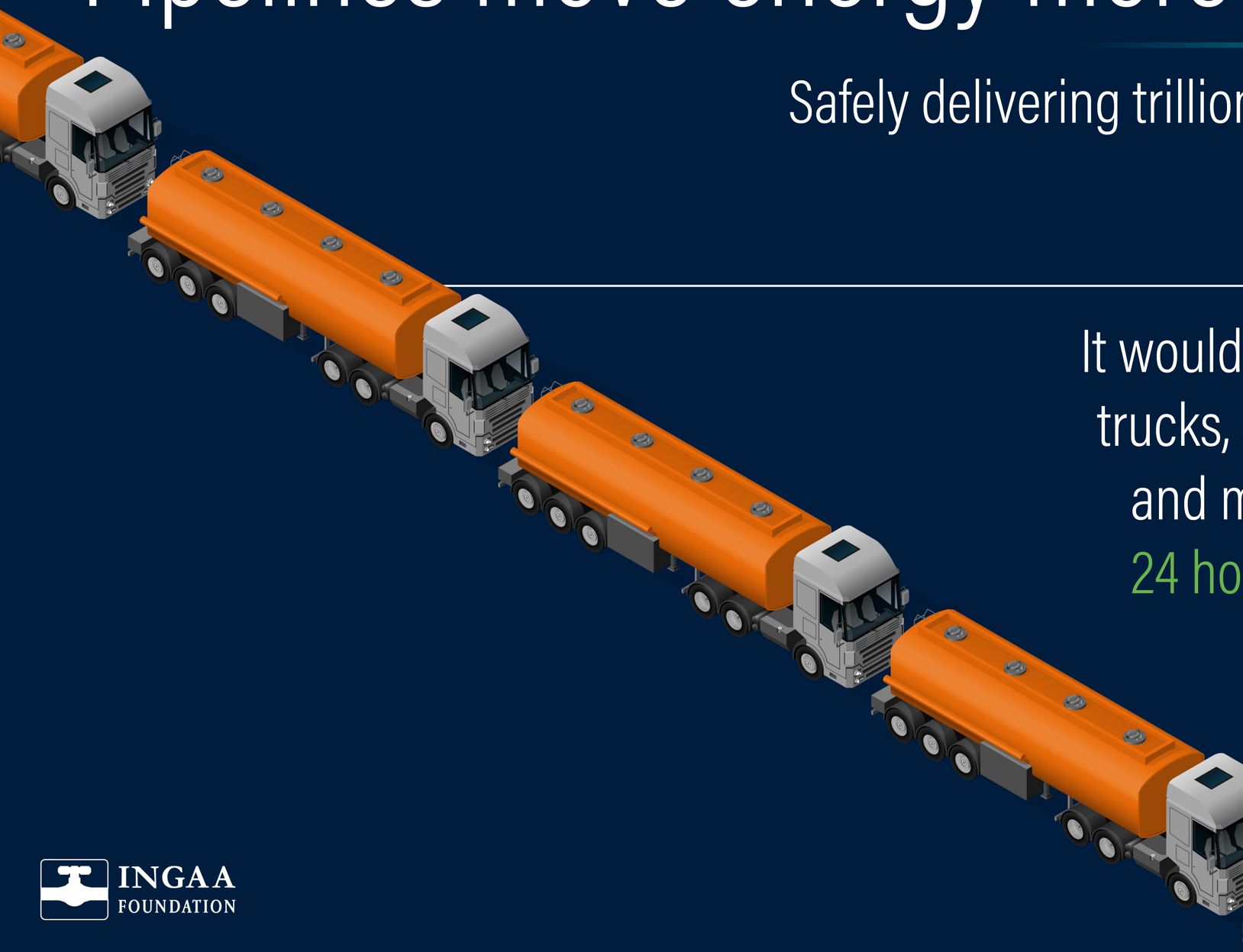
Pipelines move energy more efficiently

Safely delivering trillions of cubic feet of natural gas.



It would take a constant line of tanker trucks, about 750 per day, loading up and moving out every two minutes, 24 hours a day, seven days a week, to move the volume of even a modest pipeline.

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Deciding where a pipeline goes

Many factors determine the route of a pipeline.

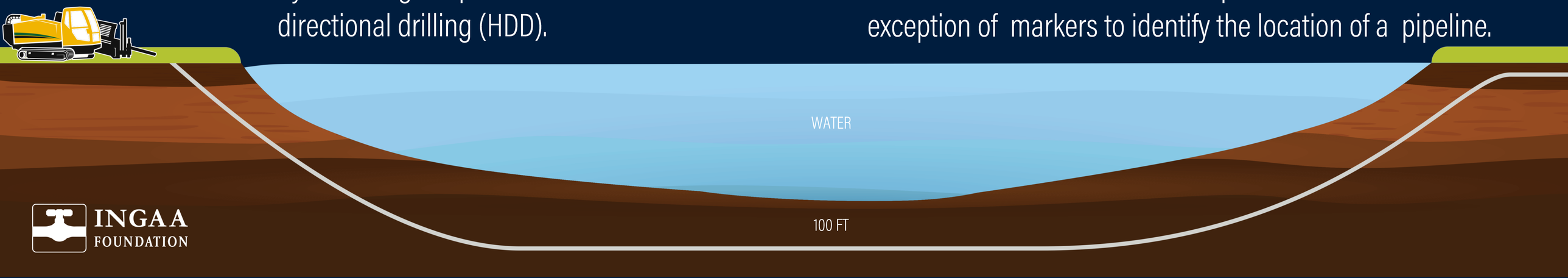
Engaging with and listening to community members.

Finding routes to avoid highly populated, environmentally sensitive or culturally significant areas.

Following existing routes when possible, to minimize environmental or community impacts.

Pipeline planners avoid impacting rivers or lakes by tunneling deep beneath them with horizontal directional drilling (HDD).

Land disturbance for pipeline construction is temporary. Crews work to restore land to its previous state with the exception of markers to identify the location of a pipeline.



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Pipelines are the safest way to deliver energy

Regulators and operators work together to keep pipelines safe.

Pipelines make up less than

.01%

of all transportation accidents in the U.S.

The steel used for pipelines must be certified and meet industry and federal government quality standards for toughness and strength.

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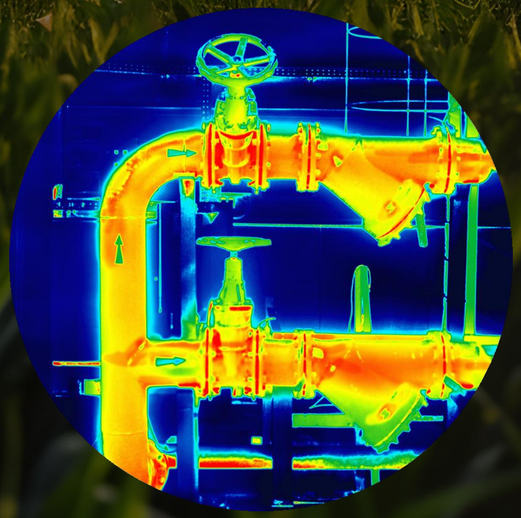
The technology that keeps pipelines safe

PIPELINE MONITORING TECHNOLOGIES

Real-time sensors, AI-powered diagnostics and drones ensure early detection of leaks, corrosion or other pipeline issues, long before they would become dangerous.



Technologies like infrared cameras and laser-based systems help detect leaks before they become hazardous.

In emergencies, automatic shut down systems can automatically and instantly stop gas flow to prevent accidents.

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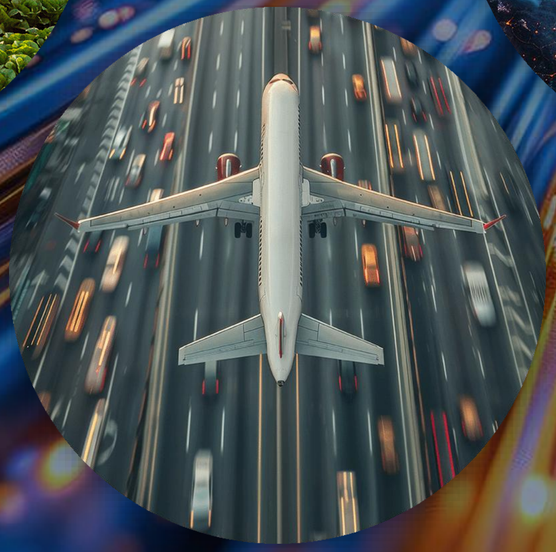
Pipelines benefit communities

POWERING
OUR LIVES

MANUFACTURING OUR PRODUCTS

SUPPORTING
OUR FARMS



GETTING US WHERE WE WANT TO GO

PROVIDING
ENERGY SECURITY

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New pipelines are needed

Low-carbon energy solutions depend on new pipeline networks.

Approximately
16k
miles of CO_2 transmission lines are needed by 2050

More than
50k
miles of CO_2 lateral lines could be needed by 2050

67k
miles of hydrogen transmission lines could be needed by 2050

500k
miles of hydrogen customer lateral lines could be needed by 2050

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SAFETY
IS OUR TOP
PRIORITY
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Industry safeguards help prevent accidents

Call 811, the national
call-before-you-dig hotline.

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Commitment to keeping workers safe

Wearable technology like smart helmets or vests can help fulfill a variety of safety functions:

TRACK WORKER LOCATIONS

MONITOR VITAL SIGNS IN HAZARDOUS OR REMOTE LOCATIONS

ALERT WORKERS TO POSSIBLE DANGERS

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ENERGY
CAREERS
FOR THE FUTURE
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Workers in energy

How many people work to ensure you have the energy you need?

8.1 million
Americans are employed in the energy sector

300k
energy sector jobs added in 2022

150k
increase in women working in energy in 2022

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Source: usafacts.org

Energy careers in natural gas

The natural gas industry offers a unique, rewarding pathway.

4 million
U.S. jobs are supported by this industry

1.9 million
projected job opportunities to be available by 2035

$50k
higher average pay than the national average

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Sources: empoweringamerica.org and api.org

Natural gas careers

Which career is not a part of the natural gas industry?

A. Land Surveyor
B. Engineer
C. Environmental Specialist
D. IT Analyst
E. Construction Professional

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STEM careers in natural gas

For those interested in pursuing a college degree in STEM-related fields.

ENGINEER

Salary range:
$78K-$130K*

ENVIRONMENTAL SPECIALIST

Salary range:
$79K-$133K

CAD (COMPUTER-AIDED DESIGN) TECHNICIAN

Salary range:
$63K-$98K

GIS (GEOGRAPHIC INFORMATION SYSTEMS) ANALYST

Salary range:
$66K-$83K

PROJECT MANAGER

Salary range:
$89K-$172K

IT ANALYST / INFORMATION SECURITY ANALYST

Salary range:
$120K-$182K

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*These salaries reflect a range of median salaries for various types of engineers within this industry.

Career opportunities with no prior experience

For those interested in heading directly into the workforce after high school.

PIPELINE CONTROLLER

Salary range:
$42-$57 per hour

LAND SURVEYOR

Salary range:
Field Surveyor
$22 -$45 per hour

Salary range:
Office Surveyor
$30-$50 per hour

NATURAL GAS TECHNICIAN

Salary range:
$24-$50 per hour

INSPECTOR

Salary range:
$22-$35 per hour

CONSTRUCTION PROFESSIONAL

Salary range:
$16-$43 per hour*

WELDER

Salary range:
$24-$35 per hour

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*These salaries reflect a range of median salaries for various types of construction professionals within this industry.

The benefits of a career in natural gas

- Competitive pay
- Long, stable career
- Opportunities for travel
- Comprehensive healthcare coverage
- Excellent commitment to safety
- Meaningful and important work
- Diversity, equity and inclusion
- Career growth and advancement opportunities
- Variety of career pathways

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New pipelines create new jobs

Pipelines create hundreds of thousands of good-paying jobs across the U.S.

A single major pipeline project can create:

42,000
jobs paying more than

$2 billion
in salaries for workers and their families

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Thank You

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