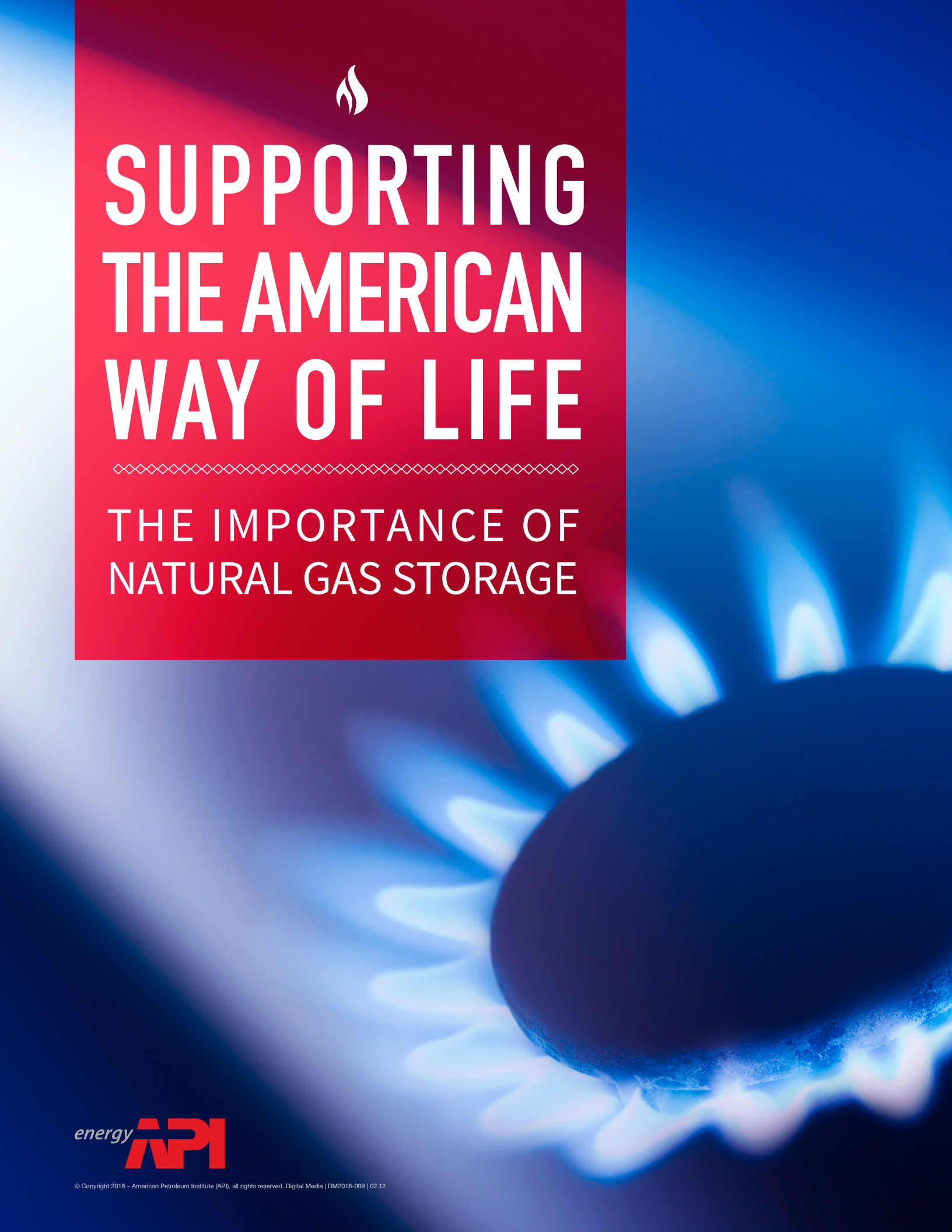


SUPPORTING THE AMERICAN WAY OF LIFE

THE IMPORTANCE OF NATURAL GAS STORAGE

energy API

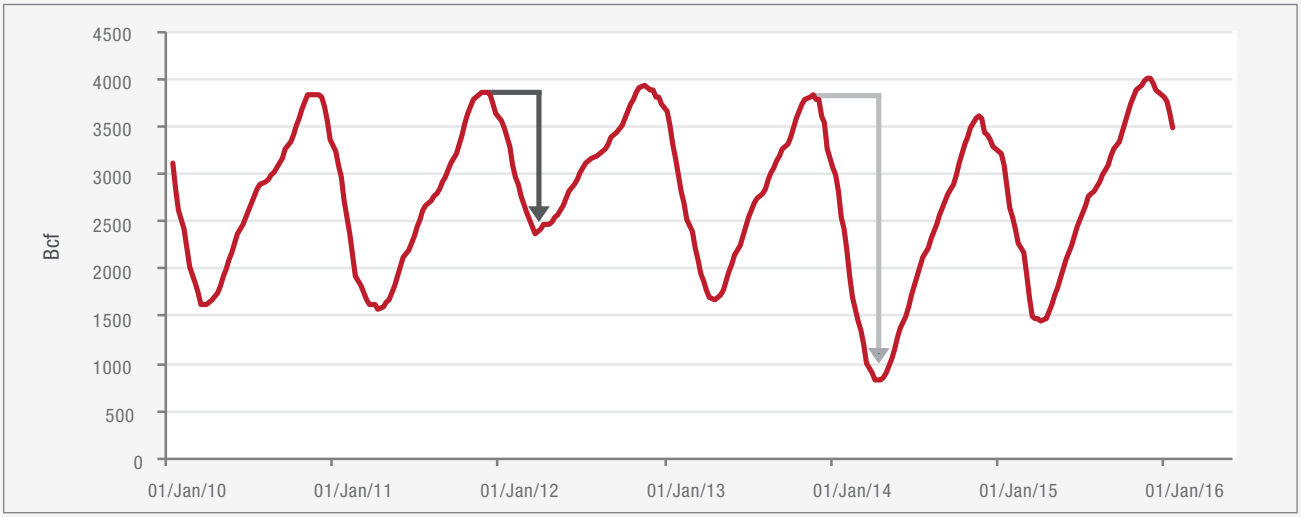
NATURAL GAS STORAGE ENSURES RELIABLE AND RESPONSIVE DELIVERY

Natural gas is used for many purposes, including cooking food, fueling buses, trucks and cars, generating electricity, and as a raw material for products such as fertilizer and plastics. One of the most important uses of natural gas is to heat buildings and homes. About half of all U.S. homes use natural gas as their main heating source.[1]

This use results in significant seasonal variations in which natural gas consumption is highest during the winter time and lowest during mild-weather months. Natural gas storage enables supply to match demand on any given day throughout the year.

Natural Gas Working Storage Levels

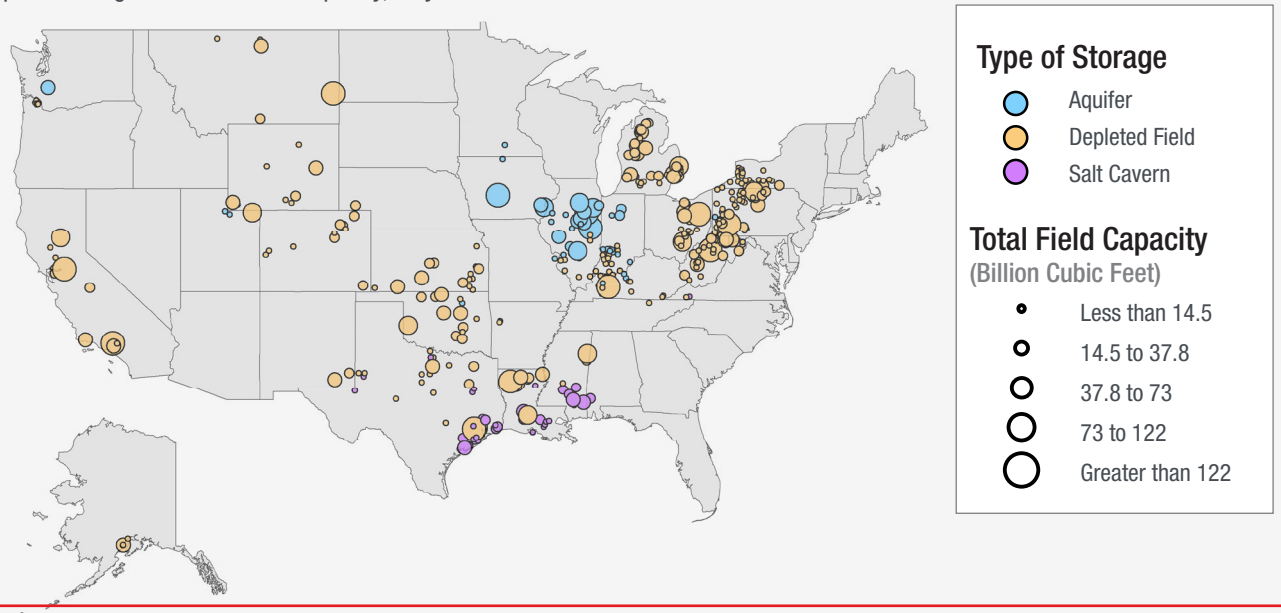
Energy Information Administration, "Weekly Natural Gas Storage Report, History," January 8, 2016.



The chart above shows how storage fluctuates with the weather. During the mild winter of 2012, the gas withdrawn from storage was far more moderate (see black arrow). In contrast, in 2014, the year of the Polar Vortex, natural gas storage was "drawn down" sharply (see grey arrow). But even in the mildest of winters, such as 2012, natural gas withdrawals from storage were vital to meeting winter natural gas demand.

Where Natural Gas Underground Storage Fields are Located

Type of Storage and Total Field Capacity, July 2014



[1] Energy Information Administration, "Natural Gas Explained, Use of Natural Gas," accessed January 15, 2016, http://www.eia.gov/energyexplained/index.cfm?page=natural_gas_use

NOTE: that the map includes both active and inactive fields.

SOURCE: EIA Energy Mapping System; EIA-191 Monthly Underground Gas Storage Report July 2014.

WHERE NATURAL GAS STORAGE IS LOCATED

How is Natural Gas Stored?

Natural gas is stored underground primarily in three reservoir types: depleted oil and gas fields, depleted aquifers, and in salt beds and salt caverns. Natural gas may also be stored above ground in refrigerated tanks, as liquefied natural gas (LNG).

There are approximately 400 active underground storage facilities in 30 states.

Depleted Natural Gas or Oil Fields

Of the approximately 400 active underground storage facilities in the U.S., about 79 percent are depleted natural gas or oil fields. Conversion of an oil or gas field from production to storage takes advantage of existing wells, gathering systems, and pipeline connections. Depleted oil and gas reservoirs are the most commonly used underground storage sites because of their wide availability

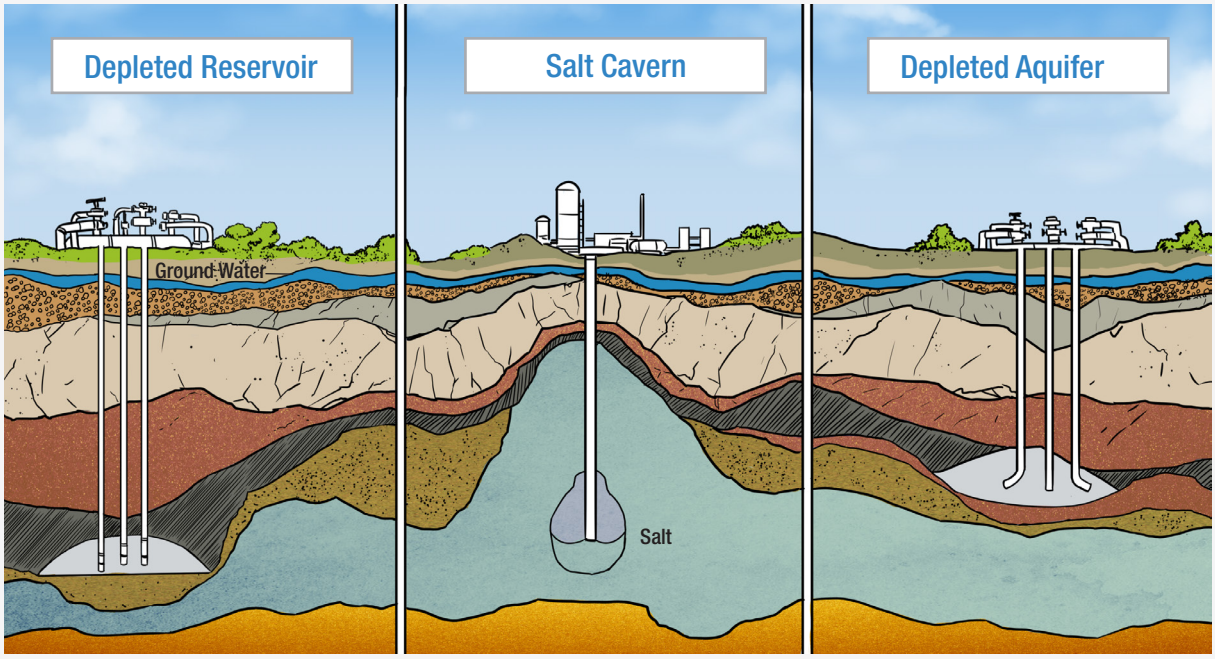
Salt Formations

Salt formation storage facilities (also known as salt caverns or salt beds) make up about 10 percent of all facilities. These subsurface salt formations are primarily located in the Gulf Coast states. Salt formations provide very high withdrawal and injection rates.

Depleted Aquifers

Depleted natural aquifers, which may have similar geology to depleted oil and gas fields, can be converted to gas storage reservoirs and make up about 10 percent of storage facilities.

Type of Natural Gas Underground Storage



SAFETY IN UNDERGROUND STORAGE OF NATURAL GAS



Underground natural gas storage operators are committed to ensuring the safety and integrity of their facilities. The industry's construction, operation and integrity management protocols are overseen by multiple agencies at the state and federal level with jurisdiction over underground storage facilities:

- The Federal Energy Regulatory Commission (FERC) regulates projects connected to interstate pipeline systems. FERC is responsible for authorizing the construction or expansion of storage facilities and the terms and conditions of service (i.e., open access) and the rates charged by these providers.
- The Pipeline and Hazardous Materials Safety Administration (PHMSA) is authorized to regulate the safety of natural gas transportation and storage.
- Intrastate storage may fall under the regulatory authority of various state government entities depending upon the state. For example, underground storage in Texas is under the authority of the TX Railroad Commission – Oil & Gas Division. Often state utility commissions as well as state environmental or natural resource agencies set the rules governing intrastate underground storage.

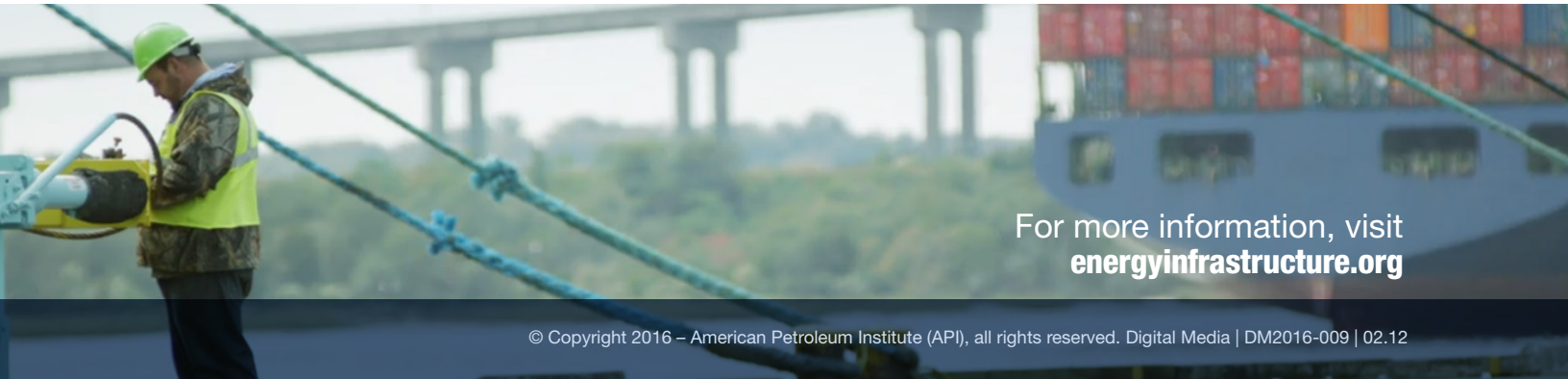
Beyond federal and state regulation, industry has taken the initiative to work with external stakeholders to develop two recommended practices (RPs)—accredited by the American National Standards Institute—for underground storage. RP 1170 and 1171 provide guidance to operators on how to design, and operate, and ensure the integrity of underground storage for natural gas.

Underground Storage by the Numbers

- Approximately 400 active storage facilities in 30 states
- Approximately 20 % of all natural gas consumed during the winter is supplied by underground storage
- Depleted natural gas or oil fields (80%), depleted aquifers (10%) and salt caverns (10%) represent storage
- Underground storage capacity increased 18.2% between 2002 and 2014
- Approximately 4 trillion cubic feet of natural gas can be stored

AGA INGAA

American Gas Association



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