Underground Natural Gas Working Storage Capacity, With Data for November 2024

May 2025

Independent Statistics and Analysis
U.S. Energy Information Administration

www.eia.gov
U.S. Department of Energy
Washington, DC 20585

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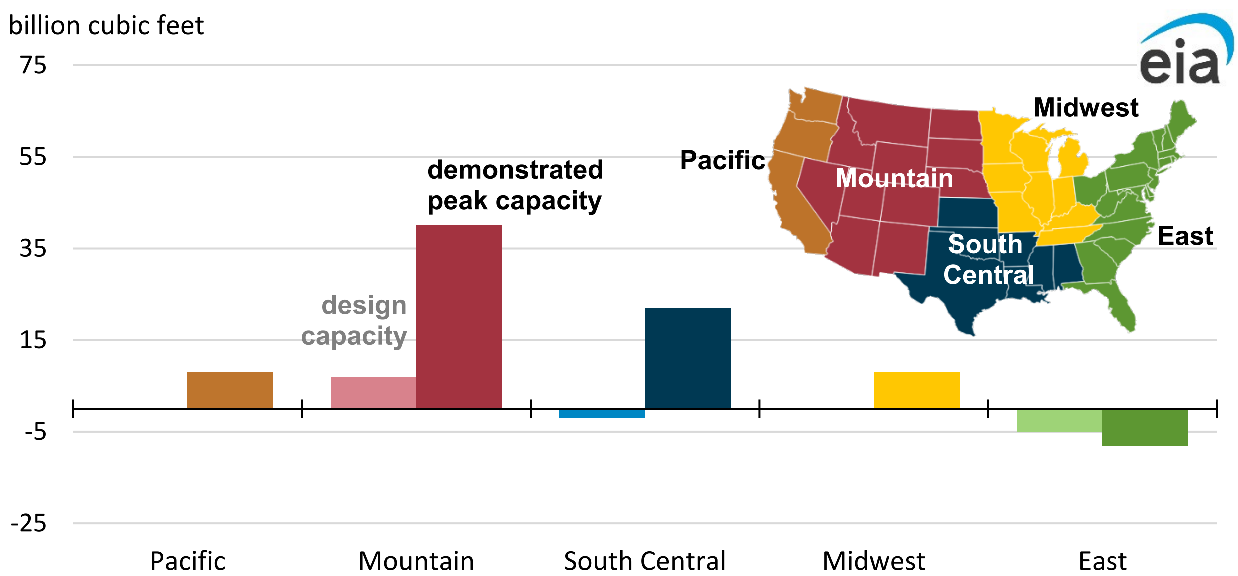
Overview

Underground working natural gas storage capacity in the Lower 48 states increased in 2024. We use two metrics to assess working natural gas storage capacity. The first metric—demonstrated peak capacity—rose 1.7%, or 71 billion cubic feet, (Bcf) in 2024, reflecting increased use of natural gas storage due to market conditions. The second metric—working gas design capacity—rose 0.1%, or 3 Bcf, in 2024. Underground natural gas storage capacity continues to play an important role in balancing energy needs in the United States, regardless of how it is measured.

Figure 1. Changes in natural gas storage capacity by storage region (2023–24)



Data source: U.S. Energy Information Administration, Form EIA-191, *Monthly Underground Natural Gas Storage Report*
Note: Measures of capacity reflect final revised values as published in the *Underground Natural Gas Storage Capacity Report*.

Measures of Working Natural Gas Capacity

Demonstrated peak capacity

Demonstrated peak capacity, or total maximum demonstrated working natural gas capacity, represents the sum of the largest volume of working natural gas reported for each individual storage field during the most recent five-year period, regardless of when the individual peaks occurred. This report considers demonstrated peaks from December 2019 through November 2024. Demonstrated peak capacity is based on survey data from Form EIA-191, *Monthly Underground Natural Gas Storage Report*, and is typically less than design capacity because it relates to actual usage rather than potential capacity based on the design of the facility. Several factors can influence changes in demonstrated peak capacity over time, including:

- New capacity additions
- Existing storage field abandonments

- Commercial and regulatory decisions about storage fields
- Shifts in regional fuel use due to electricity market changes
- Significant departures from normal temperatures for extended periods
- Changes in infrastructure

Table 1. Estimates of demonstrated peak and design capacity of underground working natural gas storage, November 2024

	Demonstrated peak capacity[a] [billion cubic feet (Bcf)]			Design capacity[b] (Bcf)			Demonstrated peak capacity share of design capacity[c] (percentage used)	
Region	(Dec 2018–Nov 2023)	(Dec 2019–Nov 2024)	Percentage change	Nov-23	Nov-24	Percentage change	Nov-23	Nov-24
East	991	983	-0.8%	1,048	1,043	-0.4%	95%	94%
Midwest	1,173	1,181	0.7%	1,221	1,221	0.0%	96%	97%
Mountain	266	306	15.1%	472	479	1.7%	56%	64%
Pacific[d]	360	368	2.0%	369	369	0.2%	98%	100%
South Central	1,417 R	1,439	1.6%	1,560 R	1,558	-0.1%	91%	92%
Nonsalt	1,003	1,012	0.9%	1,076	1,088	1.1%	93%	93%
Salt	414 R	427	3.2%	484 R	471	-2.7%	85%	91%
Lower 48	4,206 R	4,277	1.7%	4,668 R	4,671	0.1%	90%	92%

Data source: U.S. Energy Information Administration, *Monthly Underground Natural Gas Storage Report*
Note: Design capacity information for all underground storage facilities, including inactive fields, is available in the *Natural Gas Annual Respondent Query System*. Totals and calculations may not equal the sum of the components because of independent rounding. Information about storage regions is available in *The Basics of Underground Natural Gas Storage*. Mentions of specific companies in this report include only information that is publicly available on our website or in the Federal Energy Regulatory Commission (FERC) dockets.

[a] Demonstrated peak capacity, otherwise known as the maximum demonstrated working natural gas volume, is the sum of the highest storage inventory levels of working natural gas observed in each distinct storage reservoir during the previous five-year period as reported by the operator on Form EIA-191, *Monthly Underground Natural Gas Storage Report*. The timing of the peaks for different facilities do not need to coincide. Inactive fields are not included in estimates of working natural gas capacity.

[b] Design capacity is an estimate of a natural gas facility's physical working natural gas capacity as reported by the operator on Form EIA-191, *Monthly Underground Natural Gas Storage Report*. It represents the sum of all fields' capacities at a point in time. Design capacity is a measure based on the physical characteristics of the reservoir, installed equipment, and operating procedures particular to the site, which are often certified by federal or state regulators. Inactive fields are not included in estimates of working natural gas capacity.

[c] Demonstrated peak capacity in some cases exceeds 100% of design capacity because design capacity limits may differ from actual capacity limits in storage fields, as determined by the facility operator and local regulations.

[d] The design capacity of Southern California Gas Company's Aliso Canyon field was included in this report and in the Pacific region totals as 86.2 billion cubic feet, as publicly reported on Form EIA-191. The authorized working natural gas capacity of this facility may be lower because of ongoing operational constraints.

Design capacity

Design capacity, sometimes referred to as *nameplate capacity*, is based on the physical characteristics of the reservoir, installed equipment, and operating procedures on the site, which often must be certified by federal or state regulators. We calculate total design capacity as the sum of the reported working natural gas capacities of the 387 active storage fields in the Lower 48 states as reported on Form EIA-191, *Monthly Underground Natural Gas Storage Report,* as of November 2024. This total excludes 27 inactive fields. The design capacity metric represents a theoretical limit on the total amount of natural gas that can be stored underground and withdrawn for use.

Increases in Demonstrated Peak Capacity

Demonstrated peak capacity increased in four of five of the storage regions EIA collects data from. Demonstrated peak capacity for the Lower 48 states climbed 1.7% (71 Bcf) during the November 2024 report period, which ran from December 2019 through November 2024, compared with the November 2023 report period, which ran from December 2018 through November 2023 (Table 1).

Demonstrated working natural gas capacity in the Lower 48 states increased for the second year in a row. This year's growth in peak demonstrated capacity was due mostly to continued increasing utilization of natural gas storage facilities. Another factor was a material change in California's natural gas regulation to help ensure energy market reliability ahead of the winter of 2023–24.

The recent increases in demonstrated peak natural gas storage capacity in the United States followed a period of declining capacity since reaching its highest level on record, 4,362 Bcf, in 2016. Declines in demonstrated peak capacity were the result of less use of existing natural gas storage fields and less investment in new storage fields and expansions. The largest decreases during this period occurred in the Pacific region, accounting for nearly 33% (70 Bcf) of the reduction in demonstrated peak capacity in the Lower 48 states. In the aftermath of the natural gas leak in 2015, the natural gas facility at Aliso Canyon has operated with reduced effective capacity since the California Public Utilities Commission (CPUC) granted conditional approval for limited natural gas injections at the facility.

These restrictions were eased somewhat in 2023, when the CPUC voted to increase the regulatory cap on the Aliso Canyon natural gas storage facility. The CPUC authorized increasing the working gas capacity at Aliso Canyon in late August 2024 by 67% to 68.6 Bcf. In the wake of the regulatory change, net injections of natural gas into Aliso Canyon rose, increasing working gas stored in the Pacific region and in maximum demonstrated capacity.

The largest increases in demonstrated working gas capacity in 2024 occurred in the Mountain region where colder-than-normal temperatures during the 2023–24 winter recently demonstrated the need for more working gas in storage to meet winter demand. Increased demonstrated peak capacity in the region reflected more use of existing facilities as well as expansions to existing facilities.

Increases in Design Capacity

Overall natural gas storage design capacity increased slightly in 2024. Mountain region capacity additions exceeded capacity declines in the East and South Central regions. Design capacity of underground natural gas storage facilities in the Lower 48 states were essentially unchanged, rising by 3 Bcf in November 2024 compared with the previous year-over-year change.

Working gas design capacity increased 7 Bcf in the Mountain region, offsetting declines elsewhere in the Lower 48 states. Working gas design capacity declined 5 Bcf in the East region primarily due to base gas adjustments in the region. Decreases in the South Central region totaled 2 Bcf; expansions to nonsalt facilities totaled 12 Bcf and salt facilities decreased 13 Bcf. Working gas design capacity in the Pacific and Midwest regions remained unchanged from the previous year. Highlights from specific projects include:

- The Columbia Gas Transmission system (Columbia) continued its base gas restoration program in 2024, decreasing working gas capacity in the East region by 5 Bcf. Purchases of natural gas restored base gas levels to historical levels at Columbia's storage facilities. The increases in base gas— coupled with no changes in total design capacity—had the effect of reducing working gas capacity at these facilities.
- Three projects added to capacity in the South Central region. Trinity Gas Storage began operating Phase 1 of its new natural gas storage facility in East Texas, increasing working gas capacity by 6 Bcf. ONEOK Texas Gas Storage increased working gas capacity nearly 3.0 Bcf, and Spire Storage Salt Plains added another 2.0 Bcf of working gas capacity to its facility. Two facilities in the South Central region reported significantly lower working gas capacity in 2024. Bobcat Gas storage reclassified 8 Bcf of natural gas from working gas to base gas, which reduced working gas capacity by 8 Bcf. Pine Prairie reported a 5.7 Bcf decline in its working gas capacity of 5.7 Bcf in 2024.
- MountainWest Pipeline LLC increased the certificated working gas design capacity of its existing Clay Basin Storage Reservoir by 7.9 Bcf in 2024.

Market Conditions Affecting the Growth of Natural Gas Storage Capacity

In recent years, offsetting trends have influenced the U.S. natural gas industry's need for more storage capacity. Current market factors can more immediately affect demonstrated peak capacity because increasing utilization of existing facilities can be accomplished more readily than adding or retiring storage capacity. As a result, changes in natural gas storage design capacity occur more slowly.

Some market factors contributed to less need for incremental storage capacity, including:

- Increased natural gas production lowered natural gas prices and enabled some customers to meet their natural gas supply needs without, for the most part, using natural gas storage services.
    - Increased utilization of existing high-deliverability storage capacity meant some customers could get the supply and risk management services they needed without signing up for incremental capacity.
    - Increased pipeline capacity and interconnectivity helped customers optimize buying and transporting natural gas.
    - Growth in natural gas demand has slowed somewhat in the residential and commercial sectors; seasonal reliability requirements for these sectors have anchored typically long-term, firm-contract storage capacity needs.

- Small seasonal differences between the average price of winter and summer natural gas—at times—reduced economic incentives for buying physical natural gas and incurring storage-related carrying charges. Tight seasonal spreads during some years, due in part to rapid shale gas production growth and sometimes weather, may have moderated storage capacity expansion. The NYMEX forward curve now shows greater price differences between average summer and winter prices, indicating a greater need for storage capacity to address seasonal differences in forward prices is likely.

However, other energy market changes likely signal greater need for storage capacity, especially flexible, high-deliverability storage, including the need to:

- Manage the increases in natural gas consumption driven by the electric power sector's demand for natural gas
- Account for the ongoing penetration of intermittent generation sources such as wind and grid-scale photovoltaic electricity
    - High deliverability storage helps commercial market participants manage daily and intraday changes in net load—or total electricity load minus solar and wind generation.
- Balance flexible receipts and deliveries to the growing South Central region pipeline and LNG export markets
- Support fast-ramp supply needs for natural gas-fired generators
- Provide a physical hedge against changes in natural gas prices and volatility

Working natural gas in storage ended the 2024 refill season 6% above the five-year average in the Lower 48 states. Working gas injections trailed the five-year average by 21% during the 2024 refill season due to increased natural gas use for generation and high end-of-season stocks for the winter of 2023–24. The industry reported below-average net injections into working gas in all regions. However, higher-than-normal inventories at the beginning of the refill season in each of the regions in the Lower 48 states, as a result of a relatively mild heating season, likely played a significant role in easing injection demand for natural gas.

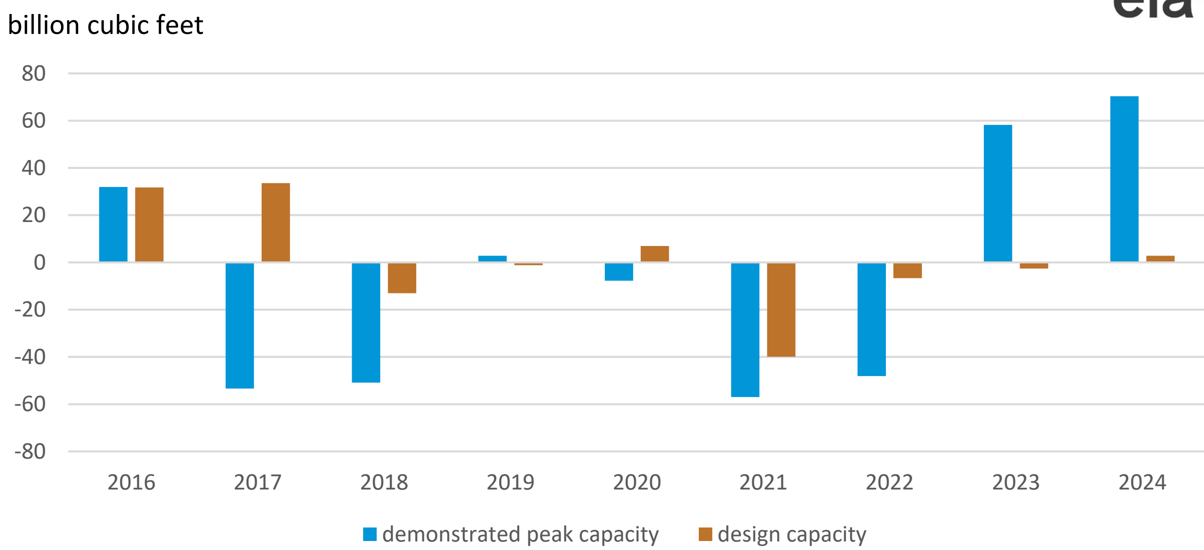
Pacific and Mountain region inventories remained above their five-year averages throughout 2024. Several factors accounted for above-average stocks during the 2024 refill season in Pacific and Mountain regions:

- Robust injections of natural gas after the winter 2022–23
    - The Pacific and Mountain regions entered the 2023 refill season below the five-year average by 56.8% and 10.1%, respectively, but entered the 2023–24 heating season with above-average working gas levels. The extremely cold temperatures of the preceding winter demonstrated the need for additional natural gas in storage to ensure sufficient supplies during periods of high natural gas demand, and storage operators responded with increased injections of natural gas into storage.
- Relatively mild temperatures during the 2023–24 heating season
    - Heating demand for natural gas in the Mountain and Pacific regions declined during the 2023–24 heating season. As a result, the surplus to the five-year average grew

throughout most of the heating season, leaving inventories well above the five-year average in both regions by the end of March.

Three of EIA's natural gas storage regions—East, Midwest, and South Central (both salt and nonsalt)—have working gas stocks below the five-year (2020–2024) average as we publish this analysis. We publish updates to these statistics each week in EIA's Natural Gas Storage Dashboard.

Figure 2. Annual changes in natural gas storage capacity (2016–24)



Data source: U.S. Energy Information Administration, Form EIA-191, *Monthly Underground Natural Gas Storage Report*
Note: Measures of capacity reflect final revised values as published in the *Underground Natural Gas Storage Capacity Report*.

State-Level Changes in Natural Gas Storage Capacity

State-level design capacity decreased in the East region and increased primarily in the South Central and Mountain regions

Columbia's base gas restoration program in 2024, or reallocating working gas capacity to base gas, accounted for most of the lost capacity. These declines reduced working gas design capacity primarily in Ohio, West Virginia, and New York. Increases in the South Central region occurred in Texas and Oklahoma, and declines in Louisiana more than offset capacity additions elsewhere in the region. Texas reported the largest increase in working gas design capacity, with additions in the region totaling 9 Bcf, owing primarily to completing the Trinity Gas Storage project. Utah reported the next largest state-level increase in 2024, adding almost 8 Bcf in 2024, because of the MountainWest Clay Basin project (Table 2, Figures 3-6).

State-level increases in demonstrated peak capacity occurred primarily in California, Texas, Montana, New Mexico, and Wyoming

The largest regional increases in demonstrated peak capacity occurred in the Mountain region. Wyoming, Montana, and New Mexico reported gains of 19 Bcf, 9 Bcf, and 9 Bcf, respectively. Demonstrated peak capacity rose 15 Bcf in Texas and 7 Bcf in California.

Table 2. Estimates of demonstrated peak and design capacity of underground working natural gas storage by state, November 2024

		Demonstrated peak capacity[a] billion cubic feet (Bcf)			Design capacity[b] (Bcf)			Demonstrated peak share of design capacity[c] (percentage)	
Region	State	(Dec 2018–Nov 2023)	(Dec 2019–Nov 2024)	Change	Nov-23	Nov-24	Change	Nov-23	Nov-24
East	Pennsylvania	401	397	-4	417	417	0	96%	95%
	West Virginia	238	240	1	241	239	-2	99%	100%
	Maryland	17	17	0	18	18	0	95%	95%
	Virginia	5	5	0	5	5	0	105%	105%
	Ohio	212	207	-5	241	240	-1	88%	86%
	New York	117	116	-1	125	124	-1	94%	94%
	Total	**991**	**983**	**-8**	**1,048**	**1,043**	**-5**	**95%**	**94%**
Midwest	Illinois	273	275	2	302	302	0	91%	91%
	Iowa	86	86	0	90	90	0	95%	95%
	Minnesota	2	2	0	2	2	0	113%	113%
	Tennessee	1	2	0	2	2	0	83%	88%
	Indiana	30	31	0	29	29	0	104%	104%
	Missouri	3	3	0	4	4	0	83%	83%
	Kentucky	102	102	0	104	104	1	98%	98%
	Michigan	675	681	6	688	688	0	98%	99%
	Total	**1,173**	**1,181**	**9**	**1,221**	**1,221**	**1**	**96%**	**97%**
Mountain	Montana	36	45	9	197	197	0	18%	23%
	Nebraska	12	12	0	13	13	0	95%	97%
	Utah	53	55	2	55	63	8	97%	88%
	New Mexico	43	52	9	60	60	0	72%	87%
	Colorado	66	67	1	73	73	0	90%	92%
	Wyoming	56	75	19	74	74	0	76%	102%
	Total	**266**	**306**	**40**	**472**	**479**	**8**	**56%**	**64%**
Pacific	Washington	24	24	0	25	25	0	96%	96%
	Oregon	22	22	0	22	22	0	101%	101%
	California[d]	315	322	7	322	323	1	98%	100%
	Total	**360**	**368**	**7**	**369**	**369**	**1**	**98%**	**100%**

South Central	Mississippi	154	154	0	201	201	0	76%	77%
	Arkansas	6	6	0	9	9	0	68%	71%
	Kansas	117	118	1	123	123	0	95%	96%
	Alabama	27	27	0	33	33	0	80%	81%
	Louisiana	423	426	3	456	443	-12	93%	96%
	Oklahoma	178	180	2	202	204	2	88%	88%
	Texas	513 R	528	15	536 R	545	9	96% R	97%
	Total	**1,417**	**1,439**	**22**	**1,560**	**1,558**	**-2**	**91%**	**92%**
Lower 48		**4,206**	**4,277**	**70**	**4,668**	**4,671**	**3**	**90%**	**92%**

Data source: U.S. Energy Information Administration, *Monthly Underground Natural Gas Storage Report*
Note: Design capacity information for all facilities, including inactive fields, is available in the *Natural Gas Annual Respondent Query System*. Totals and calculations may not equal the sum of the components because of independent rounding. Information about storage regions is available in *The Basics of Underground Natural Gas Storage*. Mentions of specific companies in this report include only information that is publicly available in our query system.

[a] Demonstrated peak capacity, otherwise known as the maximum demonstrated working natural gas volume, is the sum of the highest storage inventory levels of working natural gas observed in each distinct storage reservoir during the previous five-year period as reported by the operator on the Form EIA-191, *Monthly Underground Natural Gas Storage Report*. The timing of the peaks for different facilities do not need to coincide. Inactive fields are not included in estimates of working natural gas capacity.

[b] Design capacity is an estimate of a natural gas facility's physical working natural gas capacity as reported by the operator on the Form EIA-191, *Monthly Underground Natural Gas Storage Report*. It represents the sum of all fields' capacities at a point in time. Design capacity is a measure based on the physical characteristics of the reservoir, installed equipment, and operating procedures particular to the site, which are often certified by federal or state regulators. Inactive fields are not included in estimates of working natural gas capacity.

[c] Peak capacity in some cases exceeds 100% of design capacity because design capacity limits may differ from actual capacity limits in storage fields, as determined by the facility operator and local regulations. Maximum demonstrated working natural gas volume more commonly exceeds design capacity in states with a smaller number of facilities and smaller total storage volumes. In instances where storage fields reduce working natural gas capacity, demonstrated peak capacity may exceed design capacity.

[d] The design capacity of Southern California Gas Company's Aliso Canyon field was included in this report and in the Pacific region totals as 86.2 billion cubic feet, as publicly reported on Form EIA-191. The authorized working natural gas capacity of this facility may be lower because of ongoing operational constraints.

Figure 3. Design working natural gas capacity by state, November 2024

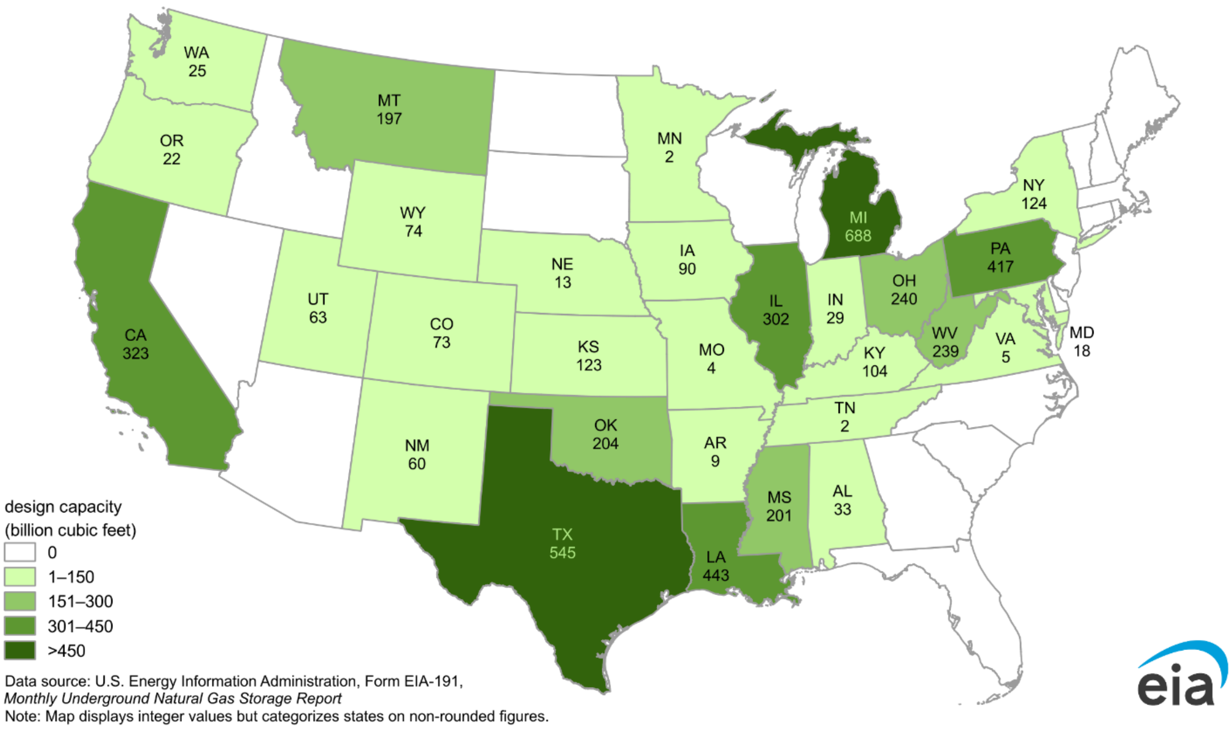
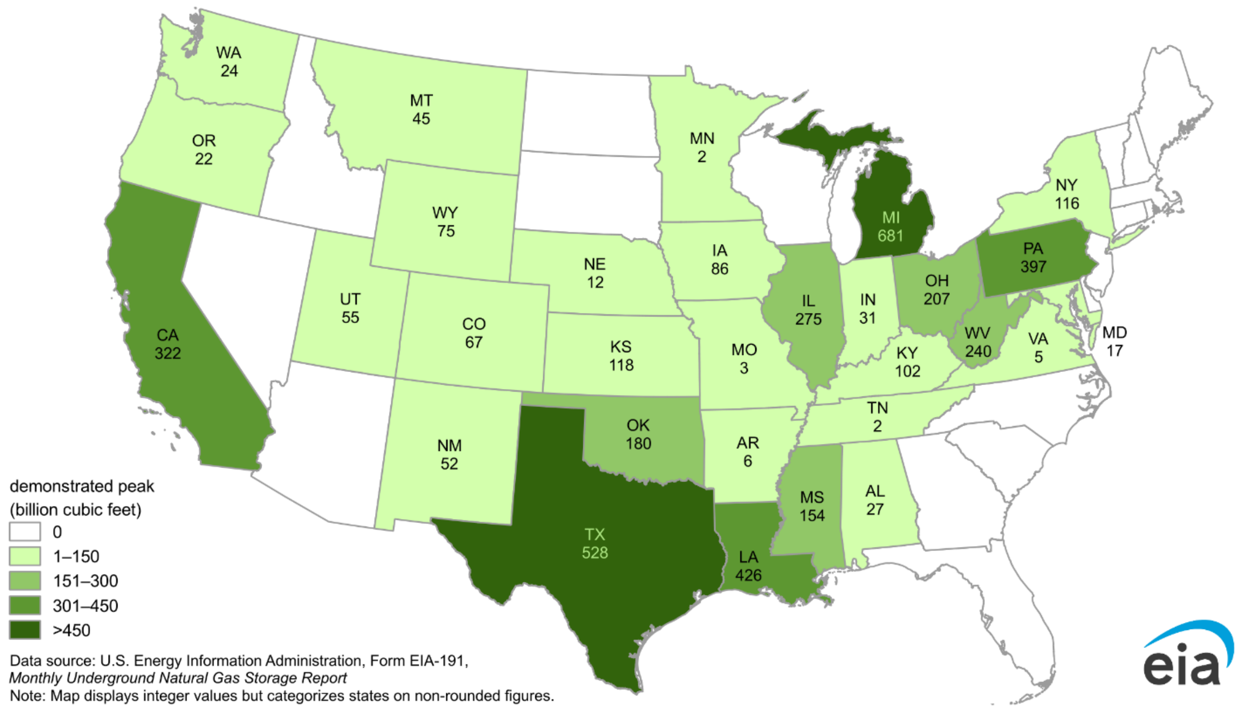


Figure 4. Maximum demonstrated working natural gas capacity by state, November 2024



Data source: U.S. Energy Information Administration, Form EIA-191,
Monthly Underground Natural Gas Storage Report
Note: Map displays integer values but categorizes states on non-rounded figures.

Figure 5. Change in design working natural gas capacity by state, November 2024

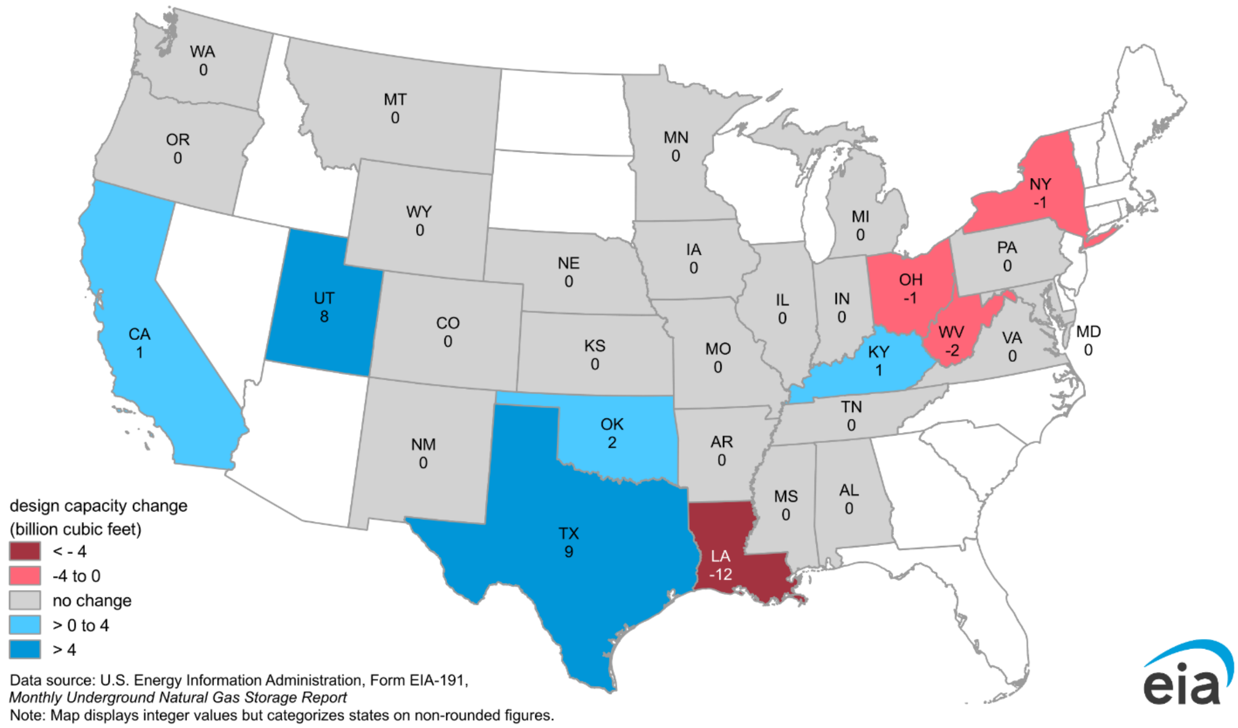
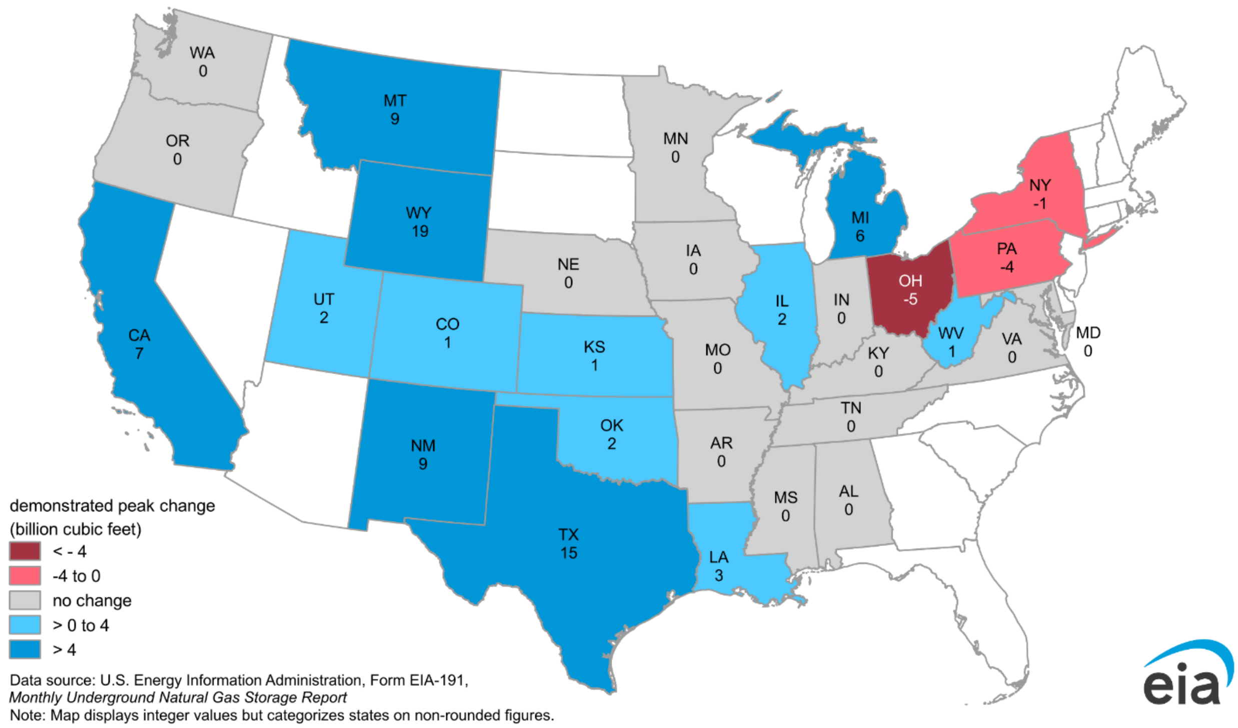


Figure 6. Change in demonstrated working natural gas by state, November 2024



Appendix

Definitions

Design capacity

Design capacity, sometimes referred to as *nameplate capacity*, is based on the physical characteristics of the reservoir, installed equipment, and operating procedures on the site, which often must be certified by federal or state regulators. We calculate total design capacity as the sum of the reported working natural gas capacities of the 387 active storage fields in the Lower 48 states as reported on Form EIA-191, *Monthly Underground Natural Gas Storage Report*, as of November 2024. This total excludes 27 inactive fields in the Lower 48 states. The design capacity metric is a theoretical limit on the total amount of natural gas that can be stored underground and withdrawn for use.

Demonstrated peak capacity

Demonstrated peak capacity, or total demonstrated maximum working natural gas capacity, represents the sum of the largest volume of working natural gas reported for each individual storage field during the most recent five-year period, regardless of when the individual peaks occurred. This report considers demonstrated peaks from December 2019 through November 2024. Demonstrated peak capacity is based on survey data from Form EIA-191, *Monthly Underground Natural Gas Storage Report,* and is typically less than design capacity because it relates to actual facility usage rather than potential use based on the design of the facility. Significant temperature departures from normal for extended periods can influence use of natural gas storage capacity, which in turn, can affect regional or Lower 48 states' estimates of demonstrated peak capacity.

Methodology

Demonstrated Peak Working Gas Capacity Estimates

We calculate these estimates by aggregating the non-coincident peak levels of working gas inventories at individual storage fields as reported monthly over a 60-month period on Form EIA-191, *Monthly Natural Gas Underground Storage Report*. This data-driven estimate reflects actual operator experience. However, the timing of peaks for different fields need not coincide. Actual available maximum capacity for any storage facility may exceed its reported maximum storage level over the past five years and is virtually certain to do so in the case of newly commissioned or expanded facilities. Therefore, this measure provides a conservative indicator of capacity and may understate the amount that can be stored.

Data from Form EIA-191 are collected from storage operators on a field-level basis. These data reflect inventory as of the last day of the report month, and a facility may have reached a higher inventory on a different day of the report month, which would not be reported on Form EIA-191.

Working Gas Design Capacity Estimates

We calculate estimates by summing the working gas design capacity of individual storage fields as reported on Form EIA-191, *Monthly Underground Natural Gas Storage Report*. Facilities must report changes in their design capacities on Form EIA-191, and new facilities must begin reporting as soon as they come online.

Working gas design capacity is a measure of the physical characteristics of the reservoir, installed equipment, and operating procedures particular to the site—often certified by federal or state regulators. However, logistical, operational, and practical considerations may preclude attainment of the maximum design capacity of a storage field, so the sum of design capacities may exceed actual available maximum storage capacity.

Inactive Fields

Fields designated as inactive must meet all the following conditions:

- Working gas has been depleted.
- No injections of working gas into the field were reported during the report year on EIA-191.
- The respondent to the EIA-191 confirmed that no injections of working gas into the field are expected to occur during the upcoming calendar year, the field is being decommissioned or plugged, or both.

By restoring service, inactive fields can be reclassified as active.