



Four Keys to Reducing Mexico's Dependence on Gas

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Acronyms

BESS. Battery energy storage systems

CAPEX / OPEX. Capital expenditure / Operating expenditure

CEL. Clean Energy Certificates

CENACE. National Center for Energy Control

CENAGAS. National Center for Natural Gas Control

CFE. Federal Electricity Commission

CNE. National Energy Commission

CONUEE. National Commission for the Efficient Use of Energy

EITI. Extractive Industries Transparency Initiative

ENTE. National Energy Transition Strategy

LNG. Liquefied natural gas

LCOE. Levelized cost of electricity

LEPEPM. Law of the State-Owned Enterprise Petróleos Mexicanos

LPTE. Energy Planning and Transition Law

LSE. Electricity Sector Law

LSH. Hydrocarbons Sector Law

MMcfd. Million cubic feet per day

Pemex. Petróleos Mexicanos

PLADESE. Electricity Sector Development Plan

PLADESHi. Hydrocarbons Sector Development Plan

PND. National Development Plan

PROSENER. Energy Sector Program

PVIRCE. Binding Program for the Installation and Retirement of Power Plants

Semarnat. Ministry of Environment and Natural Resources

Sener. Ministry of Energy

SHCP. Ministry of Finance

Executive summary

Mexico's gas dependence is structural and goes beyond imports. It is reflected not only in the volume of external supply—largely concentrated in a single supplier—but also how the national energy system has been built around this resource. Infrastructure, logistics, and political and investment decision-making processes are designed to sustain and expand gas use. Over the past decades, gas consumption has increased while domestic production has declined, deepening reliance on imports, particularly from the U.S..

This structural dependence creates significant risks for the country's socioeconomic stability and limits its ability to advance the energy transition. Unexpected events—such as natural disasters, geopolitical conflicts, or changes in U.S. trade policy—could result in gas shortages, sharp price increases, and disruptions to economic activity. The experience of Winter Storm Uri in 2021 showed that these risks are not hypothetical, but can materialize with widespread and simultaneous impacts.

Given this context, Mexico must fundamentally reassess its relationship with gas. Maintaining a high level of structural dependence on this fuel, regardless of its origin, limits the country's ability to ensure reliable, affordable, and clean energy. To date, public policy has largely focused on expanding gas supply, without sufficiently addressing demand management or the mitigation of the risks associated with this dependence.

This report proposes a shift in approach: placing demand management at the center of gas policy. Reducing demand should be part of a strategy to mitigate security of supply, economic, and environmental risks. Without strategic planning that incorporates this approach, Mexico will remain exposed to external disruptions and to decisions that reinforce dependence over the long term.

The document is structured around four keys:

1. **The current administration should develop binding energy planning instruments to improve efficiency and progressively reduce gas consumption in Mexico.** Planning should include medium- and long-term scenarios, clear indicators, and a multidimensional risk assessment framework. Together, these elements would redefine the role of gas and chart a pathway to reduce dependence. Planning should systematically consider three dimensions: security of supply, economic and financial risks, and environmental and climate risks. Without an explicit roadmap, inertia will continue to favor gas.
2. **Pemex and CFE should adopt transition plans and operating models that reduce the scale and risks of dependence on gas in Mexico.** Both companies should revise their investment criteria, incorporate systematic assessments of gas-related risks, and explore diversification options. In the case of Pemex, this includes optimizing gas use—such as

minimizing flaring, venting, and methane leaks—as well as carefully and transparently exploring new business lines.

3. **The government should strengthen its support for reliable, affordable, and clean alternatives to gas, beginning with renewable energy in the power sector.** The electricity sector is the main lever for reducing gas demand. This includes reinstating competitive energy procurement mechanisms, expanding battery storage, implementing flexibility and demanding management mechanisms, promoting electrification of end uses in high-impact sectors, and prioritizing transmission corridors that enable the integration of solar and wind energy.

4. **The government and energy companies should strengthen information disclosure to support a more inclusive and evidence-based debate on the future of gas.**

Transparency is a core tool, not an aspiration. The government and energy companies should publish standardized project- and portfolio-level information that allows stakeholders to assess the contribution of gas investments to system reliability, affordability, and decarbonization. It is also proposed that all data be published in open, machine-readable, and reusable formats, and that institutional capacity be strengthened to analyze this information and translate it into planning decisions.

Introduction

Mexico's structural dependence on gas¹ threatens socioeconomic stability and limits the country's energy transition options. It is time for a reset.

Mexico's power system and many of its industries depend on gas transported by pipeline from the U.S. (see Figure 1). There is growing consensus that this represents a problem², but it is in fact only one part of a broader challenge: Mexico's deep structural dependence on gas. Over the past three decades, the country has built much of its energy infrastructure, planning frameworks, and even its political and institutional dynamics on the assumption that gas will remain cheap, abundant, and relatively clean indefinitely. This premise shapes many of the decisions made by political actors, energy companies, investors, and consumers. It also limits Mexico's room to respond and weakens the urgency and commitment the energy transition demands.

Today, public debate on energy in Mexico rarely questions this assumption, and the solutions proposed tend to be broad and politicized. Some

voices support maintaining or even increasing gas consumption³ while Mexico diversifies its supply beyond the U.S. and expands storage capacity⁴. Others oppose this strategy and advocate for an accelerated phase-out of gas or its prohibition⁵, often primarily on environmental grounds. Opposition to gas use does not always fully consider the socioeconomic, technical, commercial, and political implications such a shift would entail.

Government policy still favors the status quo. The federal government has emphasized the need to reduce gas imports⁶, mainly by increasing domestic production. More broadly, public policy continues to support the role of gas as a "transition fuel," considering it necessary to ensure electricity supply⁷. State-owned enterprises—Petróleos Mexicanos (Pemex) and the Federal Electricity Commission (CFE)—also plan to expand gas supply and consumption in their operations and at the national level⁸.

A shift in public policy approach is needed. To date, strategies have focused on increasing supply,

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- 1 Unless otherwise indicated, in this report NRGi uses the term "gas" to refer to natural gas, defined in the Hydrocarbons Sector Law (LSH) as a "mixture of gases obtained from extraction or industrial processing and consisting mainly of methane and other, heavier hydrocarbon gases. It may also contain nitrogen, carbon dioxide and hydrogen sulphide, among other compounds. It may be associated natural gas, non-associated natural gas, gas associated with coal, or gas from industrial processing". Authors' translation. Ley del Sector Hidrocarburos (LSH), *Diario Oficial de la Federación*, March 18, 2025, www.diputados.gob.mx/LeyesBiblio/pdf/LSH.pdf
 - 2 E. Guevara, "¿Quién nos garantiza que EE.UU. nos dará gas eternamente?", *Energy Magazine México*, August 7, 2025, energymagazine.mx/2025/08/quien-nos-garantiza-que-ee-uu-nos-dara-gas-eternamente-pemex/
 - 3 AMEXHI, "AMEXHI celebra el plan estratégico para fortalecer a Pemex y la producción nacional de hidrocarburos a través de alianzas con la iniciativa privada", August 5, 2025, www.amexhi.org/comunicados/comunicado003_2025/
 - 4 D. Díaz y O. Ocampo, *Gas natural para la transición energética y competitividad de México* (IMCO, 2022), imco.org.mx/wp-content/uploads/2022/08/Gas-Natural-Competitivo-en-Mexico.pdf; Instituto Mexicano para la Competitividad (IMCO), "México necesita almacenamiento de gas natural", November 29, 2022, imco.org.mx/mexico-necesita-almacenamiento-de-gas-natural/
 - 5 S. Frabes, "Organizaciones mexicanas demandan frenar expansión de proyectos de gas", *Avispa Midia*, March 4, 2025, avispa.org/organizaciones-mexicanas-demandan-frenar-expansion-de-proyectos-de-gas/
 - 6 Presidencia de la República, "Presidenta presenta estrategia para fortalecer la soberanía energética con explotación de reservas de gas natural para disminuir importación", *Gobierno de México*, April 8, 2026, www.gob.mx/presidencia/prensa/presidenta-presenta-estrategia-para-fortalecer-la-soberania-energetica-con-explotacion-de-reservas-de-gas-natural-para-disminuir-importacion?idiom=es
 - 7 Secretaría de Energía (Sener), *Programa Sectorial de Energía 2025-2030 (PROSENER) (2025)*, dof.gob.mx/nota_detalle.php?codigo=5776838&fecha=22/12/2025#gsc.tab=05
 - 8 Petróleos Mexicanos (Pemex), *Plan Estratégico 2025-2035 (2025)*, www.pemex.com/saladeprensa/discursos/Documents/PemexPlanEstrategico2025-2035.pdf; Comisión Federal de Electricidad (CFE), "La CFE impulsa el fortalecimiento y expansión del sistema eléctrico nacional con proyectos estratégicos de transmisión, generación firme y energías limpias", *Gobierno de México*, December 17, 2025, app.cfe.mx/Aplicaciones/OTROS/Boletines/boletin?i=10396

without sufficiently addressing demand reduction and the mitigation of structural risks associated with gas. A change in approach that places demand management at the center is essential to achieve reliable, affordable, and clean energy and to strengthen the resilience of the energy system.

This report emphasizes the progressive reduction of demand and the strengthening of reliable, affordable, and clean energy alternatives, and presents Four Keys to reduce dependence on gas in Mexico:

1. The current administration should develop binding energy planning instruments to improve efficiency and progressively reduce gas consumption in Mexico.
2. Pemex and CFE should adopt transition plans and operating models that reduce the scale and risks of dependence on gas in Mexico.
3. The government should strengthen its support for reliable, affordable, and clean alternatives to gas, starting with renewable energy in the power sector.
4. The government and energy companies should strengthen information disclosure to support a more inclusive and evidence-based debate on the future of gas.

Impact of gas dependence on energy policy objectives

Dependence on gas in Mexico is structural. It is reflected not only in the volume of external supply—concentrated in a single supplier—but also in the way the energy system is oriented toward gas-based technologies⁹. Infrastructure, logistics, and decision-making are designed to sustain and expand its use. Over the past three decades, the country has steadily increased its gas consumption, while domestic production has declined, deepening its dependence on imports, particularly from the U.S.. This trajectory has shaped an energy system in which gas plays a central role in electricity generation, industrial activity, and the provision of essential services.

High dependence on gas threatens Mexico's energy policy objectives. The current energy policy framework, derived from the 2024 constitutional reform and its secondary legislation, seeks to ensure energy security and sovereignty and to strengthen state capacity through binding energy planning. This framework also aims to ensure

Figure 1. Mexico's dependence on gas: five key statistics

Three-fifths of the electricity injected into the grid is generated from gas¹⁰.

Mexico imports three-quarters of the gas it consumes¹¹.

Ninety-nine percent of gas imports come from the U.S.¹².

Ninety percent of all gas imports from the U.S. enter through two main corridors in Texas¹³.

Mexico's gas storage capacity covers only 2.4 days of consumption¹⁴.

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- 9 T. Contreras Tapia y A. Chanona Robles, *Gas in Mexico: Risks and Alternatives for a Sustainable Energy Model* (NRGI, 2025), resourcegovernance.org/publications/gas-mexico-risks-and-alternatives-sustainable-energy-model
- 10 Centro Nacional de Control de Energía (CENACE), "Estadística de la energía generada liquidada agregada (MWh) intermitente y firme por tipo de tecnología", *Gobierno de México*, April 14, 2026, www.cenace.gob.mx/Paginas/SIM/Reportes/EnergiaGeneradaTipoTec.aspx
- 11 Sener, "Prontuario estadístico: noviembre de 2025", *Gobierno de México*, 2025, estadisticashidrocarburos.energia.gob.mx/Doc/Prontuario_Actual_GnGlpPqs.pdf
- 12 Conahcyt, "Flujo y uso de gas", *Gobierno de México* (2023), energia.conahcyt.mx/planeas/hidrocarburos/flujo-gas
- 13 E. Munoz-Cortijo y J. O'Sullivan, *U.S. Natural Gas Exports to Mexico Reach New Records* (U.S. Energy Information Administration, 2025), www.eia.gov/todayinenergy/detail.php?id=66404
- 14 J. Carrillo, D. Díaz y O. Ocampo, *Almacenamiento de gas natural para la seguridad energética* (IMCO, 2022), imco.org.mx/wp-content/uploads/2022/11/Infraestructura-de-almacenamiento-de-gas-natural_Documento-2022.pdf

energy justice, prioritizing access to reliable, affordable, safe, and clean energy and energy infrastructure¹⁵.

Mexico's relationship with gas urgently needs to change. Maintaining such a high level of dependence on this fuel—regardless of whether it comes from the U.S. or other markets—risks undermining the current energy policy framework and the country's ability to achieve the following objectives.

Objective one: reliable energy

Recent events in Mexico and other countries show how unexpected developments can quickly lead to gas shortages and price increases, even when supply is typically abundant and inexpensive (see Table 1). A gas shortage in Mexico could rapidly disrupt economic activity and everyday life. This is because gas underpins electricity generation, industrial activity, and the provision of essential services, while the country has only 2.4 days of storage capacity¹⁶.

When gas supply is abruptly reduced, Mexico turns to liquefied natural gas (LNG) imports, as occurred during Winter Storm Uri in 2021¹⁷. However, greater reliance on LNG—both in the short and long term—entails significant risks. Among internationally traded commodities, LNG is particularly vulnerable to geopolitical disruptions¹⁸. Instability in distant regions can quickly alter supply and demand conditions. In some cases, energy supply can be used as an instrument of political pressure. The experience of Europe and Asia following Russia's invasion of Ukraine in 2022 illustrates these risks¹⁹.

Another example is the recent conflict involving the U.S., Israel, and Iran, which is contributing to a new global gas supply crisis. Decisions such as the closure of the Strait of Hormuz or attacks on energy infrastructure in the region have led to shortages and increased competition, in a context where an oversupply had previously been expected to lower prices in the future²⁰. Although this possibility cannot yet be ruled out, uncertainty is greater than in previous years. While these dynamics do not immediately affect pipeline gas imports to Mexico, they may translate into higher prices and greater market volatility (see next Objective).

Beyond these specific episodes, Mexico also needs to weigh the geopolitical risks of structural dependence on U.S. gas. Energy integration can generate mutual benefits and facilitate bilateral cooperation, but it also exposes Mexico to shifts in U.S. foreign and trade policy. It is not guaranteed that future U.S. administrations will conduct foreign policy in a consistent and predictable manner. Mexico should consider the possibility that energy dependence could be used as an instrument of pressure on a recurring or even permanent basis. Recent experience in other contexts suggests that this scenario is plausible—for example, when the administration of Donald Trump threatened to restrict LNG exports to Europe as a form of trade pressure²¹. This precedent shows that the U.S. has used energy as a tool of coercion and could do so in relation to Mexico as well.

15 See Article 3 of the Energy Planning and Transition Law (LPTE) and Objective 3 of PROSENER 2024–2030.

16 Carrillo, Díaz y Ocampo, *Almacenamiento de gas natural en México* (2022).

17 CFE, *Informe Anual 2021* (2022), www.cfe.gob.mx/finanzas/reportes-financieros/Informe%20Anual%20Documentos/Informe%20Anual%202021.pdf

18 International Energy Agency (IEA), *As Risks Multiply in a World Thirsty for Energy, Diversification and Cooperation Are More Urgent Than Ever* (2025), www.iea.org/news/as-risks-multiply-in-a-world-thirsty-for-energy-diversification-and-cooperation-are-more-urgent-than-ever

19 A. Sayne y T. Scurfield, *The Risks of Depending on Gas Imports* (NRGI, 2021), resourcegovernance.org/sites/default/files/2024-11/The_Risks_of_Dependent_on_Gas_Imports-slidedeck.pdf

20 F. Sassi y G. Bettinelli, *The Long-Term Consequences of the War in the Persian Gulf on Natural Gas Markets* (The Geopolitics of Natural Gas, 2026), www.linkedin.com/posts/the-geopolitics-of-natural-gas_long-term-consequences-of-persian-gulf-war-activity-7439226465822580736-7iLR

21 European Gas Hub, "Trump Threatens US LNG Supplies to Europe", March 24, 2026, europeangashub.com/trump-threatens-us-lng-supplies-to-europe.html

Table 1. Events that could trigger a gas shortage

| Trigger | Consequences | Economic and social impacts | Illustrative example |
|---|---|---|---|
| Severe weather events, natural disasters, accidents, or attacks disrupt gas flows from the U.S. | Pipeline gas flows are interrupted and available supply in Mexico drops immediately | Industrial stoppages, blackouts, and immediate impacts on economic activity | Gas supply disruptions caused by Winter Storm Uri (2021) cost industries in different Mexican states USD 2.7 billion in just two days ²² . |
| | Supply deficits force reliance on alternative sources such as LNG | A significant increase in energy costs and greater exposure to volatile international markets | During Winter Storm Uri, spot gas prices soared from USD 4 to nearly USD 400 per million BTU ²³ . The impact in Mexico was substantial, where emergency LNG imports ²⁴ , much more expensive than pipeline gas, were used (See Table 2). |
| Geopolitical events generate disruptions in global gas markets | Limited global LNG availability and a shift in U.S. supply toward markets with greater purchasing power | Extreme price increases, with effects across multiple economic sectors | When Russia cut gas supplies to European Union (EU) countries after invading Ukraine in 2022, LNG sellers charged member states up to 400 percent more for replacement gas ²⁵ . This cost households and businesses approximately USD 100 billion over 16 months ²⁶ . |
| | | Interruption of essential services and production chains; blackouts, shutdowns of economic activity, and significant social impacts | In 2022–2023, following the conflict in Ukraine, countries such as Pakistan and Bangladesh faced power outages; schools closed or reduced hours and hospitals reported disruptions in critical services ²⁷ . |
| | Increased dependence on alternative supplies in international markets at high prices | Gas shortages can also affect a country's public finances | After Russia's invasion of Ukraine in 2022, Bangladesh's gas suppliers failed to deliver and sold to EU countries at higher prices. Alternative supplies consumed a quarter of foreign exchange reserves in one year ²⁸ . This led to a USD 4.7 billion International Monetary Fund bailout. |
| U.S. gas producers and exporters redirect supplies, temporarily or intermittently, toward more profitable markets | A reduction in the volume of gas available to Mexico | Prolonged shortages, price increases, and impacts on economic activity | During periods of high global demand, producers may redirect supply toward more profitable markets, reducing availability for importing countries. |

22 S. Angulo y A. Barrera, "Texas freeze hits northern Mexico with \$2.7 billion blackout", Reuters, February 16, 2021, www.reuters.com/business/energy/northern-mexico-suffers-second-day-power-outages-after-texas-frost-2021-02-16/

23 W. N. Mann, K. Biegel, N. E. Stauff y B. Dixon, "Feb. 2021 Electricity Blackouts and Natural Gas Shortages in Texas", *Argonne National Laboratory*, July 30, 2021, p. 14, publications.anl.gov/anlpubs/2021/07/169454.pdf

24 P. T. Cervantes, "CFE sacó hasta 'debajo del colchón' para pagar cargamentos de gas", *Forbes*, July 29, 2021, forbes.com.mx/negocios-cfe-saco-debajo-colchon-pagar-gas/

25 European Council, "How the EU responded to the 2022 energy crisis", February 12, 2026, www.consilium.europa.eu/en/policies/how-did-the-eu-respond-to-the-2022-energy-crisis/

26 C. Williams-Derry, "Gas Exports Cost US Consumers More than \$100 Billion Over 16-Month Period", *IEEFA*, January 29, 2024, ieefa.org/resources/gas-exports-cost-us-consumers-more-100-billion-over-16-month-period

27 S. Varadhan, "Gas Shortage Exposes Fragile South Asian Economies to More Pain", *Reuters*, February 20, 2023, www.reuters.com/markets/asia/gas-shortage-exposes-fragile-south-asian-economies-more-pain-2023-02-20/; T. Tajmim y J. Islam, "Frequent Power Cuts Cripple Hospitals, Education Institutes", *The Business Standard*, June 6, 2023, www.tbsnews.net/bangladesh/energy/frequent-power-cuts-cripple-hospitals-education-institutes-644702

28 Bangladesh Bank, *Foreign Exchange Reserves* (2026), www.bb.org.bd/en/index.php/econdata/intreserve

| Trigger | Consequences | Economic and social impacts | Illustrative example |
|--|--|--|--|
| The U.S. government uses gas flows to Mexico as a tool of political pressure | Restriction or conditioning of exports by supplier countries | Strategic vulnerability and exposure to foreign policy decisions by supplier countries | The U.S. government's threat to restrict LNG exports to Europe ²⁹ . |

Objective two: affordable energy

Mexico has built its dependence on U.S. gas largely on low prices; however, past performance does not guarantee future outcomes. A range of factors could push prices up, either temporarily or permanently (see Table 2). It is also important to note that the price Mexico currently pays for U.S. gas, while generally low, is volatile. In April 2024, for example, the average price of gas from Texas reached a historic low of USD 0.99 per thousand cubic feet (USD/kcf), mainly due to oversupply³⁰. By early 2025, however, prices had more than tripled. Price fluctuations of between 200 percent and 300 percent within a single year are also common³¹. Sustained periods of high prices could increase the risk of stranded assets if gas becomes too expensive for power plants to operate profitably³².

At the same time, greater reliance on LNG imports would also push prices up for gas consumers in Mexico. Historical experience shows that LNG imports, both in Mexico and globally, tend not only to be significantly more expensive than pipeline gas, but that this price differential may widen over time³³. Although the possibility of a global supply glut putting downward pressure on prices had recently been considered³⁴, developments such as the closure of the Strait of Hormuz and attacks on LNG infrastructure in the Middle East have made this scenario far more uncertain. Instead, gas consumers in different parts of the world have faced a period of higher prices driven by unforeseen events beyond their control³⁵. The duration and magnitude of these pressures remain uncertain, creating more risk for consumers and energy systems that depend on these markets.

29 European Gas Hub, "Trump Threatens US LNG Supplies to Europe" (2026).
 30 Energy Information Administration (EIA), "Price of U.S. Natural Gas Pipeline Exports to Mexico", March 31, 2026, www.eia.gov/dnav/ng/hist/n9132mx3m.htm
 31 EIA, "Price of U.S. Natural Gas Pipeline Exports to Mexico" (2026).
 32 M. Thurber, J. Kincer y K. Auth, "Untangling 'Stranded Assets' and 'Carbon Lock-In'", *Energy for Growth Hub*, August 17, 2022, energyforgrowth.org/article/untangling-stranded-assets-and-carbon-lock-in/
 33 L. I. De Silva, "LNG vs. Pipeline Natural Gas: Growing Price Divide in a Dynamic Market", *Ceylon Today*, September 6, 2024, ceylontoday.lk/2024/09/06/lng-vs-pipeline-natural-gas-growing-price-divide-in-a-dynamic-market/
 34 A. Shiryaevskaya, R. Liao y S. Stapczynski, "Global LNG Market Faces Looming Supply Glut After Years of Scarcity", *Financial Post*, September 8, 2025, financialpost.com/pmnbusiness/pmnbusiness/global-lng-market-faces-looming-supply-glut-after-years-of-scarcity
 35 E. Chow y M. Rashad, "Iran War Damage to Qatar Hits Global LNG Outlook", *Reuters*, March 25, 2026, www.reuters.com/business/energy/iran-war-damage-qatar-hits-global-lng-outlook-upends-asia-demand-growth-2026-03-26/

Table 2. Market dynamics that could increase gas prices and other commodities

| Market dynamic | Economic and social impacts | Empirical evidence or reference |
|--|---|---|
| U.S. gas producers sell more of their output to LNG plants that pay higher prices than Mexico ³⁶ | A sustained increase in imported gas prices and pressure on power generation costs | Various studies by the U.S. government ³⁷ and independent organizations ³⁸ have consistently warned that the expansion of U.S. LNG exports will raise gas prices in Mexico. Some estimates show that prices could double or triple. |
| Gas demand in Mexico grows faster than supply, increasing exposure to volatility | Price increases and greater exposure to international market fluctuations | Gas consumption in Mexico has grown steadily over recent decades, increasing dependence on imports, while gas prices have recorded fluctuations of up to 200-300 percent over short periods ³⁹ . |
| Production and transport costs for gas rise because of higher taxes or tariffs in the U.S. or higher infrastructure construction and maintenance costs | Higher electricity and industrial input costs; inflationary effects | Changes in infrastructure, regulation, or transport costs in the U.S. could be passed directly into the price of gas imported by Mexico. |
| Persistently high gas prices in international markets | Pressure on public finances; pressure on governments to subsidize gas or products made with gas | In Bangladesh, gas prices for power plants and industry rose by nearly 300 percent ⁴⁰ in a single day in January 2023, when the government raised domestic gas and electricity prices ⁴¹ because emergency subsidies had become too costly. |
| Mexico experiences a gas shortage (see Table 1) | A significant increase in energy costs and greater exposure to volatile international markets | Faced with shortages during Winter Storm Uri, Mexico turned to LNG imports. In total, CFE allocated MXN 65 billion to buy LNG cargoes, mitigate the shortage, and restore electricity service ⁴² . |

36 This scenario has already occurred. See: K. Dyl, S. York y A. Smiddy, "Eastern U.S. Natural Gas Increasingly Meets LNG-Fueled Demand Growth in AEO2025", *EIA*, July 29, 2025, www.eia.gov/todayinenergy/detail.php?id=65824; NERA Economic Consulting, *Macroeconomic Outcomes of Market Determined Levels of U.S. LNG Exports* (KeyLogic Systems, 2018), www.energy.gov/sites/prod/files/2018/06/f52/Macroeconomic%20LNG%20Export%20Study%202018.pdf

37 EIA, *AEO2023 Issues in Focus: Effects of Liquefied Natural Gas Exports on the U.S. Natural Gas Market*, May, 2023, www.eia.gov/outlooks/aeo/11F_LNG/pdf/LNG_Issue_in_Focus.pdf

38 A. Williams, "LNG Buildout, Mexico Exports Seen Driving Natural Gas Price Resurgence", *Natural Gas Intelligence*, November 12, 2024, www.naturalgasintel.com/news/lng-buildout-mexico-exports-seen-driving-natural-gas-price-resurgence/

39 EIA, "Price of U.S. Natural Gas Pipeline Exports to Mexico", March 31, 2026, www.eia.gov/dnav/ng/hist/n9132mx3m.htm

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42 P. Tapia, "CFE sacó hasta 'debajo del colchón' para pagar cargamentos de gas", *Forbes México*, July 29, 2021, forbes.com.mx/negocios-cfe-saco-debajo-colchon-pagar-gas/

Objective three: clean energy

Continued dependence on gas risks locking Mexico into projects and emissions that are incompatible with the country's climate targets. This would make the decarbonization of the energy system more difficult and more costly. The risk would be even greater if the government were to import larger volumes of LNG, given its high emissions intensity due to energy-intensive⁴³ processes and emissions across its supply chain⁴⁴.

At the same time, the expansion of gas infrastructure reinforces regulatory frameworks, planning assumptions, and investment incentives that favor gas over cleaner and more flexible alternatives⁴⁵. This could crowd out investment in lower-carbon technologies and initiatives such as renewable energy, grid expansion, battery storage, electrification, and energy efficiency.

43 Intergovernmental Panel on Climate Change, *Anthropogenic and Natural Radiative Forcing — Supplementary Material* (2013), www.ipcc.ch/site/assets/uploads/2018/07/WGI_AR5.Chap_8_SM.pdf

44 ICM, *Análisis de emisiones de GEI de ciclo de vida del proyecto de exportación de GNL, Saguario Energía* (2024), iniciativaclimatica.org/analisis-de-emisiones-de-gei-de-ciclo-de-vida-del-proyecto-de-exportacion-de-gnl-saguaro-energia/

45 L. M. González y K. G. Zubía, "CFE asegura coberturas para el 60% de su consumo de gas", *El Economista*, March 20, 2026, www.eleconomista.com.mx/empresas/cfe-coberturas-60-consumo-gas-20260320-805102.html; V. Traeder, "Obstáculos para la expansión de las renovables en México", *Revista Eólica y del Vehículo Eléctrico*, February 13, 2025, reve.aeeolica.org/2025/02/13/obstaculos-para-la-expansion-de-las-renovables-en-mexico/

Methodology and scope of the document

This report is based on a qualitative analysis of multiple sources and on consultations with energy sector experts in Mexico. First, the applicable regulatory framework resulting from the 2024 constitutional reform was reviewed. This review included secondary legislation in the electricity and hydrocarbons sectors, as well as provisions related to binding energy planning and the role of state-owned enterprises. The analysis made it possible to identify the principles, constraints, and institutional tools that shape energy policy decisions in the country.

In addition, a systematic review was conducted of existing and forthcoming planning instruments, including the Energy Sector Program (PROSENER) and the Electricity Sector Development Plan (PLADESE), as well as other relevant instruments such as the National Development Plan (PND), Plan México, the National Hydrocarbons and Natural Gas Strategy, the Pemex Strategic Plan 2025–2035, and the Plan for the Strengthening and Expansion of the National Electricity System 2025–2030. These documents were analyzed in terms of their objectives, time horizons, implementation mechanisms, and degree of alignment with energy policy goals.

Second, the analysis incorporates findings from specialized literature, including research by energy sector consultancies, think tanks, academia, and civil society organizations, as well as relevant media reports. These sources were

used to complement the analysis with empirical evidence, international comparisons, and critical perspectives on the evolution of gas markets and their economic, social, and environmental implications.

Finally, the analysis draws on direct consultation with energy sector experts through exchanges held during a workshop organized by NRGi in June 2025 in Mexico City. This space brought together more than 20 senior specialists, including former public officials, climate leaders, and energy sector professionals. The workshop was structured around the identification of risks and the exploration of alternatives, fostering a technical discussion beyond polarized positions. In preparation for this dialogue, a background paper was developed that questions the validity of three key assumptions: the sustained availability of low-cost gas, the stability of international prices, and the compatibility of gas with energy transition objectives⁴⁶. The results of this exercise made it possible to contrast perspectives, identify areas of consensus, and enrich the analysis presented in this report.

Analytical premises

The Four Keys are based on a set of premises that guide the assessment of the role of gas in Mexico's energy system. These premises are not normative assumptions, but analytical criteria that allow for examining the conditions under which the current model of dependence has been consolidated.

46 Contreras Tapia y Chanona Robles, *Gas in México* (2025).

Gas demand must be significantly reduced

To date, public policy has focused on increasing supply rather than reducing demand—a potentially costly mistake. The country currently lacks immediate options to expand energy supply in ways that both minimize risks and meet the objectives of reliable, affordable, and clean energy. The scope to increase gas supply in a way that reduces risks is limited in the short and medium term. Pemex's gas production is insufficient to replace imports from the U.S. due to declining production, as well as financial⁴⁷ and infrastructure constraints⁴⁸. In addition, increasing domestic gas supply would require years and significant investment.

Expanding gas storage capacity could help prevent shortages, but it would not address price volatility or guarantee affordable prices or a cleaner energy mix. Importing more LNG would increase costs, emissions, and external risks, without addressing the underlying vulnerability associated with structural dependence on gas. This analysis considers that demand management, including limiting new consumption, should be the central pillar of any strategy to mitigate gas-related risks. Reducing structural dependence on gas therefore requires a robust policy framework focused on energy efficiency, the electrification of end uses in high-impact sectors⁴⁹, and technological diversification in the power sector.

Expansion of gas infrastructure should be limited

The construction of new gas infrastructure should be carefully assessed in light of its long-

term implications. The government is currently proposing major projects that transport or consume gas, particularly power plants (see Key 2). These assets operate for decades and can increase gas demand. Each new plant may lock Mexico into gas imports through 2050 and beyond, in a context where future gas market dynamics are highly uncertain. In addition, they may displace reliable, affordable, and clean alternatives and create risks of stranded assets⁵⁰.

Renewable energy is a reliable, affordable and clean alternative

In the power sector, renewable energy represents an increasingly reliable, affordable, and clean alternative to gas in Mexico. However, large-scale integration requires the development of battery energy storage systems (BESS) and system flexibility mechanisms to manage variability. This analysis assumes that renewable energy can play a central role in transforming the power system to reduce structural dependence on gas (see Key 3).

Reducing dependence on gas is a long-term process

Reducing dependence on gas requires time, public planning, and investment. Overcoming structural dependence will require consistent reforms, stronger institutional coordination, clear rules, and sustained public and private investment. In this context, this analysis assumes that the transition cannot be achieved through isolated actions or short-term market signals alone, but rather through a sustained set of policy decisions and investments over time.

47 F. Ballesteros, A. Furnaro, D. Manley y A. Chanona, *Conditional Support for Pemex: Achieving Financial Sustainability During the Energy Transition*, (NRGI, 2024), resourcegovernance.org/publications/conditional-support-pemex-achieving-financial-sustainability-during-energy-transition

48 L. Quintero, "Problemas logísticos de Pemex amenazan suministro en 6 estados", *Onexpo*, November 20, 2025, www.onexpo.com.mx/NOTICIAS/PROBLEMAS-LOGISTICOS-DE-PEMEX-AMENAZAN-SUMINISTRO-wGrNx/

49 Such as transportation, building heating and cooling, and certain industrial processes.

50 C. Williams-Derry y S. Mattei, *La expansión del GNL en México podría implicar mayores riesgos para los consumidores de EE. UU. y México* (IEEFA, 2026), ieefa.org/articulos/la-expansion-del-gnl-en-mexico-podria-implicar-mayores-riesgos-para-los-consumidores-de-ee

KEY 1

The current administration should develop binding and detailed plans to improve efficiency and progressively reduce gas consumption in Mexico

KEY POINTS

- Structural inertia in the energy system will reinforce dependence on gas unless investment priorities are redefined through binding planning instruments.
- Binding energy planning should define limits to gas expansion, schedule the retirement of infrastructure, and direct investment toward energy diversification, as a state policy that transcends political cycles.
- To inform decisions on gas, planning instruments must explicitly address the risks of dependence on gas by integrating a risk assessment framework that covers security of supply, economic and financial, and environmental and climate dimensions across short-, medium-, and long-term horizons.
- Without binding strategic planning that prioritizes demand management, inertia will continue to favor decisions that reinforce structural dependence on gas.

Without planning processes that reflect a shift in public policy and redefine investment priorities, dependence on gas is likely to persist. The transition toward lower gas consumption cannot rely on discretionary political decisions or market forces alone, as there is structural inertia that favors its continued use. This inertia has been driven by the availability of gas from the U.S. at competitive prices⁵¹—despite its high

volatility—and by the extensive network of pipelines and power plants already in place.

This inertia is not neutral: it reinforces a trajectory of dependence shaped by institutional priorities, incentives, and biases, and makes alternatives harder to adopt. At the same time, because energy infrastructure is capital-intensive and designed to operate for decades, current decisions shape the future structure of the system.

51 T. Contreras Tapia y A. Chanona Robles, *Gas in Mexico* (NRGI, 2025).

Overcoming this inertia requires planning to define a renewed vision of a more diversified energy future. Detailed planning is essential to establish objectives and measures that redefine the role of gas in the transition. Past responses have focused on expanding gas supply, but demand-side measures are also needed through a progressive and structural reduction in consumption. This approach is often overlooked in public policy and energy debates, and it should be explicitly incorporated into planning instruments.

In this context, planning plays a central role: it sets limits on gas expansion and the retirement of related infrastructure, shapes market expectations, and channels investment flows to promote greater diversification of the energy mix. For these instruments to be effective, they must transcend political cycles and be consolidated as long-term state policy.

RECOMMENDATION

Include a long-term, scenario-based roadmap for the gas transition in national plans

The 2024 constitutional reform and its secondary legislation granted the Ministry of Energy (Sener) expanded authority to carry out “binding energy planning.” The objective is to better align energy sector actors with national priorities⁵². Under this framework, Sener is empowered to define, on a mandatory basis, the policies, investments, technologies, infrastructure, and strategic projects that will shape the energy transition. Two documents are central to this process:

- The **National Energy Transition Strategy**

(ENTE) is the guiding instrument of national energy policy⁵³, required by law for the first time under the Energy Planning and Transition Law (LPTE)⁵⁴. Under this framework, the ENTE must establish binding guidelines on energy efficiency, clean energy, energy justice, innovation, technological development, and human capital development. It must also review sector targets based on scenarios and define institutional responsibilities and lines of action to achieve them. The law requires Sener to publish the ENTE within the first year of the administration and update it every three years. It has not yet been published.

- The **Energy Sector Program (PROSENER)**, aligned with the National Development Plan (PND), defines the objectives, priorities, and policies guiding the energy sector during the administration. It also guides the actions of authorities and coordinates planning instruments across government agencies.

Limitations of PROSENER 2025–2030

To clearly define the role of gas in the energy transition, these documents will need to be more detailed and prescriptive than current versions. For example, PROSENER 2025–2030 proposes reducing gas imports by 20 percent by 2030 by increasing domestic production to 5,000 million cubic feet per day (MMcfd)⁵⁵. However, the document does not present sufficient evidence to support the technical, economic, or infrastructural feasibility of this target. In particular, it does not describe the methodology or assumptions used (such as expected gas demand), nor does it present production pathways or alternative scenarios.

52 Ley de Planeación para la Transición Energética (LPTE), *Diario Oficial de la Federación*, March 18, 2025, www.diputados.gob.mx/LeyesBiblio/pdf/LPTE.pdf

53 See Article 24 of the LPTE.

54 The previous law, enacted in 2015, mandated that Sener approve and publish the Energy Transition Strategy to promote the use of cleaner technologies and fuels. The strategy established targets for the share of clean energy in electricity generation, with short-, medium-, and long-term scenarios, as well as energy efficiency guidelines for different sectors. The most recent version was published in January 2024.

55 Sener, *Programa Sectorial de Energía 2025-2030 (PROSENER)* (2025).

In addition, the target lacks an indicator to track progress⁵⁶.

PROSENER also describes gas-fired electricity generation as necessary to ensure grid stability; however, it does not explain the analytical basis for this claim or the required backup volumes under different generation scenarios. It characterizes gas as a “low-emissions fuel for the transition toward the predominant use of renewable energy,⁵⁷” without detailing how it will effectively support this shift. It also does not explain under what conditions and to what extent gas and renewable energy can complement each other, nor how this interaction would evolve as the share of clean energy increases.

Roadmap: key elements

To provide a clearer, more viable, and risk-informed roadmap for the future of gas, Sener should ensure that the ENTE and PROSENER:

- Explicitly address the risks of dependence on gas—including security of supply, price volatility, import dependence, and the achievement of climate targets—and define concrete measures to mitigate them.
- Are based on, and include, medium-term (15 years) and long-term (30 years) scenarios that assess the evolution of gas demand, production, and associated emissions, as well as the expansion of clean energy. These scenarios should:
 - Identify short-term decisions that shape these trajectories
 - Incorporate explicit assumptions on economic growth, electricity demand, renewable energy deployment, and energy efficiency
- Include a comprehensive gas balance that reflects the interaction between supply, demand, and imports
- Clearly define how future gas use will contribute to achieving key energy sector and development objectives. This includes specifying roles, timeframes, and conditions under which gas contributes to the energy system, particularly in relation to power system reliability, renewable energy integration, and other strategic uses. This should be supported by quantitative estimates under different scenarios, as well as criteria to assess how this role may evolve over time.
- Establish indicators to monitor progress toward targets and adjust trajectories as conditions evolve. This includes indicators linked to targets, baselines, and interim milestones.
- Assess the reliability, affordability, and climate compatibility of gas use across different time horizons. This assessment should incorporate economic assumptions and sensitivity analyses to evaluate the feasibility of targets under different conditions.
- Align hydrocarbon production targets with explicit emissions reduction goals, ensuring that operational decisions are consistent with declining emissions pathways.

RECOMMENDATION

Incorporate a multidimensional risk assessment framework for gas dependence into hydrocarbon and electricity sector plans

Once the ENTE and PROSENER define the strategic direction for gas, other sectoral planning instruments—updated annually—should provide

⁵⁶ PROSENER includes only six quantitative indicators to measure progress toward the 2030 targets. None of them is associated with the 5,000 MMcfd target, which is part of Action Line 1.2.2 under Objective 1.

⁵⁷ Authors' translation. Sener, *Programa Sectorial de Energía 2025-2030 (PROSENER)* (2025).

greater detail. For example, which specific portfolios of projects, initiatives, and investments will support the transition outlined by Sener? Two documents introduced under the 2024 constitutional reform are particularly relevant:

- The **Hydrocarbons Sector Development Plan** (PLADESHi), a 15-year plan for the development and modernization of hydrocarbon infrastructure. It is updated annually and includes three- to five-year investment programs in exploration, production, storage, transportation, and distribution of gas, refined products, and petrochemicals, as well as energy efficiency and sustainability measures. It has not yet been published.
- The **Electricity Sector Development Plan** (PLADESE), a 15-year plan for the development and modernization of electricity infrastructure. It is updated annually, aligned with national planning instruments, and includes three- to five-year investment programs⁵⁸. It incorporates the Binding Program for the Installation and Retirement of Power Plants (PVIRCE), as well as expansion and modernization programs for the national transmission and distribution networks.

Any gas-related measures supported by these instruments should be assessed through a multidimensional risk framework. This framework should go beyond simple supply and demand scenarios and consider long-term risks across at least three dimensions aligned with the objectives

outlined earlier: 1) reliable energy (security of supply)⁵⁹, 2) affordable energy (economic and financial)⁶⁰, and 3) clean energy (environmental and climate). Its application would enable authorities to systematically anticipate the potential benefits and costs of each project or initiative, particularly under high-risk, high-impact scenarios. It would also help reduce the risk of overinvestment in gas and provide clearer signals to investors.

Criteria and variables for implementation

Table 3 presents a non-exhaustive list of criteria and variables to operationalize this framework. These criteria were defined based on three complementary inputs: 1) a review of specialized literature on energy security, 2) an analysis of key risk factors affecting Mexico's gas system, and 3) a review of international experiences in countries with similar structural dependencies.

The table presents a multidimensional reference framework for assessing gas-related risks, organized across three dimensions: security of supply, economic and financial, and environmental and climate. Its purpose is to illustrate the types of variables and indicators that could be incorporated into binding energy planning instruments. In its design, priority was given to criteria that are measurable, relevant for the 2030–2050 horizon, and actionable from a public policy perspective. The examples provided are not exhaustive and do not constitute defined thresholds, but rather should be understood as indicative inputs that can be adapted depending on the type of project, analytical time horizons, and data availability.

58 Sener, *Plan de Desarrollo del Sector Eléctrico (PLADESE)* (2025), www.dof.gob.mx/nota_detalle.php?codigo=5770297&fecha=17/10/2025#gsc.tab=0

59 Including analytical frameworks such as IEA, *Reliable, affordable access to all fuels and energy sources*, www.iea.org/topics/energy-security; World Energy Council, *World Energy Trilemma Index: Mexico Country Profile* (2023), trilemma.worldenergy.org/#/!country-profile?country=Mexico&year=2023

60 Contreras Tapia y Chanona Robles, *Gas in Mexico* (2025).

Table 3. Multidimensional risk assessment framework for gas-related investments

| Dimension | Criterion | Variables/parameters | Low risk | Medium risk | High risk |
|-----------------------|--|---|-----------------|----------------------|------------------|
| Security of supply | Import concentration | Percentage of gas imported from the U.S., annual gas production in the U.S., production profile in relevant U.S. wells, investments in reserve replacement, and duration of disruptions | <X% | X-Y% | >Y% |
| | Political-commercial risk | Export control measures ⁶¹ | Low probability | Medium probability | High probability |
| | Storage capacity | Days of national coverage | >X days | Y-X days | <Y days |
| | Transport redundancy | Percentage of gas supply with low substitutability | <X% | X-Y% | >Y% |
| | Climate resilience | Percentage of infrastructure in high-risk areas | <X% | X-Y% | >Y% |
| Economic-financial | Price volatility | Variation, variability, and dispersion of Henry Hub and LNG prices | <X% | X-Y% | >Y% |
| | Stranded asset risk | Asset life horizon versus climate targets | Compatible | Partially compatible | Incompatible |
| | Fiscal cost | Percentage of the energy budget spent on subsidies, support, or bailouts | <X% | X-Y% | >Y% |
| | Regulatory transparency and certainty | Percentage of compliance with regulatory calendars and public targets, number of retroactive reforms, number of lawsuits and arbitrations, access to regulatory information, average permit approval time, etc. | High | Medium | Low |
| Environmental-climate | Compatibility with nationally determined contributions/ net-zero by 2050 | Percentage of the carbon budget occupied by gas | <X% | X-Y% | >Y% |
| | Methane emissions | Estimated percentage of volume (clear baseline and staggered targets) | <X% | X-Y% | >Y% |
| | Technological lock-in | Technology switching costs and projected share of gas in the energy mix by 2050 | <X% | X-Y% | >Y% |
| | Social conflicts | Percentage of projects facing or halted by local opposition | <X% | X-Y% | >Y% |

61 There are various analyses, proxies, and composite indices that can be used to measure political-commercial risk using hard data and assign a probability value. See: D. Kaufmann y A. Kraay, "The Worldwide Governance Indicators: Methodology and 2024 Update", Policy Research Working Paper 10952, *World Bank Group* (2024), documents.worldbank.org/curated/en/099005210162424110; *International Country Risk Guide*; The PRS Group, *International Country Risk Guide* (2026), www.prsgroup.com/; as well as risk indices developed by credit rating agencies such as S&P, Moody's and Fitch.

Implementation of the risk framework

In accordance with the new legal framework, implementation of the risk assessment framework should be coordinated among the Ministry of Energy (Sener), the Ministry of Environment and Natural Resources (Semarnat), the National Commission for the Efficient Use of Energy (CONUEE), the National Center for Energy Control (CENACE), the National Center for Natural Gas Control (CENAGAS), the National Energy Commission (CNE), and state-owned enterprises⁶².

It is important to note that the framework's criteria operate at different but complementary analytical levels. Some capture systemic risks affecting the energy system as a whole—such as import concentration or storage capacity—while others address project-level risks, such as stranded

asset risk or the economic viability of specific investments. This distinction matters: a project may be viable on its own while simultaneously increasing system-wide risk. In practice, systemic criteria are suited to establishing national-level benchmarks, while project-level criteria can be translated into specific requirements for investment evaluation.

Strengthening energy planning through binding objectives, scenario analysis, clear indicators, and comprehensive risk assessment would help overcome sectoral inertia by aligning decisions with a progressive reduction in gas demand. This framework is a necessary condition for ensuring that policy instruments translate into concrete changes in the operations and investment decisions of Pemex and CFE, as discussed below.

62 See Article 7 of the LPTE.

KEY 2 Pemex and CFE should adopt transition plans and operating models that reduce the scale and risks of dependence on gas in Mexico

KEY POINTS

- Given their size and role in the energy system, Pemex and CFE reinforce structural dependence on gas through plans that expand its use over the medium and long term.
- Current operational and investment processes in both companies do not adequately incorporate the strategic risks associated with dependence on gas. Future decision-making processes need to include mandatory risk assessments, standardized indicators, and external review.
- Pemex should prioritize optimizing gas use, including reducing methane leaks and making productive use of wasted gas, while exploring diversification options to reduce its own consumption and exposure to risk.

Pemex and CFE: drivers of dependence

Structural dependence on gas in Mexico is not just technical or market-driven. It reflects the priorities, incentives, and institutional biases of the country's most influential public entities. This is particularly evident in Pemex and CFE, the state-owned enterprises that dominate the energy sector, as they are the largest buyers, sellers, and consumers

of gas in Mexico. Pemex also accounts for most domestic gas production, while CFE is one of the main importers⁶³.

Today, the operational plans and investment priorities of both companies aim to sustain or expand gas consumption in Mexico⁶⁴. In the case of Pemex, strategic planning focuses on increasing domestic gas production as the primary

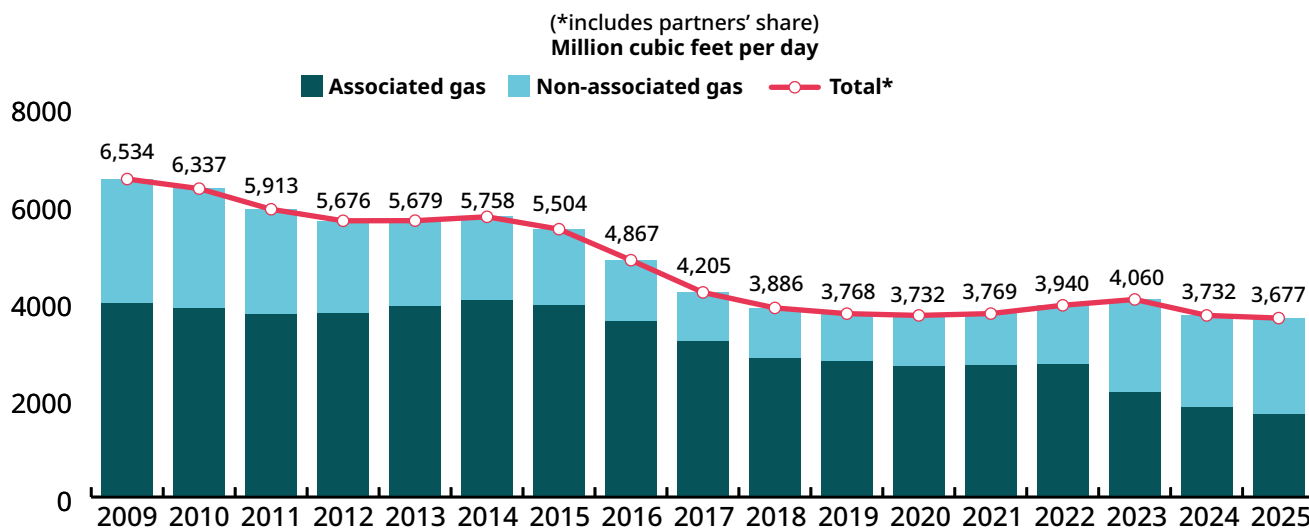
63 CFE, through its subsidiaries, plays a significant role in the procurement and management of imported gas, both in international markets and in its commercialization within the country. CF Energía is mandated to import, market, transport, store, and sell gas in Mexico, including managing key supply flows such as those originating from the Permian Basin. Meanwhile, CFE International purchases gas in international markets, particularly in the United States.

64 CFE, "La CFE fortalece la capacidad de generación eléctrica de México y lidera su transición energética", March 23, 2026, app.cfe.mx/Aplicaciones/OTROS/Boletines/boletin?i=10501; Pemex, *Pemex presenta su Plan de Trabajo 2025-2030* (2025), www.pemex.com/saladeprensa/boletines_nacionales/Paginas/2025_09-nacional.aspx

mechanism to reduce external dependence and ensure supply⁶⁵. However, this strategy faces significant constraints that limit Pemex's ability to reverse current trends⁶⁶, which have been declining for several years (see Figure 2).

For its part, CFE plans to add four new gas-fired combined-cycle power plants, in addition to four already under construction, as well as a gas-fired internal combustion plant⁶⁷. These developments reinforce the trajectory of dependence on gas.

Figure 2. Pemex natural gas production 2009-2025⁶⁸



Taken together, these projects involve long-term investment commitments and asset lifespans that shape future decarbonization decisions⁶⁹. The result is financial, regulatory, and operational inertia that reinforces dependence and limits the technical and financial options for the energy transition.

The need to realign incentives

Unless Pemex and CFE adopt plans that explicitly recognize the need to manage and reduce gas-related risks, any national strategy in this area will be incomplete. The 2024 constitutional reform and its secondary legislation reinforced the role of both

65 A. Solís, "CEO de Pemex advierte problema de seguridad nacional en México por dependencia de gas estadounidense", *Bloomberg Línea*, August 7, 2025, www.bloomberglinea.com/latinoamerica/mexico/ceo-de-pemex-advierte-problema-de-seguridad-nacional-en-mexico-por-dependencia-de-gas-estadounidense/
 66 J. M. Arteaga, "México no logrará reducir dependencia en gas natural de EU: expertos", *La Silla Rota*, October 11, 2025, lasillarota.com/negocios/2025/10/11/mexico-no-lograra-reducir-dependencia-en-gas-natural-de-eu-expertos-560588.html
 67 CFE, "La CFE impulsa el fortalecimiento y expansión del sistema eléctrico nacional con proyectos estratégicos de transmisión, generación firme y energías limpias", December 17, 2025, app.cfe.mx/Aplicaciones/OTROS/Boletines/boletin?i=10396
 68 Pemex, *Base de Datos Institucional*, ebdi.pemex.com/bdi/bdiController.do?action=cuadro&cvequa=INDI02
 69 F. Ballesteros, B. Rodríguez y A. Chanona, "Pemex and Mexico's NDC 3.0: Seizing the Moment for Climate Leadership", *NRGI*, September 24, 2025, resourcegovernance.org/articulos/pemex-and-mexicos-ndc-30-seizing-moment-climate-leadership

companies as guarantors of supply, with a focus on ensuring energy availability. In this context, effective responses to structural dependence require realigning the budgetary, regulatory, and operational incentives that currently favor gas expansion. This transformation depends primarily on the federal government through binding energy planning, but Pemex and CFE must also include it in their planning criteria, including the systematic evaluation of security of supply, economic and fiscal, and environmental and climate risks.

Given that the most impactful long-term solutions will come from the demand side, risk management should prioritize measures that reduce gas consumption and relieve pressure on imports and domestic supply. In the case of Pemex, this also involves advancing internal optimization of gas use and creating space to carefully explore diversification options that can complement its investment portfolio.

RECOMMENDATION

Develop new long-term strategies for Pemex and CFE that include detailed gas risk assessments

The risk assessment proposed at the planning level under Key 1 should be reflected at the level of state-owned enterprises. Restructuring the core businesses of Pemex and CFE should begin with revising the institutional criteria used to plan, approve, and finance investments.

While both companies already incorporate risk analysis into decision-making processes, these are largely focused on technical, operational, and short- to medium-term financial dimensions⁷⁰. In particular, risk assessments related to gas—especially security of supply, economic

and financial, and environmental and climate risks—should become an explicit requirement of corporate governance and cover short-, medium-, and long-term horizons.

Rather than being a secondary technical exercise, this risk assessment should function as an institutional mechanism to reorient core business decisions⁷¹, strengthening its weight relative to other decision criteria. To achieve this, the following is recommended:

- Include, as a mandatory annex to Pemex and CFE programs, a standardized methodology for assessing risks associated with gas projects, tailored to project type and decision horizon (exploration and production, logistics infrastructure, power generation, among others).
- Establish standardized indicators aligned with binding energy planning (PLADESHi and PLADESE) for systematic risk evaluation, structured around three dimensions: security of supply, economic and financial, and environmental and climate (see Table 3).
- Incorporate specific metrics to quantify the fiscal cost of gas-related projects and associated technologies under different scenarios for gas prices, exchange rates, and demand, consistent with ENTE and PROSENER scenarios.
- Integrate opportunity cost analyses relative to investments in clean energy, energy efficiency, or electrification.
- Expand the scope of risk assessment within formal investment approval criteria and subject results to external review by Sener, as the lead

70 Under current legislation, Pemex investment projects must be registered with the Investment Unit of the Ministry of Finance (SHCP) and may be subject to evaluation of their economic, technical, and environmental feasibility. See: Lineamientos para el ciclo de gestión de los programas y proyectos de inversión, *Diario Oficial de la Federación*, August 20, 2025, www.dof.gob.mx/nota_detalle.php?codigo=5766239&fecha=20/08/2025#gsc.tab=0

71 A. Furnaro, G. Tagliani, P. Heller, A.C. González, T. George-Ikoli, F. Ballesteros y N. Woodroffe, *National Oil Company Transformation: Strategic Choices for an Uncertain Energy Future* (NRGI, 2026), resourcegovernance.org/publications/national-oil-company-transformation

authority, as well as by the Ministry of Finance (SHCP) and the Federal Superior Audit Office.

- Ensure periodic and standardized transparency through the publication of risk assessment results in a comparable year-on-year format, reducing discretion across administrations and facilitating oversight by Congress and financial markets.

RECOMMENDATION

Carefully and transparently explore diversification options for Pemex, including those that reduce its own gas consumption

The risk assessment outlined above should be complemented by concrete operational actions to reduce Pemex's exposure to gas. This includes optimizing the use of gas it already produces and exploring diversification options compatible with its mandate.

Reducing gas demand is a central component of any strategy to manage gas-related risks. For Pemex, this requires addressing both its own gas consumption in operations and the efficiency of its production and utilization processes. This approach is consistent with the new legal framework, which mandates improvements in operational efficiency and sustainability⁷², while also requiring the incorporation of clean and renewable energy into its operations⁷³. Current framework also expands Pemex's scope to include activities beyond hydrocarbons⁷⁴.

Pemex's Strategic Plan 2025–2035 includes objectives related to operational efficiency and resource optimization, such as improving cost structures, increasing operational efficiency, eliminating duplication, and enhancing infrastructure use. It also includes emissions reduction goals, energy efficiency targets, and a commitment to achieve zero routine gas flaring by 2030⁷⁵.

However, these objectives are not new. Methane emissions reduction and efficient gas use have been identified as priorities for several years, although implementation has been inconsistent and results uneven⁷⁶. For example, over the past decade, Pemex has been fined for exceeding gas flaring limits established under technical utilization provisions issued by the regulator. One investigation found that, despite having been fined and committing in 2016 to the Comisión Nacional de Hidrocarburos to invest \$3 billion to reduce flaring, Pemex abandoned these plans, left investments incomplete, and continued flaring gas at Ku-Maloob-Zaap. In addition, in 2023 it postponed repairs to damaged equipment on the Zaap-C platform in the Gulf of Mexico, allowing continuous methane releases for several months⁷⁷.

Although recent years have seen some progress—including emissions reductions and the adoption of sustainability targets⁷⁸—significant gaps remain in operational performance and regulatory compliance.

72 See Article 110 of the LEPEPM. Ley de la Empresa Pública del Estado, Petróleos Mexicanos, *Diario Oficial de la Federación*, March 18, 2025, www.diputados.gob.mx/LeyesBiblio/pdf/LEPEPM.pdf

73 See Article 17 of the LEPEPM.

74 See Article 3 of the LEPEPM.

75 Pemex, *Plan Estratégico 2025–2035* (2025), p. 83.

76 R. Pitman y F. Ballesteros, *Closing Implementation Gaps: Recommendations for Pemex to Meet its Emission Reduction Goals*, (NRGI, 2024), resourcegovernance.org/publications/closing-implementation-gaps-recommendations-pemex-meet-its-emission-reduction-goals

77 S. Eschenbacher, "Mexico's Pemex had a plan to fix its flaring problem, but abandoned it", *Reuters*, November 7, 2022, www.reuters.com/business/energy/mexicos-pemex-had-plan-fix-its-flaring-problem-abandoned-it-2022-11-07/; S. Eschenbacher y A. Martell, "Exclusive: Mexico's Pemex put off repairs despite vast methane leak", *Reuters*, March 22, 2024, www.reuters.com/business/environment/mexicos-pemex-put-off-repairs-despite-vast-methane-leaks-documents-sources-2024-03-22/

78 For instance, in 2024, Pemex published its first sustainability plan, which includes emissions intensity reduction targets by business line. Pemex, *Plan de sostenibilidad de Petróleos Mexicanos*, March 2024, p. 25, www.pemex.com/acerca/plan-de-sostenibilidad/Documents/plan_sostenibilidad_pemex.pdf

Optimization of gas use at Pemex

In this context, optimizing gas use is particularly important as a measure to increase the effective availability of this resource and reduce internal consumption, without requiring additional projects or a significant expansion of production. This approach includes more efficient use of produced gas, the reduction of operational losses⁷⁹, and the mitigation of methane leaks, the main component of natural gas.

Capturing wasted gas represents a strategic opportunity: its recovery can reduce the need for imports, generate economic value for Pemex, and contribute to emissions mitigation. According to recent estimates, the potential is significant: the 5.7 billion cubic meters of natural gas flared in 2024 could have replaced approximately 8.5 percent of pipeline gas imports from the U.S. in that same year⁸⁰.

To strengthen gas use optimization, it is recommended to:

- Establish absolute and phased methane emissions reduction targets, complementing existing intensity-based targets and aligned with Mexico's climate commitments and energy planning.
- Strengthen the operational integration of methane management as a strategic planning priority, linking it to efficiency, security of supply, and fiscal sustainability objectives.

- Join the United Nations OGMP 2.0 framework to improve methane measurement, reporting, and verification using internationally comparable standards.
- Prioritize the recovery and productive use of gas that is currently vented or flared, as a measure to increase supply and reduce imports.

Pemex diversification activities

The expansion of Pemex's mandate allows it to develop "activities related to energy sources beyond hydrocarbons"⁸¹. Its Strategic Plan identifies several low-carbon business opportunities, including solar generation for self-consumption, electromobility, lithium production from brines, geothermal energy from wells, electricity generation from abandoned platforms, geological hydrogen, and biofuels⁸².

Some of these initiatives could help reduce Pemex's own gas consumption and exposure to long-term risks. However, as currently defined, they do not represent a comprehensive transformation of its core business, which remains focused on fossil fuel production and commercialization.

Public information on the scope, feasibility, scale, and prioritization of these initiatives is limited, as is information on the public resources allocated to them. This lack of transparency makes it difficult to assess their potential contribution, particularly given the technical, operational, and financial

79 Pitman y Ballesteros, *Closing Implementation Gaps* (2024).

80 J. M. Martín y P. Youngblood, "Opinion: It's time for Mexico to stop flaring its precious natural gas", *Mexico News Daily*, October 2, 2025, mexiconewsdaily.com/business/mexico-natural-gas-flaring-opinion/

81 Authors' translation. Article 110 of the Law of the State-Owned Enterprise Petróleos Mexicanos (LEPEPM).

82 Authors' translation. Pemex, *Plan Estratégico 2025–2035* (2025), p. 73.

constraints facing the company⁸³. Investment decisions in new technologies should therefore be guided by clear criteria related to feasibility, impact, and risk management⁸⁴, consistent with the planning and evaluation recommendations outlined above.

Going forward, Pemex should explore these initiatives transparently, ensuring that public resources are used responsibly and efficiently. At a minimum, the following information should be disclosed for any new non-hydrocarbon initiative:

- Technical and economic feasibility studies for each project (including assumptions, CAPEX/OPEX, timelines, financial indicators, and sensitivity analysis).
- Information on contractual models to be used, enabling stakeholders to understand commercial frameworks and associated risks.
- The names of potential partners, desired partner profiles, and selection criteria and processes.

- Indicative timelines (evaluation phase, pilot phase, scaling) and investment estimates.
- Risk analyses structured around the three dimensions: security of supply, economic and financial, and environmental and climate, with measurable and regularly updated indicators.
- Full disclosure of environmental and social impact assessments in accordance with applicable legislation.

If Pemex and CFE adopt operating models that integrate gas risk management and prioritize the efficient use of available resources, Mexico's energy system will be less exposed to risk. Policymakers will also be more able to make decisions that lead to more reliable, affordable, clean energy. This approach would also lay the foundation for the next stage: structurally reducing gas demand in the power sector through the deployment of alternatives to gas.

83 F. Ballesteros, A. Furnaro, D. Manley y A. Chanona Robles, *Conditional Support for Pemex* (2024).

84 Furnaro, Tagliani, Heller, González, George-Ikoli, Ballesteros y Woodroffe, *National Oil Company Transformation* (2026).

KEY 3

The government should deepen its support for reliable, affordable and clean alternatives to gas, starting with renewable energy in the power sector

KEY POINTS

- The power sector is the main lever for reducing gas demand in Mexico, given its share of total consumption and its growing dependence on combined-cycle power plants.
- Renewable energy—particularly solar and wind—can displace a significant share of gas-based generation in a reliable, affordable and clean manner when integrated with storage and other flexibility resources.
- It is necessary to restore planning and procurement mechanisms, strengthen transmission, and expand large-scale storage, alongside demand management focused on high-consumption users.
- Without policy changes that prioritize these options, current investment decisions in large-scale power generation could lock in gas dependence over the long term.

Renewable potential

Mexico's gas dependence is rarely analyzed from the demand side—that is, in terms of how to reduce the need to consume it. A more comprehensive view of the energy system would complement this approach with policies aimed at diversification, technological substitution and demand management. In the power sector, this

implies not only increasing the share of renewable energy in large-scale generation⁸⁵, but doing so in coordination with storage solutions—particularly battery energy storage systems (BESS)—and other flexibility mechanisms. Together, these elements could structurally reduce the use of gas in electricity generation while maintaining system reliability, which is a key consideration in energy planning.

85 This analysis focuses on the transformation of large-scale electricity generation to reduce the use of gas, with an emphasis on the segments with the highest demand in the electricity system, such as industrial users and other high-consumption loads. Distributed generation represents another relevant pathway for the deployment of renewable energy, although it responds to incentives and challenges different from those considered in this analysis.

The power sector is the easiest place for Mexico to reduce its gas dependence. Power plants currently consume three-fifths of the gas burned in the country and have been the main driver of rising gas demand. Since the beginning of the 21st century, gas use in the power sector has increased fivefold⁸⁶. Transforming the electricity generation mix is therefore the most important lever for structurally reducing gas dependence.

Mexico has enormous renewable energy potential. In solar energy, the country has an average generation potential of around 4.9 kWh per kWp per day—one of the highest in the world. To meet its entire electricity demand, it would need to allocate only about 0.1 percent of its territory to utility-scale photovoltaic plants⁸⁷. In wind energy, Mexico has extensive areas with adequate wind speeds (at least 3 m/s) and an estimated capacity potential of 3,699 GW, capable of generating approximately 5,759 TWh annually—equivalent to about 15 times the electricity demand in 2024⁸⁸.

However, this potential has not translated into sustained deployment. Solar generation in Mexico tripled between 2019 and 2023, but its growth has been slower than in other Latin American countries⁸⁹. This slowdown, as discussed later, is largely due to policies and decisions that have affected its expansion rate, as well as an energy strategy that has prioritized gas.

Strategic deployment of renewable energy requires a more flexible power system. This involves not only increasing its share in generation, but also integrating it with storage solutions and other resources that help manage variability. To realize this potential, mechanisms are needed to facilitate the addition of new capacity and actions to efficiently integrate this generation into system operations.

Renewable energy: three objectives

Renewable energy—particularly solar and wind—can provide reliable electricity supply, competitive costs and lower environmental impacts. These three characteristics contribute to the objectives of Mexico's energy sector.

Reliable energy

Solar and wind energy can strengthen the security and resilience of the power system when integrated into a more flexible and diversified framework. They offer greater independence from risks associated with imported fuel supply and the possibility of more stable long-term supply. While gas supply can be affected by infrastructure disruptions, geopolitical events or external decisions (see Table 1), sunlight and wind are not limited resources nor subject to depletion or interruption from distant events. Although their generation is variable and can destabilize the grid if not properly managed⁹⁰, this is a manageable technical⁹¹ challenge for which countries have developed increasingly effective strategies (see recommendations below)⁹².

86 W. Suarez, *More Gas Imports, Less Energy Independence* (Ember, 2025), ember-energy.org/latest-insights/renewables-point-the-way-to-mexicos-energy-security/more-gas-imports-less-energy-independence/

87 ESMAP, *Global Photovoltaic Power Potential by Country* (2020), World Bank, globalsolaratlas.info/global-pv-potential-study

88 National Renewable Energy Laboratory (NREL), *Mexico Clean Energy Report—Executive Summary* (2022), docs.nrel.gov/docs/fy22osti/82580.pdf

89 W. Suarez, *Renewables point the way to Mexico's energy security* (Ember, 2025), ember-energy.org/latest-insights/renewables-point-the-way-to-mexicos-energy-security/

90 B. McIntosh, "How to Address Risk from the Intermittency of Renewable Energy in Power Markets", *Wood Mackenzie*, April 23, 2024, www.woodmac.com/news/opinion/how-to-address-risk-from-the-intermittency-of-renewable-energy-in-power-markets/; A. Fattahi, J. Sijm y A. Faaij, "A systemic approach to analyze integrated energy system modeling tools: A review of national models", *Renewable and Sustainable Energy Reviews*, vol. 133, November 2020, doi.org/10.1016/j.rser.2020.110296

91 Pemex, *El reto del almacenamiento de energía limpia* (2025), www.pemex.com/saladeprensa/mix_energetico/Paginas/me_2025_09.aspx

92 Voltalis, *5 ways to overcome the challenges of renewable energy* (2025), voltalis.co.uk/blog/renewable-energy-challenges-solutions/

Affordable energy

Electricity generation costs from gas-fired combined-cycle power plants are exposed to volatility in international markets. By contrast, electricity from solar and wind farms has a more stable cost structure. The “fuel” for these technologies is free and available on-site, so costs are mainly concentrated in upfront infrastructure investment. In combined-cycle power plants, fuel cost is the main variable determining operating costs. In addition, operation and maintenance costs for solar and wind electricity tend to be lower than those of conventional thermal plants, contributing to greater cost predictability over time⁹³.

Evidence suggests that renewables are a competitive option for new power generation. Globally, a recent analysis found that 91 percent of newly commissioned utility-scale renewable capacity produced electricity at lower cost than the cheapest fossil alternative, measured by levelized cost of electricity (LCOE)⁹⁴. In recent years, utility-scale solar costs in Mexico have been comparable to—and even lower than—those of combined-cycle power plants. Between 2019 and 2023, solar PV LCOE ranged between 0.053 and 0.080 USD/kWh⁹⁵, while combined-cycle LCOE ranged between 0.048 and 0.076 USD/kWh, with a notable increase in 2021–2022 due to rising global gas prices⁹⁶. This also shows that solar and wind LCOE have been less volatile.

Long-term affordability for the government must also be considered. The level of subsidies required for gas and renewables to remain

competitive under different scenarios has not been fully analyzed. The relative affordability of these technologies is not static; it depends largely on public policy and financial support. A recent analysis estimated that if Mexico achieved its target of 45 percent clean energy by 2030, the country could save approximately USD 1.6 billion in gas imports in a single year⁹⁷. The same analysis found that meeting the target would reduce gas imports by about one-fifth.

Clean energy

Lifecycle emissions from solar and wind farms are significantly lower than those from gas-fired power plants. This is mainly due to the absence of fossil fuel combustion during operation⁹⁸. While the construction, installation, and maintenance of renewable energy infrastructure involve indirect emissions, studies show that these are considerably lower than those associated with gas-based technologies when assessed over the full life cycle, including fuel extraction, processing, and transportation⁹⁹.

Renewable energy represents a reliable, affordable and clean alternative to gas in Mexico. The central challenge is to accelerate its deployment in the power system so it can effectively reduce gas consumption. Two complementary approaches stand out: on the one hand, strengthening planning and procurement mechanisms to enable the large-scale integration of renewable capacity; on the other, developing the system's enabling conditions—particularly battery storage, especially under schemes that maximize its use at the

93 Instituto de Desarrollo, Energía y Ambiente (IDEA), *Alternativas renovables para el desarrollo de baja California Sur* (2025), ideathinktank.org.mx/wp-content/uploads/2026/03/Alternativas-Renovables-para-el-Desarrollo-de-Baja-California-Sur-1.pdf

94 International Renewable Energy Agency (IRENA), *Renewable Power Generation Costs in 2024* (2025), www.irena.org/-/media/Files/IRENA/Agency/Publication/2025/Jul/IRENA_TEC_RPGC_in_2024_2025.pdf

95 IRENA, *Renewable Power Generation Costs in 2023* (2024), www.irena.org/Publications/2024/Sep/Renewable-Power-Generation-Costs-in-2023

96 IRENA, *Renewable Power Generation Costs in 2023* (2024).

97 W. Suarez, *Renewable energy: Achievable and beneficial* (Ember, 2025), ember-energy.org/latest-insights/renewables-point-the-way-to-mexicos-energy-security/renewable-energy-achievable-and-beneficial/

98 United Nations Economic Commission for Europe (UNECE), *Carbon Neutrality in the UNECE Region: Integrated Life-cycle Assessment of Electricity Sources* (2022), unece.org/sites/default/files/2022-04/LCA_3_FINAL%20March%202022.pdf

99 NREL, *Life Cycle Greenhouse Gas Emissions from Electricity Generation: Update* (2021), docs.nrel.gov/docs/fy21osti/80580.pdf

system level, transmission network expansion, and demand-side management, especially in high electricity consumption segments—to ensure reliable and continuous operation.

RECOMMENDATION

Adapt competitive procurement mechanisms for grid-connected solar and wind projects, consistent with the current power sector framework

International¹⁰⁰ and regional¹⁰¹ evidence shows that competitive procurement mechanisms, such as auctions, have been effective tools for acquiring large-scale renewable capacity. They help secure new capacity at competitive prices and mobilize significant private investment. However, their effectiveness depends not only on bid prices, but also on stable regulatory frameworks and sufficient state capacity to coordinate system planning, transmission expansion and permitting processes. In Mexico's current context, these mechanisms could complement recently introduced mixed-investment schemes, helping expand electricity supply and reduce dependence on gas.

In Mexico, long-term auctions implemented after the 2015 reform enabled the procurement of energy, capacity and Clean Energy Certificates¹⁰². Between 2016 and 2018, they mobilized more than USD 8 billion in investment¹⁰³ and awarded 7.4 GW of new capacity, mainly solar and wind. Prices reached record international lows, such as USD 20.57/MWh in the third auction¹⁰⁴.

This experience has also yielded important lessons for the design of these mechanisms, underscoring the importance of pairing procurement mechanisms with comprehensive electricity system planning. A portion of the awarded projects faced delays or did not reach commercial operation due to factors such as permitting bottlenecks, municipal conflicts, and transmission infrastructure constraints¹⁰⁵. Likewise, the low costs recorded did not translate directly into lower final prices for consumers¹⁰⁶.

Despite these limitations, the experience of the 2010s demonstrated the capacity of auctions to attract investment, expand renewable generation, and establish competitive price benchmarks. Their cancellation beginning in 2019¹⁰⁷ eliminated one of the main mechanisms for contracting new capacity, reducing investment certainty for renewable energy projects. This decision stemmed from a public policy orientation favoring fossil fuels, rather than from a technical evaluation of the auction outcomes.

In the current electricity sector framework—characterized by more centralized planning, the principle of state primacy, and the introduction of mixed investment schemes—the reinstatement of competitive mechanisms could complement ongoing efforts to deploy renewable energy and contribute to energy transition objectives. Mixed projects allow investment to be channeled through partnership arrangements with the state and

100 IRENA, *Renewable energy auctions: Design for risk allocation* (2026), www.irena.org/-/media/Files/IRENA/Agency/Publication/2026/Jan/IRENA_POL_RE_auction_design_risk_allocation_2026.pdf

101 A. Podestá, M. Silvin Eirin, R. Contreras Lisperguer y R. Salgado Pavez, *Políticas de atracción de inversiones para el financiamiento de la energía limpia en América Latina* (CEPAL, 2022), repositorio.cepal.org/server/api/core/bitstreams/4e3ed738-06ee-45cc-9f79-7c2457b327bc/content

102 Acuerdo por el que se emite el Manual de Subastas de Largo Plazo, *Diario Oficial de la Federación*, November 10, 2015, dof.gob.mx/nota_detalle_popup.php?codigo=5416021

103 A. Chanona Robles, *México frente a la geopolítica de las energías renovables* (UNAM, 2021), archivos.juridicas.unam.mx/www/bjv/libros/14/6571/15.pdf

104 Sener, "En la tercera Subasta Eléctrica mexicana se obtuvo uno de los precios más bajos internacionalmente", *Gobierno de México*, November 2017, www.gob.mx/sener/prensa/en-la-tercera-subasta-electrica-mexicana-se-obtuvo-uno-de-los-precios-mas-bajos-internacionalmente-pjc

105 C. Guadarrama, "Renewable Energy Auctions in Mexico: The Gap Between Design and Implementation", *The Public Sphere Journal*, vol. 7, no. 1 (2019), psj.lse.ac.uk/articles/72/files/submission/proof/72-1-141-1-10-20190813.pdf

106 Guadarrama, "Renewable Energy Auctions in Mexico" (2019).

107 Oficio No. SENER.100/2019/075, *Diario Oficial de la Federación*, January 2019, www.cenace.gob.mx/Docs/MercadoOperacion/Subastas/2018/40%20Acuerdo%20de%20Cancelaci%C3%B3n%20de%20la%20SLP%20No.1%202018%20v31%2001%202019.pdf

have shown interest from the private sector in their initial calls; however, they do not replace the need for competitive mechanisms that enable the transparent identification of the lowest-cost and most efficient options for the electricity system.

To ensure that the reinstatement of these mechanisms aligns with the sector's current objectives, it is recommended to:

- Establish a clear environment for project development—particularly with respect to permits, licenses, and social engagement—through coordinated processes among authorities, defined timelines, and public monitoring mechanisms that reduce administrative uncertainty. Certainty in these processes is a necessary condition to attract investment and ensure the timely execution of awarded projects.
- Integrate procurement mechanisms into the binding planning instruments of the electricity system, so that volumes, locations, and timelines reflect the needs identified in PLADESE, including transmission network expansion based on renewable generation potential.
- Design procurement mechanisms in a manner consistent with the principle of state primacy, allowing private participation under schemes in which CFE acts as the primary buyer, contractual counterparty, or partner in mixed investment arrangements.
- Incorporate objective and verifiable prequalification criteria—such as permitting progress, site availability, and technical and financial capacity—to reduce the risk of bids lacking implementation feasibility, without compromising transparency or competition in the process.

- Include performance clauses and guarantees to enable the timely management of noncompliance in awarded projects, to preserve the credibility of the instrument.

RECOMMENDATION

Implement new policies, initiatives and public investments to accelerate the integration of renewables into the power grid

Mexico will require a more modern, flexible and digitalized power system to manage the growing variable generation from utility-scale solar and wind. The existing grid already faces significant challenges, such as congestion in transmission lines and limited interconnection capacity in regions with high renewable potential. Alongside the expansion of solar and wind energy—which would gradually replace gas—it will be necessary to develop new infrastructure, system operating models and public initiatives to strengthen system flexibility, maintain stability and control costs. Two lines of action are particularly relevant:

- **Expand electricity storage as an alternative to gas**, prioritizing schemes that allow for flexible and shared use at the system level. The integration of large-scale battery storage systems enables shifting generation over time and reduces the need to rely on conventional plants to meet daily or seasonal peaks without causing blackouts or grid failures.
- **Develop new electricity demand management mechanisms**, especially focused on high-consumption users. System operators can better anticipate and manage demand as a tool to maintain stability. This requires advancing grid digitalization, advanced metering and operational capabilities that allow real-time consumption management and facilitate energy exchange between regions. Currently, demand management measures

in Mexico are applied in a reactive and ad hoc manner, primarily focused on preventing last-minute outages rather than structurally optimizing system operation.

International experiences illustrate the potential of these tools. In California, battery storage capacity grew from approximately 500 MW in 2018 to more than 15,700 MW in the first quarter of 2025. This has made it possible to reduce thermal generation dispatch during peak hours and limit the operation of gas plants used as backup¹⁰⁸, largely through storage systems deployed at the system level. California has set a target of 52,000 MW of storage by 2045 as part of its reliability and decarbonization strategy¹⁰⁹, reflecting the central role of these systems in transforming power systems.

In Mexico, current sectoral plans do not sufficiently advance in these areas. For example, neither PROSENER nor PLADESE substantively address demand management. They also do not offer compensation mechanisms or incentives for users to modify their electricity consumption patterns, nor do they sufficiently consider the investments in grid digitalization and operational modernization needed to enable improved demand management.

For their part, storage targets in both documents are general: they are expressed as aggregate capacity additions (8,647 MW between 2025 and 2039¹¹⁰), but lack detailed implementation pathways, clear technical criteria or integration

schemes into system operations. In addition, some assumptions used in planning—such as the storage share (30 percent) associated with renewable capacity growth—are not fully justified in technical or economic terms. This limits the ability to assess whether the proposed targets are sufficient and to guide investment decisions strategically.

PLADESE includes other relevant targets to strengthen the power system—such as freeing up transmission capacity between regions, reducing system losses and improving voltage control—which may support renewable energy growth. However, taken together, these measures appear oriented toward reinforcing the current system rather than structurally transforming it to operate with higher shares of variable renewable generation.

The integration of storage and other flexibility solutions required to integrate renewables will involve significant short-term costs. In March 2025, the government announced that all new solar and wind plants must incorporate battery systems equivalent to 30 percent of their installed capacity, with a minimum duration of three hours. This approach represents progress¹¹¹, but its full value would be realized if storage could operate with a system-wide logic rather than only as a complement to individual projects.

Moreover, battery storage costs for renewable projects in Mexico are currently high compared

108 G. Hering, "California Batteries Taking Bigger Bite Out of Gas-Fueled Energy", *S&P Global*, December 26, 2024, www.spglobal.com/commodity-insights/en/news-research/latest-news/natural-gas/122624-california-batteries-taking-bigger-bite-out-of-gas-fueled-energy; California Energy Commission, *California Energy Storage System Survey* (2025), www.energy.ca.gov/data-reports/energy-almanac/california-electricity-data/california-energy-storage-system-survey; B. Plumer y N. Popovich, "Giant Batteries are Transforming the Way the U.S. Uses Electricity", *The New York Times*, May 2024, www.nytimes.com/interactive/2024/05/07/climate/battery-electricity-solar-california-texas.html

109 California Energy Commission, *California Energy Storage System Survey* (2025).

110 Acuerdo por el que la Secretaría de Energía emite el Plan de Desarrollo del Sector Eléctrico, *Diario Oficial de la Federación*, October 17, 2025, www.dof.gob.mx/nota_detalle.php?codigo=5770297&fecha=17/10/2025#gsc.tab=0

111 M. Maisch, "Mexico announces battery storage mandate for renewable energy plants", *pv magazine*, March 31, 2025, www.pv-magazine.com/2025/03/31/mexico-announces-battery-storage-mandate-for-renewable-energy-plants/

to international benchmarks¹¹². Reducing these costs depends largely on deployment scale and the development of local capabilities. Therefore, public-private financing schemes are needed to prevent investors from perceiving this requirement as overly burdensome, which could slow renewable deployment¹¹³ or even prolong dependence on gas.

To build a power system capable of accelerating renewable integration in line with the country's energy objectives:

- Sener should adopt a national target for system-wide storage capacity, similar to international approaches such as California's, and incorporate it into the next PROSENER, along with verifiable indicators and an implementation timeline.
- ENTE and PROSENER should specifically model how and to what extent battery storage systems could substitute gas-fired power generation to maintain grid stability as renewable penetration increases.
- Sener should integrate more detailed and ambitious criteria, scenarios, targets and projects for storage development and other flexibility solutions into PLADESE, ensuring expansion responds to specific operational needs rather than aggregate capacity targets.
- CNE should explore differentiated remuneration schemes for storage-based

ancillary services that recognize their economic value in system stability and as an alternative to gas-fired generation for providing backup services.

- CENACE should advance grid digitalization efforts while also modelling and piloting demand-management mechanisms, such as time-of-use tariffs or voluntary consumption reduction agreements for high-consumption users—particularly industrial users—as well as schemes that enable gradual participation by residential users.
- Sener, together with the Ministry of Finance (SHCP), should develop preferential financing schemes or specific development conditions that actively incentivize storage deployment, facilitate capital cost reductions through economies of scale and mitigate perceived risks for investors and end users.

Harnessing the potential of renewable energy—alongside storage, well-designed procurement mechanisms and demand management—is one of the most achievable ways to reduce gas use in the power sector. Expanding these solutions can lower structural demand for this fuel and diversify the energy mix. To consolidate these advances, it will be essential to strengthen the availability and quality of information so that policy and investment decisions are evidence-based and can be evaluated transparently.

112 K. Rangelova, D. Jones y W. Suárez, *La reducción de los costos de las baterías puede liberar el potencial solar de México y robustecer su seguridad energética* (Ember, 2025), ember-energy.org/app/uploads/2025/09/ES-Report-La-reduccion-de-los-costos-de-las-baterias-puede-liberar-el-potencial-solar-de-Mexico-y-robustecer-su-seguridad-energetica.pdf

113 Organización Latinoamericana de Energía, *Libro blanco del almacenamiento de energía en América Latina y el Caribe: estado actual, desafíos y recomendaciones estratégicas* (OLADE, 2025), www.olade.org/wp-content/uploads/2025/10/LIBRO_ESPANOL_FINAL.pdf

KEY 4

The government and energy companies should strengthen information disclosure to support a more inclusive and evidence-based debate on the future of gas

KEY POINTS

- Transparency can help stakeholders see the risks of gas and support the goals of reliable, affordable and clean energy.
- The lack of disaggregated, project-level information makes it hard to assess fiscal exposure, structural risks and efficiency in resource allocation in the gas sector.
- Progress is needed toward publishing standardized, project-level information—including costs, emissions, asset lifetimes and import dependence—in open and comparable formats.
- Any new disclosures will also need new institutional capacity to analyze them, for instance through tools like standardized templates, stress testing and public dashboards.

Transparency can serve as a systematic tool to make the risks associated with gas visible and to contribute to the objectives of reliable, affordable and clean energy. Without detailed information at the project and portfolio levels, decision-makers cannot act in an informed manner. They cannot adequately estimate fiscal exposure or assess structural lock-in risks. Nor can they identify potentially inefficient allocations of public and private capital, or measure the additional cost that opacity imposes on public finances and investors.

The current landscape of information on the role of gas in Mexico's energy system is mixed. For example, the LPTE establishes the creation of a website¹¹⁴ with the reports and information required by law. The Hydrocarbons Sector Law (LSH) requires Sener to publish monthly information on volumes of gas transported and stored, as well as statistics on transportation, distribution and commercialization¹¹⁵. Likewise, the hydrocarbons legal framework mandates the publication of information on contracts, assignments, permits and payments, including

114 See Article 87 of the LPTE.

115 See Article 124 of the LSH.

associated revenue and cost information. However, it also provides for significant restrictions, as information related to facilities, operations and infrastructure may be classified as confidential for national security reasons.

The Electricity Sector Law (LSE) establishes obligations to publish information relevant to system operation and the Wholesale Electricity Market. In particular, CENACE must publish information on prices, capacities and system planning¹¹⁶, and the Market Rules define what information is accessible to participants and the public¹¹⁷. However, this information is primarily presented in aggregated form and does not allow for direct identification of the role of gas as an input in electricity generation.

Similarly, planning documents such as the Natural Gas Outlook 2023–2037¹¹⁸ and PLADESE present supply and demand scenarios, but lack disaggregated assumptions on prices, contractual risks or climate compatibility metrics at the project level.

These laws and plans create a fragmented transparency landscape. While the electricity sector produces detailed information on system operations, it does not allow for evaluation of the role of gas at the project level; and the hydrocarbons sector, although it discloses contractual and financial information, does not provide sufficient visibility into the operational use of gas within the energy system. This gap prevents public and private actors from assessing decisions that will shape resource allocation for decades, as well as their impact on system reliability, energy costs and emissions. Without more detailed

information, civil society, academia and other independent researchers cannot adequately analyze the costs, benefits and trade-offs associated with new infrastructure or announced policies.

The lack of transparency also weakens political accountability for long-lived gas investments, whose costs may materialize years after approval, including potential fiscal impacts that are not fully visible at the time decisions are made¹¹⁹. Moreover, opacity tends to keep the debate on gas and energy abstract, high-level and polarized, as noted in the introduction. When there is insufficient evidence to examine claims, biases and assumptions, broad and difficult-to-verify assertions tend to proliferate¹²⁰.

RECOMMENDATION

State-owned energy companies should disclose project- and portfolio-level information on gas investments

Despite the legal framework requiring greater sectoral transparency, as of February 2026 there are no public project-level reports that integrate economic, contractual, and transition-related variables into a single, comparable format. Existing disclosures remain fragmented or aggregated, which makes it hard to evaluate the economic viability of projects, their exposure to risks affecting system reliability, and their compatibility with the energy transition. Without standardized data at the project and portfolio levels, public planning cannot transparently assess whether individual investments—or their cumulative effect—strengthen resilience or deepen systemic risks.

116 See Articles 110 and 179 of the LSE.

117 See Article 111 of the LSE.

118 Sener, *Prospectiva de gas natural 2023-2037* (2024), base.energia.gob.mx/Prospectivas23/PGN_23-37_F.pdf

119 Furnaro, Tagliani, Heller, González, George-Ikoli, Ballesteros y Woodroffe, *National Oil Company Transformation* (2026).

120 C. Boyer y R. Pitman, *How Accountability Actors Can Use the 2023 EITI Standard to Support a Just Energy Transition: A Practical Guide* (NRGI, 2024), resourcegovernance.org/publications/how-accountability-actors-can-use-2023-eiti-standard-support-just-energy-transition

Publishing information in open and reusable formats would facilitate independent technical scrutiny and enable comparisons between state-owned and private portfolios under consistent criteria. To close this gap, Sener should require:

- Publication of standardized project- and portfolio-level information to enable a comprehensive assessment of how gas investments contribute to the reliability, affordability, and sustainability of the energy system. This should include:
 - Reliability: explicit demand assumptions (including time horizon and sources), risk assessments (price, demand, regulatory, and climate), import dependence, geographic concentration, and stress scenarios
 - Affordability: CAPEX and OPEX estimates, reference prices and sensitivity analyses, as well as relevant contractual structures (including take-or-pay clauses)
 - Environmental and climate compatibility: emissions estimates and asset lifetimes
- Integration of cross-sectoral information, linking data from the hydrocarbons sector (production, transport, contracts) with power system performance (generation, dispatch, costs), so that the role of gas as an input can be evaluated at the project and portfolio levels.
- Ensuring all information is published in open, machine-readable, and reusable formats, enabling independent technical scrutiny and comparison across state-owned and private portfolios using consistent criteria.
- Strengthening international disclosure standards, including re-engagement with the Extractive Industries Transparency Initiative, which provides an operational framework for project-level reporting and reconciliation

of fiscal payments, contracts, and beneficial ownership. However, its effectiveness would depend on formal commitment and full participation by authorities and companies.

RECOMMENDATION

Strengthen transparency mechanisms and institutional capacity to analyze disclosed information and incorporate it into energy planning

The publication of information, on its own, does not guarantee better public policy decisions. The 2024 constitutional reform and its secondary laws do not define standardized reporting methodologies, clear technical verification processes, or analytical tools to translate disclosures into better-informed decisions. Without institutional capacity to assess project-level data, conduct stress tests, and compare investments under consistent assumptions, formal transparency will not enable the anticipation of risks that could affect system reliability, increase costs, or undermine climate targets.

To ensure that disclosure supports risk management and planning, the government should:

- Establish standardized project-level reporting templates, with clearly defined economic, fiscal, risk, and transition metrics, enabling regulators and planning agencies to compare investments under consistent assumptions.
- Allocate dedicated technical resources within Sener, Semarnat, CONUEE, CENACE, and the newly created CNE to assess disclosures, conduct scenario analysis, and translate findings into binding planning instruments. In doing so, existing capacities, methodologies, and platforms previously developed by the National Hydrocarbons Commission could be leveraged.

- Develop and publish standard methodologies for stress testing and systemic risk assessment, including scenarios of shocks in prices, demand, or public policy applicable to both the hydrocarbons sector and the power system.
 - Create analytical tools and public dashboards, integrated into a single sectoral information portal, to enable comparisons across projects, portfolios, and years in simple and transparent formats.
 - Incorporate formal peer-review mechanisms for reporting methodologies and analytical models, strengthening technical credibility and reducing discretion across administrations.
- Having standardized and accessible project-level information makes it possible to identify risks associated with gas, reduce discretion, and evaluate available alternatives more rigorously. In this way, transparency contributes both to accountability and to improved management of supply security, economic, and environmental risks.

Concluding remarks

Mexico's structural gas dependence extends well beyond its reliance on U.S. imports. It is the result of decades of compounding decisions about how the country plans, invests in and operates its energy system. Addressing it requires a shift in approach that places demand-side management at the center of public policy, supported by binding planning instruments, more robust risk assessment criteria, adjustments to the operating models of state-owned enterprises, and greater transparency.

The proposals in this report do not seek to eliminate the role of gas in the short term, but rather to gradually reduce its structural weight

and the risks associated with its use. Taken together, they outline a pathway toward a more resilient energy system that can better respond to uncertainty in international markets, fiscal pressures, and Mexico's climate commitments.

Without these changes, Mexico's energy future will be shaped by technological, regulatory, and financial inertia instead of deliberate strategic decisions. Moving toward an approach based on risk management, efficiency, and diversification would expand the country's room for maneuver and strengthen its ability to build a more reliable, affordable, and clean energy mix over the long term.

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About NRGi

Natural Resource Governance Institute is an independent, nonprofit organization that supports informed and inclusive decision-making on natural resources and the energy transition. We work in partnership with change agents in governments and civil society to design and implement fair, evidence-based policies aligned with the priorities of citizens in resource-rich developing countries. More information: www.resourcegovernance.org
