



# Country Analysis Brief: Venezuela

Last Updated: February 8, 2024

Next Update: February 2026

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## Overview

**Table 1. Venezuela's energy overview, 2021**

|   | Crude oil<br>and other<br>petroleum<br>liquids | Natural<br>gas | Coal | Nuclear | Hydro | Other<br>renewables | Total  |
|---|--|----------------|------|---------|-------|---------------------|--------|
| Primary energy<br>consumption (quads)         | 0.66   | 0.61           | 0.00 | --      | 0.53  | 0.00                | 1.81   |
| Primary energy<br>consumption<br>(percentage) | 36.7%  | 33.8%          | 0.1% | --      | 29.4% | 0.0%                | 100.0% |
| Primary energy<br>production (quads)          | 1.35   | 0.61           | 0.00 | --      | 0.51  | 0.03                | 2.50   |
| Primary energy<br>production (percentage)     | 53.9%  | 24.5%          | 0.2% | --      | 20.4% | 1.0%                | 100.0% |
| Electricity generation<br>(terawatthours)     | 10.04  | 23.61          | --   | --      | 61.00 | 0.10                | 94.75  |
| Electricity generation<br>(percentage)        | 10.6%  | 24.9%          | --   | --      | 64.4% | 0.1%                | 100.0% |

Data source: U.S. Energy Information Administration, International Energy Statistics; the International Energy Agency, *World Energy Statistics 2022*; and Energy Institute, *Statistical Review of World Energy 2023*

Note: Quads=quadrillion British thermal units. *Other renewables* include solar and wind.

- Several factors have severely hampered Venezuela's energy sector, most notably government mismanagement, international sanctions, and the country's economic crisis. These factors led to a lack of investment and maintenance in the energy sector and a deteriorating infrastructure.<sup>1</sup> As such, Venezuela's total energy production decreased by an annual average rate of 8.2% from 2011 to 2021. Petroleum and other liquids accounted for most of the energy production decrease.<sup>2</sup>
- Since 2005, the United States has imposed sanctions on Venezuelan individuals and entities for criminal, antidemocratic, or corrupt behavior. The U.S. government began to grant exemptions from sanctions on Venezuela starting in 2022, allowing more crude oil from Venezuela to enter the global market.
- U.S. crude oil imports from Venezuela stopped shortly after the United States imposed sanctions on state oil company Petróleos de Venezuela SA (PDVSA) in January 2019. In November 2022, the U.S. Department of the Treasury's Office of Foreign Assets Control (OFAC) granted Chevron waivers to resume exporting crude oil from its joint venture operations in Venezuela to U.S. Gulf Coast refineries, which resumed in January 2023.<sup>3</sup> In addition, OFAC granted Trinidad and Tobago a two-year license to collaborate with PDVSA on the development of an offshore natural gas field in January 2023. OFAC amended the license in October 2023 to allow cash payments for the natural gas.<sup>4 5</sup>

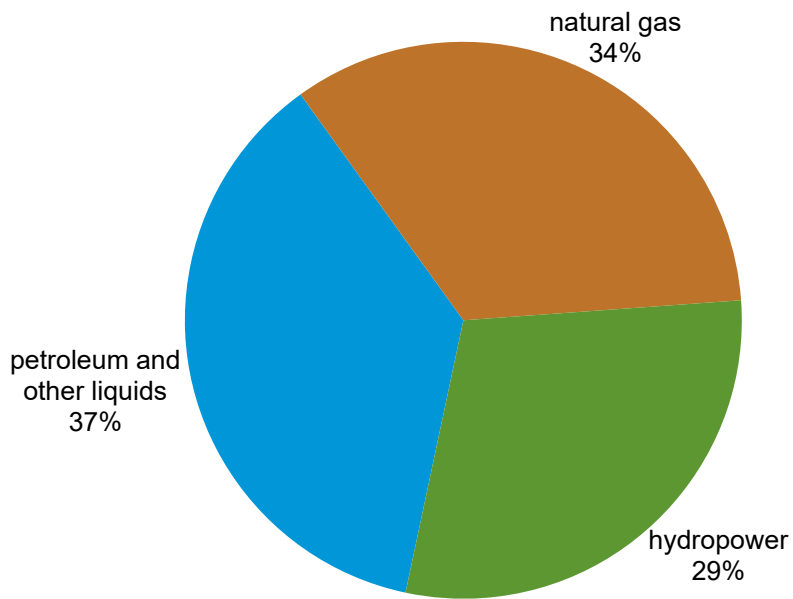
- In October 2023, OFAC issued licenses easing some sanctions on Venezuela through April 2024 in exchange for assurances that Venezuela's government would allow opposition candidates to run in the elections. Eased restrictions allow for the sale of Venezuela's crude oil to the United States, payments to PDVSA, and investment in new oil and natural gas projects, subject to certain conditions. Furthermore, the United States removed restrictions on the secondary trading of certain Venezuelan bonds as well as PDVSA debt and equity.<sup>6</sup>
- We expect that [Venezuela's crude oil output growth will be limited](#) following the lifting of sanctions. Much of Venezuela's crude oil production capacity and infrastructure have suffered from a decade-long lack of capital and regular maintenance. Chevron's earlier exemption increased its production to 135,000 barrels per day (b/d) in 2023, and we expect Chevron's output in Venezuela to reach 200,000 b/d by the end of 2024. According to IPD Latin America, ventures operated by ENI, Repsol, and Maurel & Prom could increase production by an additional 50,000 b/d in the near term. As a result, we estimate that these projects will increase Venezuela's total output to around 900,000 b/d by the end of 2024.<sup>7</sup>
- Venezuela's restrictive economic policies (Figure 3) have resulted in a decrease in inflation-adjusted GDP per capita, which has led to a decrease in energy consumption (Figure 4). Venezuela has the refining capacity to meet its domestic demand, but the country's refineries are in poor condition. A crippled downstream sector, years of divestments, and poor maintenance have led to a severe shortage of transportation fuels in Venezuela. Because of U.S. sanctions, refined fuel import capabilities have been limited, restraining the availability of refined fuels for consumption in Venezuela. Yet, since 2020, petroleum imports from Iran have lessened gasoline shortages. Since the end of 2022, PDVSA has been collaborating with Iran on repair and maintenance work at the state-owned refineries.<sup>8</sup>

Figure 1. Map of Venezuela



Data source: U.S. Central Intelligence Agency, [CIA World Factbook—Venezuela](#)

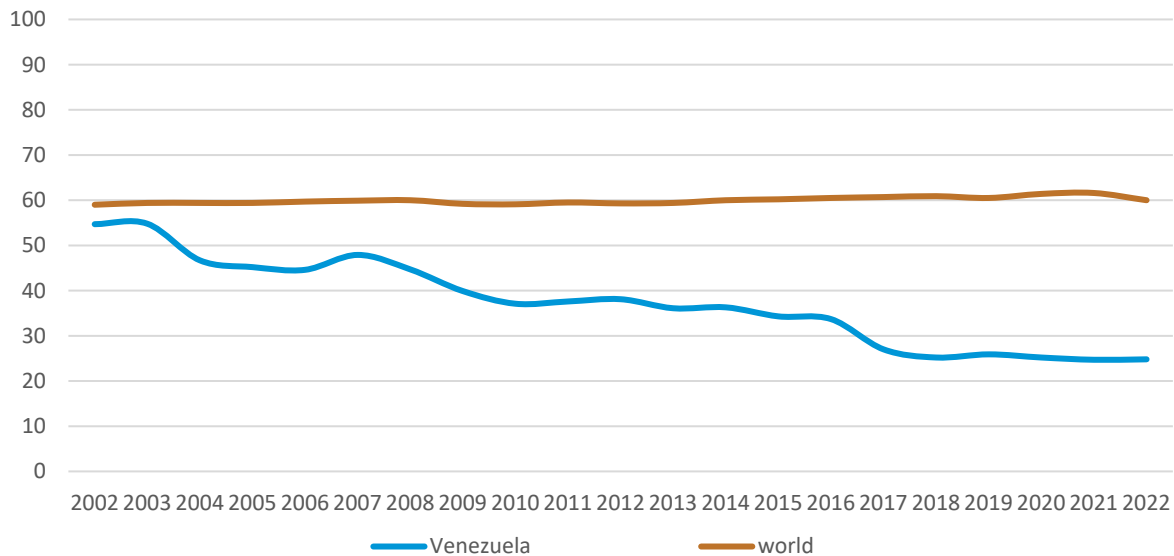
**Figure 2. Total primary energy consumption in Venezuela by fuel type, 2021**  
percentage of total energy consumption



Data source: U.S. Energy Information Administration, International Energy Statistics

**Figure 3. Index of Economic Freedom, 2012–2022**

0=least free; 100=most free

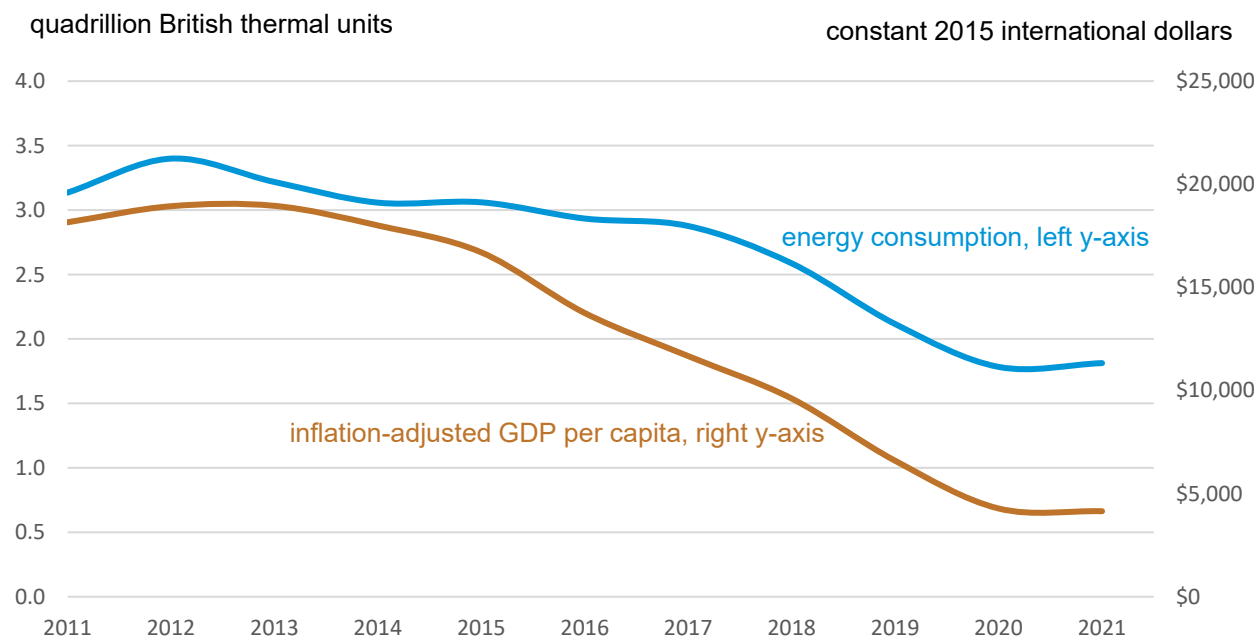


Data source: The Heritage Foundation

Note: The Heritage Foundation assesses economic freedom using 12 quantitative and qualitative factors organized into four broad categories, or pillars, of economic freedom: rule of law, government size, regulatory efficiency, and open markets. Each of these categories' 12 economic freedoms is graded on a scale of 0 to 100. The overall score of a country is calculated by averaging these 12 economic freedoms, with equal weight given to each.



**Figure 4. Venezuela’s total primary energy consumption and inflation-adjusted GDP per capita, 2011–2021**



Data source: U.S. Energy Information Administration, International Energy Statistics

Note: An international dollar would buy the same amount of goods and services in the cited country that a U.S. dollar would buy in the United States. This term is frequently used with data on purchasing power parity.



## Petroleum and Other Liquids

- Venezuela had the world's largest proven crude oil reserves in 2023 with approximately 303 billion barrels (Figure 5), accounting for approximately 17% of global reserves (Figure 6). Despite the sizeable reserves, Venezuela produced 0.8% of total global crude oil in 2023. Most of Venezuela's proven oil reserves are extra-heavy crude oil from the Orinoco Belt. The extraction of extra-heavy crude oil requires a higher level of technical expertise, which international oil companies possess but their involvement has been limited by international sanctions. Furthermore, budgetary constraints at Venezuela's state oil company PDVSA and a lack of qualified technical personnel and foreign direct investment have all hampered Venezuela's oil and natural gas development.
- PDVSA is the largest source of revenue for the Venezuelan government. When Venezuela nationalized its oil industry in the 1970s, PDVSA was formed. The government gave the company significant autonomy until the 1990s, when it took direct control of PDVSA. By imposing a 40%–45% levy on PDVSA, the Venezuelan state has used the state oil company as a revenue stream to fund a variety of social programs, particularly under Presidents Chavez and Maduro. State control of PDVSA has reduced profit reinvestment, contributing to declining petroleum production over the last decade.<sup>9</sup>
- In 2023, Venezuela produced 742,000 b/d of crude oil, a 70% cumulative decline from production levels in 2013. Yet, for the first time in a decade, Venezuela's crude oil production increased by 13% in 2021 and 18% in 2022 (Figure 7). The increase was the

result of a few factors, including assistance from Iran in the form of shipments of diluents required for transporting and processing Venezuela's extra-heavy crude oil, technical assistance from China National Petroleum Corporation (CNPC) on specific fields, and the partial return of some local oil field service providers after PDVSA settled a portion of its debt, allowing some workover and maintenance rigs to operate and boost production levels (Figure 8). The recent increase suggests a growth trend, with Chevron playing a key role. Following the waiving of some sanctions, Chevron has increased naphtha and condensate shipments to provide diluent for the project it jointly operates with PDVSA.<sup>10</sup> We expect a moderate increase in Venezuela's crude oil production in 2024, but increased power outages and limited diluent are risk factors.

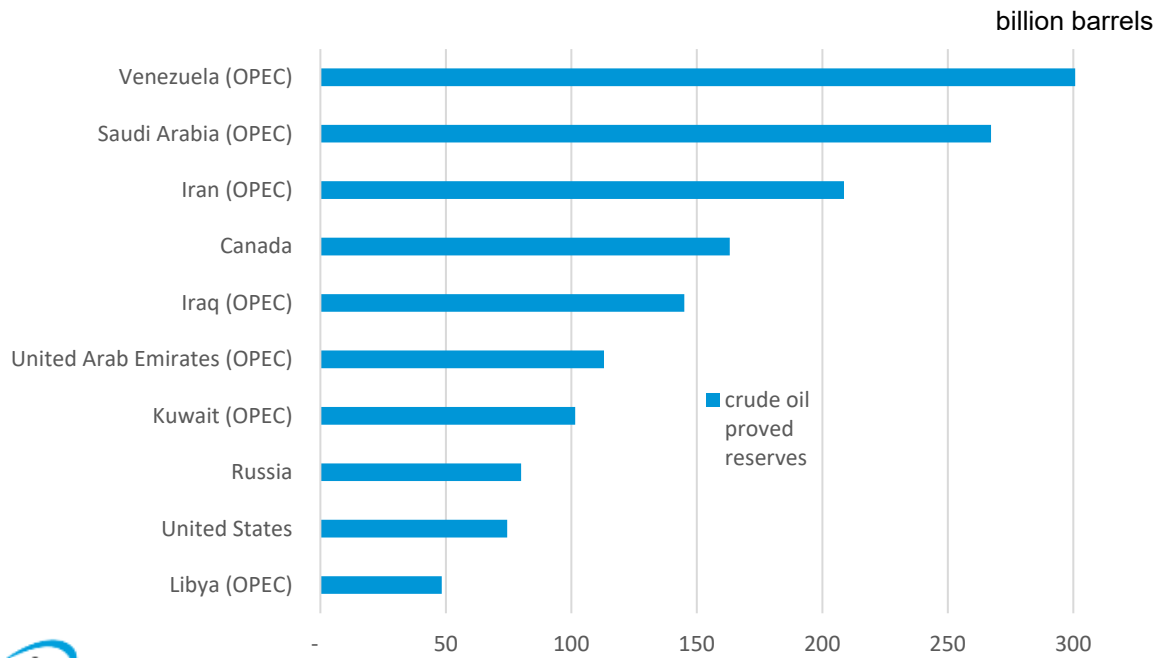
- PDVSA owns and operates Venezuela's five refineries, which have a total nameplate processing capacity of 1.46 million b/d as of 2022 (Table 2). Much like the rest of the sector, the midstream is facing significant challenges as a result of ongoing underinvestment and mismanagement.<sup>11</sup> The firing of nearly 20,000 highly skilled workers in the early 2000s, combined with a reported tendency to hire based on government loyalty rather than technical skill, continues to affect operations, resulting in a lack of high-level expertise. Venezuela's extra-heavy crude must be processed by specialized refineries, making development economically, environmentally, and technologically costly.<sup>12</sup> Venezuela's Cardon and Amuay refineries are part of the Paraguana Refining Center, which is one of the world's largest but has been operating at a fraction of capacity for the last decade because of lack of maintenance. After two crude oil distillation units (CDUs) were shut down because of a fire and a lack of feedstock, the entire complex was processing at about 10% of its nameplate capacity as of October 2023.<sup>13</sup> As a result, distribution issues at the Paraguana Refining Center dispatch center hampered the supply of gasoline and diesel to the domestic market.<sup>14</sup>
- In October 2023, the U.S. District Court for the District of Delaware started a process to sell three refineries owned by Citgo parent company PDV Holdings, a U.S. subsidiary of PDVSA. Together, the three refineries account for about 5% of the United States' refining capacity. Citgo's refinery assets have a high coking capacity and can handle relatively heavy crude oil slates. All three refineries processed imported crude oil supplied by PDVSA. However, since 2019, the Citgo refineries have been processing imported crude oil from other countries, primarily Colombia and Canada. The sale of Venezuela's PDV Holdings' refining assets follows OFAC's decision to temporarily lift most energy-related sanctions against the country as part of an electoral process agreement.<sup>15</sup> President Nicolas Maduro and the Venezuelan opposition oppose the auction. Venezuela appealed the auction, which was denied by the U.S. Supreme Court in January 2024. The final decision on the winning bids is expected in the coming months, pending approval from the U.S. Department of the Treasury.<sup>16</sup>
- The declining crude oil production and operational refining capacity of PDVSA is causing widespread shortages of gasoline, diesel, and other oil products in the domestic market. According to IPD Latin America estimates, Venezuela's refinery throughput has been less than 300,000 b/d, or roughly one-fifth of its nameplate capacity.<sup>17</sup> Venezuela has worked with Iran to supply fuel as well as refining materials, spare parts, and technicians to restart the refineries. China is also assisting Venezuela in repairing and restarting its refineries by supplying catalysts and refinery parts.<sup>18</sup>
- Venezuela primarily relied on crude oil-for-gasoline swaps with international oil companies such as Repsol in Spain and Rosneft in Russia to meet its fuel demand. However, the U.S. sanctions have complicated these crude oil-for-gasoline



arrangements. In response to U.S. sanctions, Venezuela reduced naphtha imports between 2020 and 2022, shifting from synthetic crude oils to blended heavy and light oils. Venezuela began to import naphtha and condensates in 2023 following the waiving of some U.S. sanctions (Figure 17).

- As of 2023, Venezuela had 25 operational pipelines with a total capacity of 8,969,985 barrels of oil equivalent per day and a total length of 2,139 miles (Table 3). Venezuela relies on an aging pipeline network to transport oil from wells to refineries, with many pipelines estimated to be more than 50 years old. This aging infrastructure is a challenge made more difficult by Venezuela's extra-heavy crude oil. PDVSA estimates that updating pipeline infrastructure alone would require around \$8 billion in investment to return oil production to late 1990s levels. Although PDVSA no longer reports spills, the head of Venezuela's Unitary Federation of Petroleum and Gas Workers estimates that oil spills occur almost daily in some states.<sup>19</sup>
- Venezuelans voted on December 3, 2023, on five issues relating to Guyana's disputed Essequibo region. The most contentious questions gave the option to oppose the International Court of Justice's (ICJ) jurisdiction over the territorial dispute and proposed incorporating the disputed territory into a new Venezuelan state. Following the referendum, Venezuelan President Nicolas Maduro directed PDVSA to issue crude oil extraction licenses in Essequibo and ordered foreign oil companies operating under Guyanese concessions to stop operations within three months. Guyana's President, Irfaan Ali, responded by placing his military on high alert and contacting allies and regional partners to activate defense agreements to protect Essequibo, which accounts for two-thirds of the country. To settle the dispute peacefully, Presidents Maduro and Ali met on December 14, 2023, and signed a joint declaration in which both countries agreed to "not threaten or use force against one another in any circumstances" and "refrain, whether by words or deeds, from escalating any conflict or disagreement arising from any controversy between them." Following a meeting on January 25, 2024, Venezuela's and Guyana's foreign ministers pledged to maintain peace and work toward a diplomatic solution to their dispute over the oil-rich Essequibo region.<sup>20 21 22</sup>

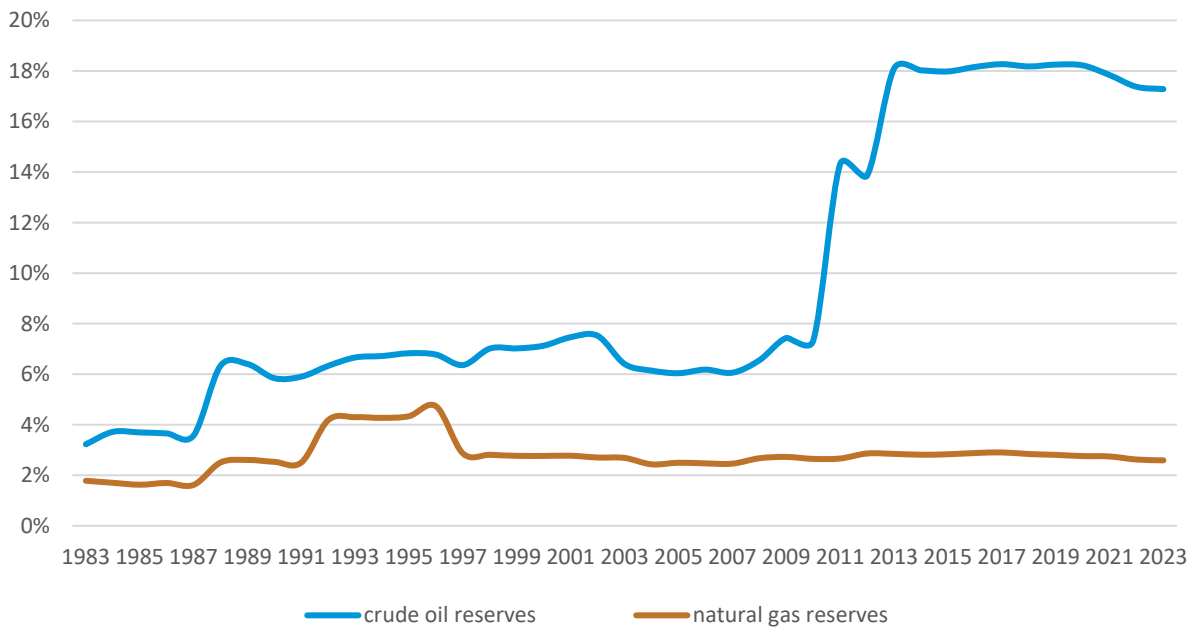
**Figure 5. Venezuela’s crude oil proved reserves ranking, 2023**



Data source: *Oil & Gas Journal*, 2023 Worldwide Reserves and Production

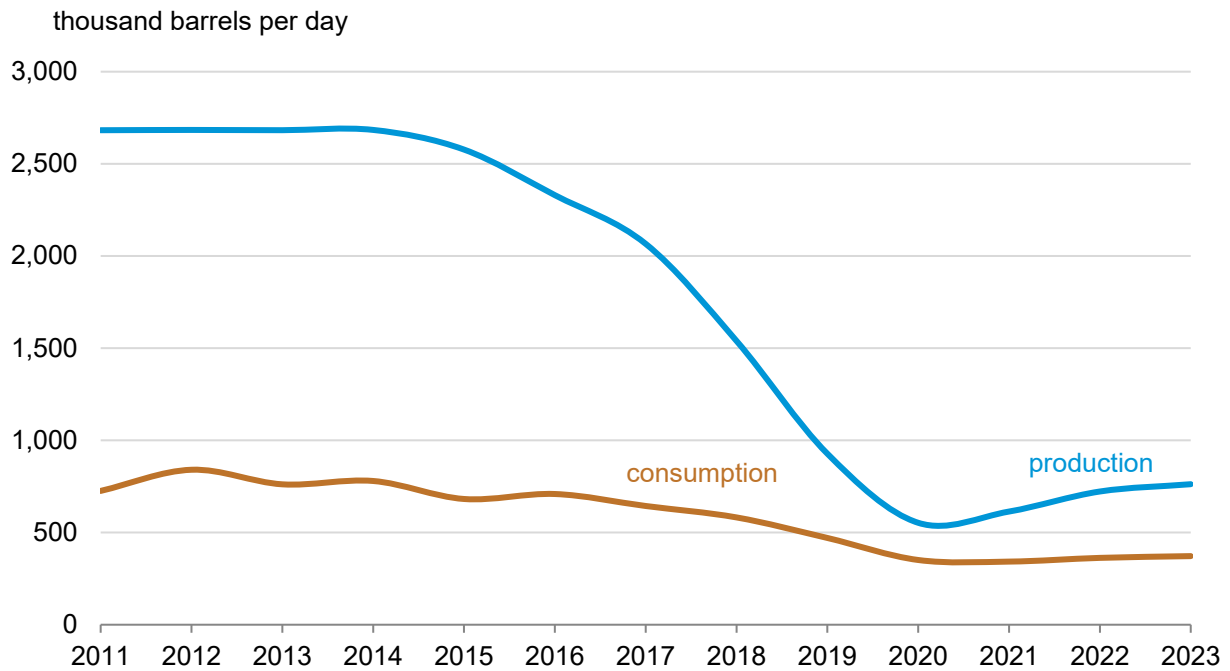
**Figure 6. Venezuela’s crude oil and natural gas reserves, 1983–2023**

share of global total, percentage



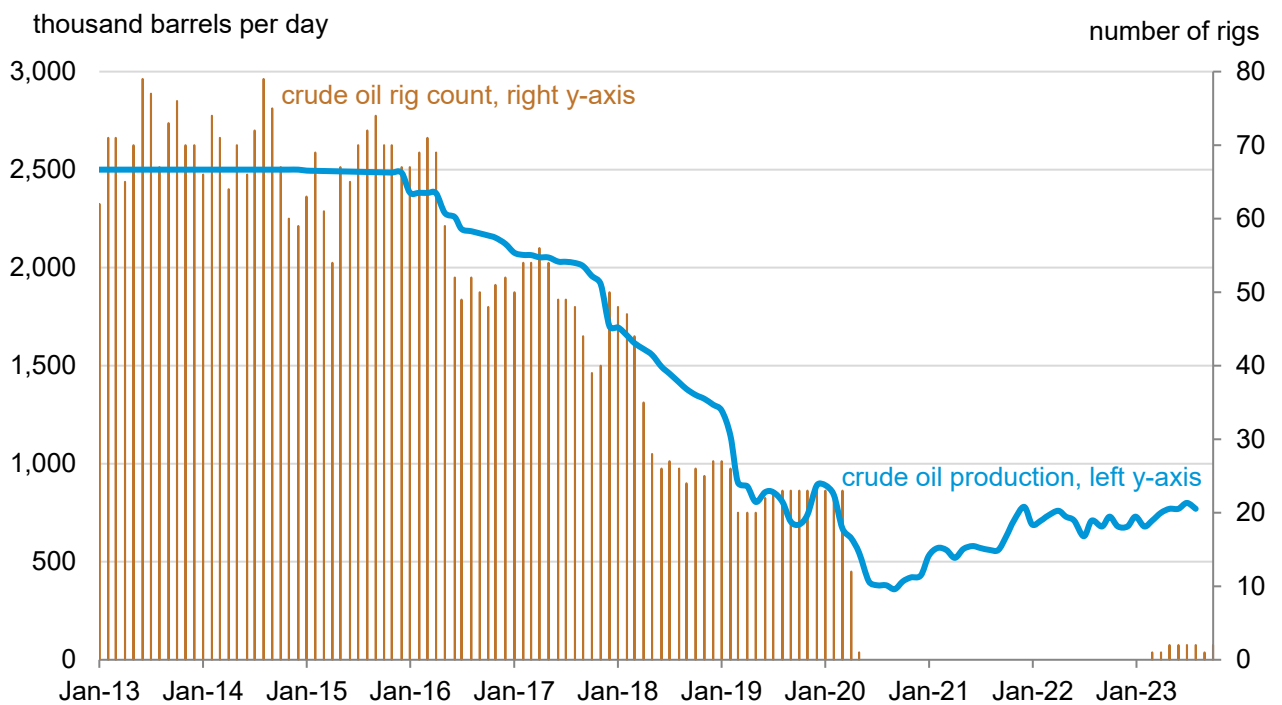
Data source: U.S. Energy Information Administration, International Energy Statistics; *Oil & Gas Journal*, 2022 & 2023 Worldwide Reserves and Production

**Figure 7. Venezuela's total petroleum and other liquids production and consumption, 2011–2023**



Data source: U.S. Energy Information Administration, International Energy Statistics and *Short-Term Energy Outlook*

**Figure 8. Venezuela's crude oil rig count and crude oil production, 2013–2023**



Data source: U.S. Energy Information Administration, International Energy Statistics, and Baker Hughes  
 Note: Crude oil rig count data are through October 2023; crude oil production data are through August 2023.

**Table 2. Venezuela's oil refineries**

| Refinery                       | Operator                  | Nameplate crude oil distillation capacity (thousand barrels per day) | Location                      |
|--------------------------------|---------------------------|--|-------------------------------|
| Centro de Refinacion Paraguana | Petroleos de Venezuela SA | 940  | Amuay and Cardon, Falcon      |
| Refineria Puerto la Cruz       | Petroleos de Venezuela SA | 310  | Puerto de la Cruz, Anzoategui |
| Refineria El Palito            | Petroleos de Venezuela SA | 187  | Puerto Cabello, Carabobo      |
| Refineria Bajo Grande          | Petroleos de Venezuela SA | 16   | Bajo Grande, Zulia            |
| Refineria San Roque            | Petroleos de Venezuela SA | 5  | San Roque, Anzoategui         |
| <b>Total</b>                   |                           | <b>1,458</b>   |                               |

Data source: *Oil & Gas Journal*, 2022 Worldwide Refining Survey

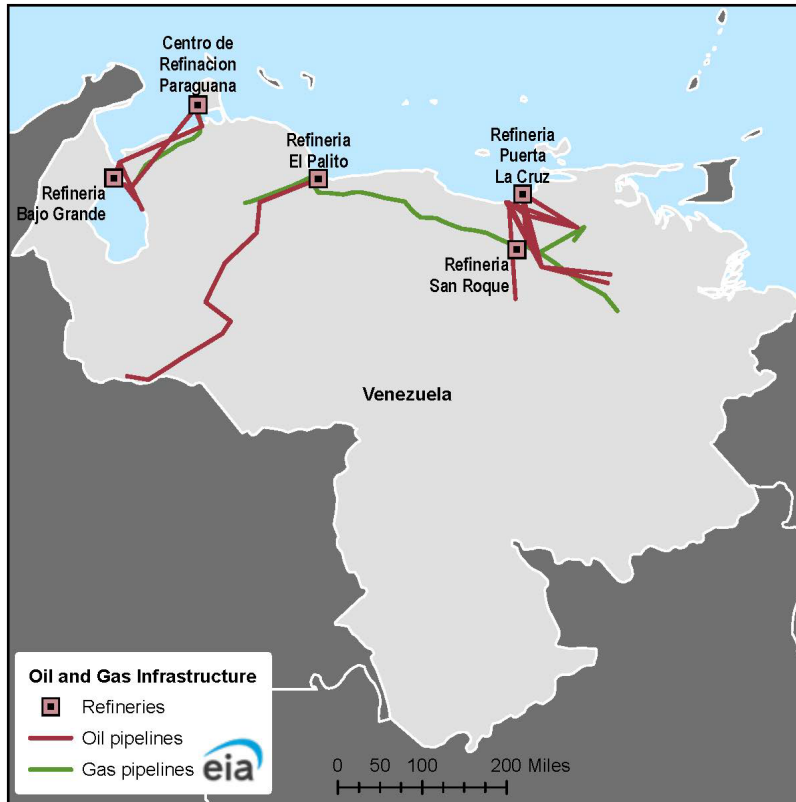
**Table 3. Venezuela's operating crude oil pipelines**

| Name                                   | Operator                  | Capacity (thousand barrels of oil equivalent per day) | Start location                                 | End location                                   |
|--|---------------------------|---|--|--|
| Traviaso-Naricual Oil Pipeline         | Petroleos de Venezuela SA | 942   | El Tejero, Monagas                             | Puerto La Cruz, Anzoátegui                     |
| PT Oficina-José Palmichal oil pipeline | Petroleos de Venezuela SA | 856   | Patio de Tanques Oficina, El Tigre, Anzoátegui | Barcelona, Anzoátegui                          |
| Traviaso-TAEJ Oil Pipeline             | Petroleos de Venezuela SA | 734   | El Tejero, Monagas                             | Barcelona, Anzoátegui                          |
| ZPS-JPS Oil Pipeline                   | Petroleos de Venezuela SA | 632   | Zuata, Anzoátegui                              | Barcelona, Anzoátegui                          |
| ERB-II-TAEJ Oil Pipeline               | Petroleos de Venezuela SA | 587   | Potrerito, Anzoátegui                          | Barcelona, Anzoátegui                          |
| Ule-Amuay 2 Oil Pipeline               | Petroleos de Venezuela SA | 577   | Tía Juana, Zulia                               | Carirubana, Falcón                             |
| Ule-Amuay Oil Pipeline                 | Petroleos de Venezuela SA | 555   | Tía Juana, Zulia                               | Carirubana, Falcón                             |
| PT Oficina-Puerto la Cruz Oil Pipeline | Petroleos de Venezuela SA | 544   | Patio de Tanques Oficina, El Tigre, Anzoátegui | Puerto La Cruz, Anzoátegui                     |
| EPM-I-PT Oficina Oil Pipeline          | Petroleos de Venezuela SA | 391   | Morichal, Monagas                              | Patio de Tanques Oficina, El Tigre, Anzoátegui |
| COPEM-PT Oficina Oil Pipeline          | Petroleos de Venezuela SA | 384   | Cogollal, Anzoátegui                           | El Tigre, Anzoátegui                           |
| Bachaquero-Puerto Miranda Oil Pipeline | Petroleos de Venezuela SA | 374   | Bachaquero, Zulia                              | Puerto Miranda, Zulia                          |

|  |                           |              |  |                                       |
|--|---------------------------|--------------|--|---------------------------------------|
| Puerto Miranda-Cardón Oil Pipeline         | Petroleos de Venezuela SA | 338          | Puerto Miranda, Zulia                          | Punta Cardón, Falcón                  |
| Bachaquero-Puerto Miranda 2 Oil Pipeline   | Petroleos de Venezuela SA | 290          | Bachaquero, Zulia                              | Puerto Miranda, Zulia                 |
| CIJAA-PT Oficina Oil Pipeline              | Petroleos de Venezuela SA | 220          | Patio de Tanques Oficina, El Tigre, Anzoátegui | Barcelona, Anzoátegui                 |
| Mata Larga-PT Silvestre Oil Pipeline       | Petroleos de Venezuela SA | 208          | Las Monas, Apure                               | Silvestre Tank Farm, Torunos, Barinas |
| PT Oficina-Puerto la Cruz 2 Oil Pipeline   | Petroleos de Venezuela SA | 199          | Patio de Tanques Oficina, El Tigre, Anzoátegui | Puerto La Cruz, Anzoátegui            |
| Lagunillas-La Salina Oil Pipeline          | Petroleos de Venezuela SA | 183          | Lagunillas, Zulia                              | Terminal La Salina, Cabimas, Zulia    |
| PT Silvestre-El Palito Oil Pipeline        | Petroleos de Venezuela SA | 183          | Silvestre Tank Farm, Torunos, Barinas          | El Palito, Carabobo                   |
| ERB-II-Puerto la Cruz Oil Pipeline         | Petroleos de Venezuela SA | 171          | Potrerito, Anzoátegui                          | Puerto La Cruz, Anzoátegui            |
| Punta de Palma-Puerto Miranda Oil Pipeline | Petroleos de Venezuela SA | 148          | Punta de Palma, Zulia                          | Puerto Miranda, Zulia                 |
| Traviaso-ERB-II Oil Pipeline               | Petroleos de Venezuela SA | 147          | El Tejero, Monagas                             | Potrerito, Anzoátegui                 |
| PT Oficina-Puerto la Cruz 3 Oil Pipeline   | Petroleos de Venezuela SA | 145          | San Joaquin, Anzoátegui                        | Puerto La Cruz, Anzoátegui            |
| ERB-II-Anaco Oil Pipeline                  | Petroleos de Venezuela SA | 73           | Potrerito, Anzoátegui                          | Anaco, Anzoátegui                     |
| PT Oficina-Anaco Oil Pipeline              | Petroleos de Venezuela SA | 73           | Patio de Tanques Oficina, El Tigre, Anzoátegui | Anaco, Anzoátegui                     |
| La Victoria-Las Monas Oil Pipeline         | Petroleos de Venezuela SA | 14           | PDVSA Centro Operacional La Victoria, Apure    | Las Monas, Apure                      |
| <b>Total</b>                               |                           | <b>8,970</b> |  |                                       |

Data source: Global Oil Infrastructure Tracker, Global Energy Monitor, May 2023

Figure 9. Map of Venezuela's refineries and pipelines



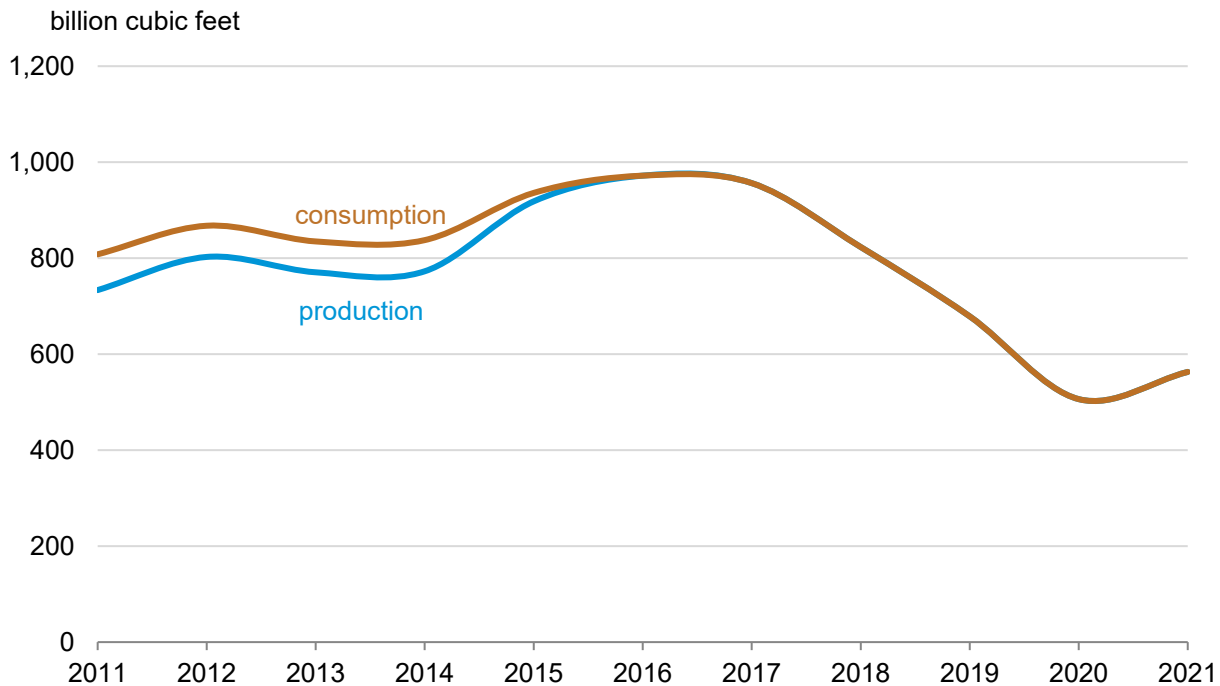
Data source: Global Oil Infrastructure Tracker, Global Energy Monitor, May 2023; Global Gas Infrastructure Tracker, Global Energy Monitor, December 2023; and *Oil & Gas Journal*, 2022 Worldwide Refining Survey

## Natural Gas and LNG

- Venezuela has significant natural gas reserves, accounting for 73% of total natural gas reserves in South America and totaling 195 trillion cubic feet (Tcf) as of 2023.<sup>23</sup> The majority of the country's natural gas reserves are associated with crude oil; around 80% of produced natural gas is associated gas produced as a *by-product* of oil production. Venezuela's natural gas reserves are still underutilized, and a large portion of the country's current natural gas output is used to supplement the output of mature oil fields rather than sold to generate revenue.<sup>24</sup> A portion of this natural gas (about 30%) is reinjected into oil fields to increase crude oil production. However, the drop in oil production in recent years has limited natural gas output. Venezuela lacks natural gas infrastructure, particularly for reinjection into oil fields, for natural gas storage and distribution, and for residential supply.
- Venezuela's natural gas production has historically been limited in comparison to its potential, owing to a poor investment climate, a lack of adequate infrastructure development to monetize the natural gas, a lack of a domestic demand market, and an inability to develop natural gas projects for export. After peaking at 1.12 trillion cubic feet (Tcf) in 2001, Venezuela's natural gas production halved to 563 billion cubic feet (Bcf) by 2021.<sup>25</sup>

- Natural gas in Venezuela is primarily used for domestic purposes.<sup>26</sup> Venezuela's consumption of natural gas has fluctuated over the last decade. Demand increased by 12% in 2015 to 936 Bcf, mainly for electric power generation as utilization of hydropower facilities declined. Venezuela's natural gas consumption fell by 7% per year on average from 2016 to 2021, reaching 563 Bcf in 2021 because of declining economic activity and lower power demand.
- Given the limited ability to monetize natural gas production produced alongside oil, much of Venezuela's natural gas production is flared, making the country one of the world's largest natural gas flarers. Flaring is a method of relieving pressure caused by flammable natural gas during pumping. Although flaring is sometimes necessary to reduce the risk of explosions at oil wells, it is also a major source of greenhouse gas emissions. According to a 2021 report from the World Bank-supported Global Gas Flaring Reduction Partnership, Venezuela's flaring intensity increased by a factor of four between 2012 and 2021, and various industry estimates point to natural gas flaring of around 706 Bcf per year in 2022, more than Venezuela's total amount of monetized natural gas. Venezuela's energy sector has lost much of its capacity to collect and use natural gas, preferring instead to burn it off.
- Venezuela's government regulates natural gas prices, and concerns exist about the pricing structure and regulations for this market. Venezuelans pay below market rates because of price subsidies provided by the Venezuelan government to support domestic natural gas demand. However, investment is limited by these below-market prices, which have remained low since 2016.

**Figure 10. Venezuela's dry natural gas production and consumption, 2011–2021**



Data source: U.S. Energy Information Administration, International Energy Statistics

**Table 4. Venezuela’s operating natural gas pipelines**

| Name                                 | Operator                  | Capacity<br>(billion cubic<br>feet per year) | Start location         | End location               |
|--------------------------------------|---------------------------|--|------------------------|----------------------------|
| Anaco-Barquisimeto Gas Pipeline      | Petroleos de Venezuela SA | 354  | Anaco, Anzoátegui      | Barquisimeto, Lara         |
| Muscar-Soto Gas Pipeline             | Petroleos de Venezuela SA | 292  | Muscar, Monagas        | Maremare, Anzoátegui       |
| Santa Bárbara-Aguasay 2 Gas Pipeline | Petroleos de Venezuela SA | 292  | Santa Bárbara, Monagas | Aguasay, Monagas           |
| Anaco-Puerto Ordaz Gas Pipeline      | Petroleos de Venezuela SA | 225  | Anaco, Anzoátegui      | Puerto Ordaz, Bolívar      |
| Anaco-Puerto La Cruz Gas Pipeline    | Petroleos de Venezuela SA | 219  | Anaco, Anzoátegui      | Puerto La Cruz, Anzoátegui |
| Santa Bárbara-Aguasay Gas Pipeline   | Petroleos de Venezuela SA | 146  | Santa Bárbara, Monagas | Aguasay, Monagas           |
| Ule-Amuay Gas Pipeline               | Petroleos de Venezuela SA | 91   | Ulé, Zulia             | Amuay, Falcón              |
| <b>Total</b>                         |                           | <b>1,620</b>                                 |                        |                            |

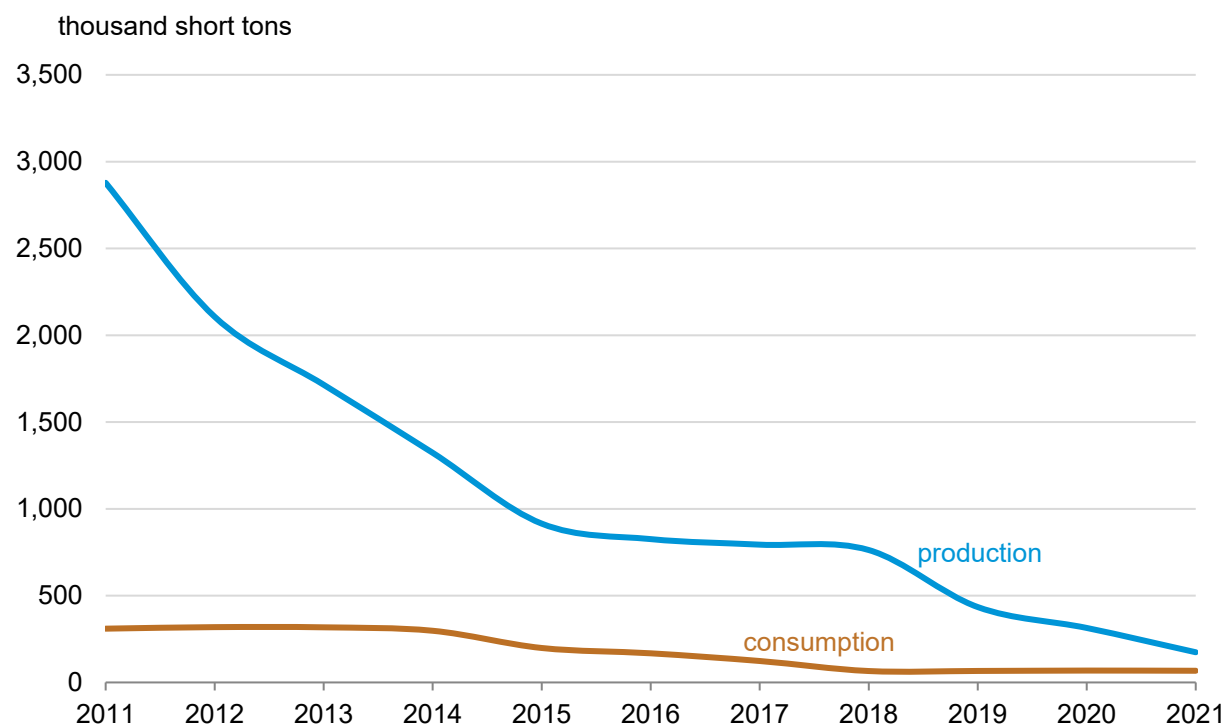
Data source: Global Energy Monitor, Latin America Energy Portal, January 2023

## Coal

- Venezuela holds South America’s fourth-largest coal reserves, with 806 million short tons in 2021.<sup>27</sup> The main coalfields of Venezuela are in the western Zulia State, which borders Colombia. In comparison to oil and natural gas, coal plays a minor role in Venezuela’s energy mix, accounting for 0.2% of total energy production and 0.1% of total energy consumption.
- Venezuela’s coal industry has faced challenges such as outdated infrastructure and limited investment, which has affected production. Venezuela’s coal production fell by an average annual rate of 16% from 2001 to 2021 after peaking at nearly 8.7 million short tons in 2000. Venezuela was the fourth-largest coal producer in South America as of 2021, with 174 thousand short tons. Venezuela’s coal production is entirely bituminous.<sup>28</sup>
- Venezuela’s coal was mostly used for domestic consumption, particularly in industrial processes.<sup>29</sup> Coal consumption briefly rose from 56,000 short tons in 2005 to a peak of 319,000 short tons in 2012. Since then, Venezuela’s economic decline brought coal consumption down to 67,000 short tons in 2021, close to where it started less than two decades prior.<sup>30</sup>



**Figure 11. Venezuela's coal production and consumption, 2011–2021**



Data source: U.S. Energy Information Administration, International Energy Statistics

## Biofuels

- Venezuela does not produce or consume biofuels.

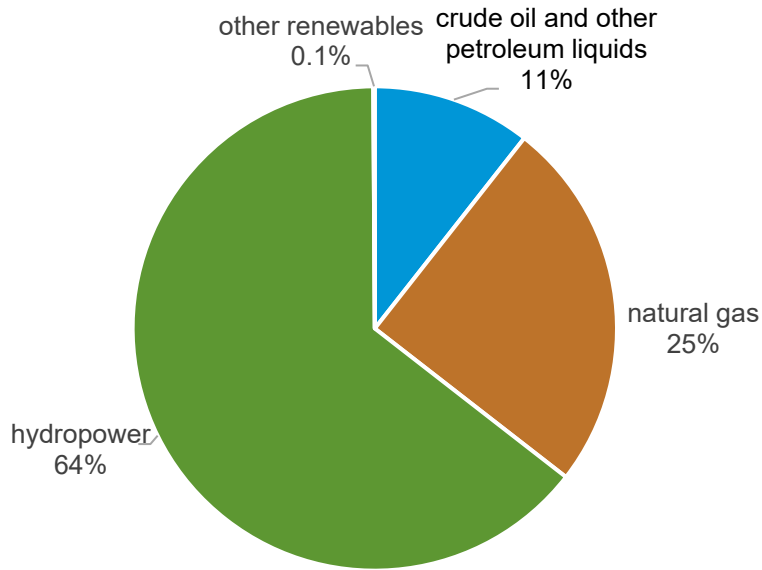
## Electricity

- Venezuela's electricity generation is primarily reliant on hydropower, which supplies 64% of the country's electricity as of 2021. Because of the grid's reliance on hydropower, it is vulnerable to fluctuations in water availability and droughts. Furthermore, widespread concern surrounds hydropower overutilization and overexertion of existing facilities. Venezuela relies on six operating hydroelectric plants with a total capacity of 16,010 megawatts (MW). The largest plant is Central Hidroeléctrica Guri in Orinoco, which accounts for 64% of Venezuela's hydroelectric capacity (Table 5). Venezuela also relies on natural gas and petroleum for electricity generation, which contributed 25% and 11%, respectively, of the country's total electricity generation in 2021 (Figure 12).
- Venezuela relies on the state-owned Corporación Eléctrica Nacional (CORPOELEC) for its electricity. CORPOELEC was established in 2007 to consolidate the electric power sector under state ownership following the restructuring of the sector, which merged the 14 previous power companies. CORPOELEC oversees the entire electricity supply chain and owns all of Venezuela's major power companies. Its operations encompass generation, transmission, distribution, and trading.<sup>31</sup>

- Venezuela's electricity generation peaked at 120 billion kilowatthours (kWh) in 2013 after rising steadily for over three decades. Since then, Venezuela's electricity generation has decreased by an average annual rate of 2% between 2014 and 2021, reaching 95 billion kWh in 2021 (Figure 13). A variety of factors contribute to the decline in electricity generation, including out-of-date infrastructure, poor maintenance, insufficient investment, a lack of market incentives, government control, CORPOELEC's declining professional capacity, and a failure to anticipate and respond to challenges posed by the existing system's generation mix.
- Data from the World Economic Forum suggest that Venezuela's electrification rate is 99% as of 2019, higher than the rest of Central America's and South America's average rate (Figure 14). However, according to an analysis of electricity usage, Venezuela's rural-urban divide has widened, as large swaths of the country continue to experience daily power outages, undermining the potential for economic activity. According to the study, these power outages are the result of a government policy of cutting power to rural areas to ensure a steady supply for urban areas to avoid protests.<sup>32</sup>
- Frequent and lengthy power outages have crippled Venezuela's electricity system in recent years. The prolonged power outages have serious humanitarian consequences in healthcare, water supply, and public transportation, and they have also caused disruptions to industry, the commercial and retail sectors, and oil production. The power crisis worsened in 2019, with a nationwide blackout between March 7 and March 14 that affected all 23 states, Caracas, and the neighboring Brazilian state of Roraima. State-enforced power rationing has become common, particularly in areas outside of Caracas, and the number of blackouts in Venezuela increased by 22% between 2021 and 2022.<sup>33</sup>
- Fuel shortages, including natural gas and diesel, hampered power plant operation, furthering the challenges in electricity generation.

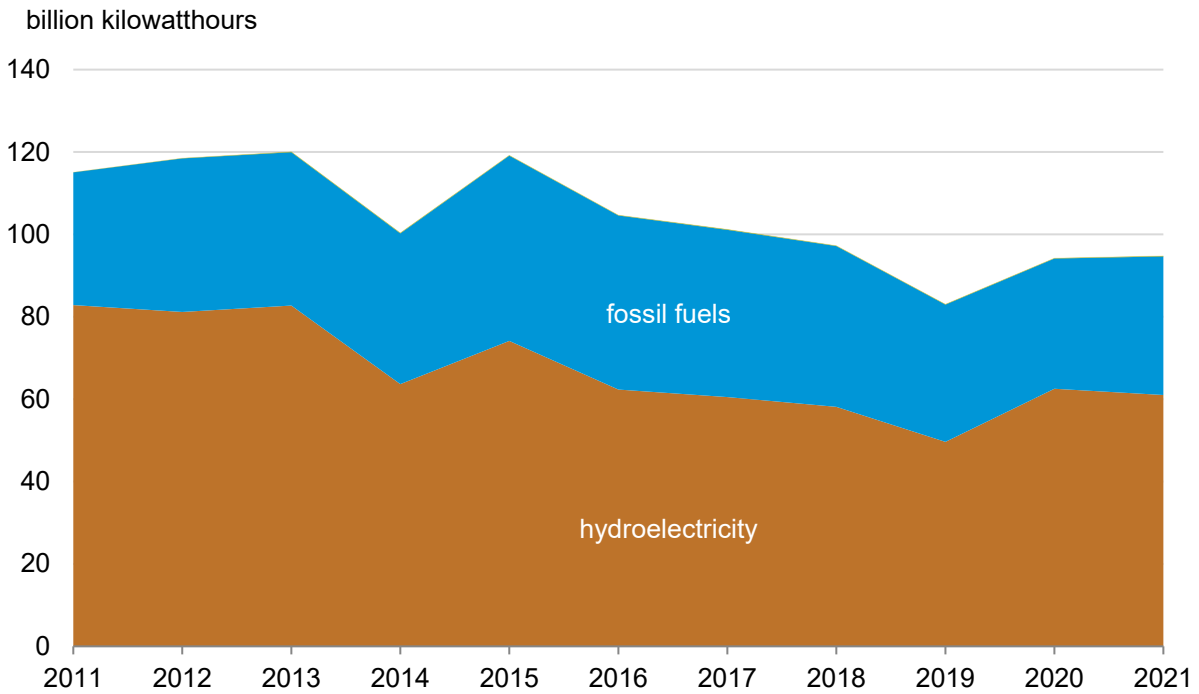
**Figure 12. Venezuela's electricity generation supply, 2021**

percentage of total electricity generation



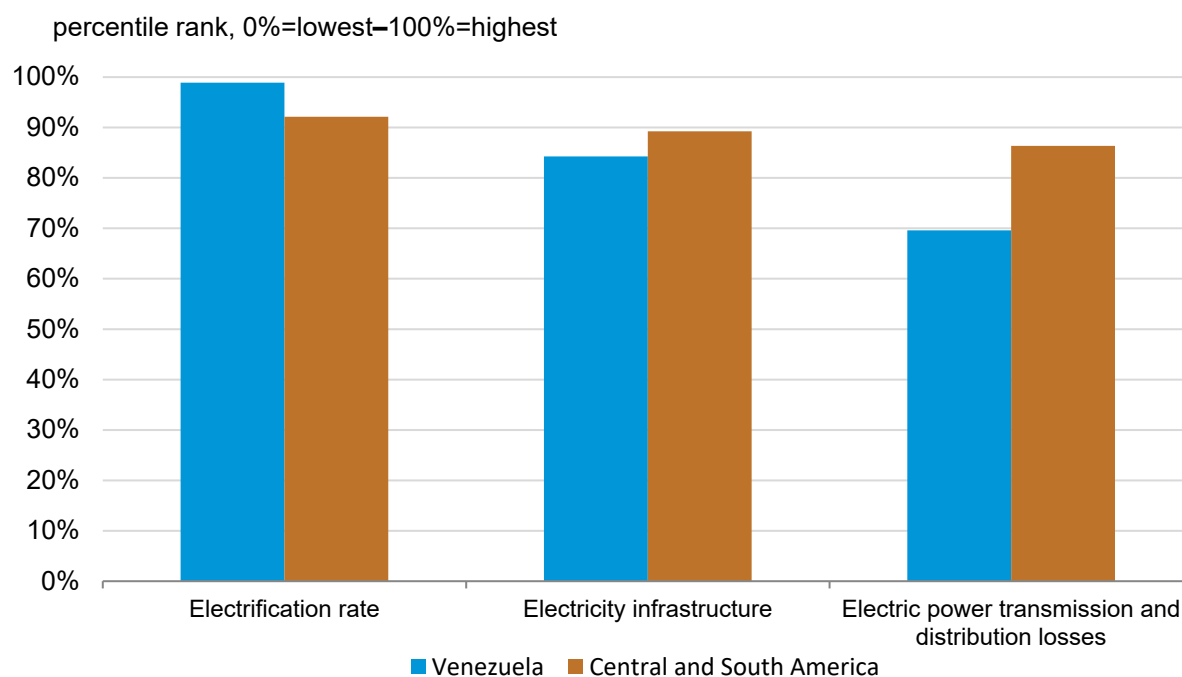
Data source: U.S. Energy Information Administration, International Energy Statistics, and International Energy Agency, Electricity Information 2022  
 Note: *Other renewables* include solar and wind sources.

**Figure 13. Venezuela's electricity generation by source, 2011–2021**



Data source: U.S. Energy Information Administration, International Energy Statistics

**Figure 14. Venezuela’s electricity access and infrastructure, 2019**



Data source: World Economic Forum Global Competitiveness Index



Note: *Central and South America* is an average that contains Argentina, Bolivia, Brazil, Barbados, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, Guatemala, Honduras, Haiti, Jamaica, Nicaragua, Panama, Peru, Paraguay, El Salvador, Trinidad and Tobago, and Venezuela.

**Table 5. Venezuela’s operating hydroelectric plants**

| Name  | Owner                             | Start year | Capacity (megawatts) | Type                 | Location                          |
|---|-----------------------------------|------------|----------------------|----------------------|-----------------------------------|
| Central Hidroeléctrica Guri                             | Corporación Eléctrica Nacional SA | 1986       | 10,200               | Conventional storage | Orinoco, Bolívar                  |
| Central Hidroeléctrica Macagua 2                        | Corporación Eléctrica Nacional SA | 1996       | 2,850                | Conventional storage | San Félix, Caroní, Bolívar        |
| Central Hidroeléctrica Caruachi                         | Corporación Eléctrica Nacional SA | 2003       | 2,160                | Conventional storage | Puerto Ordaz, Caroní, Bolívar     |
| Central Hidroeléctrica Macagua 1                        | Corporación Eléctrica Nacional SA | 1959       | 480                  | Conventional storage | San Félix, Caroní, Bolívar        |
| Central Hidroeléctrica José Antonio Páez                | Corporación Eléctrica Nacional SA | 1973       | 240                  | Conventional storage | Bolívar, Barinas                  |
| Central Hidroeléctrica Juan Antonio Rodríguez Domínguez | Corporación Eléctrica Nacional SA | 1986       | 80                   | Conventional storage | Alberto Arvelo Torrealba, Barinas |
| <b>Total</b>  |                                   |            | <b>16,010</b>        |                      |                                   |

Data source: Global Energy Monitor, Global Hydropower Tracker, May 2023

## Energy Trade

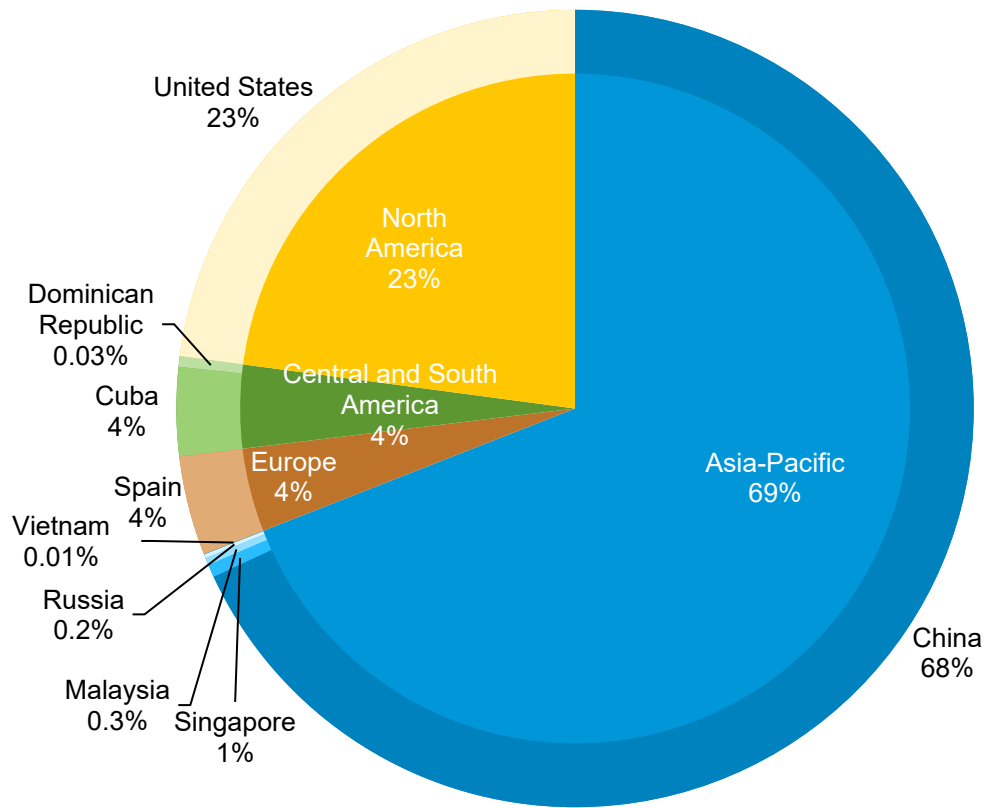
- Prior to the United States imposing sanctions on Venezuela, the United States was the largest importer of Venezuela's crude oil. Venezuela's heavy crude oil is well suited for U.S. refineries, particularly those along the Gulf Coast. Most of the remaining crude oil was destined for India, China, and Europe. Venezuela has seven crude oil export loading points, in practice; however, most of its crude oil exports are routed through the Puerto Jose terminal, which is located offshore of the Jose industrial complex in northeastern Venezuela. Prior to the full sanction imposition in 2019, the terminal handled approximately 90% of Venezuela's crude oil exports.
- Since the 2019 sanctions, a significant portion of Venezuela's crude oil exports have been part of oil-for-loans arrangements, which are debt repayments rather than PDVSA receiving actual payments for crude oil deliveries. Notably, a significant portion of Venezuela's exports have been supplied to China as part of its oil-for-loans arrangements, in which China has loaned close to \$50 billion to Venezuela in exchange for crude oil deliveries over the last decade.<sup>34</sup> Exports to China and other countries were also done as part of sanctions evasions prior to 2023. As of 2023, China received 69% of Venezuela's crude oil exports (Figure 15).
- In 2018, PDVSA announced an indefinite suspension of crude oil and fuel exports to all of [Petrocaribe](#) countries, except for Cuba, because of insufficient production, rising domestic fuel shortages, and a deteriorating refinery industry. Venezuela has been Cuba's main political ally as well as its largest supplier of crude oil and fuel for over two decades. Cuba is increasingly turning to Russia and Mexico for crude oil to alleviate a severe diesel and gasoline shortage and supplement Venezuela's crude oil. In 2022, Venezuela accounted for 75% of Cuba's crude oil imports, and Russia accounted for 25%. In 2023, Venezuela accounted for 58% of Cuba's crude oil imports, Mexico for 31%, and Russia for 11%.<sup>35</sup>
- Venezuela's crude oil exports increased slightly in 2023, owing primarily to Iranian assistance and [the easing of U.S. sanctions](#) (Figure 16). Cooperation with Iran from 2020 to 2023 resulted in higher diluent imports, allowing for greater availability of export-ready heavy crude oil grades, without which upstream volumes would fall and exports would decline (Figure 17). Furthermore, as of 2022, Iran and Venezuela have accelerated crude oil swaps, exchanging Venezuela's heavy Orinoco crude oil for condensates, which can be used to mix and dilute the Orinoco crude oil for export. The swaps also bring in crude oil from Iran that Venezuela can use directly in its refineries, in turn leaving Venezuela's lighter crude oil grades available for export.
- In May 2022, OFAC allowed Eni and Repsol to resume oil-for-loan exchanges, a partial easing of sanctions; this agreement allowed the import of Venezuela's crude oil as a way to clear arrears and settle billions of dollars in unpaid debt and dividends owed by PDVSA. OFAC's action accelerated negotiations between PDVSA and its foreign joint venture partners, including Eni, Repsol, Chevron, ONGC, Maurel, and Prom. Starting in June 2022, tankers transported Venezuela's crude oil into Spain and Italy for the first time in over two years.
- In November 2022, OFAC granted Chevron a temporary license allowing it to resume operations in Venezuela at its four joint ventures with PDVSA. Chevron is granted permission to produce and export petroleum or petroleum products in Venezuela through its joint ventures. The license, however, is only temporary and allows Chevron to sell and export oil from the ventures to the United States to repay Venezuela's debts

to the company; it does not allow Chevron to pay taxes, royalties, or dividends to PDVSA.

- Overall, due to Iran's assistance and a relaxation of restrictions to allow for oil-for-loan repayment swaps, as well as Chevron's partial return to business operations in Venezuela, crude oil exports have increased from a low of 263,000 b/d in 2021 to 442,000 b/d in 2022 and an estimated 621,000 b/d in 2023.
- Venezuela does not participate in liquefied natural gas (LNG) trade; however, the government plans to expand offshore natural gas production and to export it as LNG. Atlantic LNG signed an agreement in 2023 that allows Trinidad and Tobago's state-owned National Gas Company to increase its equity across the liquefaction trains, creates a single unitized commercial structure, and, most importantly, allows third-party access. As a feedstock for Atlantic LNG, nearby natural gas from Venezuela could be a viable short-term development option, leading to a boost in natural gas production and opening the door to natural gas exports.
- Trinidad and Tobago received a two-year license from the U.S. Department of the Treasury in January 2023 to work with Venezuela on developing the Dragon Field. Shell would operate the Dragon field, and once operational, the natural gas would be transported to the Hibiscus platform for transmission to the Trinidad and Tobago plants license was amended in March 2023 and authorizes those entities to engage in activities related to the Dragon natural gas field's planning, financing, development, execution, and management. The license also authorizes payments to the Venezuelan government in U.S. dollars or bolivars, including taxes, royalties, fees, and lease bonus payments. Negotiations with Venezuela are ongoing on commercial terms, the price of the natural gas, and technical aspects of the field's development.<sup>36</sup> The license expires in October 2025.

Figure 15. Venezuela's crude oil exports by region and country, 2023

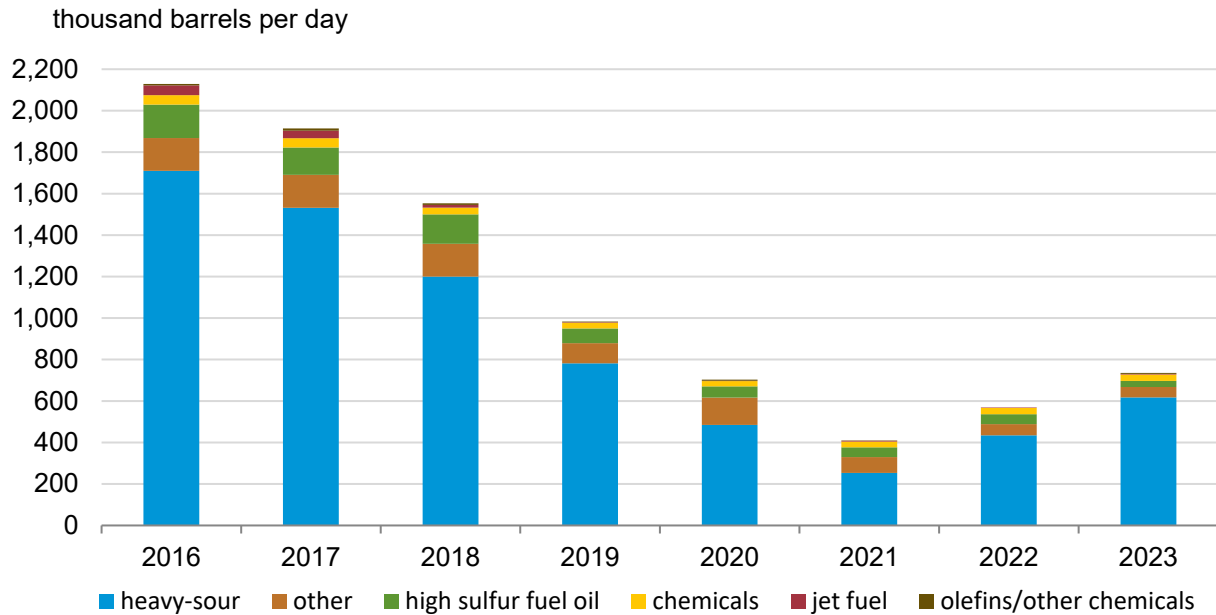
percentage of total crude oil exports



Data source: Vortexa Ltd.

Note: Some individual figures do not match the regional total because of rounding. Exports to Malaysia and Singapore were mostly re-exported to China.

**Figure 16. Venezuela's oil exports, 2016–2023**

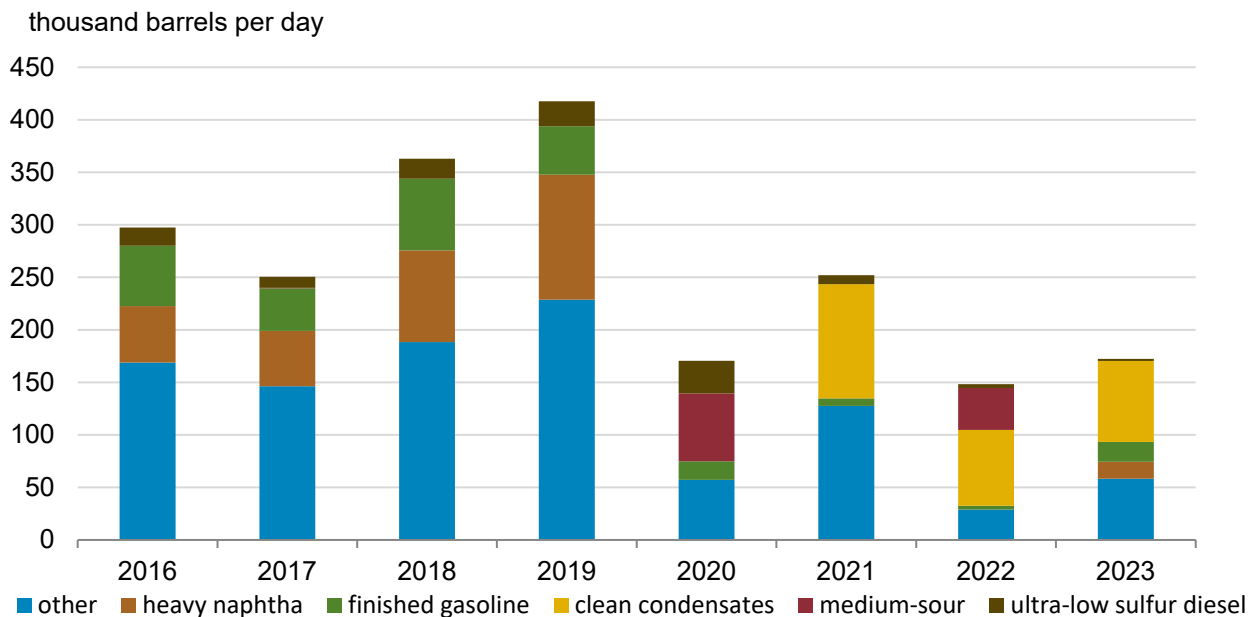


Data source: Vortexa Ltd.

Note: *Other* contains asphalt, biodiesel feedstock, bitumen, blending components, butane, diesel, dirty feedstocks, finished biodiesel, finished gasoline, full range naphtha, gasoil, heavy-sweet, kerosene, light-sour, light-sweet, low sulfur fuel oil, lube oils, medium-sour, olefins or other chemicals, other biodiesel or edible oils, propane, ultra-low sulfur diesel, undetermined, and vacuum gas oil.



**Figure 17. Venezuela's oil imports, 2016–2023**



Data source: Vortexa Ltd.

Note: *Other* contains biodiesel feedstock, bitumen, blending components, butane, chemicals, diesel, dirty condensates, finished biodiesel, full range naphtha, gasoil, heavy-sour, heavy-sweet, high sulfur fuel oil, jet fuel, light naphtha, light-sour, light-sweet, low sulfur fuel oil, lube oils, medium-sweet, olefins or other chemicals, other biodiesel or edible oils, propane, undetermined, and vacuum gas oil.







