



**U.S. Oil, Gas & Mining
Private CBRS Network
Forecast, 2021 – 2026**





U.S. Oil, Gas & Mining Private CBRS Network Forecast, 2021 – 2026: *CBRS Network Build, Integration and App Spending in Oil, Gas & Mining Facilities*

A Market Study

Published Third Quarter, 2022
Version 1.0
Report Number: 03Q2022-05

iGR
12400 W. Hwy 71
Suite 350 PMB 341
Austin TX 78738

Table of Contents

Abstract	1
Executive Summary	3
Total Spending for Private CBRS Networks, Oil, Gas, and Mining Facilities	4
Table A: Total Spending for Private CBRS Networks in Oil, Gas, and Mining Facilities, 2021-2026 (\$M)	4
Figure A: Total Spending for Private CBRS Networks in Oil, Gas, and Mining Facilities, 2021-2026 (\$M)	5
What this means	5
Methodology	6
Sources	6
Definitions	6
Oil, gas, and mining facilities	7
Employment Trends	7
Employment by Occupation	8
NAICS 211000: Oil and Gas.....	8
Table 1: Oil & gas extraction, employment by select occupation, 2019-21	8
Figure 1: Oil & gas extraction, employment by select occupation, 2019-21	9
NAICS 212000: Mining (except Oil & Gas).....	9
Table 2: Mining only, employment by select occupation, 2019-21	10
Figure 2: Mining only, employment by select occupation, 2019-21	10
Employment Summary	10
What is Required for a Connected Oil, gas, and mining facility?	12
Benefits of Private CBRS Networks	12
Case Studies	13
Outlook for Private CBRS Networks in Oil, gas, and mining facilities	14
Technologies and spectrum behind connected oil, gas, and mining facilities	15
5G	15
CBRS	16
Forecast Methodology and Assumptions	18
Basic Assumption	18
Oil, Gas and Mining Facilities Methodology	18
Mining	18
Table 3: Mining by type of facility	18
Table 4: Mining by type of resource extracted.....	19
Oil and Gas Extraction	19
Table 5: Oil and gas extraction	19
Table 6: Oil refineries	20
Network Build & Operate Spending Methodology	20
Network Build Spending	20
Operational Spending	20
Network/Systems Integration: Assumptions and Methodology	21
Application Spending: Assumptions and Methodology	21
Private CBRS Network Spending Forecast – Oil, Gas, and Mining facilities	23
Private CBRS Networks Build and Operation	23

Oil & Gas Rigs Network Build.....	23
Table 7: Private CBRS Network Build Spending in Oil & Gas Rigs, 2021-2026 (\$M).....	23
Figure 3: Private CBRS Network Build Spending in Oil & Gas Rigs, 2021-2026 (\$M).....	23
Oil & Gas Rigs Operational	23
Table 8: Private CBRS Network Operational Spending in Oil & Gas Rigs, 2021-2026 (\$M)	24
Figure 4: Private CBRS Network Operational Spending in Oil & Gas Rigs, 2021-2026 (\$M).....	24
Total Private CBRS Network Build and Operational Spending for Oil & Gas Rigs.....	24
Table 9: Total CBRS Private Network Spending for Oil & Gas Rigs, 2021-2026	24
Figure 5: Total CBRS Private Network Spending for Oil & Gas Rigs, 2021-2026.....	25
Mines Network Build	25
Table 10: Private CBRS Network Build Spending in Mines, 2021-2026 (\$M)	25
Figure 6: Private CBRS Network Build Spending in Mines, 2021-2026 (\$M).....	26
Mines Operational	26
Table 11: Private CBRS Network Operational Spending in Mines, 2021-2026 (\$M)	26
Figure 7: Private CBRS Network Operational Spending in Mines, 2021-2026 (\$M)	27
Total Private CBRS Network Build and Operational Spending for Mines.....	27
Table 12: Total CBRS Private Network Spending for Mines, 2021-2026	27
Figure 8: Total CBRS Private Network Spending for Mines, 2021-2026	28
Oil Refineries Network Build.....	28
Table 13: Private CBRS Network Build Spending in Oil Refineries, 2021-2026 (\$M).....	28
Figure 9: Private CBRS Network Build Spending in Oil Refineries, 2021-2026 (\$M).....	28
Oil Refineries Operational	29
Table 14: Private CBRS Network Operational Spending in Oil Refineries, 2021-2026 (\$M)	29
Figure 10: Private CBRS Network Operational Spending in Oil Refineries, 2021-2026 (\$M).....	29
Total Private CBRS Network Build and Operational Spending for Oil Refineries.....	29
Table 15: Total CBRS Private Network Spending for Oil Refineries, 2021-2026	30
Figure 11: Total CBRS Private Network Spending for Oil Refineries, 2021-2026.....	30
Total Oil, Gas, and Mining Private CBRS Network Spending	30
Table 16: Total CBRS Private Network Spending for Oil, Gas, and Mining Facilities, 2021-2026.....	30
Figure 12: Total CBRS Private Network Spending for Oil, Gas, and Mining Facilities, 2021-2026.....	31
Private CBRS Networks Integration.....	31
Systems/Network Integration.....	31
Table 17: Private CBRS Systems/Network Integration Spending in Oil, Gas, and Mining Facilities, 2021-2026, (\$M).....	31
Figure 13: Private CBRS Systems/Network Integration Spending in Oil, Gas, and Mining Facilities, 2021-2026	32
Private CBRS Networks Applications.....	32
Applications spending.....	32
Table 18: Private CBRS Applications Spending in Oil, Gas, and Mining Facilities, 2021-2026, (\$M)	32
Figure 14: Private CBRS Network Application Spending in Oil, Gas, and Mining Facilities, 2021-2026	33
Total Spend.....	33
Table 19: Total Spending for Private CBRS Networks in Oil, Gas, and Mining Facilities, 2021-2026 (\$M)	33
Figure 15: Total Spending for Private CBRS Networks in Oil, Gas, and Mining Facilities, 2021-2026 (\$M)	34
Definitions	35
Definitions Table.....	35
About iGR.....	52
Disclaimer	52

Abstract

This report focuses on U.S. industries that extract oil, gas, and mineral resources. As of this writing, in the U.S. there are hundreds of operating oil and gas rigs, wells and refineries, and there are also more than 13,000 mines of various types. All these operations rely on wired, wireless and cellular communications systems.

Private cellular networks using LTE and 5G New Radio (NR) operating in the CBRS band, along with the accompanying Internet of Things (IoT) technologies and standards, allow companies operating in these industries to transition from their purpose-built, often legacy, wireless/cellular networks to secure, scalable, standards-based networks.

This report provides an overview of three aspects of the resource extraction activities in the U.S.:

- Oil rigs and wells
- Oil refineries
- Mines of all types, including coal, metal, and non-metal, that operate on the surface or underground.

For this report, iGR defines an in-building private cellular system as one that uses the U.S. CBRS band for 4G/5G-based services and is funded by a third party distinct from a Mobile Network Operator (MNO). Note that iGR includes campus-wide cellular networks within the “in-building” umbrella. In this report, the vast acreage covered by these operations are considered a “campus” deployment.

This market study provides a five-year forecast for spending for three types of spending on private cellular systems using CBRS in these U.S. extraction enterprises. The three types of spending include:

- Network build and operational spending: the costs associated with installing and operating the private CBRS network
- Network/systems integration spending: the costs associated with designing, sourcing equipment, integrating the network and applications, etc.
- Applications: the costs associated with purchasing and licensing the applications that run on the private CBRS network.

Key questions addressed in this market study include:

- What is a private cellular network?
- How can a private cellular network be used to create a connected oil, gas, and mining facility?
- What is the primary purpose of a connected oil, gas, and mining facility?

- What technologies are required for a connected oil, gas, and mining facility?
- What use cases are enabled in a connected oil, gas, and mining facility?
- How much will be spent to build and operate a private CBRS network in U.S. oil, gas, and mining facilities from 2021 to 2026?
- What is the forecasted network/systems integration spending associated with the private CBRS network opportunity in U.S. oil, gas, and mining facilities from 2021 to 2026?
- What is the forecasted applications spending for private CBRS networks in U.S. oil, gas, and mining facilities from 2021 to 2026?

Who should read this report?

- Systems integrators and wireless network integrators
- CBRS solutions vendors
- Mobile operators
- Infrastructure OEMs
- Financial analysts and investors.