

Global CNG Powertrain Market: Analysis By Drive Type (Front Wheel Drive, All-wheel Drive, & Rear Wheel Drive), By Fuel Type (Bi-fuel & Mono-fuel), By Vehicle Type (Passenger & Commercial), By Region, Size & Forecast with Impact Analysis of COVID-19 and Forecast up to 2028

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Abstracts

CNG powertrains are propulsion systems used in vehicles that run on CNG as fuel. CNG is a clean-burning, domestically-produced fuel that compresses natural gas to high pressure. It is often used as an alternative to gasoline or diesel fuel in vehicles. CNG powertrains consist of a CNG fuel tank, a fuel delivery system, and an internal combustion engine modified to run on CNG. The fuel delivery system regulates the flow of CNG from the fuel tank to the engine, and the engine burns the CNG to generate power.

The global CNG powertrain market in 2022 was valued at US\$79.58 billion and is expected to reach US\$198.75 billion by 2028, growing at a CAGR of 16.48%, during the forecast period of 2023-2028. As environmental concerns continue to take center stage, the automotive industry is undergoing a significant transformation. The demand for cleaner and more sustainable transportation solutions has fueled the growth of alternative fuel technologies. Among these, Compressed Natural Gas (CNG) powertrains have emerged as a promising option, offering a greener and economically viable alternative to traditional internal combustion engines.

Market Segmentation Analysis:

By Drive Type: The report splits the global CNG powertrain market into three different

drive type: Front Wheel Drive, All-wheel Drive, and Rear Wheel Drive. The front-wheel-drive segment dominated the market in 2022, and this growth can be attributed to the advantageous characteristics of front-wheel-drive vehicles, such as their lightweight, improved fuel economy, and weight distribution balance, which increases the vehicle's overall stability on rugged terrains. Additionally, front-wheel drive is a cost-effective option for consumers because drivetrains require less maintenance, and the engine provides increased fuel economy.

By Fuel Type: The global CNG powertrain market can be divided into two segments on the basis of fuel type: Bi-fuel and Mono-fuel. Mono fuel segment is anticipated to grow at the fastest CAGR during the forecasted period. The mono-fuel CNG powertrain refers to vehicles that solely operate on compressed natural gas without the option to switch to other fuels. These vehicles are designed and optimized to run exclusively on CNG. Since these vehicles are purpose-built to run solely on CNG, their engines and overall systems are optimized to achieve better mileage and performance when compared to bi-fuel counterparts. This makes them a preferred choice for consumers and businesses seeking greater fuel economy. Moreover, the mono-fuel CNG powertrain segment finds particular relevance in niche markets and specific applications.

By Vehicle Type: The report divides the global CNG powertrain market into two vehicle types: Passenger and Commercial. Passenger vehicle segment held the maximum share of the market. The Passenger Vehicle segment in the global CNG powertrain market encompasses cars, SUVs, and other personal-use vehicles that are equipped with compressed natural gas (CNG) powertrains. CNG is often more affordable than gasoline or diesel, providing a cost-effective option for consumers seeking to save on fuel expenses. This cost advantage becomes particularly significant in regions where natural gas is abundant and prices are lower. As consumers become more conscious of their budgets, the potential for cost savings drives the popularity of CNG-powered passenger vehicles. The growth of CNG-powered passenger vehicles is further facilitated by the expanding infrastructure for refueling.

By Region: According to this report, the global CNG powertrain market can be divided into four major regions: Asia Pacific (China, Japan, India, South Korea and Rest of Asia Pacific), Europe (Germany, UK, France, Italy, Spain and Rest of Europe), North America (The US, Canada and Mexico), and Rest of the World. Asia Pacific held the maximum share in the global CNG powertrain market. The region is diverse, encompassing both rapidly developing countries and highly industrialized nations. Many countries in Asia Pacific face severe air pollution issues, particularly in densely populated urban centers. Governments are actively seeking solutions to improve air

quality, and CNG powertrains present a cleaner alternative to conventional gasoline and diesel vehicles.

Moreover, several countries in the region have implemented policies to promote the use of alternative fuels and reduce greenhouse gas emissions. These policies often come in the form of financial incentives, subsidies, and tax breaks for CNG-powered vehicles and the development of CNG refueling infrastructure. Some countries in Asia Pacific, such as China and India, have significant natural gas reserves. Utilizing these domestic resources as a transportation fuel helps reduce dependency on imported oil and supports the growth of the CNG powertrain market.

Market Dynamics:

Growth Drivers: Increasing environmental regulations and sustainability has emerged as a significant driving factor for the CNG powertrain market. CNG is considered a cleaner alternative to traditional fossil fuels, such as gasoline and diesel, due to its lower emissions of greenhouse gases and pollutants. Environmental regulations, imposed by governments and regulatory bodies, have become increasingly stringent over the years to address the negative impact of transportation on air quality and climate change. These regulations often include emission standards that encourage the use of cleaner fuels and technologies. CNG powertrains have gained popularity as they meet these stringent regulations and offer reduced emissions of carbon dioxide (CO₂), nitrogen oxides, and particulate matter. Further, the market is expected to increase due to low running costs, abundant natural gas resources, advancements in CNG powertrain technology and government incentives and infrastructure development.

Challenges: However, some challenges are impeding the growth of the market such as increasing shift to electric vehicles and high upfront cost. The increasing shift to electric vehicles (EVs) has had a significant impact on the compressed natural gas (CNG) powertrain market, leading to several challenges and hindrances. EVs offer numerous advantages over CNG-powered vehicles, including lower emissions, reduced dependence on fossil fuels, and improved energy efficiency. As a result, the popularity and demand for EVs have been steadily rising, while CNG powertrain sales have been declining. One of the main reasons for the decline in the CNG powertrain market is the growing availability and infrastructure development for EV charging stations.

Trends: A major trend gaining pace in CNG powertrain is increasing adoption of dual-fuel systems. Dual-fuel systems enable vehicles to run on a combination of CNG and diesel or gasoline, providing greater flexibility and efficiency to end users. CNG is a

cleaner-burning fuel compared to diesel or gasoline, resulting in reduced emissions of pollutants such as particulate matter, nitrogen oxides, and greenhouse gases. By integrating a dual-fuel system, vehicles can leverage the benefits of CNG while still having the option to use conventional fuels when necessary. This flexibility helps in the transition to cleaner energy while minimizing infrastructure and operational challenges. More trends in the market are believed to augment the growth of CNG powertrain market during the forecasted period include advancements in CNG fuel storage and distribution infrastructure, integration of renewable natural gas (RNG), etc.

Impact Analysis of COVID-19 and Way Forward:

The COVID-19 pandemic had a negative impact on the compressed natural gas (CNG) powertrain market. In the initial stages of the pandemic in 2020, strict lockdowns and travel restrictions led to a sharp decline in demand for transportation, including commercial fleets and public transport, which heavily relied on CNG powertrains. This resulted in reduced vehicle sales and a slump in the CNG powertrain market. The manufacturing and supply chain disruptions caused by the pandemic also affected the production and availability of CNG vehicles and related components, leading to delays and higher costs. Additionally, uncertainty regarding the duration and severity of the pandemic caused a decrease in investments and a cautious approach from businesses, further dampening the market's growth.

However, as the situation improved and economies began to recover in 2021 and beyond, there was a gradual rebound in the CNG powertrain market. The growing focus on sustainable and eco-friendly transportation solutions, coupled with increasing government incentives for clean energy adoption, provided a boost to the market's revival. Advancements in CNG powertrain technology may result in more efficient and high-performance engines. Improvements in infrastructure, such as advanced refueling stations and enhanced storage solutions for CNG, could address some of the limitations that may have hindered market growth in the past.

Competitive Landscape and Recent Developments:

The CNG powertrain market is consolidated with the presence of few number of players dominating worldwide. Prominent players are adopting strategies such as expansion, mergers & acquisitions, and partnerships to strengthen their market presence in various regions.

Key players of the CNG powertrain market are:

Robert Bosch GmbH

Cummins Inc.

Ford Motor Company

Iveco Group (FPT Industrial)

Hyundai Motor Company

Maruti Suzuki India Limited

Honda Motor Co., Ltd.

General Motors Company

Volvo Group

Organic growth remains the key strategy for most of the market's incumbents. As such, CNG powertrain manufacturers are focused on enhancing their existing product offerings and brand awareness to gain a competitive edge in the market. For Instance, in October 2021, Cummins announced a launch of the X15N engine, a 15-liter natural engine for heavy-duty trucks, which is a specially modified bi-fuel engine and can run on diesel and CNG. Additionally, the X15N engine model is incorporated with Eaton automated transmission technologies and Cummins fuel delivery system to ensure the development of a fully integrated natural gas powertrain.

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