

# Compressed Air Energy Storage (CAES) Market by Type (Adiabatic, Diabatic, Isothermal), Storage Type (Constant-Volume Storage, Constant-Pressure Storage), Application (Power Station, Distributed Energy System, Automotive Power), and Region 2024-2032

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## Abstracts

The global compressed air energy storage (CAES) market size reached US\$ 5.4 Billion in 2023. Looking forward, IMARC Group expects the market to reach US\$ 30.6 Billion by 2032, exhibiting a growth rate (CAGR) of 20.52% during 2024-2032. The burgeoning energy sector, rising production of electricity, and the growing employment of CAES in offshore wind turbines represent some of the key factors driving the market.

Compressed air energy storage (CAES) is a method of storing energy by compressing air in an underground storage reservoir. It relies on the gas turbine cycle that is used to compress air using a rotary compressor. It helps retrieve stored energy by allowing the air to expand, which pushes high-pressure air through a turbine to create electricity. It is used to supplement energy usage during high-demand periods, enhance air quality, and maintain system stability. It allows energy companies to provide sufficient energy for the entire service area without the need for added energy production. It reduces dependency on the electrical grid and decreases energy charges and operational overhead. It enhances power grid stability by lowering the strain on the electrical infrastructure and improving energy reliability. It offers a long shelf-life as CAES allows the compressor to unload before starting again and reduces short cycling. As it requires little maintenance costs due to reduced compressor maintenance frequency, the demand for CAES is rising across the globe.

### Compressed Air Energy Storage (CAES) Market Trends:

At present, there is a rise in the production of electricity from renewable sources, such as wind, solar, and water energy, to meet the supply and demand for electricity across the globe. This, along with the increasing utilization of CAES by electricity system operators and electricity generators to store electricity, represents one of the key factors supporting the growth of the market. In addition, the growing demand for CAES to ensure the provision of the electrical grid with energy during peak demand periods is positively influencing the market. Moreover, there is an increase in the demand for isothermal storage that relies on heat exchangers to always keep the internal and external temperatures same. This, coupled with the thriving energy sector around the world, is catalyzing the demand for CAES. Apart from this, the growing employment of CAES in offshore wind turbines due to its cost-effectiveness and environment-friendliness is offering a favorable market outlook. In line with this, the increasing demand for CAES to ensure the stability of the aging power grid and replace coal-based electricity generation with natural gas is providing lucrative growth opportunities to industry investors. Additionally, the rising awareness among the masses about the benefits of using CAES, such as increased energy reliability, is strengthening the growth of the market.

### Key Market Segmentation:

IMARC Group provides an analysis of the key trends in each segment of the global compressed air energy storage (CAES) market, along with forecasts at the global, regional, and country level from 2024-2032. Our report has categorized the market based on type, storage type, and application.

### Type Insights:

Adiabatic

Diabatic

Isothermal

The report has provided a detailed breakup and analysis of the compressed air energy storage (CAES) market based on the type. This includes adiabatic, diabatic, and isothermal. According to the report, diabatic represented the largest segment.

### Storage Type Insights:

Constant-Volume Storage

Constant-Pressure Storage

A detailed breakup and analysis of the compressed air energy storage (CAES) market based on the storage type has also been provided in the report. This includes constant-volume storage and constant-pressure storage.

#### Application Insights:

Power Station  
Distributed Energy System  
Automotive Power

A detailed breakup and analysis of the compressed air energy storage (CAES) market based on the application has also been provided in the report. This includes the power station, distributed energy system, and automotive power.

#### Regional Insights:

North America  
United States  
Canada  
Asia Pacific  
China  
Japan  
India  
South Korea  
Australia  
Indonesia  
Others  
Europe  
Germany  
France  
United Kingdom  
Italy  
Spain  
Russia  
Others  
Latin America  
Brazil  
Mexico

## Others

### Middle East and Africa

The report has also provided a comprehensive analysis of all the major regional markets that include North America (the United States and Canada); Asia Pacific (China, Japan, India, South Korea, Australia, Indonesia, and others); Europe (Germany, France, the United Kingdom, Italy, Spain, Russia, and others); Latin America (Brazil, Mexico, and others); and the Middle East and Africa. According to the report, North America was the largest market for compressed air energy storage (CAES). Some of the factors driving the North America compressed air energy storage (CAES) market included the increasing demand for energy storage, rising adoption of renewable energy sources, and government support for energy efficient technologies.

### Competitive Landscape:

The report has also provided a comprehensive analysis of the competitive landscape in the global compressed air energy storage (CAES) market. Competitive analysis such as market structure, market share by key players, player positioning, top winning strategies, competitive dashboard, and company evaluation quadrant has been covered in the report. Also, detailed profiles of all major companies have been provided. Some of the companies include Alacaes SA, Apex Compressed Air Energy Storage LLC, Hydrostor Inc., Pacific Gas and Electric Company, Storelectric Limited, etc. Kindly note that this only represents a partial list of companies, and the complete list has been provided in the report.

### Key Questions Answered in This Report:

How has the global compressed air energy storage (CAES) market performed so far and how will it perform in the coming years?

What are the drivers, restraints, and opportunities in the global compressed air energy storage (CAES) market?

What is the impact of each driver, restraint, and opportunity on the global compressed air energy storage (CAES) market?

What are the key regional markets?

Which countries represent the most attractive compressed air energy storage (CAES) markets?

What is the breakup of the market based on the type?

Which is the most attractive type in the compressed air energy storage (CAES) market?

What is the breakup of the market based on the storage type?

Which is the most attractive storage type in the compressed air energy storage (CAES) market?

What is the breakup of the market based on the application?

Which is the most attractive application in the compressed air energy storage (CAES) market?

What is the competitive structure of the global compressed air energy storage (CAES) market?

Who are the key players/companies in the global compressed air energy storage (CAES) market?

## Contents

### 1 PREFACE

### 2 SCOPE AND METHODOLOGY

- 2.1 Objectives of the Study
- 2.2 Stakeholders
- 2.3 Data Sources
  - 2.3.1 Primary Sources
  - 2.3.2 Secondary Sources
- 2.4 Market Estimation
  - 2.4.1 Bottom-Up Approach
  - 2.4.2 Top-Down Approach
- 2.5 Forecasting Methodology

### 3 EXECUTIVE SUMMARY

### 4 INTRODUCTION

- 4.1 Overview
- 4.2 Key Industry Trends

### 5 GLOBAL COMPRESSED AIR ENERGY STORAGE (CAES) MARKET

- 5.1 Market Overview
- 5.2 Market Performance
- 5.3 Impact of COVID-19
- 5.4 Market Forecast

### 6 MARKET BREAKUP BY TYPE

- 6.1 Adiabatic
  - 6.1.1 Market Trends
  - 6.1.2 Market Forecast
- 6.2 Diabatic
  - 6.2.1 Market Trends
  - 6.2.2 Market Forecast
- 6.3 Isothermal

- 6.3.1 Market Trends
- 6.3.2 Market Forecast

## **7 MARKET BREAKUP BY STORAGE TYPE**

- 7.1 Constant-Volume Storage
  - 7.1.1 Market Trends
  - 7.1.2 Market Forecast
- 7.2 Constant-Pressure Storage
  - 7.2.1 Market Trends
  - 7.2.2 Market Forecast

## **8 MARKET BREAKUP BY APPLICATION**

- 8.1 Power Station
  - 8.1.1 Market Trends
  - 8.1.2 Market Forecast
- 8.2 Distributed Energy System
  - 8.2.1 Market Trends
  - 8.2.2 Market Forecast
- 8.3 Automotive Power
  - 8.3.1 Market Trends
  - 8.3.2 Market Forecast

## **9 MARKET BREAKUP BY REGION**

- 9.1 North America
  - 9.1.1 United States
    - 9.1.1.1 Market Trends
    - 9.1.1.2 Market Forecast
  - 9.1.2 Canada
    - 9.1.2.1 Market Trends
    - 9.1.2.2 Market Forecast
- 9.2 Asia-Pacific
  - 9.2.1 China
    - 9.2.1.1 Market Trends
    - 9.2.1.2 Market Forecast
  - 9.2.2 Japan
    - 9.2.2.1 Market Trends

- 9.2.2.2 Market Forecast
- 9.2.3 India
  - 9.2.3.1 Market Trends
  - 9.2.3.2 Market Forecast
- 9.2.4 South Korea
  - 9.2.4.1 Market Trends
  - 9.2.4.2 Market Forecast
- 9.2.5 Australia
  - 9.2.5.1 Market Trends
  - 9.2.5.2 Market Forecast
- 9.2.6 Indonesia
  - 9.2.6.1 Market Trends
  - 9.2.6.2 Market Forecast
- 9.2.7 Others
  - 9.2.7.1 Market Trends
  - 9.2.7.2 Market Forecast
- 9.3 Europe
  - 9.3.1 Germany
    - 9.3.1.1 Market Trends
    - 9.3.1.2 Market Forecast
  - 9.3.2 France
    - 9.3.2.1 Market Trends
    - 9.3.2.2 Market Forecast
  - 9.3.3 United Kingdom
    - 9.3.3.1 Market Trends
    - 9.3.3.2 Market Forecast
  - 9.3.4 Italy
    - 9.3.4.1 Market Trends
    - 9.3.4.2 Market Forecast
  - 9.3.5 Spain
    - 9.3.5.1 Market Trends
    - 9.3.5.2 Market Forecast
  - 9.3.6 Russia
    - 9.3.6.1 Market Trends
    - 9.3.6.2 Market Forecast
  - 9.3.7 Others
    - 9.3.7.1 Market Trends
    - 9.3.7.2 Market Forecast
- 9.4 Latin America



#### 9.4.1 Brazil

##### 9.4.1.1 Market Trends

##### 9.4.1.2 Market Forecast

#### 9.4.2 Mexico

##### 9.4.2.1 Market Trends

##### 9.4.2.2 Market Forecast

#### 9.4.3 Others

##### 9.4.3.1 Market Trends

##### 9.4.3.2 Market Forecast

#### 9.5 Middle East and Africa

##### 9.5.1 Market Trends

##### 9.5.2 Market Breakup by Country

##### 9.5.3 Market Forecast

### **10 DRIVERS, RESTRAINTS, AND OPPORTUNITIES**

#### 10.1 Overview

#### 10.2 Drivers

#### 10.3 Restraints

#### 10.4 Opportunities

### **11 VALUE CHAIN ANALYSIS**

### **12 PORTERS FIVE FORCES ANALYSIS**

#### 12.1 Overview

#### 12.2 Bargaining Power of Buyers

#### 12.3 Bargaining Power of Suppliers

#### 12.4 Degree of Competition

#### 12.5 Threat of New Entrants

#### 12.6 Threat of Substitutes

### **13 PRICE ANALYSIS**

### **14 COMPETITIVE LANDSCAPE**

#### 14.1 Market Structure

#### 14.2 Key Players

#### 14.3 Profiles of Key Players

- 14.3.1 Alacaes Sa
  - 14.3.1.1 Company Overview
  - 14.3.1.2 Product Portfolio
- 14.3.2 Apex Compressed Air Energy Storage LLC
  - 14.3.2.1 Company Overview
  - 14.3.2.2 Product Portfolio
- 14.3.3 Hydrostor Inc.
  - 14.3.3.1 Company Overview
  - 14.3.3.2 Product Portfolio
- 14.3.4 Pacific Gas and Electric Company
  - 14.3.4.1 Company Overview
  - 14.3.4.2 Product Portfolio
  - 14.3.4.3 Financials
  - 14.3.4.4 SWOT Analysis
- 14.3.5 Storelectric Limited
  - 14.3.5.1 Company Overview
  - 14.3.5.2 Product Portfolio

Kindly note that this only represents a partial list of companies, and the complete list has been provided in the report.

## List Of Tables

### LIST OF TABLES

Table 1: Global: Compressed Air Energy Storage Market: Key Industry Highlights, 2023 & 2032

Table 2: Global: Compressed Air Energy Storage Market Forecast: Breakup by Type (in Million US\$), 2024-2032

Table 3: Global: Compressed Air Energy Storage Market Forecast: Breakup by Storage Type (in Million US\$), 2024-2032

Table 4: Global: Compressed Air Energy Storage Market Forecast: Breakup by Application (in Million US\$), 2024-2032

Table 5: Global: Compressed Air Energy Storage Market Forecast: Breakup by Region (in Million US\$), 2024-2032

Table 6: Global: Compressed Air Energy Storage Market: Competitive Structure

Table 7: Global: Compressed Air Energy Storage Market: Key Players

## List Of Figures

### LIST OF FIGURES

- Figure 1: Global: Compressed Air Energy Storage Market: Major Drivers and Challenges
- Figure 2: Global: Compressed Air Energy Storage Market: Sales Value (in Billion US\$), 2018-2023
- Figure 3: Global: Compressed Air Energy Storage Market Forecast: Sales Value (in Billion US\$), 2024-2032
- Figure 4: Global: Compressed Air Energy Storage Market: Breakup by Type (in %), 2023
- Figure 5: Global: Compressed Air Energy Storage Market: Breakup by Storage Type (in %), 2023
- Figure 6: Global: Compressed Air Energy Storage Market: Breakup by Application (in %), 2023
- Figure 7: Global: Compressed Air Energy Storage Market: Breakup by Region (in %), 2023
- Figure 8: Global: Compressed Air Energy Storage (Adiabatic) Market: Sales Value (in Million US\$), 2018 & 2023
- Figure 9: Global: Compressed Air Energy Storage (Adiabatic) Market Forecast: Sales Value (in Million US\$), 2024-2032
- Figure 10: Global: Compressed Air Energy Storage (Diabatic) Market: Sales Value (in Million US\$), 2018 & 2023
- Figure 11: Global: Compressed Air Energy Storage (Diabatic) Market Forecast: Sales Value (in Million US\$), 2024-2032
- Figure 12: Global: Compressed Air Energy Storage (Isothermal) Market: Sales Value (in Million US\$), 2018 & 2023
- Figure 13: Global: Compressed Air Energy Storage (Isothermal) Market Forecast: Sales Value (in Million US\$), 2024-2032
- Figure 14: Global: Compressed Air Energy Storage (Constant-Volume Storage) Market: Sales Value (in Million US\$), 2018 & 2023
- Figure 15: Global: Compressed Air Energy Storage (Constant-Volume Storage) Market Forecast: Sales Value (in Million US\$), 2024-2032
- Figure 16: Global: Compressed Air Energy Storage (Constant-Pressure Storage) Market: Sales Value (in Million US\$), 2018 & 2023
- Figure 17: Global: Compressed Air Energy Storage (Constant-Pressure Storage) Market Forecast: Sales Value (in Million US\$), 2024-2032
- Figure 18: Global: Compressed Air Energy Storage (Power Station) Market: Sales

Value (in Million US\$), 2018 & 2023

Figure 19: Global: Compressed Air Energy Storage (Power Station) Market Forecast: Sales Value (in Million US\$), 2024-2032

Figure 20: Global: Compressed Air Energy Storage (Distributed Energy System) Market: Sales Value (in Million US\$), 2018 & 2023

Figure 21: Global: Compressed Air Energy Storage (Distributed Energy System) Market Forecast: Sales Value (in Million US\$), 2024-2032

Figure 22: Global: Compressed Air Energy Storage (Automotive Power) Market: Sales Value (in Million US\$), 2018 & 2023

Figure 23: Global: Compressed Air Energy Storage (Automotive Power) Market Forecast: Sales Value (in Million US\$), 2024-2032

Figure 24: North America: Compressed Air Energy Storage Market: Sales Value (in Million US\$), 2018 & 2023

Figure 25: North America: Compressed Air Energy Storage Market Forecast: Sales Value (in Million US\$), 2024-2032

Figure 26: United States: Compressed Air Energy Storage Market: Sales Value (in Million US\$), 2018 & 2023

Figure 27: United States: Compressed Air Energy Storage Market Forecast: Sales Value (in Million US\$), 2024-2032

Figure 28: Canada: Compressed Air Energy Storage Market: Sales Value (in Million US\$), 2018 & 2023

Figure 29: Canada: Compressed Air Energy Storage Market Forecast: Sales Value (in Million US\$), 2024-2032

Figure 30: Asia-Pacific: Compressed Air Energy Storage Market: Sales Value (in Million US\$), 2018 & 2023

Figure 31: Asia-Pacific: Compressed Air Energy Storage Market Forecast: Sales Value (in Million US\$), 2024-2032

Figure 32: China: Compressed Air Energy Storage Market: Sales Value (in Million US\$), 2018 & 2023

Figure 33: China: Compressed Air Energy Storage Market Forecast: Sales Value (in Million US\$), 2024-2032

Figure 34: Japan: Compressed Air Energy Storage Market: Sales Value (in Million US\$), 2018 & 2023

Figure 35: Japan: Compressed Air Energy Storage Market Forecast: Sales Value (in Million US\$), 2024-2032

Figure 36: India: Compressed Air Energy Storage Market: Sales Value (in Million US\$), 2018 & 2023

Figure 37: India: Compressed Air Energy Storage Market Forecast: Sales Value (in Million US\$), 2024-2032

Figure 38: South Korea: Compressed Air Energy Storage Market: Sales Value (in Million US\$), 2018 & 2023

Figure 39: South Korea: Compressed Air Energy Storage Market Forecast: Sales Value (in Million US\$), 2024-2032

Figure 40: Australia: Compressed Air Energy Storage Market: Sales Value (in Million US\$), 2018 & 2023

Figure 41: Australia: Compressed Air Energy Storage Market Forecast: Sales Value (in Million US\$), 2024-2032

Figure 42: Indonesia: Compressed Air Energy Storage Market: Sales Value (in Million US\$), 2018 & 2023

Figure 43: Indonesia: Compressed Air Energy Storage Market Forecast: Sales Value (in Million US\$), 2024-2032

Figure 44: Others: Compressed Air Energy Storage Market: Sales Value (in Million US\$), 2018 & 2023

Figure 45: Others: Compressed Air Energy Storage Market Forecast: Sales Value (in Million US\$), 2024-2032

Figure 46: Europe: Compressed Air Energy Storage Market: Sales Value (in Million US\$), 2018 & 2023

Figure 47: Europe: Compressed Air Energy Storage Market Forecast: Sales Value (in Million US\$), 2024-2032

Figure 48: Germany: Compressed Air Energy Storage Market: Sales Value (in Million US\$), 2018 & 2023

Figure 49: Germany: Compressed Air Energy Storage Market Forecast: Sales Value (in Million US\$), 2024-2032

Figure 50: France: Compressed Air Energy Storage Market: Sales Value (in Million US\$), 2018 & 2023

Figure 51: France: Compressed Air Energy Storage Market Forecast: Sales Value (in Million US\$), 2024-2032

Figure 52: United Kingdom: Compressed Air Energy Storage Market: Sales Value (in Million US\$), 2018 & 2023

Figure 53: United Kingdom: Compressed Air Energy Storage Market Forecast: Sales Value (in Million US\$), 2024-2032

Figure 54: Italy: Compressed Air Energy Storage Market: Sales Value (in Million US\$), 2018 & 2023

Figure 55: Italy: Compressed Air Energy Storage Market Forecast: Sales Value (in Million US\$), 2024-2032

Figure 56: Spain: Compressed Air Energy Storage Market: Sales Value (in Million US\$), 2018 & 2023

Figure 57: Spain: Compressed Air Energy Storage Market Forecast: Sales Value (in

Million US\$), 2024-2032

Figure 58: Russia: Compressed Air Energy Storage Market: Sales Value (in Million US\$), 2018 & 2023

Figure 59: Russia: Compressed Air Energy Storage Market Forecast: Sales Value (in Million US\$), 2024-2032

Figure 60: Others: Compressed Air Energy Storage Market: Sales Value (in Million US\$), 2018 & 2023

Figure 61: Others: Compressed Air Energy Storage Market Forecast: Sales Value (in Million US\$), 2024-2032

Figure 62: Latin America: Compressed Air Energy Storage Market: Sales Value (in Million US\$), 2018 & 2023

Figure 63: Latin America: Compressed Air Energy Storage Market Forecast: Sales Value (in Million US\$), 2024-2032

Figure 64: Brazil: Compressed Air Energy Storage Market: Sales Value (in Million US\$), 2018 & 2023

Figure 65: Brazil: Compressed Air Energy Storage Market Forecast: Sales Value (in Million US\$), 2024-2032

Figure 66: Mexico: Compressed Air Energy Storage Market: Sales Value (in Million US\$), 2018 & 2023

Figure 67: Mexico: Compressed Air Energy Storage Market Forecast: Sales Value (in Million US\$), 2024-2032

Figure 68: Others: Compressed Air Energy Storage Market: Sales Value (in Million US\$), 2018 & 2023

Figure 69: Others: Compressed Air Energy Storage Market Forecast: Sales Value (in Million US\$), 2024-2032

Figure 70: Middle East and Africa: Compressed Air Energy Storage Market: Sales Value (in Million US\$), 2018 & 2023

Figure 71: Middle East and Africa: Compressed Air Energy Storage Market: Breakup by Country (in %), 2023

Figure 72: Middle East and Africa: Compressed Air Energy Storage Market Forecast: Sales Value (in Million US\$), 2024-2032

Figure 73: Global: Compressed Air Energy Storage Industry: Drivers, Restraints, and Opportunities

Figure 74: Global: Compressed Air Energy Storage Industry: Value Chain Analysis

Figure 75: Global: Compressed Air Energy Storage Industry: Porter's Five Forces Analysis

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