+357 96 030922
info@marketpublishers.com

On-Grid Combined Heat and Power Market - Global Industry Size, Share, Trends, Opportunity, and Forecast, Segmented, By Technology (Internal Combustion Engine, Gas Turbine, Microturbine, Fuel Cell, Stirling Engine), By Application (Residential, Commercial, Industrial), By Fuel Type (Natural Gas, Biomass, Coal, Renewable Energy, Waste Heat), By System Configuration (Single-Heat, Dual-Heat, Multi-Heat), By Region, By Competition, 2020-2030F

https://marketpublishers.com/r/OFC253635C55EN.html
Date: July 2025
Pages: 180
Price: US$ 4,500.00 (Single User License)
ID: OFC253635C55EN

Abstracts

Market Overview

Global On-Grid Combined Heat and Power Market was valued at USD 25.61 Billion in 2024 and is expected to reach USD 33.09 Billion by 2030 with a CAGR of 4.21%. The On-Grid Combined Heat and Power (CHP) Market refers to the segment of the energy industry focused on systems that simultaneously generate electricity and useful thermal energy from a single fuel source, with the electricity being supplied directly to the power grid. These systems are designed to achieve higher overall energy efficiency compared to conventional methods of separate heat and power generation. On-grid CHP systems are typically integrated into municipal, industrial, institutional, and commercial facilities where there is a consistent demand for both electricity and heat, such as in manufacturing plants, hospitals, universities, and large residential complexes.

Unlike off-grid CHP systems that operate independently, on-grid CHP solutions are connected to the main power distribution network, allowing excess electricity to be exported to the grid and ensuring a reliable backup supply during peak demand or

+357 96 030922
info@marketpublishers.com

maintenance. The core advantage of these systems lies in their ability to reduce fuel consumption and lower greenhouse gas emissions by utilizing waste heat that would otherwise be lost in traditional power generation. On-grid CHP installations often use natural gas, biogas, coal, biomass, or waste-derived fuels to drive turbines or engines, which generate power while capturing and repurposing heat for space heating, water heating, or industrial processes.

Key Market Drivers

Increasing Demand for Energy Efficiency and Decentralized Power Generation

The growing global focus on energy efficiency and decentralized energy systems is a primary driver for the on-grid combined heat and power (CHP) market. Governments, utilities, and industries are increasingly seeking integrated energy solutions that offer improved efficiency, reduced energy losses, and lower operational costs. On-grid CHP systems, which simultaneously generate electricity and useful thermal energy from a single fuel source, typically achieve total efficiencies exceeding 80%, compared to conventional systems that waste a significant portion of input energy as heat. This high efficiency is particularly valuable in urban areas and industrial zones where both electricity and heat are in high demand. As global electricity consumption rises, especially in emerging economies, grid-tied CHP systems offer a reliable and flexible alternative to large-scale centralized generation.

These systems can also relieve grid congestion and reduce transmission and distribution losses by generating power close to the point of use. Moreover, rising awareness among commercial and industrial end-users about the benefits of CHP, such as energy cost savings and enhanced resilience during grid outages, is further propelling adoption. Governments across developed and developing nations are supporting energy efficiency programs, offering incentives and policy frameworks to promote the installation of on-grid CHP systems. This aligns with broader global sustainability goals and climate action plans focused on reducing carbon emissions, improving energy access, and increasing the share of low-emission technologies in the energy mix. As more businesses and municipalities seek integrated energy strategies that reduce reliance on conventional power grids while maintaining connectivity for flexibility and backup, on-grid CHP systems are emerging as a preferred solution.

Their ability to serve as distributed energy resources (DERs) capable of grid support, load balancing, and even participating in demand response programs further enhances their appeal. The continued push for decarbonization, energy resilience, and efficiency

+357 96 030922
info@marketpublishers.com

is expected to accelerate the deployment of on-grid CHP systems across residential, commercial, and industrial sectors, establishing them as a cornerstone in the global transition toward smarter and more sustainable energy infrastructure. Global energy efficiency improvements could reduce energy demand by up to 30% by 2040. Decentralized power generation is expected to contribute over 40% of global electricity supply by 2030. Investments in energy-efficient technologies are projected to exceed USD 500 billion annually worldwide. More than 70 countries have national policies promoting energy efficiency and distributed energy systems. Global demand for decentralized energy solutions is growing at a CAGR of over 6%. Around 60% of new power capacity additions globally are expected to come from decentralized sources by 2030.

Key Market Challenges

High Capital Investment and Long Payback Period

One of the primary challenges facing the on-grid combined heat and power (CHP) market is the substantial upfront capital investment required for system installation, integration, and maintenance. The implementation of CHP systems involves the deployment of sophisticated equipment such as gas turbines, reciprocating engines, heat recovery units, and grid integration mechanisms, all of which contribute to a significant initial financial burden for project developers, industries, and utilities. This challenge is particularly prominent in small and medium-sized enterprises (SMEs) and commercial facilities, where budgetary constraints often hinder the adoption of such technologies, even when long-term cost savings and energy efficiency gains are apparent.

Additionally, the payback period for on-grid CHP systems can extend over several years, which may deter investment, especially in regions or sectors that prioritize short-term returns. The return on investment (ROI) is highly dependent on fluctuating energy prices, fuel costs, local grid tariffs, and government incentives—factors that introduce financial unpredictability and discourage potential adopters. Moreover, the installation process is complex and requires skilled labor, careful planning, and system customization to ensure compatibility with existing infrastructure, which adds to the overall cost.

Even though the operational cost of CHP systems is generally lower compared to conventional systems, the initial capital outlay and slow ROI can result in reluctance among stakeholders to commit to long-term energy infrastructure upgrades.

+357 96 030922
info@marketpublishers.com

Furthermore, in markets where subsidies for conventional power generation are still in place, the relative financial advantage of on-grid CHP becomes less attractive. These economic barriers are compounded by limited access to financing options or lack of favorable lending terms in certain regions, particularly in developing economies. Financial institutions may view CHP projects as high-risk ventures due to technological complexity, regulatory uncertainty, and long amortization periods. In many cases, a lack of awareness or technical knowledge about the full economic and environmental benefits of CHP systems further hampers market penetration.

This financial challenge is not only slowing adoption but also limiting innovation and scale-up, particularly for smaller market participants. Without consistent policy support in the form of tax incentives, feed-in tariffs, or capital subsidies, the adoption rate of on-grid CHP solutions remains constrained. To overcome this challenge, there is a growing need for innovative financing models such as energy-as-a-service, leasing arrangements, or public-private partnerships that can reduce the financial burden on end users. However, until such mechanisms are widely adopted and integrated into national energy frameworks, high capital costs and long payback periods will continue to be a major restraint in the expansion of the on-grid combined heat and power market across various sectors and geographies.

Key Market Trends

Increasing Integration of Renewable Energy with CHP Systems

A major trend reshaping the on-grid combined heat and power (CHP) market is the increasing integration of renewable energy sources with CHP systems to enhance energy efficiency and sustainability. Traditional CHP systems, which primarily operate on natural gas or other fossil fuels, are now being hybridized with solar thermal, biomass, and biogas technologies to create hybrid energy systems that are both cleaner and more cost-effective. This trend is gaining momentum as countries worldwide commit to net-zero emission targets and decarbonization strategies. The integration of renewables into on-grid CHP setups not only reduces dependency on fossil fuels but also improves grid stability by providing consistent base-load power and thermal energy.

These hybrid systems are increasingly being adopted in urban and industrial zones to meet rising energy demands while minimizing environmental impact. In addition, government incentives, subsidies, and policy frameworks supporting renewable energy adoption are accelerating this trend, making it economically attractive for industries and

+357 96 030922
info@marketpublishers.com

utilities to invest in integrated CHP solutions. Technological advancements in energy management systems, automation, and smart grids are further enabling seamless synchronization between renewable inputs and CHP units, optimizing performance and reducing energy losses. Moreover, the development of advanced thermal storage technologies allows CHP systems to store excess heat generated from renewable sources, improving flexibility and dispatchability of power.

The ability of CHP systems to operate alongside solar PV installations or use biogas from waste treatment facilities also presents a circular economy opportunity, enhancing energy security and resource utilization. This trend is expected to continue gaining traction, particularly in developed nations and regions with high renewable energy penetration, as energy producers and consumers alike seek more resilient, cost-effective, and low-carbon energy solutions that align with sustainability goals.

Key Market Players

Siemens Energy AG

General Electric (GE)

Caterpillar Inc.

Mitsubishi Power, Ltd.

MAN Energy Solutions SE

Clarke Energy

2G Energy AG

Bosch Thermotechnology

Capstone Green Energy Corporation

ABB Ltd.

Report Scope:

+357 96 030922
info@marketpublishers.com

In this report, the Global On-Grid Combined Heat and Power Market has been segmented into the following categories, in addition to the industry trends which have also been detailed below:

On-Grid Combined Heat and Power Market, By Technology:

Internal Combustion Engine

Gas Turbine

Microturbine

Fuel Cell

Stirling Engine

On-Grid Combined Heat and Power Market, By Application:

Residential

Commercial

Industrial

On-Grid Combined Heat and Power Market, By Fuel Type:

Natural Gas

Biomass

Coal

Renewable Energy

Waste Heat

On-Grid Combined Heat and Power Market, By System Configuration:

Single-Heat

+357 96 030922
info@marketpublishers.com

- Dual-Heat
- Multi-Heat

On-Grid Combined Heat and Power Market, By Region:

- North America
  - United States
  - Canada
  - Mexico
- Europe
  - France
  - United Kingdom
  - Italy
  - Germany
  - Spain
- Asia-Pacific
  - China
  - India
  - Japan
  - Australia
  - South Korea

+357 96 030922
info@marketpublishers.com

South America

Brazil

Argentina

Colombia

Middle East & Africa

South Africa

Saudi Arabia

UAE

Kuwait

Turkey

Competitive Landscape

Company Profiles: Detailed analysis of the major companies presents in the Global On-Grid Combined Heat and Power Market.

Available Customizations:

Global On-Grid Combined Heat and Power Market report with the given Market data, Tech Sci Research offers customizations according to a company's specific needs. The following customization options are available for the report:

Company Information

Detailed analysis and profiling of additional Market players (up to five).

+357 96 030922
info@marketpublishers.com

Contents

1. PRODUCT OVERVIEW

1.1. Market Definition
1.2. Scope of the Market
  1.2.1. Markets Covered
  1.2.2. Years Considered for Study
1.3. Key Market Segmentations

2. RESEARCH METHODOLOGY

2.1. Objective of the Study
2.2. Baseline Methodology
2.3. Formulation of the Scope
2.4. Assumptions and Limitations
2.5. Sources of Research
  2.5.1. Secondary Research
  2.5.2. Primary Research
2.6. Approach for the Market Study
  2.6.1. The Bottom-Up Approach
  2.6.2. The Top-Down Approach
2.7. Methodology Followed for Calculation of Market Size & Market Shares
2.8. Forecasting Methodology
  2.8.1. Data Triangulation & Validation

3. EXECUTIVE SUMMARY

3.1. Overview of the Market
3.2. Overview of Key Market Segmentations
3.3. Overview of Key Market Players
3.4. Overview of Key Regions/Countries
3.5. Overview of Market Drivers, Challenges, and Trends

4. VOICE OF CUSTOMER

5. GLOBAL ON-GRID COMBINED HEAT AND POWER MARKET OUTLOOK

5.1. Market Size & Forecast

+357 96 030922
info@marketpublishers.com

5.1.1. By Value
5.2. Market Share & Forecast
5.2.1. By Technology (Internal Combustion Engine, Gas Turbine, Microturbine, Fuel Cell, Stirling Engine)
5.2.2. By Application (Residential, Commercial, Industrial)
5.2.3. By Fuel Type (Natural Gas, Biomass, Coal, Renewable Energy, Waste Heat)
5.2.4. By System Configuration (Single-Heat, Dual-Heat, Multi-Heat)
5.2.5. By Region
5.3. By Company (2024)
5.4. Market Map

6. NORTH AMERICA ON-GRID COMBINED HEAT AND POWER MARKET OUTLOOK

6.1. Market Size & Forecast
6.1.1. By Value
6.2. Market Share & Forecast
6.2.1. By Technology
6.2.2. By Application
6.2.3. By Fuel Type
6.2.4. By System Configuration
6.2.5. By Country
6.3. North America: Country Analysis
6.3.1. United States On-Grid Combined Heat and Power Market Outlook
6.3.1.1. Market Size & Forecast
6.3.1.1.1. By Value
6.3.1.2. Market Share & Forecast
6.3.1.2.1. By Technology
6.3.1.2.2. By Application
6.3.1.2.3. By Fuel Type
6.3.1.2.4. By System Configuration
6.3.2. Canada On-Grid Combined Heat and Power Market Outlook
6.3.2.1. Market Size & Forecast
6.3.2.1.1. By Value
6.3.2.2. Market Share & Forecast
6.3.2.2.1. By Technology
6.3.2.2.2. By Application
6.3.2.2.3. By Fuel Type
6.3.2.2.4. By System Configuration

+357 96 030922
info@marketpublishers.com

6.3.3. Mexico On-Grid Combined Heat and Power Market Outlook
6.3.3.1. Market Size & Forecast
6.3.3.1.1. By Value
6.3.3.2. Market Share & Forecast
6.3.3.2.1. By Technology
6.3.3.2.2. By Application
6.3.3.2.3. By Fuel Type
6.3.3.2.4. By System Configuration

7. EUROPE ON-GRID COMBINED HEAT AND POWER MARKET OUTLOOK

7.1. Market Size & Forecast
7.1.1. By Value
7.2. Market Share & Forecast
7.2.1. By Technology
7.2.2. By Application
7.2.3. By Fuel Type
7.2.4. By System Configuration
7.2.5. By Country
7.3. Europe: Country Analysis
7.3.1. Germany On-Grid Combined Heat and Power Market Outlook
7.3.1.1. Market Size & Forecast
7.3.1.1.1. By Value
7.3.1.2. Market Share & Forecast
7.3.1.2.1. By Technology
7.3.1.2.2. By Application
7.3.1.2.3. By Fuel Type
7.3.1.2.4. By System Configuration
7.3.2. United Kingdom On-Grid Combined Heat and Power Market Outlook
7.3.2.1. Market Size & Forecast
7.3.2.1.1. By Value
7.3.2.2. Market Share & Forecast
7.3.2.2.1. By Technology
7.3.2.2.2. By Application
7.3.2.2.3. By Fuel Type
7.3.2.2.4. By System Configuration
7.3.3. Italy On-Grid Combined Heat and Power Market Outlook
7.3.3.1. Market Size & Forecast
7.3.3.1.1. By Value

+357 96 030922
info@marketpublishers.com

7.3.3.2. Market Share & Forecast
7.3.3.2.1. By Technology
7.3.3.2.2. By Application
7.3.3.2.3. By Fuel Type
7.3.3.2.4. By System Configuration
7.3.4. France On-Grid Combined Heat and Power Market Outlook
7.3.4.1. Market Size & Forecast
7.3.4.1.1. By Value
7.3.4.2. Market Share & Forecast
7.3.4.2.1. By Technology
7.3.4.2.2. By Application
7.3.4.2.3. By Fuel Type
7.3.4.2.4. By System Configuration
7.3.5. Spain On-Grid Combined Heat and Power Market Outlook
7.3.5.1. Market Size & Forecast
7.3.5.1.1. By Value
7.3.5.2. Market Share & Forecast
7.3.5.2.1. By Technology
7.3.5.2.2. By Application
7.3.5.2.3. By Fuel Type
7.3.5.2.4. By System Configuration

8. ASIA-PACIFIC ON-GRID COMBINED HEAT AND POWER MARKET OUTLOOK

8.1. Market Size & Forecast
8.1.1. By Value
8.2. Market Share & Forecast
8.2.1. By Technology
8.2.2. By Application
8.2.3. By Fuel Type
8.2.4. By System Configuration
8.2.5. By Country
8.3. Asia-Pacific: Country Analysis
8.3.1. China On-Grid Combined Heat and Power Market Outlook
8.3.1.1. Market Size & Forecast
8.3.1.1.1. By Value
8.3.1.2. Market Share & Forecast
8.3.1.2.1. By Technology
8.3.1.2.2. By Application

+357 96 030922
info@marketpublishers.com

8.3.1.2.3. By Fuel Type
8.3.1.2.4. By System Configuration
8.3.2. India On-Grid Combined Heat and Power Market Outlook
8.3.2.1. Market Size & Forecast
8.3.2.1.1. By Value
8.3.2.2. Market Share & Forecast
8.3.2.2.1. By Technology
8.3.2.2.2. By Application
8.3.2.2.3. By Fuel Type
8.3.2.2.4. By System Configuration
8.3.3. Japan On-Grid Combined Heat and Power Market Outlook
8.3.3.1. Market Size & Forecast
8.3.3.1.1. By Value
8.3.3.2. Market Share & Forecast
8.3.3.2.1. By Technology
8.3.3.2.2. By Application
8.3.3.2.3. By Fuel Type
8.3.3.2.4. By System Configuration
8.3.4. South Korea On-Grid Combined Heat and Power Market Outlook
8.3.4.1. Market Size & Forecast
8.3.4.1.1. By Value
8.3.4.2. Market Share & Forecast
8.3.4.2.1. By Technology
8.3.4.2.2. By Application
8.3.4.2.3. By Fuel Type
8.3.4.2.4. By System Configuration
8.3.5. Australia On-Grid Combined Heat and Power Market Outlook
8.3.5.1. Market Size & Forecast
8.3.5.1.1. By Value
8.3.5.2. Market Share & Forecast
8.3.5.2.1. By Technology
8.3.5.2.2. By Application
8.3.5.2.3. By Fuel Type
8.3.5.2.4. By System Configuration

9. SOUTH AMERICA ON-GRID COMBINED HEAT AND POWER MARKET OUTLOOK

9.1. Market Size & Forecast

+357 96 030922
info@marketpublishers.com

9.1.1. By Value
9.2. Market Share & Forecast
9.2.1. By Technology
9.2.2. By Application
9.2.3. By Fuel Type
9.2.4. By System Configuration
9.2.5. By Country
9.3. South America: Country Analysis
9.3.1. Brazil On-Grid Combined Heat and Power Market Outlook
9.3.1.1. Market Size & Forecast
9.3.1.1.1. By Value
9.3.1.2. Market Share & Forecast
9.3.1.2.1. By Technology
9.3.1.2.2. By Application
9.3.1.2.3. By Fuel Type
9.3.1.2.4. By System Configuration
9.3.2. Argentina On-Grid Combined Heat and Power Market Outlook
9.3.2.1. Market Size & Forecast
9.3.2.1.1. By Value
9.3.2.2. Market Share & Forecast
9.3.2.2.1. By Technology
9.3.2.2.2. By Application
9.3.2.2.3. By Fuel Type
9.3.2.2.4. By System Configuration
9.3.3. Colombia On-Grid Combined Heat and Power Market Outlook
9.3.3.1. Market Size & Forecast
9.3.3.1.1. By Value
9.3.3.2. Market Share & Forecast
9.3.3.2.1. By Technology
9.3.3.2.2. By Application
9.3.3.2.3. By Fuel Type
9.3.3.2.4. By System Configuration

10. MIDDLE EAST AND AFRICA ON-GRID COMBINED HEAT AND POWER MARKET OUTLOOK

10.1. Market Size & Forecast
10.1.1. By Value
10.2. Market Share & Forecast

+357 96 030922
info@marketpublishers.com

10.2.1. By Technology
10.2.2. By Application
10.2.3. By Fuel Type
10.2.4. By System Configuration
10.2.5. By Country
10.3. Middle East and Africa: Country Analysis
10.3.1. South Africa On-Grid Combined Heat and Power Market Outlook
10.3.1.1. Market Size & Forecast
10.3.1.1.1. By Value
10.3.1.2. Market Share & Forecast
10.3.1.2.1. By Technology
10.3.1.2.2. By Application
10.3.1.2.3. By Fuel Type
10.3.1.2.4. By System Configuration
10.3.2. Saudi Arabia On-Grid Combined Heat and Power Market Outlook
10.3.2.1. Market Size & Forecast
10.3.2.1.1. By Value
10.3.2.2. Market Share & Forecast
10.3.2.2.1. By Technology
10.3.2.2.2. By Application
10.3.2.2.3. By Fuel Type
10.3.2.2.4. By System Configuration
10.3.3. UAE On-Grid Combined Heat and Power Market Outlook
10.3.3.1. Market Size & Forecast
10.3.3.1.1. By Value
10.3.3.2. Market Share & Forecast
10.3.3.2.1. By Technology
10.3.3.2.2. By Application
10.3.3.2.3. By Fuel Type
10.3.3.2.4. By System Configuration
10.3.4. Kuwait On-Grid Combined Heat and Power Market Outlook
10.3.4.1. Market Size & Forecast
10.3.4.1.1. By Value
10.3.4.2. Market Share & Forecast
10.3.4.2.1. By Technology
10.3.4.2.2. By Application
10.3.4.2.3. By Fuel Type
10.3.4.2.4. By System Configuration
10.3.5. Turkey On-Grid Combined Heat and Power Market Outlook

+357 96 030922
info@marketpublishers.com

10.3.5.1. Market Size & Forecast
10.3.5.1.1. By Value
10.3.5.2. Market Share & Forecast
10.3.5.2.1. By Technology
10.3.5.2.2. By Application
10.3.5.2.3. By Fuel Type
10.3.5.2.4. By System Configuration

11. MARKET DYNAMICS

11.1. Drivers
11.2. Challenges

12. MARKET TRENDS & DEVELOPMENTS

12.1. Merger & Acquisition (If Any)
12.2. Product Launches (If Any)
12.3. Recent Developments

13. COMPANY PROFILES

13.1. Siemens Energy AG
13.1.1. Business Overview
13.1.2. Key Revenue and Financials
13.1.3. Recent Developments
13.1.4. Key Personnel/Key Contact Person
13.1.5. Key Product/Services Offered
13.2. General Electric (GE)
13.3. Caterpillar Inc.
13.4. Mitsubishi Power, Ltd.
13.5. MAN Energy Solutions SE
13.6. Clarke Energy
13.7. 2G Energy AG
13.8. Bosch Thermotechnology
13.9. Capstone Green Energy Corporation
13.10. ABB Ltd.

14. STRATEGIC RECOMMENDATIONS

+357 96 030922
info@marketpublishers.com

15. ABOUT US & DISCLAIMER

+357 96 030922
info@marketpublishers.com

I would like to order

Product name: On-Grid Combined Heat and Power Market - Global Industry Size, Share, Trends, Opportunity, and Forecast, Segmented, By Technology (Internal Combustion Engine, Gas Turbine, Microturbine, Fuel Cell, Stirling Engine), By Application (Residential, Commercial, Industrial), By Fuel Type (Natural Gas, Biomass, Coal, Renewable Energy, Waste Heat), By System Configuration (Single-Heat, Dual-Heat, Multi-Heat), By Region, By Competition, 2020-2030F

Product link: https://marketpublishers.com/r/OFC253635C55EN.html

Price: US$ 4,500.00 (Single User License / Electronic Delivery)

If you want to order Corporate License or Hard Copy, please, contact our Customer Service:
info@marketpublishers.com

Payment

To pay by Credit Card (Visa, MasterCard, American Express, PayPal), please, click button on product page https://marketpublishers.com/r/OFC253635C55EN.html