

# 2024 Sustainable Energy Research Review

https://marketpublishers.com/r/2A98BE4E7408EN.html

Date: April 2025

Pages: 168

Price: US\$ 4,650.00 (Single User License)

ID: 2A98BE4E7408EN

## **Abstracts**

### Research Review Scope:

The developing landscape of the green energy transition is underway to achieve decarbonization of hard-to-abate industries globally. This trend has increased the importance of sustainable energy practices, that allow organizations to reduce and manage their carbon emissions. There are various sustainable technologies that are gaining traction in the market such as carbon capture, utilization, storage, carbon dioxide removal, carbon credits among others. These technologies are expected to grow significantly, with a growing focus on maintaining environmental sustainability, hence, much R&D is required to demonstrate the viability and applicability of these technologies in the global market.

Currently, 40 countries and 20 cities across the globe have adopted carbon pricing. The World Bank announced that the revenues from ETS and carbon taxes reached \$104 billion in 2023. These instruments covered around 24% of the global GHGs and were expected to reach 50% by 2030. Furthermore, sustainable marine fuels are cleaner versions of fossil-based energy dense heavy oils. However, it accounts for less than 1% share in total marine fuel consumed across the globe. The positive outlook towards clean fuels by shipping industry and fuel producers is expected to propel the demand for sustainable fuels.

Research Reviews from BCC Research provide market professionals with concise market coverage within a specific research category. This 2024 Research Review of sustainable energy provides a sampling of the type of quantitative market information, analysis, and guidance that BCC Research has been developing since its inception in 1971 to help its customers make informed business decisions. This

Research Review includes highlights and excerpts from the following reports published



by BCC Research in 2024:

ENV069A Carbon Dioxide Removals (CDR) Market.

EGY200A Carbon Credits Market: Global Outlook.

EGY117E Biorefinery Products and Applications: Global Markets.

EGY198A Global Sustainable Marine Fuel Market.

After you survey the excerpts in this Research Review, we encourage you to follow up on these topics by checking out the full market research reports associated with each topic. BCC Research looks forward

to serving your market intelligence needs in the future.



## **Contents**

### **CHAPTER 1 FOREWORD**

Research Review Scope

# CHAPTER 2 GLOBAL CARBON DIOXIDE REMOVALS (CDR) MARKET (ENV069A)

Scope of Report

Market Outlook

Market Summary

Market Overview

Climate Regulations and Policies

The Paris Agreement

The European Green Deal

Kyoto Protocol

Carbon Pricing

Macroeconomic Factors Analysis

Value Chain Analysis: Carbon Dioxide Removal

Porter's Five Forces Analysis

**SWOT Analysis** 

Market Dynamics

Market Driver

Market Challenge

Market Restraint

Market Opportunity

Global CDR Market, by Technology Type

Key Takeaways

Biochar

Enhanced/Carbon Mineralization

Direct Air Capture (DAC)

Bioenergy With Carbon Capture and Storage (BECCS)

Ocean Alkalinization

Others

Global CDR Market, by Region

Key Takeaways

North America

Europe, Middle East and Africa (EMEA)

Asia-Pacific (APAC)



### South America

### CHAPTER 3 CARBON CREDITS MARKET: GLOBAL OUTLOOK (EGY200A)

Market Outlook

Scope of Report

**Executive Summary** 

Carbon Credits Market Overview

Carbon Pricing

Kyoto Protocol

The Paris Agreement

European Green Deal

Macroeconomic Factors Analysis in the Carbon Credit Market

Value Chain Analysis

**SWOT Analysis** 

**Global Market Dynamics** 

**Market Driver** 

Market Challenge

Market Opportunity

Market Restraint

Market Trend

Carbon Credits Market Analysis, by End-User

Power

Energy

Transportation

**Building and Construction** 

Other Industries

Carbon Credits Market Analysis, by Region

Europe

Asia-Pacific (APAC)

North America

Rest of the World (RoW)

Sustainability in the Carbon Credit Industry: ESG Perspective

Introduction to ESG

**Environmental Issues** 

Social Issues

Governance Issues

Future of ESG: Emerging Trends and Opportunities

Concluding Remarks from BCC Research



# CHAPTER 4 BIOREFINERY PRODUCTS AND APPLICATIONS: GLOBAL MARKETS (EGY117E)

Market Outlook

Scope of Report

Summary and Highlights

Biorefinery Products and Applications: Market Overview

**Biomass** 

**Bioproducts** 

**Biorefinery Products** 

Market Dynamics

**Market Driver** 

Market Opportunity

Market Restraint

Market Challenge

**Emerging Technologies and Developments** 

Wastewater to Energy

Co-solvent Enhanced Lignocellulosic Fractionation (CELF)

Artificial Intelligence

Carbon Capture and Utilization (CCU)

Market for Biorefinery Products and Applications, by Application

**Key Takeaways** 

**Biofuels** 

**Biobased Chemicals** 

**Biomaterials** 

Bioenergy

Medicines and Healthcare

Market for Biorefinery Products and Applications, by Region

**Key Takeaways** 

North America

Europe

Asia-Pacific

Rest of the World (RoW)

ESG in the Biorefinery Products Industry

ESG Practices in the Biorefinery Products Industry

Future of ESG: Emerging Trends and Opportunities

Concluding Remarks



## **CHAPTER 5 GLOBAL SUSTAINABLE MARINE FUEL MARKET (EGY198A)**

Market Outlook

Scope of Report

Market Insights

Sustainable Marine Fuel Market Overview

**Biofuels** 

Hydrogen

**Ammonia** 

Bio-methanol

Macroeconomic Factors Analysis

Porter's Five Forces Analysis

Value Chain Analysis

**SWOT Analysis** 

Climate Policies and Regulations in Sustainable Marine Fuel Market

IMO Marine Environment Protection Committee (MEPC)

The Paris Agreement

The European Green Deal

Market Dynamics of Sustainable Marine Fuels

**Market Driver** 

Market Challenge

Market Restraint

Market Opportunity

**Emerging Technologies and Developments** 

Development of Algae-based Feedstock

Sustainable Marine Fuel Market Analysis by Fuel Type

Overview

**Biofuel** 

Bio-methanol

Ammonia

Hydrogen

Sustainable Marine Fuel Market Analysis by Region

Overview

Asia-Pacific (APAC)

Europe

North America

Middle East and Africa (MEA)

South America

ESG Developments in the Sustainable Marine Fuel Industry



ESG Practices in the Industry

Future of ESG: Emerging Trends and Opportunities

Concluding Remarks from BCC Research

### **CHAPTER 6 APPENDIX**

Methodology Analyst's Credentials

### 12. LIST OF TABLES

- Table 1 : Global Market for Carbon Dioxide Removal, by Region, Through 2028
- Table 2: Global Market Volume for Carbon Dioxide Removal, Through 2028
- Table 3: Post-2020 National Emission Reduction, by Country
- Table 4: CO2 Emissions, by Fossil Fuels, by Country, 2021
- Table 5 : Comparison of Different CDR Technologies
- Table 6 : Global Market for Carbon Dioxide Removal, by Technology Type, Through 2028
- Table 7: Carbon Stability of Biochar
- Table 8 : Major Developments in Carbon Dioxide Removal, by Biochar Technology, 2023
- Table 9: Global Market for Carbon Dioxide Removal, by Region, Through 2028
- Table 10: Global Market for Carbon Credits, by End User, Through 2029
- Table 11: Carbon Taxes, by Country, 2023
- Table 12: Carbon Credit Pricing, by Project Type
- Table 13: Global Carbon Credits Market, by Value and Volume, Through 2029
- Table 14: Key Roles of Carbon Credit Industry Actors
- Table 15: Recent Developments in DAC Projects, 2022-2024
- Table 16: Carbon Credits Purchased, by Citigroup as its ESG Practices
- Table 17: Global Market for Carbon Credits, by End User, Through 2029
- Table 18: Global Market for Carbon Credits in Power, by Region, Through 2029
- Table 19: Global Market for Carbon Credits in Energy, by Region, Through 2029
- Table 20 : Global Market for Carbon Credits in Transportation, by Region, Through 2029
- Table 21: Global Market for Carbon Credits in Building and Construction, by Region, Through 2029
- Table 22 : Global Market for Carbon Credits in Other Industries, by Region, Through 2029
- Table 23: Global Market for Carbon Credits, by Region, Through 2029



- Table 24: Carbon Pricing Revenues, by Instrument Type, 2023
- Table 25: European Market for Carbon Credits, by End User, Through 2029
- Table 26: Compliance Carbon Pricing Instruments in Europe
- Table 27: Asia-Pacific Market for Carbon Credits, by End User, Through 2029
- Table 28 : Compliance Carbon Pricing Instruments in Asia-Pacific
- Table 29: North American Market for Carbon Credits, by End User, Through 2029
- Table 30: Compliance Carbon Pricing Instruments in North America
- Table 31: Rest of World Market for Carbon Credits, by End User, Through 2029
- Table 32: Compliance Carbon Pricing Instruments in the Middle East and Africa
- Table 33: Compliance Carbon Pricing Instruments in South America
- Table 34: Global Market for Biorefinery Products, by Product Type, Through 2029
- Table 35: Phases of Biorefineries
- Table 36 : Biorefinery Outlook
- Table 37: Global Distribution of Biorefineries, 2022
- Table 38: Petroleum Raw Materials with Biobased Materials
- Table 39: Recent Developments in the Biobased Industry, 2021-2024
- Table 40: Biomass, Biobased Products and Biorefinery Products
- Table 41: Ranking of Regions, by Total Energy Contained in Residue Produced
- Table 42: Facts Related to Energy Crops
- Table 43: Global Market for Biorefinery Products and Applications, by Application,
- Through 2029
- Table 44: Biofuels, by Type
- Table 45: Biofuel Adoption and Related Policies, by Region
- Table 46: Global Market for Biofuel Application in Biorefinery Products and
- Applications, by Region, Through 2029
- Table 47: Biobased Chemicals, by Type
- Table 48: Biobased Chemicals, by Country/Region
- Table 49: Global Market for Biobased Chemicals, by Region, Through 2029
- Table 50: Biomaterials, by Type
- Table 51: Biomaterial Adoption and Related Policies, by Region/Country
- Table 52: Global Market for Biomaterial Applications, by Region, Through 2029
- Table 53: Bioenergy, by Type
- Table 54: Bioenergy Adoption and Related Policies, by Region
- Table 55: Global Market for Bioenergy Applications, by Region, Through 2029
- Table 56: Biobased Medicines and Healthcare, by Type
- Table 57: Biobased Medicines and Healthcare, by Region
- Table 58: Global Market for Biobased Medicines and Healthcare Applications, by
- Region, Through 2029
- Table 59: Global Market for Biorefinery Products and Applications, by Region, Through



2029

Table 60: North American Market for Biorefinery Products and Applications, by

Country, Through 2029

Table 61: North American Market for Biorefinery Products and Applications, by Source,

Through 2029

Table 62: North American Market for Biorefinery Products and Applications, by Product,

Through 2029

Table 63: North American Market for Biorefinery Products and Applications, by

Application, Through 2029

Table 64: European Market for Biorefinery Products and Applications, by Country,

Through 2029

Table 65: European Market for Biorefinery Products and Applications, by Source,

Through 2029

Table 66: European Market for Biorefinery Products and Applications, by Product,

Through 2029

Table 67: European Market for Biorefinery Products and Applications, by Application,

Through 2029

Table 68: Asia-Pacific Market for Biorefinery Products and Applications, by Country,

Through 2029

Table 69: Asia-Pacific Market for Biorefinery Products and Applications, by Source,

Through 2029

Table 70: Asia-Pacific Market for Biorefinery Products and Applications, by Product,

Through 2029

Table 71: Asia-Pacific Market for Biorefinery Products and Applications, by Application,

Through 2029

Table 72: RoW Market for Biorefinery Products and Applications, by Sub-Region,

Through 2029

Table 73: RoW Market for Biorefinery Products and Applications, by Source, Through

2029

Table 74: RoW Market for Biorefinery Products and Applications, by Product, Through

2029

Table 75: RoW Market for Biorefinery Products and Applications, by Application,

Through 2029

Table 76: ESG Metrics

Table 77: ESG Diversity Issues

Table 78: ESG Employee Safety and Labor Practices Issues

Table 79: ESG Resource Efficiency and Emissions Issues

Table 80: ESG Waste Reduction Issues

Table 81 : ESG Sustainable Supply Chain Issues



- Table 82: ESG Corporate Behavior Issues
- Table 83: Global Market for Sustainable Marine Fuel, by Fuel Type, Through 2028
- Table 84: Overview of Alternative Fuels and their Production Pathways
- Table 85: Algae-based Biofuel Companies
- Table 86: Global Market for Sustainable Marine Fuel, by Fuel Type, Through 2028
- Table 87 : Global Market Volume for Sustainable Marine Fuel, by Fuel Type, Through 2028
- Table 88: Increase in Biofuel Use in All Ships of 5,000 GT and Above, 2021 and 2022
- Table 89: Potential Biofuels for the Shipping Industry
- Table 90 : Maersk's Renewable Methanol Projects
- Table 91: Demonstrations of the Use of Ammonia in the Maritime Sector, 2020-2024
- Table 92: Ports Supplying the Most Marine Fuel, 2022
- Table 93: Bio-blend Fuel Supply by Supplier, 2022 and 2023
- Table 94: Global Market for Sustainable Marine Fuel, by Region, Through 2028
- Table 95: World's Largest Container Ports, by Throughput, 2021–2023
- Table 96: Bio-blended Fuel Supply, Rotterdam Port, 2021-2023
- Table 97: Green Energy Investment Initiatives, by European Country

### 12. LIST OF FIGURES

- Figure 1: Share of Global Market for Carbon Dioxide Removal, by Region, 2022
- Figure 2: Annual CO2 Emissions, by Fossil Fuels, 2015-2022
- Figure 3: Carbon Taxes, by Country, 2021
- Figure 4: Carbon Dioxide Removal Value Chain
- Figure 5: Carbon Capture, Utilization and Storage (CCUS) Value Chain
- Figure 6: Porter's Five Forces Analysis: Global Market for Carbon Dioxide Removal
- Figure 7 : SWOT Analysis: Global Market for Carbon Dioxide Removal
- Figure 8 : Share of Global Market for Carbon Dioxide Removal, by Technology Type, 2022
- Figure 9 : Share of Global Market for Carbon Dioxide Removal, by Technology Type, 2028
- Figure 10: Biochar Applications
- Figure 11 : Ocean-Based CDR Technologies
- Figure 12: Global Market for Carbon Dioxide Removal by Region
- Figure 13: Share of Global Market for Carbon Dioxide Removal, by Region, 2022
- Figure 14: Share of Global Market for Carbon Dioxide Removal, by Region, 2028
- Figure 15: North American Market for Carbon Dioxide Removal, 2022-2028
- Figure 16: EMEA Market for Carbon Dioxide Removal, 2022-2028
- Figure 17: Asia-Pacific Market for Carbon Dioxide Removal, 2022-2028



- Figure 18: South American Market for Carbon Dioxide Removal, 2022-2028
- Figure 19: South American Market for Carbon Dioxide Removal, 2022-2028
- Figure 20: Value Chain for Carbon Credit Market
- Figure 21: SWOT Analysis: Global Carbon Credits Market
- Figure 22: Benefits of Blockchain Technology in Carbon Credit Industry
- Figure 23: Share of Global Market for Carbon Credits, by End User, 2023
- Figure 24: Share of Global Market for Carbon Credits in Power, by Region, 2023
- Figure 25: Share of Global Market for Carbon Credits in Energy, by Region, 2023
- Figure 26: Share of Global Market for Carbon Credits in Transportation, by Region, 2023
- Figure 27 : Share of Global Market for Carbon Credits in Building and Construction, by Region, 2023
- Figure 28: Share of Global Market for Carbon Credits in Other Industries, by Region, 2023
- Figure 29: Global Share of Power Generation Sources, 2018-2021
- Figure 30 : Share of Global Market for Carbon Credits, by Region, 2023
- Figure 31: Share of European Market for Carbon Credits, by End User, 2023
- Figure 32: Share of Total GHG Emissions (MTCO2e) in China, by CRF Category, 2023
- Figure 33: Share of Asia-Pacific Market for Carbon Credits, by End User, 2023
- Figure 34: Share of North American Market for Carbon Credits, by End User, 2023
- Figure 35: Share of Rest of World Market for Carbon Credits, by End User, 2023
- Figure 36: Global Market for Biorefinery Products, by Product Type, 2023-2029
- Figure 37: Share of Global Bioenergy Supply, by Segment, 2020
- Figure 38: Overview of Separation and Purification Processes
- Figure 39: Dedicated Energy Crops, by Category
- Figure 40 : Concept of the Circular Economy
- Figure 41: Share of Global Market for Biorefinery Products and Applications, by
- Application, 2023
- Figure 42: Share of Global Market for Biorefinery Products, by Region, 2023
- Figure 43 : Overview of ESG Factors
- Figure 44: Share of Global Market for Sustainable Marine Fuel, by Fuel Type, 2022
- Figure 45: Electricity Required to Generate 1 kg of Hydrogen, by Technology
- Figure 46: Porter's Five Forces Analysis of Sustainable Marine Fuel Market
- Figure 47: Value Chain Analysis of Sustainable Marine Fuel Market
- Figure 48 : SWOT Analysis of Sustainable Marine Fuel Market
- Figure 49: CO2 Emissions by Fossil Fuels, 2018-2023
- Figure 50: Annual CO2 Emissions per Capita, by Country/Region, 2021–2023
- Figure 51: Share of Global Market for Sustainable Marine Fuel, by Fuel Type, 2022
- Figure 52: Share of Global Market Volume for Sustainable Marine Fuel, by Fuel Type,



### 2022

Figure 53: Biofuel as Marine Fuel: Drivers and Challenges

Figure 54: Bio-methanol as Marine Fuel: Drivers and Challenges

Figure 55 : Ammonia as Marine Fuel: Drivers and Challenges

Figure 56: Hydrogen as Marine Fuel: Drivers and Challenges

Figure 57: Share of Global Market for Sustainable Marine Fuel, by Region, 2022



# I would like to order

Product name: 2024 Sustainable Energy Research Review

Product link: <a href="https://marketpublishers.com/r/2A98BE4E7408EN.html">https://marketpublishers.com/r/2A98BE4E7408EN.html</a>

Price: US\$ 4,650.00 (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 <a href="https://marketpublishers.com/r/2A98BE4E7408EN.html">https://marketpublishers.com/r/2A98BE4E7408EN.html</a>