Organic Rankine Cycle Market Trends 2025-2029: Regional Outlook and Sizing Analysis

The Business Research Company's Organic Rankine Cycle Global Market Report 2025 – Market Size, Trends, And Global Forecast 2025-2034

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Organic Rankine Cycle Market Growth Forecast: What To Expect By 2025?
The market size for organic rankine cycle has seen significant growth in the past few years. We expect its value to rise from $0.7 billion in 2024 to $0.74 billion in 2025, signifying a compound annual growth rate (CAGR) of 6.2%. This positive trend during the historic period can be traced back to the increasing consumer demand for renewable energies, industrial expansion, the escalating demand for energy globally, the widespread adoption of orc systems, and government policies urging the use of sustainable energy technologies.

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In the upcoming years, the market size of the organic rankine cycle is anticipated to witness significant growth, reaching a value of $0.96 billion by 2029 at a compound annual growth rate of 6.7%. This projected growth during the forecasted period is mainly due to factors such as an upsurge in sectoral collaborations, intensified efforts to enhance energy efficiency, growth in electric vehicle (EV) applications, a heightened emphasis on curbing greenhouse gas emissions, and a boost in environmental consciousness. The forecasted period is expected to be defined by key trends such as technology upgrades, incorporation of renewable energy, the integration of energy storage, focus on low-temperature sources, and governmental incentives.

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What Are Key Factors Driving The Demand In The Global Organic Rankine Cycle Market?
The burgeoning need for renewable energy is set to fuel the expansion of the organic rankine cycle market as we move forward. Renewable energy, harnessed from naturally occurring and self-replenishing sources such as the sun, wind, rain, currents and geothermal heat, is a sustainable choice for the long-term. The mounting demand for such energy sources is attributed to the desire to minimize greenhouse gas emissions, combat climate change, and guarantee a stable energy supply for the future. Renewable energy systems utilize the organic rankine cycle (ORC) technology, which converts the low-temperature heat derived from geothermal, biomass, and solar thermal sources into power, thereby augmenting their efficiency and feasibility. For example, according to the Energy Information Administration (EIA), a government agency in the U.S., by 2024, solar energy production in the country is expected to surge by 75%—from 163 billion kWh in 2023 to 286 billion kWh by 2025. Likewise, it is expected that wind energy generation will witness a growth of 11%, rising from 430 billion kWh in 2023 to 476 billion kWh in 2025. Consequently, the ever-increasing demand for renewable energy is predicted to spur the growth of the organic rankine cycle market.

Who Are The Leading Players In The Organic Rankine Cycle Market?
Major players in the Organic Rankine Cycle include:
• General Electric Company
• Siemens Energy AG
• Mitsubishi Heavy Industries Ltd.
• Asea Brown Boveri Ltd.
• Baker Hughes Company
• Atlas Copco AB
• Kawasaki Heavy Industries Ltd.
• IHI Corporation
• Alfa Laval AB
• Dürr AG
• Ormat Technologies Inc.
• Exergy International Srl
• Turboden S.p.A.
• Calnetix Technologies LLC
• TAS Energy Inc.
• ORCAN ENERGY AG
• Kaishan USA
• Triogen Limited
• Elvosolar a.s.
• Enertime S.A.
• INTEC GMK GmbH
• Climeon AB
• Enogia S.A.

What Are The Key Trends Shaping The Organic Rankine Cycle Industry?
Leading companies in the organic rankine cycle market are striving to develop novel advancements such as waste heat recovery systems. These advancements aim to improve energy efficiency, decrease emissions, and utilize industrial process waste heat for green power generation. The waste heat recovery system is a cutting-edge technology designed to capture waste heat from industrial processes and transform it into electrical power, thereby enhancing energy efficiency and lowering total emissions. For example, Alfa Laval AB, a Sweden-based industrial machinery manufacturer, introduced the E-PowerPack in March 2022. This product is an organic rankine cycle (ORC)-based waste heat recovery system designed for ships that changes waste heat into electrical power directly. The E-PowerPack is an integrated unit that aids ships in improving their existing ship index (EEXI) and carbon intensity indicator (CII), making it attractive to shipowners looking for sustainability and regulatory adherence. The E-powerpack lessens fuel usage and CO2 emissions by creating power from waste heat, facilitating significant fuel savings and an improved CII rating. The unit's adaptable design permits up to 100 kW or 200 kW of net electrical output, which can be incorporated into larger systems. It is compatible with all types of vessels and marine fuels, including prospective fuels like green methanol and ammonia.

Analysis Of Major Segments Driving The Organic Rankine Cycle Market Growth
The organic rankine cyclemarket covered in this report is segmented –
1) By Model: Dynamic, Steady-State
2) By Fluid Type: Hydrocarbon-Based ORC Systems, Siloxane-Based ORC Systems, Other Fluid Types
3) By Power Output: ≤ 1 MWe, > 1 - 5 MWe, > 5 - 10 MWe, > 10 MWe
4) By Capacity: Small-Scale ORC Systems, Medium-Scale ORC Systems, Large-Scale ORC Systems
5) By Application: Waste Heat Recovery, Geothermal, Biomass, Oil And Gas, Waste To Energy, Solar Thermal

Subsegments:
1) By Dynamic Model: Real-Time Performance Simulation, Transient State Analysis, Dynamic Load Tracking Systems, Control System Modeling, Start-Up And Shut-Down Dynamics, Adaptive Control Systems
2) By Steady-State Model: Thermodynamic Cycle Modeling, Energy Efficiency Analysis, Constant Load Operation Systems, Heat Exchanger Design And Optimization, Performance Optimization At Fixed Operating Conditions, System Stability And Thermal Balance Analysis

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Which Region Is Expected To Lead The Organic Rankine Cycle Market By 2025?
In 2024, North America led the organic rankine cycle market. The quickest projected growth, however, is anticipated in the Asia-Pacific region. The market report encompasses regions such

as Asia-Pacific, Western Europe, Eastern Europe, North America, South America, Middle East, and Africa.

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