شـركـة وادي الريـاض
Riyadh Valley Co

Circular Energy

Pathway to a Sustainable and Resilient Future

November, 2025

Growth by Innovation

Riyadh Valley Co. A Quality Shift towards the Future

Riyadh Valley Company

Riyadh Valley Company (RVC) established in 2010 by Royal Decree No. 116 dated 1431/4/13 AH, to be the investment arm of King Saud University in the fields of Knowledge economy and the university strategic projects

Based on the company's stated purposes in the Articles of Association, the following main activities have been identified:

1. Venture Capital Investments
2. Strategic Investments
3. Enriching Innovation Ecosystem

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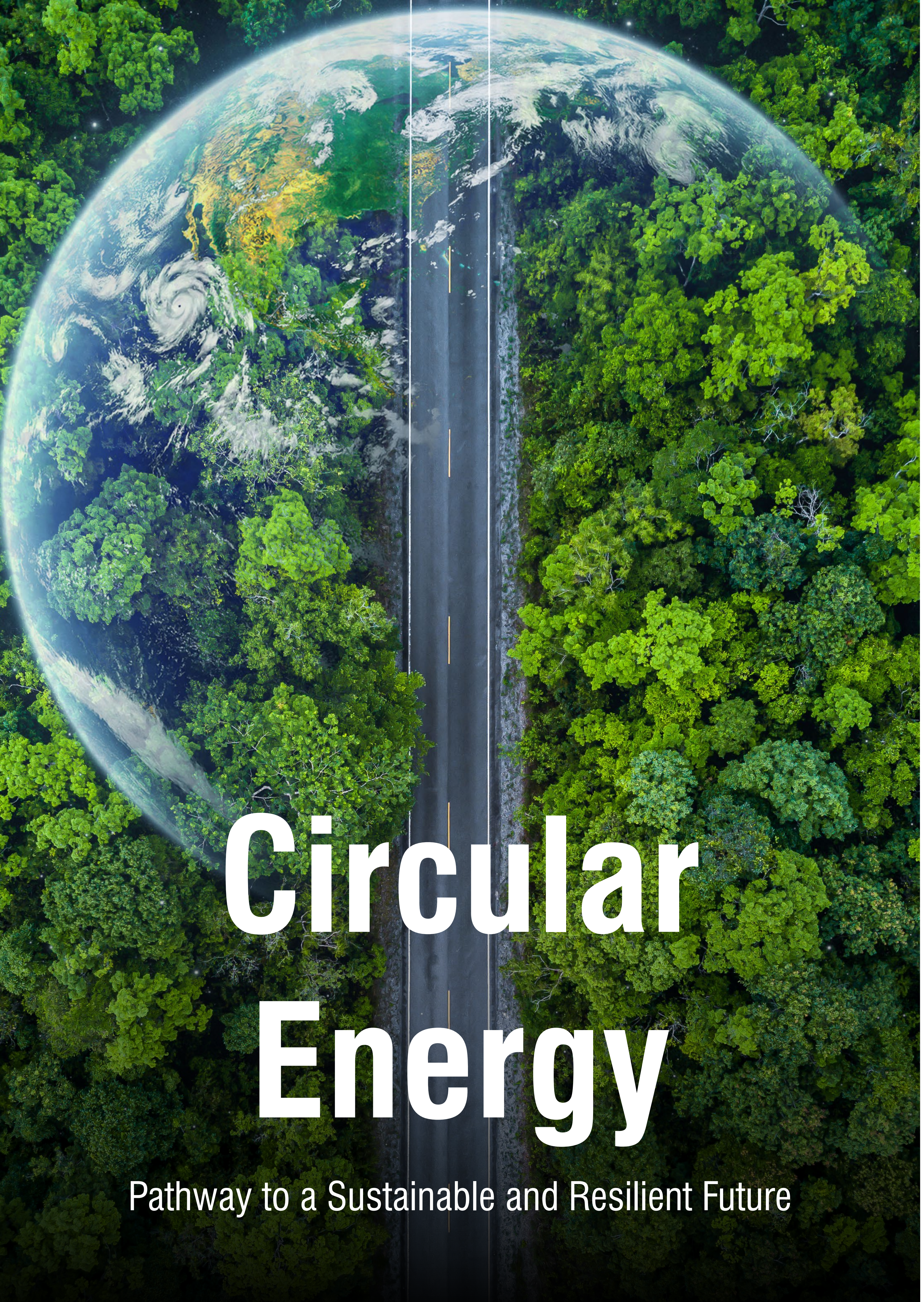


Introduction

The global imperative to transition toward sustainable energy systems has brought the concept of circular energy to the forefront of policy, industry and research agendas. Circular energy represents the integration of circular economy principles into the energy sector, fostering a regenerative system where resource use is optimized, waste is minimized, and environmental impacts are substantially reduced.

The circular economy is a systemic approach to economic development designed to benefit businesses, society, and the environment. Unlike the traditional linear model of “take-make-dispose,” it emphasizes designing out waste and pollution, keeping products and materials in use and regenerating natural systems. It encourages reuse, repair, recycling, and the efficient use of resources across all sectors. When applied to energy, these principles form the foundation of circular energy, which aim to close energy loops by reusing byproducts, improving energy efficiency, and integrating renewable and low-carbon technologies.[1]

The circular energy approach challenges conventional energy models by promoting closed-loop systems that reduce dependency on finite resources and lower emissions. It reflects a broader shift in societal thinking about energy production and resource management, aligning with systemic design, climate goals, and sustainability targets.

Technological advancements, from energy storage and smart grids to carbon capture and hydrogen innovation, are enabling the practical implementation of circular energy systems. Digital tools are further enhancing system optimization and resource circulation. Simultaneously, policy frameworks and investment strategies are evolving to support this paradigm, with governments and financial institutions increasingly recognizing circular energy as a cornerstone of long-term competitiveness and energy security. Regional initiatives across Europe, Asia, and the Middle East underscore its growing global relevance.

For economies heavily reliant on hydrocarbons, such as those in the GCC, it presents a unique opportunity to diversify, extend the utility of existing assets, and transition toward more sustainable development models. Countries like Saudi Arabia are actively embracing the Circular Carbon Economy (CCE) framework, which integrates traditional energy resources with circular practices such as carbon capture, utilisation and storage (CCUS), bioenergy and renewable energy deployment. These efforts are part of broader national strategies like Saudi Vision 2030, aimed at reducing environmental impact while maintaining economic growth.

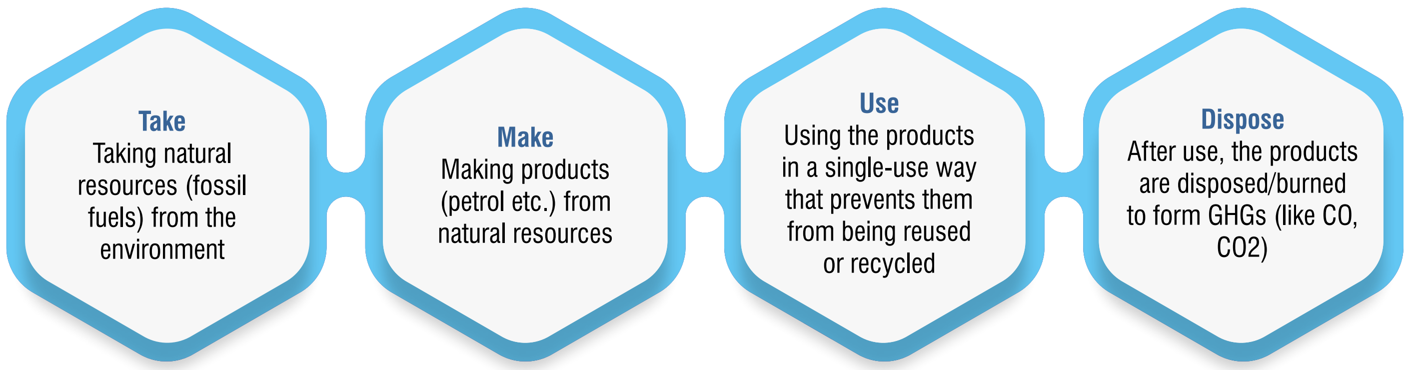
In essence, circular energy lies at the intersection of sustainability, innovation, and economic transformation. It offers a forward-looking model that bridges current energy dependencies with the vision of a low-carbon future, making it a vital consideration for decision-makers, businesses, and investors aiming to navigate the complexities of the 21st-century energy landscape.

[1] Ellen MacArthur Foundation

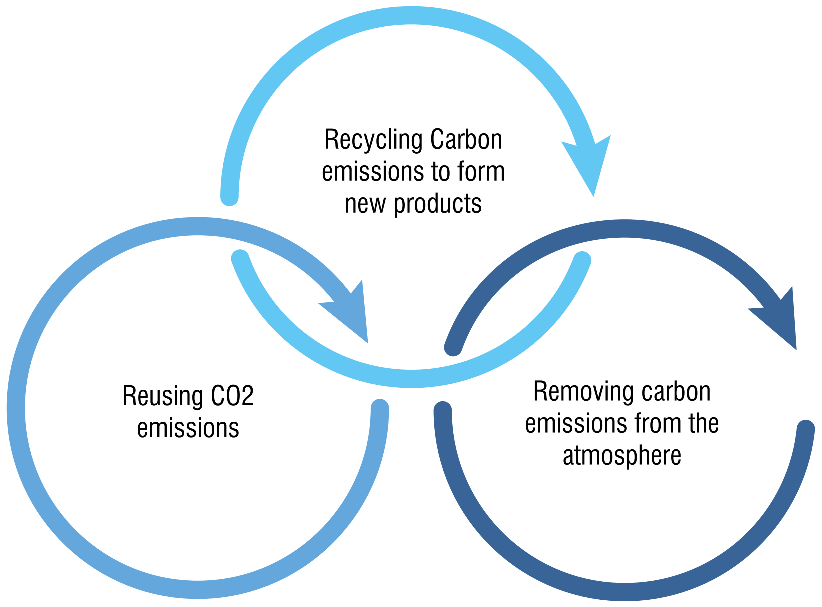
2. Circular Energy

Circular energy can be understood as an approach within the broader circular economy framework, emphasizing the continuous use, recovery and regeneration of energy resources and materials involved in energy production, distribution and consumption. Circular energy systems aim to keep energy flows and related materials (such as batteries, solar panels, and industrial by-products) in productive use for as long as possible, converting waste into valuable inputs for new energy processes and ensuring minimum environmental footprints.[2]

Linear/Traditional Carbon Economy:



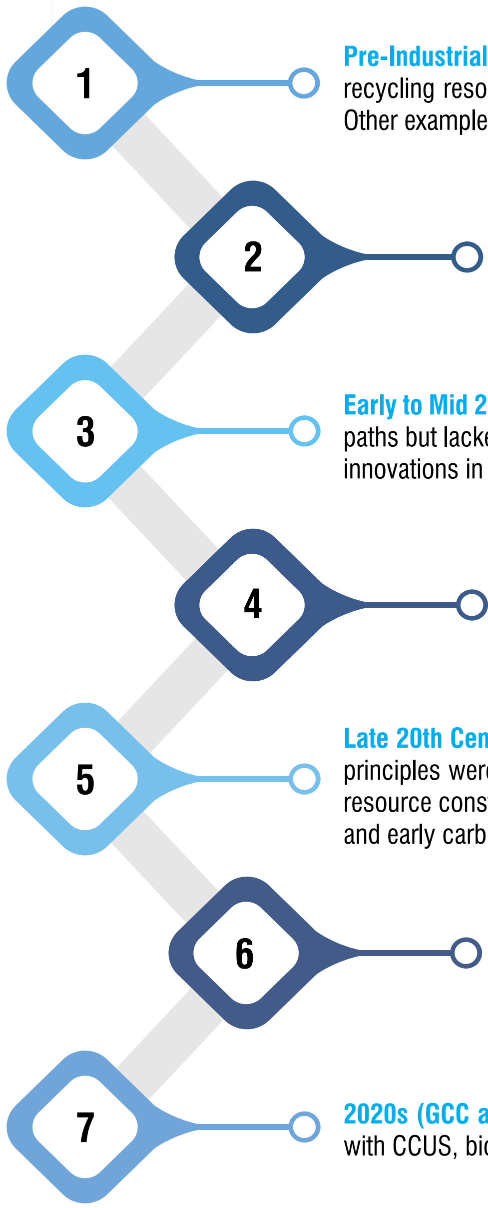
Core Principles of a Circular Carbon Economy:



Source: Arab News, Santander

[2] Ellen MacArthur Foundation

a. History of Circular Energy



1. **Pre-Industrial Era (Pre-19th Century):** Societies practiced natural circularity by locally reusing, repairing, and recycling resources. Evidence from Roman shipwrecks shows recycling of materials like copper and glass. Other examples include repurposed wood for shipbuilding and making paper from rags and discarded cloth.

2. **19th Century (Industrial Revolution):** The industrial era introduced linear energy systems powered by coal and steam, replacing circular practices with a "take-make-dispose" model. Mass production and fossil fuel reliance grew, while resource depletion and pollution were largely overlooked.

3. **Early to Mid 20th Century:** The expansion of renewables like hydro and geothermal showed alternative energy paths but lacked circular system integration. While the World Wars increased fossil fuel use, they also spurred innovations in energy efficiency and resource management.

4. **1960s to 1970s (Rise of Environmental Awareness):** Growing concerns over pollution and resource depletion led to the rise of industrial ecology, promoting closed-loop systems and waste reduction, key principles that now shape circular economy approaches in energy systems. The oil crisis renewed focus on sustainability, driving advances in solar, wind and bioenergy and promoting efficient energy use.

5. **Late 20th Century (Circular Economy Concepts Emerges):** Building on industrial ecology, circular economy principles were formalized to promote continuous reuse of materials and energy. Popularized in China due to resource constraints, the concept evolved to include circular energy, integrating renewables, waste-to-energy, and early carbon capture to reduce environmental impact.

6. **2010s (Technological and Policy Advances):** Rapid growth in renewables, advanced CCUS, and digital tech enabled circular energy systems. Governments and industries formalized frameworks to drive decarbonization and sustainability goals.

7. **2020s (GCC and Global Adoption):** GCC countries adopted CCE models, combining hydrocarbon resources with CCUS, bioenergy, and renewables as part of economic diversification.

Source: Swiss National Museum, Ellen MacArthur Foundation

b. Why is Circularity essential for a Sustainable Energy Transition?

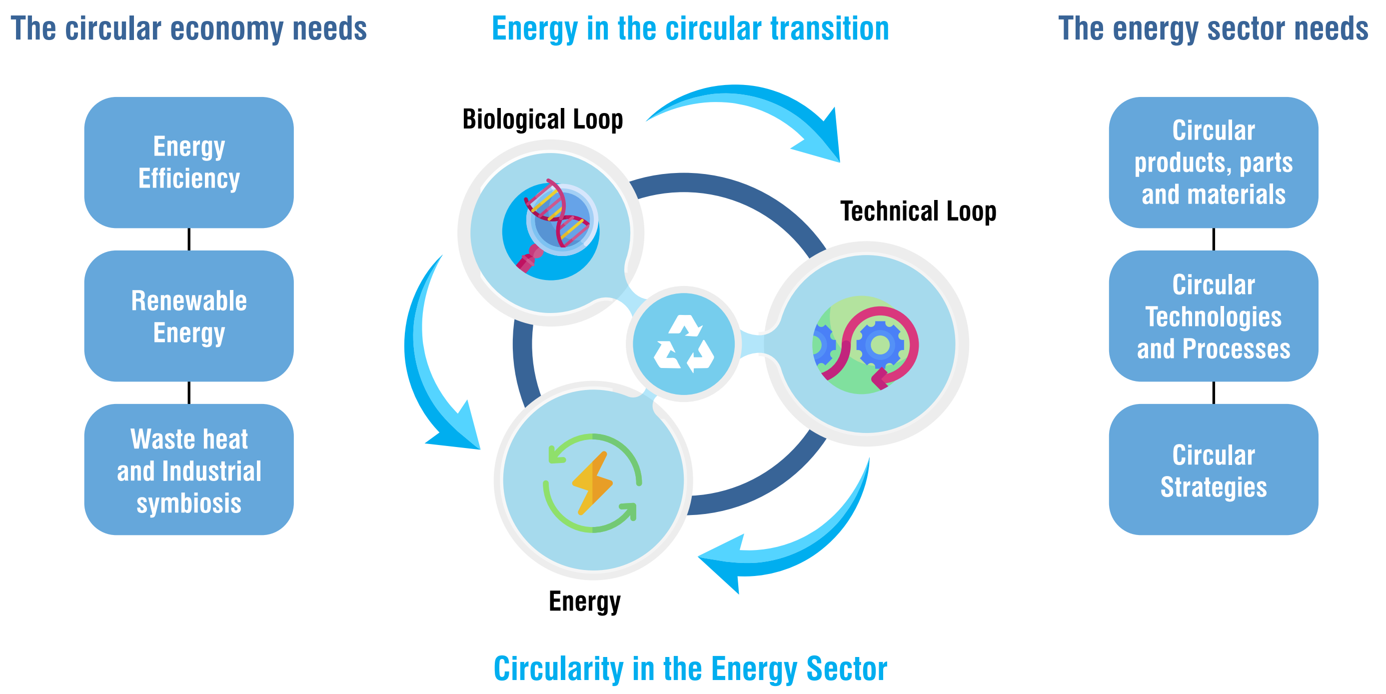
Circularity and energy transition are deeply interconnected and mutually dependent (this relationship is referred as the "energy-circular economy nexus"). Achieving a sustainable future requires both a shift to clean energy and the adoption of circular economic principles.

Interdependence

Clean energy infrastructure, such as wind turbines, relies on finite materials. As the demand for renewable energy grows, so does the need for critical minerals, making it unsustainable to use these resources only once. Therefore, the energy sector must embrace circularity—reusing, recycling, and maximizing the value of materials—to avoid resource shortages.

Energy Efficiency

The transition to a circular economy does not eliminate energy needs but emphasizes using energy more efficiently. This involves reducing primary energy consumption, utilizing waste heat, and prioritizing renewable sources that align with circular principles.



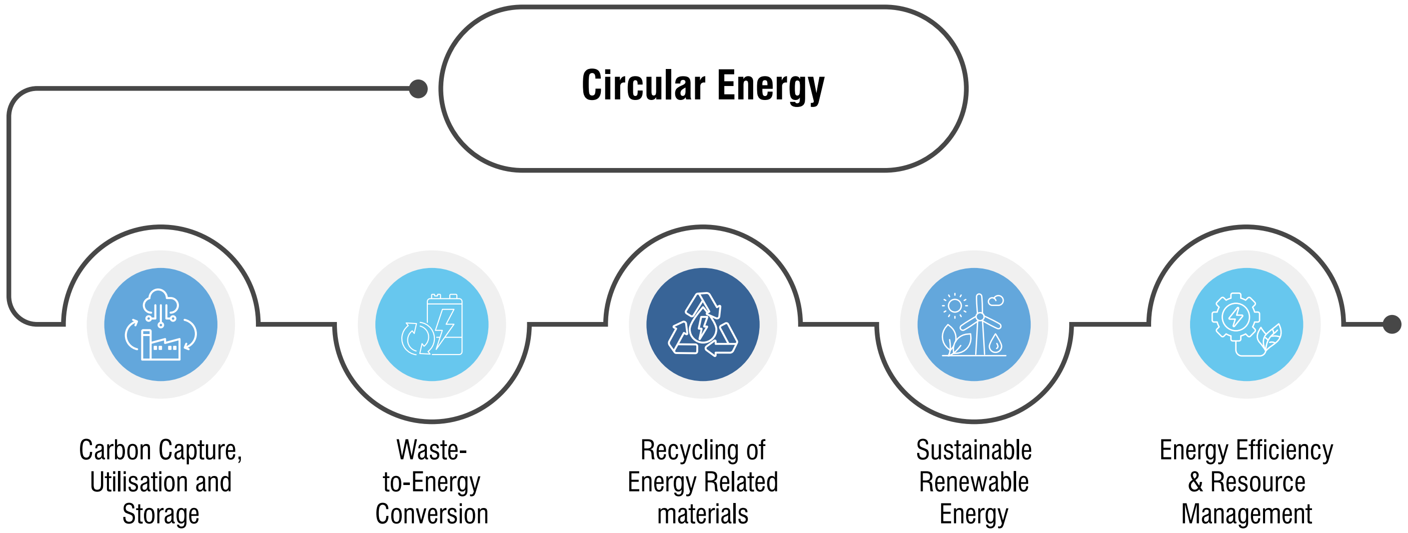
The Energy Transition - Circular Economy Nexus

Source: Ramboll

The energy transition–circular economy nexus shows the interdependence between the two. As renewable energy infrastructure expands, demand for critical minerals rises, making circular strategies essential to mitigate resource scarcity and ensure long-term sustainability. At the same time, circular economy principles support the energy transition by promoting efficient energy use, reducing waste, and enabling the reuse of materials and byproducts. Together, these transitions must progress in tandem to achieve resilient, low-carbon energy systems.[3]

[3] Ramboll

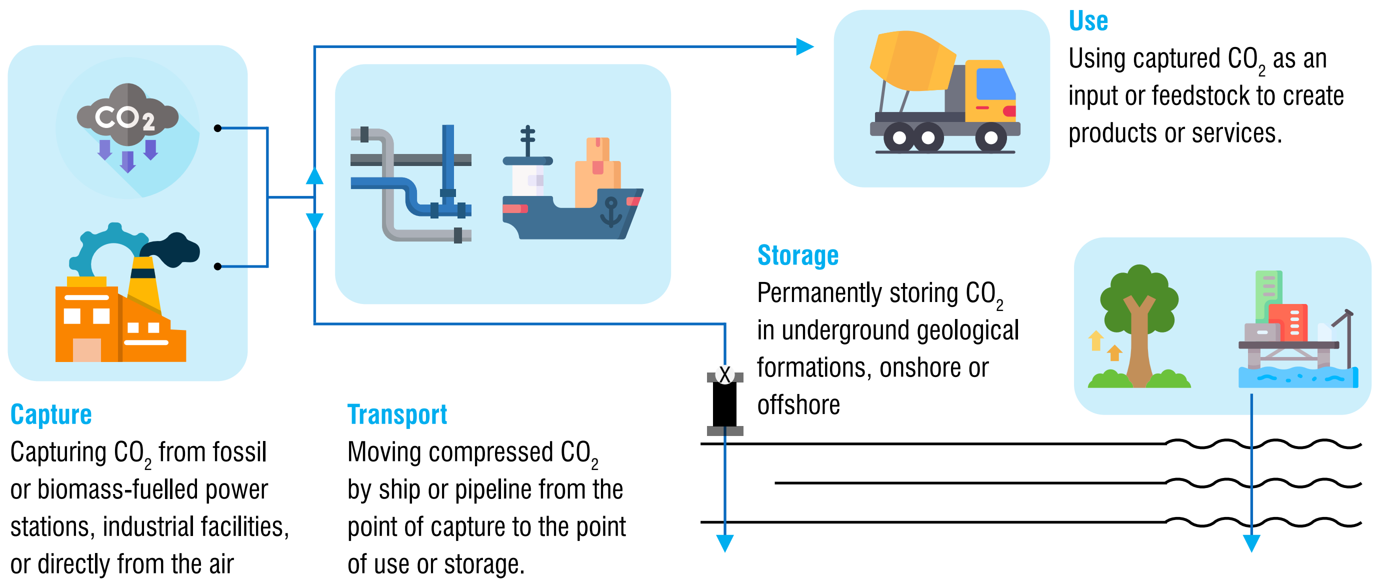
3. Global Circular Energy Landscape



a. Carbon Capture, Utilisation, and Storage

Carbon Capture, Utilisation and Storage (CCUS) is a technology designed to reduce CO_2 emissions from sources like power plants and industrial facilities. It involves capturing CO_2 before it enters the atmosphere, compressing it, and transporting it, via pipelines, ships, or trucks, for reuse in industrial processes or permanent storage in deep underground formations such as depleted oil and gas reservoirs or saline aquifers.

Visual overview of CCUS process:



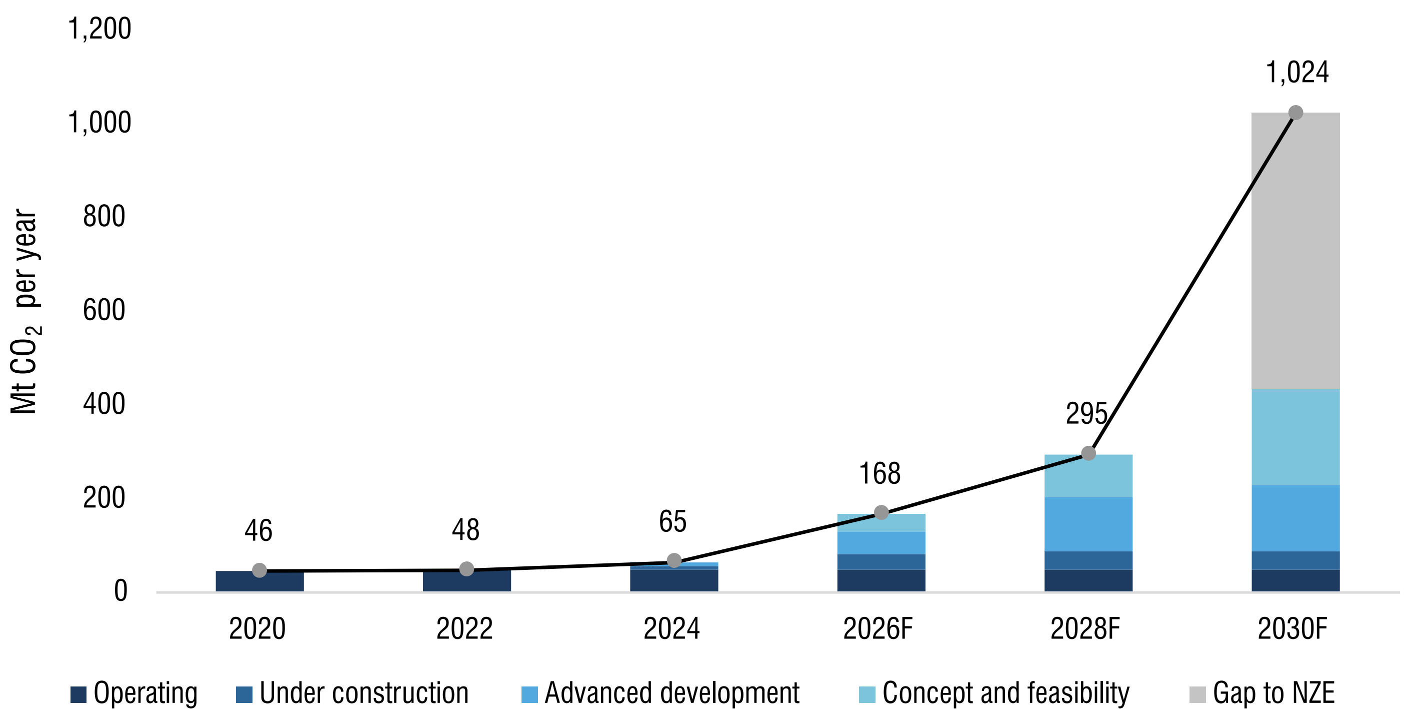
Source: IEA

CCUS is vital for a cleaner energy future. It helps high-emission sectors like cement, steel, and chemicals cut emissions while continuing operations. CCUS also enables low-carbon hydrogen production and supports decarbonization in transport. Additionally, it can remove CO_2 directly from the atmosphere, offsetting hard-to-eliminate emissions.

Global CCUS Scenario:

In 2023, global momentum for CCUS grew through major investments. The U.S. committed USD 2.9 billion to carbon and direct air capture projects,[4] while the EU contributed over USD 2 billion for CO_2 transport and storage.[5] The Netherlands and Denmark invested USD 7.3 billion and USD 1.2 billion respectively, advancing key projects like the Dutch Porthos and Italy's Ravenna. Germany rejoined the CCUS space with a national strategy, regulating offshore CO_2 storage, and Japan launched seven large-scale projects aiming to capture 13 Mt CO_2/year by 2030 along with legislation supporting CCUS infrastructure and storage. These efforts highlight a rising global commitment to CCUS in tackling climate change.[6]

Capacity of current and planned large-scale CO2 capture projects vs. the Net Zero Scenario, 2020-2030



Source: IEA

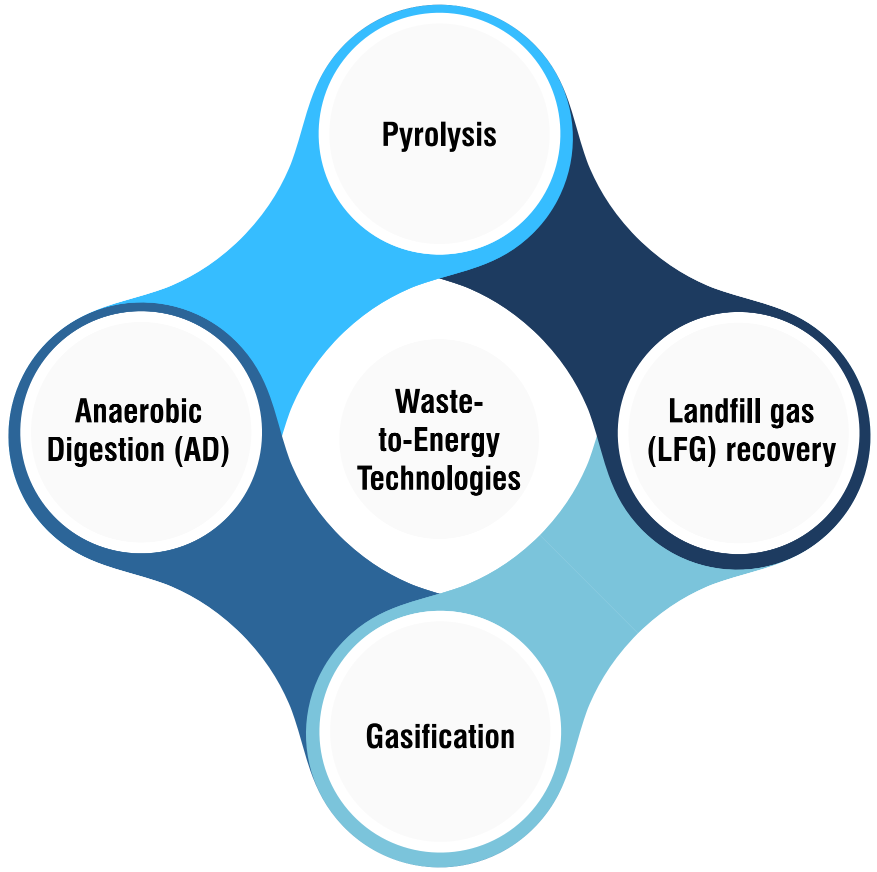
CCUS technologies have advanced significantly, with over 50 million tonnes of CO_2 captured annually across 45 commercial facilities. In 2023, nearly 10 large-scale projects began operations, including key U.S. sites like the Blue Flint ethanol plant, Linde Clear Lake capture facility, and the first direct air capture (DAC) units by Heirloom and Global Thermostat. China also advanced with four major projects, such as the Jiling Petrochemical facility, the CNOOC Enping oil field, the China Energy Taizhou power plant, and the Guanghui Energy CCUS integration project. Additionally, the Petra Nova facility in the U.S. also resumed operations.

Despite progress, the current CCUS pipeline meets only 40% of the capacity needed for the Net Zero Scenario by 2030. Over 700 projects are in development, showing growing global interest. However, accelerated deployment, stronger policies, and greater investment are essential to close the gap and fully realize CCUS's role in climate goals.[7]

[4] USA's Infrastructure Investment and Jobs Act
[5] Investment via EU's Innovation Fund (USD 1.5 billion) and Connecting Europe Facility (USD 0.5 Billion)
[6] IEA
[7] IEA

b. Waste-to-Energy

Waste-to-Energy (WtE) is a controlled waste management method that converts municipal solid waste (MSW), such as food scraps, packaging, and household items, into electricity, primarily through incineration. Globally, around 13% of MSW is processed in WtE facilities, helping reduce landfill volumes and greenhouse gas emissions. While WtE offers an alternative to fossil fuels, it is not classified as renewable energy due to its reliance on finite waste inputs and the carbon emissions generated during incineration and transportation.[8]



Source: IBM

Waste-to-Energy benefits

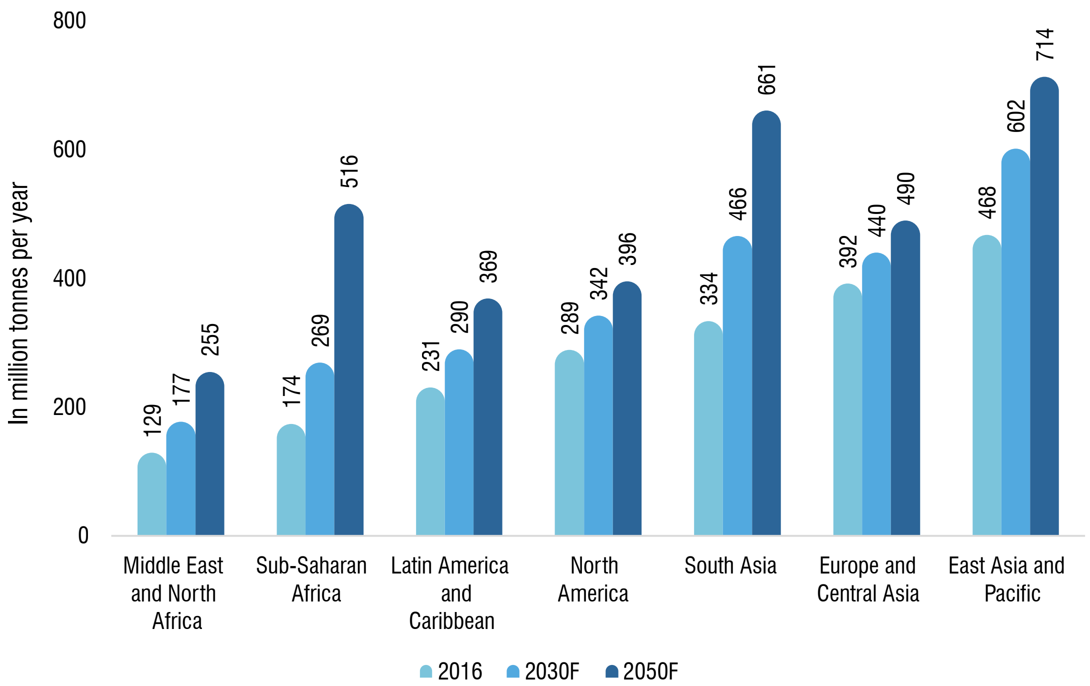
Reduced waste volume
Cleaner landfills
Resource recovery

Global Waste-to-Energy Industry

Global MSW generation is projected to reach 3.40 billion tonnes annually by 2050, growing by almost 70%, from 2.01 billion tonnes in 2016.

[8] IBM

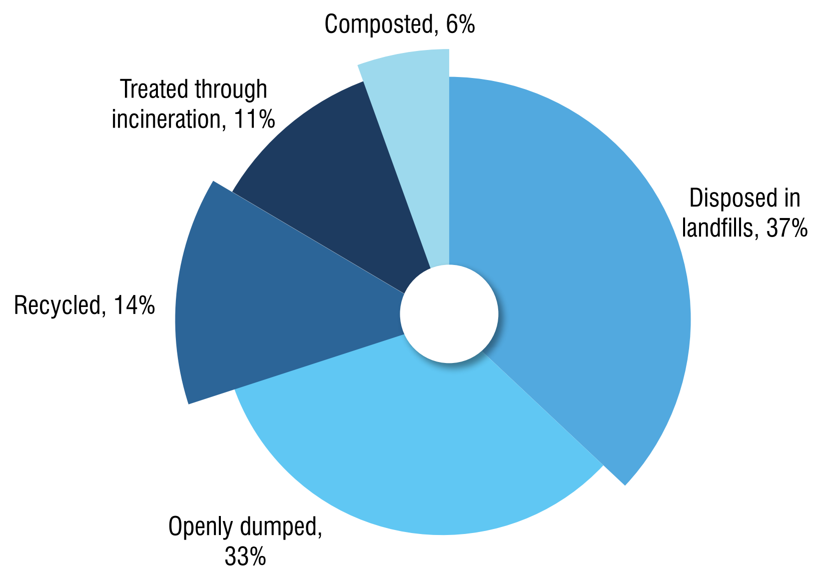
Projected Waste Generation by Region



Source: World Bank report "What a Waste 2.0" - 2018

Regional trends show varying growth rates: Europe and Central Asia are expected to generate 490 million tonnes per year by 2050, about 100 million tonnes more than in 2016. In contrast, Sub-Saharan Africa is projected to experience a threefold increase, with waste generation rising from 174 million tonnes in 2016 to 516 million tonnes by 2050, highlighting the urgent need for sustainable waste management strategies globally.

Global Waste Management and Disposal Practices



Source: World Bank report "What a Waste 2.0" - 2018

Despite growing sustainability awareness, 70% of global waste is still improperly managed, often dumped without treatment, posing serious environmental and health risks. In OECD countries, 39% of solid waste goes to landfills, with volumes expected to rise.[9] The U.S. landfills 52% of its waste,[10] while Europe fares better at 24%, though treatment methods vary across the EU.[11]

Globally, waste disposal methods vary significantly based on a country's income level. High-income countries have more structured systems with higher recycling and WtE use, yet landfilling remains common. In middle and low-income countries, poor infrastructure leads to widespread open dumping and minimal WtE adoption. These disparities underscore the urgent need for improved global waste management, emphasizing recycling, composting, and energy recovery to reduce landfill reliance and support circular economy goals.[12]

c. Recycling Energy Related Materials

As the global energy transition accelerates, the volume of waste generated from energy technologies, particularly batteries, solar panels, and wind turbines, is rising sharply. Circular energy systems aim to address this challenge by integrating recycling and resource recovery into the lifecycle of energy infrastructure, thereby reducing environmental impact and enhancing material efficiency.

Solar PV Panel Recycling

- Solar panels, especially crystalline-silicon types, contain recyclable materials such as glass (75% of panel weight), aluminium frames, copper wiring, and plastic components. These panels are disassembled and materials are recovered.
- Recent innovative projects like Icarus are exploring the use solar panel waste (e.g., silicon sawdust or "black gold") to manufacture new panels, promoting circularity.

Battery (Lithium Ion) Recycling

- With the rise of electric vehicles and renewable energy storage, battery recycling is critical for sustainability and resource recovery. Current production scrap can be up to 30% of new battery factory output. EV batteries are initially repurposed as stationary energy storage before recycling, where they are disassembled and elements are recovered chemically.
- The battery value chain could grow to USD 400 billion by 2030, emphasizing sustainability and closed-loop systems.

Wind Turbine Blade Recycling

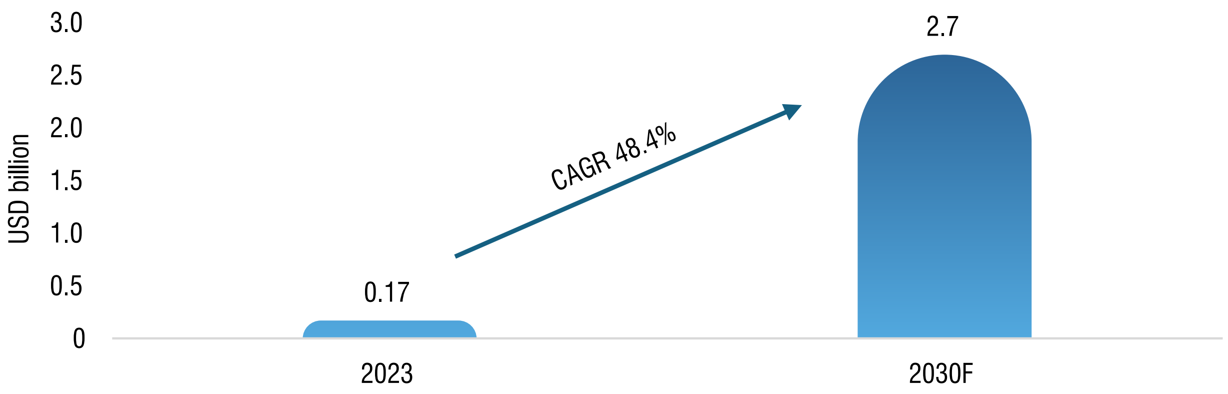
- About 85–90% of a wind turbine's mass is recyclable, but blades remain problematic due to their composite structure.
- Collaborative efforts such as DecomBlades and ZEBRA (Zero wastE Blade ReseArch), initiated by wind turbine manufacturers, are focused on enhancing the efficiency and effectiveness of turbine blade recycling.

Sources: US EPA, PVCase, McKinsey, IRT Jules Verne, LM Wind Power, Arkema, CANOE, Engie, Owens Corning and SUEZ

[9] World Bank report "What a Waste 2.0"
[10] US EPA
[11] Eurostat
[12] World Bank report "What a Waste 2.0"

The global solar PV recycling industry is expected to see a significant growth in the upcoming years. This surge is driven by the exponential increase in solar installations and the looming supply bottlenecks for critical minerals.

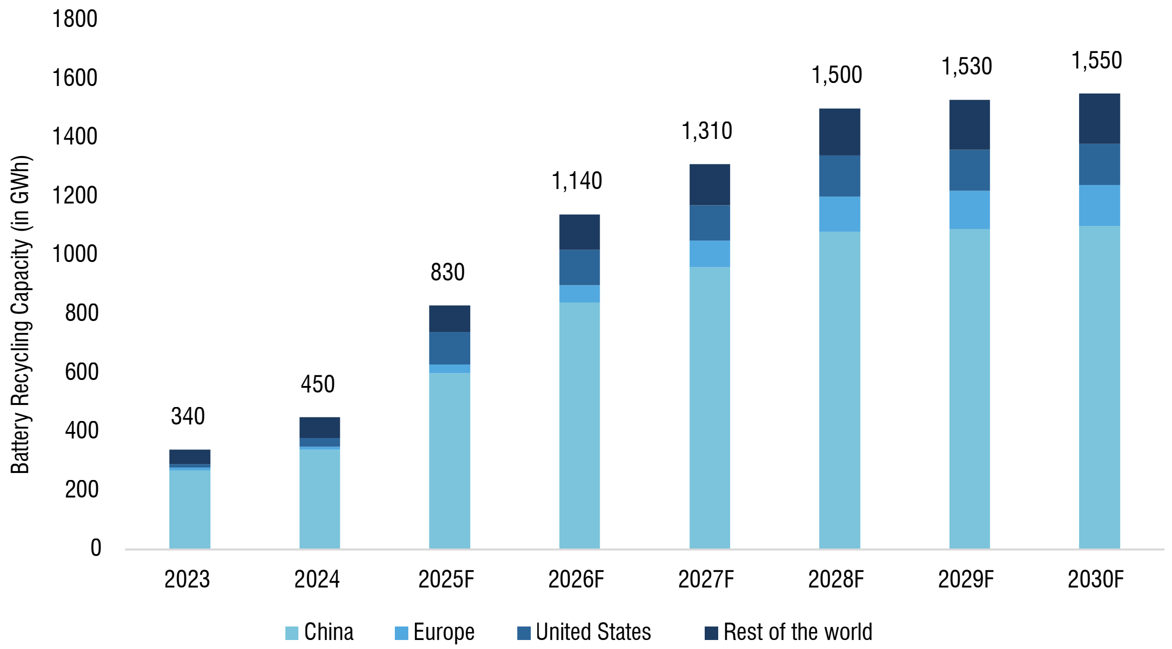
Solar PV Recycling Material Value Growth



Source: Rystad Energy

By 2040, solar PV waste is expected to reach 27 million tonnes annually, making recycling essential to energy transition. Valuable materials like silver, aluminium, copper, and polysilicon can be recovered, silver, though just 0.05% of panel weight, contributes 14% of material value. Recycling could meet 21% of silver and 11% of aluminium demand for future panels, reducing mining and emissions. However, its economic viability depends on technological advances, supportive policies, and rising energy costs.

Projected regional battery recycling capacity from 2023 to 2030, based on currently announced plans



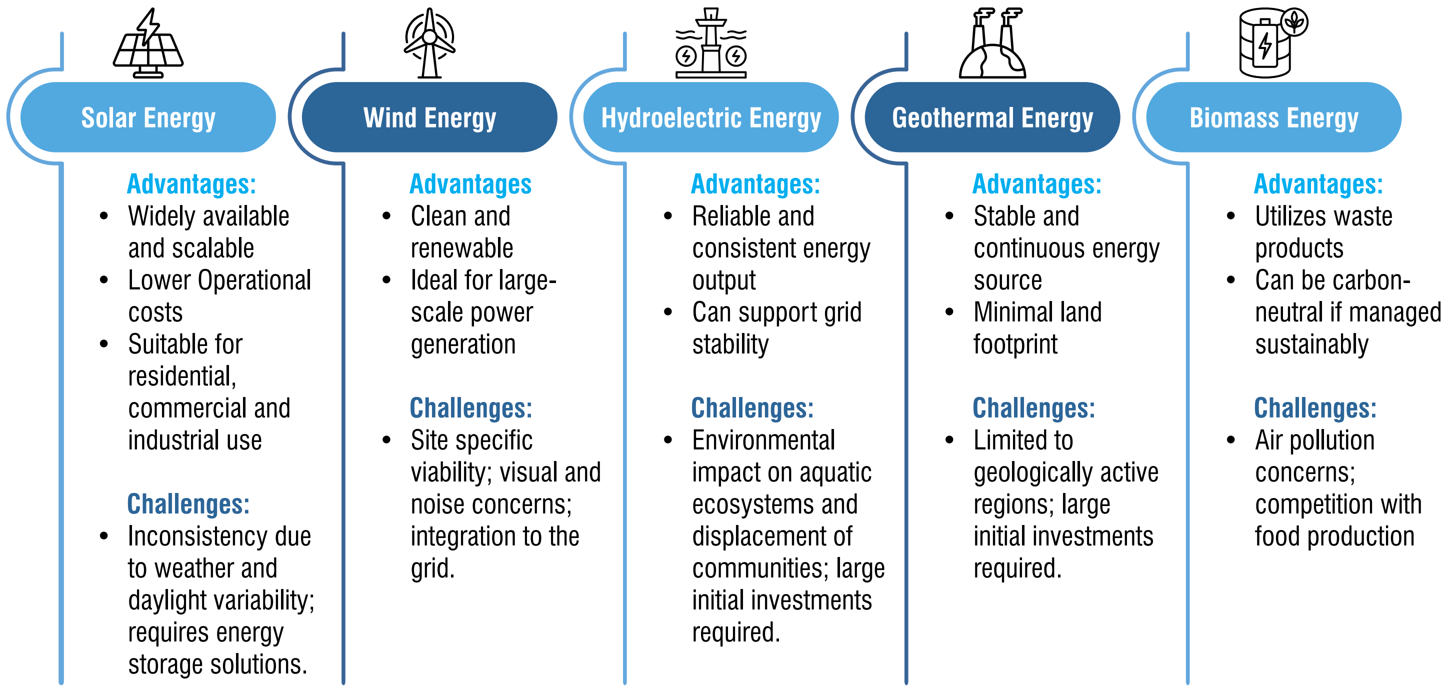
Source: IEA

Note: Recycling capacity refers to material recovery. A maximum utilisation factor of 85% and an average cell energy density of 180 Wh/kg are assumed.

d. Sustainable Renewable Energy

Sustainable renewable energy refers to energy derived from naturally replenishing sources, (i.e. such as solar, wind, hydro, geothermal and biomass) that are harnessed in ways that are environmentally, socially, and economically responsible over the long term. While all renewable energy is replenishable, sustainability ensures that its production and use do not compromise the needs of future generations or harm ecosystems and communities.

Types of Sustainable Renewable Energy



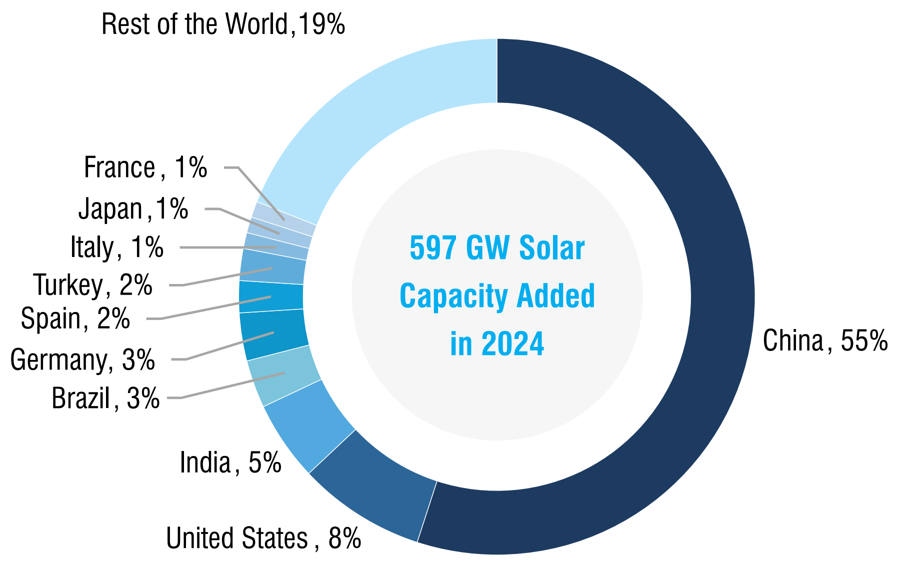
Source: Routledge, Bajaj Finserv

Sustainable energy extends beyond replacing fossil fuels; it promotes a comprehensive approach that prioritizes resource efficiency, environmental protection, and social equity. By supporting cleaner air, reduced emissions, and long-term energy security, it plays a vital role in advancing global climate goals and sustainable development.

Global Renewable Energy Market

Between now and 2028, renewable electricity generation is projected to grow faster than global electricity demand, leading to a gradual decline in coal-based generation while natural gas remains stable. By 2028, renewables will generate 42% of global electricity, with wind and solar PV contributing 25%, and hydropower remaining dominant. However, adoption must accelerate, as currently renewables are the main electricity source in 57 countries, mostly due to hydropower, representing 14% of global power demand. By 2028, 68 countries will rely primarily on renewables, yet they will still account for just 17% of global demand.

Solar Capacity share by country (2024)

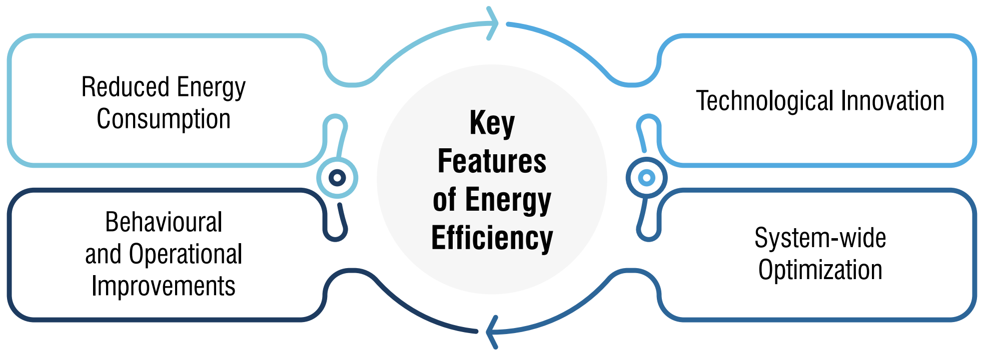


Source: Solar Power Europe

In 2024, China dominated the global solar PV market with a record 329 GW of installations, 55% of global additions, surpassing the combined total of all other top 10 markets. The U.S. followed with 50 GW (up 54% year-on-year), while India rebounded to 30.7 GW (up 145% y-o-y), reclaiming third place. Türkiye and France entered the top 10, replacing Australia and the Netherlands. The world added 597 GW of solar in 2024, bringing total capacity to 2.2 TW, just two years after reaching the first TW milestone. However, deployment remains uneven, the top 10 countries account for 81% of installations, with Asia-Pacific holding 63% of global capacity and China alone reaching 1 TW. Per capita, Australia, the Netherlands, and Germany lead with over 1 kW/capita, while the global average is just 276 W/capita.[13]

e. Energy Efficiency and Resource Management

Energy efficiency refers to the ability to achieve the same level of output, whether in comfort, productivity, or service, using less energy. It involves optimizing energy use across production, distribution, and consumption, thereby reducing waste and environmental impact. Resource management, in this context, complements energy efficiency by ensuring that natural and energy resources are used responsibly, sustainably, and economically throughout their lifecycle.



[13] Solar Power Europe

Energy Efficiency Worldwide

In response to rising energy challenges, countries across the globe have significantly strengthened their energy efficiency policies over the past year. Nations representing over 70% of global energy consumption have introduced new regulations or enhanced existing frameworks to accelerate efficiency improvements.

Global Policies for Energy Efficiency		
Region/Country	**Policy/Initiative**	**Key Highlights**
European Union	• Energy Performance of Buildings Directive (2024) • Energy Efficiency Directive (2023)	• Zero-emission new buildings by 2030, MEPS[14] for non-residential buildings, long-term renovation plans. • Strengthened targets for energy savings across sectors
United Kingdom	• Public Sector Decarbonisation Scheme	• USD 680 million for efficiency upgrades in schools, hospitals and public buildings.
United States	• Updated CAFE standards (2024) • Zero-Emissions Vehicles (ZEV) Sales Target	• 2% annual fuel economy improvement for passenger cars (2027–2032); heavy-duty vehicle standards up to 60% stricter from 2027. • Zero-emission vehicles to make up 60% of total car sales by 2032.
Canada	• Canada Green Building Strategy	• USD 600 million for retrofits; phase out of oil heating in new buildings by 2028.
China	• Energy Conservation and Carbon Reduction Action Plan (2024-2025)	• 2.5% annual energy intensity improvement nationally; 3.5% for large industries. Sector-specific targets aim to save energy equal to 100 million tonnes of coal.
India	• PM E-DRIVE (2024)	• Incentives for EVs and charging infrastructure; new manufacturing scheme for electric passenger cars
Japan	• Strategy for Energy Efficiency and Transition to Non-Fossil Energy (2024)	• Focus on industrial heat use, building efficiency and vehicle performance
South Korea	• Energy Intensity Target Management Programme	• Efficiency targets for medium and large buildings based on area
Australia	• New Vehicle Efficiency Standard	• Emissions reduction target of 60% for passenger vehicles, 50% for light commercial vehicles by 2030
Singapore	• Household Appliances Voucher	• USD 225 (SGD 300) for energy and waste efficient appliances

Source: IEA

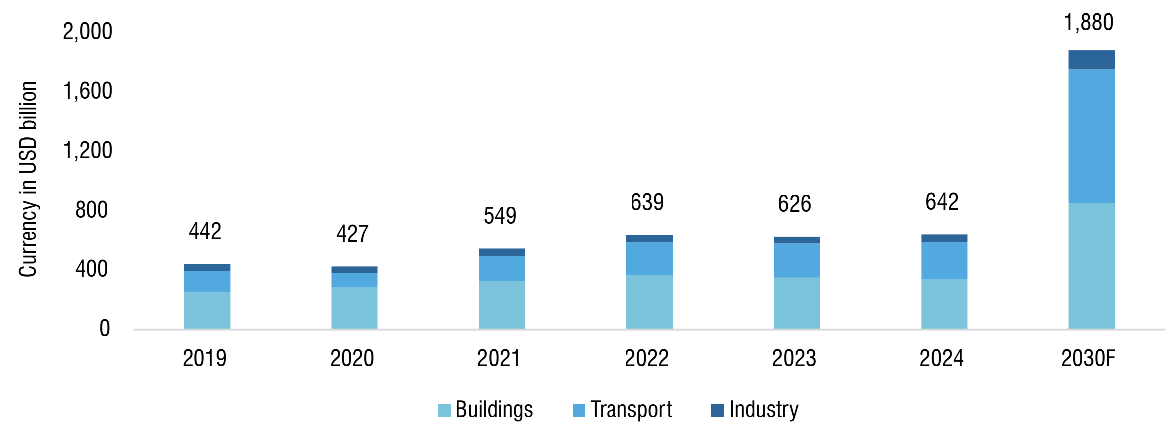
[14] Minimum Energy Performance Standards

These policy updates reflect a growing global commitment to energy efficiency as a key strategy for reducing emissions, enhancing energy security, and supporting sustainable economic growth.[15]

Global Energy Efficiency Ratings

To support consumer awareness and promote smarter energy choices, many organizations have introduced energy efficiency ratings and labelling systems. These standardized labels, such as ENERGY STAR in the U.S., the EU Energy Label, and India's BEE Star Rating, are displayed on products to indicate their energy performance. By making energy consumption data visible and comparable, these labels, help consumers choose low-energy products that cut costs and reduce environmental impact. They also influence buying behavior and drive demand for sustainable technologies.

Global Investment in Energy Efficiency for End-User Sectors in Net-Zero Scenario



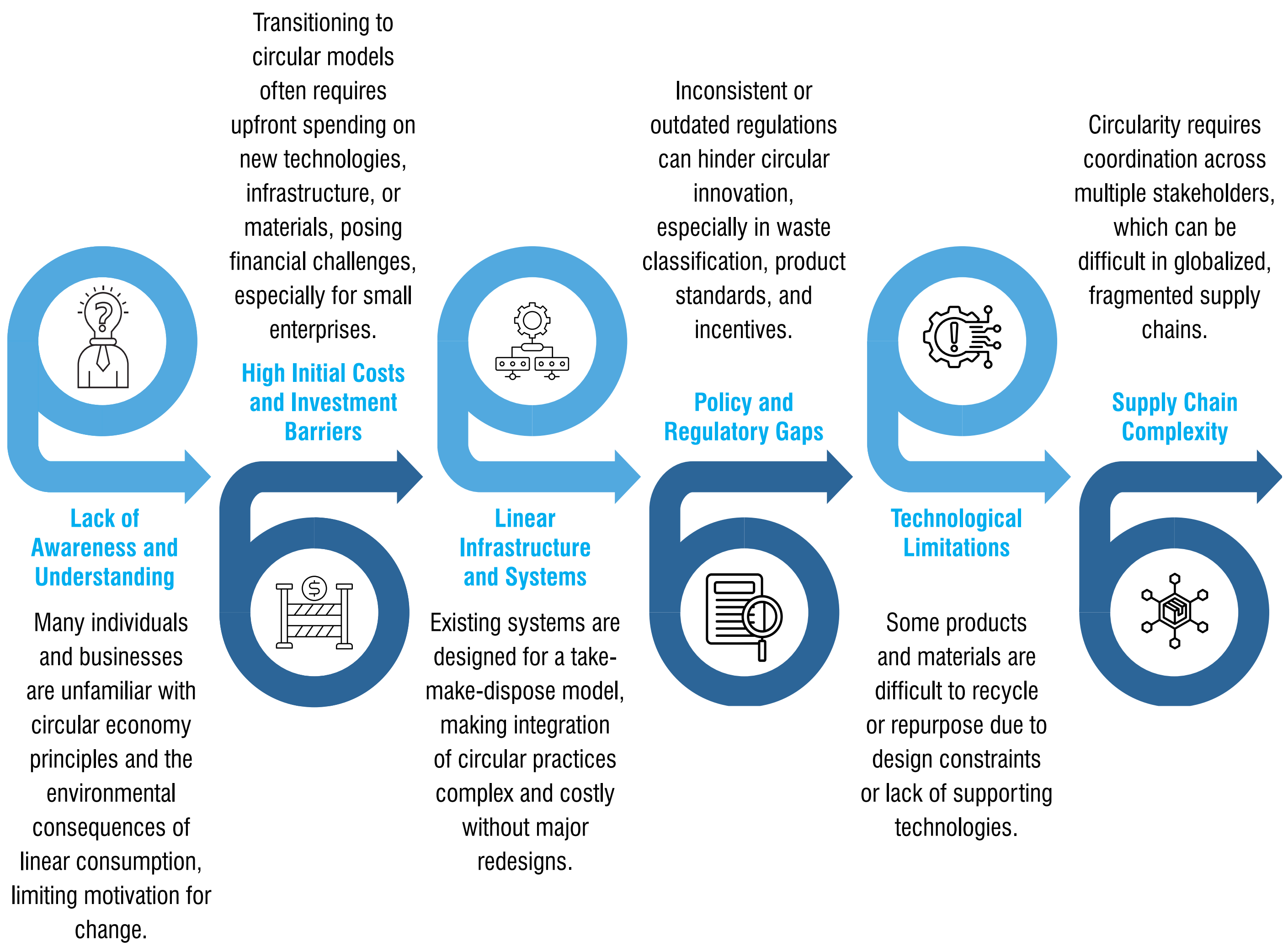
Source: IEA

Global energy efficiency investment rose by 4% in 2024 to USD 660 billion, matching the 2022 peak and surpassing oil and gas investment by 10%. Since 2019, investment has grown 45%, led by transport (77%), buildings (34%), and industry (13%). While electrification, especially EVs in China, Europe, and North America, is accelerating, overall growth has plateaued due to easing energy prices, reduced stimulus, inflation, and higher interest rates. To meet net-zero goals, annual investment must triple to USD 1.9 trillion by 2030, with emerging economies focusing on efficient infrastructure and advanced economies on electrification and smart technologies.[16]

[15] IEA
[16] IEA

f. Challenges and Opportunities of Circular Energy

Challenges



Source: Energy Sustainability Directory

Opportunities

Better Use of Finite Resources
Transitioning to recycled and recyclable materials, especially in sectors like textiles, can drastically reduce the use of land, water, and fossil fuels, while promoting reuse and second-hand markets.

Emission Reduction
Circular strategies can cut global greenhouse gas emissions by up to 39%, particularly by reducing food waste and shifting to recycled materials in manufacturing.

Protecting Health & Biodiversity
Proper waste management and product design reduce pollution and hazardous exposure, benefiting both human health and ecosystems.

Economic Growth
The circular economy presents a USD 4.5 trillion opportunity through innovation, reduced waste, and new business models like repair, remanufacturing, and sharing.

Job Creation & Social Equity
It could generate 6 million net new jobs by 2030, especially in recycling and repair services, while offering safer, formal employment for informal workers like waste pickers.

g. Key Supporting Policies Related to Circular Energy

Country/ Region	Policy	Description
USA	Net Metering Policy	A billing system that credits solar energy users for excess electricity they send to the grid, helping reduce their utility bills and support clean energy growth.
	Solar Investment Tax Credit (ITC)	A federal policy offering a 30% tax credit for residential and commercial solar installations
	Property Tax Exemption	Property tax exemption for installing eligible renewable energy systems like solar, wind, and fuel cells.
	Community Distributed Generation	Community Distributed Generation program lets residents subscribe to shared renewable energy projects and earn bill credits.
	Home Electrification and Appliance Rebate (HEAR) Program	HEAR Program offers rebates for low- and moderate-income households to switch from gas to electric appliances and improve home energy efficiency.
China	100% VAT Exemptions	100% VAT exemption applies to construction materials made from recycled waste and for waste disposal and sludge treatment.
	VAT Refund policies	100% VAT refunds to energy, oils, and products made from industrial waste and organic materials; 80% refunds cover wood-based boards and extracts from agricultural residues. 50% refunds for recycled paper, fuels, metals, textiles, and graphite products made from various industrial and consumer waste sources.
Europe	Public Grants	Hungary offers up to two-thirds subsidies for solar panels with energy storage, while Sweden provides a 20% rebate through its simplified Grön Teknik program.
	VAT Reduction for Solar Implementation	Nine European countries, including Germany, have cut or provided complete VAT on solar panels and installation, directly lowering consumer costs without complex reimbursement processes.
	Installation Cost Loan	Governments and banks offer low-interest or zero-interest loans for solar installations, while countries like Spain, Italy, Germany, and Sweden provide tax deductions on solar energy income.
	Pfandsystem (Germany)	Germany's deposit return scheme is the world's most effective, achieving a 98% return rate for single-use drink containers through high deposit values and a network of return points.

Source: SEIA, DSIRE, WTO, DW

4. State of Circular Energy Adoption in GCC

Circular energy holds strategic importance for the GCC region, where the energy sector is a cornerstone of economic growth and development. The GCC's heavy reliance on hydrocarbon exports creates both an opportunity and imperative to transition toward more sustainable and diversified energy systems. Circular energy strategies, including the CCE, enable GCC countries to extend the value of fossil fuel resources through carbon capture, utilization and recycling, while simultaneously investing in renewable energy and waste-to-energy projects. Given the energy sector's outsized contribution to GCC's GDP, government revenues and employment, incorporating circular energy is crucial for sustaining economic resilience, fostering innovation and maintaining the region's competitive edge in a rapidly evolving global energy landscape.[17 18]

a. GCC National Renewable Energy Mix, Commitments and Net-Zero Emission Targets

Country	Renewables Energy Mix Targets	NZE Targets	Climate Change Commitments
Bahrain	• 20% of electricity generation by 2035	• 30% emissions reduction by 2035 • Net-zero by 2060	• Carbon neutral goal by 2060 • Target of peak 5% renewable capacity by 2025 and 10% by 2030 • 6% reduction of energy consumption in the year 2025
Kuwait	• 30% of peak load by 2030 • 40% by 2040 • 50% by 2050	• Net-zero for the oil sector by 2050 • Net-zero by 2060	• Commitment to reduce their emissions by 7.4% by 2035 compared to BAU (2015)
Oman	• 16% by 2025 • 30% of electricity generation by 2030 • 60-70% by 2040 • 100% by 2050	• Net-zero by 2050	• Commitments to reduce GHG emissions by 4% (unconditional) and 7% (conditional) by 2030 • Compared to the BAU scenario (estimated to be about 125.3 MT CO2 equivalent)
Qatar	• 20% of total capacity by 2030	• 25% emission reductions by 2030	• Commitments to reduce GHC emissions by 25% by 2030 compared to BAU • Introduced a rapid mass transit system and upgraded its airport to level 3 • Introducing electric vehicle charging infrastructure and is gradually adopting Euro 6 emissions standards for regular vehicles
Saudi Arabia	• 50% of electricity generation by 2030	• Net-zero by 2060	• Committing to reduce, avoid and remove GHG emissions by 278 million tons of CO2 equivalent annually by 2030 • Carbon neutral goal by 2060 • Commitment to advance low-carbon hydrogen development (green and blue)
UAE	• Federal: 44% of the national energy mix by 2050 • Dubai: 7% by 2020, 25% by 2030, 75% by 2050	• Net-zero by 2050	• Commitments to reduce GHC emissions by 23.5% for 2030 compared to BAU. • Carbon neutral goal by 2060 • Develop a green growth strategy • Formed hydrogen alliances • Hosted COP28 in 2023

Source: Gulf Research Center, London School of Economics, Respective Nation's Strategy

[17] ARAMCO
[18] KAPSARC

b. Circular Carbon Economy Index for GCC Nations

Country	CCE Index Ranking (2021)	CCE Index Ranking (2024)
UAE	26	22 ▲
Qatar	39	32 ▲
Saudi Arabia	54	41 ▲
Bahrain	62	62 =
Oman	56	64 ▼
Kuwait	76	84 ▼

Note: 125 nations are included in the overall ranking
Source: KAPSARC CCE Index

Based on the 2024 CCE Index, GCC countries show a mix of progress and challenges in adopting circular carbon principles. The UAE leads regionally, rising to 22nd place with strong policy support and investments. Qatar and Saudi Arabia improved to 32nd and 41st, respectively, reflecting growing efforts in energy efficiency and carbon management.

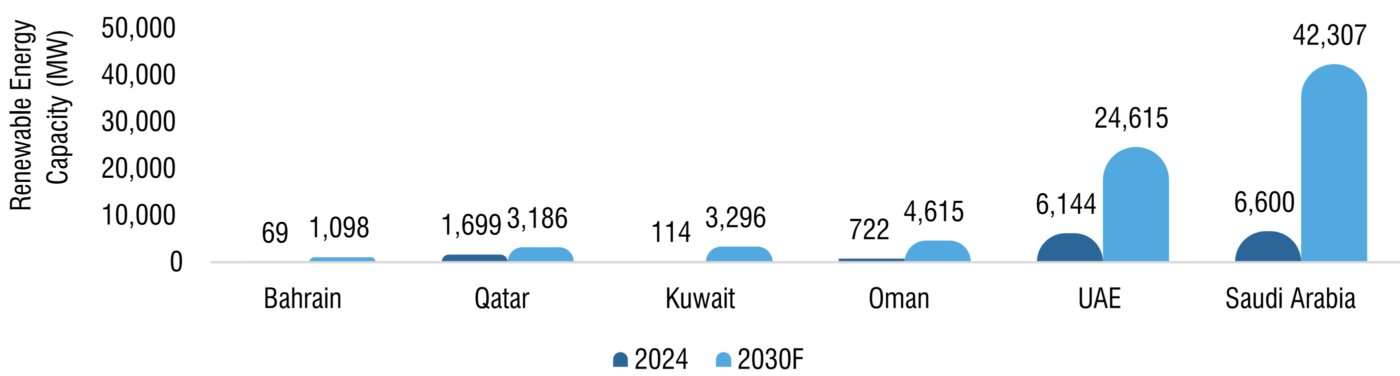
c. Carbon Capture, Utilisation and Storage in GCC

Carbon capture, utilisation and storage (CCUS) have emerged as a strategic pillar in the GCC countries' efforts to decarbonize their economies, diversify industrial activities, and maintain global energy relevance.[19] Major projects are underway or operational in Saudi Arabia, the UAE, and Qatar, establishing the region as an early mover in large-scale CCUS deployment.[20]

The GCC currently has a combined CO_2 capture capacity of about 3.7 million tonnes per year, with flagship projects including i) Ras Laffan in Qatar (2.1 $MtCO_2$/year) ii) Uthmaniyah in Saudi Arabia (0.8 $MtCO_2$/year) iii) Abu Dhabi CSS in the UAE (0.8 $MtCO_2$/year)[21]

d. Renewable Energy in GCC

Renewable Energy Capacities in GCC Countries



Source: IRENA, Deloitte

Solar PV capacity in the Middle East and North Africa is expected to grow to 84 GW by 2030, with more than half coming from Saudi Arabia and the United Arab Emirates. Overall, installed solar PV capacity in the region is expected to increase more than fourfold between 2024 and 2030, expanding its share in the power mix from 2% to over 8%. [22]

[19] OGCI
[20] Roland Berger
[21] Roland Berger
[22] IEA Renewables 2024

e. GCC Major Circular Energy Projects and Investments

Country	Major Circular Energy Projects/Investments
Oman	• Oman Utility-Scale Solar and Battery Storage: Projects supporting cleaner grid integration. • Oman Waste-to-Energy Plant: First large-scale WtE plant planned to reduce landfill use and emissions. • Salalah E-Waste Recycling Facility: Large-scale electronic waste recycling project to extend material lifecycles and reduce environmental footprint. • Carbon Mineralization Pilot Projects: Innovative GHG removal projects leveraging Oman's natural geology.
Qatar	• Ras Laffan LNG CO_2 Capture: Large-scale CO_2 capture from LNG operations supporting decarbonization. • Industrial Waste Recycling Facilities: Emerging projects aimed at circular use of industrial by-products. • Municipal Organic Waste-to-Fertilizer Programs: Initiatives to convert organic waste into agricultural inputs.
Saudi Arabia	• Jubail CCUS Hub: Multi-sector carbon capture, utilization, and storage cluster serving industrial decarbonization and clean hydrogen/ammonia production. • Sakaka and Sudair Solar PV Plants: Large-scale solar projects contributing to renewables expansion and integration into the grid. • Saudi Investment Recycling Company (SIRC): National program for large-scale waste recycling and waste-to-energy facilities. • Dammam and Riyadh Waste-to-Energy Facilities: Planned plants to reduce landfill emissions and generate power from waste.
UAE	• Mohammed Bin Rashid Al Maktoum (MBR) Solar Park: World's largest single-site solar PV project with battery storage. Once completed, it will reduce carbon emissions by 6.5 million tonnes annually. • Al Reyadah CCUS Project (Abu Dhabi): First commercial-scale CCUS facility for steel sector; expanding to other industrial sectors. • Masdar's Solar and Battery Storage Projects: Integrated solar-plus-storage projects to support clean grid transition. • Dubai Municipality Recycling and Waste-to-Energy Initiatives: Urban circular economy projects focusing on municipal solid waste management.

Source: PwC-The rise of circularity

f. Examples of Circular Energy adoption in GCC companies

Company/ Projects	Present Market Size/Revenues
SABIC (Saudi Arabia)	SABIC's Trucircle program promotes circularity through products like certified circular polyethylene and polypropylene made from recycled plastic feedstock. In partnership with Plastic Energy, SABIC is building the world's first commercial unit to produce these polymers, aiming for full recyclability in packaging.
ADNOC Borouge (UAE)	Borouge, a joint venture between ADNOC and Borealis, is investing in a Packaging Centre of Excellence in Abu Dhabi to advance circular packaging. As part of its 2030 strategy, it targets a 60% cut in flaring, 40% reduction in hazardous waste, and 14% lower energy consumption and 6% less water use per tonne of production.
DEWA (UAE)	In 2019, DEWA cut water network losses to just 6.63% using advanced supervisory control and data acquisition (SCADA) systems and leak detection technologies. It also launched smart tools like Advanced Metering Infrastructure (AMI) and high-usage alerts to help customers detect leaks and manage water use efficiently.
Emirates Waste to Energy Company (UAE)	Emirates Waste to Energy Company, a joint venture between Bee'ah and Masdar, is building a USD 220 million WtE plant in Sharjah to power 28,000 homes and divert 300,000 tonnes of waste annually. Two more facilities are planned to expand sustainable energy across the UAE.
EGA (UAE)	Emirates Global Aluminium (EGA) is recycling spent pot lining (SPL), a hazardous by-product of aluminium smelting, by supplying it to UAE cement plants. This has diverted over 46,696 tonnes from landfills, cutting energy use and CO_2 emissions in cement production.
EMSTEEL (earlier Emirates Steel Arkan) (UAE)	EMSTEEL, in partnership with ADNOC's Al Reyadah project, captures up to 800,000 tons of CO_2 annually from its iron reduction process. The captured CO_2 is compressed and piped 43 km for use in Enhanced Oil Recovery at ADNOC's onshore oilfields.

Source: PwC-The rise of circularity, SABIC, Plastic Energy, ADNOC, DEWA, NS Energy, EGA, EMSTEEL

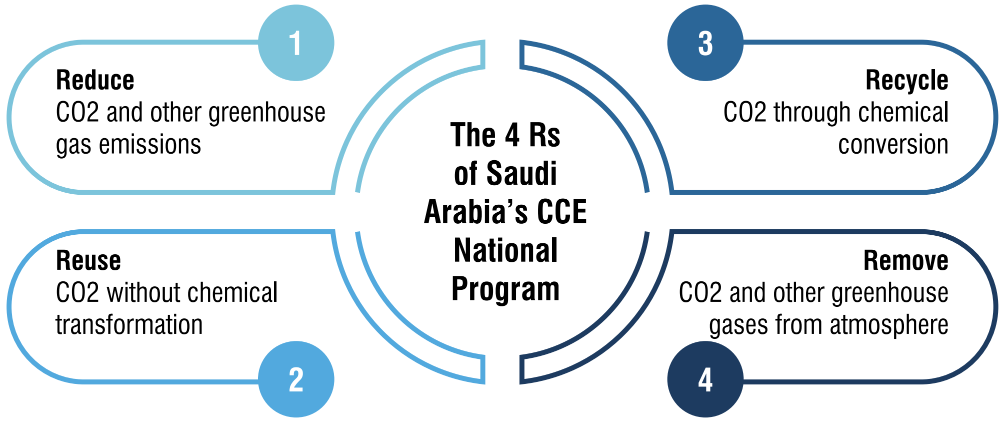
g. Key Policies Supporting Circular Energy Adoption in GCC

Country/Region	Policy	Description
Bahrain	National Renewable Energy Action Plan (NREAP)	NREAP targets 710 MW of renewable energy by 2035, backed by USD 1.8 billion in investment and incentives like 0% corporate tax, full foreign ownership, and financial support for solar manufacturing.
Kuwait	Local Solar Module Manufacturing Incentives	Promoting local solar manufacturing through 'local content' preferences in public tenders and offers incentives like tax holidays, customs duty relief, and full foreign ownership via KDIPA.
Oman	Incentives to boost green hydrogen projects	Oman's third green hydrogen auction round offers incentives like land allocation, infrastructure support, and streamlined regulatory processes to attract large-scale project developers.
Qatar	BeSolar	The service promotes distributed solar energy by enabling residents and businesses to install rooftop systems, supporting its goal of generating 200 MW from renewables by 2030.
UAE	Financing support from Emirates Development Bank	EDB supports renewable energy in the UAE through 100% project financing, zero-interest loans, long tenors up to 15 years, customs duty relief, and full foreign ownership for solar and clean energy initiatives.
	"Make it in the Emirates" Initiative	Federal initiative supporting industrial investment aligned with national renewable transition goals.
	In-Country Value (ICV) Program	Preferential treatment in government contracts for locally manufactured solar products.
	Free Zone Benefits	100% foreign ownership; Tax exemptions and profit repatriation; Streamlined logistics and customs clearance
	Tax Incentives for Solar Module Manufacturing	0% corporate tax in Free Zones; 9% federal tax outside Free Zones.
	Vat Relief and R&D Tax deductions	Zero-rating or complete VAT exemption on renewable energy products and services and other tax deductions for companies innovating in clean energy technologies.

Source: PVKnowHow, Zawya, EDB

5. State of Circular Energy Adoption in Saudi Arabia

Introduced during Saudi Arabia's G20 presidency, the CCE Framework has gained international momentum, promoting emissions reduction, renewable energy investment, and carbon capture. Endorsed by G20 leaders in 2020, it offers a cost-effective, sustainable approach to climate action while ensuring clean energy access. Building on this, Saudi Arabia launched its CCE National Program in 2021, focusing on reducing and offsetting carbon emissions through strategies of reduction, reuse, recycling, and removal.



Source: Arab News, KAPSARC

The key goal of the CCE National Program is to turn Saudi Arabia from a linear carbon economy to circular carbon economy. Saudi Arabia has integrated the CCE Framework into national policy through the Saudi Green Initiative (SGI), which targets net-zero emissions by 2060 via emissions reduction, afforestation, and ecosystem protection.

Key SGI Targets		
Target	**Description**	**Initiatives**
Reduce carbon emissions by 278 mtpa by 2030	Saudi Arabia has committed to have 50% of its energy from renewable sources by 2050 and achieve net zero emissions by 2060.	» Captured carbon will be converted into chemicals and 12 tons/day of green methanol. » Saudi Arabia aims to shift 50% of electricity to renewables, displacing 1 million barrels/day of liquid fuels and cutting 175 million tonnes of CO_2 annually. » 6.2 GW of renewables are online, with 44.2 GW under development, enough to power 7 million homes. » 100–130 GW of renewable capacity planned to be tendered by 2030.
Protecting 30% of Saudi Arabia's land and sea	Saudi Arabia pledges to protect 30% of its land and seas by 2030, partnering with global biodiversity groups like IUCN to conserve wildlife and ecosystems.	» 400,000 km² of land and sea under protection. » USD 25 million committed to Arabian leopard conservation. » 7,000+ endangered species rewilded since 2021. » 6,693 km² "No-Take" Marine Protected Area planned along the Red Sea.
Grow 10 billion trees across Saudi Arabia	Saudi Arabia plans large-scale afforestation, aiming to plant 10 billion trees and restore over 74 million hectares to fight desertification.	» Over 100 million trees and shrubs planted since 2021. » 118,000 hectares of degraded land restored. » Tree canopy projected to lower urban temperatures by 2.2°C. » 1,150+ field surveys conducted for the 10 billion trees initiative.

Source: Saudi & Middle East Green Initiatives

a. Carbon capture, utilization, and storage (CCUS) in Saudi Arabia

Saudi Arabia has become a regional leader in carbon capture, utilization, and storage (CCUS), using this technology as a cornerstone in its strategy to achieve net-zero emissions by 2060 and drive the broader energy transition.[23] [24] The country's CCUS ecosystem is powered by major industrial players such as Saudi Aramco and SABIC and backed by ambitious government targets and strong international collaboration.

Key Projects and Capacity

Description	Initiatives
Jubail CCS Hub with Larsen & Toubro (L&T)	Saudi Aramco has awarded L&T a USD 1.5 billion EPC contract for the first phase of a major CCS hub in Jubail, which will receive 6 million tons of CO_2 annually from Aramco and aims to store up to 9 million tons per year by 2027–2028, with contributions from other industrial sources.
Air Products Qudra (Blue Hydrogen Industrial Gases Company – BHIG)	Saudi Aramco has acquired a 50% stake in Blue Hydrogen Industrial Gases Company (BHIG) to produce lower-carbon hydrogen in Jubail using carbon capture and storage (CCS) technology. This joint venture with Air Products Qudra aims to build a hydrogen network in Saudi Arabia's Eastern Region, supporting industrial decarbonization and energy diversification.
SLB and Linde (Jubail CCS Hub)	Aramco, Linde, and SLB will develop a major CCS hub in Jubail, with Aramco holding 60% and the others 20% each. Phase one, due by 2027, will capture and store up to 9 million tons of CO_2 annually, supporting Saudi Arabia's climate goals.
Siemens Energy (Direct Air Capture Pilot Unit)	Saudi Aramco, in partnership with Siemens Energy, has launched a pilot Direct Air Capture (DAC) project in Saudi Arabia to extract CO_2 directly from the atmosphere, marking a significant step in its decarbonization strategy. The initiative supports Aramco's broader goal of achieving net-zero emissions by 2050.
SABIC's Jubail Facility	SABIC has built the world's largest carbon capture and utilization (CCU) plant at its United affiliate, capturing 500,000 metric tons of CO_2 annually from ethylene glycol production. The captured CO_2 is reused to produce urea, methanol, and liquefied CO_2, supporting SABIC's sustainability goals and cutting emissions.
Uthmaniyah Project	Aramco's Uthmaniyah EOR project at the Hawiyah plant has been capturing 800,000 tonnes of CO_2 annually since 2015, using it for enhanced oil recovery.

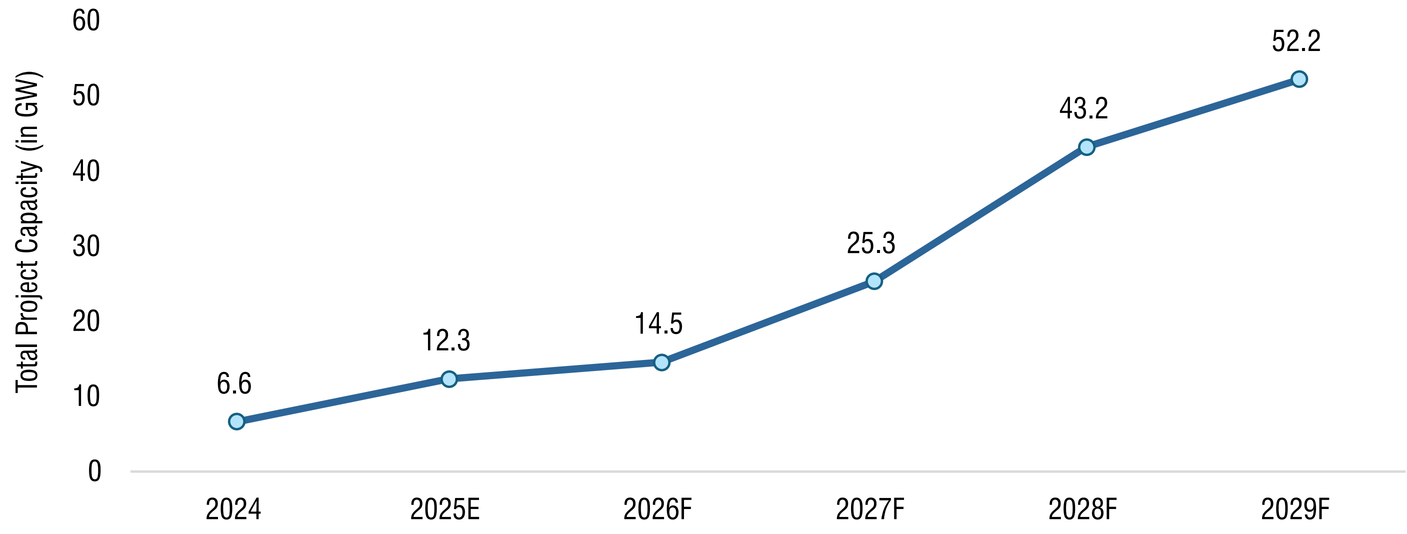
Source: Saudi Press Agency, Aramco, SLB, Enterprise News, CCUS Forum

b. Renewable Energy in Saudi Arabia

Saudi Arabia's renewable energy sector is anchored by large-scale utility solar photovoltaic (PV) and wind projects, with recent highlights including the connection of the Layla and Wadi al-Dawaser solar plants and the expansion of battery storage solutions to address grid intermittency.[25]

[23] KAPSARC
[24] Saudi & Middle East Green Initiatives
[25] ReportLinker

Renewable Energy Capacity in Saudi Arabia



Source: KAPSARC

A landmark agreement signed in 2025 will add 15 GW (12 GW solar, 3 GW wind) by 2028, reflecting an USD 8.3 billion investment and solidifying strategic partnerships between ACWA Power, Badeel, SAPCO, and international entities.[26]

Saudi Arabia's Renewable Energy Initiatives	
Initiative	**Details**
National Renewable Energy Program (NREP)	Aims to develop renewable energy projects across the country, targeting 58.7 GW of solar and 40 GW of wind capacity by 2030.
Wind Saudi Green Initiative	Focuses on combating climate change by planting 10 billion trees and generating 50% of energy from renewables by 2030.
NEOM City Project	A USD 500 billion futuristic city powered entirely by renewable energy, including solar, wind, and the world's largest green hydrogen plant.
Red Sea Project	A luxury tourism destination powered by 100% renewable energy, using solar, wind, and battery power.
Sakaka Solar Power Plant	Saudi Arabia's first utility-scale solar project, producing 300 MW of power and serving as a model for future solar developments.
Dumat Al Jandal Wind Farm	The country's first utility-scale wind farm with a capacity of 400 MW, contributing to the national energy mix.
Energy Efficiency Program	A set of initiatives aimed at reducing energy consumption and improving efficiency across sectors to support renewable energy goals.

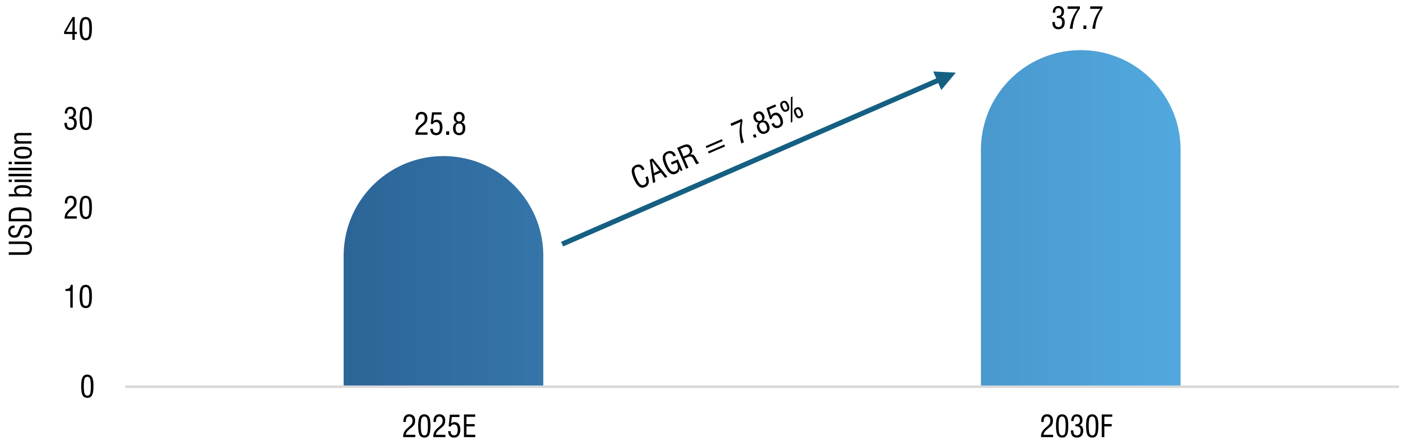
Source: Center on Global Energy Policy at Columbia University SIPA

[26] PIF

c. Saudi Arabia's Waste Management Market

The waste management market is expected to grow at a CAGR of 7.85% between 2025 and 2030, reaching a market value of USD 37.7 billion by the end of the forecast period.

Waste Management Market Growth in Saudi Arabia



Source: Mordor Intelligence

Saudi Arabia generates approximately 15 million tons of MSW annually, and a per capita rate of 1.4 kg per day, projected to double by 2033 due to rapid urbanization and population growth. Food waste makes up the largest share (40-51%) followed by paper, cardboard, plastics, and other materials,[27] and only 10–15% of waste is recycled, mostly informally. Most waste is landfilled, causing environmental issues like methane emissions and leachate. Waste-to-energy (WtE) technologies (like pyrolysis, anaerobic digestion, and incineration) could generate up to 5.6 TWh annually, supporting the Kingdom's goal to meet half of its energy demand (72 GW) through renewables, including WtE, by 2032.

Saudi Arabia is implementing a comprehensive waste management strategy aligned with Vision 2030 and Net Zero 2060. Led by the National Centre for Waste Management (MWAN), the plan aims to divert 90% of waste from landfills by 2040 through recycling (40%), composting (31%) and WtE (16%). Backed by SAR 55 billion and 65 initiatives, it targets a 95% recycling rate, contributing SAR 120 billion to GDP and creating over 100,000 jobs. Saudi Investment Recycling company launched a waste-to-fuel plant in July 2024[28], which will process 3 million tonnes of waste annually, converting 35% into refuse-derived fuel and recycling 14%, reducing of 1.8 million tonnes of CO_2 emissions per year.[29]

[27] EcoMENA
[28] Zawya
[29] Arab News

d. Key Policy Measures promoting Circular Energy Adoption in Saudi Arabia

Policy	Description
Customs Duty Exemption and Drawbacks	Exemption on primary raw materials, manufacturing equipment, and spare parts for foreign companies; Refunds for importers/exporters when raw materials are processed in Saudi Arabia and re-exported as finished products.
Saudi Industrial Development Fund Loans	Up to 75% of project financing available through soft loans from the SIDF.
Land Incentives	Lease land starting from USD 0.26 per sqm.
Nationalization Incentives	HRDF subsidizes up to 15% of male employees' and up to 20% of female employees' monthly salaries for Saudi nationals.
Ownership and Repatriation of Capital incentives	100% foreign direct ownership is permitted and no restrictions on capital repatriation.

Source: Ministry of Investment of Saudi Arabia

6. Spotlight: 44.01

a. Company Brief

44.01 (Protostar Group Limited) It is one of Riyadh Valley Company's investments through the Oryx Fund. A company specializing in accelerating the natural mineralisation process to permanently remove large amounts of CO_2 from the atmosphere. Mineralisation is a natural geological process in which carbon dioxide reacts with certain minerals in rocks such as peridotites to form stable carbonate minerals, effectively turning CO_2 into solid rock. 44.01 enhances and speeds up this process using innovative technologies for efficient and permanent carbon removal.

44.01 was founded in 2020 with the goal of permanently removing captured carbon dioxide by accelerating the natural mineralization process in peridotite rock formations in Oman. The company's name, 44.01, refers to the molecular weight of carbon dioxide, underscoring its mission to address carbon emissions on a large scale.

b. Technology and Process

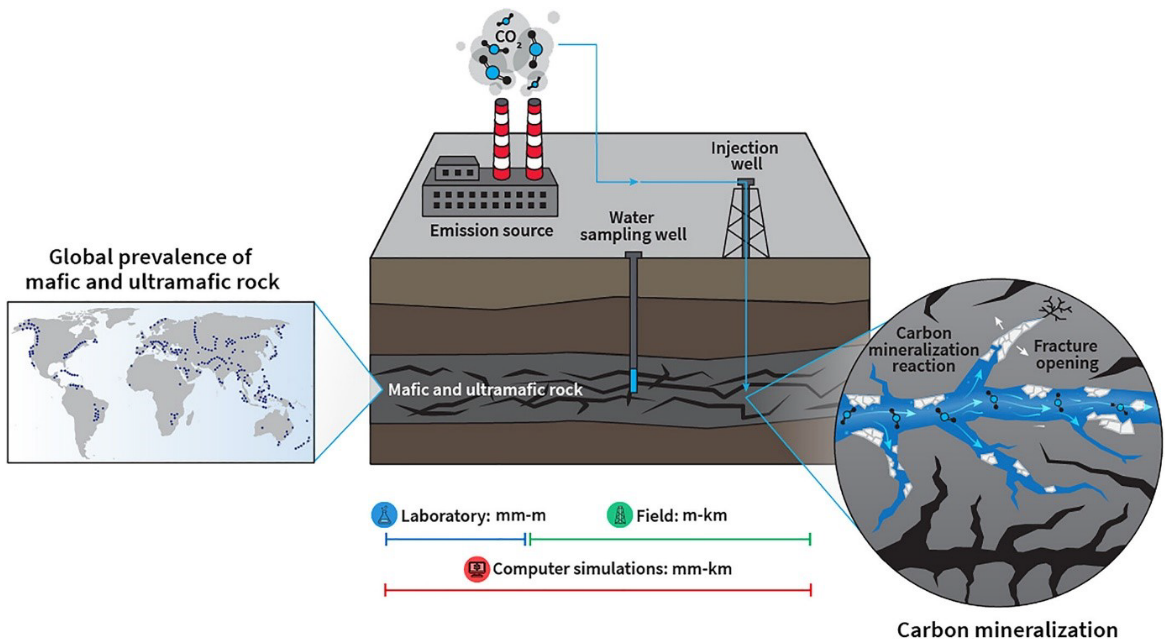


Image Source: Carbon Mineralization in Fractured Mafic and Ultramafic Rocks: A Review[30]

[30] Nisbet, H., Buscarnera, G., Carey, J. W., Chen, M. A., Detournay, E., Huang, H., et al. (2024). Carbon mineralization in fractured mafic and ultramafic rocks: A review. Reviews of Geophysics, 62, e2023RG000815. https://doi.org/10.1029/2023RG000815

CO_2 Capture and Carbonated Injection Fluid

The company takes CO_2 captured from industrial sources or directly from the atmosphere and dissolves it in water to create a carbonated injection fluid, comparable to sparkling water. They use non-potable water sources like seawater or treated wastewater for this step.

Injection Into Subsurface Rock

This carbonated fluid is injected deep underground into reservoir rocks far below drinking water sources. The fluid, being denser than water, remains trapped below without rising.

Mineralisation Reaction

The injected fluid dissolves minerals such as magnesium and silicon from the reservoir rock, generating an ion-rich fluid that reacts with the CO_2 to form new carbonate minerals, effectively new rock. This process permanently fixes the CO_2 underground in less than one year.

Monitoring and Verification

44.01 employs various geochemical and geophysical techniques to monitor the injected fluids' behaviour, ensuring the mineralisation proceeds as expected, and confirming CO_2 is securely mineralized.

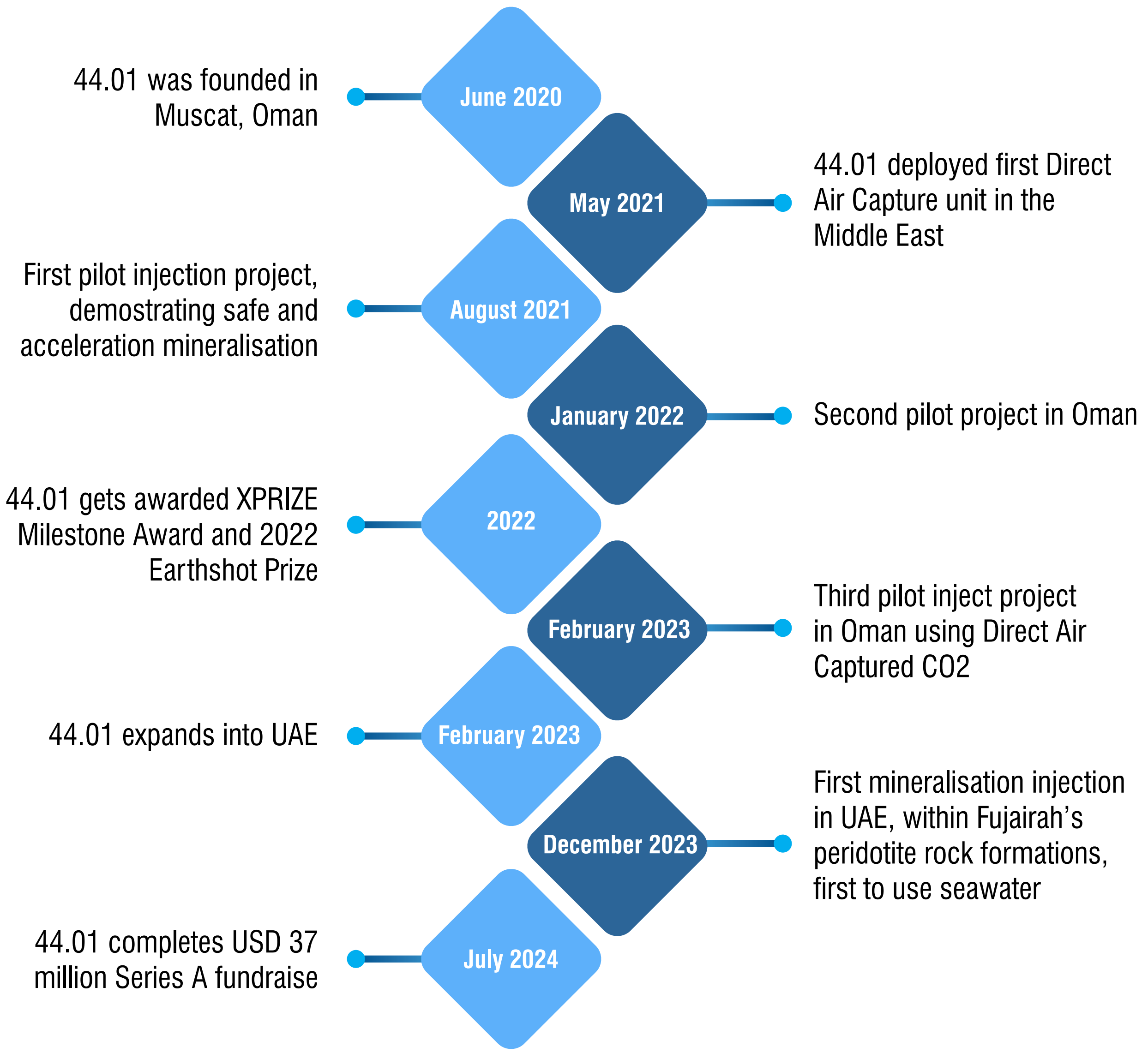
Renewable Energy Powered

Their operations are powered by renewable energy to maximize the net CO_2 removed and ensure sustainability.

Scalable and Low risk

The mineralisation projects have limited upfront costs and are modular, allowing quick development and scalable expansion once site potential is confirmed. The company leverages proven oil and gas techniques but reverses the process by injecting CO_2 rather than extracting hydrocarbons. 44.01 focuses on safely locking CO_2 underground in stable rock formations, ensuring no risk of leakage back into the atmosphere or impact on local environments, and offers a scalable carbon removal solution that aligns with the energy transition and climate goals.

C. Timeline



Source: 4401.Earth

7. Conclusion

As the world stands at the crossroads of an energy revolution, the circular energy paradigm offers more than just a solution — it illuminates a transformative path toward sustainable prosperity. Globally, the integration of renewables, carbon capture, waste-to-energy, and recycling technologies is reshaping energy systems to be more resilient, resource-efficient, and environmentally harmonious. Renewable energy is no longer an alternative but the dominant force, with solar and wind rapidly expanding, complemented by innovations in CCUS that turn carbon liabilities into assets, and advanced recycling and waste management that ensure materials reuse and emissions reduction.[31] [32]This systemic shift envisions a future in which energy is produced, used, and regenerated in a closed loop, minimizing waste, optimizing resources, and unlocking new economic opportunities.

In the GCC, this momentum is palpable and accelerating with unprecedented investments and policies driving circular energy adoption. The region's ambitious renewable energy projects, from vast solar farms to pioneering wind endeavours, are paired with world-scale CCUS hubs and emerging waste-to-energy solutions that together form a dense, integrated ecosystem.[33] Recycling initiatives, urban planning, and industrial symbiosis further embody the circular ethos, reflecting the GCC's commitment to decarbonize oil and gas, diversify economies, and lead in emerging clean technologies. The GCC is strategically positioning itself as a global supplier of green hydrogen and circular energy products, transforming challenges into competitive advantages.

Saudi Arabia, the anchor of GCC's energy transition, epitomizes the circular energy vision with its bold targets under Vision 2030 and the Saudi Green Initiative. With over 130 GW of renewable capacity on the horizon and CCUS capacity scaling to 44 million tonnes annually, the Kingdom is pioneering projects that weave together clean power generation, carbon management, waste enhancement and resource sustainability.[34] The Kingdom's circular approach is not just a policy or a technical strategy, it is a holistic reimagining of energy, economy, and environment that will foster innovation, bolster energy security, and drive long-term resilience. Looking ahead to 2030 and beyond, Saudi Arabia is on course to cement its position as a clean energy powerhouse and a global exemplar of circular energy in action.

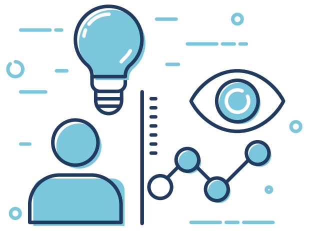
In essence, the circular energy future is an inspiring odyssey that demands bold innovation, collaborative governance, and a shared vision. From global ecosystems to regional champions like the GCC and Saudi Arabia, the journey transcends traditional energy narratives to unlock a regenerative, inclusive, and vibrant energy world—ready to meet the challenges of climate change and resource scarcity while delivering sustainable growth for generations to come.
[35] [36]

[31] World Economic Forum – Circularity in Renewables 2025
[32] Future Earth
[33] OGCI
[34] Gas World
[35] World Economic Forum
[36] IEA – Renewables 2024

شركة وادي الرياض
Riyadh Valley Co

Riyadh Valley Company

Riyadh Valley Company established in 2010 by Royal Decree No.116 dated 13/4/1431 AH to be the investment arm of King Saud University in the fields of Knowledge Economy and the university strategic projects.



Vision

To be the regional leader in knowledge-based investment and technology.

Mission

Riyadh Valley Company is a strategic investor, focused on leveraging the local capabilities, investing locally and globally in growth - stage businesses to create financial and strategic returns that will support the future of economic development in the Kingdom.

The Core Focus Areas of RVC

Venture Capital Investments

- Healthcare Investment
- Renewable energy& Sustainable Recourses
- Information & Communication Technology
- FinTech
- Education
- Logistics and Trasportation

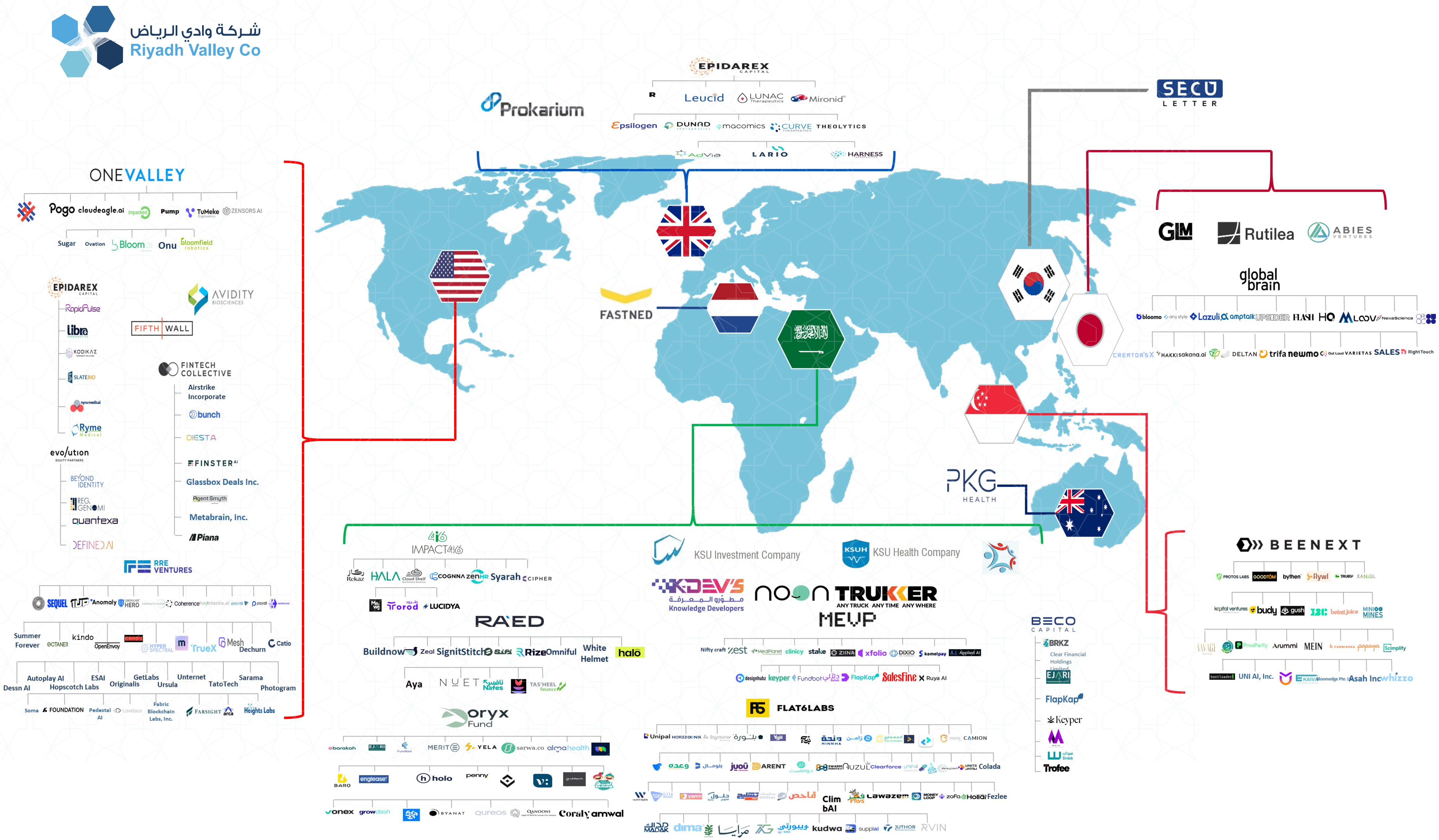
Strategic Investments

- Innovation and R&D Projects
- Educational Projects
- Healthcare Projects
- Commercial Projects
- Residential Projects
- Mixed-use Projects

Enriching Innovation Ecosystem

- Attract distinguished scientists and consultants
- Prepare students for work experience through training
- Supporting Scientific Research and technology industry
- Enhance the environment to support the knowledge economy

Knowledge Investment Portfolio



Strategic Investment Portfolio

Sudair Pharma Company Project

Research center and offices

Four Directions Company Project

Office project

Derma Clinic Company Project

Residential project

Qasr Alaaredh Company Project

Building

NMR Real Estate Company Project

Mixed-use project

Commission for AlUla Building

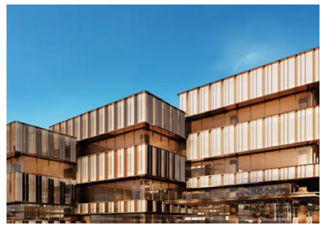
Building

ELM Information Security Company Project

Research & Innovation center

Majd Real Estate Company Project

Offices project



City Lights Real Estate Company Project

Mixed-use project

Sahat Al-Ardh Company Project

Mixed-use project

Takween Altanmia Company Project

Offices project

Oasis of creativity Schools

Educational project

Al-sorooh Al-Mubarakah Company Project

Offices project

Derma Clinic Company Project

Healthcare project

Four Directions Company Project

Commercial project

The Esplanade Project

Commercial project

Arrowad Education Company Project

Educational project

Obeikan Company Project

Commercial project

Dur Alkuttab Company Project

Educational project

U WALK Project

Commercial project

Al Maarefa University and Diabetes Research Center

Buliding project

Innovation Tower Project

Office building project

شـركـة وادي الـريـاض
Riyadh Valley Co

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