Clearthought

Automotive Sustainability and Circularity

The need to make the industry more sustainable and circular has become a huge focus of activity.

Inside:

- Drive to circularity
- Regulatory environment
- Preparing for circularity
- M&A activity

Drive to circularity

The automotive sector continues to go through huge transformation. In recent years the focus has very much been on the rise and impact of electric vehicles, alongside the push towards autonomous driving and increased connectivity. But added to these two great drivers is a crucial third element, namely the need to make the industry more sustainable and circular.

This drive towards sustainability is by no means a passing phase. In part, it is being driven by increased regulation around sustainability reporting, and crucially, by investors and financial markets which want to see companies make clear commitments to their Environmental, Social, and Governance (ESG) targets. In short, both regulators and investors are pushing the industry to go much further and faster.

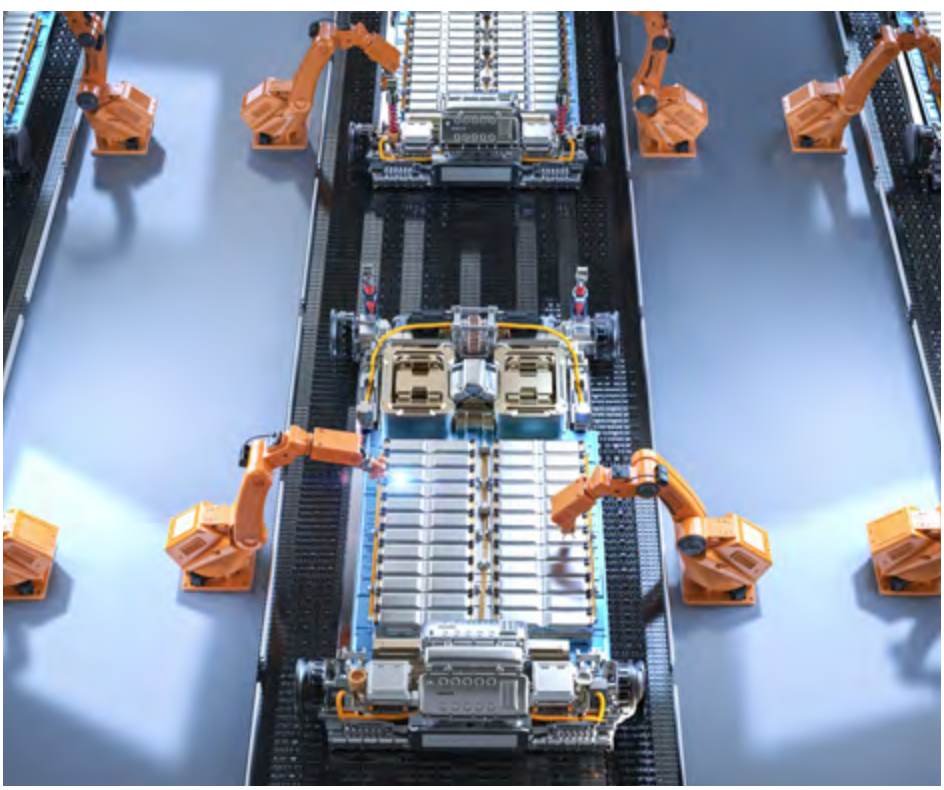
At a system level the utilisation of vehicles is highly inefficient, as European cars are parked for approximately 92% of the day.

Many automotive players have already taken the issue into their own hands, starting out on the journey of transforming their operations in line with circular principles. Examples include Renault's plans for a factory near Paris, completely dedicated to improving vehicle material use and reuse, and BMW's plans to build the world's greenest car using circularity principles.

Start of the journey

However, the industry has a long way to go. One report[1] from the World Economic Forum (WEF) says the sector is still not on track to "effectively implement the circular economy levers". It says that at a system level the utilisation of vehicles is highly inefficient, as European cars are parked for approximately 92% of the day and, on average, carry only 1.6 people. The report highlights that higher value-retention processes for materials and components remain underutilised, while reuse, remanufacturing, and recycling systems lack scale.

The report also adds that the onus on this shift towards circularity doesn't just fall on manufacturers. For instance, insurance companies could reward the use of sustainable vehicle parts with lower insurance premiums, while financial institutions could support the wider industrialisation of circular business models.



1: Paving the Way: EU policy action for automotive circularity (World Economic Forum)

Finance

Given the growing regulatory environment around circularity, all OEMs and large suppliers are rethinking their value chains to ensure that their upstream processes are as green as possible, while ensuring that secondary materials are increasingly used.

Meanwhile, from a financing perspective, it is also becoming more and more difficult for companies to actually access finance if they do not have sufficiently green credentials. Companies are therefore increasingly aligning their work around circularity with the UN's Sustainable Development Goals (SDGs), a call for all countries to tackle the global challenges faced by humanity. The SDGs cover a wide range of challenges and the goals include tackling poverty, inequality, climate change and environmental degradation, as well as promoting prosperity, peace and justice.

What is a circular car?

A circular car refers to a theoretical vehicle that has maximised materials efficiency. Such a vehicle produces zero materials waste and zero pollution during manufacture, usage, and disposal.

Realistically, cars may never be fully circular, but the industry can significantly increase its degree of circularity.

As another recent report from WEF[1] states, building a sustainable ecosystem for circular materials will require investment in clean materials supply chains, building market demand for these materials, and designing vehicles so that their materials can be easily disassembled, sorted, and reused at end of life.

As the report adds, the development of a more sustainable and circular automotive economy highlights many research questions for OEMs, suppliers, and policymakers alike.

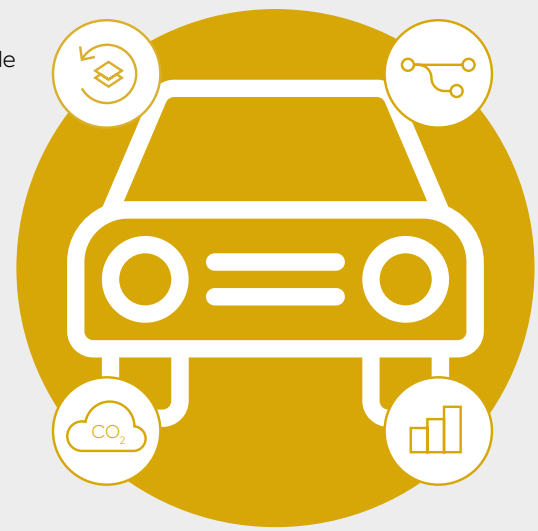
These include:

- How can end-of-life disposal responsibility for producers or initial buyers be used to promote circularity?
- How can modular construction be encouraged?
- What are the critical regulatory requirements regarding design for disassembly?
- How big an opportunity is remanufacturing?
- What data standards and regimes are necessary to trace material origins?
- How can the supply of clean electricity and hydrogen be accelerated?
- What role can tax and fees play in disincentivising production of emissions-intensive materials and products?
- Where should new regulatory standards be applied to decarbonise materials?

A circular car maximises the value from resource consumption

Energy (incl. fuel) is used efficiently (per km of movement) and is renewable

Lifetime of the vehicle and components is optimised for resource efficiency (by emphasising efficient design, modularity, purpose-built vehicles, reuse, repair, remanufacturing etc.)



Materials are used without waste (reduced, reused, recycled, and/or renewed)

Use rates are optimised (accounting for resiliency requirements)

Source: The Road Ahead: A policy research agenda for automotive circularity. World Economic Forum

1: The Road Ahead: A policy research agenda for automotive circularity (World Economic Forum)

Market and policy barriers

There remain significant market and policy barriers which hinder the uptake of circular processes, products, and services. As the WEF report[1] says, policy action is insufficiently addressing these market failures, while simultaneously creating counter-productive incentives.

In terms of market-related barriers, it cites issues such as prevailing consumer habits and use patterns; traditional business models which focus on selling cars as a product rather than as a service; financial and performance metrics and competitive dynamics, which incentivise the development and production of larger, heavier, and more powerful vehicles.

There remain significant market and policy barriers which hinder the uptake of circular processes.

Policy-related barriers include regulatory CO_2 performance metrics which only cover tailpipe emissions and fail to take a life-cycle perspective; end-of-life legislation which focuses on recycling but lacks specific quality requirements; transparent data on material composition of vehicles; taxation systems which do not reflect externalities in market prices; and poor understanding of the social implications of the circular transition of the automotive industry.

1: Paving the Way: EU policy action for automotive circularity (World Economic Forum)

Action

The report calls on EU policymakers to act in three key areas. Firstly, by creating cross-cutting market enablers, such as consistent metrics that take a life-cycle perspective in regulations. Secondly, by reshaping economic incentives so that tax changes or carbon market mechanisms can account for negative externalities, by compensating for market price differences between 'green' products and less green products. And thirdly, by harmonising and strengthening measures that reflect the systemic dynamics of automotive circularity.

Collaboration

Collaboration across the value chain of the automotive industry will be crucial to the ultimate success of circularity. For instance, another WEF report[1] says we could begin to see the rise of 'orchestrator' organisations, which establish a direction and common framework for stakeholders along the value chain, by assisting in the development of standards and regulations.

Many OEMs are already responding to these developments by increasing horizontal integration along their value chains, while broader initiatives such as Catena-X are taking hold. This group of around 100 companies from the sector is laying the foundations for an end-to-end vehicle data infrastructure, potentially improving a range of circularity activities.

1: Driving Ambitions: The business case for circular economy in the car industry (World Economic Forum)

Regulatory environment

For circularity to become embedded in the automotive industry, it is essential that a common language around what constitutes sustainable economic activity is created.

To this end, the EU has introduced reporting standards for companies and a framework for investment - known as the taxonomy - as part of its wider approach to increasing sustainability under the Green Deal framework.

The transition to a circular economy is actually one of five environmental objectives defined in the Green Deal. The others include climate change mitigation and adaptation, sustainable use and protection of water and marine resources, pollution prevention and control, and protection and restoration of biodiversity and ecosystems.

Non-financial reporting

The taxonomy imposes a number of non-financial reporting commitments on companies. Under the EU's proposed rules, known as the Corporate Sustainability Due Diligence Directive, companies with more than 500 employees or €150m in global turnover, would be required to identify and prevent or mitigate activities such as child labour, worker exploitation, or damage to natural ecosystems in their supply chains.

From this year the intention is that companies will be required to disclose a proportion of their turnover, CapEx, and OpEx associated with economic activities that qualify as environmentally sustainable.

Criticism

The taxonomy has attracted criticism. For instance, while it explicitly recognises the contribution of the manufacture of hydrogen vehicles and components, batteries, and electric vehicles to climate objectives, it does not address EV components explicitly.

The European Association of Automotive Suppliers states[1] that automotive supplier investments and revenues related to the production of EV components should be taxonomy eligible.

It says a distinction between vehicle assembly and component production in the implementation of the taxonomy, would disadvantage automotive suppliers over vehicle manufacturers. It adds that the taxonomy will only efficiently direct capital to the transport equipment sector if automotive suppliers can apply similar screening criteria as vehicle manufacturers, and access the market for sustainable investment on equal terms.

If research, design, and production of components for EVs are not considered taxonomy eligible, the level playing field between vehicle manufacturers and automotive suppliers will be distorted, it adds. Over the years, this could allow vehicle manufacturers to access capital at better conditions and distort competition in the capital market.

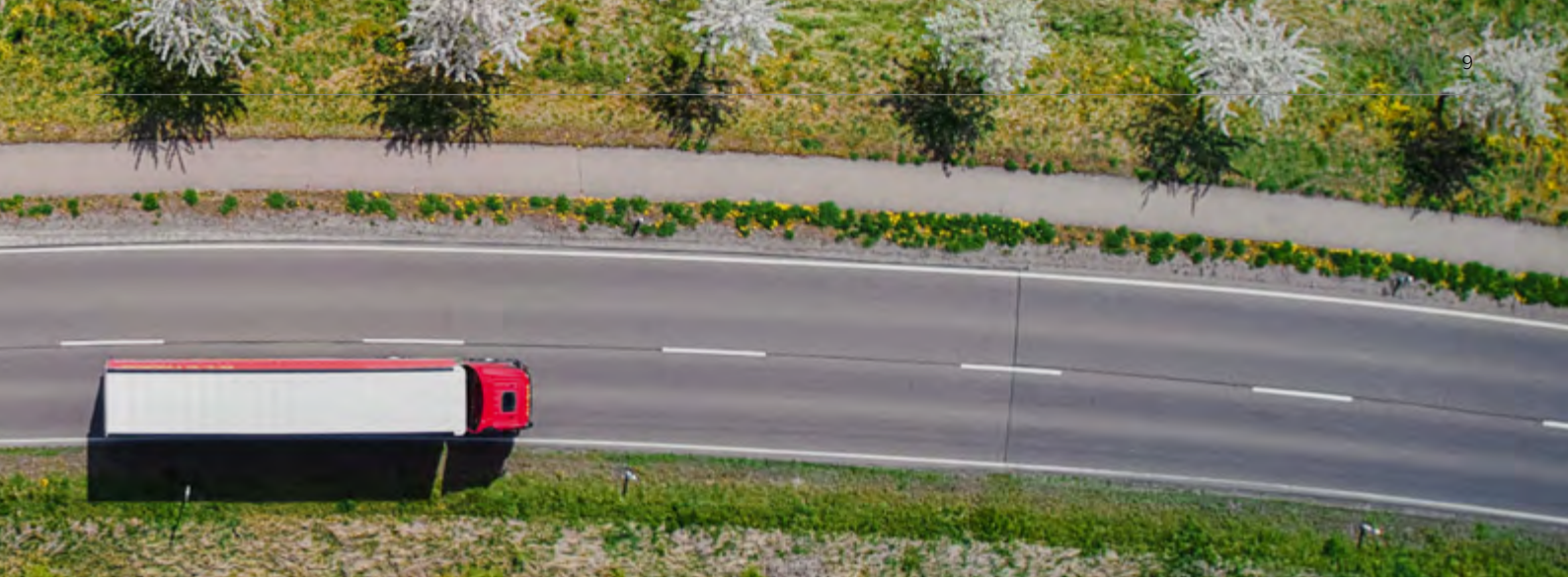
1: Keys to a successful implementation of the EU's sustainable financial taxonomy (European Association of Automotive Suppliers)

Preparing for circularity

Overview of the most promising solutions for circularity

Solution	Description
Low-carbon materials	Recyclers and material suppliers deploy energy-efficiency measures and scale the use of renewable energy in the recycling of automotive materials.
Low-carbon production	OEMs and component suppliers deploy energy-efficiency measures and scale the use of renewable energy in component production and vehicle assembly.
Minimised production scrap	OEMs and component suppliers collaborate with material suppliers to reduce material scrap in production.
Modular vehicle design	Cars are designed based on a modular concept that simplifies repair, disassembly, and remanufacturing.
End-of-life management	Industry works together to increase efficiency of disassembly. Components and materials are channelled towards specialised facilities.
Circular material stock	All materials are 100% recyclable. Waste is reduced and materials are recycled at the highest level by specialised recyclers.
Components as service	Critical components are sold as a service rather than as a product by OEMs. For instance, batteries are a high value component with the potential for an extended life in automotive and non-automotive applications.
Reuse and remanufacturing at scale	Necessary technologies are improved, processes automated, and large-scale facilities established to increase cost-competitiveness.

Source: Raising ambitions: A new roadmap for the automotive circular economy (World Economic Forum)



Solution	Description
Workshops as a circularity hub	Workshops increase cost efficiency, optimise maintenance services based on predictive analytics, and use manufactured parts as the default option.
Purpose-built vehicle	OEMs provide purpose built/purpose adjusted vehicles to mobility providers, that enable improved capacity use and optimised vehicle lifetime.
Alternative drivetrain	OEMs scale alternative drivetrain solutions with substantially lower exhaust emissions to reduce use phase emissions.
Energy grid integration	OEMs scale smart charging and vehicle-to-grid technology for battery electric vehicles, plug-in hybrids, and fuel cell electric vehicles.
Leasing and subscription	OEMs and fleet management companies increase their offerings for fleet-based private mobility.
Vehicle on demand	A variety of on-demand solutions are already on the market, including car rental, car sharing, P2P sharing, and micro mobility.
Mobility on demand	Ride pooling has the potential to optimise capacity use of the vehicle by increasing life-cycle kilometre per vehicle, as well as the average number of passengers.
Breathing fleets	Fleet management companies share the fleet across multiple service offerings. Cars are shifted from one service offering to another.

Source: Raising ambitions: A new roadmap for the automotive circular economy (World Economic Forum.)

OEM action

OEMs are already taking significant action around circularity. For instance, BMW[1], together with its national sales companies, has 2,800 return points in 30 countries offering environmentally friendly recycling, while the group currently manufactures an average of just under 30% of its vehicles from recycled and reused materials.

Through BMW i Ventures, the group has also invested in key technologies that can make a decisive contribution towards achieving its long-term vision of carbon neutrality. For instance, it has invested in Prometheus Fuels, which has developed technology that enables carbon-neutral synthetic fuels to be produced using green energy.

By the end of 2025, Audi[2] wants to reduce the environmental impact of group sites by 35% per car produced, compared to 2010, and its vision is to produce vehicles at all sites with no CO_2 emissions or wastewater. The company is taking steps to make the life-cycle of batteries as sustainable as possible, while it has also launched the Aluminium Closed Loop project in which offcuts are returned to suppliers and recycled.

1. https://www.bmwgroup.com/en/sustainability/our-focus/circularity.html
2. https://www.audi.com/en/company/sustainability/core-topics/value-creation-and-production/promoting-circular-economy.html

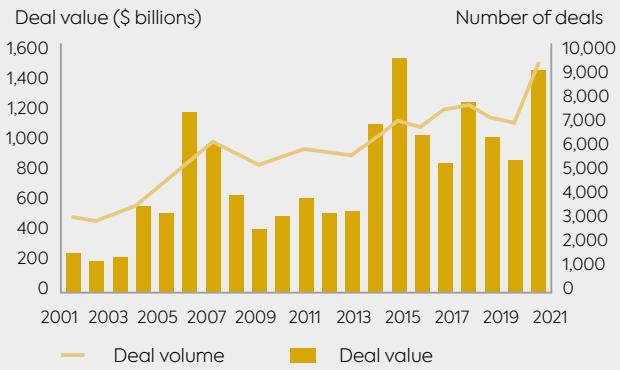
M&A activity

The move toward circularity and sustainability is already having a significant impact on M&A activity, driving a number of transactions across the automotive sector.

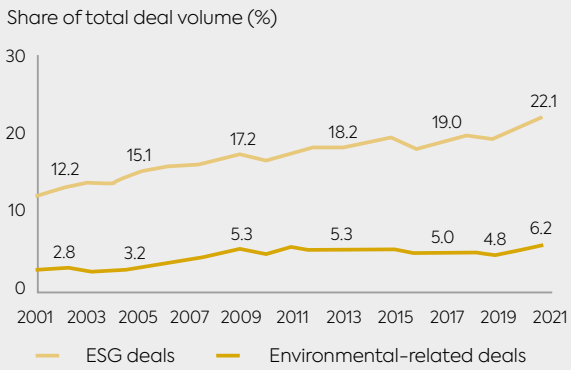
Sometimes these transactions are disposals where players decide that non-core business areas are no longer compliant with sustainability strategies. Alternatively, they may pursue acquisitions to support green strategies, using M&A to reposition portfolios around sustainable alternatives. Or they may buy shares in specific businesses, perhaps in order to gain access to specific raw materials.

ESG is gaining importance in M&A

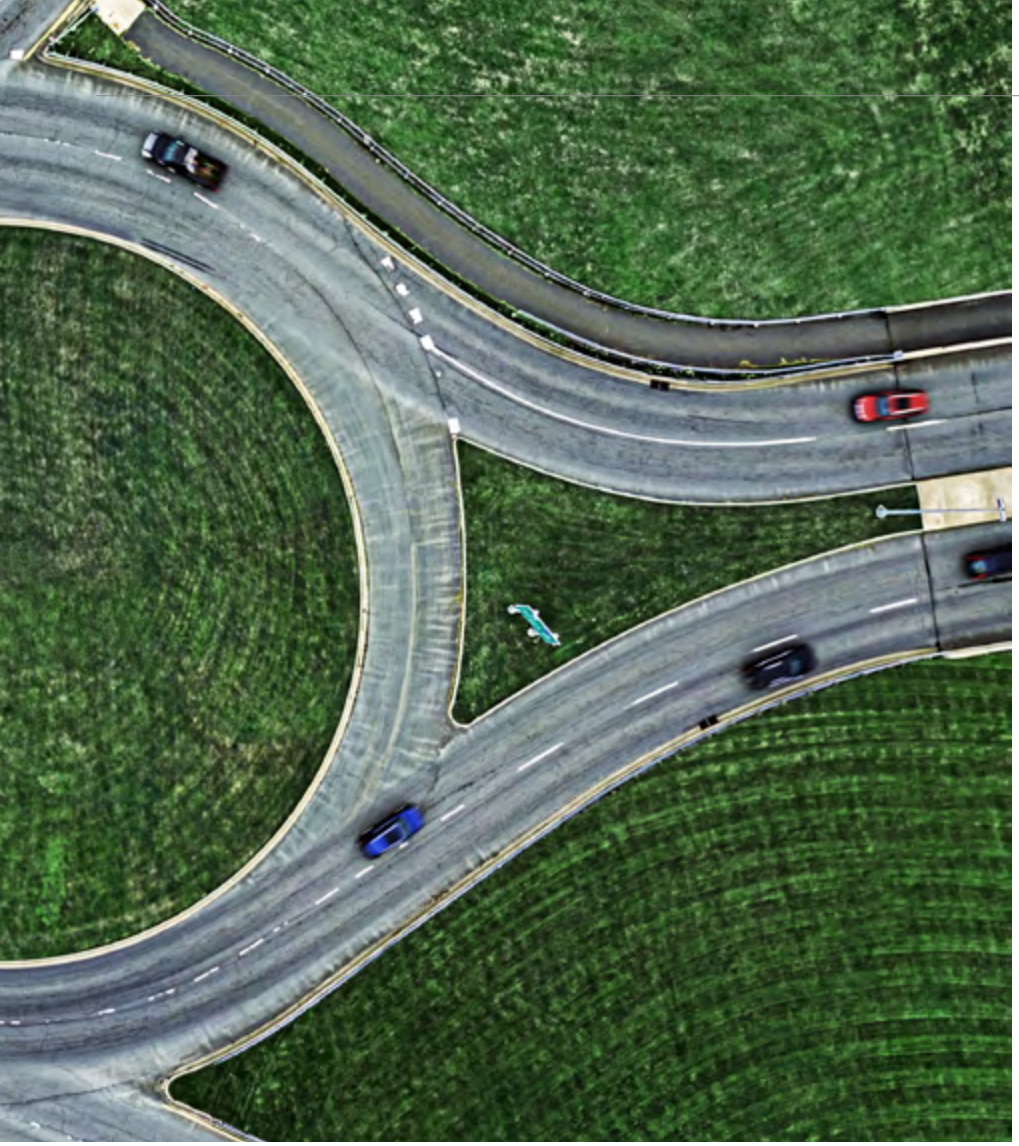
The volume and value of ESG deals have risen over the past two decades



The shares of ESG deals and environmental-related deals have grown continuously



Source: Refinitiv, BCG
https://www.bcg.com/publications/2022/green-deals-on-the-rise-according-to-the-latest-mergers-and-acquisitions-report



ESG funds

As we have mentioned, the role of financial investors is becoming increasingly significant, with companies now expected to follow investors by integrating ESG into their M&A strategies.

Latest figures[1] from 2021 saw record inflows to funds focused on ESG issues, with ESG funds accounting for 10% of worldwide fund assets that year. Stocks of companies rated highly for their sustainability efforts also notched gains. For instance, the MSCI World ESG Leaders' Index rose more than 20% in 2021.

Latest figures from 2021 saw record inflows to funds focused on ESG issues.

A recent report from BCG[2] found that dealmakers were increasingly focusing on the opportunities for ESG-related value creation, such as investing in the clean energy transition, or gaining a competitive edge through sustainable sourcing.

It found that the volume of ESG-related deals, as a share of all deals, rose from 12% in 2001 to 22% in 2021, while the growth of green M&A has been fastest in industries at the forefront of the energy transition and in emerging markets.

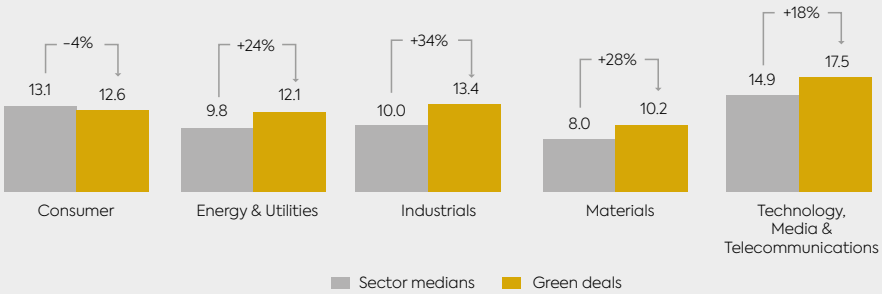
1: Reuters, Dec 2021: How 2021 became the year of ESG investing https:/www.reuters.com/markets/us/how-2021-became-year-esg-investing-2021-12-23/

2: BCG, Oct 2022: Green Deals Gain Steam, The 2022 M&A Report https:/www.bcg.com/publications/2022/green-deals-on-the-rise-according-to-the-latest-mergers-and-acquisitions-report

Green deals command higher prices

Multiples of green deals versus sector medians in selected industries from 2019 through 2021

Median EV/EBITDA acquisition multiple (x)



Source: Refinitiv, BCG
https:/www.bcg.com/publications/2022/green-deals-on-the-rise-according-to-the-latest-mergers-and-acquisitions-report

ESG premium

As the chart on the previous page shows, green deals also command a significant price premium. According to BCG, the average acquisition prices for these deals have exceeded the overall market average by approximately 7% between 2019 and 2021, with premiums of 20% to 30% in some industries.

Between these dates it analysed the enterprise value to EBITDA ratios of green targets in majority acquisitions valued at more than $50m. The median ratio was 13.0 for green deals, versus 12.2 for overall multiples in the same sector. In energy & utilities, the premium is among the strongest and most persistent over time. Meanwhile, competition for green assets continues to increase, driving up prices.

Deal impact

It is clear that ESG will increasingly influence deal making. As a recent report from Harvard Law School Forum[1] states, in the future ESG will not simply be a tool for identifying and mitigating risks, but also a lever for value creation with acquirers and targets increasingly expected to demonstrate their ESG credentials.

It says that many critical aspects of M&A will be affected by the integration of ESG into investor decision-making. For instance, the ESG premium will directly impact due diligence. In addition to assessing ESG risks – such as corrupt business practices, labour law violations, cybersecurity threats, and carbon emissions – acquirers will also need to examine related processes and procedures, including the degree of board oversight, and the scope and quality of internal and external ESG reporting.

Acquirers will also need to consider the ESG impact of a transaction, including reputation and culture, when assessing deal synergies. On the target side, boards and management will also need to be aware that ESG concerns may increasingly factor into shareholder decisions to support or reject a proposed transaction, particularly where the deal consideration includes shares of the acquirer.

1: ESG and M&A in 2022: From risk mitigation to value creation. Harvard Law School Forum on Corporate Governance, Jan 2022 https:/corpgov.law.harvard.edu/2022/01/24/esg-and-ma-in-2022-from-risk-mitigation-to-value-creation/"

Recent deals

Announced date	Target company	Target description	Bidder company	Deal value EUR(m)
21.03.2023	Careco SA	The french network specialising in vehicle dismantling, recycling, and second-hand trading	Autocirc AB	
25.10.2022	American & Import Auto Parts (100% stake)	US-based full-service automotive recycler company	Fenix Parts, Inc.	
04.10.2022	Reno Auto Parts Inc. (100% stake)	US-based provider of automotive recycler servicing	Fenix Parts, Inc.	
08.03.2022	almaak (70% stake)	Germany-based specialist in high quality recycled engineered polymer compounds	HEXPOL AB	
03.02.2022	Svenssons Bildemontering (100% stake); Svenssons Forvaltning I va AB (100% stake)	Car assembly and seller of recycled car parts	Autocirc AB	
24.11.2021	Ionity	Germany-based operator of high-power charging station network for electric vehicles	BMW AG; Volkswagen AG and others	700
27.09.2021	Polestar Performance AB	Sweden-based electric car manufacturing company	Gores Guggenheim, Inc.	17,141
17.08.2021	Columbus Recycling Corporation	US-based company engaged in recycling and supplying of scrap metals of different grades	Schnitzer Steel Industries, Inc	
28.07.2021	Redwood Materials Inc.	US-based company engaged in technology and process development for materials recycling, remanufacturing, and reuse	Amazon.com, Inc.; Ford Motor Company and others	592
09.06.2021	Northvolt AB	Sweden-based company engaged in the production of lithium-ion battery cells and systems	Volkswagen AG; Scania AB and others	2,257

In the future ESG will not simply be a tool for identifying and mitigating risks, but also a lever for value creation with acquirers and targets increasingly expected to demonstrate their ESG credentials.

Our recent automotive transactions

Working for many years with leading suppliers and OEMs, and more recently with new digital players, we have built up an extensive network and knowledge of the sector, becoming a trusted adviser for many of the world's leading automotive players. With more than 300 successfully completed automotive deals, our unique automotive transaction experience covers virtually every system and component of a vehicle, plus all relevant materials and process technologies.

nazca

on its acquisition of

DOGA

Buy-side
Undisclosed

DRIVE SYSTEM DESIGN

sold to

HINDUJA TECH

Sell-side
Undisclosed

The shareholders of Allgaier Werke GmbH

sold a majority stake in

ALLGAIER | GROUP

to

Sell-side
Undisclosed

KOPERNIKUS AUTOMOTIVE

received investment from

Continental

Sell-side
Undisclosed

CapitalPartners

invested in

Grupo Simoldes

Buy-side
Undisclosed

HEITKAMP & THUMANN GROUP

sold

WESTFALIA Metal Components

to

Vollmann Group

Sell-side
Undisclosed

ROLEC

on the sale to

SDIPTECH

Sell-side
Undisclosed

EMK Capital

raised bank club financing to support its acquisition of

RLG

complementing its existing portfolio company

Reconomy

Acquisition finance
Undisclosed

SHAFTEC

received investment from

Ardenton

Sell-side
Undisclosed

Our international automotive team

With offices in Europe, the US and Asia, our automotive team can deliver seamless, integrated global advice to SME/owner-managed, corporate, and private equity clients. Our team is supported by a number of high-profile senior advisers, who are all former top tier executives with relevant product knowledge and a far-reaching network of contacts.

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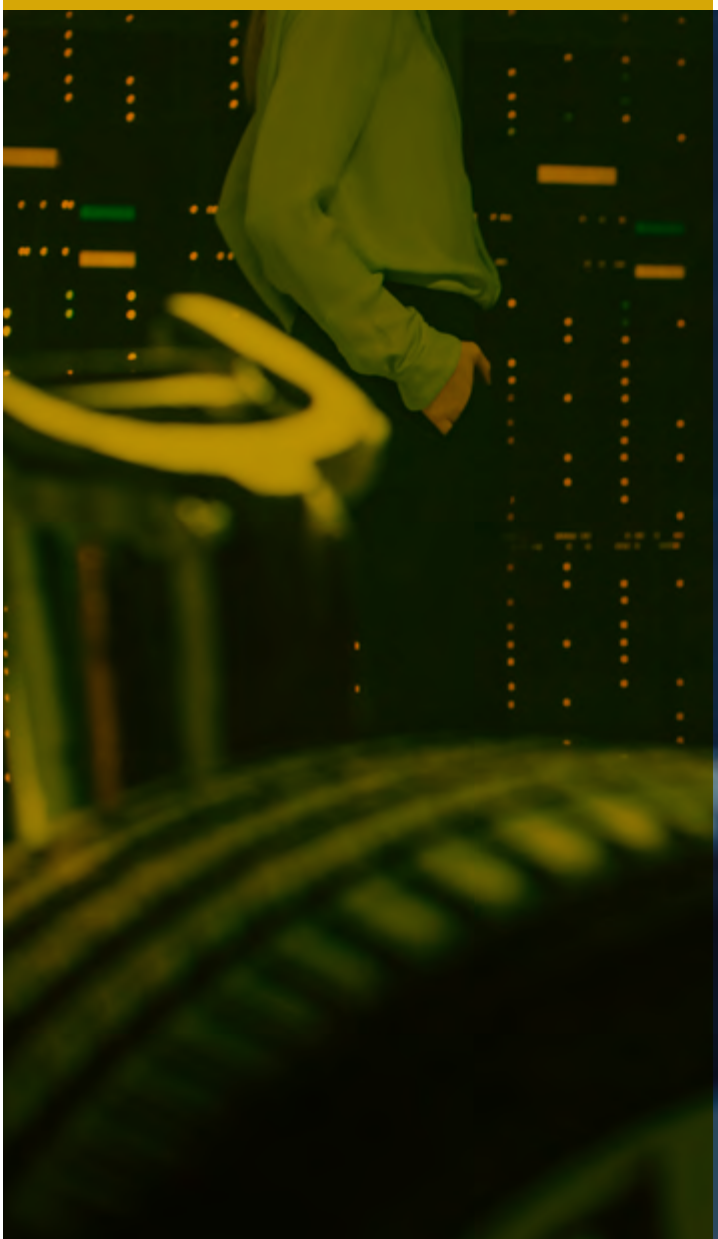

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