

THE ECOLOGICAL TRANSITION: A SUSTAINABLE INVESTMENT OPPORTUNITY



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SUMMARY

The rapid warming of the planet has become a serious public concern, and justifiably so, as CO₂ emissions have risen by 62% since 1990, causing a loss of 40% of the global stock of natural capital over the same period. Unless this trend is reversed rapidly, a significant portion of the planet's surface will become uninhabitable, triggering a flurry of conflicts over the use of resources.

There is a growing awareness of the need to steer a global ecological transition that will take us towards a model of sustainable development, with new ways of producing, consuming and travelling. This is now an essential condition for meeting the challenges of climate change, scarcity of resources and the accelerating loss of biodiversity.

Despite the ambition displayed after the declaration of the Paris Agreement in 2015 and the many new commitments made since then, global warming remains

on a trajectory of 2.7 to 3.1°C by 2100, which is still far below the Agreement's 1.5 to 2°C target.

In response to this challenge, both public and private actors must rally in meeting investment needs of \$1500bn to \$2000bn annually between now and 2030. ODDO BHF Asset Management wants to play an active role in this effort, including the reallocation of financial flows to the ecological transition. To do so, we have identified opportunities for significant growth and creation of value in four main areas of the transition: clean energy, energy efficiency, sustainable mobility and conservation of natural resources. As responsible asset managers, we strive to do our utmost in helping to meet this major challenge and allowing our clients to benefit from this structural change that is also a source of long-term growth.



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A person is sitting on a hillside, looking towards a large, rounded mountain in the distance. The sky is filled with heavy, grey clouds, suggesting an overcast or stormy day. The person is wearing a blue, textured t-shirt and is sitting on the ground, which appears to be a mix of dirt and sparse vegetation. The overall mood is contemplative and somber.

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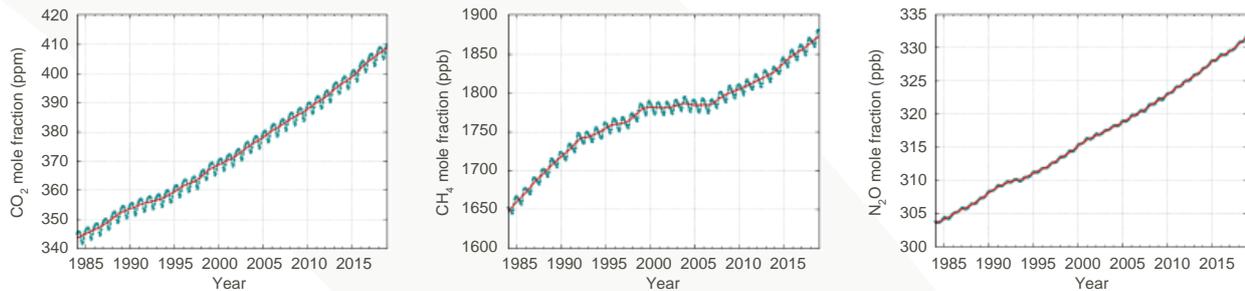
A GLOBAL ENVIRONMENTAL
CRISIS

THE CLIMATE EMERGENCY

The rapid warming of the planet is now a serious public concern, and justifiably so. Global emissions of carbon dioxide (CO₂) reached a new record of 36.7 Gigatons (Gt) in 2019¹, a **62% increase from 1990 levels**. Meanwhile, anthropogenic emissions of methane (CH₄) and nitrous oxide (N₂O), two other greenhouse gases

that are especially powerful (respectively 25 and 298 times stronger than CO₂ in terms of cumulative greenhouse effects over one century²), have also risen steeply during this period, with methane now accounting for 15% of the anthropogenic greenhouse effect.

CONCENTRATION OF GREENHOUSE GASES IN THE ATMOSPHERE



Source: World Meteorological Organization, 2020

Without meaningful environmental reforms, scientists project that CO₂ emissions could reach 56Gt/year by 2030, **whereas they would have to be limited to 25Gt/year by that year to hope to keep global warming under the 1.5°C limit³**. This discrepancy is equivalent to the total emissions of the six territories that emit the most greenhouse gases, i.e., China, the United States, the EU-28, India, Russia and Japan. **Current**

climate commitments and policies are putting us on path of global warming of 3.1°C above pre-industrial levels by the end of the century (and as much as +4.8° if these policies should fail). This would make a large portion of the earth's land uninhabitable and would trigger a flurry of conflicts arising over the use of resources.

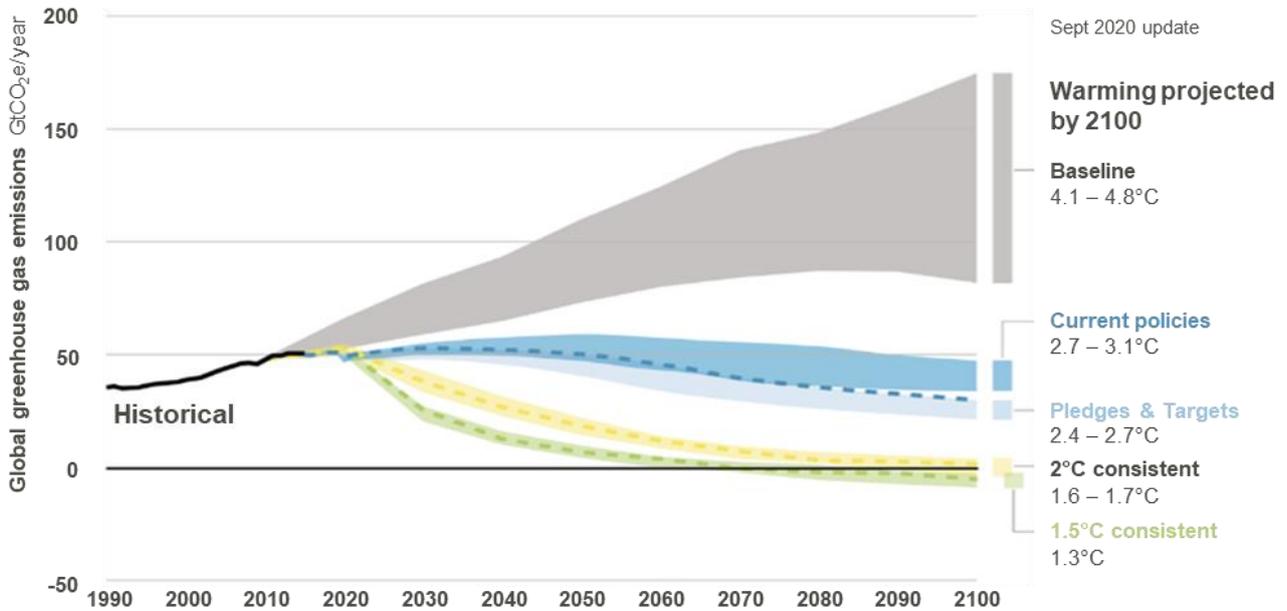


¹ Source: Global Carbon Project

² Source: IPCC, Fourth Evaluation Report, 2007

³ Source: UN Emission Gap Report, 2019

PROJECTED GREENHOUSE GAS EMISSIONS AND GLOBAL WARMING BASED ON CURRENT POLICIES AND COMMITMENTS

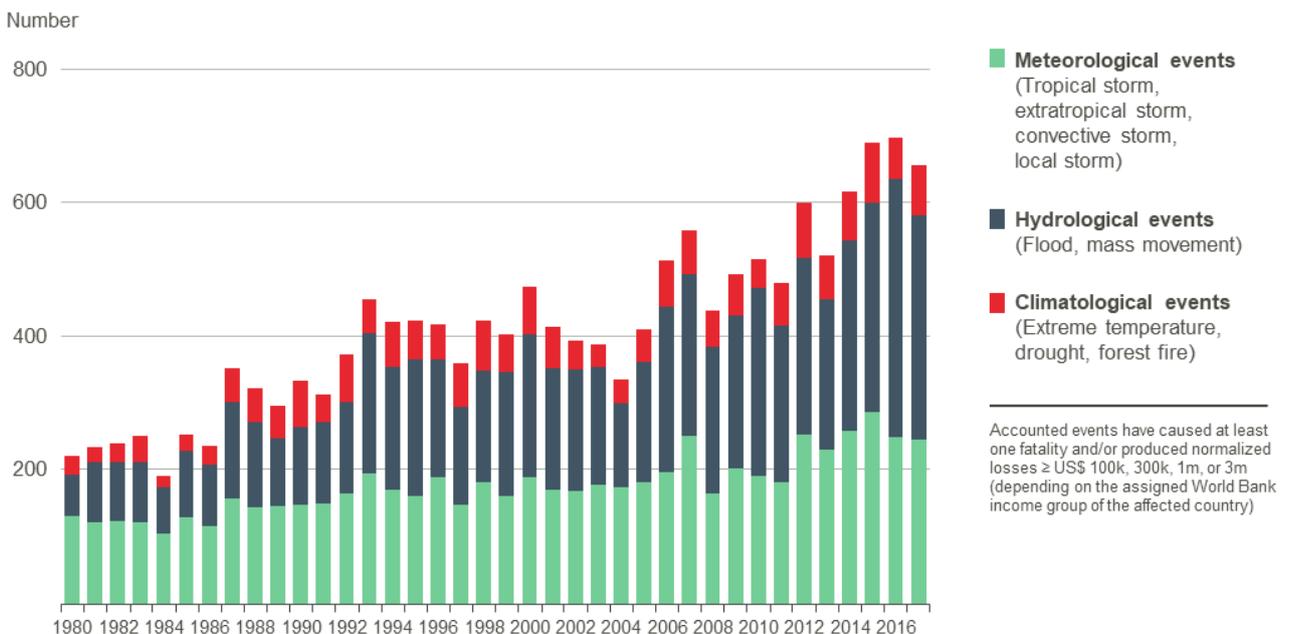


Source: Climate Action Tracker, 2020

The consequences of climate change are already being felt in natural disasters, such as hurricanes, flooding and droughts. There is a scientific consensus that these

have anthropogenic causes, and they have become significantly more frequent in the past 30 years, with increasingly severe human and economic costs.

MEASURE OF NATURAL DISASTERS ON A GLOBAL SCALE



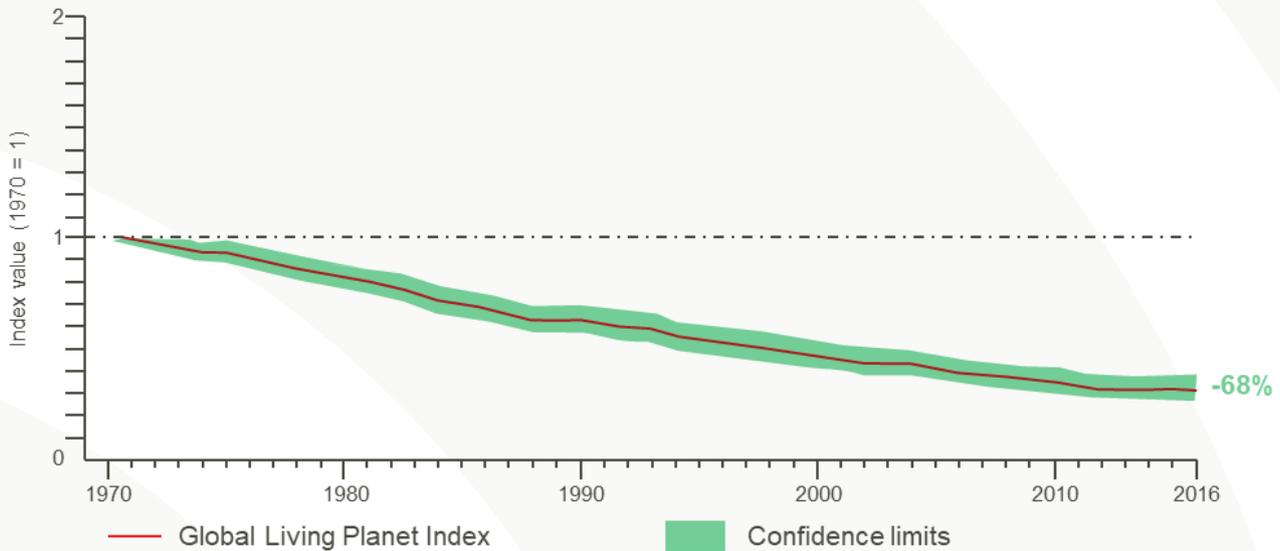
Source: Munich Re, 2018

THE ALARMING DECLINE OF ECOSYSTEMS

The climate crisis is also causing an accelerated disappearance of entire swaths of biodiversity. According to the WWF, 68% of the populations of mammals, birds, amphibians, reptiles and fish vanished

between 1970 and 2016. **Scientists call this the “sixth mass extinction”** while stressing its anthropogenic origin.

THE “LIVING PLANET” INDEX FROM 1970 TO 2016



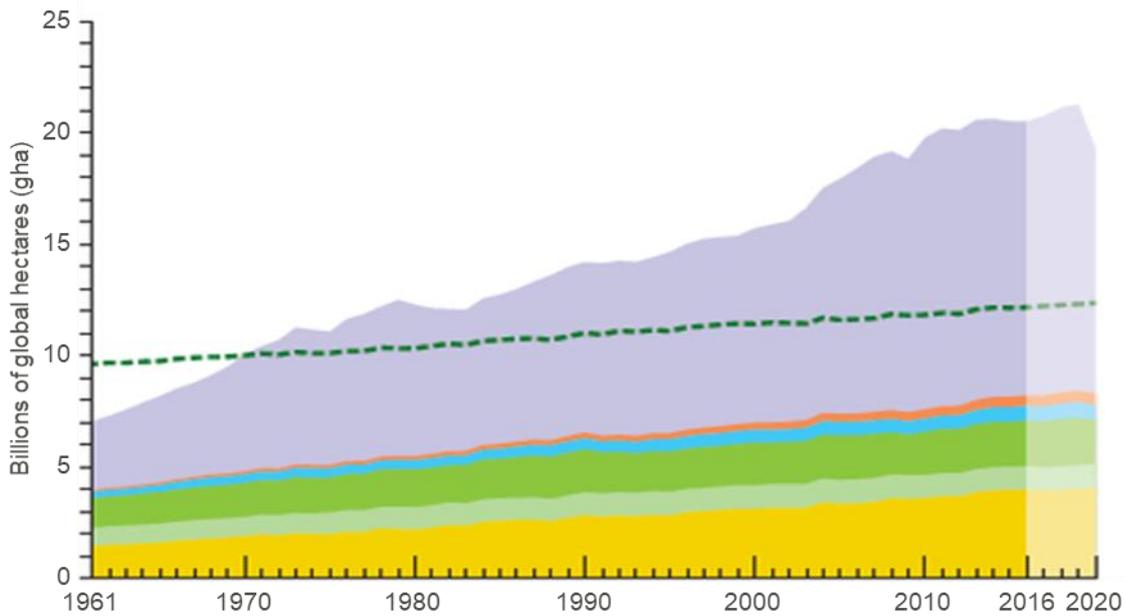
Source: WWF, 2020

The inexorable advance of “Earth Overshoot Day” is another illustration of the price of excessive use of natural resources. UNEP estimates that the Earth’s biocapacity is at least 56% overexploited, while the

global stock of “natural capital” – the planet’s natural renewable and non-renewable resources (e.g., plants, soil, minerals, etc.) has shrunk by 40% since the start of the 1990s.



HUMANITY’S ECOLOGICAL FOOTPRINT COMPARED TO THE EARTH’S BIOCAPACITY BETWEEN 1961 AND 2020



Key

- Carbon footprint** for absorbing emissions from fossil fuel burning and cement production
- Built-up land footprint** for accommodating roads and buildings
- Fishing grounds footprint** for wild and farmed seafood from oceans and freshwater
- Forest product footprint** for fuel wood, pulp and timber
- Grazing land footprint** for meat, dairy, leather and wool
- Cropland footprint** for food, fibre, oil and feed crops, including rubber
- World biocapacity**

Source: WWF – Living Planet Report, 2020

The international community has thus far failed to halt the collapse of the biodiversity. A recent report from the United Nations warned that none of the targets of the 2011-2020 Strategic Plan set under the Aichi Convention on Biological Diversity of 2010 have been met, thus postponing by a decade the implementation of an ambitious action plan on this issue⁴.

The collapse of ecosystems has a direct impact on the viability of socio-economic systems. More than half of the global GDP (about €44,000bn) depends on natural resources, according to a report by the World Economic Forum⁵.

To take one example, the UN estimates that the global population’s fresh water needs will be 40% greater than available renewable resources by 2030, leading to widespread social and political instability.

⁴ Source: UNEP – Global Biodiversity Outlook 5, 2020

⁵ Source: WEF – Nature Risk Rising: Why the crisis engulfing nature matters for business & the economy, 2020

A SOCIAL, POLITICAL AND ECONOMIC MOMENTUM TO SHIFT THE TRAJECTORY

In 2019, at least 15 disasters linked to climate change caused damages costing over \$1bn. Seven of them caused damages of more than \$10bn⁶. The increased frequency of environmental disasters and their ever greater economic and social consequences have led to growing awareness among the public, public authorities and economic actors of the need to act fast, decisively

and in coordinated fashion to prevent the worst effects of global warming. While the success of the Fridays for Future marches illustrates the mobilisation of younger generations worldwide, the World Economic Forum now ranks lack of action on climate as the worst danger threatening humanity and economic stability.

RISKS MOST LIKELY TO OCCUR BY 2030

Top 10 risks in terms of LIKELIHOOD

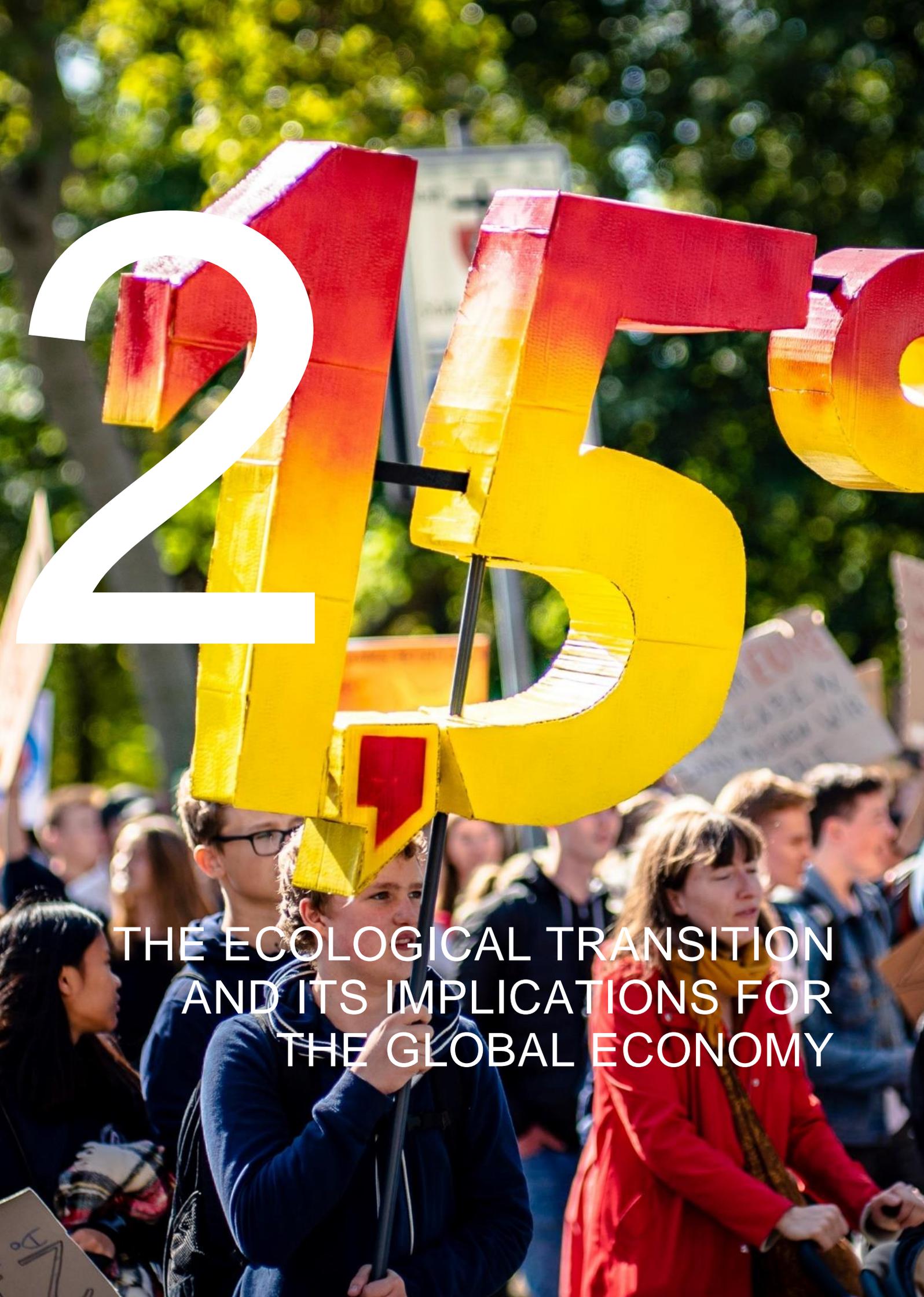
- 1 Extreme weather
- 2 Climate action failure
- 3 Natural disaster
- 4 Biodiversity loss
- 5 Human made environmental disaster
- 6 Data fraud or theft
- 7 Cyberattack
- 8 Water crises
- 9 Global governance failure
- 10 Asset bubbles

Top 10 risks in terms of IMPACT

- 1 Climate action failure
- 2 Weapons of mass destruction
- 3 Biodiversity loss
- 4 Extreme weather
- 5 Water crises
- 6 Information infrastructure breakdown
- 7 Natural disaster
- 8 Cyberattack
- 9 Human made environmental disaster
- 10 Infectious diseases

Source: WEF – Global Risk Report 2020

⁶ Source: Christian Aid, 2020



THE ECOLOGICAL TRANSITION
AND ITS IMPLICATIONS FOR
THE GLOBAL ECONOMY

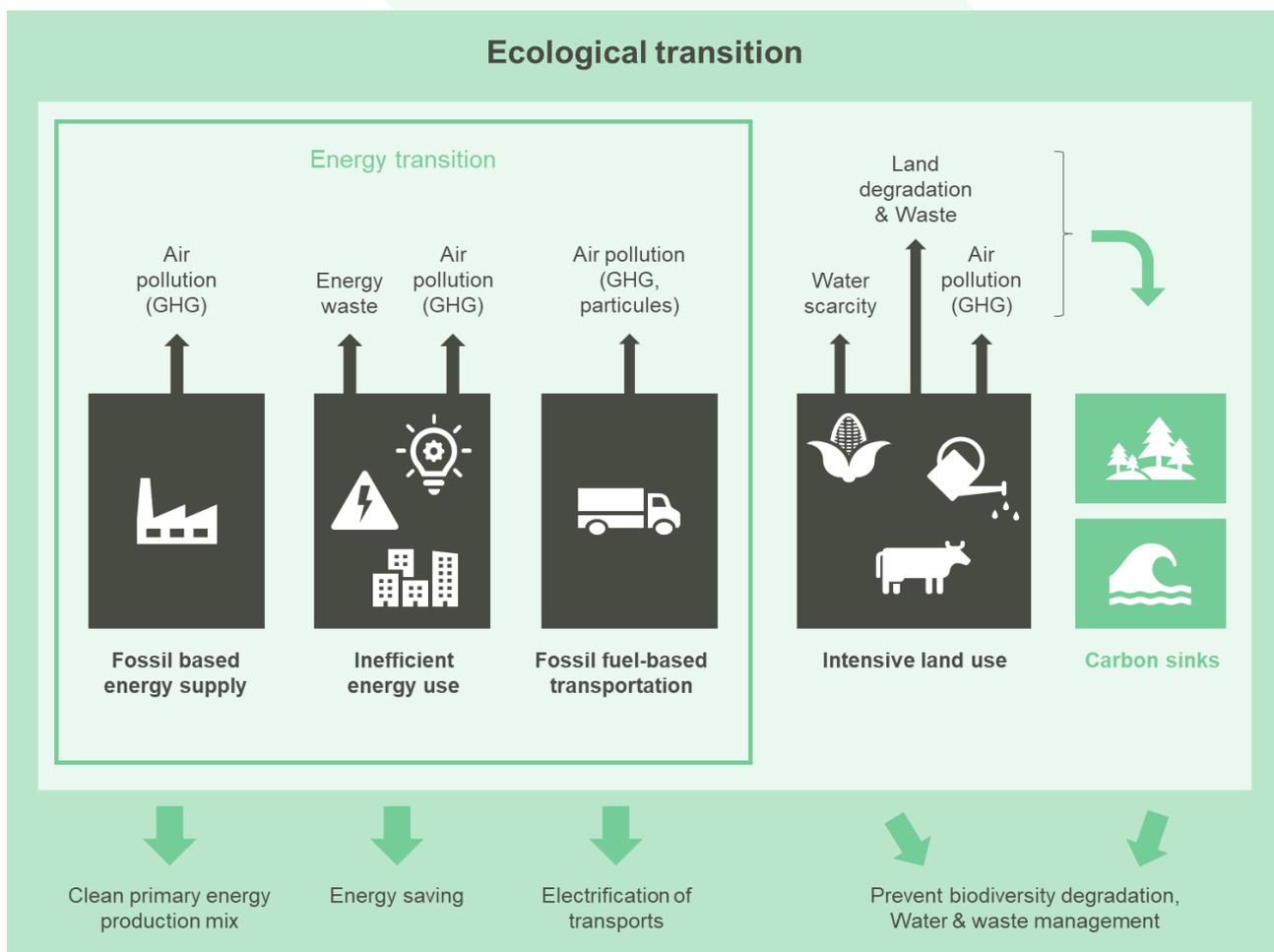
THE NEED FOR A GLOBAL ECOLOGICAL TRANSITION

It is now clear that the current model of development and growth, based on excessive energy consumption, is not viable. Accordingly, a large part of policy initiatives aiming to limit global warming are focusing on the **energy transition**, i.e., the move away from an energy system based on exhaustible fossil fuel-based energy production that causes pollution and emits greenhouse gases, to an energy mix centred on renewable energies.

However, the International Energy Agency (IEA) states that, while projects to transform the energy sector are necessary to limit global warming, **initiatives centred solely on energy transition will not be enough to achieve carbon neutrality and preserve our ecosystems.**

Concentrating efforts to reduce greenhouse gas emissions on the way energy is produced **overlooks the major role played by the soaring demand for energy as well as the accelerating destruction of ecosystems** in global warming. **Restricting energy demand** via the enhanced energy efficiency of electrical grids (transmission and distribution), buildings and industrial infrastructures is an important lever in reducing emissions. Likewise, biodiversity plays an essential role in mitigating the impact of global warming through natural carbon sinks, such as oceans, forests and soil, which capture some anthropogenic greenhouse gases, making it vital to protect them.

THE SCALE OF THE GLOBAL ECOLOGICAL TRANSITION



Source: ODDO BHF Asset Management

Meanwhile, focusing solely on reducing CO₂ emissions is of limited efficacy, as some sectors with heavy global warming contributions mainly emit other types of greenhouse gases (e.g., agriculture, which mainly emits methane).

A **global ecological transition**, including the industrial transition, thermal renovation of buildings, adaptation of transport, land use planning, the agro-food transition, the circular economy and protection of biodiversity is thus crucial if we are to limit global warming.

AMBITIOUS POLITICAL AND ECONOMIC RESPONSES

THE PARIS AGREEMENT RELAUNCHED THE GLOBAL COMMITMENT TO A LOW-CARBON ECONOMY

The declaration of the Paris Agreement at the conclusion of COP21 (2015) was a turning point in the global fight against global warming in establishing a **universal legal instrument whose main objectives are to keep temperatures from rising more than 2°C above pre-industrial levels** and to make further efforts to attempt to limit this increase to 1.5°C. The Paris Agreement was designed to be dynamic and balanced (with a differentiation of contributions based on individual countries' level of economic development and greenhouse gas emissions) and was signed by all countries recognised by the UN, with the exceptions of Syria, Nicaragua and, potentially, the United States.⁷

The Paris Agreement requires signatory countries to do their utmost to submit "Nationally Determined Contributions (NDCs) and to report their greenhouse gas emissions on a regular basis. A five-year process of upward revisions of the NDCs is also mandatory, based on a ratchet mechanism that makes it impossible to reverse course. The NDCs stipulated during COP21 place the world on a 3°C warming trajectory. The upward revision in ambitions at COP26 (2021) will therefore be a key step in achieving an effective and ambitious multilateral agreement to achieve carbon neutrality.



⁷ The United States have officially left the Accord on 5 November 2020, but Joe Biden, the 46th president of the United States, has advocated for a renewed signing to follow his inauguration in January 2021.

THE EMERGENCE OF GREEN DEALS IS HELPING TO REDIRECT FINANCIAL FLOWS AND SUPPORT KEY PLAYERS IN THE ECOLOGICAL TRANSITION



Since the signing of the Paris Agreement, many governments and organisations have stepped up their climate policy ambitions. The launch of the **European Green Deal** in late 2019, which aims to put the European Union on a trajectory towards carbon neutrality by 2050 and contains numerous action plans in areas such as the circular economy, sustainable mobility and protection of biodiversity, is an example of its **leadership** in this area. This ambitious plan was recently expanded by the European Commission president, Ursula Van Der Leyen, who has proposed raising the 2030 target for reducing greenhouse gas emissions from 40% to 55% vs. 1990 levels. The 2021-2030 European budget, 25% of which is to be devoted to the ecological transition, will be the key to meeting these targets, as will the **Just Transition Fund**, for which €40bn in subsidies have been earmarked to accelerate the energy transition in countries that are the most heavily dependent on fossil fuels.



The EU's proactive attitude contrasts with that of the United States, which has lagged behind on climate issues since it announced in 2017 that it was pulling out of the Paris Agreement. However, **the Democratic victory in the recent presidential elections will change things**. Joe Biden has unveiled an environmental strategy, which, if put into action, will earmark \$2,000bn for the ecological transition, including \$400bn for investments in decarbonisation projects (energy efficiency, carbon capture technologies), as well as the elimination of greenhouse gas emissions from power plants by 2035, the roll-out of 500,000 electrical vehicle charging stations, heavy investments in green hydrogen, etc. Such measures could have a considerable impact, given that the United States currently accounts for 13% of global greenhouse gases⁸. At the same time, the 26 US states and territories that are part of **the United States Climate Alliance** have pledged to comply with the Paris Agreement, and several of them, including California, Hawaii, Washington, Puerto Rico and New Mexico have pledged to have an energy mix consisting solely of renewable energy by 2045, something that should help lighten the US's carbon footprint.



There has also been a **robust expansion in investments** in China, the world's biggest greenhouse gas emitter (with 28.2% of global emissions of CO₂⁹). According to the Chinese finance minister, China will have spent **€52bn in favour of the environment in 2020**, in particular in subsidising solar and wind power. In a historic speech before the 75th General Assembly of the United Nations in September 2020, the Chinese president, Xi Jinping, announced that China had set a **target of reaching carbon neutrality by 2060**, providing renewed impetus to the Paris Agreement.

⁸ Source: UN Environment Programme

⁹ Source: IEA – Key world energy statistics 2019



THE ECOLOGICAL TRANSITION GETS THE LION'S SHARE OF POST-COVID STIMULUS PLANS

The Covid-19 pandemic and the resulting economic recession have severely disrupted the international environmental agenda, with the risk of moving aggressive climate action to the backburner of political concerns, including the one-year postponement of the COP26 on climate and the COP15 on biodiversity. Even so, the ecological transition is a key component of many economic stimulus plans:

- **the European Union decided to allocate 37% of its Recovery Plan to the European Green Deal** and announced plans to build 1 million recharging stations for electrical vehicles and to create 1 million green jobs, particularly in the circular economy;
- **In France, 30% of the €100bn stimulus plan will be earmarked for the ecological transition**, including €11bn to sustainable mobility, €7bn to energy renovation of buildings and €9bn to decarbonisation of manufacturing and energy sectors;
- **In Germany, the focus is on developing hydrogen energy (€9bn dedicated) and promoting electrical vehicles (€7bn).**

This focus of stimulus plans **confirms that the ecological transition is a priority**. The considerable investments being devoted to it are a testament to the ability to enact in-depth changes to the structure of the global economy and **prefigure a major shift on the markets** in the coming decades.



THE NEED FOR AN ACCELERATION OF INVESTMENT PLANS IN FAVOUR OF THE ECOLOGICAL TRANSITION

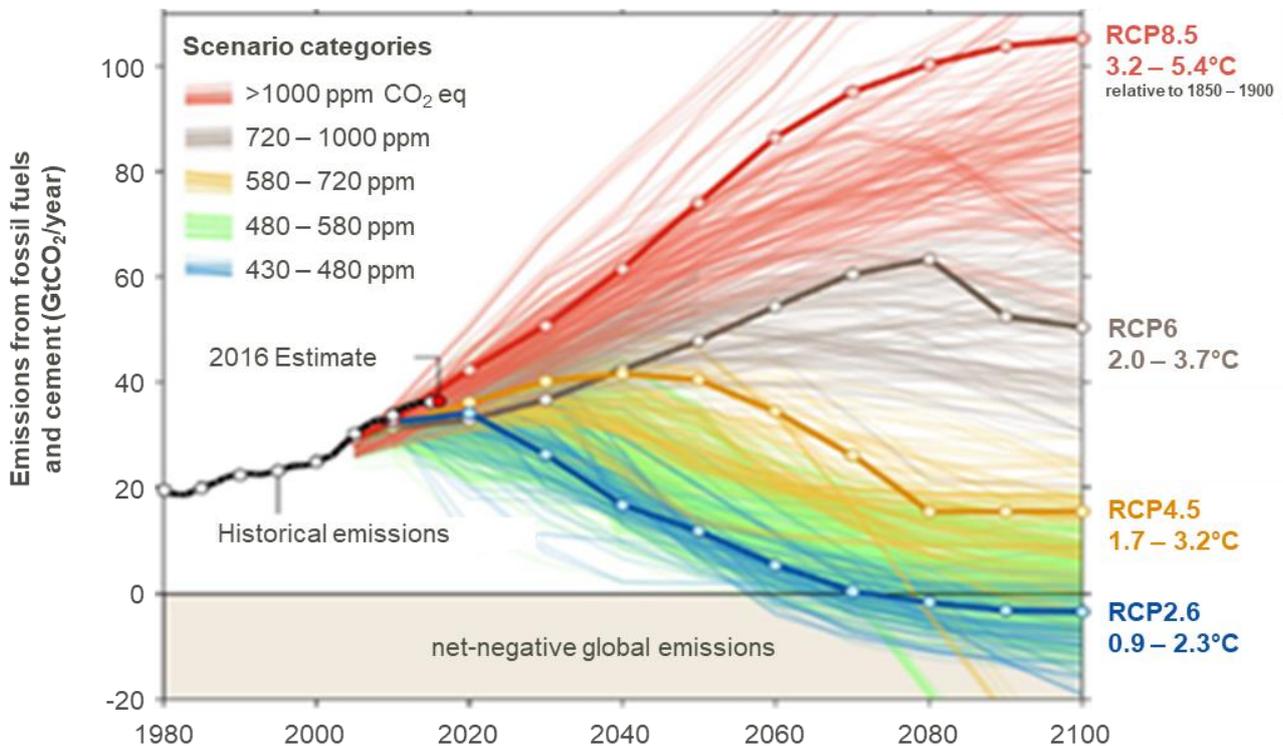
THE CURRENT TRAJECTORY IS DISCONNECTED FROM A 2°C SCENARIO

While policy and economic initiatives in favour of the ecological transition are promising, scientists of the Intergovernmental Panel on Climate Change (IPCC) have warned that **the current level of commitments is still not enough** to limit global warming to “well below 2°C above pre-industrial levels”, as stipulated in the Paris Agreement.

In its most recent report on climate change, the IPCC laid out four benchmark scenarios, called the

Representative Concentration Pathways (RCPs), which represent the increase in greenhouse gas concentrations in the atmosphere and temperature as a function of the effectiveness of measures taken to combat global warming. These scenarios are used to assess the short-, medium- and long-term environmental impacts of more or less ambitious climate and environmental policies. **Only one of the four scenarios considered plausible by the IPCC (RCP 2.6) would limit the increase in temperatures to 2°C.**

INCREASE IN TEMPERATURES BASED ON VARIOUS IPCC SCENARIOS



Source: IPCC

Meanwhile, the International Energy Agency (IEA) has studied **trends in the energy sector based on the degree of ambition and efficiency of climate policies**. The Stated Policies Scenario (STEPS) illustrates the coming shifts in the sector based on current climate policies, which lead to a warming of about 3.1°C. The Sustainable Development Scenario (SDS) addresses the dual constraint of keeping global warming under the 2°C mark, which would mean

abandoning the use of fossil fuels in the future, while providing universal access to energy. One way to do so would be to renovate buildings or invest in sustainable mobility solutions.

One thing is certain: **all ecological transition scenarios that fall within the limit of a maximum of 2°C warming require a faster roll-out of the transformation to all sectors of the economy.**

Scientists insist in particular on the importance of imposing a carbon tax and gradually increasing it (from \$40-80/tCO₂ in 2030 to \$100/tCO₂ in 2050) in order to expedite the abandoning of coal and stimulate investments in renewable energies and carbon capture technologies. Experts also expect a gradual ban on internal combustion engines beginning in 2035, which would trigger a disruption in the transport sector, as such engines still account for almost all the world's automobiles in 2020¹⁰. The agriculture sector is also likely to see considerable change, as rapid decarbonation of the economy will require rethinking the use of land to increase its carbon storage capacity (given that soil and forests function as natural carbon sinks). The elimination of deforestation by 2030 and an

aggressive reforestation plan are indeed crucial components for entering into a climate trajectory that does not exceed 2°C of warming. Accordingly, massive investments will be needed in irrigation and agrotechnology systems, in order to optimise the land available for agriculture.

In our view, the unprecedented political and financial commitments to the ecological transition and their expected acceleration offer a major investment opportunity for the coming decades. In recent years, they have resulted in a strong growth in economic sectors tied to the ecological transition, and we expect this trend to continue in the short, medium and long terms.



¹⁰ Source: IEA

A large, white, stylized number '3' is positioned on the left side of the image. The background features a close-up of several hands of different skin tones, all reaching out to touch or hold a tree trunk. The tree trunk is the central focus, with its rough bark texture clearly visible. The background is a soft-focus green, suggesting a forest or park setting. The overall composition conveys a sense of unity, care, and environmental stewardship.

3

OUR INVESTMENT APPROACH
TO THE ECOLOGICAL
TRANSITION

The ecological transition market amounts to **\$1,500bn to \$2,000bn per year** of investments between now and 2030 on the global scale¹¹. The approach of ODDO BHF Asset Management consists of identifying those companies that are best placed to benefit from the change in paradigm arising from the ecological transition in its entirety. Accordingly, we seek to invest on a multi-sector and multi-geographical basis in the future majors of four underlying themes:

- clean energy
- energy efficiency
- sustainable mobility
- preservation of natural resources

Our thinking is that these segments offer an especially attractive growth, due to stricter environmental regulations and the resulting technological changes.

Our approach assumes an alignment with a global warming trajectory limited to 2°C above pre-industrial levels, based on the scientific recommendations stated in the benchmark scenarios.

Against the backdrop of this transition, we also believe that financing companies that have demonstrated a credible intention to change models and take environmental challenges into account in their development strategies has a potentially greater environmental impact than if we limited ourselves to companies that are already fully aligned with low-carbon objectives.

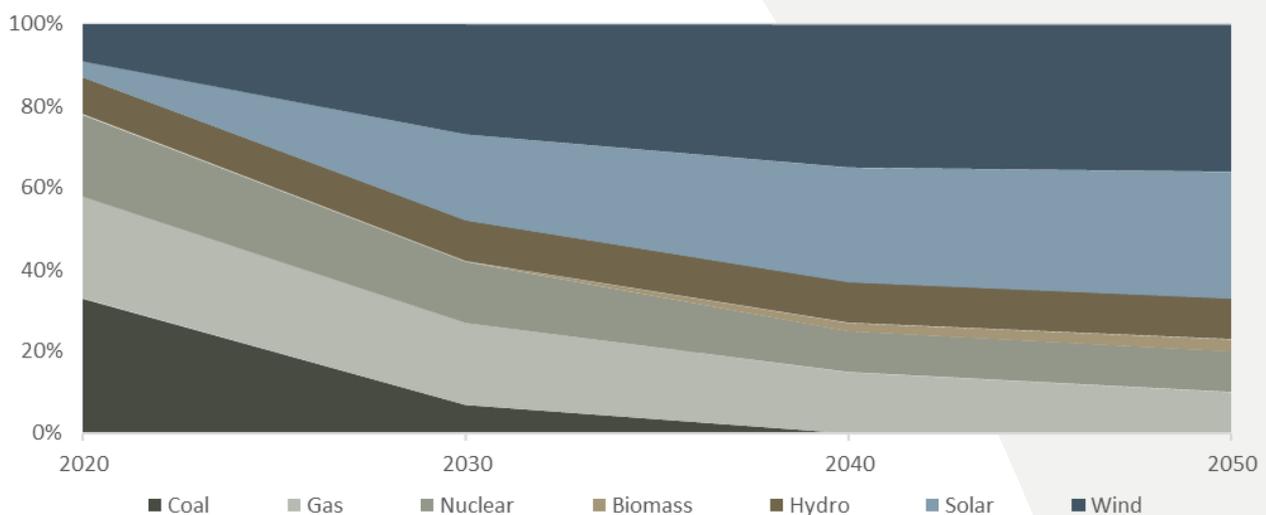
CLEAN ENERGY

All climate change adaptation scenarios suggest that a rapid transformation of the energy sector is essential for achieving carbon neutrality. Scientists forecast a peak in coal demand in 2020, followed by a rapid decline between then and 2030. The peak in oil is expected to happen around 2026-2028. Nuclear power demand is expected to remain stagnant due to its high costs, the risks nuclear waste pose to ecosystems and a vocal

public opposition. All this means that renewable energies are expected to exceed fossil fuels in the energy mix as early as 2030.

Our energy mix trend assumptions, particularly a complete exit from coal by 2030, take these forecasts into account, in order to optimise our exposure to clean energy players.

PROJECTED SHIFT IN THE ENERGY MIX



Source: ODDO BHF Asset Management

¹¹ Source: Oddo BHF Asset Management

Alongside the decline in fossil fuels, the development of the renewable energies market is expected to accelerate and reach \$1,512bn as early as 2025¹².

Technologies that have been heavily subsidised (solar power in particular) have now achieved technological maturity and the critical size needed to be **competitive with fossil fuels**.

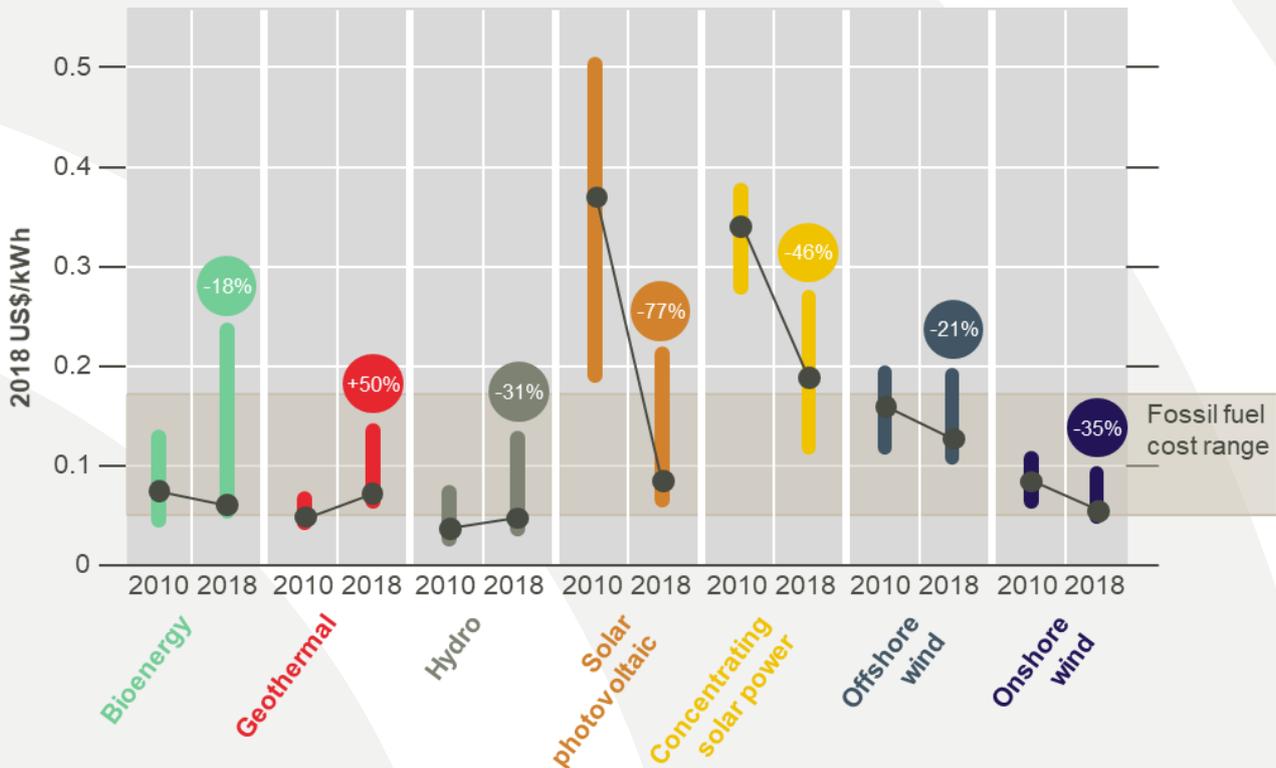


Needed investments
\$449bn/year



Growth potential (CAGR)
8% (2018 – 2025)

COST OF RENEWABLE ENERGY BETWEEN 2010 AND 2018



Source: UNEP – Emission Gap Report

We consider that the most promising clean energy companies – whether pure players or companies targeting an ambitious transition – are part of the following segments:

- **Solar power:** generation of electricity from photovoltaic panels or thermal solar plants is a mature and established renewable energy source, making it a stable investment.
- **Wind power:** China, the United States and Germany are leading countries in this fast-growing market (651MW of global capacity in 2019). Wind power is also a mature technology that helps diversify energy mixes and increase countries' energy independence. In addition, there is considerable potential for offshore development.
- **Biomass:** the transformation of organic matter into energy in the form of shavings, bioalcohols or biogas can be used to generate low-cost heat and electricity and reduce dependence on fossil fuels. Many companies are exposed to this theme, including utility providers, waste management companies, wood industries, and so on.
- **Geothermal energy:** this technology exploits the temperature difference of the earth's crust in producing electricity, district heating and individual heating. It is still a marginal source of energy (with 0.3% of global power output¹³) but is

¹² Source: IEA

¹³ Source: Renewables 2013 Global Status Report

expanding fast through advances in prospection and sampling techniques.

- **Hydropower:** the biggest source of renewable energy and the world’s third largest source of electricity¹⁴ (behind coal and natural gas). This form of renewable energy is attractive mainly for its predictability in production and its historical cost-effectiveness.
- **Tidal energy:** this market is still immature but is expected to expand fast, driven by a surge in

development and public subsidy, particularly in Europe, China and the United States.

- **Biofuels:** these fuels (biodiesel, bioethanol) are created from a reaction between vegetable oils and alcohol. Second- and third-generation biofuels are still immature but are quite attractive energy sources, as they are not produced at the expense of food-destined agricultural output. The market is expected to reach \$234bn by 2025¹⁵.

BORALEX

- Boralex is a Canadian producer of renewable energy specialising in wind, hydraulic and biomass energies.
- The company’s growth strategy is based on a long-term vision. Boralex develops and acquires renewable energy production sites with a potentially attractive return.



- EDP is one of the main European producers of renewable energy, with more than 70% of its power output coming from hydroelectric and wind projects (it is the world’s fourth largest wind power producer).
- EDP actively seeks to expand its renewable energy production capacity and reduce its exposure to carbon-intensive activities.

ENERGY EFFICIENCY

Energy efficiency is also a core theme in achieving decarbonation of the economy, **particularly in industry and real estate**. An acceleration of investments in energy efficiency of industrial infrastructures is especially important, as the sector accounts for 21% of global greenhouse gas emissions¹⁶ and the shift in its energy mix is slowed by the long lifecycle of its infrastructures (40 years).

There is also considerable potential for energy savings in the real-estate sector. At the scale of the European Union, 75% of buildings are not energy efficient, while residential and non-residential buildings account for 42% of French energy consumption. One of the main objectives of the *Green Deal* is to double the building renovation rate in order to eliminate poorly isolated energy guzzlers. The energy renovation market is accordingly expected to expand strongly.



Needed investments
\$519bn/year



Growth potential (CAGR)
6% (2018 – 2023)

¹⁴ Source: BP – Statistical Review of World Energy, 2019

¹⁵ Source: Researchstore

¹⁶ Source: IPCC

We regard the following as promising underlying themes in energy efficiency:

- **Sustainable construction:** eco-construction, which helps ensure optimum energy performance in buildings while limiting their environmental impacts, should make it possible to meet increasingly strict environmental regulations aiming to limit buildings' carbon footprint. The market for wooden buildings is expanding fast in Europe and is an example of a promising segment.
- **Insulation:** the thermal insulation market is also expanding, driven mainly by various national building energy renovation plans and is expected to reach \$77bn by 2025¹⁷.
- **Smart grids:** the market for smart grids is expected to reach \$70bn by 2024, up from \$30bn in 2017, i.e., an attractive CAGR of 11.7% during the period¹⁸.
- **Energy management:** this segment, which includes products such as sensors and meters, helps monitor energy consumption. It is benefitting from the increasing awareness by both companies and individuals of the need to optimise their consumption of natural resources.
- **Energy storage:** this sector is being driven by heavy R&D investments from major players such as GE and Tesla, thus lowering production costs substantially. Favourable government policies are also helping to create high growth opportunities (22% CAGR in smart grids between 2020 and 2025, according to the IEA).
- **Batteries:** lithium-ion batteries are crucial to the development of electrical vehicles. In reaction to the progress that Asian manufacturers are making in this area, The EU has released €3.2bn in funding and is seeking to attract €5bn in private investments to set up an industrial consortium called the "Airbus of batteries"¹⁹. The global battery market could reach €45bn by 2027²⁰ and is therefore of considerable interest to investors. This technology is at the heart of much government investment and therefore offers prospects for CAGR of 14.1% over the 2020-2027 period²¹.
- **Domotics:** the home automation market, including smoke detectors, online cameras and thermostats, is also expanding. According to a study by McKinsey, the US market achieved CAGR of 31% between 2015 and 2017.
- **Energy-efficient lighting:** the global market for LED bulbs is being driven by stricter energy efficiency regulations for buildings, and its CAGR is estimated at 13.4% between 2020 and 2027²².
- **Smart infrastructures:** this is a sector where social and environmental challenges are considerable and becoming more so, driven by the rapid urbanisation of the global population and the large negative outward impact that metropolises have on ecosystems. **Smart cities**, having the capacity for smart management, prediction and resilience, have both huge environmental and financial potential, thanks to the development of optimised resource management systems (e.g., automated management of drinking water and sewage, smart energy consumption in buildings, demand-based forecasting production, transport and distribution of energy, and decentralised micro-energy grids) and pollution control systems (including sensors for monitoring air quality).

¹⁷ Source: Grand View Research

¹⁸ Source: Smart Grid Market Share Report – Industry Trend Outlook 2024

¹⁹ Source: European Commission

²⁰ Source: BCG

²¹ Source: Grand View Research

²² Idem



- Azbil Corp is a Japanese corporation with special focus on the following business segments: automated buildings (software, sensors, surveillance monitors) and advance automatization (implementation and maintenance).
- The solutions offered by Azbil allow other businesses from many sectors to improve their energy efficiency in their production facilities and industrial buildings.



- Kingspan is an Irish supplier of insulation materials and building envelope solutions.
- The company is ideally positioned to benefit from the vast future government plans for energy renovation of buildings.

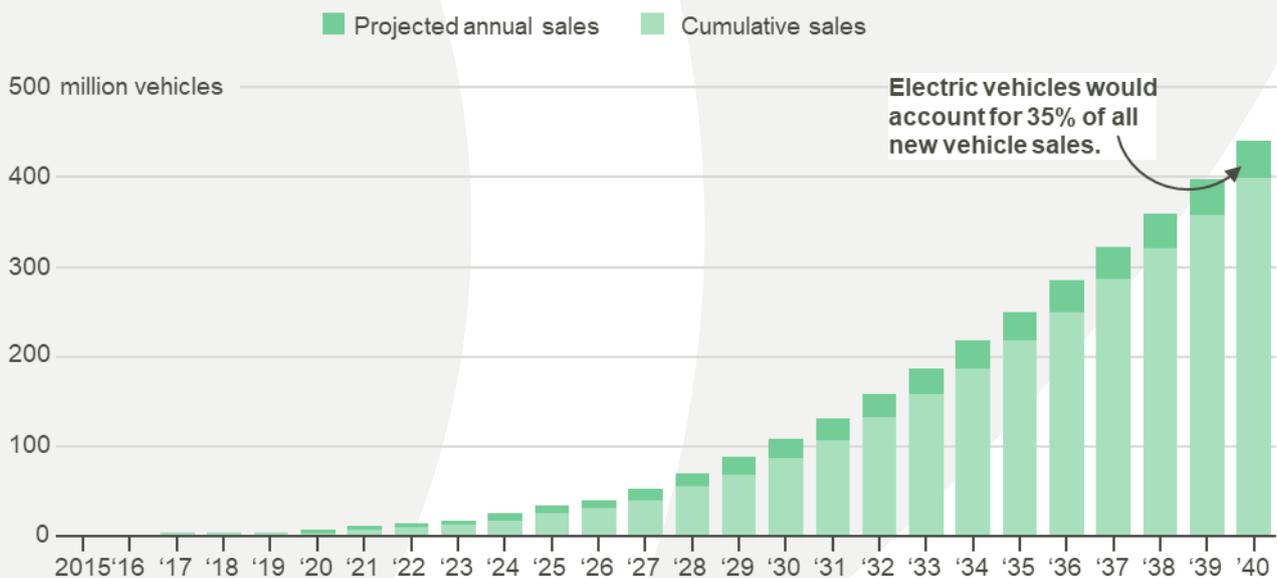
SUSTAINABLE MOBILITY

The transport sector is justifiably at the heart of ecological transition investment plans, as it accounts for one quarter of global CO₂ emissions and in many countries has become the main source of greenhouse gas emissions. Moreover, mobility is likely to continue expanding at a brisk pace between now and 2050, thus making the decarbonisation of the sector imperative.

The transport sector is already undergoing rapid change, driven in particular by the auto industry's

growing awareness of the likely medium-term ban on internal combustion engines in many countries. The sector's adaptation will, to a great extent, entail a shift towards the construction of ultra-low-emission vehicles (electrical vehicles, hybrids and hydrogen power), which are expected to account for 70% of passenger vehicles by 2040. According to the IEA, the proportion of electrical vehicles in particular is likely to rise sharply, from 8 million in circulation worldwide in 2019 to 245 million in 2030.

SALES OF ELECTRICAL VEHICLES



Source: Bloomberg New Energy Finance

Rail transport is also likely to benefit from heavy public subsidies under climate policies, as it is the least damaging form of transport in terms of greenhouse gas emissions (27 less than private cars and 45 times less than airplanes²³). This is one the European Union's

priority avenues of development, with €35bn in funding to the sector since 2014²⁴.

The global theme of sustainable mobility is therefore especially promising, with a CAGR estimated at 32% between 2017 and 2025²⁵.



Needed investments
\$207bn/year



Growth potential (CAGR)
32% (2017 – 2025)

We see investment opportunities in the following segments:

- **Electrical vehicles:** this type of vehicle is benefiting from both rapid technological progress (enhanced energy storage capacity of lithium-ion batteries), heavy public subsidy and the fall in renewable energy prices, and therefore constitutes a major segment in sustainable mobility.
- **Hybrid vehicles:** hybrid vehicles combine a thermal and an electric motor to limit CO₂ emissions and optimise energy consumption compared to a conventional vehicle. This segment is growing fast, with a CAGR estimated at 16.35% between 2020 and 2025²⁶.
- **Hydrogen vehicles:** this technology has not yet been rolled out massively, due mainly to the lack of infrastructures, including a scarcity of charging stations. However, it is benefitting from the expansion of the fuel cell market (mainly in Asia) and the resulting fall in costs. The European Commission, for example, has made the **development of the hydrogen sector** (green hydrogen in particular, i.e., obtained from renewable energies) a priority. Hydrogen currently accounts for just 2% of Europe's energy mix but is destined to become a key component in the decarbonation of Europe, accounting for 16% of the mix by 2050²⁷. There is also lots of interest in China, which is targeting a drastic increase in its proportion of hydrogen vehicles by 2030.
- **Rail transport:** the sector is developing many initiatives to improve its carbon footprint, which is already relatively small (compared to passenger numbers). One of these is Alstom's hydrogen train which is being tested in several European countries. Meanwhile, many countries have made the modernisation of their rail networks a strategic priority; we see rail transport as an especially attractive segment.
- **Sustainable transport:** this underlying theme includes innovative forms of transport such as carpooling, car rental platforms and vehicle co-ownership, which make the rational use of resources possible.
- **Urban transport:** this underlying theme is an especially important social and environmental challenge, given the rapid rate of urbanisation in the global population. Public transport is used by a growing number of people and is a major avenue of socio-economic development, as well as an investment opportunity.

²³ Source: ADEME

²⁴ Source: European Commission

²⁵ Source: ODDO BHF AM, 2019

²⁶ Source: Mordor Intelligence

²⁷ Source: ADEME



- Taiwan-based Giant is the world’s largest bicycle manufacturer. Some of the technologies it has developed (carbon fibre bikes and aluminium frames) are now a must.
- Giant focuses its innovativeness on developing electric bikes, a fast-growing segment.



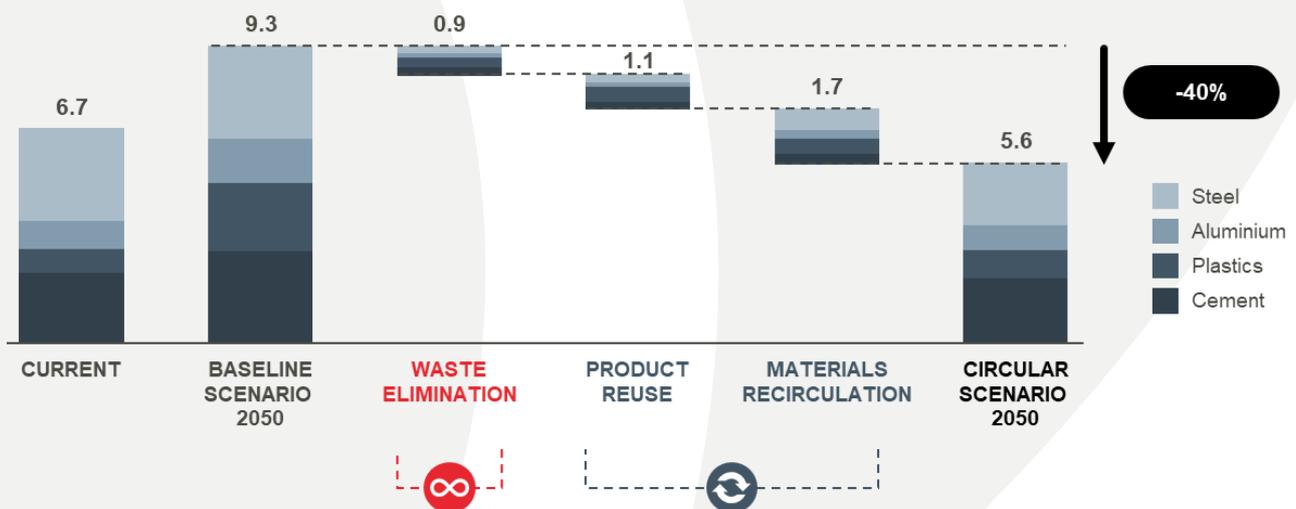
- The French equipment maker Alstom offers a full range of rail products and services, including high-speed trains, subway trains, electric buses, and infrastructures.
- The company supplies cutting-edge technologies (its hydrogen-powered train, for example, which is in the development phase) and its strategy is based fully on sustainable mobility solutions.

PRESERVATION OF NATURAL RESSOURCES

Preservation of resources, either by developing circular economy systems, setting up efficient recycling chains (particularly for non-renewable or polluting resources) or enhancing the protection of biodiversity (eliminating air, water and soil pollution, reforestation) is a prerequisite for the ecological transition. The potential for upgrading practices is considerable, as 45% of global CO₂ emissions are related to the production of goods²⁸. The current recycling rate is sub-optimal and many initiatives are under way to rectify this. This points to strong potential growth by specialised companies. One recent example is

the European Union directive stipulating that all packaging materials in the European Union must be reusable or recyclable by 2030, thus providing a boost to companies exposed positively to this sector. Meanwhile, heavy government investments are expected to reduce dependency on imports of raw materials having a harmful environmental impact. This will create big opportunities for circularity, particularly in the steel, plastic, aluminium and cement industries.

ESTIMATED IMPACT OF THE CIRCULAR ECONOMY ON CO₂ EMISSIONS (STEEL, ALUMINIUM, PLASTIC AND CEMENT SECTORS)



Source: Ellen MacArthur Foundation

²⁸ Source: Ellen MacArthur Foundation

On the whole, the preservation of resources thematic offers a strong potential growth, with a CAGR estimated at 13% from 2017 to 2025 for sustainable agriculture

and at 10% from 2017 to 2026²⁹ for the circular economy.



Needed investments
\$206bn/year



Growth potential (CAGR)
10% (2017 – 2026)



We take a particular interest in actors in the following underlying themes:

- **Water and waste management:** the robust growth in consumption of goods worldwide has made companies specialising in this area key players in the transition, as well as attractive investment opportunities, with a CAGR estimated at 6.2% between 2017 and 2023
- **Sustainable agriculture:** Agriculture, and in particular livestock, is responsible for 24% of global greenhouse gas emissions. This underlying theme includes farming practices that aim to ensure long-term production while limiting the environmental impacts of their activity (integrated, organic and biodynamic farming, etc.). The global market for plant protein is expanding fast and should reach €11bn in 2020.
- **Conservation of biodiversity:** this underlying theme is mainly the province of public sector actors, but the biodiversity offset market is expected to expand in the medium term. Ecotourism offers attractive growth prospects, with a CAGR of 14% from 2021 to 2026 and could also be a way to invest in this underlying theme.
- **Green chemicals:** this concept seeks to make chemicals more efficient while reducing their environmental impact via increased use of renewable energies to end dependence on fossil fuels. The global green chemical market is expanding fast, with a CAGR close to 10% for the 2019-2023 period.

²⁹ Source: ODDO BHF Asset Management

- **Circular economy and recycling:** the circular economy could generate up to €600bn in additional wealth in Europe by 2030 according to the Ellen MacArthur foundation, making it an especially attractive market for investors.
- **Eco-design & ecological manufacturing processes:** sustainable manufacturing processes using renewable resources and having a low environmental impact offer an attractive investment opportunity. The market for wooden manufacturing (from sustainable sources), for example, is expected to expand fast due to stricter regulations to limit buildings' carbon footprint.
- **Carbon capture:** the carbon capture and sequestration (CCS) market is extremely attractive in the medium and long terms, as development of this technology is one of the major levers of the ecological transition. This segment has a projected CAGR of 8% between 2020 and 2023.



GLOSSARY

IEA: the International Energy Agency is an organisation founded in 1974 with the objective of facilitating the coordination of energy policies of OECD member-countries. The IEA is an authority in energy sector trends and publishes regular studies on the coal, oil, and natural gas renewable energy markets

COP: an annual conference of almost all the world's countries, as well as non-governmental actors, such as NGOs and scientists, as part of the UN's action plan to combat global warming by the UN; COPs are, among other things, an opportunity to establish global agreements on reducing anthropogenic greenhouse gas emissions

Anthropogenic emissions: this term refers to the scientifically established human origin of a portion of the greenhouse gas emissions present in the atmosphere; anthropogenic emissions have been rising sharply since the first Industrial Revolution and stem mainly from the use of fossil fuels in the energy, agriculture, manufacturing, transport and construction industries

Greenhouse gases: carbon dioxide, methane, nitrous oxide and other greenhouse gases absorb infrared radiation emitted by the earth's surface; their concentration in the atmosphere is one of the main causes of global warming

IPCC: the Intergovernmental Panel on Climate Change is a body under the aegis of the United Nations Environment Programme (UNEP) and gathers scientists from 195 countries for the purpose of objectively assessing all scientific information pertaining to climate change-related risks. The IPCC has thus far published five evaluation reports that are scientific benchmarks and are meant to allow policy makers to establish suitable action plans to combat global warming.

Earth Overshoot Day: a symbolic date calculated each year by the US NGO Global Footprint Network, which marks the annual point at which humanity has consumed all resources that the planet is capable of regenerating in one year. In 2020, this date was 22 August and it has been occurring earlier and earlier each year, thus constituting a worrisome sign of overexploitation of resources on a global scale.

Carbon tax: a tool used to combat global warming via an environmental tax on emissions of carbon dioxide (CO₂), one of the main greenhouse gas

UNEP: the United Nations Environment Program, one of the UN organisations that publishes frequent reports on the extent of the climate crisis and assists member-countries in implementing their environmental policies.

WWF: the World Wide Fund for Nature is one of the largest non-governmental organisations aiming to protect the environment and promote sustainable development

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ODDO BHF AM is part of the independent Franco-German financial group ODDO BHF that was founded in 1849.

ODDO BHF AM is an asset management leader in Europe. It comprises ODDO BHF AM GmbH in Germany, ODDO BHF AM SAS, ODDO BHF Private Equity SAS in France and ODDO BHF AM Lux in Luxembourg, which together manage assets totaling € 55.9 billion.

ODDO BHF AM offers its institutional and wholesale clients a unique range of high-performance investment solutions in all main asset classes, i.e. European equities, quantitative strategies, fixed income, multi-asset solutions, private equity and private debt. A UN-PRI signatory since 2010, ODDO BHF AM has integrated sustainable investment criteria into a wide range of strategies. Its ESG approach focuses on ESG criteria integration, engagement with companies and a climate policy supporting the energy transformation.

On a combined basis, 61% of assets under management are from institutional clients and 39% from distribution partners. The teams operate from investment centers in Dusseldorf, Frankfurt, Paris and Luxembourg with additional locations in Milan, Geneva, Stockholm, Madrid, Hong Kong, Abu Dhabi and Zurich.

ODDO BHF AM puts the long-term support of its clients at the heart of its priorities. Its independence allows its teams to be responsive, flexible and innovative in order to constantly find solutions tailored to the customers' needs.

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