EDMOND DE ROTHSCHILD

SUSTAINABILITY IN ACTION

ENERGY TRANSITION

Whitepaper

EDMOND DE ROTHSCHILD, BOLD BUILDERS OF THE FUTURE

ENERGY TRANSITION
TIME FOR ACTION

CHRISTOPHE CASPAR
Global CEO
Asset Management

Welcome to our white paper about energy transition, part of our "Sustainability in action" series and our comprehensive look at this very important subject across our diverse businesses of mutual funds and real assets.

For many years now energy transition was a global imperative, with warnings that without fundamental change in business and personal lives, the world was heading for a climatic/environmental disaster.

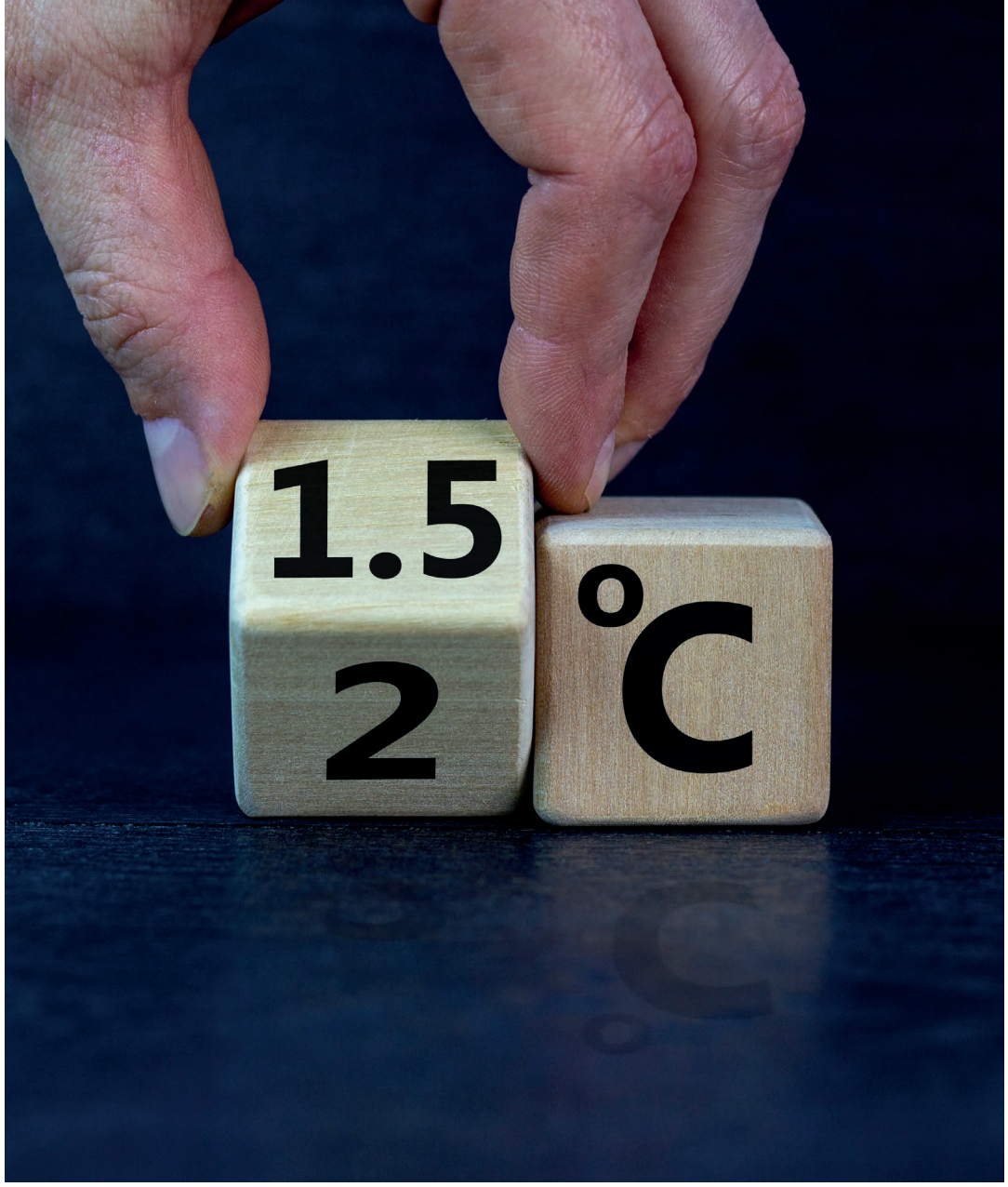
2022 has seen this environmental imperative for change joined by a global cost of living crisis and the desire to ensure National energy security. We have taken this crucial time for energy strategies to take a look at these challenges and have proposed solutions.

The Ukraine war will no doubt act as a genuine catalyst for energy transition. Prices of fossil energy like oil, gas and coal have been steadily rising since the beginning of the year. Russia is a key producer and supplier so the price surge accelerated after the start of the war and sanctions were adopted, increasing a cost of living crisis across Europe.

This trend is expected to last, forcing European countries which are heavily dependent on Russian fossil energy to tighten their belts and increase their use of more renewable energy sources like wind and geothermal power. The ghost of stagflation is hovering over Europe and the continent must definitely reinvent its approach to energy.

At Edmond de Rothschild, we realised it was urgent to take action several decades ago. We did not wait for these issues to dominate the headlines before redirecting our investments in real and liquid assets. By reconciling sustainability and profitability, they ensure long-term value creation.

Our high-conviction investment firm is based on the notion



that wealth must help build tomorrow's world. We have a clear responsibility to roll out innovative, impact strategies that seek to finance and accelerate energy transition. Stock markets, as well as private equity, real estate and infrastructure debt, have a pivotal role to play in helping us preserve our planet for future generations. Our experts have analysed the major challenge facing the 21st century. By providing concrete solutions, they are helping to take up this challenge.

Time is running out, we may have only three years to change. The Intergovernmental Panel on Climate Change (IPCC) recently warned us that we only had up to 2025 to roll out ambitious measures to reduce greenhouse gas emissions and to limit global warming to 2 degrees. It is now time to act.

I hope you find the paper thought provoking.

A SIMPLE AND ROBUST 2°C ROADMAP

JEAN-PHILIPPE DESMARTIN
Head of the Responsible Investment Team
Edmond de Rothschild Asset Management

Jean-Philippe Desmartin, Head of the Responsible Investment team, points out that Edmond de Rothschild Asset Management made a climate pledge as early as 2017 based on a roadmap aimed at limiting global warming to under 2 degrees.

This "2°C roadmap" is aligned with the firm's objective: gradually transitioning investment portfolios to net-zero GHG emissions by 2050.

Addressing the climate emergency requires action from governments, corporate players, and citizens alike. Yet, as is the case with biodiversity, climate risks are concentrated rather than evenly distributed. Our roadmap encourages us to focus our efforts on a limited number of sectors, activities, and issuers. Indeed, rather like the 80/20 Pareto Principle, in this case a 90/10 principle applies: in practical terms, 10% of issuers operating in less than a dozen industries account for 90% of the overall climate risk. This is true both for direct greenhouse gas emissions (scopes 1 and 2) and for indirect emissions (scope 3)[1].

For example, for a European investor, less than 30% of the Stoxx 600 Europe index carries a substantial climate risk. Industries with exposure to climate risk are chemicals, energy, paper, metals & mines, aeronautics, construction and cement, airlines and car manufacturers, agri-food, utilities, and real estate companies.

► **Energy efficiency is the first lever that can offer solutions** to climate change, particularly over the next couple of years. As the most sustainable energy is the energy we do not use, investing in better efficiency is a priority for many sectors: capital goods, automotive suppliers, construction materials and insulation, LED technologies and corporate services. Other opportunities such as the circular economy and envi-

ronment-related service providers (recycling, waste management, etc.) also feature within the “resource management” theme. All have a common common goal: to save energy.

► **Renewable energy, in all forms** - biomass, wind, geothermal, hydropower, solar, green hydrogen etc. - is the second key lever available to us today, together with the acceleration of electrification and the fast improvement of associated technologies and costs. The vital progress made in the field of energy storage will help to support the deployment of renewable energy (for example, the production of decentralised electricity).

► **Companies offering products and services emphasising climate-friendly solutions** also provide investment opportunities, both in the B2B (smart grid) and B2C (hybrid or 100% electric vehicles) markets. The emergence and expansion of new markets (green hydrogen, green bonds…) is also creating new investment opportunities. It is important, as with any type of “pioneering” investment, to remain vigilant and cautious with regards to learning curves, the challenges associated with upscaling and maturity, liquidity and volatility, due to the cyclical nature of the projects.

Finally, focusing on the concept of climate resilience enables us to identify particularly durable assets, such as rail infrastructure or green buildings. This notion of resilience should be applied as a priority, and systematically, to long-term assets such as infrastructure, electricity producers and construction.

1. Scopes describe the boundary within which the greenhouse gas (GHG) emissions of an entity or product are examined. Scope 1 is the smallest and scope 3, the broadest. Scope 1 includes direct GHG emissions generated when a product is made; scope 2 encompasses all GHG emissions generated by the energy used to make the product. Scope 3 covers all GHG emissions that are not directly related to the manufacture of the product, but to other stages in the product’s life cycle (sourcing, transportation, use, end of life…).

THE BREAKDOWN OF EUROPE'S ENERGY INDEPENDENCE

Expert viewpoint

MARC-ANTOINE EYL-MAZZEGA
Director of the Energy & Climate Centre, IFRI (*Institut Français des Relations Internationales*)

The war in Ukraine has hastened the start a new era for the European Union (EU) and its members, marked by the end of cheap and abundant energy, the end of functioning markets in all weathers, and finally, the breakdown of its energy partnership with Russia.

This new era has also dissipated a **number of illusions:**

- the **availability of competitively priced Russian gas** to offset renewables;
- the idea that **the transition is already well under way**;
- that the latter would take place in a **context of low fossil fuel prices** and would be **financed in part by the lower cost of imported energy**;
- that consumers would enjoy **cheap and zero-carbon energy**;
- that **electricity** supply would be **abundant and secure**;
- that Germany's decarbonization pathway would involve **exiting nuclear power**;
- that **France had time to undertake deep transformations**;
- and finally, that the transition would be **a smooth process and strengthen the EU**.

The inevitable and irreversible energy breakup with Russia has begun, though uncertainty over the pace of the decoupling remains. The process will be painful considering the extent of some of Europe's dependencies. Disruptions to supply flows will come on top of existing pressure on prices, at a time when imported inflation is becoming systemic, many

industrials and consumers are weakened, and meeting the huge capital expenditure needs seems unattainable.

So far, the response has frequently (and inevitably) been contradictory. Guaranteeing a safe supply over the short-term requires building up coal and strategic oil reserves and securing the gas supply. The EU's climate diplomacy has become a gas diplomacy aimed at substituting Russian gas with LNG and developing its own infrastructure. Member states are attempting to soften the effects of inflation on consumers, even if this requires resurrecting fossil fuel subsidies. Over the longer term, the objective is to speed up the deployment of renewable energies (which implies accelerating the annual pace of deployment three-fold) and energy efficiency (two-fold).

These responses will require adjustments, including capping wholesale gas prices if the market overheats, urging all consumers to make energy savings, and ensuring all anti-inflation measures target the most vulnerable.

Looking ahead to 2030, it will be important to truly facilitate investments in renewable energies and flexibility solutions, while also charting a clear pathway that involves increasing the price of carbon while supporting carbon intensive industries.

Outbidding one another's' objectives and accelerating hydrogen in Europe are counterproductive. Imports of electricity from Norway or North Africa, as well ammoniac, will have to be strengthened. Nuclear power must be safeguarded and the gamble on small, modular reactors must be won. A comprehensive mineral strategy, led on all fronts and with the same degree of activism as for gas, is essential.

The challenge will be to remain credible and not damage climate governance. The solution is to take action in support of biodiversity and against fugitive methane emissions, and to develop an effective and funded plan for the closure of coal-fuelled power plants throughout the world, well before the end of their technical life cycle.

RENEWABLES HAVE A KEY ROLE TO PLAY IN ACHIEVING ENERGY SECURITY

KEVIN NET
Fund Manager Equities
Edmond de Rothschild
Asset Management

The energy transition already enjoyed pride of place on the European agenda but became a top priority for governments after the Russian invasion of Ukraine.

Europe's reliance on Russian energy brought into sharp relief the importance of energy security. Today, Russia accounts for 44% of natural gas imports, 27% of oil imports and 46% of coal imports[1]. While the extent of exposure to Russian energy imports varies from one country to another, the interconnected nature of Europe's gas network means that the issue touches upon all member states. In addition to implementing sanctions, the European Union has therefore developed new measures designed to reduce its reliance on Russia.

Among the various solutions available, ramping up the energy transition seems the most straightforward. Three priority areas are to be put forward, namely renewable energy, electrification, and energy efficiency, already highlighted in the European Green Deal[2]. With RePowerEU, the plan developed to reduce reliance on Russian fossil fuel imports, the European Union has set more ambitious targets for these three areas.

Renewable energies will have a particularly important role to play in the years to come. In addition to supporting the decarbonization of the economy, today's environment also has put the spotlight on several benefits associated with **renewables**:

- they do **not rely on fuel imports** and can **generate elec-**

trical and thermal (biomass) energy on an autonomous basis

- they are not affected by the volatility of fuel prices and therefore offer **better price stability**, as the cost of **producing renewable energy** is largely predictable
- it is also worth noting that the cost of renewable energies has lowered with time and should continue to decrease thanks to new economies of scale and innovation. **Renewables have already ranked among the cheapest energy sources since 2020**
- final point, **renewable power plans take much less time to build** (under one year for solar energy, under two years for wind farms, two years for biomass co-generation plants, vs. over two years for a combined cycle power plant and over four years for a nuclear power station[3]) and therefore provide a timely solution to reduce reliance on Russia

As part of the RePowerEU package, the European Union has upped the targets set by the European Green Deal - 900GW (480GW for wind and 420GW for solar) to be installed by 2030 – by a further 80GW and wishes to accelerate the development of these new capacities. This will also encourage the production of green hydrogen, which may become a partial substitute to natural gas. RePowerEU also doubles the EU's previous biomethane target for 2030, which will be achieved using sustainable biomass sources.

The next step will be to support these objectives with draft legislation and fiscal measures, which will likely take place at national level for each member state.

The key challenge of energy security has vastly increased the growth potential of the renewables industry and introduced a new sense of urgency, on top of the pre-existing climate emergency. While the European Union was the first to become aware due to the conflict in Ukraine, these events have led many other countries (United States, China, India…) to acknowledge the importance of owning independent energy sources, such as renewables, particularly as these will also contribute to the fight against climate change.

1. Source: European Commission. Data as of May 15th 2022.

2. Package of guidelines and measures designed to enable the EU to achieve climate neutrality by 2050.

3. Source: EIA.

ACTION SHOULD BE UNDERTAKEN ON THE EXISTING BUILDING STOCK

PIERRE JACQUOT
CEO
Edmond de Rothschild
Real Estate Investment
Management

In today's world, buildings generate around 30% of total greenhouse gas emissions, largely caused by heating, lighting, and cooling systems.

The real estate business - and the construction industry in particular – therefore have a vital role to play in reducing energy consumption and CO_2 emissions. While this provides exciting opportunities, it also comes with huge responsibilities.

The first idea that springs to mind is to imagine highly efficient new builds, incorporating the latest technologies, that are carbon neutral and even able to produce energy. Viewed independently, these features offer undeniable progress: it is now possible to create residential or commercial facilities that harm neither our natural resources, nor our environment.

Nevertheless, this reasoning comes with three limitations:

- The first is that **new builds require energy - known as "grey energy"** - for the production and handling of building materials, including cement, aluminium and insulation components derived from the oil industry
- A **new build eats up** our most expensive and limited resource: **natural land**
- New developments have **zero impact on existing real estate assets**, built 20 years ago or more, and which tend to display very poor energy efficiency.

Consequently, building new, energy efficient buildings, will not suffice if we are to reduce our greenhouse gas emissions.

Having taken this factor into account, and as we wish to

create an impact on the scale of an entire city and no longer a plot of land, we see our mission as two-fold: on the one hand, invest in assets that meet the most recent technical standards and comfort expectations, and on the other - maybe more importantly - ensure that we have **a positive impact on the existing stock of obsolete buildings**, our legacy from the former generation.

If we are to address the challenge from a technical perspective, the energy efficiency of older buildings can be enhanced by fitting double or triple glazing, improving insulation, switching to LED lighting and importantly, by installing more efficient heating systems using renewable fuels and technologies. Another lever is reorganising and limiting the installation of cooling and air-conditioning systems, which use a great deal of energy in today's "vicious circle" of climate change.

However, implementing these enhancements is **never simple**, as these upgrades come with **challenges**:

- **Disruptions for the users of the building**, or even displacement during the works, resulting in a loss of income
- The t**echnical and financial viability of the projects** is sometimes hard to achieve over the short-term, which is why subsidy programs have been set up in many countries

However, we are convinced that this is **the only effective solution if we are to reduce the carbon footprint of our existing building stock in a meaningful way**. In quantitative terms, **achieving a 30% drop in emissions by 2030 would require the energy retrofitting of buildings over 2,000 square metres, as a priority**.

While the task ahead is huge, the real estate and construction industries are presented with a tremendous opportunity that will enable these players to have a significant impact on the energy transition.

Beyond the purely quantitative aspects, we like the idea that our contribution as an asset owner or manager could strengthen the appeal of a given site and support the building and **rebuilding of the city 'within itself'.** These transformations offer extensive opportunities, from **converting office buildings into homes, cleaning up former industrial sites, or giving a regenerating boost to some neighbourhoods**, thereby creating a double virtuous circle.

PROVIDING SUSTAINABLE SOLUTIONS IN A CHANGING WORLD

JOHNNY EL HACHEM
CEO
Edmond de Rothschild
Private Equity

In keeping with the Group's convictions, we have ensured that sustainability lies at the very heart of Edmond de Rothschild Private Equity's action. Since the creation of the firm, we have designed and developed pioneering strategies that provide long-term solutions to increasingly pressing environmental, social and demographic challenges.

The war in Ukraine has reshuffled the cards in many areas, notably for the energy and food industries which are closely interdependent.

As the war loomed, European energy prices began to surge in September 2021. The conflict has put into sharp relief the continent's reliance on fossil fuels and diversifying energy sources appears vital if Europe is to phase out its dependency.

By offering a carbon neutral, high added value and continuous source of energy, promoting the circular economy through the revalorisation of co-products and waste, biomass cogeneration plants are part of the solution.

Europe's food sovereignty is also back on the list of priorities. We need to **"produce more – and more sustainably – in Europe"**. Agriculture accounts for over 35% of the world's energy consumption[1].

With soaring energy, wheat, and cereal prices, energy and food issues have never been so closely interrelated. As we tackle these major challenges as well as geopolitical, institutional, regulatory and climate risks, technology offers nimble, fast, effective, and scalable solutions:

- **biotechnology** can improve the efficiency and resilience of farming

- **digitalisation applied to food value chains** enables a better use of resources, reduced food waste and helps prevent bottlenecks throughout the value chain
- **robotics** facilitate the adoption of precision farming, which uses natural resources – including water – more sparingly and reduces the use of pesticides

We acknowledge that the challenges are massive. But so are the opportunities for action. Whether diversifying our energy supplies and our production chains, or bolstering our food security, **it is our responsibility to provide sustainable solutions in a changing world.**

1. FAO - Food and Agriculture Organization of the United Nations.

SUPPORTING ALTERNATIVE AND CARBON-NEUTRAL ENERGIES

JEAN-CHRISTOPHE GUIMARD
Founding Partner of PEARL Infrastructure

Aggravated by the pandemic, then by the war in Ukraine and the soaring energy prices that followed, Europe is seeing massive and urgent demand for alternatives to fossil fuels that are both autonomous and sustainable, particularly from public authorities and industrial players.

Despite receiving lower media attention than other renewables, **biomass ranks as the number one renewable energy used within the EU**[1] and offers **a tangible solution to climate-related issues**. Biomass derived from forestry or farming, for example, displays a low carbon footprint.

During photosynthesis, the carbon dioxide within the air is turned into oxygen; when organic matter burns, the combustion simply releases the same quantity of CO_2 as was absorbed during the growth of the matter (wood, plant...) - with a virtually neutral carbon footprint.

Biomass is also aligned with the circular economy principle as it burns organic waste (recycling wood, sawmill wood waste, agricultural waste etc.) which if not used, may produce large quantities of methane (CH_4). Yet methane is a powerful greenhouses gas with global warming potential 21 times that of CO_2.

By investing in Kogeban, a 16 MW (electric) and 42 MW (thermal) biomass cogeneration plant located in Picardy (France), Pearl – a private equity fund dedicated to the energy transition, the circular economy and environmental impact and member of the Edmond de Rothschild Private Equity

partnership - promotes high added value renewable and baseload energy solutions combining both electric and thermal energy.

Operating within a strict environmental charter, the facility transforms residue from the wood and recycling industry into electricity which is fed into the grid, and in sustainable and competitive thermal energy for two industrial groups within the agri-food and biotechnology sectors.

Over the past two years, Pearl has invested in 8 biomass cogeneration plants in Europe.

1. Source: European Commission's Knowledge Centre for Bioeconomy.

NEEDS, AMBITIONS, OPPORTUNITIES, AND CONVICTIONS: FUNDING THE ENERGY TRANSITION

JEAN-FRANCIS DUSCH
CIO Infrastructure Debt (BRIDGE)
Edmond de Rothschild Asset Management

Just five years ago, questions were still being raised over the intent of funding the energy and environmental transition: were these ambitions merely a passing fad, or motivated by demagogic rhetoric? But today, they have become a reality, an undeniable need, a vital and fundamental mission for our planet and future generations. Addressing these issues, the European Union – through its "Fit for 55" initiative – is pushing for a faster reduction of greenhouse gases, aiming for a 55% cut in CO2 emissions by 2030.

Helping to achieve these climate change and carbon footprint targets will require massive investments for developing, financing, building, and running new infrastructure. These amounts will reach trillions in the current decade. In Europe, **"Fit for 55" entails 700 billion euros invested in new infrastructure projects every year** to accelerate the Energy Transition.

These projects require **capital flows on a similar scale**, to which institutional investors can contribute in a material and decisive manner. Over the past few years, conviction-driven asset managers have successfully convinced a growing number of institutionals to make meaningful investments in this thematic, building diversified equity and debt portfolios within a specific risk framework. The most advanced will usually

have anticipated and incorporated the **SFDR/ Taxonomy directive** that officially came into force in March 2021. This has had a major impact on the sourcing, selection, detailed analysis, structuring, monitoring, and reporting of financing tools for underlying projects. Most and foremost, it provides us with an opportunity to be innovative, engaged and highly disciplined in our contribution to developing projects that are essential for preserving our planet and the environment, creating jobs, and supporting the economy.

While the energy and environmental transition is more obviously associated with **renewable energies**, **transportation** (green mobility), **public services** (modernisation and gradual exit from fossil commodities), **digital infrastructure and social infrastructure** (energy efficiency) are also an integral part of

the transition and offer a broad investment universe. The energy transition, for example, will foster maturation and reliance on new technologies - which we refer to as the second-generation energy transition. As a result, a wide range of sub-sectors and technologies are emerging:

- **Off-shore wind farms**, with the development of floating structures
- **Battery storage**
- **Biomass**, using technologies enabling substantial cuts in CO_2 emissions
- **Hydropower**
- **Geothermal power**

Funding these assets is essential if we are to support the policies of developed and emerging countries wishing to reverse their energy mix, by making substantial cuts to their use of fossil resources and maximizing the share of green energies.

Transport infrastructure is also undergoing a major transformation. The **Trans European Network**, a linchpin for the construction and interconnectivity of European infrastructure over the past decades and written into the Juncker investment plan for Europe, includes priority initiatives for the implementation and operating of charging stations for electric vehicles. Equity and private debt are directed towards funding these projects.

Social infrastructure is also central to the energy transition, with the development of "**sustainable buildings**" able to report on clear **energy efficiency** indicators in sectors such as healthcare or education.

Public utility services are also undertaking their energy transition, modernising installations, reducing CO_2 emissions and gradually but surely – and within ambitious timeframes – exiting fossil raw materials.

Following this logic, Smart Cities will be a convergence point for the development of infrastructure enabling the energy and environmental transition.

INSTITUTIONAL INVESTORS HAVE A KEY ROLE TO PLAY IN THE TRANSFORMATION

However, this calls for humility and a sense of realism. If it is essential to usher in the energy transition as early as possible, asset managers and institutional investors may also play an active role in supporting the transformation process for some infrastructure projects. It is important we give ourselves all the means needed to achieve the carbon neutral and climate change targets.

Aided in their approach by **regulatory reforms**, institutional investors have understood the **challenges and opportunities associated with the energy transitio**n. As part of the Solvency II directive[1], regulatory authorities have introduced measures to support investment, including a favourable treatment for infrastructure debt. **SFDR regulation is key and on the agendas of all institutional investors**.

We feel it is both comforting and promising that political leaders, regulatory authorities, infrastructure developers and operators, public and private funders, have aligned their interests and their actions to speed up the much needed energy and environmental transition.

1. Solvency II (name given to the Directive 2009/138/EC of the European Parliament and Council of November 25th 2009) is a European regulatory reform for the insurance industry that came into force in July 2016. Similar to Basel II (for banks), the objective of the directive is to ensure that insurance and reinsurance companies' capital requirements are better aligned with the risks they incur in their operations.

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