ecofin at redwheel

# Ecofin **Energy Transition Strategy**

2024 IMPACT REPORT

FOR PROFESSIONAL INVESTORS ONLY

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# 01 Introduction


## Matthew Breidert

**Portfolio Manager**

Ecofin Energy Transition Strategy



## Max Slee

**Portfolio Manager**

Ecofin Energy Transition Strategy


2024 was a remarkable year for us as an investment team because Ecofin was acquired by Redwheel in September. We are excited for the opportunities joining Redwheel provides, particularly the access to a range of sustainability experts in the Greenwheel team and their broader networks outside asset management. These resources will allow us to further examine the opportunities and risks the energy transition presents to us as investors.

2024 was also a notable one for electricity demand growth, which reaccelerated after two decades of flat US electricity consumption. We believe that this re-acceleration is likely to be structural over the next decade and beyond, driven by data centre demand, re-shoring of manufacturing, and longer term by increases in electric vehicle penetration. These factors will likely also impact electricity demand in other regions, such as Europe, with some time lag relative to the US.

We believe this electricity demand acceleration will have a significant impact on demand for electrification enablers, including both the supply side of the equation, such as power generation technologies, transmission and distribution equipment, battery storage, as well as the demand side, including more efficient power semiconductors, electric motor technology advancements, and more energy efficient heating and cooling solutions for industrial and building applications.

Furthermore, the value of electricity generation differs according to its characteristics, with baseload, clean and reliable power receiving among the highest power price premia. Electricity supply is evolving from an afterthought to an increasingly scarce commodity. The challenge ahead will be to serve the expanding demand growth with supply that can ramp relatively quickly, at attractive cost, with a carbon footprint that allows countries or corporations to remain on their decarbonisation trajectories.

While corporate and consumer demand is a very important driver of the energy transition,

policy continues to hold significance. Policy, varying regionally, remains an ongoing influence on the pace, mix and cost of energy transition trends, such as electric vehicle penetration and renewable energy capacity build rates. In the year ahead, we will be particularly focused on the following policy drivers that we believe will influence the path of the energy transition in the next year and beyond:

1. The Republican administration approach to energy, trade policy and the Inflation Reduction Act
2. China's ability to stimulate their economy (via domestic consumption) and escape the deflation trap
3. European elections and the impacts on energy incentives[1]

## Stephanie Kelly

**Head of Greenwheel**

It has been an exciting year at Redwheel thanks to the arrival of our Ecofin colleagues. For us in Greenwheel, their arrival marks an opportunity to work with and support an extremely well-informed team of investors.

Greenwheel is the sustainability insights partner to Redwheel's Sustainable, Transition and Enhanced Integration funds. We provide tailored thematic and sector-level sustainability research and advice to fund managers, commissioned by fund managers, at every stage of the product lifecycle from fund design through to investment research and engagement support, dependent on each team's needs and requirements.

The Ecofin team have a long and robust investing history so our focus is very much on building on this solid foundation. As such, I expect a lot of lively debates and hope that the team will benefit from Greenwheel insights, tools and frameworks designed to maximise sustainable investing opportunities, help minimise sustainability risks and ultimately support return and impact for our clients.

Greenwheel is made up of a core team of experts specialised in climate, environmental and social research with a range of experience from asset management, academia, non-governmental organisations (NGOs) and working on the ground with companies on sustainability issues. Our climate lead Paul Drummond and climate analyst Anna Polise have already begun work with the team on further developing their work on avoided emissions, while our social lead Jessica Wan will be a valuable support on human rights issues that emerge.

This combination of disciplines and focus areas provides both breadth and depth for the Ecofin team to draw on to complement their existing expertise. In addition, Greenwheel's experts bring with them deep networks to provide a variety of specialist perspectives from outside the asset management industry that we expect will further support the Ecofin team.

Finally, the Greenwheel Fellowship programme, an academic partnership that brings graduate students into the Greenwheel team for specific, fund manager-commissioned research projects, completes the flexible insights model allowing us to be nimble and investment outcome focused. We have already worked with the Ecofin team to identify potential research for one of the three Greenwheel fellowship projects to take place this summer.

1 Forecasts and estimates are based upon subjective assumptions about circumstances and events that may not yet have taken place and may never do so.

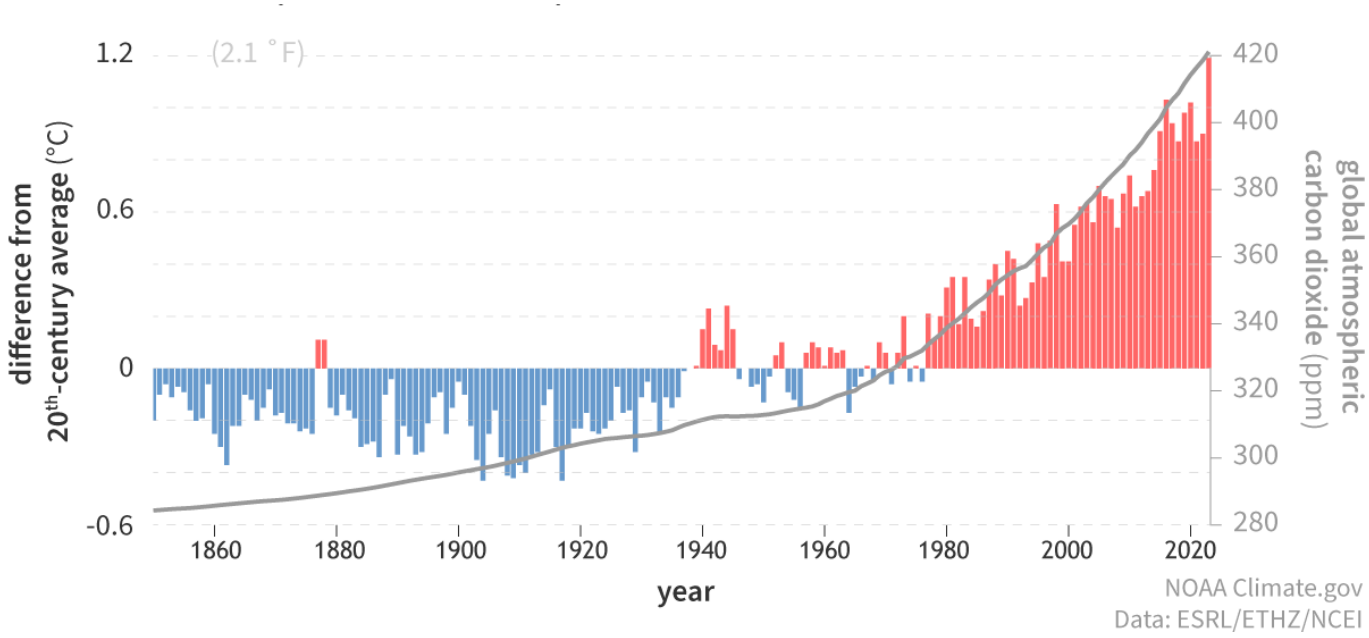
# 02 Theory of Change

## The Need: Solutions to mitigate a growing problem

The planet has warmed by over 1.2°C on average since pre-industrial times[2], driven by ever rising emissions.[3] Climate change is not a future problem: even at 1.2°C of warming, glaciers are shrinking, sea level rise is accelerating, while storms, droughts, and heat waves grow more intense.[4]

Between 1970 and 2021, the World Meteorological Organization estimates that extreme weather events have resulted in over two million deaths and 4.3 trillion USD in economic losses.[5]

**Figure 1: Earth's surface temperature and atmospheric carbon dioxide (1850-2023)**

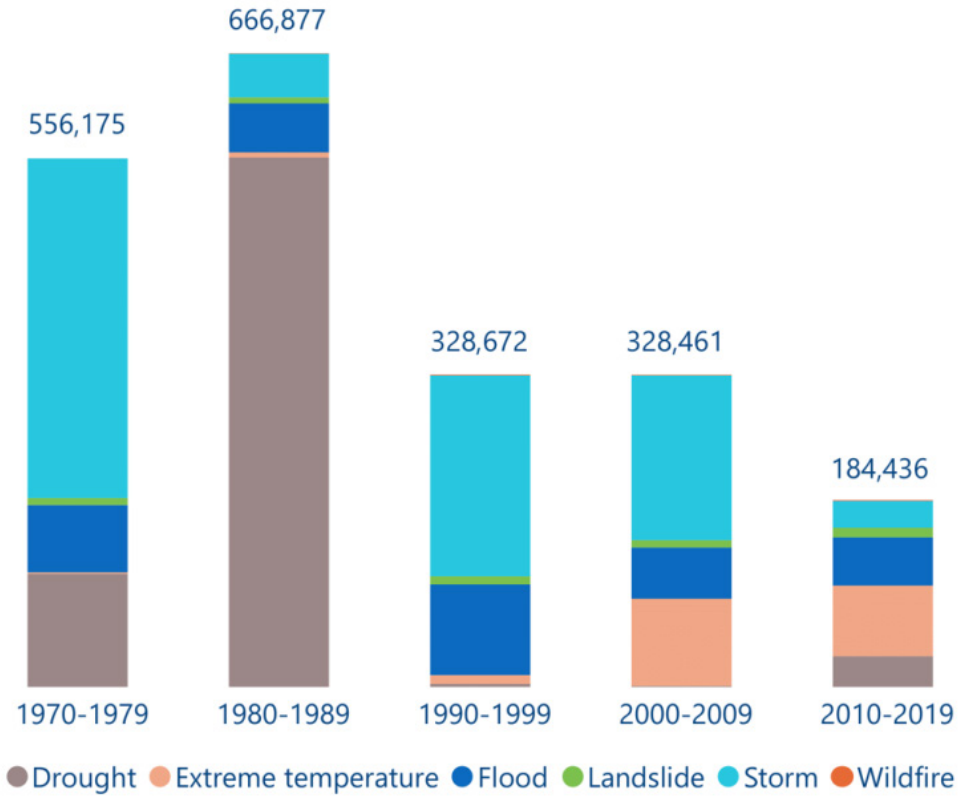



Source: NOAA Climate.gov; Data: ESLR / ETHZ / NCEI

*The information shown above is for illustrative purposes only and is not intended to be, and should not be interpreted as, recommendations or advice.*

2 Our World in Data, $CO_2$ and Greenhouse Gas Emissions (2023)
3 UN Environment Programme, Emissions Gap Report 2023
4 NASA, The Effects of Climate Change (October 2024)
5 World Meteorological Organization, Economic costs of weather-related disasters soars but early warnings save lives (May 2023)

**Figure 2: Number of reported deaths by decade**

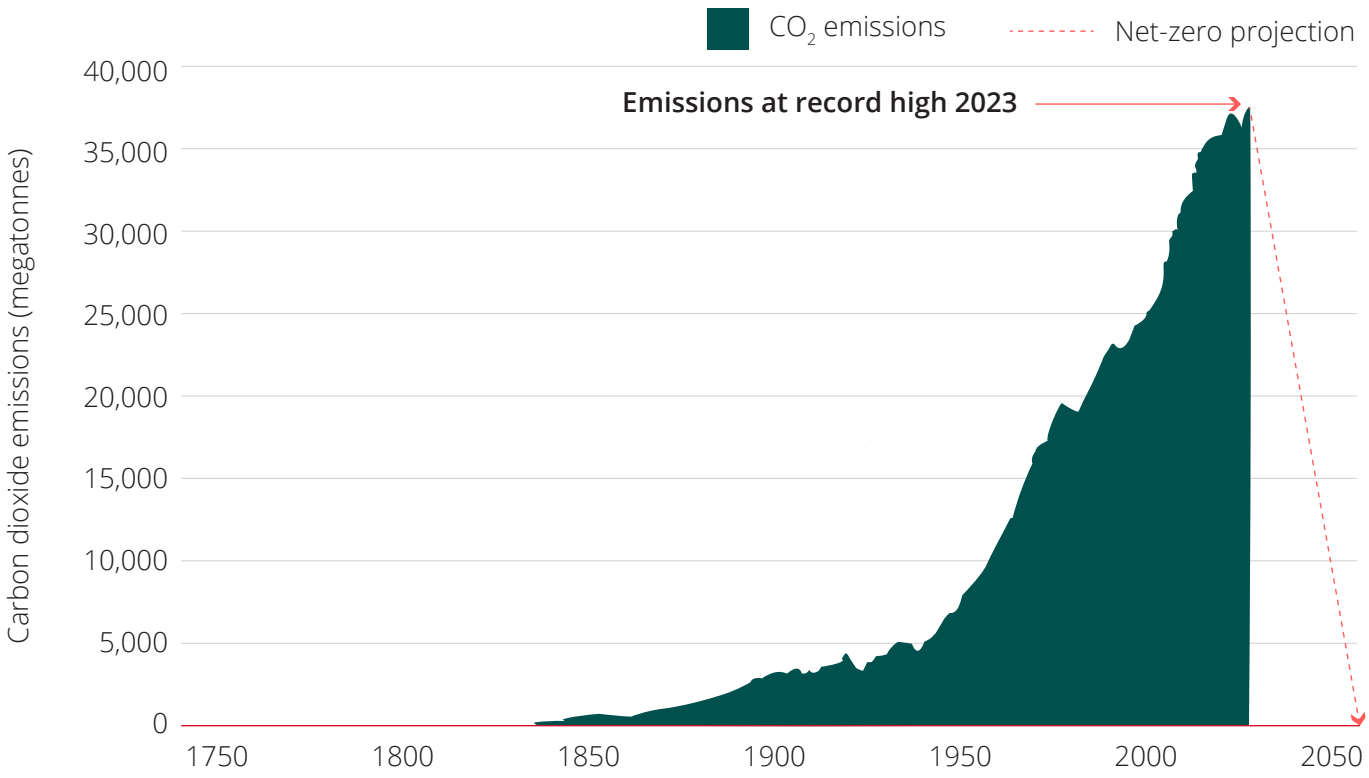



Source: World Meteorological Organization, Economic costs of weather-related disasters soars but early warnings save lives (May 2023)

*The information shown above is for illustrative purposes only and is not intended to be, and should not be interpreted as, recommendations or advice.*

The stark reality of climate change is evident, yet our modern society is built on high carbon emissions. Despite net zero pledges and billions invested in clean energy, 2023 again set a record for global carbon emissions.

**Figure 3: Global carbon dioxide emissions and net-zero protection, 1750 – 2050**




Source: Resilience, Climate Change and Energy Transition: The 2023 Scorecard (January 2024) / Graphic created by Redwheel

While the staggering scale of change needed to wean our global economy away from carbon emissions may seem overwhelming, there is hope. Policy makers, regulators, politicians, corporate titans, and ordinary citizens are demanding an acceleration to the change.

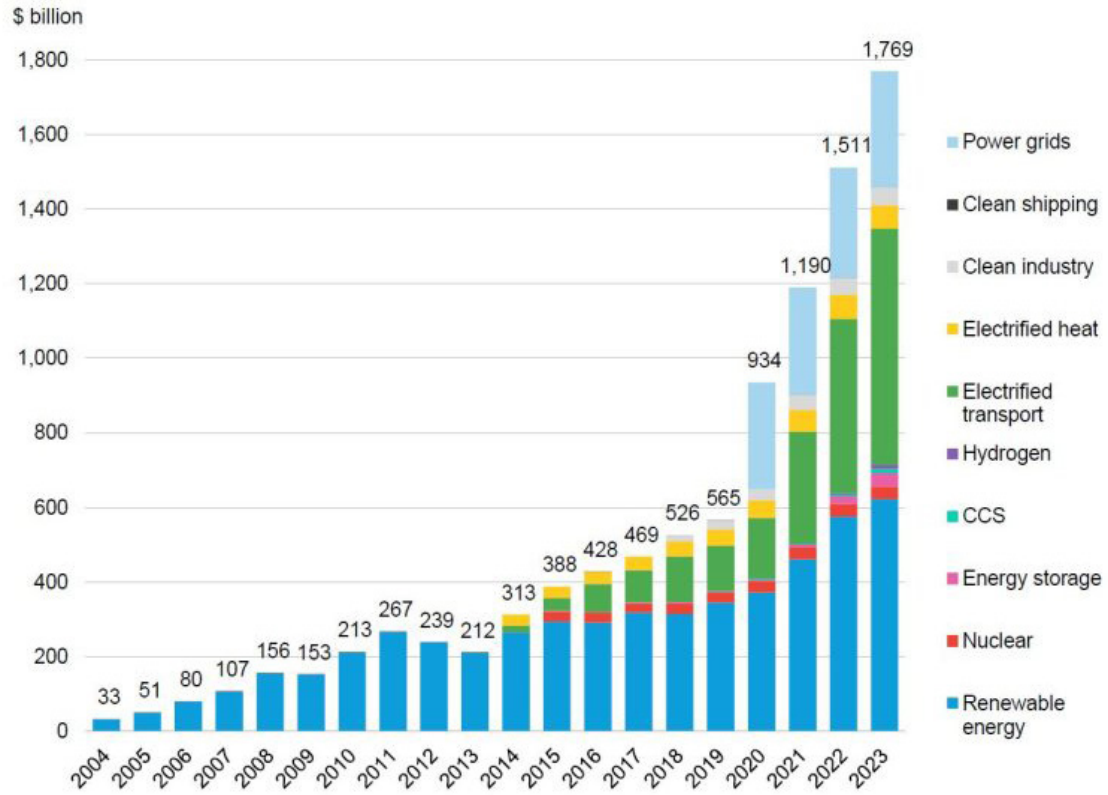
The importance of the energy transition is reflected in the priorities of the UN Sustainable Development Goals (SDGs). The SDGs are a call to action for governments, countries, investors and individuals to protect the planet and improve lives and prospects for everyone, everywhere. The energy transition is most directly addressed through SDGs 7, Affordable and Clean Energy and SDG 13, Climate Action, however, transitioning to a cleaner, less intensive economy also impacts many other related SDGs including SDG 3, Good Health and Well-Being, SDG 8, Decent Work and Economic Growth, and SDG 11, Sustainable Cities and Economies, among others.

## The Opportunity: Solving Problems is Good Business

While the push toward a lower carbon future is really just beginning, it appears obvious that the effort to transition our economy and society from the carbon-intensive present to a low-intensity future will have ramifications across every part of our economy and society.

Solving problems has always been the basis for building good businesses and solving problems around emissions looks to be no different. Like the technology boom spawned by the internet over the last 30 years, the next 30 years is expected to be dominated by new investment, technology, and products aimed at reducing emissions and making our planet and our place on that planet more sustainable.

**| Figure 4: Global Investment in energy transition, by sector**




Source: BloombergNEF (January 2024)

*Note: Start years differ by sector but all sectors are present from 2020 onwards; see Methodology for more detail. Most notably, nuclear figures start in 2015 and power grids in 2020. CCS refers to carbon capture storage.*

*The information shown above is for illustrative purposes only and is not intended to be, and should not be interpreted as, recommendations or advice.*

According to BNEF global investment in the energy transition hit 1.8 trillion USD in 2023 up 17% from the previous year.[6] This number is only expected to grow in the future as BNEF estimates that investment in the energy transition would need to average nearly 5 trillion USD per year between 2024 to 2030 to align with BNEF's Net Zero Scenario.

We believe that companies delivering products and services that provide economically attractive solutions for reducing emissions or increasing resource efficiencies will be competitively advantaged and offer attractive returns to investors today as the energy transition accelerates.

6 BloombergNEF (January 2024)

# How we do it: The Energy Transition Strategy

Our Energy Transition strategy attempts to identify and invest in these opportunities, and it does so through four main investment themes:

## 01 - Electrification


We believe the power sector is undergoing a profound transformation driven by the decarbonisation and electrification of energy demand. Utilities are at the forefront of this multidecade transition. By adapting and, in many cases, substantially overhauling their business models to accommodate new greener technologies and decentralised power sources, we believe utilities are bound to be major beneficiaries of secular growth and attractive returns on significant capital investments.

These investments promote:

- Replacement of coal and other fossil fuel generating plants with renewables
- Reduction in GHG and other pollutants
- Provision of cheap, clean, and abundant electricity to consumers and industry

## 02 - Clean Transportation


We believe companies that are actively working to produce and enhance the clean transportation industry represent important investments in the energy transition. This industry is working to offer the convenience of modern transportation without the environmental impact. Efficiency of the transportation sector is crucial to reach the goal of net zero emissions. In order to reduce emission intensity, we must improve or replace typical internal combustion engines with electric powertrains. By choosing the ‘cleaner is better# approach, the global demand for fossil fuels will decrease.

These investments promote:

- Reduction in GHG and other pollutants
- Adoption of electric vehicles

## 03 - Industrial and Building Efficiency:


We believe efficiency is often seen as the less glamorous cousin to clean energy on the path to net zero emissions, however efficiency is equally important for Energy Transition as decarbonising the electric grid. Increasing industrial efficiency stretches resource utilisation and empowers the circularisation of industrial processes and ultimately the economy as a whole.

These investments promote:

- Reduction in GHG and other pollutants
- Increasing energy efficiencies

## 04 - Circular Economy:


We believe our current culture of one-time-use consumption is unsustainable. The U.S. EPA has estimated roughly 42% of all greenhouse gas emissions are caused by the production and use of goods, including food, products and packaging. Reducing, reusing and recycling will conserve that energy and dramatically reduce our carbon emissions.

These investments promote:

- Increasing recycling
- Protecting groundwater
- Reduction in GHG and other pollutants

Our Energy Transition strategy is borne from the belief that humanity needs and will continue to accelerate the transformation to a greener, decarbonised, and more sustainable economy. We believe that addressing climate change and circularising the economy is not only good for the future but has and will continue to deliver compelling absolute and risk-adjusted investment opportunities as we expect these trends to drive earnings growth for years and decades to come.

We firmly believe that addressing climate change through decarbonisation and circularisation of the economy is not only a necessary condition for the preservation of future global living standards, but also represents a once in a generation investment opportunity.

7 United States Environmental Protection Agency, Climate Change and Waste (September 2016)

# 03 Setting up for Success

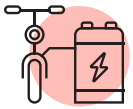
## Thematic Focus

The Ecofin Energy Transition Strategy invests primarily in companies exposed to secular growth opportunities related to the energy transition associated with decarbonisation, focusing on four major investment themes: electrification, clean transportation, industrial and building efficiency, and circular economy. The strategy invests in companies which provide products and services that are enabling systematic decarbonisation of the economy.

1

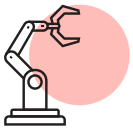
**Electrification**

2



**Clean transportation**

3



**Industrial and building efficiency**

4

**Circular economy**

## Commitment to Themes

Investee companies derive at least 35% of their revenues, profit or assets from, or invest a significant portion of their capital expenditures to, activities in electrification, clean transportation, industrial and building efficiency, environment or other activities related to decarbonisation associated with the energy transition. The fund manager identifies and measures this contribution.

The Ecofin Energy Transition strategy tracks and reports on performance of the strategy in the spirit of Redwheel's 'sustainable investments' approach, defined as companies that demonstrably contribute positively to environmental and / or social objectives primarily through its products and services. Sustainable investments should also do no significant harm to established European environmental and social objectives and follow 'good governance' practices. Redwheel's approach to assessing 'good governance' is set out within the Redwheel Stewardship Policy.

When reviewing the portfolio's allocation to positive revenues, we start with SDG-aligned revenue data from SDI Asset Owner Platform, which was chosen by Redwheel following extensive research in the market for SDG aligned data. SDI AOP's commitment to transparency, rigour and asset owner focus aligns with the Redwheel approach to sustainability so is a natural partner for us. The data provides estimated revenue alignment to SDGs in the form of percentage of total revenue.

SDI AOP is also used in checking for harm, where we set a threshold of 10% maximum negative revenue alignment to the SDG.

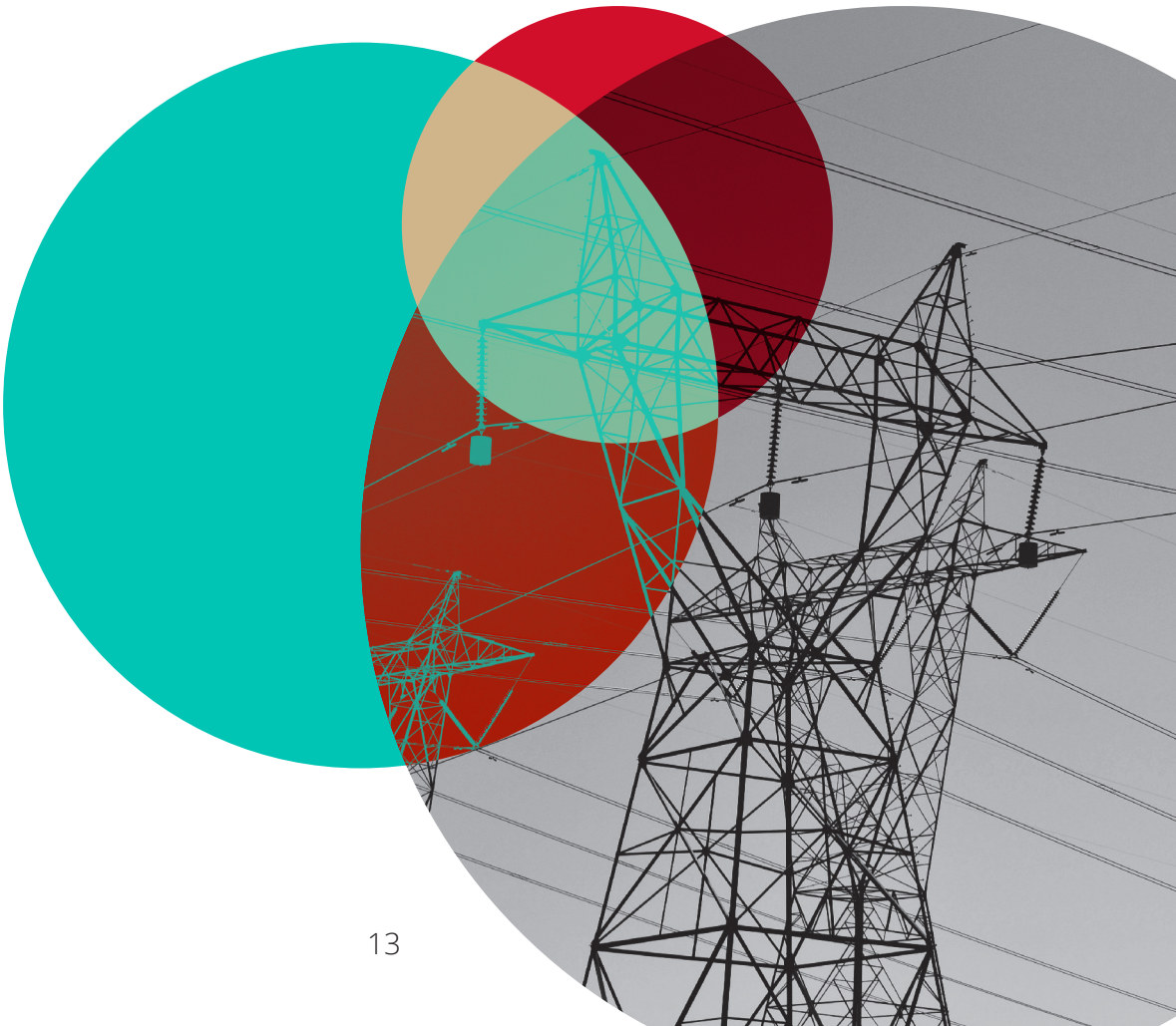
Of course, there are occasions where we may disagree with the revenue alignment from SDI AOP e.g. or when we have more recent data, where there are legitimate philosophical or methodological differences of view.

In these cases, we present a case for the potential investee company to be considered to the Sustainable Investments Working Group chaired by the Head of Sustainability Strategy, Governance and Policy supported by members from Greenwheel and the Product team. Debate is a core part of this process and the Group fosters an environment of collegiate, robust discussion that we consider positive and additive to our thinking in this space.

Beyond SDG revenue alignment, we use Sustainalytics data to check for other potential harms and ESG risk exposure of potential investee companies.

## Key Performance Indicators for Ecofin Energy Transition

In addition to revenue alignment and thematic alignment, we also track the carbon emissions avoidance of investee company activities, based on company disclosures.



# 04 Thematic Research

## Industrial and Building Efficiency

Industrial and Building Efficiency has been an important thematic in our Energy Transition Strategy since the inception as we identified the importance of the opportunity for companies offering solutions toward higher efficiency. Greenwheel has produced relevant research[8] on the importance of efficiency and the important role it plays in greening and circularising the economy that sums up many of the benefits as we see them.

## Squeezing more juice from the lemon

Improving energy efficiency can capture greater welfare and economic value from energy resources, improve economic and societal resilience to energy-related shocks, and reduce the environmental consequences associated with energy systems.

Energy efficiency is often called the 'first fuel' for the energy transition. This is because it:

a. relies on actions that are broadly known, are often highly cost-effective, and generally quick to introduce.

b. reduces the need for transition in energy production, transformation, and supply, which may be more difficult, uncertain, expensive, and have longer timescales.

c. produces a range of other co-benefits, including reducing energy cost and energy waste, shoring up economic and geopolitical vulnerabilities, and assists in staving off environmental degradation.

## Choosing the juiciest lemons

Increasing efficiency within industry and commercial and residential buildings holds some of the greatest potential for gains on the road to a more sustainable world (see Figure 5).

Efficiency comes in lots of forms: changes in behaviour leading to reduced demand for energy services that are not useful; deploying more energy efficient technologies and systems; and switching to more efficient fuels, such as electricity.

## Industry in focus

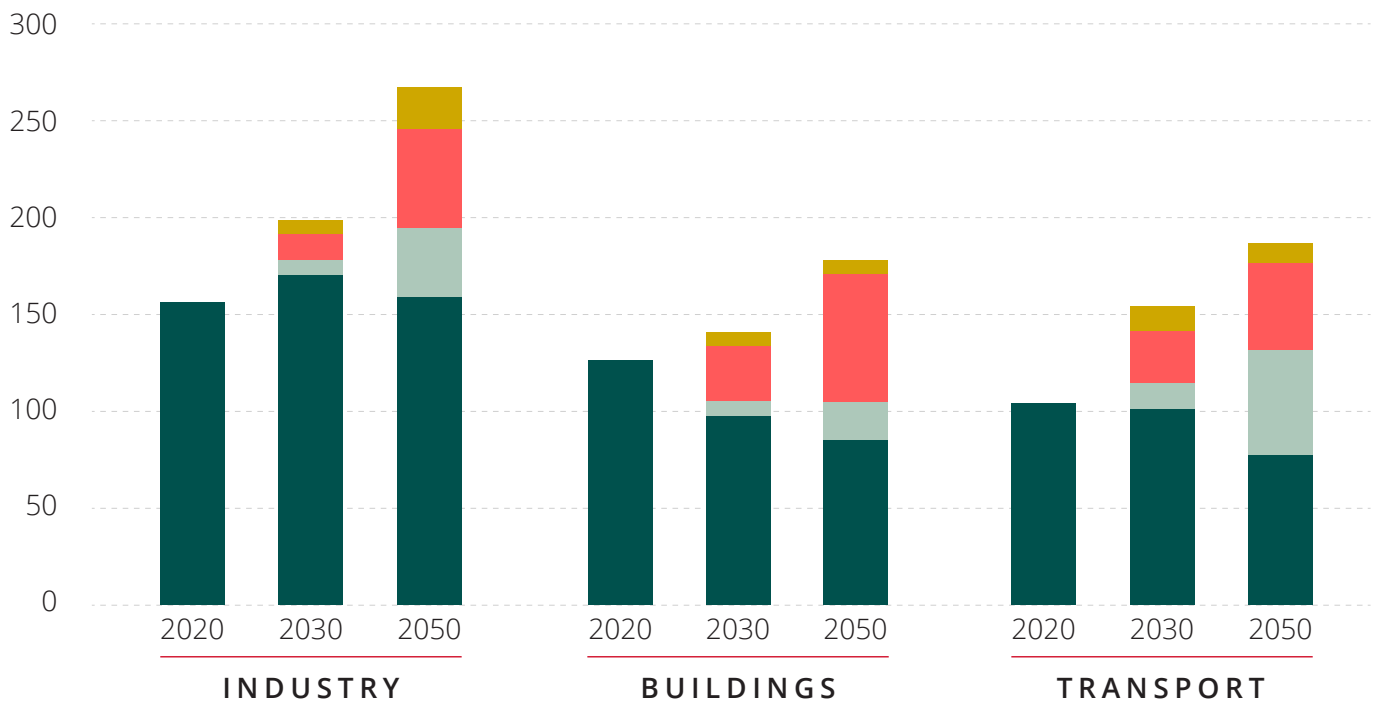
While most manufacturing processes are relatively efficient (e.g., use of materials), there is room to improve their overall energy efficiency through:

1. The installation of best-in-class industrial equipment (e.g., electric motors, variable speed drives, heaters, grinders)

2. Process integration options (e.g., waste heat recovery; combined heat and power systems - CHP)

8 'Energy Efficiency Brief', Paul Drummond, 2023 (this research is available on request)

**Figure 5: Energy efficiency drivers under the IEA NZE scenario**




Source: IEA, Net Zero by 2050 (May 2021)

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3. The adoption of advanced energy and process management systems

Collectively, industrial electric motors use approximately 45 percent of all energy produced, being primarily used in fans and pumps.[9] One effective way to improve a fan or pump motor's efficiency is to pair motors with a variable speed drive (VSD). A VSD adjusts a motor's speed to exactly match the requirements of the task. Any time it is not operating at full speed, it is saving power. Slowing a motor can produce significant savings – reducing a motor's speed by just 20 percent reduces energy use by 50 percent.6

Converting fossil fuel-based processes to electricity, such as moving from blast furnaces to electric arc furnaces in the steel sector or industrial heat pumps for high-temperature processes, offers the second largest opportunity for efficiency gains by 2050.[10]

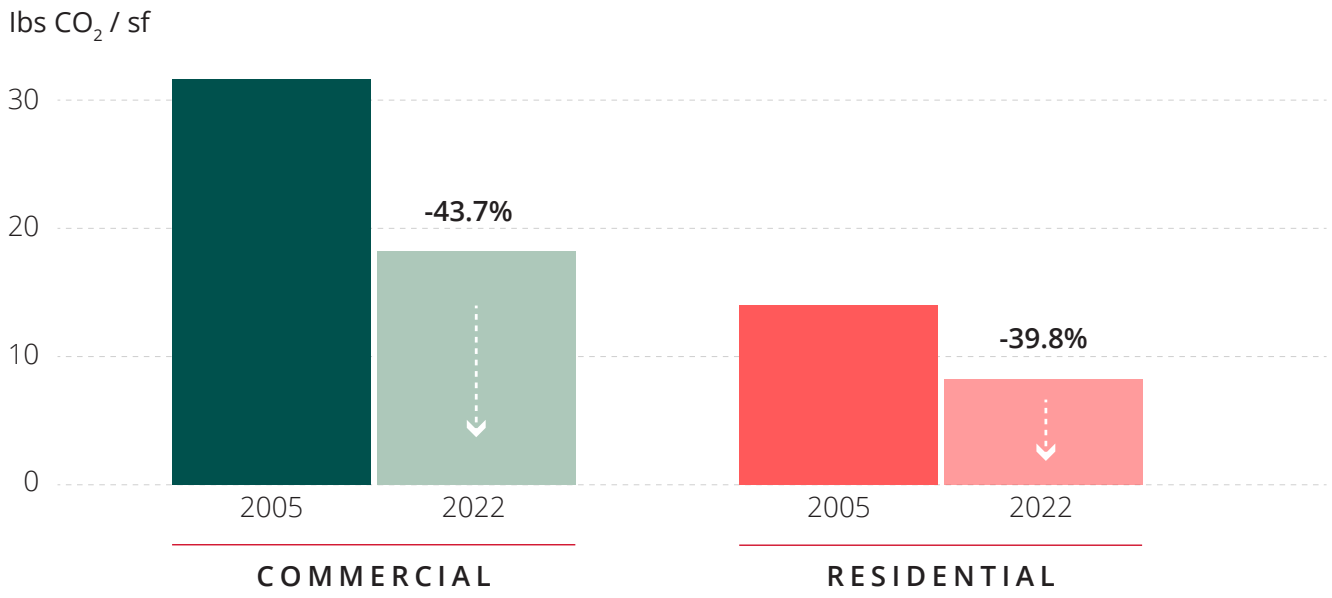
However, industrial sectors are typically capital intensive with long-lived assets and complex processes, making deep and rapid gains in efficiency (and reductions in emissions) challenging. Chemicals, steel, and cement production together account for nearly 60% of all industrial energy consumption and about 70% of $CO_2$ emissions from the industrial sector.[11] The production of these materials is concentrated in emerging markets, where both opportunities for and challenges to efficiency gains are generally greater.

9 Energy Digital, Energy efficiency: delivering measurable ROI (June 2023)
10 IEA, Net zero by 2050 hinges on a global push to increase energy efficiency (June 2021)
11 S&P Global, Decarbonizing cement (October 2022)

## Buildings in focus

From 2005 to 2022, the U.S. added 62.5 billion square feet (5.8 billion square meters) to its building stock – the equivalent to adding about six cities the size of Boston each year – but building sector operating energy consumption did not increase (down 3.5%) and $CO_2$ emissions declined 28.4%.[12]

**| Figure 6: $CO_2$ emissions intensity in the US building sector**




Source: Architecture 2030 (May 2023); U.S. Energy Information Administration (EIA); Annual Energy Outlooks (AEO)

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## Building envelopes

Building envelope design (the combination of components that separate the interior from the exterior of the building) defines the building's demand for heating and cooling by moderating the rate of heat transfer with the outside environment.

Energy efficient building materials and components, sealing air leakage sites like gaps and heating / cooling ducts, and high-quality construction to reduce 'thermal bridging' all contribute to reducing the heating and / or cooling needs of a building.

Advanced options such as climate adaptive building shells (CABS), which use sensors and automation to adjust envelope configuration in response to changing environmental conditions, are also available.

In advanced economies, it's likely that most buildings that will exist by 2050 have already been built. Retrofitting existing buildings to reach high levels of energy efficiency offers the greatest potential in these economies but it can be costly or otherwise difficult.

In emerging markets, most buildings that will exist in 2050 are probably yet to be built. Although some retrofitting is needed, the greatest potential in these economies is to ensure high levels of efficiency in initial construction.

12 Architecture2030, Climate Bright Spot: Building Sector Success Story & IPCC 1.5°C: What Are the Odds? (May 2023)

However, designing and constructing high efficiency buildings requires the right materials and components, and a knowledgeable and highly skilled supply chain (from architects to builders). While designing and building for high efficiency may not necessarily increase costs, retrofitting for efficiency can require large investments.

## Heating, ventilation, and cooling (HVAC) systems and water heating

While using high-efficiency boilers and furnaces would increase energy efficiency, particularly in emerging markets, by far the greatest potential for high-efficiency, low-carbon heating rests with heat pumps. Heat pumps use electricity to harness ambient heat from the ground, water, or air to heat water or internal spaces. Reversible heat pumps can also provide cooling like a standard air conditioner.

The most advanced natural gas boilers are around 95% efficient.[13] When heating, heat pumps are typically around 300-400% efficient.[14] This is because they use one unit of electricity for every 2-3 units of heat drawn from the environment. Additionally, if they use renewable power, they facilitate upstream energy efficiency. The good news is that in the U.S., heat pumps have outsold gas furnaces in three out of the last four years.[15]

Global energy demand for space cooling (air conditioning) has tripled since 1990, with the number of air conditioning units deployed doubling since 2000 (with strong growth in Asia-Pacific and the Middle East).[16] Demand is likely to continue growing, particularly in emerging markets as populations, temperatures, income, and floor space all continue to increase.

Globally, new electricity demand for cooling by 2035 may be greater than all electricity used in the Middle East today, which makes driving the use of efficiency cooling technologies highly important.[17] Units exist that are twice as efficient as the average units sold in some markets (often at comparable prices) and a range of other innovations are underway to drive greater efficiencies.

As data centres expand, so will their electricity demand. Much of the electricity used by data centres is for cooling. Driving towards ever more efficient cooling technologies and data centre architectures will be crucial, particularly in regions with high concentrations of data centres or where their use might otherwise be limited by electricity supply constraints.

## Bringing it all together: Energy Transition

We believe that efficiency leads to exciting investment opportunities. Within our Energy Transition Strategy, we actively seek companies offering leading efficiency solutions today and innovating for better solutions tomorrow. Schneider Electric has been a core holding within the strategy and serves as a good example of the types of industrial and building efficiency investments being made.

Schneider offers products, services, and software that aim to increase energy efficiency for customers. As they constantly innovate new solutions, Schneider has become a technology enabler for electrification of buildings and renewable integration at medium and low voltage levels.

These sorts of global efficiency leaders are building durable businesses models while providing the tools needed to make our economy more efficient and resilient.

13 PICKHVAC, Highest Efficiency Boilers (Gas Propane & Oil) [930 Units Studied] (September 2022)
14 Energy Saving Trust, In-depth guide to heat pumps (December 2024)
15 MIT Technology Review, Sales slowed in 2023, but heat pumps are gaining ground on fossil fuels (February (2024)
16 IEA, Space Cooling (July (2023)
17 IEA, World Energy Outlook 2024 (October 2024)

# 05 Measuring Sustainable Outcomes and Company Impact

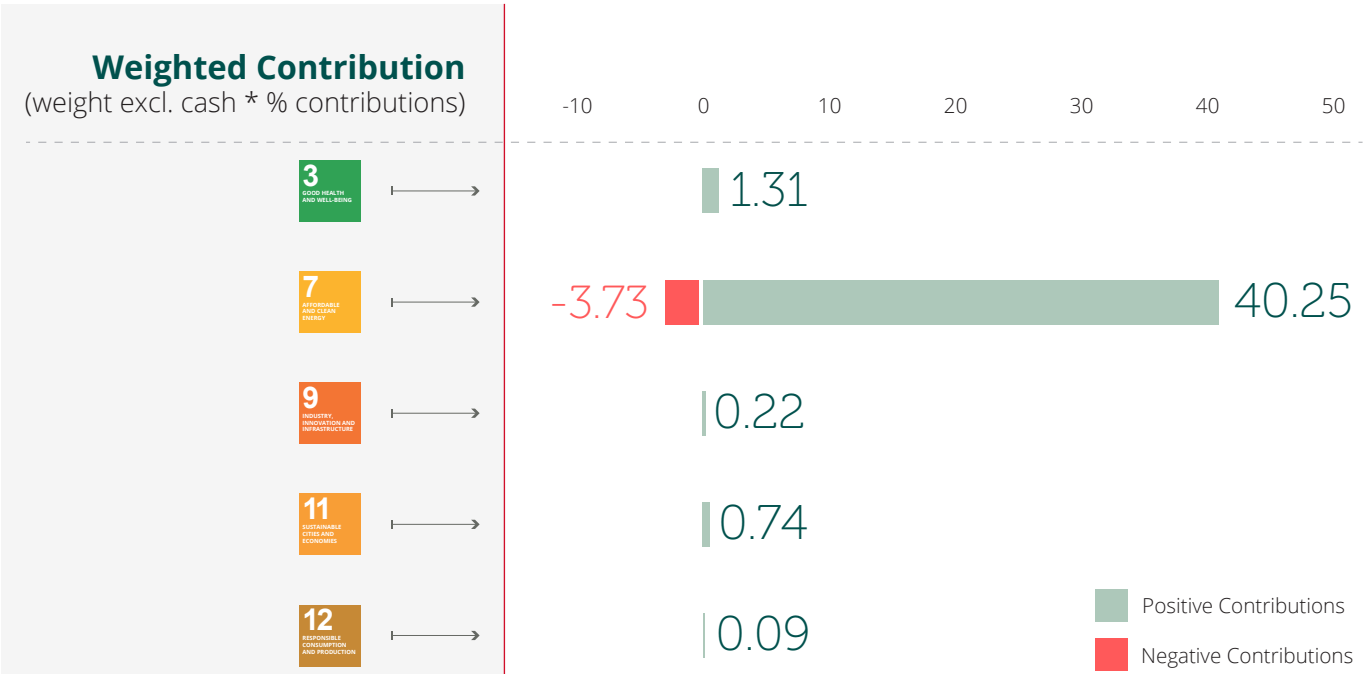
The Ecofin Energy Transition strategy is firmly focused on investing in companies with products and services that contribute to sustainable outcomes around our key investment themes. This section provides an overview of these efforts at a portfolio level in terms of both contribution by sustainable development goals and alignment to investment themes, as well as company-specific outcomes as reported by our holdings.

Information on operational and / or ESG risks associated with this strategy are available in factsheets and regular reporting.

**57.93%**

Of the portfolio in sustainable investments as at 31 December 2024

**Figure 7: Sustainable Contribution by SDG*:**




Source: Redwheel and SDI AOP (as at 31 December 2024)

* Contribution to Sustainable Development Goals is measured primarily through revenue alignment except in the case of financial inclusion where loan book exposure is utilised and in the case of renewable energy production wherein proportion of generation is used.

*The information shown above is for illustrative purposes only and is not intended to be, and should not be interpreted as, recommendations or advice.*

## Figure 8: Portfolio Breakdown by Theme


*The information shown reflects portfolio holdings as at 31 December 2024. For further information on themes and sub-themes please refer to the Setting up for Success and Theory of Change sections of this report. The constituents within the Themes presented within this report have been selected and determined by the Investment Team without independent governance and are subject to change without notice. The Themes presented are for illustrative purposes only and should not be relied upon.*

## Figure 9: Ecofin Energy Transition Strategy Company Impacts

**Constellation Energy**

- Generated 10% of the carbon free energy in the US in 2023
- 174TWh of carbon-free electricity generated in 2023
- 122 million metric tonnes of $CO_2$ emissions avoided

**Enel**

- 55.5GW of consolidated renewable capacity in 2023

**Energias de Portugal**

- 24.4GW of renewables installed capacity in 2023.

**ERG**

- 3266MW of renewables installed capacity in 2023.

**First Solar**

- Over 1.14 billion metric tons of $CO_2$ emissions avoided from the 60 GW of already sold modules.

**Innergex Renewable Energy**

- 2 million tonnes of $CO_2$ emissions avoided through production of renewable energy.

**Linde**

- Helped customers avoid 91 million metric tonnes of $CO_2e$ in 2023.
- Enabled 225m people access to safe drinking water in 2023.

**Prysmian**

- Enabled 56 m households to access green electricity in 2023.

**RWE AG**

- 45TWh electricity from renewable sources.

**Schneider Electric SE**

- Avoided/saved 112 MT $CO_2$ emissions in 2023; 553 million tonnes since 2018.
- Provided access to green electricity fo 46.5 million people between 2009 – 2023.

**Solaredge Technologies**

- 40m metric tonnes of GHG emissions avoided in 2023.

**TE Connectivity**

- Electric vehicle applications enable the auto industry to avoid more than 49 million metric tons of $CO_2e$ in 2023.
- Renewable energy solutions enabled energy providers to avoid 212 million metric tons of $CO_2e$ in 2023.
- Data and device applications enabled data centres to avoid 40,000 metric tons of $CO_2e$ per data centre in 2023.

**Trane Technologies**

- Avoided 746 metric tons $CO_2e$ emissions through returnable packaging in 2023.
- Avoided 1,616 metric tons of solid waste through returnable packaging in 2023.
- Avoided 213,918 metric tons of $CO_2e$ emissions through refrigerant reclamation in 2023.

*This data comes directly from investee companies for the latest available public reporting year, which we have not amended or altered. In the case of avoided emissions, we recognise the complexity of this metric and do not aggregate the reported figures to avoid inaccurate portfolio level reporting. We are working with Greenwheel and our external data partner SDI AOP to try to evolve how we measure and report avoided emissions in future and we hope to see improved reporting across impact metrics from our holdings over time.*

*The information in this section is based on a Representative Portfolio. Please see the disclaimer at the end of the presentation for further information.*

# 06 Impact Case Studies

## Infineon

### The Company

Infineon is a market leading power semiconductor manufacturer headquartered in Germany. The company is a pioneer in developing sophisticated electronic power management components and microprocessors which are critical for managing electrical systems.

### SDG Alignment

We believe that Infineon is an important enabler of the following Sustainable Development Goals (SDGs):


#### SDG 7 - Affordable and Clean Energy

Semiconductors from Infineon enable efficient generation of electricity from renewable sources. Furthermore they offer increased efficiency at all stages of the value chain in the (electrical) energy industry: generation, transmission and storage, with a particular focus on the usage and control of electricity during consumption.

Their components form the basis for the intelligent usage of electricity, in particular in controlling voltage and power cycles in electric and hybrid vehicles, as well as inverters for large scale solar power systems.


#### SDG 11 - Sustainable Cities

Infineon designs and manufacturers sensors, controllers, power semiconductors, connectivity and security solutions, as well as software components, which enable intelligent, secure and energy-efficient IoT applications for smart buildings and cities, smart fitness and lifestyle applications and connected smart vehicles.

We believe Infineon is a leader in enabling efficient mobility, both through internal power management, as well as external power control needed for charging and energy management, used in mass transit and EV's alike.

## Company Impact Analysis

### What is the challenge to solve?

The energy transition requires huge energy efficiency savings and technological development to be successful. Semiconductors are crucial enablers in this regard.

### Who is the target beneficiary?

Decarbonisation to reduce climate change supports society globally to survive and thrive. In the case of Infineon specifically, applications are outlined in the SDG section above.

### How is the company delivering impact?

The company's largest end-markets include automotive and industrial customers, but large data centre power management applications are a growing opportunity, where power management demands are significant.

### How much impact is being delivered?

Infineon has now made a calculation of the gross (non-apportioned) avoided emission footprint related to usage of its products, which are pervasive across heavy duty industries with very high carbon footprint. In their most recent 2024 Sustainability Report, Infineon estimates that on a total lifecycle basis, they facilitate the avoidance of over 130M tonnes of carbon.[18]

Considering their average bill of materials incorporated across various deployed carbon mitigation technologies, for example inside the power conversion inverters that manage DC current output from solar panels, or in specific transistor components inside electrified vehicles, we estimate roughly 6.5-13M tonnes of carbon avoided on an average annual production of goods and services basis.

### Risks

One of the key risks and challenges for the company relates to complex chemical usage during the process of semiconductor manufacturing. Specifically, the company uses large quantities of perfluorinated compounds (PFC) including poly-fluorinated carbon, sulphur hexafluoride (SF6) and nitrogen trifluoride (NF3).

These are GHG compounds and cannot be replaced by another class of substances, and as a result account for about 79% of total Scope 1 emissions.18 As products become more complicated and etching demand rise as chip density formats compress, the usage of these chemicals is rising.

The use of alternate gases under development which have lower GHG factors can help minimise increases in emission intensity. Infineon has undertaken a voluntary PFC abatement which enables them to avoid almost ¾ of potential Scope 1 emissions already.[18]

18 Infineon, Sustainability at Infineon Report 2024

# Energias de Portugal

## The Company

Energias de Portugal (now known solely as EDP, SA) is a leading global integrated utility company actively engaged in many facets of the energy transition.

EDP is one of the largest renewable developers, operators and owners of infrastructure worldwide and has more than 9 million customers focused across five regions: Iberia, Europe, North America, South America and Asia Pacific regions.

## SDG Alignment

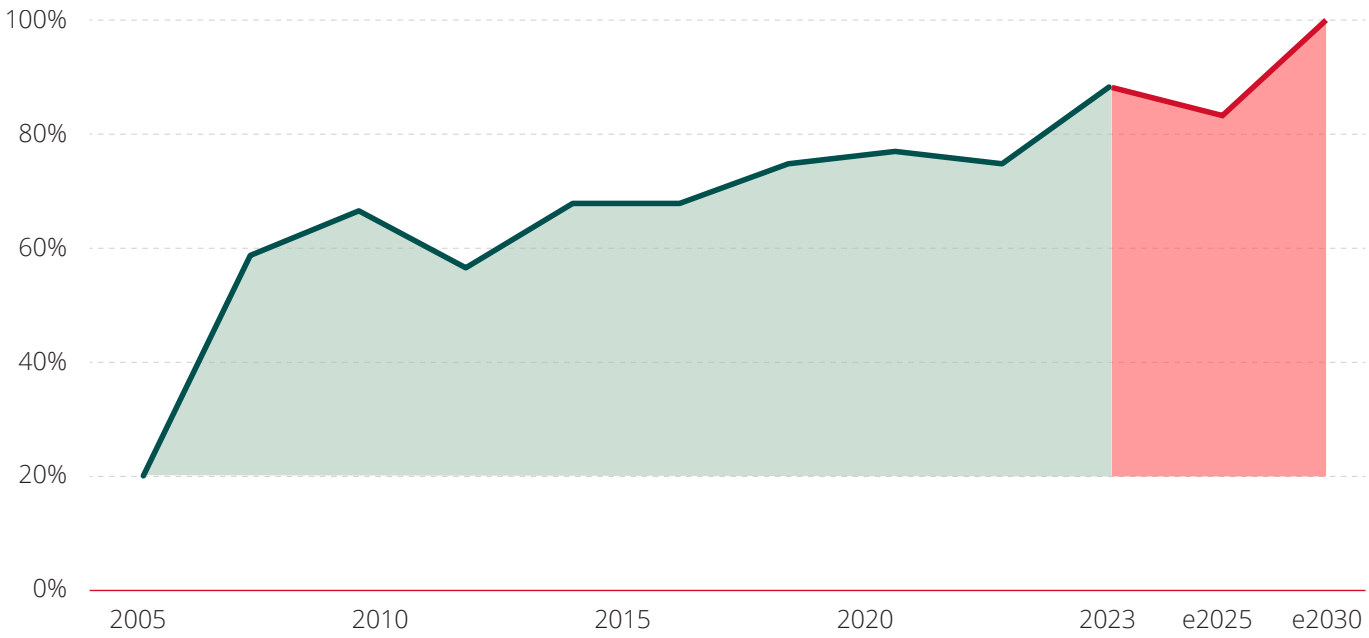
We estimate that approximately 85% of EDP's generation output is currently aligned with SDG 7.[19]

85%

Currently aligned with SDG 7

7
AFFORDABLE AND CLEAN ENERGY

**Figure 11: Renewable energy generation (%)**




Source: EDP (as of 2024) Graphic created by Redwheel.

*Forecasts and estimates are based upon subjective assumptions about circumstances and events that may not yet have taken place and may never do so.*

19 Redwheel / EDP Annual Report 2023

## Company Impact Analysis

### What is the challenge to solve?

Climate change poses a real and urgent challenge to humanity. Developing low carbon energy infrastructure is crucial to fighting this challenge.

For EDP specifically, there are two major focal points when it comes to clean infrastructure development. The first is how to de-intensify carbon emissions on the grids in which they operate. This requires a significant build-out of renewable and transmission-related power infrastructure projects.

The second challenge is how to improve the quality of the grid (both in accessibility / reliability and cost) to attract key energy intensive activities to substitute electricity usage away from existing direct fossil fuel consumption.

### Who is the target beneficiary?

Reductions in greenhouse gas emissions benefits the overall global effort to limit temperature change to 1.5-2.0 degrees. For EDP's customers, their products and output may be seen to greatly benefit their customers by facilitating decarbonisation efforts inside their operations, and by reducing carbon footprints of their products on an ongoing basis. Lastly, continuous development of a clean electricity network allows all devices that attach to that grid to keep improving their own emission profile with no additional effort.

### How is the company delivering impact?

EDP is active in developing both onshore and offshore wind projects, solar, battery storage as well as considering ways to decarbonise their existing CCGT assets in the future.

The company has a commitment to capital expenditures of €25B over the next 4 years relating to further decarbonising the electricity networks in which it operates. This marks a rapid acceleration from trend in past decade.[20]

### Key Risks

EDP operates in many jurisdictions where regulatory policy changes can be impacted by political changes and shifts in commitment to decarbonisation policies and enforcement. While long-term contracts or regulated frameworks (such as utility distribution networks) are underpinned by strong legal frameworks, forward-looking activity could be disrupted if incentives or market design shifts alter the competitive advantage of renewable or other decarbonised assets vs traditional fossil fuels.

*Forecasts and estimates are based upon subjective assumptions about circumstances and events that may not yet have taken place and may never do so.*

20 EDP Annual Integrated Report 2023

# Prysmian S.p.A.

## The Company

Prysmian S.p.A. is a global market leader in manufacturing high-performance and large format cabling, predominantly focused on electricity-related applications, and related activities.

The company has recently reorganised into four functional groups which are strategically focused on rapid growth areas within electrification, as follows:

## SDG Alignment

Excluding the Telecom division, which is about 10% of revenues, we believe that the remainder of Prysmian's revenues are supportive of the goals of SDG 9 - by developing innovative products and solutions that support continuous improvement in the sustainability of energy infrastructure - and SDG-7 - by facilitating access to clean energy through development of advanced solutions for the production and transportation of renewable energy.[21]

90%

Remainder revenues are supportive of the goals of SDG 7 and SDG 9.

**7** AFFORDABLE AND CLEAN ENERGY

**9** INDUSTRY, INNOVATION AND INFRASTRUCTURE

**Figure 12: Prysmian, four functional groups**

### Transmission

Which includes the Submarine Power and Land HVDC business units, currently belonging to the Projects segment

### Power Grid

Which includes the HVAC business unit, also currently in the Projects segment, and Power Distribution and Overhead Lines, currently part of the Energy segment

### Electrification

Which includes the Industrial & Construction (now called Trade & Installer) and Specialties (formerly included in Industrial &NWC) business units, currently belonging to the Energy segment.

### Digital Solutions

The current Telecom segment, which includes the following business units; Fiber and Optical Cables, Connectivity, Multimedia & Inside Plant cables (MMS).

Source: Prysmian (as of 2024)

*The information show above is for illustrative purposes only and is not intended to be, and should not be interpreted as, recommendations or advice.*

21 Prysmian, 2023 Integrated Annual Report

## Company Impact Analysis

### What is the challenge to solve?

The energy transition requires a modern, sustainable energy infrastructure. There are several key challenges in this context for which Prysmian offers important technology solutions.

The first relates to high-voltage cabling connections for electrical systems, where increasingly complex and geographically disperse electric supply resources (such as offshore wind) are being added to power grids globally.

The manufacturing of cabling that can withstand adverse conditions such as ocean floor or high desert temperatures, or even high tower connections for long-distance transmission lines, is highly complex and must be built to avoid defects or threats to degradation from usage given their critical role in system resources.

Another challenge relates to the manufacturing material used, both from an optimal conductivity material selection, cost considerations, weight, heat / voltage capacity malleability and of course sustainability in procurement and end-of-life considerations.

### Who is the target beneficiary?

The target beneficiaries are both the direct customers of their products, which are typically electric utilities, power development operators, renewable developers and large-scale commercial and industrial customers; but also the customers of the final electricity delivery that occurs as a service. On a broader scale, the 'uprating and upscaling' of the electrical grid also facilitates additional resource optimisation and growth in connection nodes, critical for expanding the energy transition overall (such as high-speed charging for transport).

### How is the company delivering impact?

Prysmian's key impact relates to facilitating new renewable energy connectivity, often delivering that electricity far distances to demand (load) centres. Simply put, large scale on and offshore wind as well as utility-scale solar projects would not be able to easily interconnect without this kind of enabling technology.

### Key Risks

Operations: voltage tolerances are critical and require precision manufacturing and ongoing service, including testing and remote sensing.

Policy: Strong regulatory frameworks are needed to cultivate clear market signals for demand and underlying order activity. As political regimes shift, the company is exposed to both positive and negative aspects of commitment to climate mitigation.

On the other hand, policy support for key areas like AI and data centre infrastructure growth also are creating substantial upside risks for the company's addressable markets and customers. As such, manufacturing capacity issues are critical to manage through this wave of secular growth in electrification.

# Glossary

| | Term | Definition |
|---|---|---|
| | Greenhouse Gas Protocol Scope 1 Emissions | Direct emissions that are owned or controlled company sources. |
| | Greenhouse Gas Protocol Scope 2 Emissions | Indirect emissions that are produced from the generation of purchased energy. |
| | Greenhouse Gas Protocol Scope 3 Emissions | Indirect emissions (not included in scope 2) that occur in the value chain of the reporting company, including both upstream and downstream emissions. |
|  | Sustainable Development Goal 1 | End poverty in all its forms. |
|  | Sustainable Development Goal 2 | End hunger, achieve food security, improved nutrition and promote sustainable agriculture. |
|  | Sustainable Development Goal 3 | Ensure healthy lives and promote well-being for all ages. |
|  | Sustainable Development Goal 4 | Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all. |
|  | Sustainable Development Goal 5 | Achieve gender equality and empower all women and girls. |
|  | Sustainable Development Goal 6 | Ensure availability and sustainable management of water and sanitation for all. |
|  | Sustainable Development Goal 7 | Ensure access to affordable, reliable, sustainable, and modern energy for all. |
|  | Sustainable Development Goal 8 | Promote sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work for all. |
|  | Sustainable Development Goal 9 | Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation. |
|  | Sustainable Development Goal 10 | Reduce inequality within and among countries. |
|  | Sustainable Development Goal 11 | Make cities and human settlements inclusive, safe, resilient and sustainable. |
|  | Sustainable Development Goal 12 | Ensure sustainable consumption and production patterns. |
|  | Sustainable Development Goal 13 | Take urgent action to combat climate change and its impacts. |
|  | Sustainable Development Goal 14 | Conserve and sustainably use the oceans, seas, and marine resources for sustainable development. |
|  | Sustainable Development Goal 15 | Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, halt and reverse land degradation and halt biodiversity loss. |
|  | Sustainable Development Goal 16 | Promote peaceful and inclusive societies for sustainable development provide access to justice for all, and build effective, accountable and inclusive institutions at all levels. |
|  | Sustainable Development Goal 17 | Strengthen the means of implementation and revitalize the global partnership for sustainable development. |

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# Impact Report

**Ecofin Energy Transition Strategy**

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