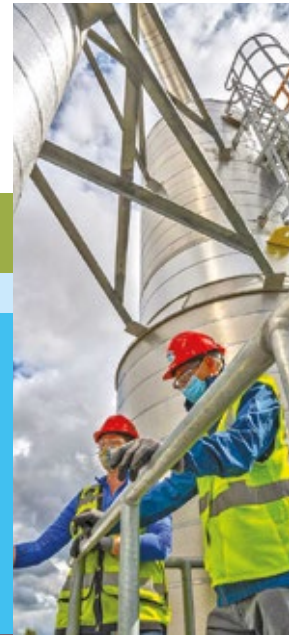


# Intel Ireland Climate Action Plan 2023

Intel Ireland  
[www.intel.ie](http://www.intel.ie)



intel®



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# Introduction

Founded in 1968, Intel has been at the heart of computing breakthroughs with its technology. We are an industry leader, creating world-changing technology that enables global progress and enriches lives. Increasingly central to every aspect of human existence, technology is transforming our world at an accelerated pace. And at the heart of that technology: semiconductors. Semiconductors are the foundation of all innovation as the world becomes more digital, from powering our ability to work remotely, to staying connected with friends and family, to providing enhanced healthcare and autonomous vehicles.

Intel products are some of the most complex devices ever manufactured, requiring advanced manufacturing technology. Our manufacturing processes advance according to Moore's Law, delivering ever more functionality and performance, improved energy efficiency, and lower cost per transistor with each generation. With five wafer fabrication sites and four assembly test manufacturing locations worldwide, Intel's manufacturing facilities employ exceptional flexibility on a global, virtual network.

Intel views climate change as a serious environmental, economic, and social challenge. We focus on reducing our own climate impact—the emissions resulting from our own operations, our supply chain, and the marketing and use of our products. We also work to identify ways that Intel® technology can help others reduce their climate impacts. Our Climate Change Policy outlines our formal position on climate change and our policy advocacy principles.



## Intel in Ireland

Intel Ireland's Leixlip campus, located in County Kildare, began operations in 1989. Since then, Intel has invested more than €30 billion in turning the 360-acre former stud farm into one of the most technologically advanced manufacturing locations in Europe. This facility is the largest private investment ever made in the history of the Irish State. Today, more than 4,500 people work at the campus in Leixlip.

The Leixlip campus is home to a semiconductor wafer fabrication facility – or fabs as they are referred to by Intel – which is a key location for production of Intel's 14nm process technology.

The Irish fab operations have consistently played a central role within Intel's global manufacturing network. We've also leveraged our advanced manufacturing capability and world class infrastructure to develop new competencies for Intel in the areas of research and design. Ireland is also part of Intel's global manufacturing site expansion plans. Construction activity began in early 2019 on the multiyear project that will double the available manufacturing space in Ireland. Intel is investing €17 billion in this new fab development which will enable the production of Intel 4, the company's most advanced process technology at the time of its release.

Construction activity is well advanced and tool installation began at the beginning of 2022. The project will involve 6,000 construction workers at its peak and once complete, will require 1,600 full time, hi-tech roles.

## Manufacturing at Intel

Our manufacturing facilities are where we make microprocessors. Microprocessors are miniature electronic devices that can be found in a whole variety of digital technologies, from personal computers, to mobile devices and servers that enable the cloud. Individual microprocessors contain billions of tiny switches called transistors. Because the features of a processor are on the nanoscale, the manufacturing process to make them is highly complex, involving several hundred steps and taking several months from beginning to end. Even though the products that we make are so small, they require a large amount of utilities, such as energy and water, in the processes of being manufactured.





# Governance

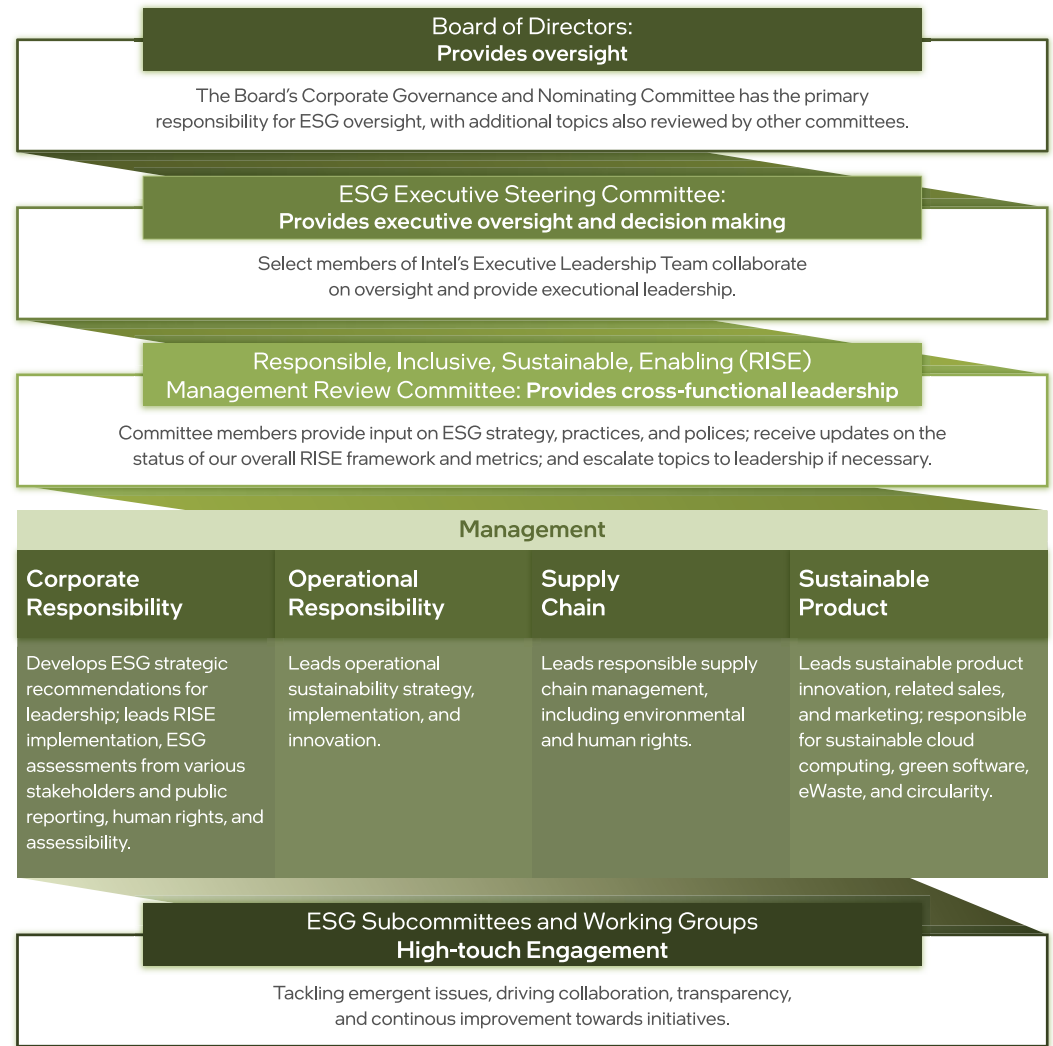
We believe that having an integrated strategy and embedding corporate responsibility across the company is the most effective management approach to drive continuous improvements in our performance.

We follow an integrated approach to address climate change, with multiple teams across the company responsible for managing climate-related activities, initiatives, and policies, with senior-level management involvement. Intel established board-level oversight for corporate responsibility in 2003, with the Corporate Governance and Nominating Committee having primary responsibility for oversight of Environmental, Social, and Governance (ESG) issues at Intel.

Management provides formal updates to the Board’s Corporate Governance and Nominating Committee and to the full Board on the company’s ESG performance and disclosure. This includes reviews of the annual **Corporate Responsibility Report** and updates on issues including environmental sustainability, human capital, human rights, political accountability, and investor outreach and feedback.

Intel is committed to transparency around our carbon footprint and climate change risk, and use the framework developed by the **Task Force for Climate-Related Financial Disclosures** (TCFD) to inform this Climate Action Plan and disclosure on climate governance, strategy, risk management, and metrics and targets.

In 2022 we established an ESG Executive Steering Committee which is chaired by our Chief People Officer. Management groups oversee the functional areas (corporate responsibility, operational sustainability, supply chain, and sustainable product) of our ESG strategy. The visual to the right shows our current governance structure.





## Corporate Strategy

Intel has a long history of leadership in corporate responsibility. We have a track record of setting ambitious goals and transparently reporting on both our progress and challenges. For decades, we have worked to progress on complex issues together with our customers and other stakeholders.

Through our integrated **ESG strategy, 'RISE,' and associated 2030 goals**, we aim to create a more responsible, inclusive, and sustainable world, enabled through our technology and the expertise and passion of our employees. Our strategy not only raises the bar for ourselves and our supply chain, but also increases the scale and global impact of our work through new collaborations with our customers and a broad range of stakeholders.



### Responsible

We seek to lead in advancing safety, wellness, and responsible business practices across our global manufacturing operations, our value chain, and beyond. We will also collaborate with others and revolutionise how technology will improve health and safety through strategic healthcare, manufacturing and transportation initiatives..



### Inclusive

We are working to advance diversity and inclusion across our global workforce and industry, and expand opportunities for others through technology, inclusion, and digital readiness initiatives. Together with a broad range of stakeholders, we will strive to make technology fully inclusive and expand digital readiness for everyone.



### Sustainable

We strive to be a global leader in sustainability by continuing to invest in reducing our own environmental footprint, including company-wide goals for achieving Net Zero greenhouse gases (GHG) emissions (Scope 1 and 2), net positive water, and zero waste to landfill. We have also taken on the challenge with our customers and others to achieve carbon neutral computing through improved product energy efficiency and sustainable design – and the increased application of technology solutions to reduce emissions in high-impact industries.



### Enabling

Through innovative technology and the expertise and passion of our employees we enable positive change within Intel, across our industry, and beyond. We believe that the health of our community depends on an increasingly inclusive community of innovators prepared for the jobs of the future. We are collaborating with others to broaden access to opportunity, support community needs, and inspire the next generation of innovators.

## Net Zero

Intel has pledged to achieve net-zero GHG emissions across its global operations by 2040, to increase the energy efficiency and lower the carbon footprint of Intel products and platforms with specific goals, and to work with customers and industry partners to create solutions that lower the GHG footprint of the entire technology ecosystem.

### What It Means for Intel's Global Operations

Intel has committed to reach **net-zero GHG emissions across its operations, otherwise known as its Scope 1 and 2 emissions, by 2040**. Intel's priority is to actively reduce its emissions, in line with international standards and climate science. Intel will only use credible carbon offsets where other feasible options are exhausted.

Intel is also committed to addressing climate impacts throughout its upstream and downstream value chain, known as Scope 3 emissions. Intel's Scope 3 GHG strategy focuses on partnering with suppliers and customers to take action to reduce overall emissions. Intel is actively engaged with its suppliers to identify areas of improvement, including increasing supplier focus on energy conservation and renewable energy sourcing, increasing chemical and resource efficiencies, and leading cross-industry consortia to support the transition to a net-zero GHG semiconductor manufacturing value chain.

To support customer sustainability goals and reduce Scope 3 product-use GHG emissions, Intel will continue to increase the energy efficiency of its products.

Global climate change is a serious environmental, economic and social challenge, and Intel believes that it warrants an equally serious response by governments and the private sector. Intel exercises leadership both in reducing our own footprint and in working with others to influence the development of sound public policy. As a semiconductor manufacturing company that is committed to reducing our carbon

footprint and increasing our handprint (i.e. developing products with a positive climate impact), we have taken voluntary actions to reduce our GHG emissions for decades including:

 <h3>Scope 1</h3> <p>Point-of-use (POU) abatement, nitrogen trifluoride (NF<sub>3</sub>) remote plasma chamber cleans, chemical substitution, process and equipment optimisation, energy efficiency of our operations, electrification of fossil fuel heating.</p>	
	 <h3>Scope 2</h3> <p>Renewable electricity purchases, onsite renewable/alternative electricity systems, green building/factory design, energy efficient operations.</p>
 <h3>Scope 3</h3> <p>Energy efficient products, logistics and distribution, electric vehicle charging stations, employee commuting and business travel programs, renewable electricity to reduce upstream energy transmission losses, landfill avoidance and upcycling to reduce downstream waste disposal impacts, collaboration with suppliers.</p>	





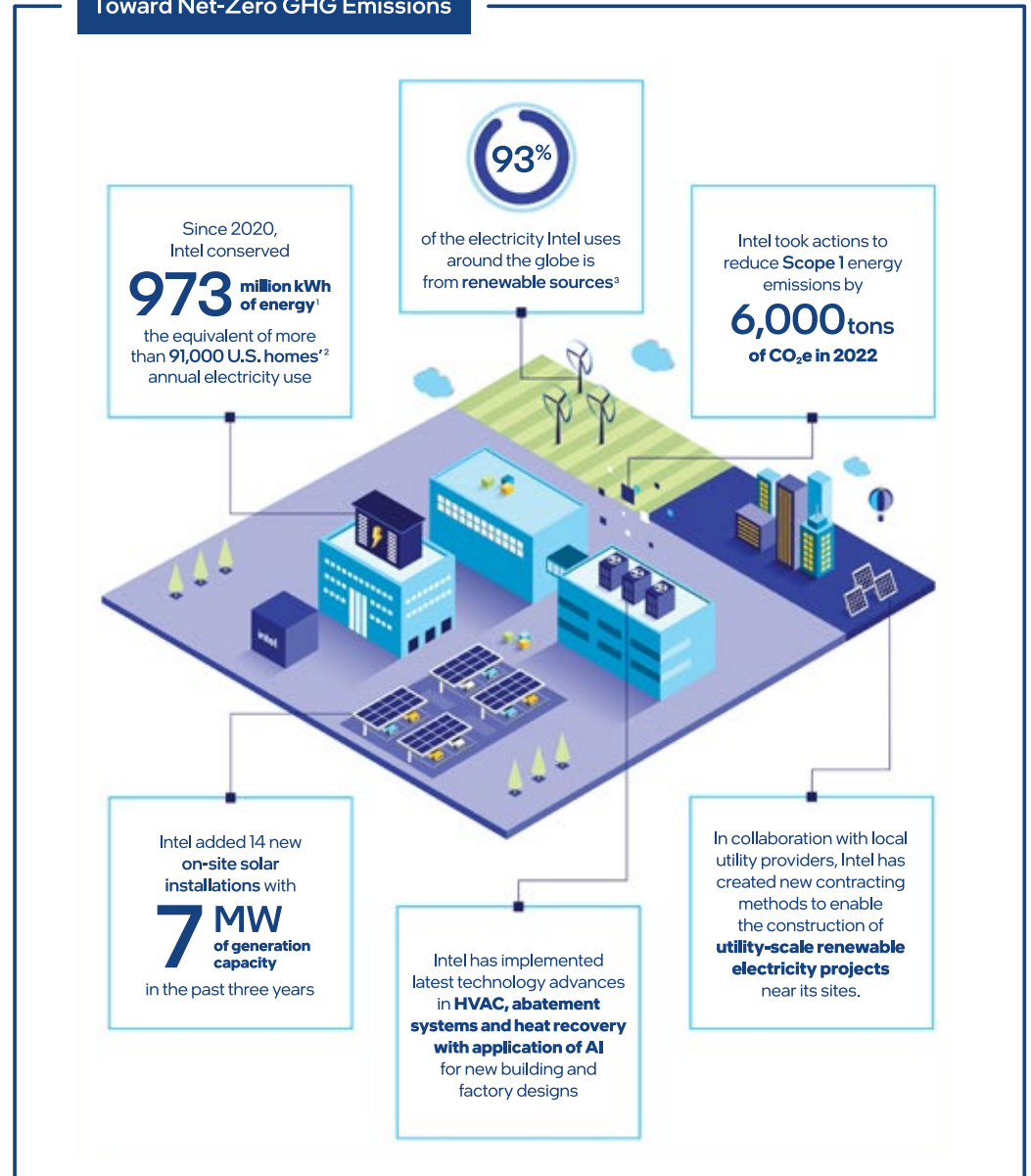
Our products play a key role in climate-related solutions such as smart electricity grids, energy management systems, smart logistics, harnessing and grid integration of wind and other renewable (i.e. our handprint). Additionally, the accelerating deployment of the “Internet of Things” (IOT), powered by Intel silicon, promises to bring vast increases in intelligence to the world around us, leading to, among other things, further gains in energy efficiency.

## What This Means for Intel’s Supply Chain

Intel is actively engaged with its suppliers to identify areas of improvement, including increasing supplier focus on energy conservation and renewable energy sourcing, increasing chemical and resource efficiencies, and leading cross-industry consortia to support the transition to a net-zero GHG semiconductor manufacturing value chain. To accelerate progress, Intel is committed to partnering with suppliers to drive supply chain GHG emissions to at least 30% lower by 2030 than they would be in the absence of investment and action.



## Toward Net-Zero GHG Emissions





# Risk Management

Intel considers risk to be the possibility that an undesired event could occur that might adversely affect the achievement of our objectives. Risks vary in many ways, including the ability of the company to anticipate and understand the risk, the types of adverse impacts that could result if the undesired event occurs, the likelihood that an undesired event and a particular adverse impact would occur, and the ability of the company to control the risk and the potential adverse impacts.

## Examples of climate related risks faced by Intel include:

- Physical risks, such as natural disasters
- Supply chain disruption due to climate change impacts
- Business-specific risks related to regulatory compliance and corporate responsibility

Not all risks can be dealt with in the same way. Some risks may be readily perceived and controllable, while other risks are unknown; some risks can be avoided or mitigated by particular behaviour, and some risks are unavoidable as a practical matter.

## Intel’s Board has primary responsibility for risk oversight. The Board executes its oversight duties through:

- Assigning specific oversight duties to the Board committees
- Periodic briefing and informational sessions by management on:
  - The types of risks the company faces
  - Enterprise risk management: risk identification, mitigation, and control

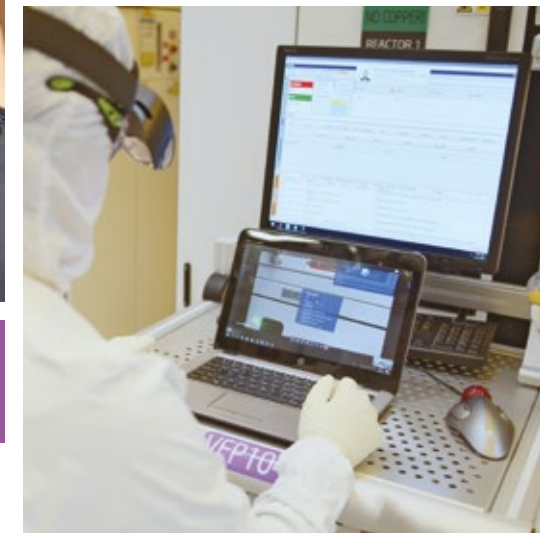
The Corporate Governance and Nominating Committee oversees issues related to risks arising from the company’s environmental, social, and governance practices as well as corporate responsibility and sustainability initiatives and performance.

## Management is primarily responsible for:

- Identifying risk and risk controls related to significant business activities
- Mapping the risks to company strategy
- Developing programs and recommendations to determine the sufficiency of risk identification, the balance of potential risk to potential reward, and the appropriate way to manage risk

We describe our overall risk management processes in our [2022 Proxy Statement](#), and we describe our climate-related risks and opportunities in this report, our [Climate Change Policy](#); “Risk Factors” within of our [2021 Annual Report on Form 10-K](#), and in our most recent CDP Climate Change survey, which is available

on our [Report Builder website](#). Our Corporate Responsibility Report also includes a mapping of our disclosure to the [TCFD](#) and [Sustainability Accounting Standards Board \(SASB\)](#) frameworks. We continue to work with our stakeholders to identify and support climate related risk mitigation.



## Corporate

Unlike many companies in the electronics industry that outsource their production, we manufacture the majority of our products in our own wafer fabrication facilities. As a result, Intel's direct environmental footprint is more significant than those of our "fab-less" competitors, whose manufacturing footprints sit in their supply chains. This business model also gives us a unique advantage when it comes to integrating sustainable practices within production, as we have direct control over manufacturing processes.

We continually strive to improve our operations and minimise our impact on the environment. In our view, a commitment to sustainability requires a broad portfolio of efforts; we invest in conservation projects and set company wide environmental targets, seeking to drive reductions in GHG emissions, energy use, water use, and waste to landfill.

### Linking Compensation and Financing to Environmental Performance

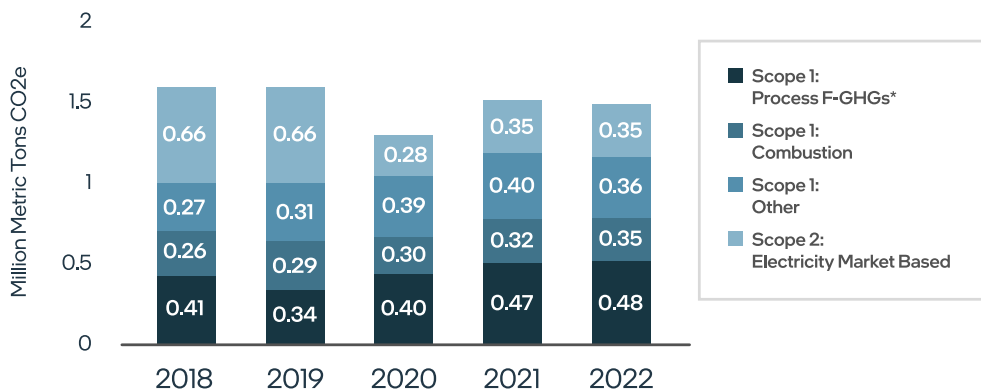
Since 2008, we have linked a portion of executive and employee compensation to corporate responsibility factors. Our 2022 bonus incorporated environmental-related metrics aligned to our 2030 goals, including achieving 90% renewable electricity globally, conserving 8.5 billion gallons of water in our operations, and restoring 2.5 billion gallons of water to local watersheds. We surpassed each of the targets, conserving 9.6 billion gallons and restoring 3.0 billion gallons of water, and reaching 93% of renewable electricity globally. In 2023, environmental metrics include achieving at least 95% renewable electricity globally, reducing Scope 1 and 2 GHG emissions by 130,000 metric tons of carbon dioxide equivalent (CO<sub>2</sub>e), conserving and restoring 12 billion gallons of water, and sending ≤5% of waste to landfill by the end of 2023. For more information, see our [2023 Proxy Statement](#). In 2022, for the third consecutive year, we achieved our green revolving credit facility targets for energy and water conservation.

In August 2022, we also announced the pricing of our inaugural green bond issuance, totaling \$1.25 billion. The net proceeds of the green bond offering are intended to be used to fund eligible projects in six key areas that support Intel's sustainability goals, including green buildings, energy efficiency, circular economy and waste management, GHG emissions reductions, water stewardship, and renewable electricity. Intel has allocated \$425 million, or approximately 34%, of the \$1.25 billion green bond proceeds. As highlighted in our first [green bond impact report](#), the proceeds, which support Intel's investments in sustainable operations, have been allocated across five project categories: pollution prevention and control, water stewardship, energy efficiency, renewable energy, and circular economy and waste management.



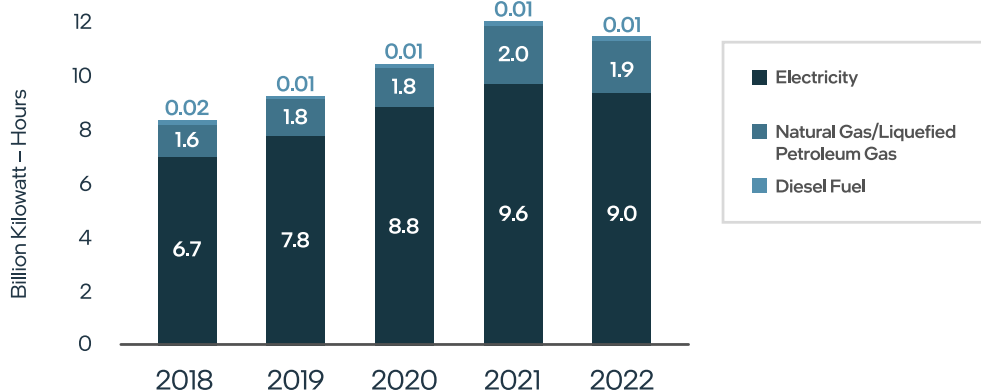
# Corporate Metrics

## 1.1 Scope 1+2 GHG Emissions



\*Note: F-GHGs stands for fluorinated greenhouse gases and includes perfluorocarbons (PFCs) and other fluorinated GHGs used in Intel's semiconductor fabrication.

## 1.2 Energy Use



# Corporate Goals

In 2011, Intel set the first long term (10-year), sustainability goals to be achieved by 2020. We repeated this goal setting strategy in 2020 with our RISE 2030 goals. In 2022, we followed this with our Net Zero GHG by 2040 commitment. Each year we set internal 1-year targets to drive progress toward our sustainability goals, which are tied to all employees' bonuses. We can set out the elements of these goals according to their support of our Ireland Climate Action Plan as follows:

## Scope 1 & 2

**Greenhouse Gases** – Drive a 10% reduction in our absolute Scope 1 and 2 GHG emissions from 2019 baseline by 2030. Progress measured as percent reduction from our calendar year 2019 emissions. *(2030 RISE Sustainability Commitment)*

Intel is committed to reaching net-zero GHG emissions across its operations, otherwise known as Scope 1 and 2 emissions, by 2040. Intel's priority is to actively reduce its emissions, in line with international standards and climate science. We will use credible carbon offsets to achieve our goal only after other feasible options are exhausted. *(Net Zero 2040 Commitment)*

**Renewable Electricity** – Achieve 100% renewable electricity by 2030. *(2030 RISE Sustainability Commitment)*

**Energy Conservation** – Invest approximately \$300 million in energy conservation at our facilities to achieve 4 billion cumulative kilowatt hours (kWh) of energy savings by 2030. *(2030 RISE Sustainability Commitment and Net Zero 2040 Commitment)*  
Achieve cumulative electricity savings of 4 billion kWh from 2020 to 2030. Progress measured from baseline of January 1, 2020. *(2030 RISE Sustainability Commitment)*

**New Developments** – Build new factories and facilities to meet U.S. Green Building Council® LEED® program standards, including recently announced investments in the U.S., Europe and Asia. *(Net Zero 2040 Commitment)*

## Scope 3 – Supply Chain

Intel is committed to partnering with suppliers to drive supply chain GHG emissions to at least 30% lower by 2030 than they would be in the absence of investment and action. We are committed to reaching Net Zero GHG emissions by 2050. We are also committed to logistics and distribution, electric vehicle charging stations, employee commuting and business travel programs, renewable electricity to reduce upstream energy transmission losses, landfill avoidance and upcycling to reduce downstream waste disposal impacts. *(Net Zero 2050 Commitment)*

## Net Positive Water

Achieve net positive water by conserving 60 billion gallons of water and funding water restoration projects that restore more fresh water than we consume to our local watersheds. *(2030 RISE Sustainability Commitment)*

## Circular Economy

We continue to find ways to recover materials and regenerate resources to create circular economy solutions that reduce costs and environmental impact. Our circular economy actions have a positive impact on Scope 1, 2 and 3 GHG emissions.

### To that end we have the following water and waste goals:

- **Water** – Achieve net positive water by conserving 60 billion gallons of water and funding water restoration projects that restore more freshwater than we consume to our local watersheds. *(2030 RISE Sustainability Commitment)*
- **Waste** – Achieve zero waste to landfill and implement circular economy strategies for 60% of our manufacturing waste streams in partnership with our suppliers. *(2030 RISE Sustainability Commitment)*

To learn more about our other sustainability commitments such as net positive water and zero waste to landfill, visit [www.intel.com/responsibility](http://www.intel.com/responsibility).

## Corporate Progress

For over two decades we have voluntarily reduced our GHG emissions through significant investments and actions. Despite the increase in complexity of our current manufacturing process technologies, we have avoided 80% of our cumulative Scope 1 and 2 GHG emissions over the last decade, through these investments and actions. We are working to drive further reductions to reach net-zero GHG emissions (Scope 1 and 2), as well as through collaboration with others in the semiconductor and other manufacturing industries. We collaborate with others in the semiconductor and other industries to identify new and innovative approaches to reduce emissions.

Intel strives to contribute to the global effort toward science-based GHG emissions reductions, in line with the reduction pathway to limit global warming to 1.5°C. However, we face challenges in gaining formal approval for an emissions-reduction target under the methodology of the Science-Based Targets Initiative (SBTi) due to a number of factors. First, the absolute contraction approach for setting science-based GHG targets does not allow companies to account for early action to reduce emissions. By not accounting for these historical reductions in Scope 1 and 2 emissions, companies that have demonstrated leadership in early, voluntary emissions reductions are at a disadvantage compared to companies that are now beginning their GHG reduction efforts. While Intel's long-term net-zero GHG goal is in line with a 1.5°C emissions reduction scenario required for a science-based target, we are challenged by the near-term reduction requirement without the ability to account for significant historical reductions.

Second, demand for semiconductors is increasing, due in part to the role that technology plays in driving climate change solutions. Current frameworks do not include consideration of the reduction in GHG emissions through the application of technology, or the "handprint"—the environmental benefit that technology provides.

In 2022, we continued our work with industry members to evaluate options for setting an SBTi-approved target, and we will continue this work in 2023.

### Progress towards Corporate Sustainability Goals as of end 2022:

#### Scope 1 & 2

**Greenhouse gas emissions** – Our combined Scope 1 (direct) and Scope 2 (indirect) GHG emissions decreased 4% on an absolute basis in 2022 from the 2019 baseline. Our total GHG emissions (including Scopes 1, 2, and 3) decreased by 2% from 2020 to 2021 while also maintaining 100% renewable electricity in locations with substantial growth in usage.

**Energy Conservation** – we have conserved a cumulative total of over 269,000 Metric tons of carbon dioxide equivalent (MTCO<sub>2e</sub>) through energy conservation projects since the baseline date of 1st January 2020.

#### Scope 2

**Renewable Electricity** – In 2022, we achieved 100% renewable electricity in the US, European Union, Israel, and Malaysia, and are approaching 100% in Costa Rica—bringing the global total to 93%. Over the last five years, we have purchased 33.6 billion kWh of renewable electricity.

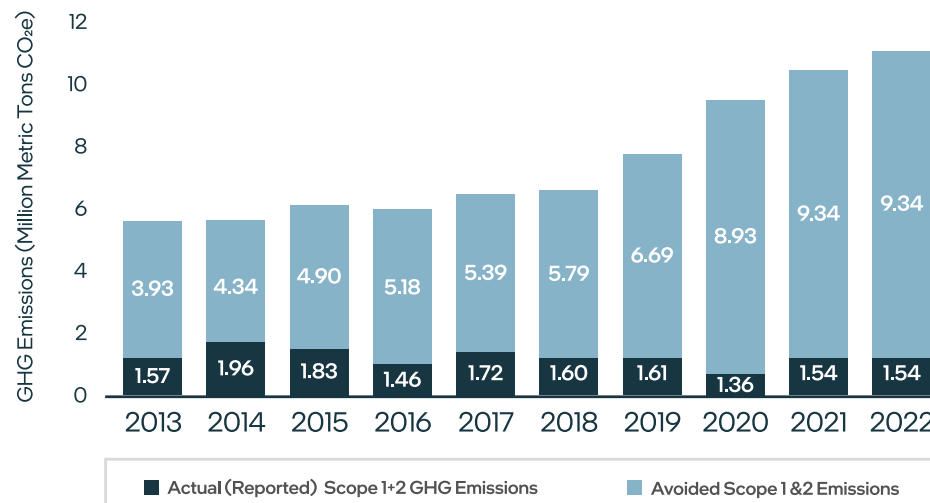
**Electricity Conservation** – In 2022, we invested in projects that enabled us to conserve an additional 160 million kWh of electricity. Cumulatively we conserved approximately 970 million kWh of electricity from the 2020 baseline through the end of 2022.

## Circular Economy

**Water** – During 2022, we conserved 9.6 billion gallons of water and 26 billion gallons cumulatively from the 2020 baseline. In addition, Intel-enabled projects restored over 3.04 billion gallons of water to our watersheds in 2022.

**Waste** – During 2022, we sent approximately 6.4% of our total waste to landfill and continue to work toward our goal of zero total waste to landfill by 2030. For 2022, circular economy practices were applied to 67% of our manufacturing waste streams via reuse, recovery, or recycling.

1.3 Scope 1 + 2 avoided emissions over the last decade





# Environmental Management

The **Intel Code of Conduct**, **Climate Change Policy**, **Global Water Policy**, **Energy Policy**, and **Environmental, Health, and Safety Policy** guide our sustainability strategy and help us set goals. Under these policies, we strive to consider environmental impact when we select sites, design buildings, set performance levels for manufacturing tools, and establish goals for production processes.

For over a decade, Intel has maintained multi-site, third-party-verified International Organization for Standardization (ISO) 14001 registration to evaluate the effectiveness of our Environmental Management System. Our Corporate Energy Management System is designed to follow the ISO 50001 Energy Management Standard; to date, we have received third-party ISO 50001 accreditation for 6 of our manufacturing sites. To minimize our emissions of particulate matter (PM) — including PM less than 2.5 microns (PM<sub>2.5</sub>), volatile organic compounds (VOCs), hazardous air pollutants (HAPs), nitrogen oxides (NO<sub>x</sub>), and carbon monoxide (CO) — we seek to use emissions reduction strategies, including abatement equipment such as rotary concentrator thermal oxidizers, wet electrostatic precipitators, wet scrubbers, and ultra-low NO<sub>x</sub> burners.

We also conduct regular environmental, health, and safety (EHS) program self-assessments to validate EHS compliance at the individual site level. In addition, our senior global EHS professionals' partner with legal counsel to complete periodic internal audits related to compliance, management systems, and business risk at various Intel sites. The audits are designed to include in-depth documentation and records reviews, interviews with site leadership, and physical inspections related to EHS compliance. Key to our chemical

management strategy is a comprehensive review of materials, which starts with a regulatory search of all applicable chemical regulations and use restrictions. The search includes Intel-specific restrictions (which often go beyond regulatory requirements), and local and global regulations. We then identify the environmental and safety controls needed to protect personnel and the environment during a chemical's intended use.

On an annual basis, we report Intel's emissions, waste transfers off-site, and treatment of reportable chemicals in the countries where Intel operates and seek to do so in accordance with local and national regulations. To better understand how Intel compares to others in our industry, we regularly benchmark our environmental performance with semiconductor and other large companies.





## Introduction

For over 30 years, Intel has had a manufacturing presence here in Ireland, producing some of the world's most complex devices from North Kildare.

The Leixlip site has been at the forefront of many sustainability initiatives to support Intel's Corporate Sustainability Goals. Since Ireland is a member state of the EU, Intel has benefited from the progressive national and regional ecosystem to tackle climate change.

## Intel Ireland Environmental Management

The site's formal energy management program has been in place since 2002 and was developed with national partnership, through the Sustainable Energy Authority Ireland's (SEAI) Large Industry Energy Network (LIEN) Agreement Program for National IS393 Energy Standard. EN16001 followed and finally ISO 50001 Energy Management System Standard certification in 2011. Intel Ireland has assisted other Intel sites across the Corporation to establish an ISO 50001 certified Energy Management Systems and is now the headquarter site for Intel's ISO 50001:2018 certified multisite Energy Management System.

Based on Intel's experience in world class energy efficiency design, Intel was a key contributor to the development of the IS399 Energy Efficient Design Standard. All our global sites are guided by Intel's Environmental, Health, and Safety Policy, Climate Change Policy, and Energy Policy to care for people and the planet from the development of our technology, through our manufacturing operations and supply chain management.

## Environmental Footprint

CO<sub>2</sub> emissions from Intel Ireland are associated with the combustion of fossil fuels in boilers, emergency generators and abatement systems as well as exhaust

### Key takeaways

We have conserved over **70 million kWh** of electricity since 2020

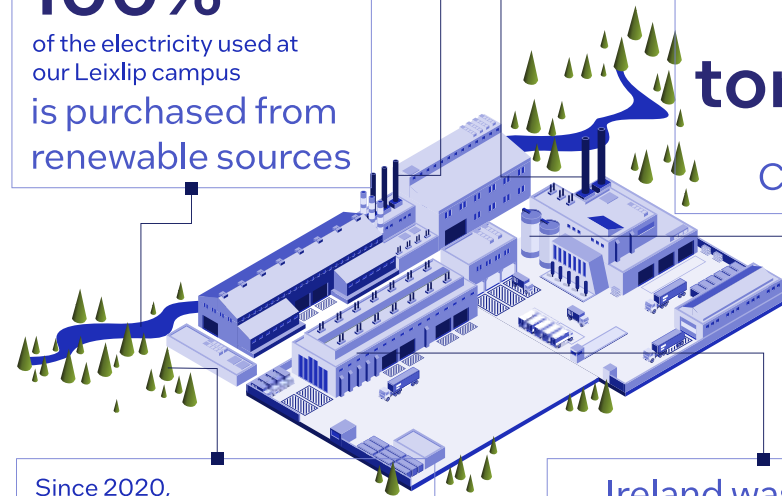
We have conserved over **4.6 million kWh** of Natural Gas since 2020

**100%** of the electricity used at our Leixlip campus is purchased from renewable sources

This resulted in over **900 tonnes** of scope 1 CO<sub>2</sub> saved

Since 2020, Intel invested over **€7 million** in energy conservation projects at the Leixlip campus

Ireland was the first Intel site to achieve an **ISO 50001** certified Energy Management System





VOCs which are combusted in the Rotary Concentrator Thermal Oxidiser (RCTO) abatement systems. Natural gas is the main source of combustion CO<sub>2</sub> emissions and is used in the boilers and abatement systems. Natural gas has the lowest GHG emissions of any fossil fuel. Intel is the holder of a GHG Permit (IE-GHG-058-10373) from the Irish Environmental Protection Agency (EPA). Under the EU's Emissions Trading Scheme (ETS), Intel has a preliminary free allocation of 6,680 EU Allowances (EUAs)/annum for 2021 through 2025 and this is expected to be reduced to zero allowances by 2030. During the period 2020 - 2022, Intel Ireland emitted 44,067 tonnes of CO<sub>2</sub> in 2020, 43,205 tonnes in 2021 and 54,168 tonnes in 2022. The increase in 2022 was due to increased natural gas usage as part of site construction operations. Based on the expansion of the site to include Fab 34 – which represents a doubling of cleanroom manufacturing area – it is anticipated that there will be an increase in CO<sub>2</sub> emissions but we have pursued efficiencies to ensure that heat-related CO<sub>2</sub> emissions are lower relative to our existing cleanroom manufacturing area. In addition, Intel has aggressively pursued energy conservation over many years as part of our commitments under ISO 50001, the International Energy Management Standard.

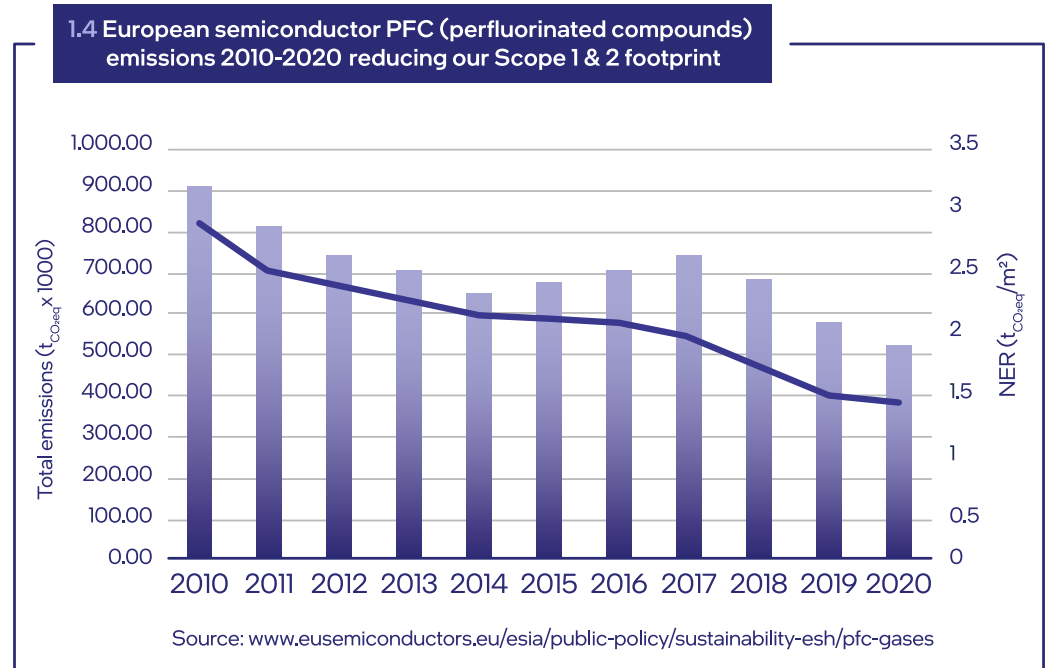


The use of perfluorinated compounds (PFC) is essential to the manufacture of high-performance semiconductor products. These compounds tend to have relatively high global warming potentials (GWP). Although the semiconductor manufacturing sector would not currently be considered a significant contributor to global warming, Intel Ireland, in conjunction with the European semiconductor manufacturing sector, has long recognised the need to be proactive in addressing these emissions. In the 1990's, the sector agreed to a voluntary commitment to reduce PFCs to 10% below the 1995 emissions level by 2010. The European semiconductor industry met and surpassed that voluntary reduction goal by

reducing absolute emissions 42% below the 1995 baseline by 2010. Intel Ireland has played its part in these reductions and has made great strides in reducing normalised emissions leading to a substantial fall in emissions over the last fifteen years.

This reduction has been achieved through several measures such as the successful introduction of low-GWP alternatives into the manufacturing process, enhanced process control and abatement units for the process tools that remove PFC compounds before they are released to the atmosphere.

A post 2010 voluntary agreement set targets for the global industry to achieve normalised emission reductions for the period 2010 to 2020. See the chart below which demonstrates a 54% reduction in European semiconductor PFCs from 2010 to 2020.



# Intel Ireland Strategy

Our sustainability strategy is based on company-wide initiatives which are driving reductions in GHG emissions, energy use, water use, and waste to landfill, and increasing circularity around the world. Intel's company-wide sustainability targets are implemented throughout our global manufacturing and non-manufacturing sites. Intel Ireland is committed to achieving each of Intel's global sustainability targets through corporate level programs and local strategies.

## The following strategies have evolved as technology solutions have emerged and site conditions allowed:

### Scope 1

Heating reduction, combustion energy reduction and plant efficiency. Electrification through heat pumps and heat recovery. Extensive use of F-gas Point of Use (POU) abatement systems. Upgrade of equipment to eliminate high Global Warm Potential (GWP) refrigerants and Heat Transfer Fluids (HTF) or replacement with low GWP/less impactful chemicals when available. Energy efficient design of new facilities.

### Scope 2

Renewable electricity supply and attributes. Asset electricity use reduction and efficiency improvement. Energy efficient design of new facilities.

### Scope 3

Employee commuting. Electric Vehicle charging. Supplier engagement.

Intel recognises Ireland's national strategy to increase renewable electricity supply percentage on the grid. Intel is contributing toward this strategy by working toward our global commitment to reach 100% renewable electricity by 2030.

Since 2016, 100% of the electricity used at our Leixlip campus is purchased from renewable sources. These renewable sources are supported by Irish in-country Guarantees of Origin (GoOs) where possible.

Intel also recognises that Ireland's natural gas grid is transitioning to support Net Zero GHG strategies. Intel is committed to supporting this transition through natural gas replacement and reductions, including continued implementation of heating demand reductions that would require natural gas boilers through expansion of the site heat recovery infrastructure and displacement with high temperature heat pumps.

The use of natural gas in air pollution control equipment such as thermal oxidizers, will be reduced through more efficient operation and waste heat recovery from the flue gas both corporately and locally.



# Intel Ireland Goals

Our sustainability 'RISE' goals are set at the corporate level and Intel's corporate strategy enables the programs, resourcing, and support for the Leixlip site to plan, set local objectives, and take action to meet the National, European, and corporate goals.

Under ISO 14001 environment and ISO 50001 energy management systems, the site sets objectives and targets to contribute to both corporate and local sustainability, environmental and energy goals.

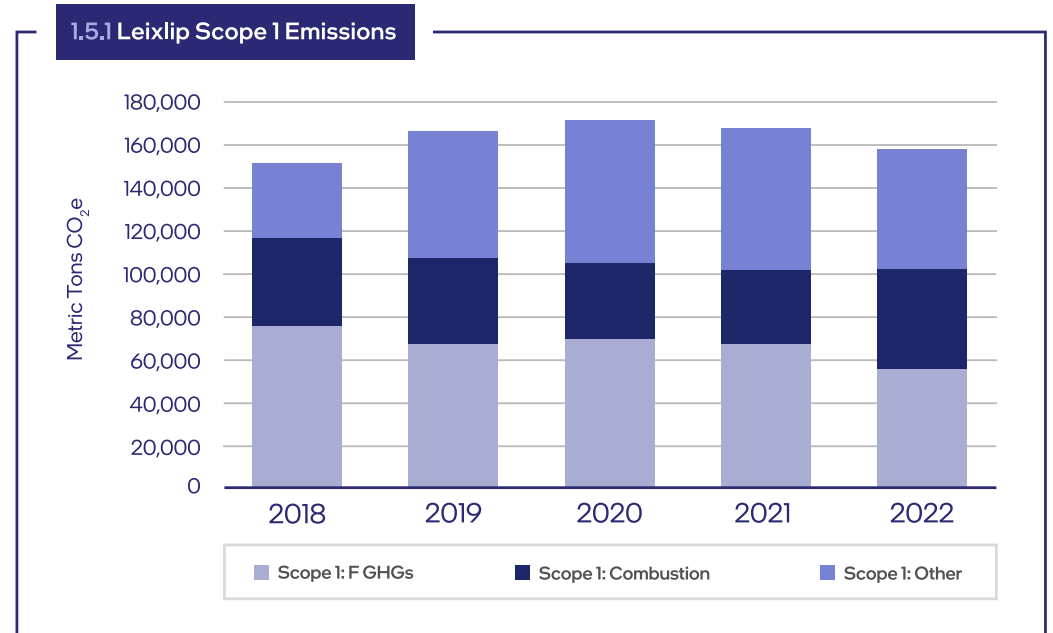
The Leixlip site contribution to the goals are detailed in the following sections on Intel Ireland progress and plans.



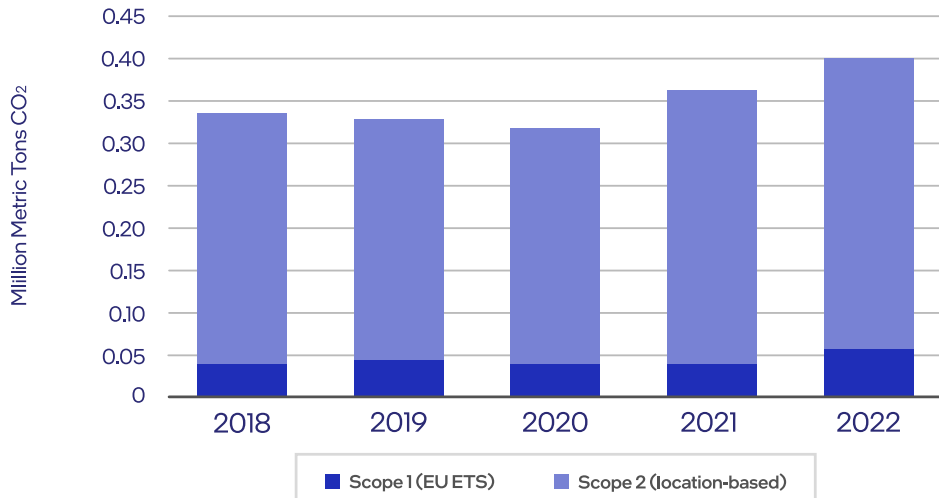
# Intel Ireland Metrics

Under its GHG permit, Intel Ireland reports CO<sub>2</sub> data related to combustion activities on an annual basis and are required to purchase carbon credits to pay for emissions outside of the free allowances that we receive from the European Commission. This further incentivises natural-gas savings projects.

# Scope 1+2 Greenhouse Gas Emissions



### 1.5.2 Intel Leixlip Energy-Related GHG Emissions



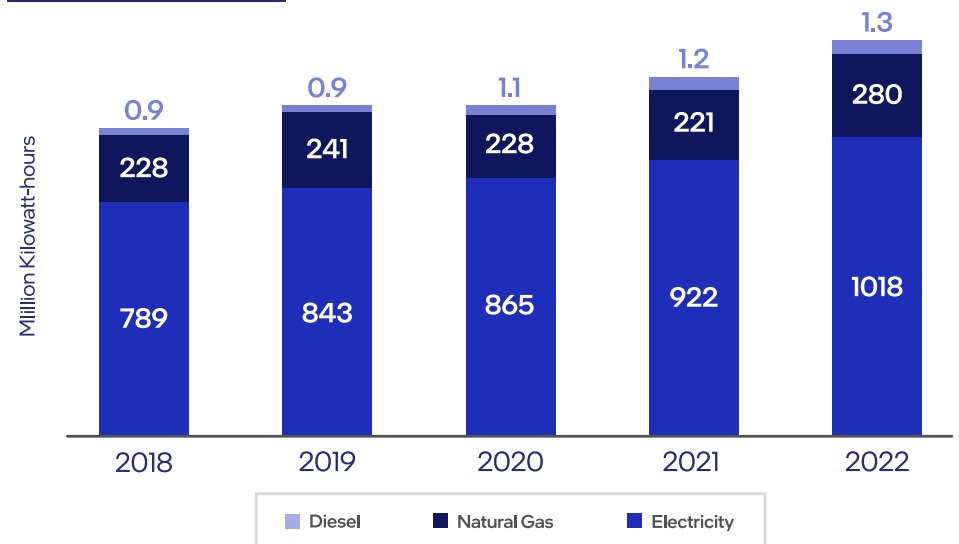
## Energy Use

Electricity (Scope 2) is the main energy source for the Leixlip site at approximately 80% (on a kWh basis). Everything from factory tools to facilities and buildings use electricity. Natural gas is supplied to boilers for heating and for emissions abatement. Diesel is used for back-up electricity generation in the event of a power outage.

The increase in energy consumption from 2021 to 2022 for electricity, natural gas and diesel is due to the construction of the Fab 34 facility.



### 1.6 Leixlip Energy Use

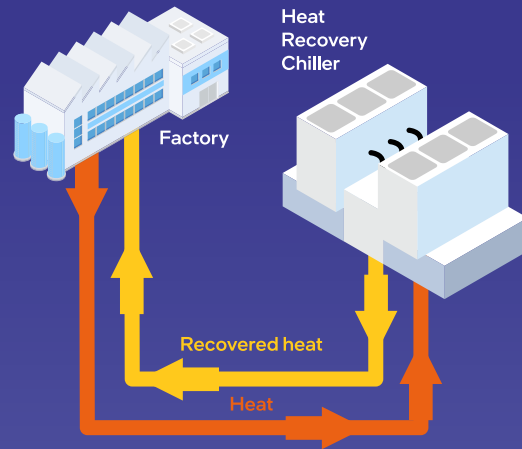


## Did you know we use waste heat to heat our buildings?

Through operation of our factories, heat is generated and needs to be removed. Traditionally that heat would be cooled by chillers and cooling towers with heat exhausted to the atmosphere. Using an energy mapping method, sources of heat demands were identified that could operate at lower temperatures and utilise this heat from the process. Heat recovery chillers, an industrial version of a heat pump, are installed, with a low temperature distribution system and right sized air handling units. When fully operational, the buildings will be using a 9:1 ratio of heat generated by heat recovery versus heat generated by traditional methods.

The amount of high-grade heat generated by burning natural gas is minimised to only that required by the production process when lowgrade heat cannot be used. When designing our new manufacturing building (Fab 34), heat recovery systems were incorporated to maximise the collection and use of the low-grade heat generated by the manufacturing process. This allowed the design approach to select air handlers and heat exchangers across the buildings to be able to utilise the low-grade heating water generated by the heat recovery system. Therefore, we are maximising the number and size of heat recovery chillers that the system can use to produce the heat required by the buildings.

We have retrofitted the infrastructure to enable this heat recovery system in our existing Fab 14 and Fab 24 manufacturing facilities. Work is underway as part of Intel's Net Zero GHG 2040 strategy to extend this to Fab 10 and reduce further our dependence on natural gas for heating.



## Intel Ireland Progress

The Intel Ireland Energy Management System provides a systematic approach to driving reductions and efficiency improvements in the use of electricity, natural gas and water. Intel is achieving these reductions through continued investment in energy and water conservation projects in Leixlip with over €60 million voluntarily invested in these measures since 2012. Operational measures include extensive use of heat recovery systems to displace natural gas boiler heating for the likes of heating factory process water and cleanroom space heating. Sources of this heat include heat from air compressors and use of industrial heat recovery chillers that send recovered 40 °C heat back to the factory.

### Intel Ireland contribution to corporate sustainability goals as of December 31<sup>st</sup> 2022:

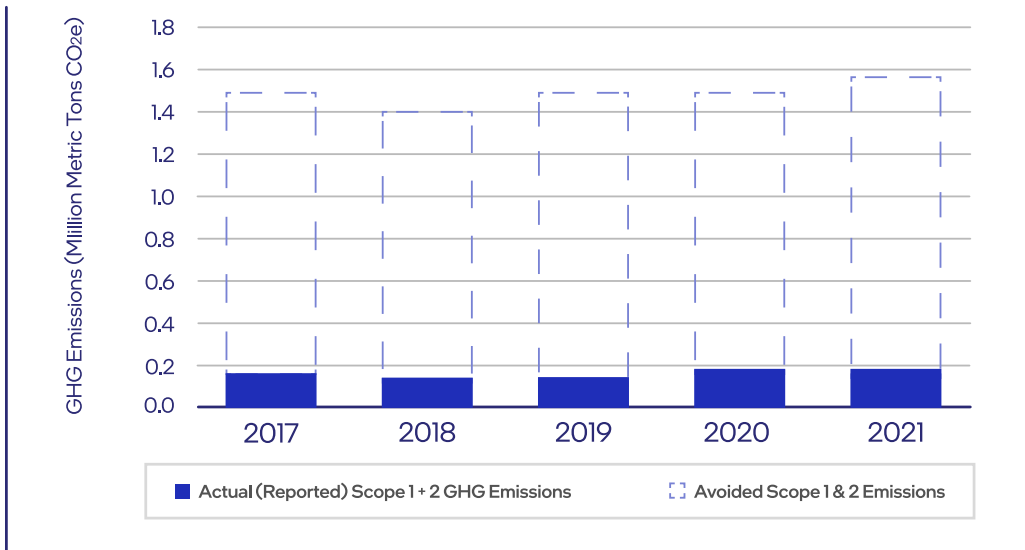
#### Scope 1 & 2

**GHG emissions** – Our absolute Scope 1 and 2 GHG emissions increased by approximately 6% from 2021 to 2022 due to construction of the Fab 34 facility.

**However, the relative increase in emissions related to this expansion have been reduced significantly through the following strategies:**

- **Reduction strategies** – These include the installation of abatement on all tools that use PFCs for the new process technology used in Fab 34. Also, there are ongoing efforts to improve GHG reporting accuracy such as abatement downtime and fluorinated GHGs (F-GHG) inventory tracking.
- **Energy conservation** – In 2022, Intel invested over €6 million in energy conservation projects at the Leixlip campus that enabled the site to conserve approximately 14 million kWh of electricity. We have conserved a cumulative total of over 70 million kWh of electricity since the baseline date of 1<sup>st</sup> January 2020.

1.7.1 The Leixlip site avoided Scope 1 and 2 emissions through the implementation of extensive emissions abatement, energy-reduction projects, and renewable electricity purchases.



## Scope 2

**Renewable electricity** – Since 2016, 100% of the electricity used at our Leixlip campus is purchased from renewable sources.

We are investing in unique technologies to further reduce our footprint. This includes continuously advancing our systems to maximise the reuse of waste heat from our factories, thereby reducing our dependency on natural gas.

We are also developing ultra-efficient abatement equipment, using the latest capabilities in artificial intelligence, software systems, and energy efficiency to create technologies that limit and potentially eliminate the use of fossil fuels for our future factory designs.

The table below gives the details of some of the larger energy conservation projects which were completed in the last 5 years.

Project	Start	Finish	Annual kWh Saving	Overview	Investment €m	Scope 1 CO <sub>2</sub> Reduction Tonnes	Scope 2 CO <sub>2</sub> Reduction (Location based)
Chiller upgrade to new GWP refrigerant and Variable Speed Drives (VSD)	2018	2020	9,202,142	Upgrade of old inefficient chillers with new more efficient VSD driven chillers with low GWP refrigerant	6	0	2,761
Cleanroom Lighting upgrade to LED	2018	2023	13,509,695	Upgrade of fluorescent cleanroom lighting with more efficient LED	4.6	0	4,053
Compressed Air Heated air dryers, dewpoint Control and System Pressure setpoint reduction	2020	2022	6,726,090	Upgrade on Non Heated air Dryers to heated to reduce dryer purging losses. System Pressure reduction	4.7	0	2,018
Increased use of heat recovery in ultra-pure water treatment to reduce natural gas usage	2021	2022	4,771,789	Usage of recovered heat to preheat incoming water was increased to reduce the natural gas needed for heating	0	943	23



## Scope 3

Intel Ireland has a number of provisions in place to support flexible commuting options that reduces our Scope 3 GHG impact and benefits our employees. For example:

- **Cycling and Walking** – Intel has secure weather-proof bicycle parking adjacent to all main entrances for employees to park their bikes. Intel offers the Bike to Work scheme to employees – a tax efficient scheme whereby employees can purchase a bicycle and accessories. Intel also provides storage lockers and shower facilities in main office buildings for those that require their use after travel to work.
- **Train and Bus** – Intel offers the Tax Saver scheme to employees – a tax efficient scheme whereby employees can purchase train and bus tickets at a reduced rate. There is a bus stop located on the Intel campus and a train station within walking distance.
- **Car-pooling** – Intel has an internal website and database to help employees set up a car-pool group and meet others interested in carpooling. Intel has priority car-pooling parking spaces adjacent to main building entrances – only car-poolers are authorised to park in these spaces.
- **Shuttle Bus** – Intel provides a shuttle bus, (free of charge), to transport employees from Celbridge to Leixlip.
- There are **48 Electric Vehicle (EV) charging points** located across each of the car parking facilities at our Leixlip campus. This was first introduced with free or nominal costs which enabled uptake of employee EV's.



**Did you know** – Intel Ireland has a number of strategies that focus on water conservation and restoration and the reduction of waste. For example:

**Water conservation** – During 2022, Intel Ireland conserved 688 million gallons (2.6 billion litres) of water and more than 1.6 billion gallons (6.05 billion litres) cumulatively from the 2020 baseline.

**Water restoration** – In May 2021, Intel Ireland funded the National Parks and Wildlife Service to launch a blanket bog restoration pilot project in the Wicklow Mountains National Park. The project involves 60 hectares of drained bog being re-wetted to increase and restore water storage levels in the River Liffey headwaters by an expected 50-90 million litres, which is about 36 Olympic-sized pools of water. This supports the National bog rehabilitation strategy to increase carbon sequestration.

**Reduction of waste** – During 2022, we sent less than 1% of our total waste to landfill and continue to work toward our goal of zero total waste to landfill by 2030. Through the end of 2022, circular economy practices were applied to 80% of our manufacturing waste streams via reuse, recovery, or recycling.

# Looking to the Future

## Intel Ireland Manufacturing Expansion

In recent years, we have reaffirmed our commitment to this business model by introducing “IDM 2.0,” a major evolution of the IDM strategy. Intel’s new IDM model includes significant manufacturing expansions, plans for Intel to become a major provider of foundry capacity in the U.S. and Europe to serve customers globally, and expansion of Intel’s use of external foundries for some of its products. Intel’s global, internal factory network for at-scale manufacturing is a key competitive advantage that enables product optimisation, improved economics and supply resilience.

Intel is expanding its global manufacturing network, including here in Ireland.

We are maintaining our commitment to our climate change commitments, even as our operations are expanding substantially.

## On the path to LEED® Gold certification in our Ireland Expansion project

For many years, our engineers have incorporated green design into the new construction and renovation of our facilities, which helps us achieve efficiencies in energy consumption, water use, and recycling.

Here in Ireland, we began a large-scale manufacturing expansion project at the Intel campus in Leixlip in early 2019. The €17 billion project is one of the largest construction activities in Europe and will see Intel double its available manufacturing space at the campus.

For the expansion project, we are in the process of compiling and submitting data to the USGBC (United States Green Building Council) and Green Building

Certification Institute as part of the LEED® process for review. The project is on target to achieve LEED® Gold certification. Globally, we have achieved LEED® green building certification for more than 18.5 million square feet of space in 53 buildings.

### There are many areas of focus required to achieve LEED® Gold standard, at a glance:

- Under the scope of transportation, we have exceeded the LEED® requirements for green vehicle parking with 48 electric vehicle charging stations available. We also have access to quality transit through offsite public transportation options and access to a dedicated on-site transit system of bussing.
- The expansion project will be the first Intel manufacturing facility to completely utilise LED lighting which uses a significantly lower amount of power than a traditional fluorescent unit. Additionally, as the LED units are programmable and sensor enabled, they can be controlled in order to further reduce their use. This means that we don’t unnecessarily have to leave lights on when an area or room is not occupied.
- Energy metering is being installed in order to give stakeholders valuable information regarding how buildings are performing and to drive efficiencies of mechanical and electrical systems through monitoring and control.
- When it comes to materials, the expansion project has taken care to source low emitting materials to drive good indoor air quality. One specific example of this is the material being used in our raised metal flooring.
- In the past two years alone, the expansion project has recycled over 298 thousand tonnes of waste.
- The project carried out an Energy Efficient Design review in accordance with Energy Efficient Design Management Standard IS399. This covered both design for energy performance and design for energy management for the expanded manufacturing facilities.



## Low carbon cement

Cement and concrete are the most frequently used construction materials in the world. As such, they have a role to play in reducing the environmental impacts of construction. For construction activity at the Intel campus in Leixlip, where possible, we have been using eco-friendly, low-carbon cement. To create this low-carbon solution, ground granulated blast furnace slag (GGBS), is used in the concrete mix design to increase the recycled content and to reduce the environmental impact of a structure or precast element. It typically produces half the amount of GHG emissions compared to traditional concrete. A specific aspect of construction that has recently been completed at our campus was the installation of a new multistorey car park. For this project, thousands of precast units were pieced together to form a new 5-story car park with capacity for more than 2,000 cars. Low-carbon cement was utilised in approximately 33% of the pre-cast units. We have utilised low-carbon cement in our latest expansion project, both for precast units being manufactured off site and later fitted in position, and for elements that were constructed at the site.

## Off-site Manufacturing

For our latest manufacturing expansion project, we have been able to utilise a significant amount of off-site manufacturing, which has sustainability benefits such as direct control and management of energy and production processes, and reduced traffic bringing materials to the site. This means that we can construct, assemble, and stage a number of modular units at a location away from the main site and transport the units in as required.

Off-site manufacturing also enables greater precision and predictability whilst lessening some of the heavy

construction activity required on-site. An aspect of off-site manufacturing that is perhaps lesser recognised however, is that it is often a more sustainable approach.

For example, off-site manufacturing enables us to move significant elements of the construction process from the building site to a location that is more like a factory or warehouse environment. The factory or warehouse location has much more control of aspects such as light and heat than construction sites, with greater opportunities for efficiencies.

By constructing modules in an offsite location, there is a reduction in the overall number of vehicle movements and deliveries needed at the building site. By utilising precast elements, 800 fewer truck deliveries were needed just in the construction of our new multi storey car park at the site.

Our commitment to green design standards and building concepts in the construction of our facilities is shaping how we deliver large scale building projects, driving innovation and efficiencies that will create a more sustainable construction approach and with it, a lasting environmental impact.



**Did you know** - We have a dedicated online platform to share data on our environmental performance. Explore Intel is a website which has been created to promote corporate transparency by sharing information on our environmental performance specific to each of our manufacturing locations worldwide. The website has a wide variety of environmental resources including environmental information on water, waste, energy and air: [www.exploreintel.com/ireland](http://www.exploreintel.com/ireland)

## Reducing our Impact

Our strategy to reduce first then recycle/recover and finally refuel is applied to all that we do. An example for this is building heating: first reduce the need for building heating; then recover heat to displace the heating source and finally refuel with electrical heat pumps.

The plans below are some examples of the reduction efforts identified for both our existing manufacturing facility and our new Fab 34 expansion.

### Scope 1 & 2

Our overall goal is to eliminate the use of natural gas for combustion. To that end, we plan to further reduce our heating needs for process heating and building heating. An example is the Fab 10 heat pump which is illustrated in the table shown below. As part of our ISO 50001 Energy management system we continue to identify and implement energy reduction projects.

We also continue to assess opportunity for Hydrogen use as a refuel opportunity.

### Scope 2

**Renewable electricity** – The site continues to implement the electricity purchasing strategy for 100% Green supply that also supports National and European targets for renewable electricity. .

**We are in the process of considering strategies and supply mechanisms for the following:**

- Renewable CPPA projects / contract opportunities that would add more renewable power to the grid.
- Opportunities to continue to look for on-site projects. For example, exploring renewable generation options that can directly connect on our campus.
- The continued purchase of Green Attributes from Irish National Grid and from the EU that are credible and verified GoOs (guarantees of origin certificates), to continue to support renewable energy generation.

Project	Start	Finish	Annual kWh Saving	Overview	Scope 1 CO <sub>2</sub> Reduction	Scope 2 CO <sub>2</sub> Reduction (location based)
Fab 10 Heat Pump	2023	2024	18,316,911	Use of water-to-water heat pump to recover waste heat from factory to reduce natural gas usage in boilers.	4,769	(1627) increase*
Chiller Upgrade	2023	2025	4,573,730	Upgrade of old, inefficient chillers with new more efficient VSD driven chillers.	0	1,372
Chiller Upgrade to Variable Speed Drive	2024	2025	6,726,090	Upgrade of compressors on chillers to variable speed drives to increase operational efficiency.	0	2,018
F10 Cleanroom Heating	2023	2024	6,409,821	Installation of heat recovery water coils in F10 cleanroom makeup air handlers to reduce the use of hot water from natural gas. Optimisation of these units provided further savings of heating and cooling.	1,168	178

\*the increase in scope 2 emissions from this project is due to the electrical energy consumed by the heat pumps

The table gives the details of some of the larger energy conservation projects which are currently in development.

Planned investments are not guaranteed to take place. The implementation of these projects will depend on several variables including availability of technologies and solutions, funding, internal resourcing, supply chain and wider ecosystem constraints.





# Appendices

## References

[www.intel.com/content/www/us/en/environment/intel-and-the-environment](http://www.intel.com/content/www/us/en/environment/intel-and-the-environment)

### Corporate Social Responsibility

[www.intel.ie/content/www/ie/en/corporate-responsibility/corporate-responsibility](http://www.intel.ie/content/www/ie/en/corporate-responsibility/corporate-responsibility)

### 10-K Report

[www.intc.com/filings-reports/annual-reports##document-5321-0000050863-23-000006-2](http://www.intc.com/filings-reports/annual-reports##document-5321-0000050863-23-000006-2)

### Intel 2022 Proxy Statement

[www.intc.com/news-events/annual-stockholders-meeting](http://www.intc.com/news-events/annual-stockholders-meeting)

### Explore Intel

[www.exploreintel.com](http://www.exploreintel.com)

## Additional References

### CDP

[www.cdp.net](http://www.cdp.net)

### Industry Engagement: SEAI LIEN Large Industry Energy Network (LIEN) | Business & Public Sector | SEAI

- [www.seai.ie/business-and-public-sector/large-business/lien](http://www.seai.ie/business-and-public-sector/large-business/lien)
- [www.climateneutraldatacentre.net](http://www.climateneutraldatacentre.net)

### RE 100

[www.there100.org](http://www.there100.org)

### Semiconductor Climate Consortium | SEMI

[semi.org/en/industry-groups/semiconductor-climate-consortium](http://semi.org/en/industry-groups/semiconductor-climate-consortium)

### IEEE International Roadmap for Devices and Systems - IEEE IRDS™

[irds.ieee.org](http://irds.ieee.org)

## Policies & Documents

### Intel Climate Change Policy Statement

[www.intel.com/content/www/us/en/corporate-responsibility/environment-climate-change-policy](http://www.intel.com/content/www/us/en/corporate-responsibility/environment-climate-change-policy)

### Intel Environmental, Health, and Safety Policy

[www.intel.com/content/www/us/en/corporate-responsibility/environmental-health-safety-policy](http://www.intel.com/content/www/us/en/corporate-responsibility/environmental-health-safety-policy)

### Intel Energy Policy

[www.intel.com/content/www/us/en/corporate-responsibility/intel-energygypolicy](http://www.intel.com/content/www/us/en/corporate-responsibility/intel-energygypolicy)

### Intel Leixlip EHS and Energy Policy (pdf)

[www.exploreintel.com/assets/documents/ireland/reports/Intel%20Ireland%20EHS%20and%20Energy%20Policy.pdf](http://www.exploreintel.com/assets/documents/ireland/reports/Intel%20Ireland%20EHS%20and%20Energy%20Policy.pdf)

### Intel Ireland EHS and Energy Policy (video)

[www.youtube.com/watch?v=F79YQH\\_F-rE&t=29s](http://www.youtube.com/watch?v=F79YQH_F-rE&t=29s)

### Intel Ireland Ltd Annual Environmental Report 2021 (pdf)

[www.exploreintel.com/assets/documents/ireland/reports/Intel%20Ireland%20AER%202021.pdf](http://www.exploreintel.com/assets/documents/ireland/reports/Intel%20Ireland%20AER%202021.pdf)

### Intel Water Policy

[www.intel.com/content/www/us/en/policy/policy-water](http://www.intel.com/content/www/us/en/policy/policy-water)

### Ireland Corporate Responsibility

[www.intel.ie/content/www/ie/en/citizenship/intel-citizenship-programs](http://www.intel.ie/content/www/ie/en/citizenship/intel-citizenship-programs)

### Intel® Education Program

[www.intel.ie/content/www/ie/en/education/education](http://www.intel.ie/content/www/ie/en/education/education)

### Friends of the Rye publication

[www.intel.ie](http://www.intel.ie)

### Guarantees of Origin

[www.sem-o.com/markets/guarantees-of-origin](http://www.sem-o.com/markets/guarantees-of-origin)

# Certifications

## **ISO 14001**

## **ISO 5000**

[www.iso.org/iso-50001-energy-management](http://www.iso.org/iso-50001-energy-management)

## **Business Working Responsibly Mark (pdf)**

[www.exploreintel.com/Ireland](http://www.exploreintel.com/Ireland)

## **ISO 14001 Certificate (pdf)**

[www.exploreintel.com/Ireland](http://www.exploreintel.com/Ireland)

## **ISO 50001 Certificate (pdf)**

[www.exploreintel.com/Ireland](http://www.exploreintel.com/Ireland)

## **ISO 45001 Certificate (pdf)**

[www.exploreintel.com/Ireland](http://www.exploreintel.com/Ireland)

## **SEAI LIEN**

Intel Ireland has been a member for over 20 years

## **SEAI ExEED**

Intel supported the technical working group for IS 399 which led to development of EXEED programs

[www.seai.ie/publications/IS399-EnergyEfficient-Design-Management-overview-.pdf](http://www.seai.ie/publications/IS399-EnergyEfficient-Design-Management-overview-.pdf)

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<sup>1</sup> This is a preliminary estimate published in Intel's 10-K. The final number will be reported in Intel's 2022-23 Corporate Responsibility Report, to be issued later in 2023.

<sup>2</sup> Based on average U.S. household energy usage figures published by the U.S. Energy Information Administration.

<sup>3</sup> This is a preliminary estimate published in Intel's Proxy Statement. The final number will be reported in Intel's 2022-23 Corporate Responsibility Report, to be issued later in 2023.

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