

Climate Action Report

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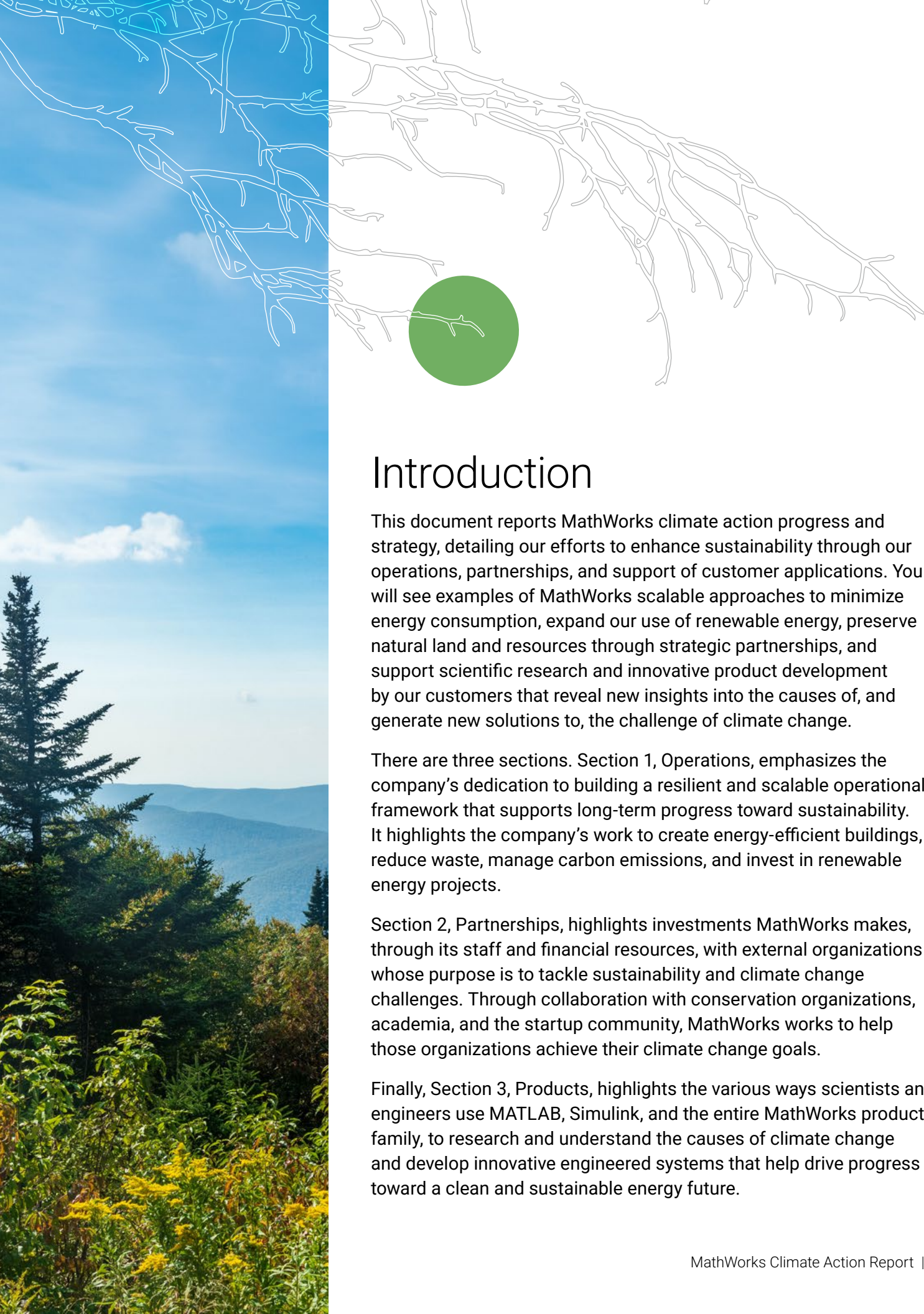
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Introduction

This document reports MathWorks climate action progress and strategy, detailing our efforts to enhance sustainability through our operations, partnerships, and support of customer applications. You will see examples of MathWorks scalable approaches to minimize energy consumption, expand our use of renewable energy, preserve natural land and resources through strategic partnerships, and support scientific research and innovative product development by our customers that reveal new insights into the causes of, and generate new solutions to, the challenge of climate change.

There are three sections. Section 1, Operations, emphasizes the company's dedication to building a resilient and scalable operational framework that supports long-term progress toward sustainability. It highlights the company's work to create energy-efficient buildings, reduce waste, manage carbon emissions, and invest in renewable energy projects.

Section 2, Partnerships, highlights investments MathWorks makes, through its staff and financial resources, with external organizations whose purpose is to tackle sustainability and climate change challenges. Through collaboration with conservation organizations, academia, and the startup community, MathWorks works to help those organizations achieve their climate change goals.

Finally, Section 3, Products, highlights the various ways scientists and engineers use MATLAB, Simulink, and the entire MathWorks product family, to research and understand the causes of climate change and develop innovative engineered systems that help drive progress toward a clean and sustainable energy future.



OPERATIONS

MathWorks Environmental Policy

Commitment to Reporting and Transparency

Addressing Our Carbon Footprint

Our Greenhouse Gas Inventory

Supporting Renewable Energy

Enabling Carbon Removal Projects

Investing in Quality Carbon Removal Projects

Managing Energy and Water

Optimizing Our Natick Facilities

Diverting Waste

Composting in Our Cafeterias

Reducing Carbon Footprint Through IT Efficiency



Operations

MathWorks has worked to create sustainable buildings at its headquarters campus sites in Natick, Massachusetts since 1995. We build and operate our facilities to minimize energy consumption and emissions and, beginning in 2020, started offsetting emissions we cannot yet eliminate. We regularly audit our buildings, collaborating with our staff and vendor partners to uncover opportunities for enhancement. To this end, and in accordance with ISO 14001, MathWorks has developed an Environmental Management System that defines our environmental governance structure and environmental policy.

For our locations around the world, MathWorks embraces practices that emphasize compliance and the reduction of our environmental footprint. Our approach is decentralized and thoughtfully tailored to the unique circumstances and capabilities of each of our offices, whether owned or leased. By considering local laws, regulations, footprint size, and the specifics of lease or ownership status, we ensure that our operational strategies are both effective and adaptable.

In our operations, we begin by actively reducing our environmental impact through the adoption of energy-efficient technologies, trimming excess, and integrating renewable energy sources. By investing our time and resources in reviewing our design standards and working to understand how building technologies are advancing, we significantly minimize our energy, waste, and carbon footprint from the outset while also ensuring that our buildings are eco-friendly and effective in meeting staff needs.

For any impact that remains, continuous improvement through waste minimization is an ongoing focus. This is achieved through monitoring building performance, comprehensive recycling and composting initiatives to divert physical waste, or through investing in nature-based carbon removal projects and clean, renewable energy.

Through these efforts, we are committed to a resilient and sustainable operational framework that supports long-term growth and success.

MathWorks organizes our operational efforts into four pillars:

Reporting	Carbon	Energy and Water	Waste
• Annual environmental reporting • GRI alignment • External assurance	• Emission reduction • Renewable energy generation • Carbon removal and offsets	• Energy and operational efficiency • Water efficiency • Energy Procurement	• Waste reduction • Recycling • Composting • Electronic waste management

MathWorks Environmental Policy

MathWorks is committed to acting responsibly as a global corporate citizen. As part of that commitment, MathWorks recognizes that a sustainable future requires action to address the effects of climate change and environmental pollution in order to ensure the well-being of our staff, our communities and other stakeholders. As part of that action, MathWorks works to continuously improve environmental performance in all operations and to protect the environment, prevent pollution, and preserve natural resources. In pursuit of these goals, MathWorks:

- Conducts business in compliance with applicable environmental laws, regulations and permits.
- Responds promptly and responsibly to incidents that threaten health, safety, or the environment at our facilities or in the surrounding community. Reports any such incidents to authorities or affected communities as required by law or as otherwise appropriate.
- Calculates and reports greenhouse gas emissions in accordance with recognized reporting standards, as well as undertakes efforts to improve energy efficiency and support renewable energy and carbon removal projects.
- Tracks waste generation and continues to implement efforts to reduce waste generation, increase use of recyclable and compostable materials where possible, and responsibly dispose of generated waste.
- Establishes policies and procedures to minimize air and water pollution, and to monitor and reduce water consumption.
- Stores and uses all chemicals on site in accordance with all applicable laws and regulations.

MathWorks integrates sustainability into its core mission. In 2022, we formalized an Environmental Management System (EMS) for our Natick campuses, aligning with ISO 14001 standards and industry best practices. Our environmental leadership team drives measurable progress through strategic investments and performance oversight, ensuring long-term stewardship across our global footprint.

Our approach combines regulatory compliance with proactive footprint reduction across 34 global offices, tailored to each location's unique context, including:

- Local laws and regulations
- Footprint size
- Options available given lease or ownership status

We prioritize investments in high-impact sites—especially our Natick campuses, Apple Hill and Lakeside—where regular audits uncover opportunities for improvement.

Commitment to Reporting and Transparency

We understand the role data plays in identifying opportunities for innovation—particularly when it comes to reducing environmental impact. This is why, beginning in 2022, we provide annual updates regarding work to reduce our carbon footprint. This report is prepared following internationally recognized standards including GRI (see Appendix) and the Greenhouse Gas (GHG) Protocol. For further assurance regarding the integrity of this report, we completed third-party verification of our environmental data following ISO 14064-3.

Addressing Our Carbon Footprint

MathWorks calculates our total global carbon footprint across Scope 1, 2, and relevant Scope 3 emissions sources following the GHG Protocol. Our goal is to avoid emitting GHGs as much as possible. To achieve this, we built energy efficient buildings on our main campus and continually enhance the efficiency of our built spaces to lower Scope 1 and 2 emissions, while also using onsite renewable energy generation. More details on how we accomplish these objectives are provided later in this report.

However, emitting some GHGs is unavoidable operating within the current global infrastructure. Because of this, since 2020, MathWorks began offsetting 100% of our Natick Scope 1 and 2 emissions, as well as our emissions related to flights associated with business travel. Then, beginning in 2022, MathWorks expanded its strategy to offset 100% of emissions for our worldwide Scope 1 and 2 energy use and portions of our Scope 3 footprint.

Our current Scope 3 emissions categories include purchased goods and services (PG&S), capital goods, fuel- and energy-related activities (FERA), waste, commuting, remote work, business travel, and downstream leased assets. While we have limited direct control over these categories, we have nevertheless started offsetting some categories of our Scope 3 footprint, including 100% of emissions from our commuting, waste, and business travel, as well as portions of our remote work and downstream leased assets.

Our efforts include setting internal policies to take carbon into account when making decisions and continuing to improve the quality of available data to inform our actions.

While 2022 marked the first year of MathWorks reporting, our efforts to formalize our GHG inventory and address emissions date back to 2009. Milestones on this path include:

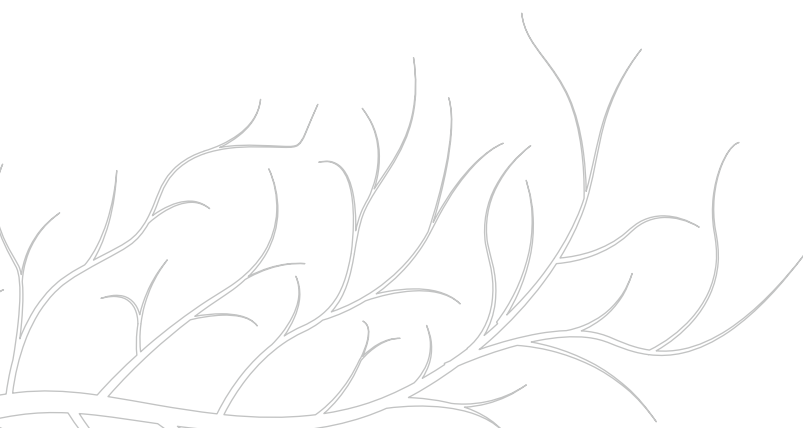
- 2009: Added 139 kW DC solar array at Apple Hill Building 2
- 2014: Installed cogeneration system at Apple Hill campus
- 2016: Added 271 kW DC and 715 kW DC solar arrays at Apple Hill Building 3 and the Lakeside garage, respectively

- 2017: Added 315 kW DC combined solar arrays at Apple Hill Buildings 1 and 4
- 2018: Completed construction of Lakeside campus, which houses cutting-edge energy efficiency data center technology, rainwater capture, 100% LED coverage with campus wide controls and photosensors, triple paned glass, and latest generation HVAC systems and controls
- 2018: Added 294 kW DC combined solar arrays at the Lakeside Math and Science buildings
- 2020: Calculated Scope 1 and 2 emissions at our locations in Natick, Massachusetts, as well as Scope 3 business travel by air. Started offsetting all business travel emissions
- 2022: Calculated MathWorks total Scope 1, 2, and 3 emissions footprint across global operations. Initiated efforts to address emissions at a greater scale, including investing in internal reduction measures, renewable energy certificates (RECs), and offsets.
- 2023: Entered 25-Mile Creek Wind Farm virtual power purchasing agreement (vPPA), offsetting 100% of our US electric consumption with renewable energy.
- 2024: Added 150,000 nature-based carbon removal credits to our long-term portfolio to support continued reforestation of the Mississippi Alluvial Valley.

Formalizing a climate strategy enables us to systematically reduce our environmental impact. With a clear understanding of our global carbon footprint, we have organized our operational climate strategy around the following actions:

- Calculate and report our carbon footprint
- Prioritize direct emission reductions through our operations
- Offset all Scope 1 and 2 emissions that cannot be avoided
- Offset select Scope 3 emissions

For emissions we cannot eliminate, MathWorks supports renewable energy projects and enables carbon removal by investing in nature-based carbon removal offsets.



Our Greenhouse Gas Inventory

To calculate our GHG footprint, we reference guidance from the GHG Protocol, consult with industry experts, and verify our approach through internal and external audits following ISO 14064-3. Read more about our environmental data calculation and methodology.

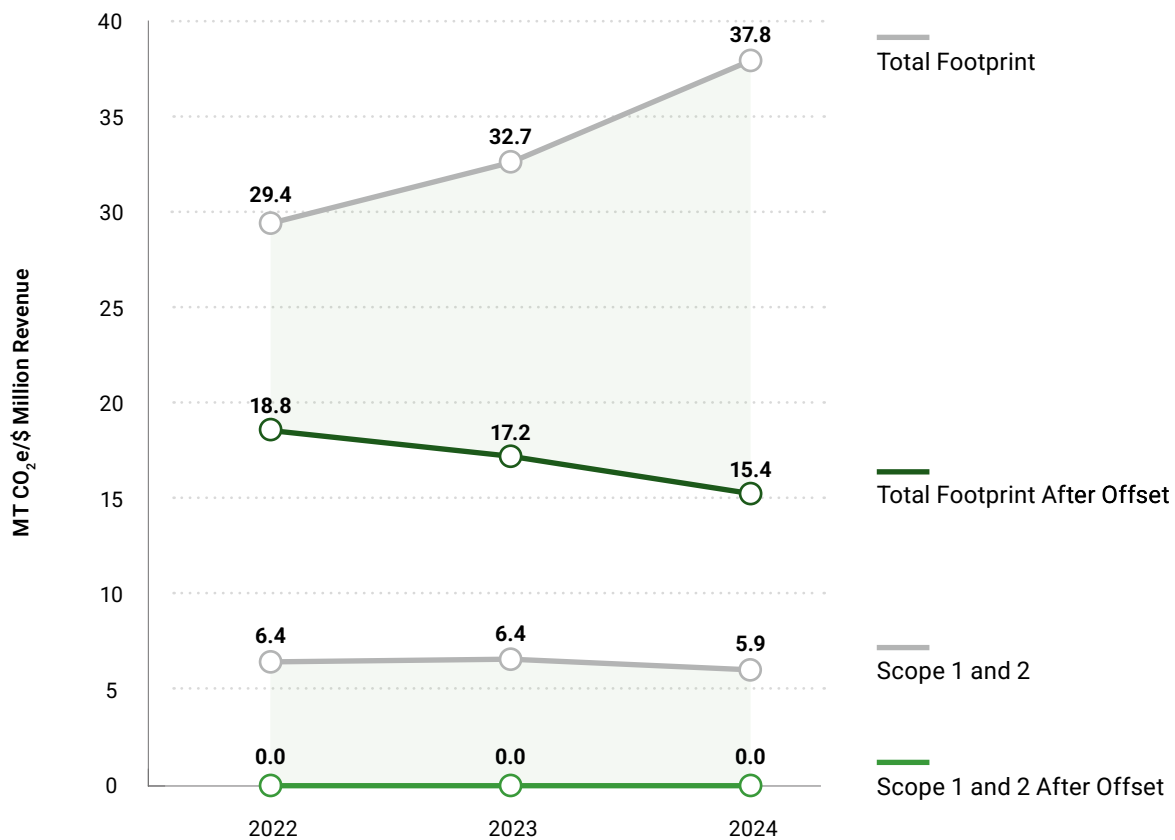
Scope 1, 2, and 3 Definitions and Sources

	GHG Protocol Definition	MathWorks Key Sources
Scope 1	Direct GHG emissions from sources owned and controlled by MathWorks	Primarily natural gas used to heat buildings, provide hot water, and operate campus cafeterias across our global footprint
Scope 2	Indirect GHG emissions from purchased grid-sourced electricity and heat	Global building operations and data centers
Scope 3	All other indirect GHG emissions that are a consequence of MathWorks activities but occur from sources not owned or controlled by the company	Purchased and capital goods and services, fuel- and energy-related activities (FERA), waste, business travel, staff commuting, remote work, and downstream leased assets

Addressing Key Sources of Global 2024 GHG Emissions (MT CO₂e)

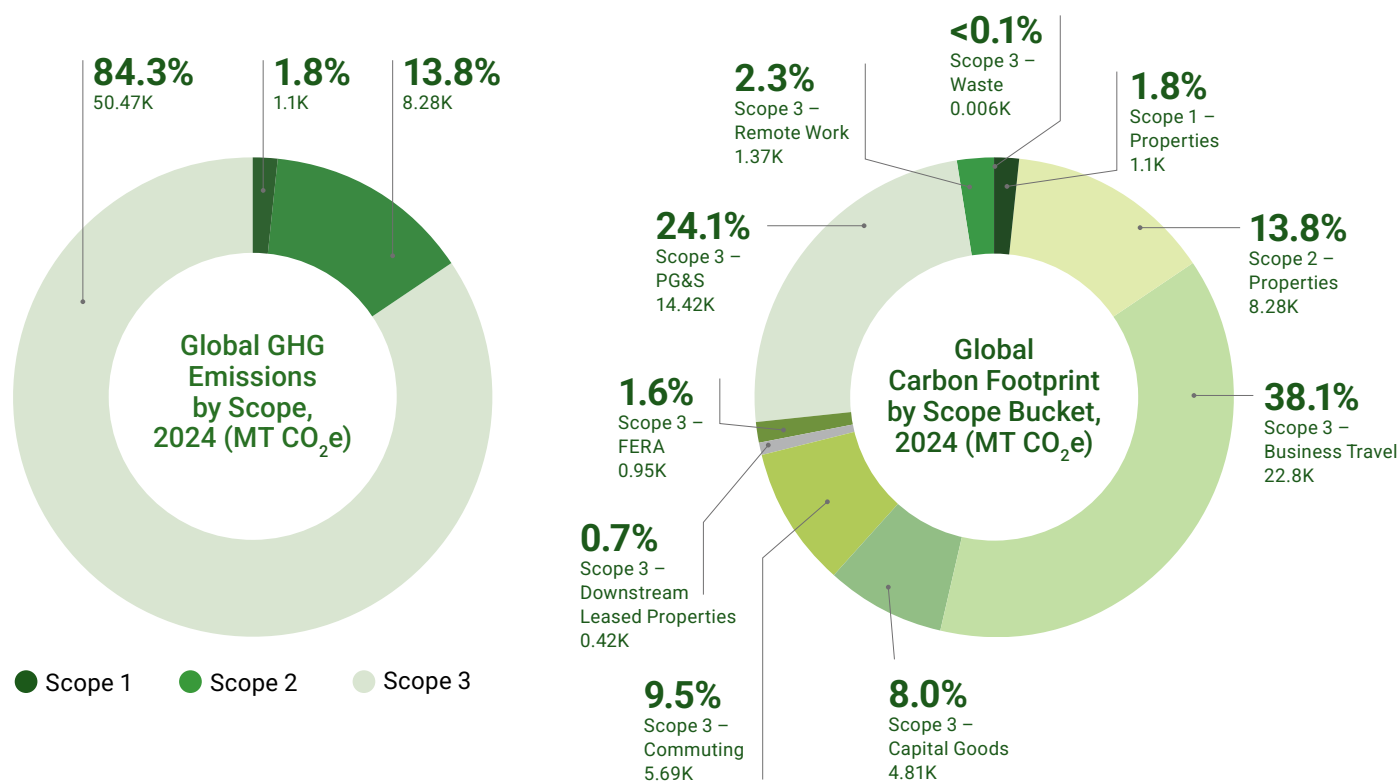
Total GHG emissions (Scopes 1, 2, and 3) associated with MathWorks operations	59,853
GHG emissions addressed	
Addressed by renewable energy procurement (RECs from VPPA and unbundled purchases)	4,798
Addressed by carbon offsets (VERs)	30,722
TOTAL	35,520
Percentage emissions addressed	59.3%

Global GHG Emissions Intensity, 2022-2024



MathWorks has grown steadily since inception. Generally, as revenue grows, so do carbon emissions. To take growth in emission into account, MathWorks tracks progress in metric tons of CO₂e per million dollars of revenue. This will be shown in terms of both our Scope 1 and 2 progress and our total carbon footprint. We will also factor in the investments we are making through offsetting our unavoidable emissions. As the graph shows, MathWorks total environmental footprint for Scopes 1 and 2 remains relatively flat before considering offsets. Furthermore, while our overall footprint has increased, we have taken steps to mitigate the impacts of our emissions by implementing additional offsets as we resume normal operations, and the business continues to expand. These steps are described in more detail later in this report.

Notably, in 2024, MathWorks celebrated our 40th anniversary. For this occasion, MathWorks brought together all our staff from across the world to Orlando, Florida for a truly special experience. As such, there is a notable one-time spike in our emissions for 2024. MathWorks has stayed true to our climate commits and offset 100% of our emissions related to flights and hotels for this special event.



Global GHG Emissions, 2024 (MT CO₂e)

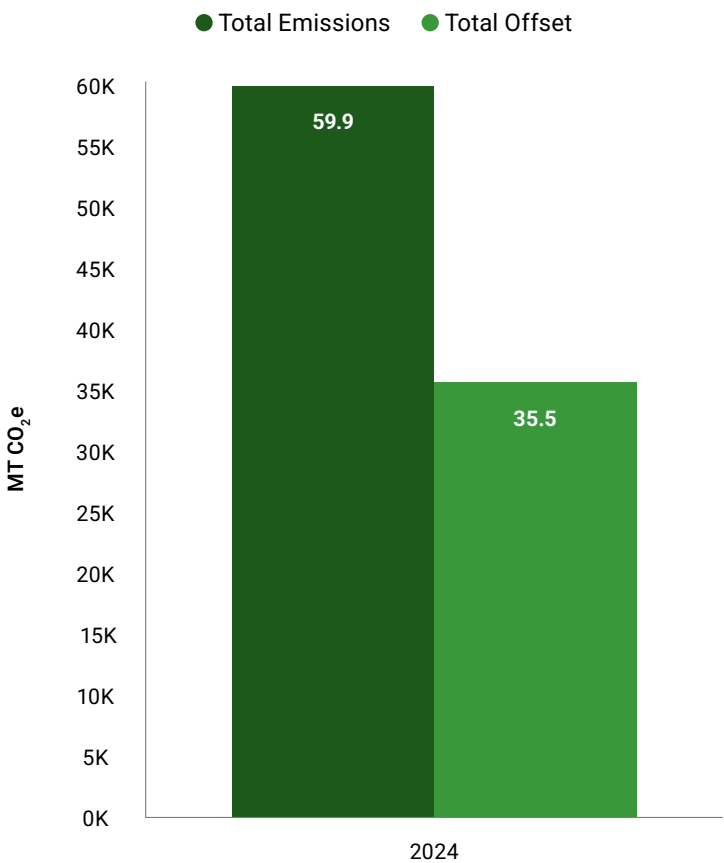
	Emissions	Offset
Scope 1	1,097	1,097
Scope 2	8,284	8,284
Scope 3		
Category 1: Purchased Goods and Services	14,418	0
Category 2: Capital Goods	4,814	0
Category 3: FERA	947	0
Category 5: Waste*	6	6
Category 6: Business Travel	22,804	20,148
Category 7: Staff Commuting	5,692	5,692
Category 7: Remote Work	1,371	103
Category 13: Downstream Leased Properties	420	191
TOTAL	59,853	35,520

* Represents ~69% of global office square footage + global electronics waste.

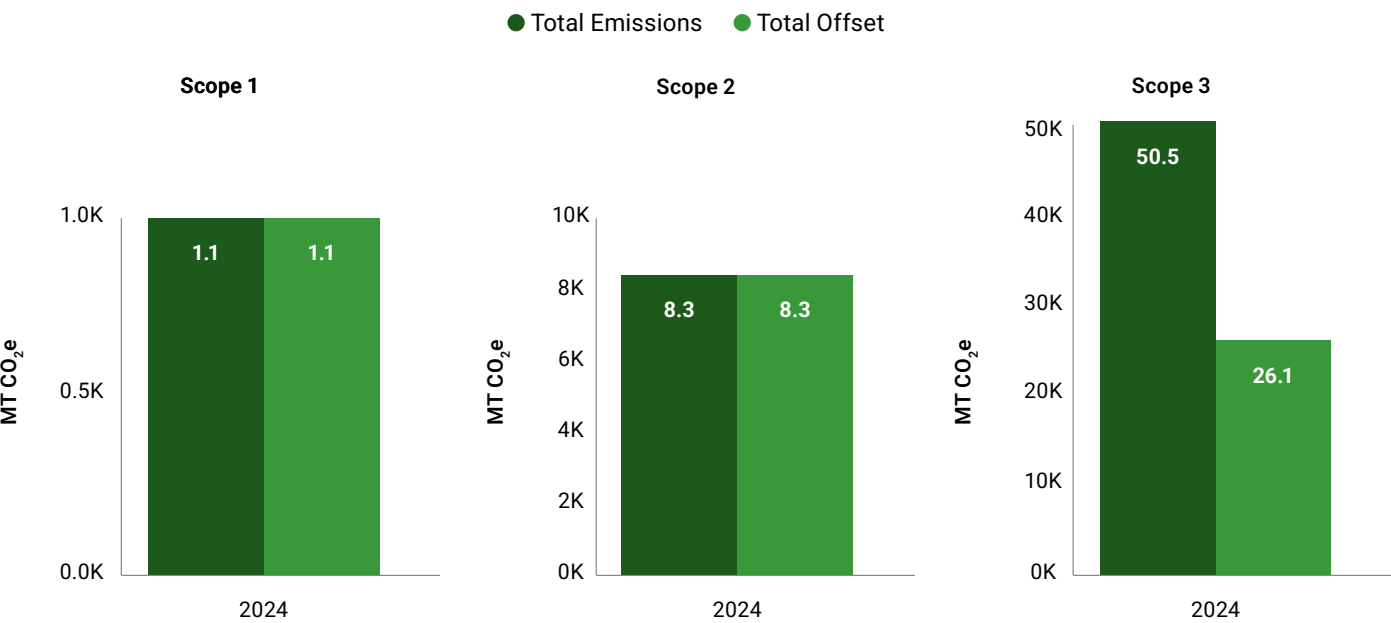
Note: For additional information on carbon offsets and RECs, [see the appendix](#).

Global Emissions and Offsets by Scope, 2024

Total Offsets vs. Total Emissions (Committed)



Emissions and Offsets by Scope



Supporting Renewable Energy

Renewable energy remains instrumental to our carbon reduction strategy. We installed our first solar array in 2009 at our Apple Hill campus and, since then, have completed six additional solar arrays onsite, totaling nearly 2MW of photovoltaic power available.

Direct Renewable Generation: Each year, our solar arrays generate nearly 2,000,000 kWh, nearly 10% of our electricity. MathWorks participates in state incentive programs, which sell the environmental attributes (RECs) to local providers. MathWorks does not record the reduced carbon of these installations and instead is amply covered by the Enel VPPA agreement.

MathWorks and Enel North America VPPA:

In 2022, MathWorks signed a 12-year VPPA with Enel North America for the output of 11MW of wind turbines at Enel's 25 Mile Creek Wind Project in Ellis County, Oklahoma. This project came online at the start of 2023. As of the end of 2024, the MathWorks portion of the project has generated nearly 95,000 MWh of clean, wind-powered electricity and the equivalent amount of renewable energy credits. MathWorks has used this project to offset 100% of our North American electric consumption and generate additional credits to support other organizations in their efforts to reduce their carbon footprint.

Through the VPPA, MathWorks is helping to expand renewable infrastructure and enable other benefits in the Ellis County, Oklahoma community. Over its lifetime, the project is estimated to create over \$24 million in new local tax revenue for schools and public services and more than \$56 million in landowner payments.



Enabling Carbon Removal Projects

MathWorks focuses on driving direct emission reductions whenever feasible. For unavoidable emissions, we strategically purchase carbon offsets from trusted sources that are already having a positive impact.

Our climate investments support reforestation, carbon sequestration, climate resilience, and renewable energy expansion.

We carefully select partners for carbon removal and prioritize investing in voluntary emission reductions. Our vetted projects guarantee emission removal and sequestration for at least 40 years.

One of the organizations we continue to partner with is Arbor Day, the largest nonprofit organization dedicated to planting trees. The Arbor Day Foundation works with GreenTrees to restore degraded agricultural lands to their original and highly beneficial forest ecosystem in the lower Mississippi River Valley. Since 2020, MathWorks has purchased carbon credits to support the GreenTrees ACRE (Advanced Carbon Restored Ecosystem) project located in the Mississippi Alluvial Valley. Through the purchase of carbon credits, our investments help GreenTrees achieve the following goals:

- 
- **Clean Water and Sanitation:** Permanent vegetation has reduced water pollution and soil erosion, helping decrease the Gulf of Mexico's "dead zone."
 - **Affordable and Clean Energy:** Interplanting cottonwoods with native hardwoods accelerates habitat creation. Cottonwoods are thinned between ages 8 and 23, allowing hardwoods to grow while providing renewable energy from chipped wood.
 - **Decent Work and Economic Growth:** GreenTrees' success relies on well-compensated personnel and benefits landowners through carbon credits and wood revenue, aiding forest restoration and greenhouse gas reduction.
 - **Climate Action:** The project has removed almost 8 million tCO₂e from the atmosphere.
 - **Life on Land:** Over 136,650 acres of forest have been restored, enhancing habitats and doubling migratory bird populations, while improving soil health and reducing dust.

*Estimates were calculated using GreenTrees' co-benefits tool (co-benefits per metric ton).

Investing in Quality Carbon Removal Projects

We are committed to investing in high-quality projects that generate extensive reductions and co-benefits. To date, our focus has been on identifying projects that either add renewable energy to the grid or remove carbon from the atmosphere. We reference guidance from The Oxford Principles for Net Zero Aligned Carbon Offsetting. Criteria we carefully consider include:

- **Certification:** Our offset projects are certified by a recognized third-party standard or certification body.
- **Additionality:** We carefully assess offset projects to ensure the GHG emissions reductions or removals would not have occurred without our offset purchase.
- **Permanence:** We collaborate with organizations when we can trust that GHG emissions reductions or removals from offset projects we invest in are permanent and will not be reversed in the future.
- **Verifiability:** We invest in offset projects that are transparent and can demonstrate that the claimed GHG emissions reductions or removals have actually taken place.
- **Avoidance of Double-Counting:** We trust the offset project to ensure that the GHG emissions reductions or removals claimed by the offset provider are not claimed by any other party.
- **Co-benefits:** We look for projects that generate additional social, economic, or environmental benefits beyond reducing GHG emissions.



Managing Energy and Water

Energy consumption and water use are both fundamental to operating our facilities, powering our data centers, and providing our workforce with comfort and safety.

MathWorks strives to be energy-efficient and to manage our water use in a way that minimizes our environmental impact—particularly in locations such as our Natick headquarters, where we can have the greatest impact. We closely monitor energy usage intensity (EUI), water usage intensity (WUI), and power usage effectiveness (PUE) metrics that measure building performance, water efficiency, and data center sustainability.

Global Energy Consumption, 2024

Source	Consumption
Electricity (MWh)	25,627
Natural gas (therms)	209,806
Diesel fuel (Gal)	1,279
District heating (MMBTU)	878



Optimizing Our Natick Facilities

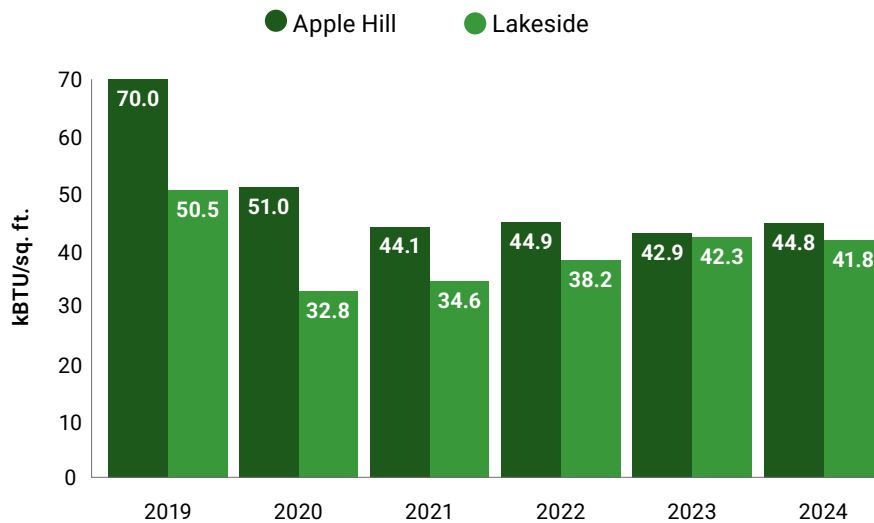
Our ability to optimize operations varies across locations and facilities. We have greater influence in spaces we own and operate, such as our Natick campuses, Apple Hill and Lakeside, than in locations where we simply lease space. Accounting for over 60% of MathWorks square footage worldwide, our Natick campuses represent the largest opportunity to viably increase our efficiency. In addition to the larger projects detailed in this report, we have built energy efficiency considerations into materials and equipment purchase decisions for our facilities:

- Met and in many cases exceeded the 2016 Massachusetts Stretch Energy Code for new construction and renovation projects. Future projects will meet or exceed requirements of the 2024 Stretch Energy Code.
- Track and report on energy use intensity (EUI) for our buildings and power usage effectiveness (PUE) for our data centers.
- Implemented highly efficient building technologies such as chilled beam heating and cooling, triple-pane glass, and a full campus building management system with advanced control strategies.
- Installed automated LED lighting with occupancy sensors, dimmers, and photocells throughout our offices.
- Deployed a free-cooling system that satisfies all data center and campus demands during cooler months in New England.
- Tracked water use intensity (WUI), audited our equipment, and installed water-saving technology such as lower-flow faucets and showerheads, rooftop rainwater harvesting systems, and rainwater irrigation tanks.
- Assessed electrifying our campuses and developed a long-term plan for replacing fossil fuel use.
- Implemented smart landscaping techniques such as using drought- and disease-resistant grass, which reduces water consumption and the need for herbicides, pesticides, and fertilizer.
- Installed green roofs, which enhance roof insulation, rainwater retention, and air quality.
- Installed over 55 electric vehicle chargers and designated over 110 of our staff parking as electric vehicle (EV) charging stations for use by MathWorks staff and visitors for free.

We have also implemented ongoing programs and processes to monitor and limit energy use, including:

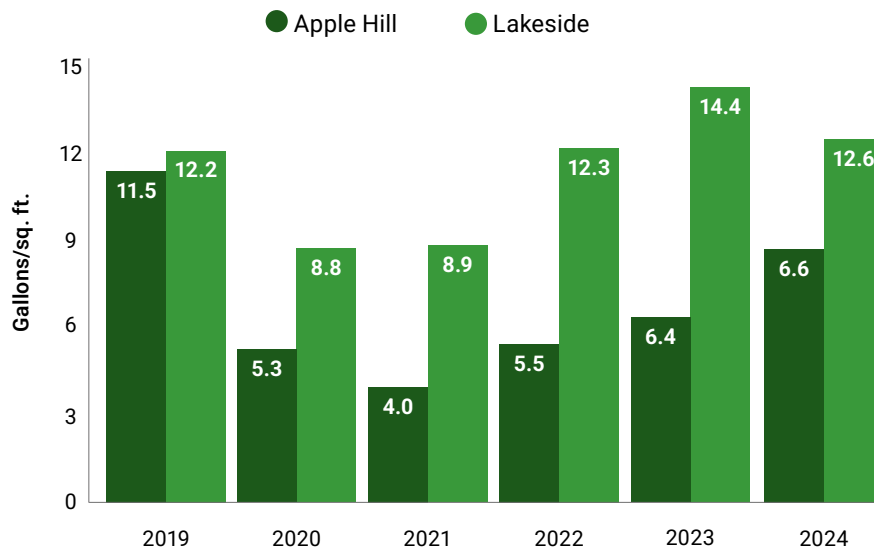
- Leveraging smart technology such as fault detection and diagnostics software, which uses MATLAB, extensive metering, and controls automation to understand how our facilities are operating and where we have opportunities to improve.
- Conducting routine audits of the building envelope to identify and correct air and water leakage.
- Offering staff commuter solutions by collaborating with local public transport agencies to enhance the efficiency and accessibility of staff routes, providing complimentary bikes and bike storage across Natick campuses, and conducting commuter surveys.

Natick Campus Energy Use Intensity, Excluding Data Centers, 2019–2024



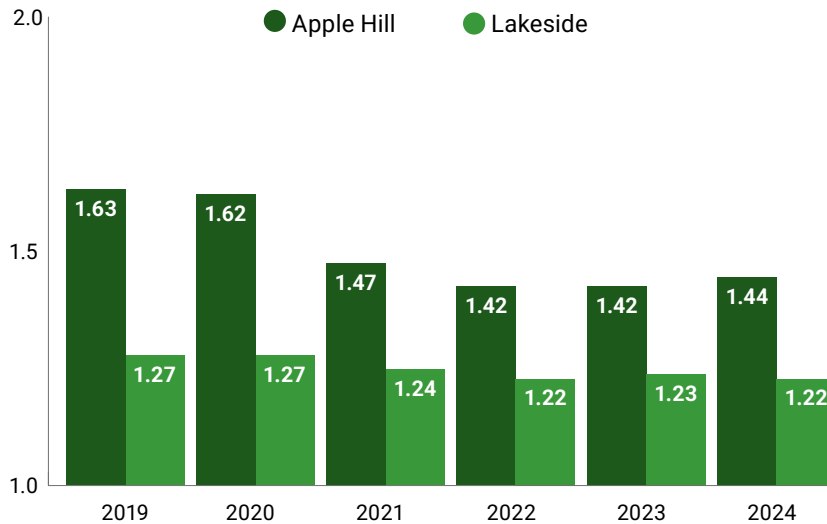
MathWorks measures office space efficiency in terms of energy use intensity (EUI), which reflects facility energy consumption per square foot, excluding data center energy consumption. MathWorks has decreased EUI through various measures, most notably the shutdown of our tri-generation plant (CCHP), implementation of fault detection and diagnostics (FDD), and adjustments to our cooling controls at Apple Hill. MathWorks was shut down in early 2020 due to the pandemic, soft-opened offices in 2021, and instated a hybrid work model in early 2022, resulting in an increase in EUI over this time. MathWorks also expanded fitness center and cafeteria operations for staff as we returned to the office, increasing consumption.

Natick Campus Water Use Intensity, 2019–2024



MathWorks measures water consumption in water use intensity (WUI), which reflects the total water consumed, in gallons per square foot. Natick water consumption decreased significantly during the pandemic and has been on the rise as we returned to office, now with expanded cafeteria and fitness center services. The Lakeside data center expansion has increased cooling demand, which requires more water as well. Increasing the cycles of concentration of cooling tower water through improved chemistry and filtering has been a significant water savings measure. We have also installed new lower-flow fixtures throughout both campuses.

Natick Campus Data Center Power Use Effectiveness, 2019–2024



Power use effectiveness (PUE), a way of measuring data center efficiency by looking at the supporting energy required to operate the data center (e.g., cooling, lighting), was relatively unaffected by the pandemic. The Lakeside campus opened in 2019, and we have been able to maintain and slightly improve its efficiency since construction. Apple Hill data center PUE has decreased mainly because of a revised cooling control strategy put in place to reduce the amount of water being pumped through the system.

MathWorks has continued to become more efficient in how we operate and maintain our data centers, keeping our PUE well below the industry average of 1.56. In 2024, we achieved an average PUE of 1.44 for Apple Hill and 1.22 for Lakeside. We do this through utilizing efficient cooling infrastructure in both the mechanical plant and server racks. We also continually improve our control strategy for this infrastructure and to make use of available “free-cooling” through our cooling towers during colder months.

Industry averages for 2024 sourced from Uptime Institute’s Global Data Center Survey 2024 (page 4).



Diverting Waste

Although tangible waste doesn’t represent a substantial part of our carbon footprint, MathWorks nevertheless prioritizes recycling and composting as a way to further reduce our ecological impact.

Managing Key Sources of Waste

Source	Mitigation and Diversion Strategies
Office and cafeteria supplies (such as paper and cardboard)	• Recycling (paper, printer cartridges, plastic, and aluminum) • Working with suppliers who use reclaimed or recycled materials as well as eliminating packaging waste when viable
E-waste (such as batteries, computers and other machinery, and data center waste)	• Recycling e-waste with a third-party vendor and holding electronic recycling events where both personal and business equipment is donated for recycling and reuse • Repairing and refurbishing technology when possible • Reclaiming, reusing, or repurposing parts and machinery when feasible • Reselling goods or returning them to the seller when possible
Food waste	• Composting • Working with our food vendor to optimize the amount of food ordered and prepared, preventing spoilage and overstock

One of our major recent accomplishments is increased data collection and reporting of our electronic waste. Through these efforts, we are now tracking electronic waste and its associated emissions throughout our global footprint. Additionally, we have also begun collecting waste data from our Cambridge and Glasgow offices, providing more information on how we can continue to reduce our waste footprint. While these accomplishments are meaningful, the overall numbers are small. The following data reflects that of only our Natick campuses.



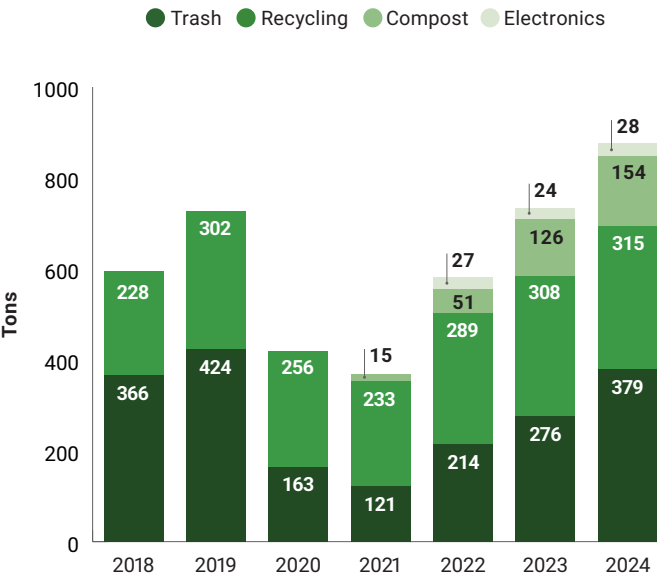
Composting in Our Cafeterias

In late 2022, we initiated a kitchen composting program at our Apple Hill and Lakeside campuses to mitigate food waste, with 2023 being the first full year of operation. This program targets the food waste generated on site through food preparation for our free breakfast and lunch programs for staff. Through this effort, we’re diverting more than an estimated 250,000 lbs. of organic waste from incinerators to a local windrow composting facility each year, where it is processed to create nutrient rich soil and fertilizer.

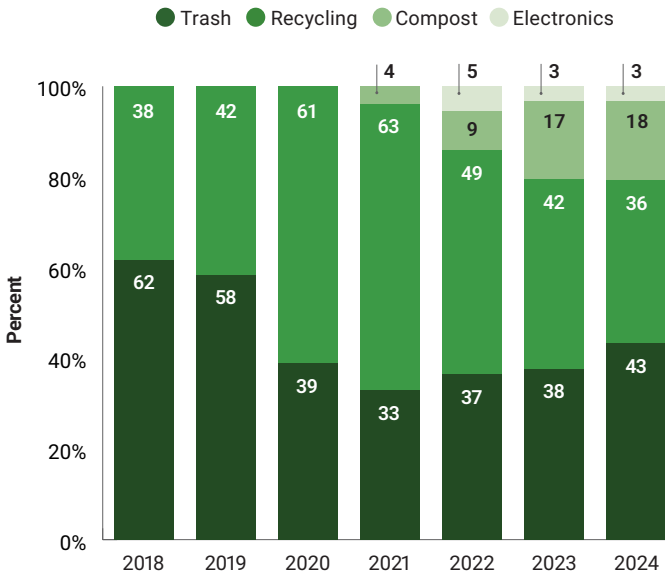
Natick Waste Management, 2024 (Tons)

Total recycled (includes paper and plastic)	315
E-waste recycled	28
Composted	154
Landfilled or incinerated	379
TOTAL	876

Natick Physical Waste Generated by Type, 2018–2024 (Tons)



Share of Natick Physical Waste Generated by Type, 2018–2024



MathWorks has tracked waste output through our vendors for several years. Before 2020, MathWorks followed a standard, five-day in-office work week. 2020 saw our campuses shut down due to the COVID-19 outbreak, leading to reduced waste generated in 2020 and 2021. Staff returned to the office in our new hybrid work model in 2022, which increased the total waste we were generating. Additionally, MathWorks introduced an expanded breakfast and lunch program for staff as we reopened our headquarters, which has increased our waste output.

Reducing Carbon Footprint Through IT Efficiency

MathWorks is dedicated to minimizing our environmental impact by enhancing the efficiency of our IT infrastructure and operations.

One of our significant initiatives involves following Apple's lead in transitioning our Mac computers from Intel® processors to ARM processors. This shift allows us to achieve 2-3 times the processing power with reduced energy consumption.

We also utilize a "phased-replacement model." This strategy calls for incrementally updating and replacing a portion of our machines annually. The typical lifespan of a desktop computer is three to four years while for datacenter hardware it is five to seven years. In the case of data center hardware, the replacement equipment typically offers two- to four-times the processing power per core while offering order-of-magnitude improvements in density and power efficiency.

Our commitment to improving IT efficiency extends to utilizing higher core machines, which provide more computing power per watt of input, aligning with our goal of reducing energy consumption. We are also evaluating the ecological and financial impacts of maintaining older hardware versus upgrading to newer, more efficient technologies.

Through our Cluster Quality Initiative (CQI), we are optimizing our product development processes to reduce resource usage while maintaining high performance. This initiative streamlines our operations, allowing us to conduct more efficient build and test cycles.



PARTNERSHIPS AND OUTREACH

Staff Initiatives

Supporting Large-Scale Land Conservation in
Massachusetts with Mass Audubon

Supporting Innovators in the Startup Community

Supporting Sustainability in Academia





Partnerships and Outreach

MathWorks recognizes that addressing the challenges posed by climate change requires active engagement with those dedicated to creating a more sustainable future. This understanding is why outreach and partnerships—along with encouraging staff initiatives internally—stands as one of the main pillars of our comprehensive climate strategy. MathWorks is committed to identifying and supporting diverse programs and initiatives focused on combating climate change.

Over the years, we have cultivated and sustained connections with organizations that are tackling sustainability challenges. These organizations work to mitigate the effects of climate change in a range of ways; from protecting and restoring land and natural habitats, developing innovative products and solutions, and conducting groundbreaking research, to equipping future generations with the necessary knowledge and tools to solve climate-related problems. Consequently, our climate-focused outreach efforts have been purposefully developed over years to be broad and inclusive, engaging with startups, nonprofits, government bodies, and academic institutions alike.

In addition to investing in these organizations and their programs, MathWorks provides access to MATLAB and Simulink products to those working on significant climate challenges. This access empowers innovators, researchers, and students to use advanced computational tools in their quest to develop impactful solutions.

Outreach efforts at MathWorks are, and will continue to be, crucial to our overarching goal of reducing our climate footprint. By partnering with stakeholders across the globe, we aim to drive systemic change, not only supporting immediate solutions but also fostering an environment where long-term, sustainable practices can thrive.

Staff Initiatives

MathWorkers are empowered to actively reduce their carbon footprints. For example, GreenWorkers, a staff-run initiative, serves as a forum to have group discussions on climate-related problems and solutions. The group provides educational resources to help staff reduce their carbon footprints at work, home, and in the community.

The GreenWorkers group also regularly promotes company-wide events and programs aimed at spreading awareness about climate challenges and encouraging environmentally sustainable practices. Activities include:

- **Interactive talks and discussions:** Staff-led presentations and conversations on topics such as sustainable commuting, urban gardening, and the power of local action.
- **Book clubs:** Group readings and discussions of climate-focused books to deepen understanding and inspire action.
- **Community engagement:** Events like group cleanups and sustainability challenges that promote hands-on involvement.
- **Awareness campaigns:** Company-wide initiatives and communications that highlight sustainable practices and encourage participation.
- **Film screenings and media sharing:** Curated content that explores environmental justice and climate science, fostering reflection and dialogue.



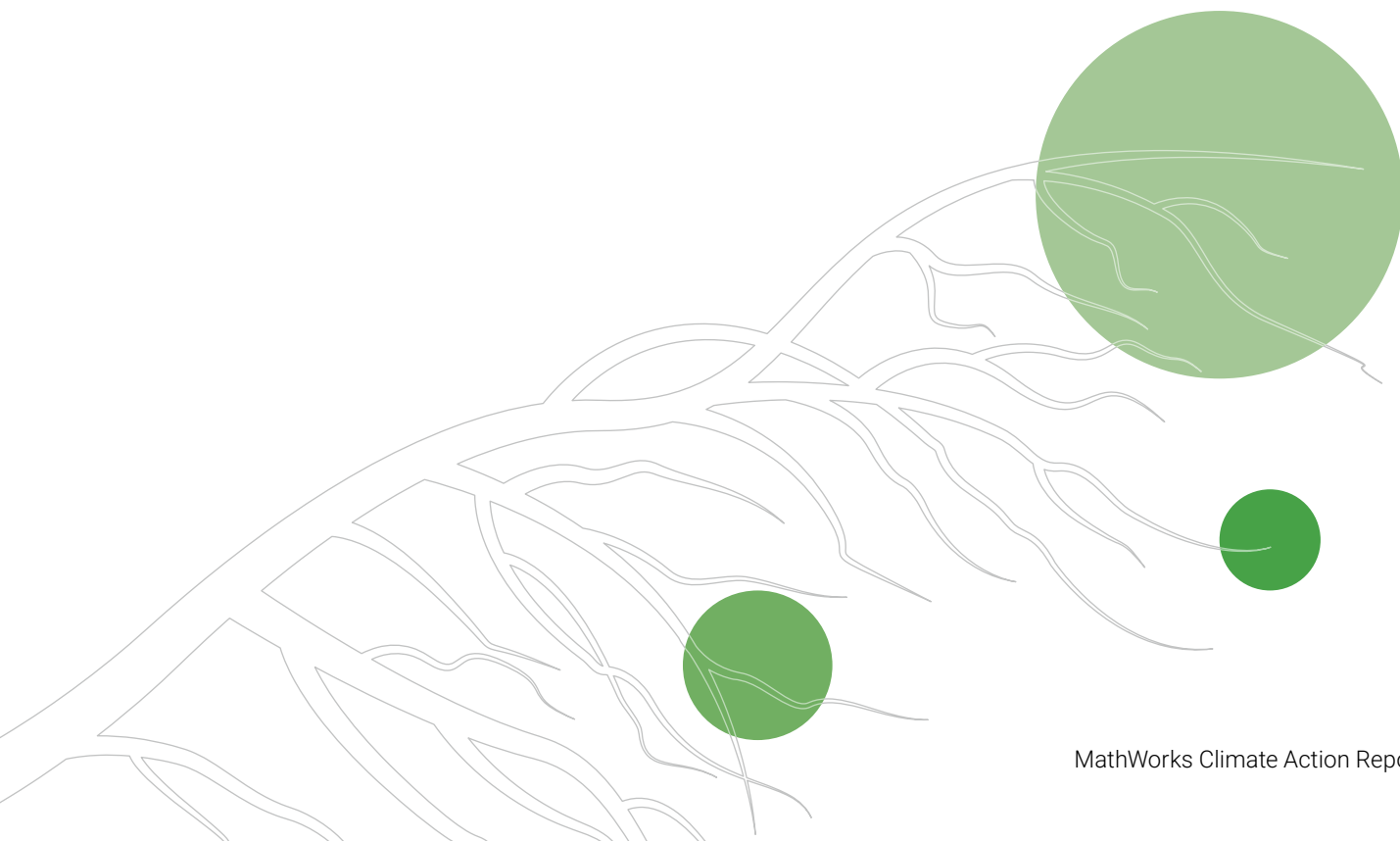
Supporting Large-Scale Land Conservation in Massachusetts with Mass Audubon

One of our most extensive partnerships is with Mass Audubon, the largest nature-based conservation organization in New England. Since beginning this collaboration in 2022, MathWorks has donated over \$27.5 million to help Mass Audubon conserve environmental landscapes and habitats critical for rare species. The bulk of the donation came in 2023, when MathWorks committed to donating \$25 million over the next seven years to support Mass Audubon's efforts to permanently preserve land in Massachusetts.

This donation represents the largest programmatic gift in Mass Audubon's 127-year history and is being used to accelerate high-impact land protection and restoration projects across Massachusetts. Since the partnership began, the Mass Audubon has protected nearly 2,900 acres of land, including 357 acres in 2023 and an additional 2,522 acres

in 2024. These efforts have helped safeguard over 85,000 metric tons of forest carbon—an amount expected to grow to 108,000 metric tons by 2050, equivalent to removing approximately 90,000 gas-powered cars from the road for one year.

The donation has also helped with the launch of the 30x30 Catalyst Fund, which supports the state goal of conserving 30% of its most biodiverse and carbon-rich lands by 2030. The 30x30 Catalyst Fund aims to raise a total of \$75 million by 2030, with MathWorks support serving as a catalyst for additional private and public investment. Currently, Mass Audubon has more than 20 land protection projects underway, totaling over 18,000 acres, including a major initiative to protect more than 5,000 acres in the Connecticut River Valley by late summer 2025.



An Investment in Winchendon State Forest and Otter River State Forest

Worcester County's Town of Winchendon is home to The Winchendon State Forest and Otter River State Forest, which include portions of the Millers River headwaters and the Sunset Lake and Lake Monomonac watersheds. The Natural Heritage and Endangered Species Program recognizes 85% of these lands as among the most critical in Massachusetts for sustaining wildlife and biodiversity.

In 2023, a large solar energy developer proposed the purchase of a 1,350-acre parcel of land in Winchendon to install solar panels.

While this project would support the Commonwealth's goal of reaching net-zero greenhouse gas emissions by 2050, the Town of Winchendon found itself at odds with the idea of clear-cutting 350 acres of forest to install solar panels.

Despite being owned by a private party, a conservation restriction gave the Town of Winchendon the right to purchase the land before it could be sold to the solar energy developer. This restriction gave the Winchendon Town Board the chance to assign the rights to buy the land to a third-party conservation organization and protect it permanently.

The Winchendon Town Board recognized Mass Audubon as having the expertise and necessary resources to conserve the land and protect its wildlife, climate, and clean water, benefiting its residents for generations to come. It was the collective effort of a group of passionate citizens from Winchendon, working closely with Mass Audubon and the Mount Grace Land Conservation Trust, that crafted a proposal for the land purchase and gained the support of hundreds of community members.

Mass Audubon acquired the 1,350-acre parcel in Winchendon because of the \$25 million donation it received from MathWorks.

This decision paves the way for the land, ultimately, to be transferred to the Massachusetts Department of Fish and Game as a Wildlife

Management Area accessible to the public for recreation. Protecting this land also supports the "30 by 30" initiative to conserve 30% of Massachusetts' biodiverse and carbon-rich land by 2030.





Supporting Innovators in the Startup Community

The MathWorks Accelerator Program supports startups worldwide. We provide incubators and accelerators with free access to our software, expert engineering support, and the MATLAB Central™ user community. Furthermore, the MathWorks Startup Program provides affordable access to MATLAB and Simulink, along with training, engineering support, and co-marketing. Since its inception, this program has supported over 1,000 startups focused on combating climate change.

MathWorks recently began partnering with **US National Labs**, including the Lawrence Berkeley National Lab accelerator Cyclotron Road. Cyclotron Road is a US Department of Energy (DOE) Lab-Embedded Entrepreneurship Program (LEEP) supporting startups focused on breakthrough technologies, including zero-emission steel production, wave energy, and long-term energy storage.

We also started collaborating with **Breakthrough Energy Fellows** (BE Fellows), a program by Breakthrough Energy dedicated to helping innovators overcome early-stage barriers to climate technology innovation. The startups in this program work on clean energy technologies including fusion energy, zero-carbon battery production, carbon-neutral cement production, and CO₂ conversion into fuel and chemical feedstock.

Turning Ocean Waves into Renewable Energy

Ocean waves can potentially generate 20-30% of our global energy needs. While industry in Europe has been innovating in the field of wave energy, it has been an underdeveloped and underfunded endeavor in the US compared to wind and solar industries. Standardizing the use of ocean wave energy has been challenging, given the lack of a universally agreed-upon structure for wave energy converters.

CalWave, a clean tech startup based in California, took

on the mission to harness the ocean's power by developing a specially designed buoy moored on the ocean floor. When activated by waves, the buoy's mechanical drivetrain system takes energy from the motion and converts it into electricity. Engineers combat potentially damaging corrosion and sea storms by utilizing solutions developed over decades in offshore and ship industries, smart device design, and control strategies. The buoy can autonomously change its behavior based on the state of the sea, so wave loads are reduced during storms and efficiency is increased during regular operation.

Prototyping and iterating with large-scale wave energy converters is neither cost-effective nor time efficient. Given this, Simulink has been integral to CalWave's development of the buoy, enabling engineers to create high-fidelity simulations that can predict performance in the ocean's uncertain environment. Using Simulink made it possible to develop and test advanced control strategies, such as reinforcement learning, which are not only crucial for optimizing the buoy's performance, but also essential to keep it functioning in harsh circumstances.



Using Electricity to Produce Cleaner and More Economical Steel

Steel is necessary to create everything from cars and appliances to buildings and machinery. Yet, steel production also creates hazards, accounting for approximately 10% of all global CO₂ emissions as of 2021. Fixing the way steel is made is integral to solving the climate crisis.



Startup **Boston Metal** is working to transform the steel production industry to make it greener and more economical. To eliminate the use of traditional steel production methods that mix iron and coal within a blast furnace, Boston Metal engineers created a patented technology known as Molten Oxide Electrolysis (MOE). MOE relies on a simpler process of using a direct electric current to separate chemical compounds and maintain temperature. This process results in the production of liquid iron with a byproduct of oxygen instead of carbon, driving carbon production down to almost zero.

As a startup with limited time and resources, Boston Metal faces an uphill challenge in achieving its goals. Adopting Model-Based Design with MATLAB and Simulink has enabled the company to maintain a small team that works efficiently. Additionally, engineers have used their access to MATLAB and Simulink tools and support, provided by their participation in the MathWorks Accelerator Program, as well as the MathWorks Startup Program, to model a complete dynamic system. This has enabled Boston Metal to test the system's performance on a digital twin, debugging any flaws to ensure the real-life model is fully operational from the moment it is turned on.

Supporting Sustainability in Academia

Students in over 6,500 universities worldwide use MATLAB and Simulink, making academia another key area for partnerships. MathWorks continues to collaborate with academic institutions to improve student learning outcomes. We specifically seek to accelerate learning and progress on environmental issues and, since 2022, have pledged \$1.5 million in funding for ongoing climate-related research activities at universities across the US, U.K., and India. MathWorks partners with academia through conferences, student competition sponsorship, curriculum support, and research programs. Through this engagement, we have supported multiple student projects explicitly focused on advancing renewable energy. We also work with educators through our MOOC Support Program to help incorporate MATLAB and Simulink in open online courses that focus on green energy.

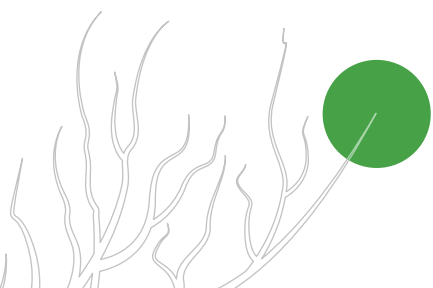
Student Competitions

MathWorks supports student competitions across several geographical regions. We provide student competitors with complimentary access to software, including interactive student tutorials that allow participants to receive instant and contextual feedback. Many of these competitions include climate-focused topics in sectors such as automotive, robotics, AI, and biotech and medical, empowering students to tackle the same technical issues as professional engineers using industry-standard tools.

These opportunities include:

- **Global competitions** that provide complimentary software, training, and mentoring for numerous competitive student events around the world.
- **Student challenges**, including a Sustainability and Renewable Energy Challenge in which participants propose how MATLAB and Simulink can be used to solve pressing environmental challenges.
- **Hackathons** where students, hobbyists, and programmers join to solve technical problems while networking and building skills.

For example, MathWorks partners with **Advanced Vehicle Technology Competitions (AVTC)**—a program sponsored by the US Department of Energy that brings together educators and industry members to help involve university students in the development of future automotive technologies. Since its inception in 1988, AVTC has grown to hold 13 multiyear student competitions. These competitions provide hands-on training for students in engineering, business, and communications, challenging them to reengineer vehicles for improved energy efficiency and emissions standards. The program has evolved to include alternative fuels, electrification, and autonomous technologies, with over 30,000 students from 111 institutions participating. MathWorks provides software, simulation models, training, technical mentoring, and operational support to help AVTC student competitors achieve their goals.



Some of the programs students participate in using our tools include:

The ECOCAR EV Challenge

Building on a 35+ year history of the US Department of Energy's AVTCs, the EcoCAR E.V. Challenge is a four-year collegiate automotive engineering competition transforming classrooms into hubs of automotive innovation. The competition's vision is to provide a hands-on, real-world experience in STEM to prepare students for future careers, develop a diverse clean energy workforce, and provide access to industry tools and training. AVTC is tasking students from 15 North American universities with engineering next-generation battery electric vehicles (BEVs). These vehicles will incorporate automation and vehicle-to-everything (V2X) connectivity to enhance energy efficiency and customer satisfaction, all while addressing the automotive industry's decarbonization goals. Each team receives a 2023 Cadillac LYRIQ from General Motors to demonstrate advanced propulsion systems, connected and automated vehicle technologies, and innovative solutions for energy efficiency. On-board sensors and bidirectional V2X connectivity are used to implement energy-efficient automated control features, refine powertrain and charging systems, and intelligently utilize grid electricity.

Battery Workforce Challenge

Started in 2023, the Battery Workforce Challenge is a three-year engineering competition in which students at North American universities and their community college partners design, build, test, and integrate an advanced EV battery pack into a Stellantis vehicle. Each team receives a 2024 Ram ProMaster EV from Stellantis to work on. The vehicle is designed specifically for electrification, featuring a unibody design that efficiently incorporates the production battery pack. The competition allows students to design batteries for larger vehicles, enhancing their engineering skills through hands-on experience. The competition aims to give students valuable engineering skills that extend beyond the classroom, including project management, communication, and teamwork. Participants must develop partnerships with community colleges and vocational partners to tackle complex battery engineering and manufacturing challenges. Teams follow real-world industry milestones focused on battery design, simulation, control development, testing, and vehicle integration. Students will use production battery cells to design their custom battery packs and complete a professional battery design review with subject matter experts.

MathWorks partners with academia through conferences, student competition sponsorship, curriculum support, and research programs. Through this engagement, we have supported multiple student projects explicitly focused on advancing renewable energy.

Sustainability and Renewable Energy Challenge

In 2023, MathWorks announced our new student challenge project, the Sustainability and Renewable Energy Challenge. This competition gives students, researchers, and engineers from around the world the opportunity to submit innovative solutions to environmental challenges related to sustainability and renewable energy. MathWorks engineers judge submissions based on real-world applicability, novelty, code, model, documentation quality, and solution depth. Winners are awarded cash prizes.

MathWorks continued this student challenge project in 2024. Among the winning projects was a *Smart Watering System with IoT and Neural Network*, which optimized plant irrigation using real-time monitoring and AI-based predictions. This solution was built using ThingSpeak™ and Deep Learning Toolbox™. Another project focused on *Torque Optimization in a Two-Motor Battery Electric Vehicle*, leveraging Simulink® and Model Predictive Control Toolbox™ to enhance torque distribution in electric vehicles. A third winning entry, *Dual-Axis Solar Tracker Simulation*, featured a Simulink-based controller designed to maximize solar panel exposure through dual-axis tracking.

Segmenting Kelp Forests

Underwater kelp forests support diverse ecosystems globally but face threats from climate change, poor water quality, and over-harvesting. The presence and growth of kelp are essential measurements for evaluating the health of many coastal ecosystems, as they provide habitats suitable for various species, increase biodiversity, and provide stability. The ability to easily monitor kelp forests could be a huge step forward in coastal climate science.

Monitoring kelp forests is challenging due to their dynamic nature, but satellite imagery offers a promising solution. MathWorks partners with DrivenData for the “Kelp Wanted” student challenge. Competitors developed algorithms for detecting kelp canopy in satellite images. Using Landsat satellite imagery and labels they generated as part of the Floating Forests project, their results provided significant advancements and accurate models to help protect these vital ecosystems. To help participants get started, MathWorks published a benchmark solution that explored how to train a basic semantic segmentation model using a SegNet network.

A total of 2,885 solutions from around the world were submitted during the competition, with winners being awarded cash prizes. Additionally, MathWorks presented the “Best Use of MATLAB” award to the team that scored the highest with a submission that utilized MATLAB.



Courseware

MathWorks collaborates with educators from leading universities worldwide to create courseware that aids in teaching discipline-specific skills. Our partners include universities such as Federal University of Rio de Janeiro, RWTH Aachen University, Shanghai Jiao Tong University, University of Cape Town, and University of Houston. The courseware incorporates climate-focused teaching elements, encompassing full courses, apps, interactive examples, datasets, and projects.

For example, instructors can use **“Climate Data Visualization and Analysis”** to teach students how to import, visualize, and analyze climate data in MATLAB. This includes analyzing temperature anomaly data and Arctic Sea ice data, as well as using multispectral imaging data to characterize drought in Northern California.

Other courseware uses climate-related examples—such as analyzing renewable energy sources, monitoring greenhouse gas, and visualizing ocean temperatures—to teach broader science and engineering concepts such as fluid mechanics, data programming, dynamic systems, and ordinary differential equations.

Electrification Instruction

As electrification continues to play an expanding role in the transition towards a more energy-efficient industrial landscape, there is an increasing demand for courses that can equip students with the knowledge and skills needed to address the growing demand for sustainable energy solutions. MathWorks supports the delivery of electrification education by **partnering with industry leaders in automotive, energy production**, and other fields. Key course topics include circuits, power electronics, power systems, renewable energy, and AI for electrification—all of which can help prepare the next generation of engineers and scientists to innovate in these critical areas. Educators can use MATLAB and Simulink to:

- Teach electrical circuit design for motor control and power system modeling
- Enhance foundational curricula using dynamic visualizations
- Implement virtual labs
- Use project-based learning with MATLAB and Simulink challenge projects nominated by industry leaders
- Provide practical experience through integrated hardware support and embedded code generation
- Engage with an active electrification community using File Exchange and GitHub



Women in Data Science

MathWorks also continues to partner with the Women in Data Science (WiDS) Datathon, offering complimentary software, tutorials, and videos on MATLAB and Simulink. This ongoing partnership empowers participants around the world—particularly women—to strengthen their data science skills. Additionally, each year, the WiDS Datathon presents a timely and impactful challenge, such as **“Adapting to Climate Change by Improving Extreme Weather Forecasts”** to help communities adapt to climate change.

Participants used physics-based models and machine learning techniques to improve sub-seasonal weather forecasts, offering crucial insights for agriculture, energy, transportation, and disaster planning sectors. The prediction task involved forecasting sub-seasonal temperatures over two weeks in the US, using provided weather and climate data for various locations and start dates to predict the average of maximum and minimum temperatures for each location and start date. With a dataset created with Climate Change AI, participants forecasted temperature and precipitation for a year, competing against other teams and official National Oceanic and Atmospheric Administration (NOAA) forecasts.

Advancing Sustainability-Focused Research

MathWorks is committed to supporting research that addresses climate-related challenges through both thought leadership and direct funding. We actively engage with the academia and industry to explore how technologies like control systems and artificial intelligence can contribute to climate change mitigation, adaptation, and resilience.

As part of this commitment, MathWorks staff have participated in collaborative visioning activities with organizations such as the IEEE Control Systems Society. These efforts have contributed to publications examining climate change as a societal driver and the role of control systems in addressing environmental challenges. One such contribution evolved from a chapter in the society's Road Map to 2030 report into a peer-reviewed article in the IEEE Control Systems Magazine.

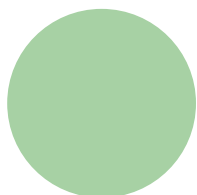
MathWorks also fosters dialogue and innovation through events like the annual **MathWorks Research Summit**, where experts convene to discuss emerging topics. One such discussion focused on the role of AI in sustainability and renewable energy, highlighting the potential of intelligent systems to drive environmental progress.

In parallel with these thought leadership efforts, MathWorks continues to expand its support for university-led research. Active projects have included work at institutions in the United States and India, covering topics such as thermal modeling and cell characterization of batteries for electric vehicles at IIT Kharagpur, vehicle stability control system design at Arizona State University, lithium-ion battery modeling at the University of Michigan, and battery fault detection and remaining useful life estimation at the University of Connecticut.

Industry Academia Partnerships

MathWorks supports industry-academia partnerships that address the shortage of trained engineers ready to work on sustainability-focused applications. For example, **National Institute of Technology Calicut (NIT Calicut)** collaborated with **Robert Bosch Engineering** and Business Solutions India Private Limited (RBEI) and MathWorks to create an *Electric Vehicle System Engineering* course. This course covers EV fundamentals, energy storage systems, electric drive train systems, and EV system modeling and simulation, with the goal of training engineers in a matter of months rather than years. Since its inception, the course has greatly reduced the on-the-job training time for new engineers at Bosch, increased student enrollment by 250%, and received overwhelmingly positive feedback.

Aviation is among the most carbon-intensive transportation methods and is one of the fastest-growing sectors for CO₂ emissions. MathWorks collaborates with the **University of Cambridge's Aviation Impact Accelerator (AIA)**, a diverse group of academics and practitioners, to pursue net-zero flight. The AIA develops interactive, evidence-based, open-source simulators that model the entire system—from sourcing renewable energy and raw materials to fuel production and transportation. These tools aim to educate and engage decision-makers and the broader public in achieving this goal.



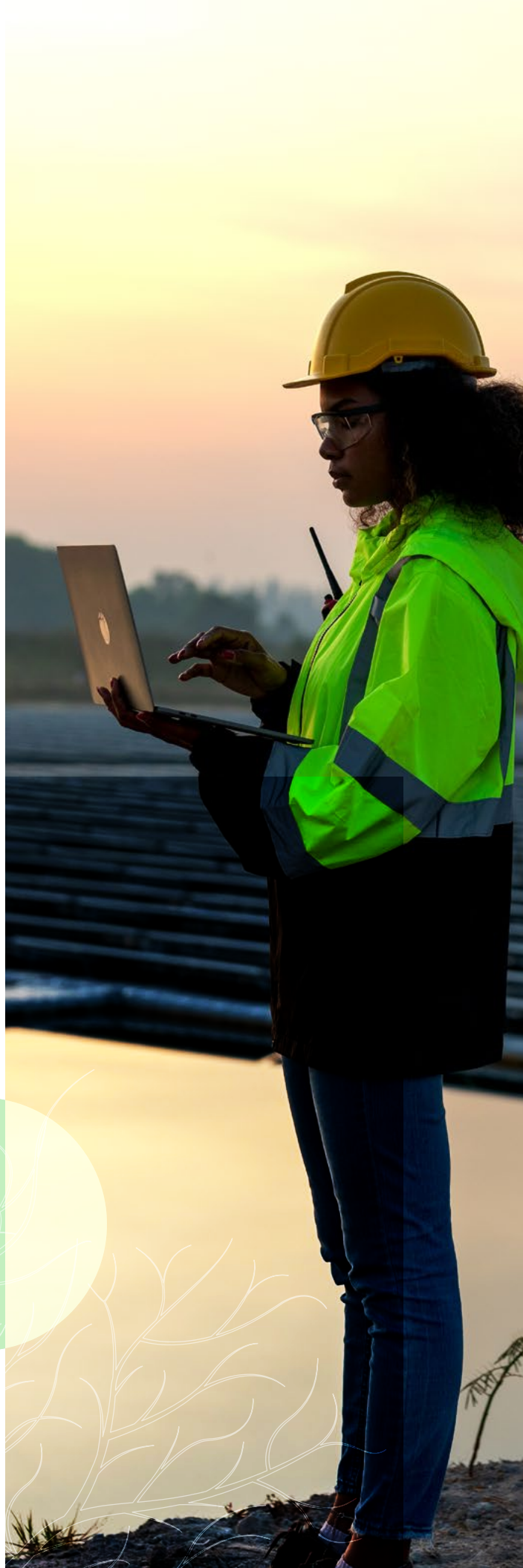
PRODUCTS

Consistent Effort to Support Electrification

Solving for Renewable Energy Systems

Enabling the Energy Transition with Climate Science

Product Performance and Efficiency





Products

MathWorks is the leading developer of mathematical computing software. Its product family, comprising MATLAB, Simulink, and over 130 additional tools, is used by scientists and engineers to advance knowledge and understanding of the forces driving climate change and to design and develop energy-efficient technologies and engineered systems.

MATLAB and Simulink are powerful computational environments which scientists and engineers use to design, simulate, and analyze complex systems. These tools allow users to create detailed models that accurately represent real-world systems, enabling them to explore innovative solutions to pressing climate challenges. By providing powerful tools for modeling, simulation, and analysis, we enable engineers and scientists to optimize designs, reduce waste, and improve energy efficiency across various industries, from automotive to renewable energy sectors.

Consistent Effort to Support Electrification

MathWorks has an ongoing commitment to support electrification, a transformative megatrend across many industries crucial for advancing scalable solutions to environmental challenges. We support customers as they tackle climate challenges through electrical innovations that enhance power generation reliability, boost equipment efficiency, and contribute to climate change mitigation by reducing greenhouse gas emissions. In addition, engineers are hard at work designing new renewable energy sources and integrating them into power grids. Transportation vehicles such as cars, boats, planes, and cycles are quickly becoming electrified.

Polestar's Whole-Vehicle Simulation Platform for Sustainable EV Innovation

Polestar, a Swedish EV manufacturer, is committed to speeding up the transition to sustainable transportation. With a strong emphasis on design, Polestar prioritizes enhancing efficiency in both the development and performance of its vehicles.

Polestar engineers wanted to optimize a vehicle's energy management by understanding the interactions between various EV control systems. This presented the challenge of accurately simulating complex vehicle components—such as powertrains, control systems, and cooling systems—while also promoting collaboration between international engineering teams. After assessing modeling requirements, Polestar chose Simulink and Simscape to [create Pandora](#), a whole-vehicle simulation platform which enables engineers to create detailed simulation of EV systems and how they interact.

Pandora was built in just nine months. Simulink enabled Polestar to integrate robust data analysis tools with existing control systems, while Simscape supported detailed physical modeling of vehicle components, such as electric motors, tires, and driveline systems. Pandora's use of variant

subsystems offered flexibility, allowing engineers to switch between different levels of model fidelity based on specific simulation requirements. This adaptability ensured that resources were used efficiently, focusing on the necessary level of detail for each stage of the vehicle design and development process.

As vehicle designs evolved, Pandora enabled Polestar to conduct design tradeoffs, concept evaluations, and development analyses. By correlating simulation models with physical hardware prototypes, Polestar was able to verify and enhance the accuracy of its simulations.

Pandora has played a crucial role in advancing Polestar's sustainability efforts. For example, through detailed simulations, Polestar optimized tire rolling resistance which reduced energy consumption and increased battery range by over 13 kilometers for the Polestar 2, directly benefiting customers with enhanced vehicle performance. Moreover, Pandora's ability to integrate and analyze extensive data from various teams allowed Polestar to make informed design decisions that align with its commitment to reducing environmental impact.

Solving for Renewable Energy Systems

MathWorks provides software that empowers engineers to engage in system-level simulation. This enables them to:

- Conduct system behavior studies for optimal component sizing and performance enhancement
- Assess power requirements for consumer, commercial, and industrial products
- Design, validate, and implement embedded software that adheres to industry standards

Designing and testing robust renewable energy systems, such as wind and solar farms, is complex due to the variability of wind and sunlight and the need to balance generation and demand. Despite these challenges, these systems are increasingly contributing to overall electricity generation. Engineers use MATLAB, Simulink, and Simscape to model renewable energy architectures, perform grid-scale integration studies, and develop controls for renewable energy and storage systems.

For example, wind energy company **Vestas Wind Systems A/S** uses MATLAB and Simulink to develop wind farm control systems and demonstrate power grid compliance to their customers and grid operators. Vestas uses simulations to demonstrate to transmission system operators how the plant will perform when connected to the grid under normal conditions and in the presence of voltage drops, oscillations, and other disturbances.

To support carbon-neutral energy production, the power grid of the future relies on power electronics and control software. **Siemens Energy** uses Model-Based Design with MATLAB and Simulink to develop and verify complex power transmission systems. Their goal is to enhance the grid for highly fluctuating distributed generation from clean energy sources and progressively increase the share of renewables in the energy mix.

Clean Technologies Power Electric Three-Wheelers

Over 6 million three-wheelers in India transport passengers, cargo, and parcels. While suited for various road conditions, most run on fossil fuels, contributing to pollution. One company, **Altigreen Propulsion Labs**, is focused on providing a green alternative that reduces both air and noise pollution. It is rolling out electric three-wheelers, neEVs, for last-mile deliveries across India. The neEV charges in under four hours, has a range of 151 kilometers (93 miles), and surpasses fossil fuel-powered three-wheelers in torque, power, and load capacity. Altigreen provides transport solutions for companies like Amazon and Flipkart and is now selling neEV to owner-operators and small businesses.

The Altigreen team had a clear understanding of the India-specific challenges and use cases related to last-mile mobility. The team used MATLAB and Simulink to design retrofit kits converting ICE vehicles into hybrids/electrics and develop drivetrain control systems for various vehicles. To accelerate electrification, they became an OEM, developing electric three-wheelers for the 400 million Indians relying on them daily.

Altigreen also used Simulink to build a system-level simulation model of the vehicle to test how different components work together, validate designs earlier in the development cycle, and generate the embedded C code that controls the three-wheeler electric motor and battery system.





Enabling the Energy Transition with Climate Science

Climate science plays a pivotal role in facilitating the energy transition by providing critical insights into environmental dynamics. Researchers use MATLAB to understand the complex interactions, preconditions, and trends associated with the Earth's systems, including the ocean and atmosphere.

With MATLAB, researchers can analyze vast datasets, model climate phenomena, and predict future changes, thereby contributing to the development of sustainable energy solutions.



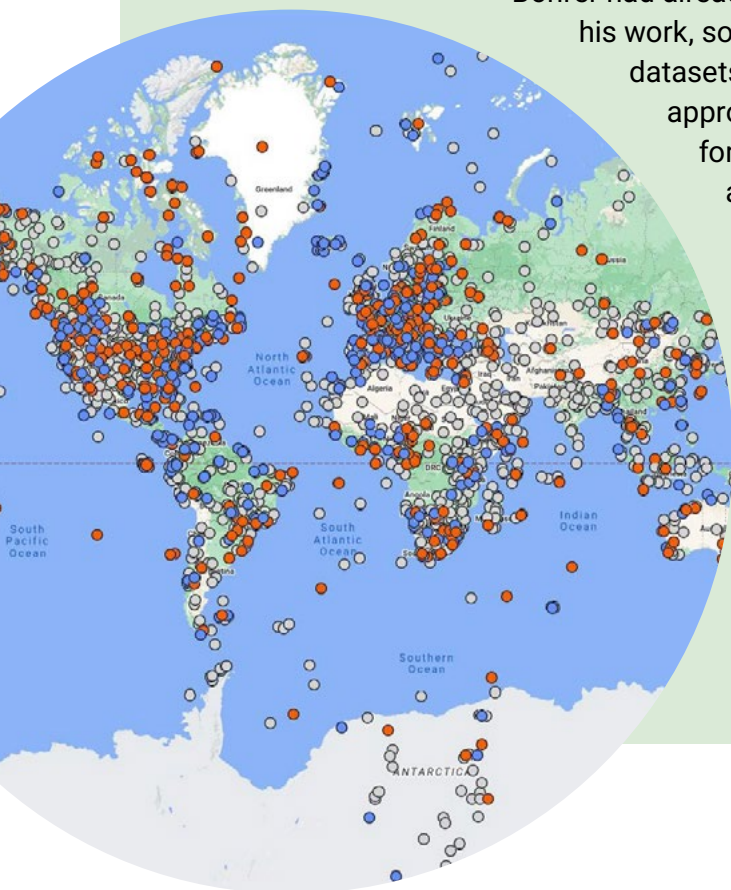
Tracking and Mapping Animal Migration Patterns for a Balanced Coexistence

An expanding human footprint has growing implications for wildlife. In turn, tools that track and map animal migration paths are critical for urban planners and conservationists focused on balancing the needs of wildlife and human communities.

In response to this growing need, the **NASA Ecological Forecasting Program** collaborated with Ohio State University's Gil Bohrer, a civil, environmental, and geodetic engineering professor, to make animal movement tracking data analysis broadly accessible. Bohrer has been developing tools that analyze animal movement data, such as Environmental-Data Automated Track Annotation (Env-DATA), since 2011.

Bohrer, along with developer Justine Missik and outreach specialist Sarah Davidson, organized a coalition of end users and launched the initiative Room to Roam: Yellowstone to Yukon Wildlife Movements (Room2Roam). The goal is to collect and organize animal migratory data from the 2,100-mile Yellowstone to Yukon (Y2Y) corridor. This ecosystem is one of the largest wildlife migratory paths in the world, supporting grizzly bears, caribou, wolves, and birds, including the golden eagle.

Bohrer had already been using MATLAB to create visualizations of his work, so he understood its capability of handling the large datasets collected from animal-attached sensors. He approached MathWorks to seek funding and collaboration for the Room2Roam project. Bohrer and his team adopted an open science approach to develop ECODATA-Animate, a user-friendly tool built with MATLAB App Designer and Mapping Toolbox. ECODATA-Animate is now accessible to many stakeholders and government agencies interested in tracking animal migration. This tool allows users without extensive coding skills to quickly create videos and animations based on data. It helps users understand how wildlife responds to roads and vehicle traffic and build human infrastructure in a way that is respectful of the animals' natural habitat and well-being.



Bringing Data Down To Earth with NASA's Earthdata Cloud

Cloud computing offers scalable resources, allowing organizations to easily adjust their IT infrastructure based on demand, reducing costs and increasing efficiency. Additionally, it provides enhanced collaboration and accessibility, enabling users to access data and applications from anywhere, improving productivity and flexibility. As part of this shift, NASA's Earth Science Data Systems (ESDS) Program aims to transition its Earth Observing System Data and Information System (EOSDIS) components to a cloud environment called the Earthdata Cloud. This transition is crucial to NASA's ESDS Transform to Open Science (TOPS) mission, which seeks to improve data access.

Moving EOSDIS to the Earthdata Cloud offers several advantages: scalability, flexibility, and reduced redundancy. This transition is also cost-effective, providing free access to NASA data for discovery, search, access, and download. Users can explore NASA's vast collection of Earth science datasets through the Earthdata Cloud without downloading large amounts of data if they prefer not to. Additionally, many users have shown interest in integrating Earthdata with MATLAB, recognizing its potential to enhance data analysis and visualization capabilities.

To support this integration, the NASA Openscapes team collaborated with MathWorks to **incorporate MATLAB into NASA Openscapes JupyterHub** and tutorials. This effort enables direct Earthdata Cloud access from MATLAB, allowing researchers to work seamlessly with cloud-based data. The two teams successfully installed MATLAB on NASA Openscapes JupyterHub, making it available to NASA Openscapes-affiliated learning event participants. The integration includes a full MATLAB desktop with 15 toolboxes, such as Mapping Toolbox, Signal Processing Toolbox™, and Statistics and Machine Learning Toolbox™. As users identify additional toolboxes they require, the list can expand. The 2022 and 2023 NASA Openscapes Champions program teams used MATLAB on the platform, further supporting the integration of NASA Earthdata Cloud access through MATLAB.



Product Performance and Efficiency

Engineers use MATLAB and Simulink to run computationally complex models and simulations that replicate real-world behaviors. This enables them to save cost and minimize the risk of testing on real systems, including energy generators, storage devices, wind turbines, batteries, and solar panels.

We continue to improve product performance and usability to ensure that customers can model real-world behaviors of complex systems while optimizing energy usage.

Over the last decade, we **increased performance speed by 2.25 times** based on nearly 100 application-level benchmarks we monitor. The decrease in runtime translates to lower energy usage and emissions.

Appendix

About This Report

This MathWorks Climate Action Report serves as an informational resource for our stakeholders and all who may be interested in learning about our approach to environmental stewardship. This report includes quantitative and qualitative information prepared following Global Reporting Initiative (GRI) standards, from January 1, 2023, to December 31, 2024, unless otherwise noted. Data in this report has been externally verified (assurance report available upon request). Going forward, we plan to report annually. For more information or with questions, email sustainability@mathworks.com.

GRI Index

The following table includes a subset of disclosures from the GRI Standards 2021 that correspond to the content and environmental boundaries of our report. Report content and responses were prepared following the GRI standards for the period of January 1, 2023, to December 31, 2024.

General Disclosures		
Disclosure	Description	Location/Response
2-1	Organizational details	About MathWorks
2-2	Entities included in the organization’s sustainability reporting	About MathWorks
2-3	Reporting period, frequency, and contact point	About This Report
2-4	Restatements of information	About This Report
2-5	External assurance	Data in this report has been externally verified by CarbonBetter using ISO 14064 - Part 3. (Assurance report available on request)
2-6	Activities, value chain, and other business relationships	About MathWorks Company Fact Sheet
2-7	Employees	About MathWorks
2-12	Role of the highest governance body in overseeing the management of impacts	MathWorks Environmental Policy
2-13	Delegation of responsibility for managing impacts	MathWorks Environmental Policy
2-14	Role of the highest governance body in sustainability reporting	MathWorks Environmental Policy

General Disclosures		
Disclosure	Description	Location/Response
2-23	Policy commitments	Policies and Statements We are in the process of developing an environmental policy.
2-25	Processes to remediate negative impacts	Operations
2-27	Compliance with laws and regulations	MathWorks Environmental Policy
2-28	Membership associations	The Business Software Alliance
Economic Performance		
201-2	Financial implications and other risks and opportunities due to climate change	Our Greenhouse Gas Inventory
Energy		
302-1	Energy consumption within the organization	Managing Energy and Water
302-3	Energy intensity	Managing Energy and Water
302-4	Reduction of energy consumption	Optimizing Our Natick Facilities
Water and Effluents		
303-1	Interactions with water as a shared resource	Managing Energy and Water
303-5	Water consumption	Managing Energy and Water
Biodiversity		
304-3	Habitats protected or restored	Supporting Large-Scale Land Conservation in Massachusetts with Mass Audubon

Emissions		
Disclosure	Description	Location/Response
305-1	Direct (Scope 1) GHG emissions	Our Greenhouse Gas Inventory
305-2	Energy indirect (Scope 2) GHG emissions	Our Greenhouse Gas Inventory
305-3	Other indirect (Scope 3) GHG emissions	Our Greenhouse Gas Inventory
305-4	GHG emissions intensity	Our Greenhouse Gas Inventory
305-5	Reduction of GHG emissions	Addressing Our Carbon Footprint
Waste		
306-1	Waste generation and significant waste-related impacts	Diverting Waste
306-2	Management of significant waste-related impacts	Diverting Waste
306-3	Waste generated	Diverting Waste
306-4	Waste diverted from disposal	Diverting Waste
306-5	Waste directed to disposal	Diverting Waste

Environmental Data Notes and Methodology

GHG emissions data has been reported for MathWorks global operations of owned and leased locations, including administrative and office spaces, which included 34 total properties in 2024.

Our emissions data was calculated following **GHG Protocol** methodology ([Version 1.0](#)), and we follow the guidelines provided by the GHG Protocol for Scopes and associated emissions. Notes are provided where a judgment call has been made after internal review and third-party consultation. We also review our scopes and categories annually for materiality and keep track of updates in the GHG Protocol guidelines.

Scope 1 GHG emissions are direct emissions from sources that are owned or controlled by MathWorks. This includes natural gas consumption at Apple Hill, Lakeside, and leased properties around the world. For properties below 20,000 square feet, where fuels categorized as Scope 1 are associated with the space we lease, we estimate consumption using CBECS data.

Scope 2 GHG emissions are indirect emissions from sources that are owned or controlled by MathWorks, including grid electricity consumption at Apple Hill and Lakeside in Natick, Massachusetts, and leased properties in AMER, APAC, and EMEA. We also consider emissions from offsetting RECs sold, which represent 1 MWh of electricity generated by our onsite solar arrays. For properties below 20,000 square feet, we estimate electric consumption using CBECS data.

Scope 3 GHG emissions are from sources not owned or directly controlled by MathWorks but are caused by our activity and operation. We primarily include emissions from purchased/capital goods and services, fuel- and energy-related activities, waste, business travel, employee commuting, remote work, and downstream leased assets. Leased properties in AMER, APAC, and EMEA are excluded from waste emissions until data can be collected.

We do not calculate emissions for certain Scope 3 categories, such as upstream/downstream transportation and distribution, processing, use, end of life for sold products, franchises, and investments as these are not material or relevant to MathWorks.

The categories for which we do calculate emissions are:

- **Category 1: Purchased goods and services.** This category is calculated based on MathWorks annual global spending, categorized, and converted to US dollars. Total category spending is aligned with the categories in the CEDA data set to convert to MT CO₂e.
- **Category 2: Capital goods.** This category is calculated based on MathWorks annual global spending, categorized and converted to US dollars. Total category spending is aligned with the categories in the CEDA data set to convert to MT CO₂e.
- **Category 3: Fuel- and energy-related activities (FERA).** FERA data for our utility consumption comes from our Scope 1 and Scope 2 calculations, regardless of whether they are from utility bills or estimated. For 2022, only electric transmission and distribution losses and fossil fuel well-to-tank (WTT) were calculated utilizing EPA, IEA, and DEFRA data. Electric WTT and WTT transmission and distribution (T&D) were not calculated as reliable emission factors were not available at the time of this report.
- **Category 5: Waste.** MathWorks only calculates waste where removal and processing data is available, which in this case is our Natick campuses. This accounts for 69% of our total square footage. Emission factors come from DEFRA. For 2023 and beyond, MathWorks aims to increase data collection for our offices on waste generation and disposal.
- **Category 6: Business travel.** Data for business travel comes from our travel booking and management software and our expense system. Emission factors are based on DEFRA or spending data leveraging the CEDA data set.
- **Category 7: Employee commuting.** Data for calculation comes from the MathWorks HR system, MathWorks security system, MathWorks commuting survey, and a MATLAB program built internally to get commute distance. Emissions per mile data comes from the EPA and DEFRA.
- **Category 7: Remote work.** The GHG protocol only briefly mentioned remote work within the commuting section but offers no formal approach or calculation methodology. On the guidance of our consultant, calculations were based off of the [Ecoact Homeworking Emissions white paper](#). Data for remote work comes from the MathWorks HR system and MathWorks security system.
- **Category 13: Downstream leased assets.** This category follows the same methodology as calculating our Scope 1 and 2 emissions for our Natick campuses.

As part of our ongoing commitment to transparency and continuous improvement, we will keep refining our data collection and calculation methodologies, ensuring accurate reporting of our environmental performance.

Climate Project Index

We retired the following carbon offsets (VERs) and RECs to address GHG emissions.

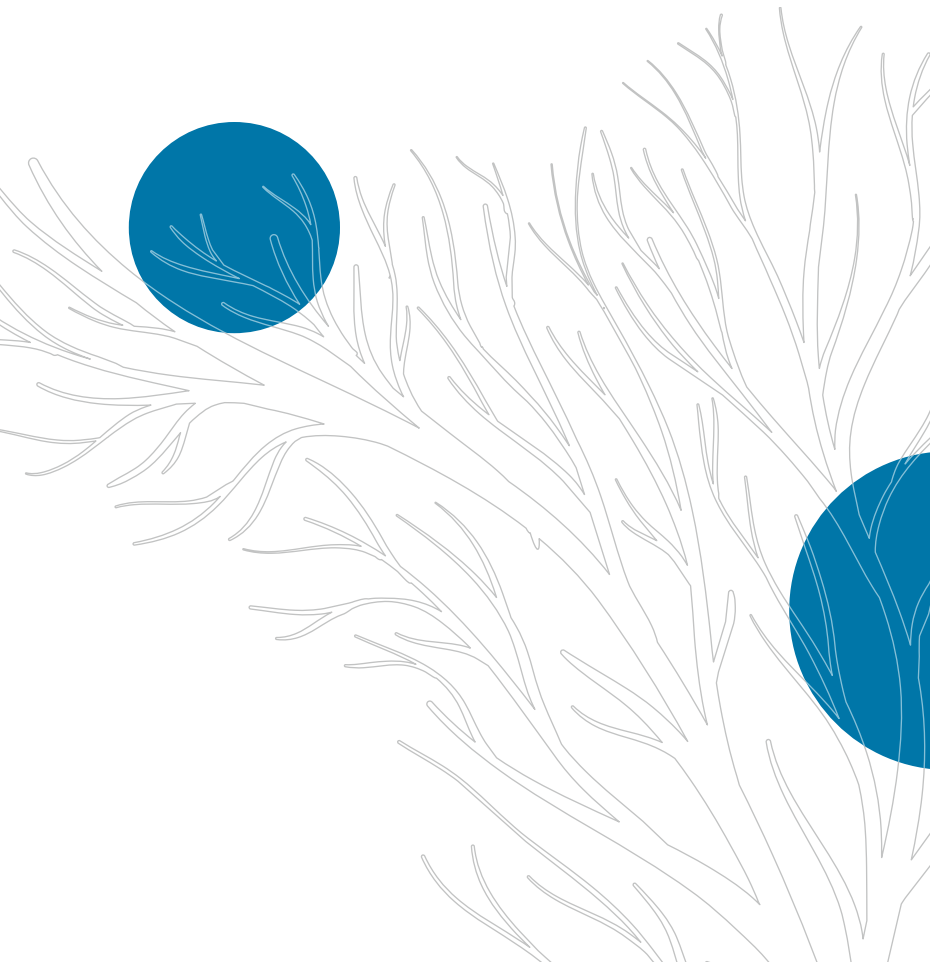
Year	Credit Type	Volume of Retirement (Unit)
2020	RECs	15,500
2020	VERs	4,916
2021	RECs	15,500
2021	VERs	1,920
2022	RECs	19,000
2022	VERs	9,736
2023	RECs	19,500
2023	VERs	17,253
2024	RECs	19,200
2024	VERs	30,722

ABOUT MATHWORKS

MathWorks at a Glance

MathWorks Offices: 34 Locations in 16 Countries

Our Products and Services



About MathWorks

MathWorks is the leading developer of mathematical computing software. Our purpose is to change the world by accelerating the pace of discovery, innovation, development, and learning in engineering and science. We achieve this through four components of our mission:

- **Technology.** We work to provide the ultimate computing environment for technical computation, visualization, design, simulation, and implementation. We use this environment to provide innovative solutions in a wide range of application areas.
- **Business.** We strive to be the leading worldwide developer and supplier of technical computing software. Our business activities are characterized by quality, innovation, and timeliness; competitive awareness; ethical business practices; and outstanding service to our customers.
- **Human.** We cultivate an enjoyable, vibrant, participatory, and rational work environment that nurtures individual growth, empowerment, and responsibility; appreciates diversity; encourages initiative and creativity; values teamwork; shares success; and rewards excellence.
- **Social.** We actively support our local and professional communities through initiatives that advance STEM education, foster staff volunteerism, build environmental sustainability, and aid global relief efforts.

MathWorks at a Glance



Founded in 1984



120+ MATLAB® and Simulink® products with 5 million+ users



Revenue of \$1.5 billion



Customers in 180+ countries



Headquartered in
Natick, Massachusetts

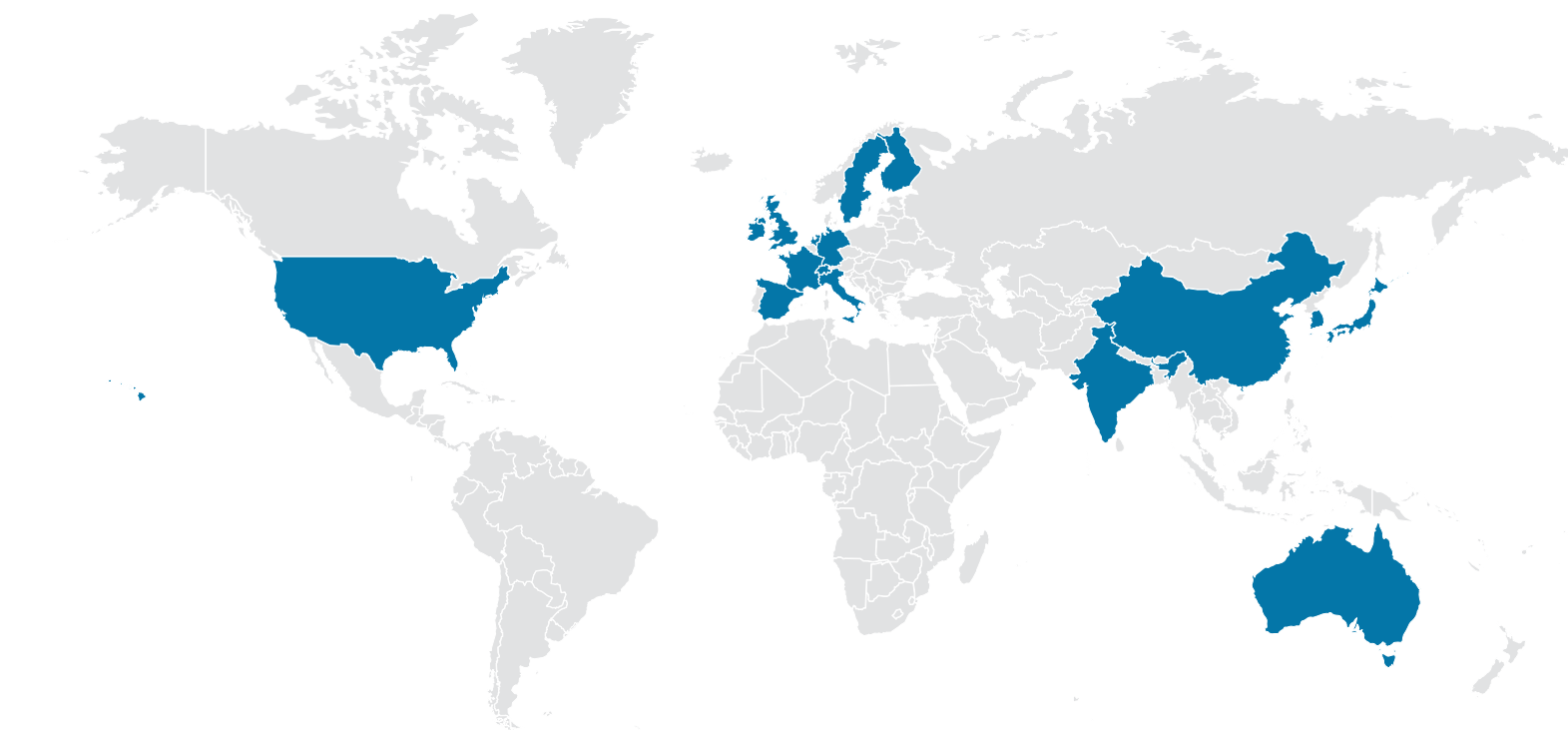


Installations at 100,000+
businesses, universities, and
government organizations



6,500+ staff members across
34 global locations

MathWorks Offices: 34 Locations in 16 Countries



AUSTRALIA | Chatswood

CHINA | Beijing and Shanghai

FINLAND | Espoo

FRANCE | Meudon and Montbonnot

GERMANY | Aachen, Munich, Paderborn, and Stuttgart

INDIA | Bangalore, Hyderabad, New Delhi, and Pune

IRELAND | Galway

ITALY | Torino

JAPAN | Nagoya, Osaka, and Tokyo

KOREA | Seoul

NETHERLANDS | Eindhoven

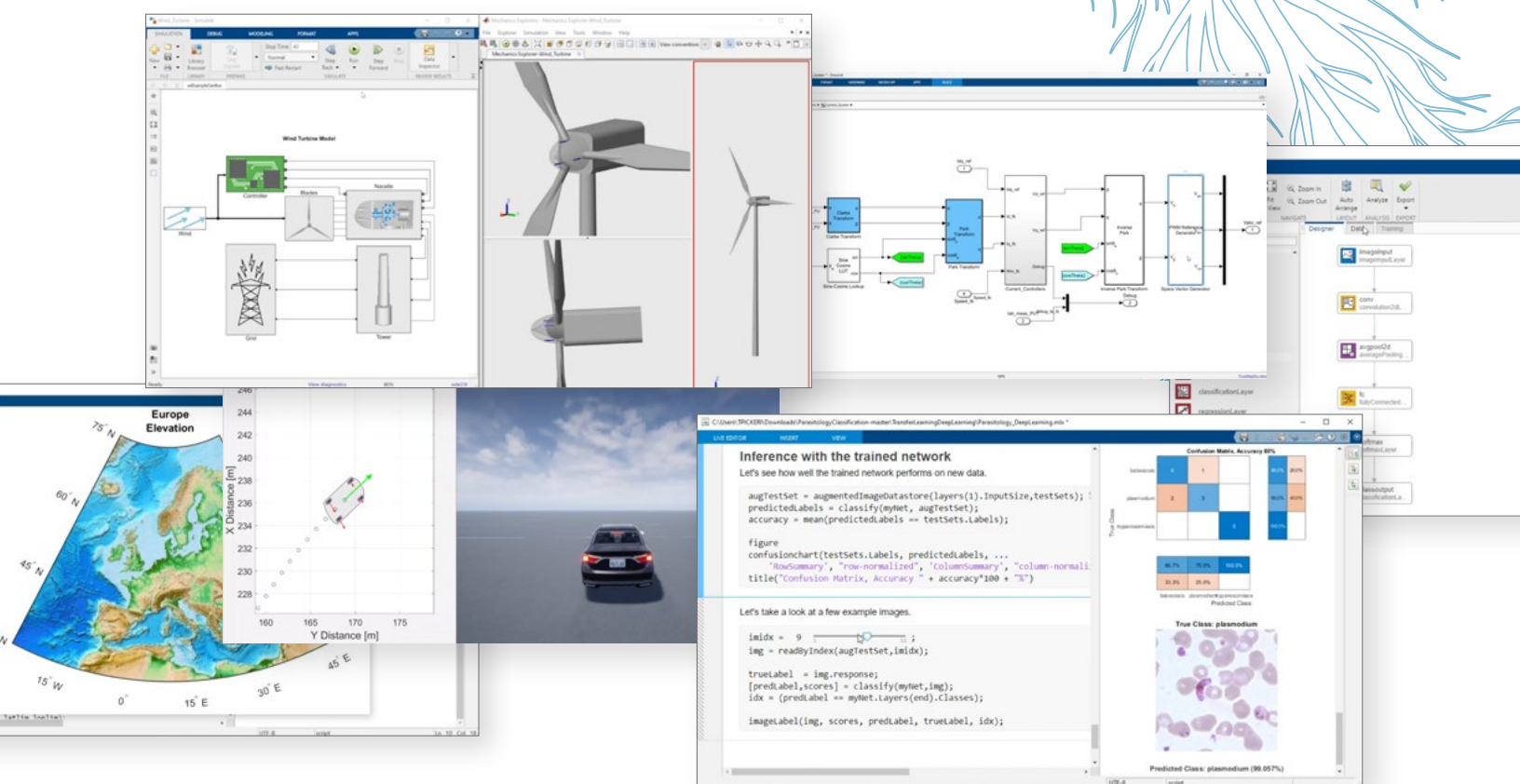
SPAIN | Madrid

SWEDEN | Gothenburg and Kista

SWITZERLAND | Bern

UNITED KINGDOM | Cambridge, England, and Glasgow, Scotland

UNITED STATES | Carlsbad, Santa Clara, and Torrance, California; Chevy Chase, Maryland; Natick, Massachusetts; Novi, Michigan; and Plano, Texas



Our Products and Services

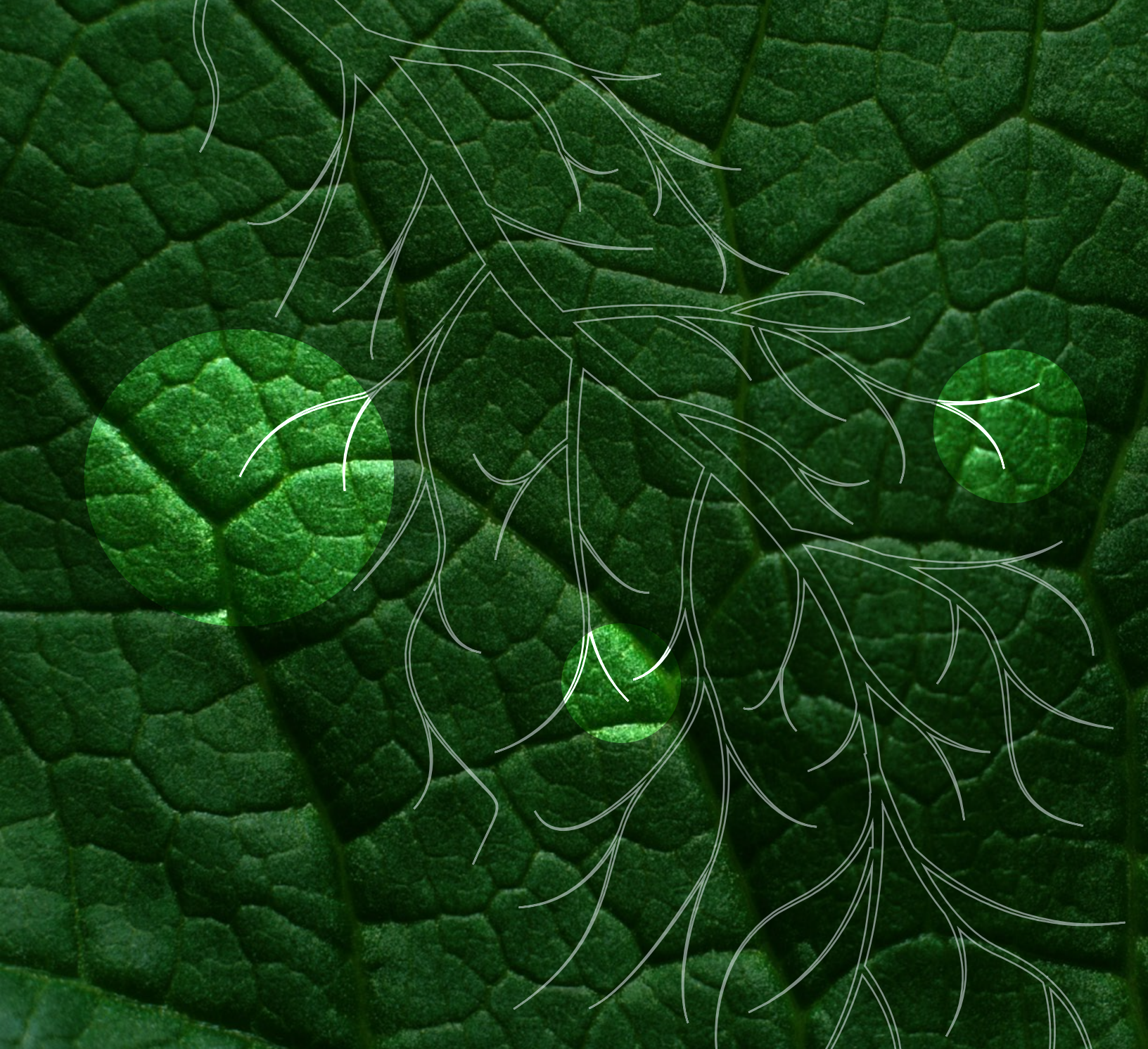
At MathWorks, we believe in the importance of engineers and scientists to increase human knowledge and profoundly improve our standard of living. We help them do their best work through two product families:

- **MATLAB**, a programming and numeric computing platform for analyzing data, developing algorithms, and creating models
- **Simulink**, a block diagram environment used to design systems with multidomain models, simulate before moving to hardware, and deploy without writing code

Engineers and scientists worldwide use MATLAB and Simulink across many industries:

- Academia
- Aerospace and defense
- Automotive
- Biotech and pharmaceutical
- Communications
- Electronics and semiconductors
- Energy
- Financial services
- Industrial automation and machinery
- Medical devices
- Software and internet

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