



Task Force on Climate-Related Disclosures (TCFD) Report
2022

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These policies contain certain forward-looking statements based on Vornado's current assumptions and expectations, including statements regarding our ESG targets, goals, commitments and programs and other business plans, initiatives, aspirations and objectives. These statements are typically accompanied by the words "aim," "hope," "believe," "estimate," "plan," "aspire" or similar words. All such statements are intended to enjoy the protection of the safe harbor for forward-looking statements within the meaning of Section 21E of the Securities Exchange Act of 1934, as amended. Our actual future results, including the achievement of our targets, goals or commitments, could differ materially from our projected results as the result of changes in circumstances, assumptions not being realized, or other risks, uncertainties and factors. Such risks, uncertainties and factors include the risk factors discussed in Item 1A of our most recent Annual Report on Form 10-K and subsequent quarterly reports on Form 10-Q filed with the Securities and Exchange Commission. We urge you to consider all of the risks, uncertainties and factors identified above or discussed in such reports carefully in evaluating the forward-looking statements in these policies. Vornado cannot assure you that the results reflected or implied by any forward-looking statement will be realized or, even if substantially realized, that those results will have the forecasted or expected consequences and effects. The forward -looking statements in this report are made as of the date of these policies unless otherwise indicated, and we undertake no obligation to update these forward-looking statements to reflect subsequent events or circumstances.

1. Introduction

ABOUT VORNADO

Vornado Realty Trust (NYSE: VNO) is a fully integrated Real Estate Investment Trust (REIT). Vornado's portfolio is concentrated in the nation's key market, New York City, along with the premier asset in both Chicago and San Francisco. Vornado is also the real estate industry leader in sustainability policy. The company owns and manages over 27 million square feet of LEED certified buildings and received the Energy Star Partner of the Year Award, Sustained Excellence 2023. Vornado Commemorated 50 years on the NYSE in 2012 and is a member of the S&P MidCap 400.

ABOUT THE TASK FORCE ON CLIMATED-RELATED FINANCIAL DISCLOSURES (TCFD)

In 2015, the Financial Stability Board (FSB) established the TCFD to develop recommendations on the types of information that companies should disclose to support investors, lenders, and insurance underwriters in appropriately assessing and pricing a specific set of risks—risks related to climate change.

TCFD is committed to market transparency, the success of the TCFD recommendations depends on widespread adoption by companies in the financial and non-financial sectors.

Through widespread adoption, financial risks and opportunities related to climate change will become a part of companies' risk management and strategic planning processes. Stakeholders' understanding of the potential financial implications associated with transitioning to a lower-carbon economy and climate-related physical risks will increase; information will become more decision-useful; and risks and opportunities will be more accurately priced, allowing for the more efficient allocation of capital.

FROM OUR CHAIRMAN

Our Board and senior management are proud of Vornado's national leadership in ESG, improving our communities, our buildings, and our tenant experiences. We continue to build upon our Vision 2030 and Science Based Target commitment through our robust ESG program. Our complete plan can be found on our website at www.vno.com/sustainability.



Key achievements include:

- Procured 100% renewable energy credits (RECs) for electricity directly managed by Vornado in the key markets in which we operate. These RECs include those sourced from hydroelectric, solar and wind facilities located in the States of New York and California.
- Achieved a 28% reduction in overall energy consumption across our in-service office portfolio, since 2009
- Reached a 64% waste diversion rate this year across our in-service office portfolio against our 75% long-term target
- Received multiple awards recognizing our continued industry leadership in sustainability including the 12th NAREIT Leader in the Light Award; Energy Star Partner of the Year with Sustained Excellence and Global "Sector Leader" for Diversified Office/Retail REITs in the Global Real Estate Sustainability Benchmark (GRESB), ranking #1 in the USA amongst peers

We use data to measure progress against our goals, align our goals with our tenants, plan for our longer-term projects and engage with our stakeholders in meaningful ways. We use carbon accounting software, energy audits and models and building automation software to:

- Manage our portfolio-wide waste, water and energy reduction strategies
- Create roadmaps for each building to understand how to achieve carbon neutrality
- Provide accurate and actionable data for our measurement, verification and reporting requirements

We have expanded services focused on the health and well-being of our best-in-class employees with continuing education and career development. Through our Vornado Volunteers program, our employees supported local organizations including Habitat for Humanity, Breaking Ground, the Central Park Conservancy and Project Cicero. In THE PENN DISTRICT, we launched WorkLife, Vornado's amenity ecosystem that allows our tenants, employees and communities to focus on work and self-care. We offer regular thought leadership, entertainment and wellness programs focused on supporting our organizations and individuals.

Our Board, and particularly our Nominating and Governance Committee, is assigned with oversight of ESG, which includes climate change risk. In 2023, we continued the assignment of ESG performance metrics as part of our Executive Compensation program. Our discussion on corporate governance is included in our proxy statement, which can be viewed at www.vno.com/proxy and the governance section of our website at www.vno.com/governance. In 2023, we will continue to monitor developments from the Securities and Exchange Commission on potential rule making for climate disclosures. Our ESG narrative is told with transparency and supported by data. All can be found at www.vno.com/sustainability.

Thanks to Lauren Moss, Samantha Benvenuto and Steven Borenstein who lead our ESG efforts.

Steven Roth
Chairman of the Board and
Chief Executive Officer

2. Task Force on Climate-Related Disclosures (TCFD)

GOVERNANCE

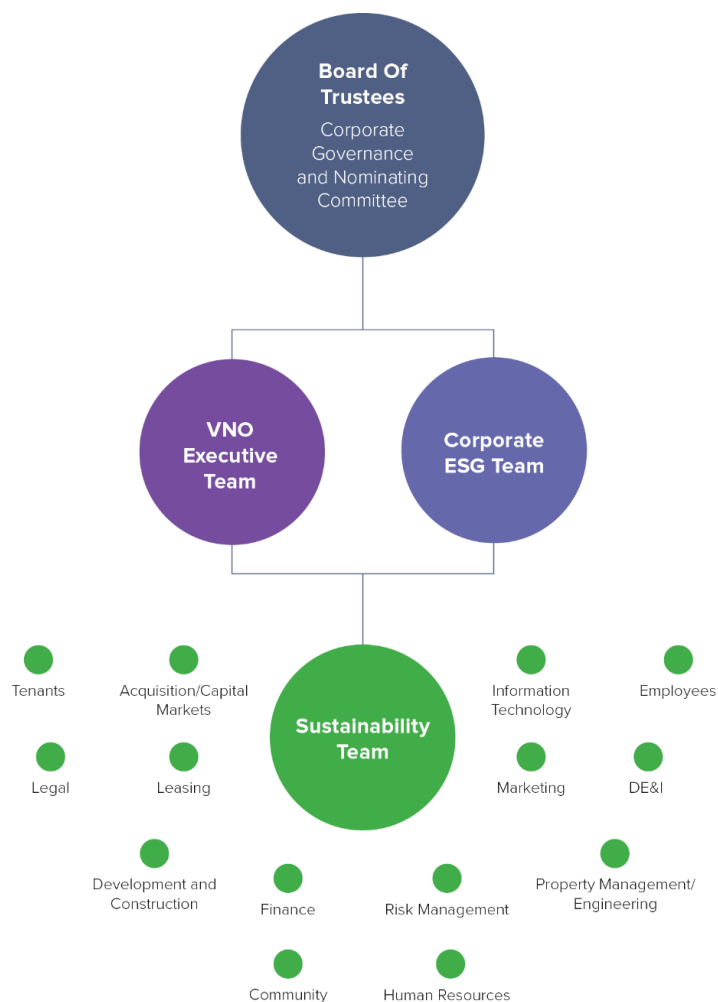
In February 2019, Vornado was among the first American real estate companies to become a signatory of and endorse the TCFD recommendations. Our leadership is committed to evaluating and disclosing climate-related risks material to our business. Vornado's detailed ESG Materiality Assessment can be found on our Environmental, Social & Governance 2022 report, issued April 2023, on page 33.

BOARD'S OVERSIGHT OF CLIMATE-RELATED RISKS AND OPPORTUNITIES

The leadership, beginning with the Board of Trustees, is part of the top-down strategy for the ongoing assessment and management of climate-related risks, which includes the execution of tasks throughout all levels and divisions of our business and receives regular updates on ESG from the Vornado Executive team. Our Board's Lead Trustee, also our Corporate Governance and Nominating Committee Chair, oversees environmental matters, including climate-related risks and opportunities. Vornado now includes critical ESG metrics, and associated progress towards achieving all-term climate targets, within the annual executive compensation package.

MANAGEMENT'S ROLE IN ASSESSING AND MANAGING CLIMATE-RELATED RISKS AND OPPORTUNITIES

A Corporate ESG Team helps to set company-wide priorities and serves as the liaison to the Board on climate-related risks and opportunities. While responsibilities are integrated throughout the company, the Chief Sustainability Officer and team oversee the management of climate risks along our properties' acquisition, development, operation, and disposition stages. Through direct interaction within various divisions, the Sustainability team continually evaluates transitional, physical, financial, and legal risks and opportunities.



The Board of Trustees is tasked with oversight of ESG matters including climate change risk, DE&I, and human capital management. They receive quarterly updates from VNO's Executive Team on ESG and an annual presentation from the SVP, Chief Sustainability Officer. The Corporate Governance and Nominating Committee oversees our ongoing ESG program and sustainability initiatives.

The VNO Executive Team is responsible for overall execution and goal setting for the organization. ESG is an integral component. ESG metrics are a part of the Executive Compensation Program and includes the metrics in our 2023 Long-term Performance Plan (LTPP), generally raising the required achievement levels in 2023 ESG metrics versus 2022 when measuring GHG emissions reductions, GRESB score, and LEED achievements.

The Corporate ESG Team is responsible for stakeholder engagement, investor communication and outreach, and execution of ESG strategy. The Team has a formal schedule of annual investor engagement on ESG and frequent meetings and communication among members.

The Sustainability Team is responsible for ESG strategy implementation within respective areas of focus. This includes daily discussions and active collaboration on specific projects as well as operations and maintenance. The Sustainability Team reports to the VNO Executive Team and the Corporate ESG Team.

ESG strategy is integrated across the entire spectrum of business units and stakeholder groups. There is frequent communication with respective heads of management.

STRATEGY

CLIMATE-RELATED RISKS AND OPPORTUNITIES THE ORGANIZATION HAS IDENTIFIED OVER THE SHORT, MEDIUM, AND LONG TERM

We have identified physical climate risk based on the IPCC Representative Concentration Pathway (RCP) 8.5, consistent with a worst-case scenario/business-as-usual scenario and assess physical risks and opportunities over the short- (present-2029), medium- (2023-2049), and long-term horizon (2050-2100). Transition risk has been assessed based on our SBTi commitment to limit global warming by 1.5°C and local regulatory controls.

Our transitional risks stem from regulatory impacts of both local and federal legislation and market impacts from workforce behavioral patterns, financial markets, and grid decarbonization. We assess physical risk as acute (event-driven) such as increased severity of extreme weather events or chronic (longer-term) such as shifts in temperature and increased variability in weather patterns.

Our physical risks are summarized and characterized as either acute or chronic and are described in further detail in the Physical Risk Assessment.

Our transitional risks are summarized and categorized by policy and legal, technological, market or reputational and are described in further detail in the Transitional Risk Assessment. We will forgo disclosure of these costs until compliance requirements for the Climate Mobilization Act (CMA), NYC's ambitious legislation passed in 2019 requiring buildings to curb and report their carbon emissions, and other climate regulations such as the SEC Climate Disclosure Rule are more definitively known. We do not expect these costs to be material within our short-term analysis.

We evaluate the potential scale and frequency of the identified risks to inform our organization's Enterprise Risk Management (ERM) assessments related to our business, strategic, and financial planning. The impact of such risks guide strategies for our buildings through acquisition, (re) development, and operations for our stabilized assets.

Our mitigation strategy against climate-related risk has been built into how we do business.

SHORT-TERM (PRESENT-2029)

RISKS	OPPORTUNITIES
<p>Policy and legal: Capital investment required towards energy efficiency or decarbonization to comply with local regulation, namely the Climate Mobilization Act (CMA).</p> <p>Policy and legal: Resources incurred to comply with pending Securities and Exchange Commission (SEC) rules regarding climate-related disclosures.</p> <p>Technology: The need for efficient and health-centric innovation.</p> <p>Market: Cost of energy, renewables and impact of market economics.</p> <p>Market: Access to capital because of high interest rates.</p> <p>Market: Global slowdown due to high interest rates limits new leases.</p> <p>Market: Manufacturing and supply chain disruption.</p> <p>Reputation: Remote working behavior and our tenants flight to quality to encourage working in offices.</p>	<p>Resilience: Accomplishment of Vision 2030 aligning our carbon footprint to a 1.5-degree climate scenario.</p> <p>Products and services: Market demand for sustainable and resilient buildings.</p> <p>Market: Proven market resilience through 40+ years of real estate cycles.</p> <p>Resource Efficiency: Reduced energy consumption and costs from energy efficiency measures.</p> <p>Energy Source: Sourcing energy from renewable grids or onsite renewables.</p> <p>Market: Expansion and outreach to our value chain.</p> <p>Markets: Leverage ESG-focused and sustainable financing mechanisms.</p>

MEDIUM-TERM (2030-2049)

RISKS	OPPORTUNITIES
<p>Policy and legal: Capital investment required towards energy efficiency or decarbonization in the cities where we do business, namely the CLCPA.</p> <p>Technology: Decarbonization of grid-supplied energy could lead to increased energy costs and operating expenses.</p> <p>Market: Changing perception of what an office should be – amenitization requirements.</p> <p>Reputation: Increased stakeholder concern or negative stakeholder feedback if CMA compliance or ESG targets are not met.</p>	<p>Resource Efficiency: Our overall energy consumption could decrease, yielding reduced operating cost.</p> <p>Products and Services: Carbon neutral buildings could be more competitive and could yield higher value to our business.</p> <p>Product and Services/Market: Alignment of climate-related goals with existing and future tenants increasing collaboration towards decarbonization and reputation.</p> <p>Markets: Energy storage, onsite renewable energy, and distributed energy resource deployment could yield additional sources of revenue and attract and retain tenants.</p> <p>Markets: Leverage ESG-focused and sustainable financing mechanisms.</p>

LONG-TERM (2050-BEYOND)

RISKS	OPPORTUNITIES
<p>Policy and legal: Capital investment towards energy efficiency or decarbonization.</p>	<p>Resource Efficiency: Improved air quality due to a cleaner grid could lead to lower HVAC operating and maintenance costs.</p>
<p>Policy and legal: Increased legislation limiting development.</p>	<p>Resilience: Mitigated increases in temperature could lead to reduced costs to adapt our buildings to be resilient to more extreme climate scenarios.</p>
<p>Technology: Increased energy costs due to full transition of grid-supplied energy to renewable sources.</p>	<p>Energy Source: Renewable energy delivered from the grid will reduce source-generated carbon emissions and potentially reduce exposure to climate regulation.</p>
<p>Market: Increased mitigation costs with long-term climate change impacts.</p>	<p>Resource Efficiency: Full transition of grid-supplied energy to renewable sources could lead to decreased offsite renewable product costs.</p>
	<p>Resilience: Increased demand and value for our product because our assets are located in dense urban areas with alternate means of transportation contributing to business continuity.</p>
	<p>Resilience: Increased demand and value for our product because a low percentage of our assets are located in flood zones.</p>
	<p>Markets: Leverage ESG-focused and sustainable financing mechanisms.</p>

VORNADO'S ACTIVATION (EXAMPLES)

Vornado is taking steps to improve its climate resilience. Within the last financial/reporting year the following actions have been taken to increase resilience.

ACTION	RESILIENCE IMPACT
Biodiversity policy, water efficiency programming and water retention policies.	Increase physical risk resilience against drought and increasing efficiency to reduce potential exposure to water shortages.
Performance-based risk assessments have been completed on all our properties that are required to comply with CMA or contribute to Vision 2030.	Manages the transition policy risk associated with CMA and other potential regulatory risk.
Completed a gap assessment with internal auditor on our current voluntary climate reporting and the SEC's proposed Climate-Related Disclosure rulings.	Provides a roadmap for future, material regulatory risk.
Expanded our Vendor Integrity Program (VIP) to assess a wide range of ESG criteria across our value chain.	Assesses the credentials of our value chain to provide a level of transition market risk preparedness protecting against potential changes in market sentiment that may impact our vendors. The action also provides signals to our supply chain about the need for ESG preparedness.
Completed a \$750 million dual-tranche green bond offering, which generated \$741.6 million of net proceeds. We have \$3.3 billion of sustainability-linked credit facilities comprising a Term Loan and two Revolving Credit Facilities, which leverage our GHG reduction efforts to provide potential loan pricing reductions.	Influences of the market through decarbonization products. These products provide a mitigation against reputational risk and potential greenwashing and demonstrate the realization of aspirations being translated into actions.
Savvy and active procurement decisions to mitigate rising energy costs, invest in renewable infrastructure and consider carbon offsetting projects.	Manage policy & legal, market, technological and reputational risk across the portfolio. Renewables will be a limited yet demanded commodity and strategic planning is essential. Fossil fuels are exposed to energy 'shocks' with renewables providing varying levels of technological and market insulation from potential future fluctuations in pricing.
Continued deployment of energy efficiency projects through operational changes, capital planning cycle, engagement with tenant operations and fuel feasibility studies.	Investment in energy efficiency aligns to policy transition risk, but also potential future market and technological risks.
Existing energy efficiency program and decarbonization efforts.	All risks have the potential to influence one another or cascade to accelerate asset stranding, so early action and implementation is needed.
Onsite renewable and battery storage feasibility studies at buildings.	

Vornado's physical risks were identified through our interpretation of the IPCC's representative concentration pathways (RCP – a description of four different 21st century pathways of greenhouse gas (GHG) emissions and additional environmental and land use scenarios) and applying industry best practice from a multitude of climate-related assessments and aligning with peer organizations. RCP 8.5 has been used as it provides the most realistic, sector relevant and conservative scenario.

PHYSICAL RISKS AND OPPORTUNITIES: SCENARIO ANALYSIS – RCP 8.5

ACUTE PHYSICAL RISKS (SHORT TERM)

- Stormwater surge, flood risk in vulnerable areas.
- Inability to transit to work due to flood or power loss.
- Localized loss of power due to severe climate-related events (eg. Hurricanes, floods, etc. ...).
- Degradation of air quality and public health due to ongoing dirty grid emitting potential increased temperature, SLR and precipitation.

CHRONIC PHYSICAL RISKS (LONG TERM)

- Accelerated increases in land and ocean temperatures could lead to increased climate-related events, including extreme precipitation events, which could yield significantly higher disaster responses and flood mitigation costs.
- Accelerated increases in sea-level rise could lead to increased damage from coastal urban floods.
- Fresh water scarcity.

FINANCIAL IMPLICATIONS

OPERATING EXPENSE	CAPITAL EXPENSE
<p>Increase in disaster relief costs as climate-related events become more severe.</p> <p>Increase in utilities due to increased extreme weather events and temperature conditions.</p> <p>Increase in equipment maintenance due to increased extreme weather events and temperature conditions.</p> <p>Increase in instances of business interruption as climate-related events become more frequent and severe.</p> <p>Increase in insurance premiums as climate events become more frequent and severe.</p> <p>Change in workplace behavior and related emissions as climate-related events become more frequent and severe.</p>	<p>Increase in infrastructure and construction costs as both a benefit and preventative measure as climate-related events become more frequent and severe.</p> <p>Increase in technology, retrofits and capital costs as both a benefit and preventative measure as climate-related events become more frequent and severe.</p>
REVENUE	
	<p>Increased demand and value for our product because our assets are located in dense urban areas with alternate means of transportation contributing to business continuity.</p> <p>Increased demand and value for our product because a low percentage of our assets are located in flood zones.</p> <p>Increased demand and value for our product because we are active members, environmental stewards, and investors in the communities we operate, leading to an environmentally sound and resilient market.</p>

IMPACT OF CLIMATE-RELATED RISKS AND OPPORTUNITIES ON THE ORGANIZATION'S BUSINESSES, STRATEGY, AND FINANCIAL PLANNING

Vornado is a preeminent and predominant owner, manager, and developer of office and retail assets in the New York City region, and therefore, many of the impacts identified, both transition and physical, are specific to New York City's location. The most notable being the passing of the Climate Mobilization Act (CMA), one of the most ambitious climate legislative mandates passed. Although the passing of this regulation has further defined climate-related implications, it has underscored our steadfast commitment to energy efficiency and strengthened the business case to continue to invest in programming throughout our buildings' life cycles.

ACQUISITIONAL CONSIDERATIONS

We incorporate energy & water management and environmental considerations into our acquisition due diligence process across all our property subsectors. We tour properties and review capital and operating budgets, as well as utility bills, to determine opportunities to reduce energy consumption and demand. We assess energy performance through quantifiable methods of consumption and cost on a per square foot basis, and we consider energy labels and benchmark values provided through ENERGY STAR. We gain an understanding of the building's equipment and energy inventory, current energy initiatives implemented at the property and ability to comply with energy-related local laws (LLs) including LL84, LL87, LL95/LL33, and LL97.

(RE)DEVELOPMENTAL ADAPTATION AND RESILIENT DESIGN

Climate risk and resilience are important lenses through which we view all development projects at any scale. Our strategy focuses on sustainable development inclusive of carbon neutrality, operational efficiencies, human health, minimizing material resources, and climate change adaptation.

RESILIENCE AND ADAPTATION



MECHANICAL EQUIPMENT

When a building is in a flood zone or when feasible, we place all critical mechanical equipment and electrical switchgear above grade to avoid flood damage.



GREEN ROOFS & STORMWATER RETENTION

Our roof landscape systems are designed to absorb and retain stormwater and to slow runoff into the urban landscape and surrounding infrastructure. Green and white roofs also insulate our buildings; reduce current and future demand for heating and cooling; and contribute to heat island reduction, which provides local relief to surface temperature.



GLAZING & ENVELOPE

Our glazing and envelope systems are designed to withstand heavy wind and ice conditions. They also are designed to reduce solar heat gains and improve insulation values to minimize heating and cooling demand.



FLOOD BARRIERS

When a new building is located in a flood zone or when feasible, we anchor temporary walls and venting systems inside our building lobbies to accommodate storm surges and floods and their associated water pressure build-up without damaging the building. At our existing buildings, we install temporary exterior barriers to prevent floodwater from touching the building envelope.



BACKUP GENERATION

We install backup generation to support, at minimum, fire and life safety systems, as well as critical infrastructure.

EMBODIED CARBON

The embodied carbon framework that Vornado will develop in 2023 will identify the leading embodied carbon reduction practices for core building materials, such as concrete, steel, timber, insulation, cladding, and interior finishes. The strategies to reduce embodied carbon will be incorporated into the management of the current development portfolio and will be used to inform the overall design process of future projects to provide greater guidance for project teams to reduce the embodied carbon of future projects.

CASE STUDY: PENN DISTRICT – EMBODIED CARBON REDUCTION

As part of our redevelopment of THE PENN DISTRICT, and our ongoing work to achieve our carbon emissions reduction goals, Vornado performed life cycle assessments of PENN 1, PENN 2, and The Farley Building to evaluate the embodied carbon emissions from the redevelopment projects and determine strategies to decrease embodied carbon. The assessments showed a great opportunity to reduce GHG emissions through the adaptive reuse of the existing building foundation, structure and enclosure. By choosing to renovate the existing buildings rather than building new, the projects achieve substantial reductions in the up-front embodied carbon emissions that come from the manufacturing and transportation emissions of new building products. The majority of the embodied carbon reductions are from the reuse of the structural concrete and steel, which are two of the most common and carbon intensive materials used in construction. At a global scale, the emissions from concrete, steel, and aluminum contribute 23% of total GHG emissions according to the Architecture 2030 Challenge. The renovations of PENN 1 achieved an 88% reduction (or 86,012 MTCO₂e), PENN 2 achieved a 75% reduction (or 60,300 MTCO₂e), and The Farley Building achieved a 64% reduction (or 86,800 MTCO₂e), all drastically reducing the carbon emissions from these high impact building materials, which is why embodied carbon reductions is a core strategy of Vornado's ESG goals.

STAGES OF WHOLE LIFE CARBON



Examples of climate resilience solutions that will require or are already planned in terms of CAPEX over the next 30 years. Resilience solutions aim to reduce the risk of climate events disrupting operations and reduce the impact of shorter return periods between climate events. Vornado considers these solutions on all our (re)development projects.

OPERATIONAL ENERGY MANAGEMENT

Vornado prioritizes its energy reduction strategies described below as the first step towards achieving its Vision 2030 pathway to carbon neutrality, decarbonization and resilience in the context of climate change.

At Vornado, our buildings' managers and operators in all our properties are trained and supported by our centralized energy management team to employ sound and responsible energy management across the portfolio. Our engineers perform in-house technical assessments, akin to a walkthrough energy audit, per guidance from the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE), as part of their ongoing preventative maintenance.

We employ third party engineering firms to complete technical assessments such as ASHRAE Level II Energy Audits and Retro-commissioning at all NYC, Chicago, and San Francisco properties over 50,000 square feet, and aim to update these assessments at least once every five years. In our NYC market, the Audits and Retro-commissioning reports are part of Local Law 87 and are subject to City review to ensure that all landlord-controlled inventory is included in the scope, all low- and no-cost recommended repairs are included, and that the assessments were completed by licensed professionals. Such technical assessments are the basis for our energy efficiency capital work. Vornado uses Environmental Management Systems (EMS), which are aligned to ISO 14001 standards, and Data Management Systems as part of our strategy.

CREATE ACTION PLAN

Define technical solutions and assess projected energy savings of projects.



IMPLEMENT ACTION PLAN

Execute plan with projected energy and carbon savings with a variety of internal and external stakeholders.



EVALUATE PROGRESS

Measure energy project savings using submeters. Subsidize cost of energy projects' utility bills where available. Recover costs through lease-driven clauses. Monitor your project's energy reduction goal.



DATA SOURCE
Resource. Consumption.
Cost Info.



**ENVIRONMENTAL
MANAGEMENT
SYSTEM (EMS)**



RECOGNIZE ACHIEVEMENTS

Annually recognize building operators and engineers with 10%+ energy savings. Apply for ENERGY STAR annual label. Share energy saving achievements with stakeholders.

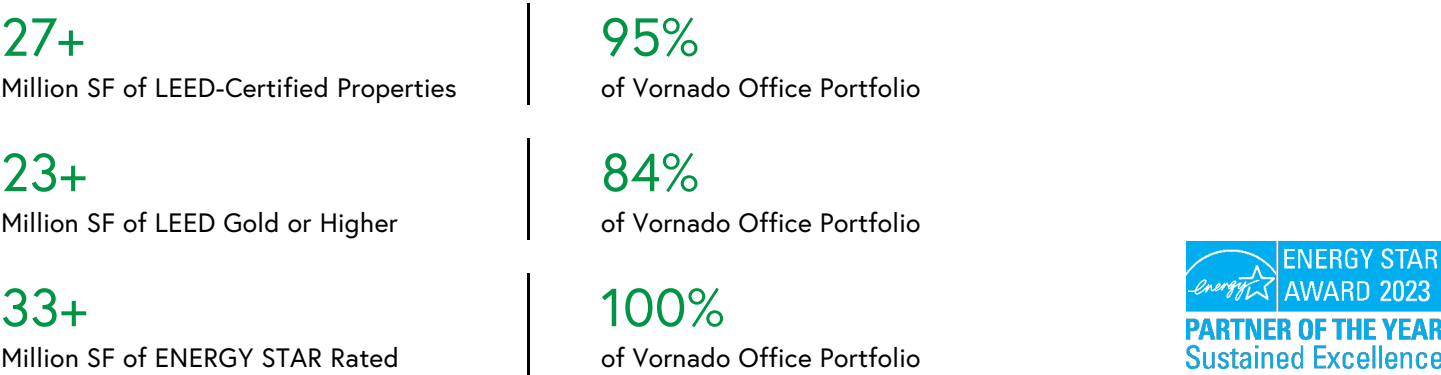


CUMULATIVE SAVINGS SINCE 2012



Vornado recognizes green building certification as emblematic of overall sustainability for our business. Vornado upholds energy ratings, benchmarking, and certifications as an important recognition tool and performance indicator. We understand that our tenants prefer buildings that have earned green building certifications and demonstrate competitive energy ratings such as a high ENERGY STAR score. We believe the benefits of such ratings and certifications outweigh the costs or resources associated with obtaining them. Because our core business is the maintenance and operation of existing assets, we believe that certifications based on ongoing performance are more relevant to us than those based on performance-modeled design objectives. These efforts are further demonstrated through our commitment of 100% LEED certification for our in-service office properties by 2024 with marked progress 95% towards that achievement, and recognition of being an ENERGY STAR Partner of the Year since 2013, with the prestigious Sustained Excellence designation for seven years.

CERTIFICATIONS AND RATINGS



Vornado has been rolling out innovative building management systems (BMS) upgrades as a strategy to reduce energy. Because these control systems impact nearly all landlord-controlled processes, an improvement that incorporates best in class design and programming has a more holistic reduction across multiple pieces of equipment and impact both electricity and steam utilities. These BMS upgrades incorporate the following actions where feasible:

1. The use of real-time air quality monitors that constantly monitor temperature, relative humidity, carbon monoxide, carbon dioxide, particulate matter (2.5 and 10 microns), volatile organic compounds, ozone, and formaldehyde in the supply and return air ducts of air handling units. These devices perform dual functions - the first and foremost is to assure the delivery of clean, healthy air to our tenants as they return to the office. The second is to monitor air quality to minimize over-ventilation, thereby reducing any excessive heating or cooling energy. The energy savings resulting from this strategy, known as demand control ventilation, has resulted in significant utility rebates for the entire package of related upgrades, including the replacement of outside air dampers, installation of variable frequency drives, and the migration from pneumatic to electronic controls, all of which enhance energy savings.
2. We have piloted the installation of a BMS interface that allows tenants to securely connect their own controls systems to VNO's so landlord and tenant can mutually share data points. This gives Vornado visibility into tenant space temperatures and damper positions so we can diagnose problems faster, deliver optimal thermal comfort, and prevent over-cooling or over-heating. We also share supply air temperatures to give the tenants assurance that we are abiding by lease obligations.

3. We are currently layering third-party analytics and fault detection software to identify equipment failures or programming errors and to build out a dashboard to monitor key performance indicators related to energy consumption. We are giving our chief engineers an opportunity to recommend KPIs that will help them quickly identify a potential problem. We are incorporating occupant counts to begin to normalize energy consumption beyond building square footage. And we are hoping to begin to monitor the seasonal variations in emissions levels to make smarter decisions about how and when we operate certain pieces of equipment (for example, in buildings with hybrid plants, whether we run an electric or steam chiller).

Vornado has developed a Tenant Energy Conservation Measure (ECM) Standards package and a High-Performance Tenant Fit-Out Guide with measures that include the use of ES-labeled equipment, reduced Lighting Power Density, receptacle controls, and local hot water heaters incorporated in our buildings' leases under Rules and Regulations. These measures will represent energy use reduction of more than 10% with minimal upfront costs.

To drive maximum efficiency and performance in our buildings, Vornado recognized the need for stronger engagement with both existing and prospective tenants. To this end, we have implemented our high-performance design guideline, the intent of which is to:

- Build above-minimum code standards
- Incorporate healthy building materials where possible
- Install ENERGY STAR-rated appliances

Tenants with supplemental cooling will be required to implement demand control ventilation, as Vornado has implemented on landlord-controlled air handling units. And plug load management will be required for all noncritical loads so unessential equipment can be safely turned off when the building or tenant office is closed.

This guideline will yield permanent energy cost savings for our tenants.

RESILIENCE

Commencing an energy efficiency and sustainability program in the early 2000s, implementing large-scale resilience and adaptation measures, and conservative financial decisions have resulted in a strong balance sheet. Investment in cybersecurity and IT infrastructure, and engaging with the communities in which we operate through leadership positions on local and regional advisory boards, and advocacy groups related to policy adoption and implementation has enabled Vornado to develop and showcase innovative decarbonization strategies.

RISK MANAGEMENT

ORGANIZATION'S PROCESSES FOR IDENTIFYING AND ASSESSING CLIMATE-RELATED RISKS

Our climate risk assessment informs the risk profiles of our properties and is a component of our Enterprise Risk Management (ERM) assessment during all stages of a building cycle. Understanding climate-related risks enables us to better assess potential acquisitions through the due diligence process, impacts within our (re)development efforts, and exposure of our operational assets.

Identifying these risks is an iterative process that annually seeks input and reassessment from leadership within each of Vornado's divisions and is then tied to our ERM assessment.

Our approach to management of material topics is through an Internal Audit Risk Assessment ("Risk Assessment") that is updated as needed to incorporate any future changes in the risk profile of the business, and at minimum, once annually. The first step is to conduct a Risk Workshop with the Risk Committee to discuss the risk landscape of the business and how it relates to strategic initiatives, emerging risks and corresponding mitigating activities. All risks identified during the workshop and survey are collated into a single risk universe document and gathered additional data points by:

- Reviewing results from prior year internal audit reports
- Researching peer organizations
- Applying internal auditor's institutional knowledge
- Considering industry hot topics

Based on the results of the risk assessment, a proposed FYE internal audit plan is developed to address the most significant risks.

Once the Internal Audit Plan of risk assessment is developed, each identified risk is assigned a high, medium or low score across various risk factors, and risk topics per category are identified and prioritized based on the residual risk scores along with the impact and likelihood of occurrence. Internal Audit Risk Assessment is presented to the Board/Audit Committee in the beginning of the year. The audit plan is approved by the Board/Audit Committee and the plan is then executed, risks monitored, and assessments are performed at the direction of the Risk Committee.

Acute physical risk is managed through our energy efficiency measures, technology, and health and wellness programming. Chronic physical risks are primarily managed through our adherence to due diligence, resilience and adaptation measures, and long-term capital planning efforts.

RISK IDENTIFICATION

INPUTS	Strategic
Conduct risk workshop with the Risk Committee to discuss risk landscape of the business and how it relates to strategic initiatives, emerging risks, and corresponding mitigating activities	Financial
Interviews with stakeholders	Operational
Business objectives, organizational goals, and strategic initiatives	Technology
External perspectives – industry trends	Legal/Regulatory, Compliance



ASSESSMENT & PRIORITIZATION

Risk Factors
Potential Impact
Probability of Occurrence



MANAGEMENT & MONITORING

Internal Audit Plan
Focus Area

METRICS AND TARGETS

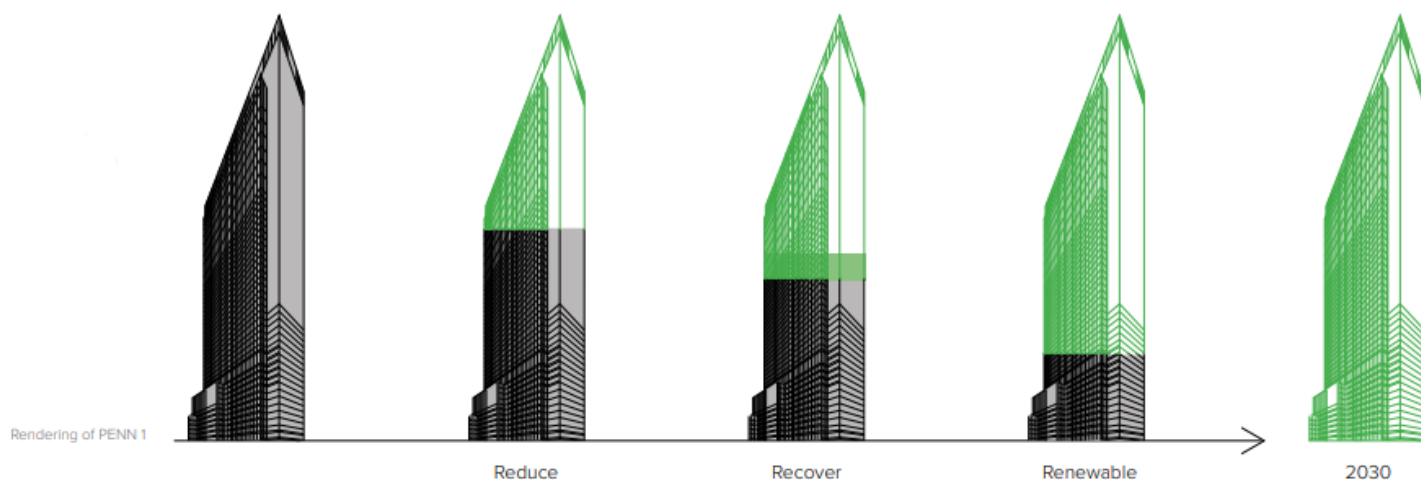
DISCLOSE THE METRICS USED BY THE ORGANIZATION TO ASSESS CLIMATE-RELATED RISKS AND OPPORTUNITIES IN LINE WITH ITS STRATEGY AND RISK MANAGEMENT PROCESS

Meaningful metrics and targets help us to evaluate our climate-related risks and opportunities, as defined in our Risk Management assessment, and are reflected in the Energy Efficiency Targets, Goals and Progress, and Greenhouse gas emissions disclosure in the Environmental Results sections provided within our annual ESG report. We view our targets and metrics as necessary steppingstones to a decarbonized future in which our company can thrive and be resilient. To ensure accuracy, we have a third-party firm assure our reported GHG emissions under International Standard on Assurance Engagements (ISAE) 3410, Assurance Engagements on GHG Statements.

DISCLOSE SCOPE 1, SCOPE 2 AND, IF APPROPRIATE, SCOPE 3 GREENHOUSE GAS (GHG) EMISSIONS, AND THE RELATED RISKS

Vision 2030 is Vornado's commitment to carbon neutrality by 2030 through a combination of three overarching principles of energy reduction, recovery, and renewables. To guide Vornado's efforts to achieve its Vision 2030 and assess and manage climate-related risks, Vornado committed to reducing its Scope 1 and 2 GHG emissions 64% per square foot by 2030 from a 2019 base year, in line with a 1.5°C trajectory per our 1.5-degree C aligned Science Based Target (SBTi) commitment. The methodologies consider various scenarios, including an IEA ETP B2DS scenario, and were modeled using the Sector Decarbonization approach which applied company-specific growth trajectories to historical GHG emissions trends. The target boundary includes biogenic emissions and removals from bioenergy feedstocks. We include our tenants' energy emissions in our Scope 2 emissions, whereas we observe divergence in how our peers report their tenant emissions.

As Scope 3 emissions account for less than 40% of total emissions, only Scope 1+2 emissions are covered by our targets. We have programs and processes to assist in further evaluation of our Scope 3 and we reassess our footprint on a continuous basis. This framework provides us with reference points to determine the appropriate plans of action to achieve emissions reductions, such as energy efficiency measures, renewable energy investments, while potentially mitigating our identified Transitional climate-related financial risks. As we continue to update our climate-related financial risk exposure, we continue to look for meaningful metrics to both affirm progress and inform on potential mitigation strategies.



PRINCIPLES

REDUCE

We continue to prioritize energy efficiency through building upgrades and retrofits including:

- Higher efficiency equipment and systems,
- Operational changes to more effectively manage and permanently reduce peak demands,
- Engagement with tenants to implement best practices, high efficiency build-outs and align efficiency and sustainability goals, and
- Implementing high-performance design guidelines for future build-outs

We continue outreach and engagement with our existing tenants to identify opportunities to reduce energy consumption and tenant-metered electricity costs. This yields dual benefits: buildings continue to provide optimal comfort conditions, and these partnerships enable more holistic operating cost and emissions reductions so that Vornado remains best in class.

RECOVER

As usage is reduced, we identify opportunities to recover discarded or waste energy. This is accomplished by recapturing heat that would otherwise be ejected from our cooling towers and reintroduced to make hot water. We also replace fossil-fuel based heating and cooling equipment with ultra-high efficiency electric chillers as existing equipment reaches end of useful life. We also monitor refrigerant use, a very high emitter of GHGs, yet typically excluded from emissions calculations.

RENEWABLE

Lastly, we focus on integration of renewables and grid modernization into our portfolio through:

- Evaluation of all available outdoor spaces for the deployment of solar panels, micro-wind turbines, and battery storage,
- Incorporation of renewables into development projects whenever feasible, and
- Purchase of renewable energy credits for all our electricity

By reducing usage as much as possible, recovering wasted energy, and deploying onsite renewables while the utility electric and steam grids go green, we will reduce the amount of purchased electricity RECs and carbon offsets required to meet Vision 2030.

The charts below illustrates Vornado's progress towards Vision 2030.

DISCLOSURE OF METRICS AND RESULTS

EMISSIONS

Financial Control Method

GHG emissions MTCO₂e

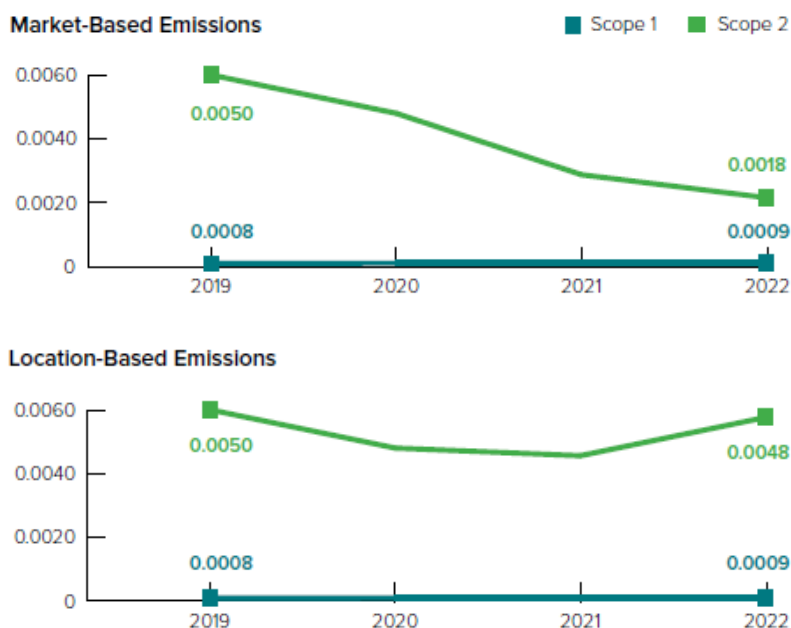
	Location-based					Market-based		
	2019	2020	2021	2022	% CHANGE 2021-2022	2021	2022	% CHANGE 2021-2022
Scope 1	28,577	29,190	29,864	31,311	4.8%	29,864	31,311	4.8%
Scope 2	177,977	133,997	131,405	166,129	26.4%	83,295	61,472	-26.2%
Scope 1 + 2 Total	206,554	163,187	161,269	197,441	22.4%	113,159	92,784	-18.0%

GHG EMISSIONS/SBTI GOALS AND PROGRESS

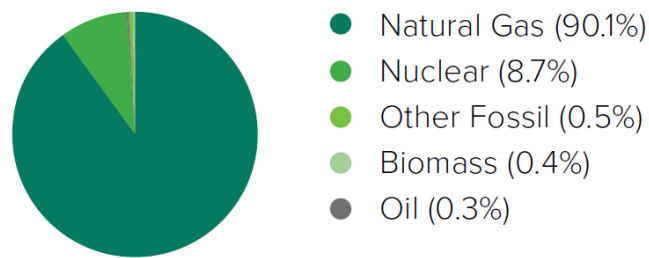
Vornado's commitment to carbon neutrality and associated emissions reductions targets have been approved by the Science Based Targets Initiative as consistent with a 1.5°C climate scenario. As of 2022, we have marked reductions of 54% in our market-based emissions and 1% in our location-based emissions.

Vornado evaluates its carbon emissions from both a location and market-based approaches. Location-Based carbon reflects emissions for our properties based on the relative grid average emission factors, while Market-Based reflects emissions that we are responsible for due to our purchasing decisions.

On January 30, 2023, the EPA released the updated 2021 eGRID factors which we have applied to our reported GHG emissions amounts. In all the regions in which we operate the eGRID coefficient has increased from the 2020 eGRID factors and in New York Zone J (NYC/Westchester) the coefficient increased significantly (29%). This unfavorable change in coefficient value is due to the regional grids becoming more reliant on nonrenewable energy sources. In Zone J, nuclear power has been taken off-line, the grid has increased natural gas consumption to compensate and eGRID coefficients have increased. This impacts our location-based emission progress until the NYS grid brings long-term renewable solutions online, anticipated to occur in 2027.

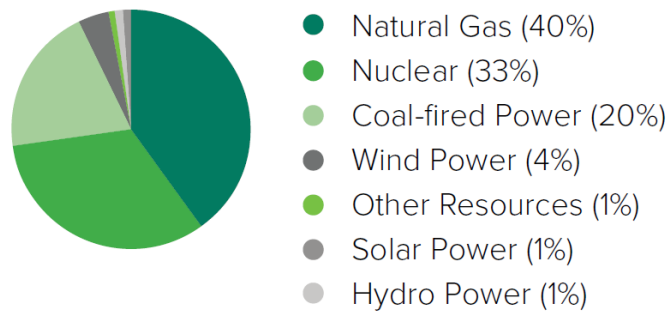


GRID ELECTRICITY NEW YORK CITY



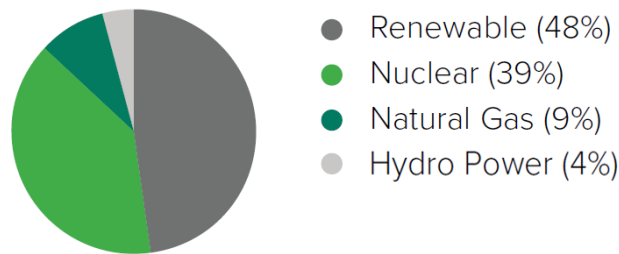
Source: EPA eGRID 2021, NYCW Generation

GRID ELECTRICITY CHICAGO



Source: ComEd's Environmental Disclosure Report, 12 months ending September 30, 2022

GRID ELECTRICITY SAN FRANCISCO



Source: PG&E's, 2021 Power Mix

ENERGY, WATER, WASTE, PROCUREMENT

ENERGY MANAGEMENT

Goal: 50% Energy Reduction Below a 2009 Base Year by 2030.



Goal: 55% Energy Reduction of Landlord-Controlled Energy by 2030.



Goal: 45% Energy Reduction of Tenant-Controlled Energy by 2030.



WATER MANAGEMENT

Goal Achieved: 10% Reduction by 2030 below 2019 base year.

EXCEEDED GOAL



TARGETS USED BY THE ORGANIZATION TO MANAGE CLIMATE-RELATED RISKS AND OPPORTUNITIES AND PERFORMANCE AGAINST TARGETS

WASTE MANAGEMENT

Goal: 75% Commercial Waste Diversion by 2026.



Goal: Introduce Organics Recycling to 85% of the Portfolio by 2025.



Goal Achieved: Complete Demonstration and Education on Recycling Procedures for 50% of total Vornado Portfolio Each Year.

EXCEEDED GOAL



PROCUREMENT AND RESPONSIBLE CONTRACTING

Goal: Purchase 75% of Cleaning Supplies that Meet Sustainability Criteria Including Certifications Designated by UL ECOLOGO, Green Seal, and EPA's Safer Choice Standard.



3. Appendix

REFERENCES

TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES (TCFD)

<https://www.fsb-tcfd.org/>

<https://www.fsb-tcfd.org/press/tcfd-report-finds-steady-increase-in-climate-related-financial-disclosures-since-2017/>

"FINAL REPORT Recommendations of the Task Force on Climate-related Financial Disclosures." February 2017.

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"TCFD Guidance on Metrics, Targets, and Transition Plans"

https://assets.bbhub.io/company/sites/60/2021/07/2021-Metrics_Targets_Guidance-1.pdf

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