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A COVID-19 Virtual Ideation Experience

Environment & Climate Change

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The key questions:

How will a company's re-entry into the post-COVID workplace affect the environment and a company's environmental and sustainability goals and commitments?

Then…..

-What are our immediate and longer-term recommendations for the corporate real estate executive (CRE) to stay on course?

To answer this the Chicago Chapter assembled experts in LEED, HVAC, Energy, A/C/E and CRE:

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Environment & Climate Change Chicago Chapter Team

Team Lead: Rick Page, MCR, CCIM, **PageOne Consulting** (former US Bank), Chapter Past President

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- Brett Gardner, RID, LEED AP BD+C, CSR-P, Project Director, Associate, **IA Interior Architects**
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How will re-entry into the post-COVID workplace affect the environment and companies' environmental commitments, and what are our recommendations for the corporate real estate (CRE) executive to stay on course?

Our Four focus areas:

1. **Ventilation and Refrigeration**
2. **Energy**
3. **Supply Chain**
4. **Waste**

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Environment & Climate Change Chicago Chapter Team Presenters

Introduction and Forecast

- Rick Page, MCR, CCIM, **PageOne Consulting** (former US Bank), Chapter Past President

Ventilation & Refrigeration

- Brett Gardner, RID, LEED AP BD+C, CSR-P, Project Director, Associate, **IA Interior Architects**

Energy Use

- Saagar Patel, PE, LEED AP BD+C, CCP, Studio Leader, Energy + Ecology Mechanical Eng., **ESD**

Supply Chain

- Susan Heinking, AIA, NCARB, LEED Fellow, **Pepper Construction**, VP High Performance

Waste

- Roy Green, **HNI Corp**., Corp. Social Responsibility Manager

1. Ventilation and Refrigeration Forecast:

- Employees, concerned about airborne virus transmission, will want to know what the building owner/facilities manager will do to improve Indoor Air Quality (IAQ).
- Improving IAQ, through increased intake of outside air, will be an energy-intensive process.
- Utilizing increased heat and refrigeration results in Greenhouse Gas (GHG) emissions.

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Ventilation

Immediate Recommendations:

- Review current HVAC system maintenance practices and consider higher MERV filtration to capture smaller particulate matter (to which viruses attach**).**

- Provide transparency to employees, describing IAQ tests, maintenance practices, enhancements and/or assessment activities conducted, and actions taken.

- Require building maintenance to utilize an industry-standard tool such as the EPA's I-BEAM, or hire a qualified engineering firm to conduct an assessment and evaluation of HVAC and identify measures to improve IAQ.

- Review utility company programs that offer free building audits/assessments of energy efficiency and recommend improvements, that often include incentives.

- Replace high GHG generating refrigerants (a top-five contributor to climate change) with low-Hydrofluorocarbons (HFC) or alternatives. Financial services firms like BlackRock increasingly screen their portfolios for GHG reduction. This initiative would boost a building's Global Real Estate Sustainability Benchmark (GRESB) ratings and value.

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Ventilation

Strategic Recommendations:

- Implement measures from an I-BEAM study, utility company audits, etc. to improve efficiency and maintenance protocols making identified system enhancements.

- Implement Smart Building technologies such as IAQ and occupancy sensors and integrated controls.

- Consider innovative technologies such as Ultra-Violet (UV) treatment to destroy biological pathogens. Currently effective for disinfecting fluids and surfaces, and inactivating microorganisms, UV is proven to eliminate microbial growth on cooling coils and surfaces of AHUs/RTUs.
  - the medium to be disinfected must be moving slowly. If air is moving greater than 250 fpm, UV may not be effective.

- When considering a new lease/building selection or building design, request conditions that provide above average IAQ (ASHRAE 62.1 standard, operable windows, etc.).

- When evaluating a new lease/building selection or design of a new building, utilize Green Lease provisions and specify energy efficiency (i.e. a high-achieving LEED or Energy Star Certified) and develop specific Owners Project Requirements (OPR) exceeding code-minimum standards.

- Specify refrigerants with low-Hydrofluorocarbons (HFC) or alternatives.

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2. Energy Forecast:

Approximately 73% of the total GHG emissions worldwide are due to energy consumption in the built environment.

HVAC systems represent over 33% of total energy consumed by buildings.

Increasing the ventilation above minimum values for IAQ will reduce the concentration of particles and pathogens in the air.

This will increase the energy associated with fan power to move this additional air through upgraded filters and the requirements of conditioning the air to meet the thermal comfort needs.

Equipment runtimes and energy needs will increase to boost the air changes in the building, perhaps running 24/7 to ensure appropriate air changes and accommodating new employee work patterns.

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Energy

Immediate Recommendations:

- Investigate improved filtering. Higher rated filters capture smaller particle.
  - Will additional fan power be required to move the air through the filters.?
  - Are filter bank clearances sufficient for higher rated filters?

- Assess investment in air cleaning devices like HEPA filtration, air scrubbers, and/or ionization technologies. These technologies can remove viruses from the air.
  - Careful consideration must be made to ensure correct installation, effectiveness in reducing pathogens, managing energy consumption and minimizing impact on employees.

- Consider the integration of on-site or purchased renewable or efficient energy (solar, wind, geothermal, other) to offset any increased COVID-related energy costs and GHG.

Strategic Recommendations:

- Invest in air quality sensors, software, and technologies that provide data on how building systems are managing the particles in the air.

- Consider technologies like Energy Management Information Systems (EMIS) and Fault Detection Diagnostics Systems (FDD) tools that process thousands of building data points that identify opportunities to improve operations and produce actionable insights to automate and optimize building operations, thus decreasing energy use.

3. Supply Chain Forecast:

- The pandemic has exposed resiliency issues and product shortages. Significant changes in your supply chain are likely. Managing the environmental impact will be vital.
- Amid Covid-19, large financial investors, such as BlackRock, have recommitted to their climate commitments with greater emphasis on environmental, social and governance (ESG) reporting, and supply chain.
- 70%-80% of a company's carbon footprint resides in their supply chain outside of their direct control.
- Per *Architecture 2030*, **materials used in constructing a building will account for 74% of a facility's CO2 emissions over its lifespan.**

See Figure 1 below.

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Supply Chain

Whole Life Carbon Approach

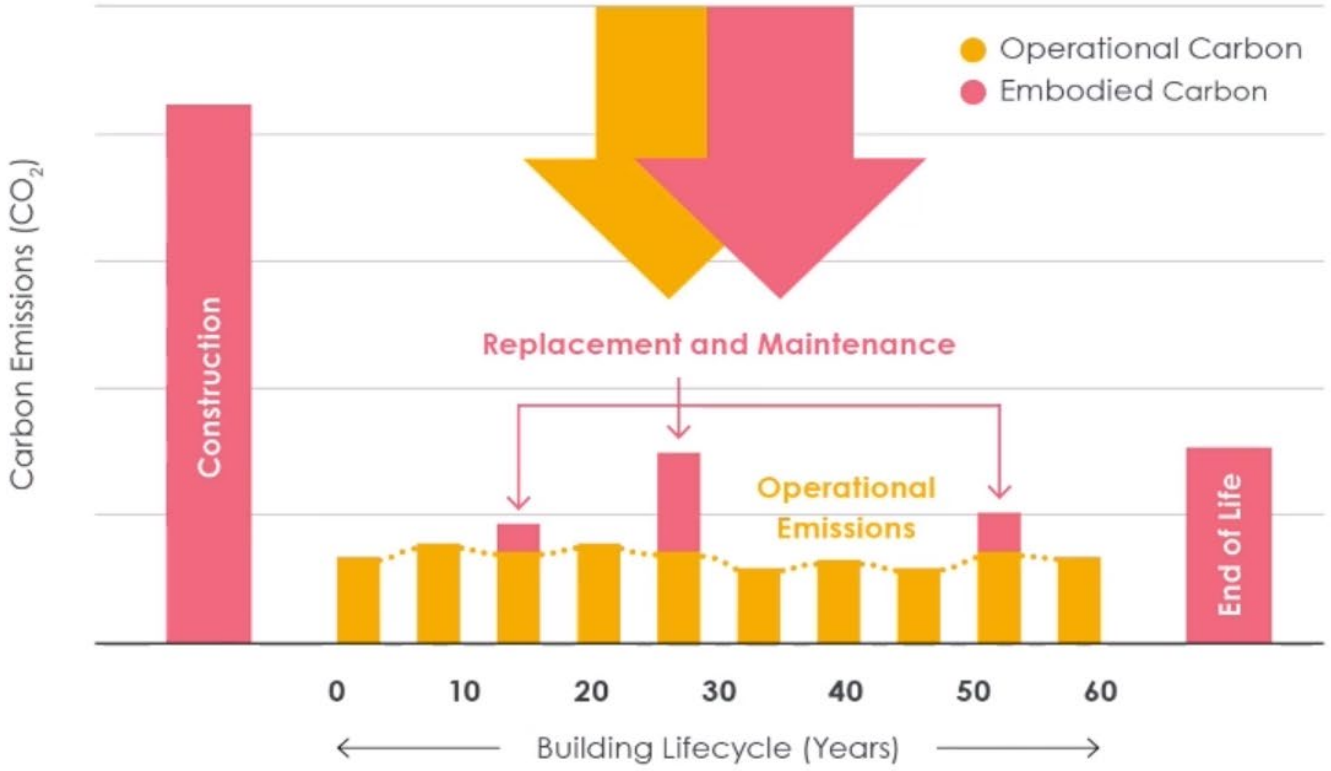

Figure 1 – CO2 Emissions Over A Building's Lifecycle. Source: Elementa Consulting.

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Supply Chain

Immediate Recommendations:

- Require that vendors disclose materials, ingredients and environmental attributes of products procured for
  - Creating social distancing or temporary barriers.
  - Furniture reconfiguration
- Ask for Health Product Declarations (HPDs) or Declare labels and Environmental Product Declarations (EPDs) for these materials.
  - If those are not available, ask for the basic material ingredient list and Globally Harmonized System of Classification (GHS) Safety Data Sheets.
  - Understanding what is in products will help guide end-of-life decisions and lessen the impact of material choices.
- Include local vendors in post COVID-19 supply chain resiliency plans. Doing so minimizes your Scope 3 carbon emissions and enhances your supply chain resiliency.

Supply Chain
Strategic Recommendations:

- To minimize supplier environmental risk of a future global crisis, implement supplier assessments with an emphasis on Corporate Social Responsibility practices including origin of your supplier's source materials, and the environmental, human, and social practices of those vendors.

- Utilize programs like the Global Supply Chain Report (Carbon Disclosure Project) that help map supplier footprints and encourage accountability across the supply chain.

- Increase awareness of new targeting models, such as SBTi, requiring companies to disclose their Scope 3 emissions, which includes purchased goods and services.

See Figure 2 below:

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Supply Chain Impact

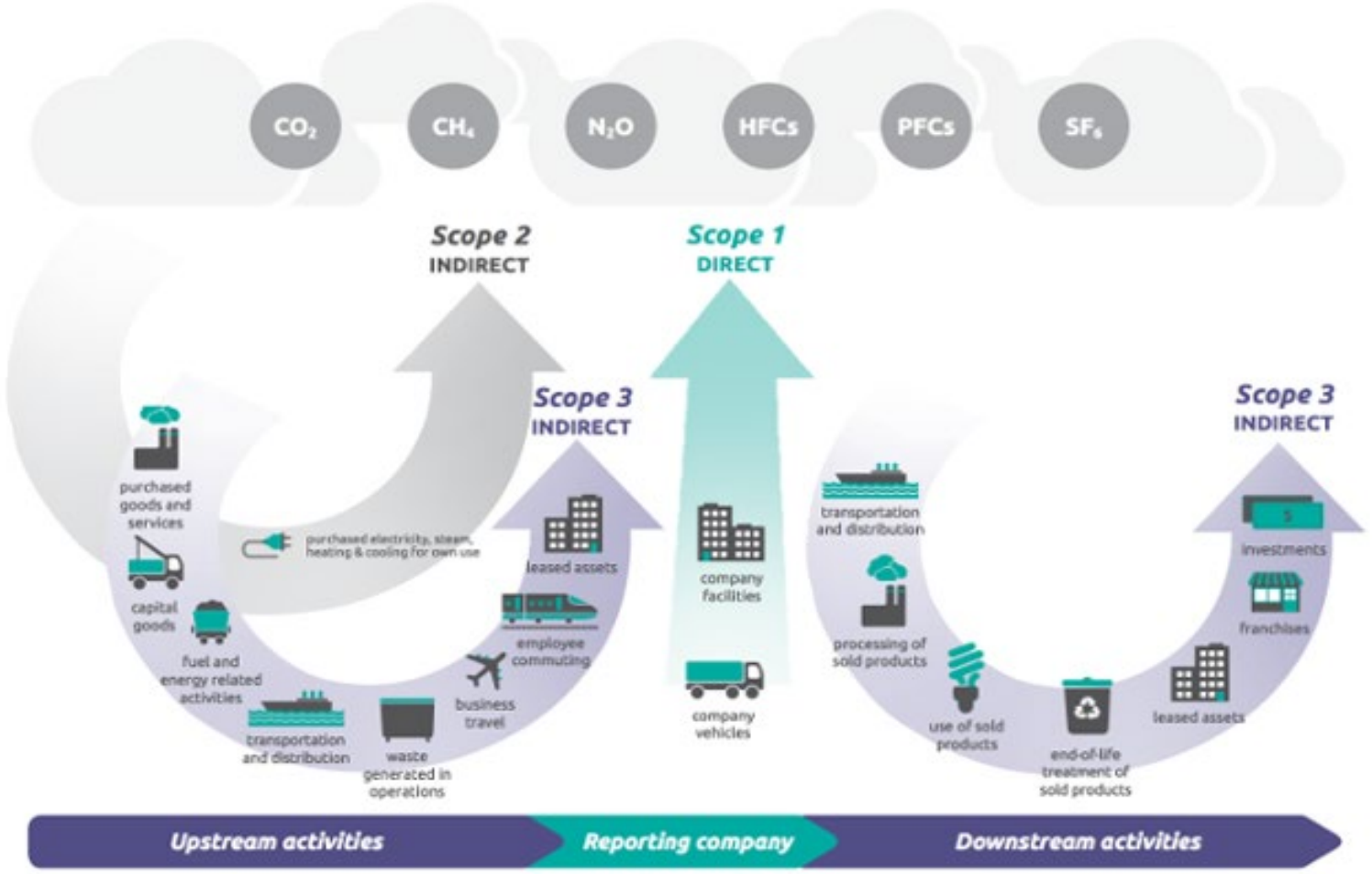

Figure 2 – The Green House Gas (GHG) Protocol Reference Chart

Supply Chain
Strategic Recommendations:

- As mechanical systems are upgraded post-COVID to allow more flexibility with ventilation and/or filtration, select equipment that:
  - Is efficient (reduced operational carbon).
  - Contains low Global Warming Potential (GWP) refrigerant (reduce GHG).
  - Can be modified or upgraded on-site in the future (waste less).
  - Has product specific Environmental Product Disclosure (EPD) (reduce embodied carbon).
  - Is sourced locally (reduce embodied carbon).
- Invest in new technology in MEP purchases. They account for up to 70% (retrofit) or 50% (new construction) of CO_2 emissions from embodied carbon.

See Figure 3 below:

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Supply Chain

Embodied Carbon

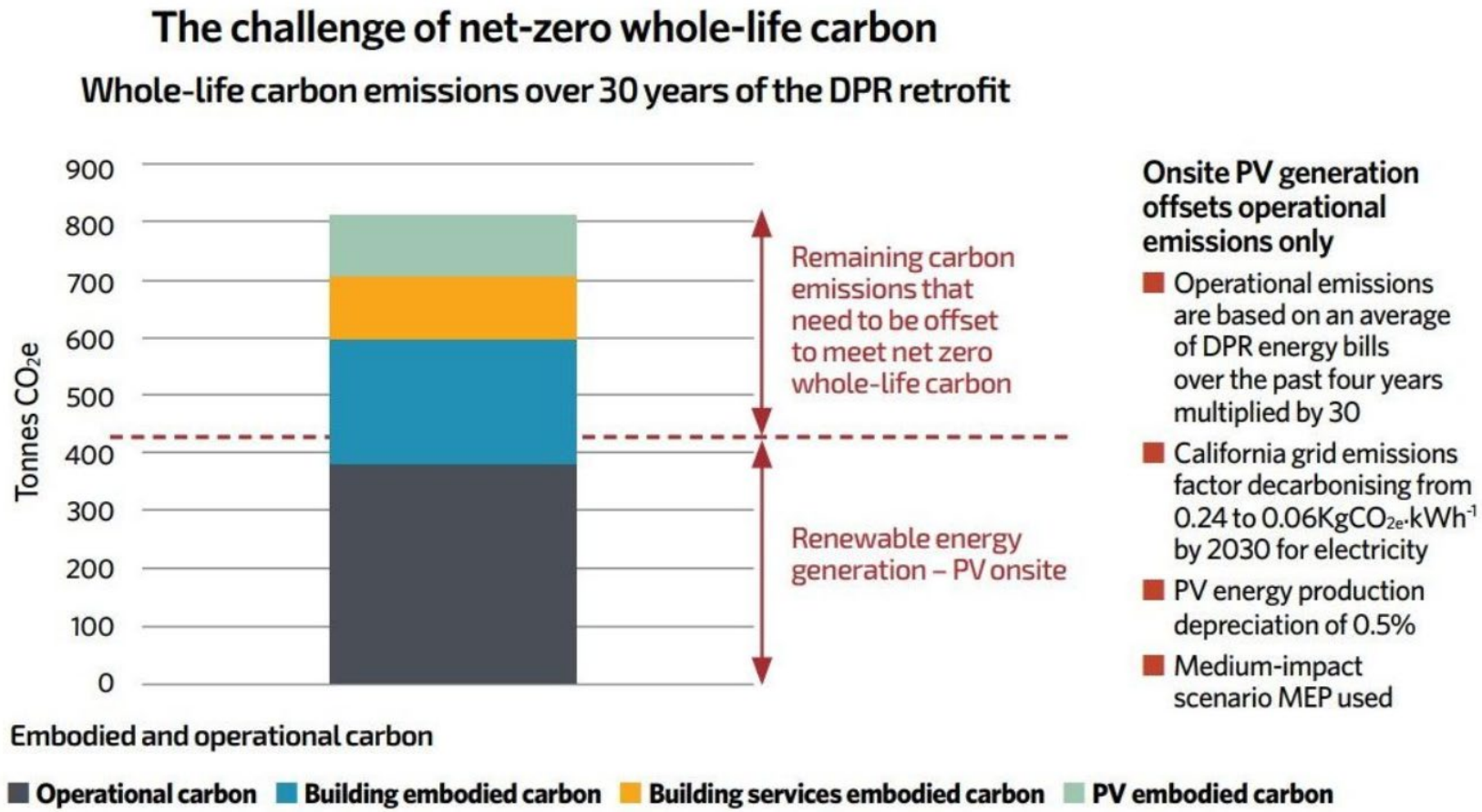

Figure 3 – Embodied Carbon of Building Services (MEP) Source: CIBSE

Waste Forecast:

- In a post COVID-19 world, there will be an abundance of caution and frequent cleaning and disinfecting. There will be a push toward more cleanable materials on high touch surfaces.
- Workspaces will likely be reconfigured to accommodate social distancing, space flexibility, and additional barriers. These changes will likely increase the amount of waste generated.

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Waste

Immediate Recommendations:

- Provide training on proper CDC protocols to minimize unnecessary regulated medical waste.
- Consider using *WaterSense*-labelled washing machines and *Energy Star* dryers for laundering microfiber cloths versus using disposables.
- Institute bulk purchasing policies to minimize packaging and maximize loads.
- Negotiate returnable packaging programs with vendors. Disinfectant protocols on returnable packaging can minimize concerns.
- Disinfect durable assets like furniture prior to reassigning, repurposing, or donation.
- Centralize waste and recycling bins for fewer collection and sanitation points.
- Choose materials for temporary barriers that are cleanable, re-usable or recyclable like polyethylene plastic. Avoid disposable materials or non-recyclable materials like vinyl.

See Figure 4.

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Waste

Social Distancing Increasing Waste?

Figure 4 -Increased Waste? Temporary corrugated barriers in a plant cafeteria in China – March

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Waste

Strategic Recommendations:

- Develop cleaning and disinfecting protocols that meet the CDC requirements and use ingredients known to be less harmful to health and protect furniture and other durable assets, preventing premature disposal.

- Build spaces with reusable and adaptable options like demountable walls and partitions that facilitate social distancing now and enable reconfiguration as needs change

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Conclusion

Environmental risks and opportunities will exist in the post-COVID- 19 world.

CRE leadership must make a difference.

Embracing the recommendations made here is a good start to stay on course with a sustainable CRE strategy.

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Thank You!

Questions?

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Resources

Waste Resources:

https://www.cdc.gov/coronavirus/2019-ncov/community/disinfecting-building-facility.html

https://www.environmentalleader.com/2020/03/covid-19-waste-generation-stericycle/

https://greenseal.org/about/blog/how-to-safely-disinfect-for-coronavirus

Energy Resources:

https://www.ashrae.org/news/ashraejournal/guidance-for-building-operations-during-the-covid-19-pandemic

https://www.ashrae.org/technical-resources/resources

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Resources Continued:

Report Hyperlinks:

https://www.comed.com/WaysToSave/ForYourBusiness/Pages/default.aspx
https://www.drawdown.org/solutions/refrigerant-management
https://www.blackrock.com/us/individual/investment-ideas/sustainable-investing
https://gresb.com/about/
https://www.boma.org/GreenLeaseGuide
https://campusplanning.hms.harvard.edu/sites/g/files/mcu791/files/HMS_OPR%20Template_160923_0.pdf
https://www.reuters.com/article/us-health-coronavirus-blackrock/blackrock-stands-by-climate-priorities-sees-tougher-shareholder-votes-idUSKBN2151EJ?_cldee=c2NvdHQuZnJhbmtlbEBhbGxzdGF0ZS5jb20%3d&recipientid=contact-7edd516404f4e8118143c4346bdc3201-a3c3b4344c9e4f03af56fe5da0936fae&esid=ca80f1c2-c26a-ea11-a811-000d3a5a1bf8
https://www.elementaconsulting.com/
https://quantis-suite.com/Scope-3-Evaluator/
https://www.cibsejournal.com/general/getting-to-grips-with-whole-life-carbon/
https://www.cdc.gov/coronavirus/2019-ncov/community/disinfecting-building-facility.html
https://greenseal.org/about/blog/how-to-safely-disinfect-for-coronavirus