Understanding Decarbonization - Building Your Roadmap

Exploring effective strategies to reduce emissions in buildings

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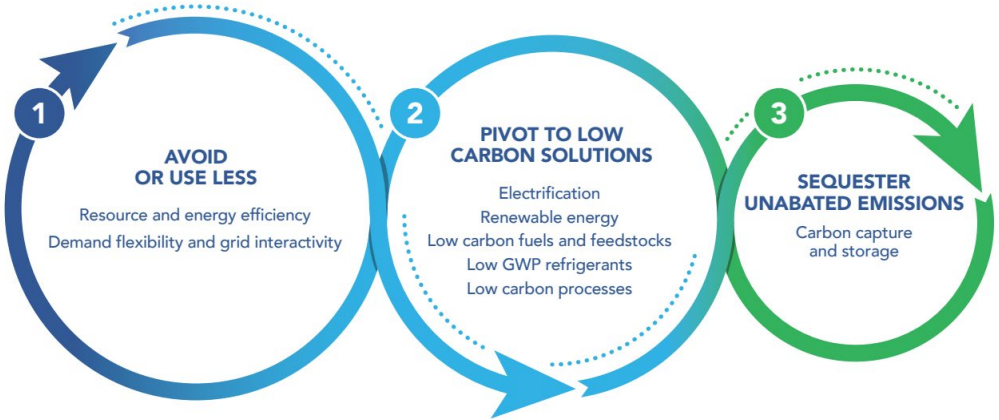
Agenda

1. Decarbonization Overview

2. Portfolio-level Decarbonization Planning

3. Building-level Decarbonization Planning
    a) Energy Audits
    b) Decarbonization Studies
    c) Ongoing Commissioning and Building Analytics

Decarbonization - Prioritization of GHG Measures



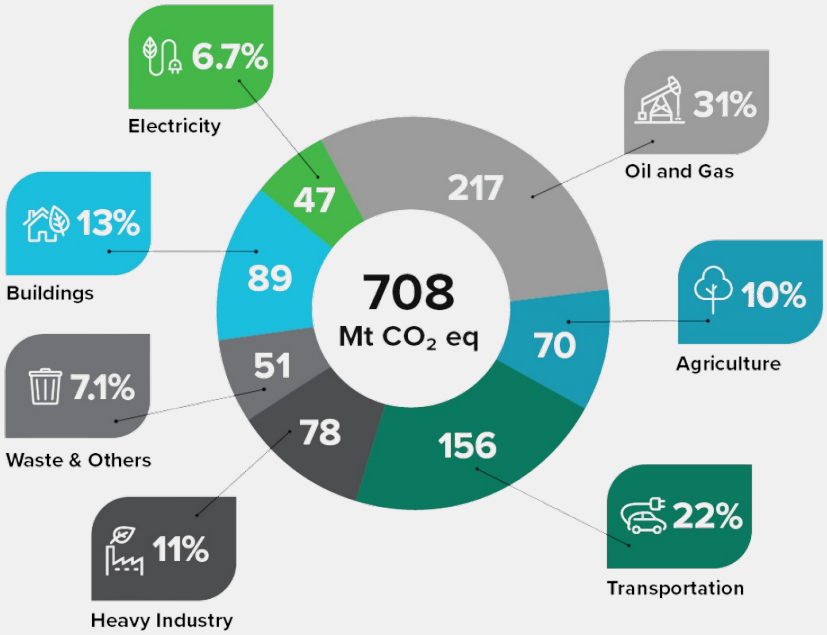
~40 %
of the world's CO_2 emission comes from buildings

>30 %
of the energy is wasted in buildings

~80 %
of the buildings that will exist in 2050 are already built

Source: "Framework for Greenhouse Gas Emissions Reduction Planning: Building Portfolios". Better Climate Challenge, U.S. Department of Energy. February 2023.
Architecture 2030, 2020
Facts + Statistics: Global Catastrophes, Insurance Information Institute 2020

The Canadian Industry Landscape



Canada's GHG emissions by Economic Sector (2022)

Source canada.ca

Introduction to Decarbonization

Understanding the Importance of Reducing GHG Emissions in BC

National Climate Goals

Canada targets a 40-45% reduction in GHG emissions from 2005 levels by 2030, highlighting urgency.

Provincial Climate Goals

BC and Ontario plans to lower climate-changing emissions by 30-40% by 2030.

Significant Emissions Source

Commercial real estate is a major contributor to overall emissions, necessitating focused decarbonization efforts.

Policy Support

There are progressive climate policies that actively encourage and support decarbonization initiatives.

Canada Wide Regulatory Landscape

Understanding Key Regulations Driving Decarbonization Efforts

Mandatory Energy Reporting

Vancouver and Toronto have mandatory reporting – which is expected to be extended to other cities.

Carbon Limits and Penalties

Vancouver: The first cap on emissions will take force in 2026 with CRE limited to 25 kgCO2e/sq.m/yr.
Penalty: $350 per excess tonne of CO2.

Similar limits and penalties are expected for other cities.

New Energy Codes

A few of the codes are the Toronto Green Standard (TGS), the BC Energy Step Code and Zero Carbon Step Code (for BC), the Vancouver Building By-law (VBBL), the Montreal Building Code, the Calgary Building Code etc.

Provincial Programs

Eg: the CleanBC Plan, the Technology Innovation and Emissions Reduction (TIER) Regulation (Alberta), Ontario Climate Change Action Plan (Ontario), the 2030 Plan for a Green Economy (Quebec), Prairie Resilience (Saskatchewan), and the Manitoba Climate and Green Plan (Manitoba).

"It's in every building owner's best interest to develop a decarbonization plan as soon as possible and start following through," VP of Sustainability, Warrington PCI Management

Financial Rebates

Understanding Key Regulations Driving Decarbonization Efforts

Canada Green Buildings Strategy

Promote energy-efficient practices in commercial buildings.

Provincial and Municipal Programs

Offers financial support specifically for energy-efficient retrofits in buildings.

Federal Tax Credits

Tax credits available under the Capital Cost Allowance to encourage investment in energy efficiency.

Grants for Carbon Reduction

Various grants are available to support projects aimed at reducing carbon emissions.

Benefits of Decarbonization

Exploring Key Advantages for Buildings

Cost Savings

Lower energy consumption leads to significant operational cost reductions, enhancing profitability.

Asset Value

Energy efficient buildings are more appealing to tenants and investors, boosting market value and enhancing brand reputation.

Regulatory Compliance

Aligning with the stringent emissions regulations avoids penalties.

Resilience

Decarbonization helps mitigate risks associated with future energy price volatility and climate impacts.

Decarbonization Process Overview

Establish Carbon Baseline

Creating a baseline is crucial for tracking progress and setting targets.

Monitoring of Energy Consumption

Continuously monitoring energy consumption to understand progress.

Analyze Energy Consumption

Understanding current energy use helps identify areas for improvement and innovation.

Set Reduction Goals

Defining clear, measurable goals to guide decarbonization efforts.

Collaborate with Experts

Working with experts ensures that solutions are effective and customized to needs.

Develop a Decarbonization Roadmap

A structured approach outlines steps for achieving reduction goals over time.

Portfolio-level Decarbonization Planning

Portfolio-level Review & Reporting

Top-down approach

Measure and report on portfolio-level energy and emissions

Ranking Your Buildings

Emissions Benchmarking

Identifying top and worst performers based on GHGI.

Focus on Worst Performers

Perform decarbonization study

Evaluate the feasibility and cost-effectiveness of low-carbon technologies

Portfolio-level Decarb Plan

Develop a detailed, strategic road map for your portfolio

Decarbonization Planning Tools

Utilizing Software and Services for Effective Building Performance

Understanding your emissions

Portfolio level emissions tracking

Benchmarking

Compare buildings in your portfolio to other similar buildings to understand where you stand

Zeigo™ Activate
by Schneider Electric

Decarbonization Road-mapping

Guidance for creating roadmaps to achieve net-zero carbon emissions

Data Visualization and Reporting

Dashboards and reports make it easier for organizations to track their progress toward carbon reduction goals and report on sustainability performance to stakeholders

Building-level Decarbonization Plan

Conduct Energy Audits

Analyze current energy use to identify inefficiencies in systems like HVAC, lighting and building envelope.

Perform Decarbonization Studies & Carbon Transitioning

Establish a carbon baseline, set clear reduction goals, and explore low-carbon solutions.

Ongoing Commissioning & Building Analytics

Enroll in building analytics services for continuous performance monitoring and optimization.

Building-level Energy Audits

Uncovering Energy Inefficiencies for Decarbonization Success

- Site Assessment
- Analysis of Data
- Audit Report
- Actionable Items

- Develop a Database of Equipment Inventory
- Identify Energy Use Patterns and End-Use Breakdown
- Identify Energy and Cost Saving Opportunities
- Identify Potential Improvements to Existing Systems

Building-level Energy Audits

Essential First Step in Decarbonizing Commercial Real Estate

EUI Benchmarking

Comparing where your building stands in comparison with similar buildings

Create Actionable Insights

Low Cost-No Cost Measures with Quick Payback Periods

Understanding Building Operation

Discussion and Improvement of Operational and Maintenance Procedures

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Building-level Decarbonization Studies

Decarbonizing Commercial Real Estate

Existing Carbon Performance

Understanding current carbon performance, benchmarking, and other regulatory implications

Heating and Cooling Demands

Derive actionable findings from audits to implement energy-saving measures effectively

Electrification Feasibility

Reviewing existing electrical capacity is critical as electrification of buildings is inevitable

Carbon Reduction Plan

Reviewing immediate and long-term carbon reduction strategies

Building-level Decarbonization Studies

- Assess carbon emissions impact from energy savings measures.
- Analyze costs and savings for emission reduction measures.
- Discuss timelines for major system replacements or renewals.
- Identify dismissed impractical measures and those needing further investigation.
- Analyze projected carbon emission reductions based on practical options.
- Evaluate electricity grid emission intensities and their impact on reduction goals.

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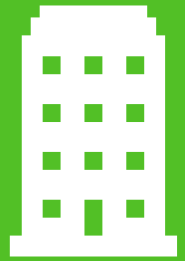
Ongoing Commissioning and Building Analytics

- Data-driven methodology
- Continuously monitor desired equipment and systems in the building
- Established data flow from buildings to the platform (often cloud-based)
- Include data from silo-ed systems (example: energy metering, elevator system, lighting)
- Implement building analytics for ongoing commissioning and fault detection and diagnostics (FDD)
- Realize impactful reductions in energy and cost

How does FDD work?

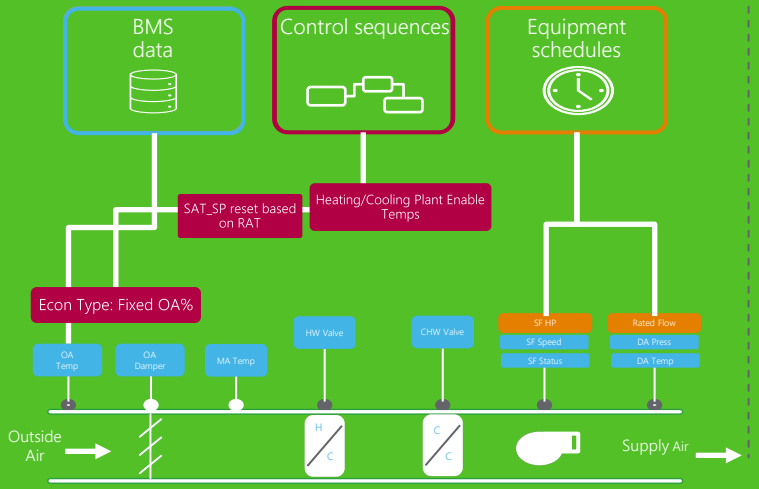
Connect

Outbound only



Model

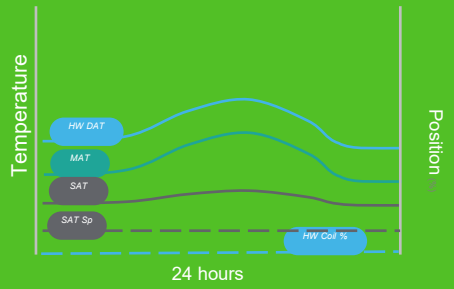
(Air handling unit example)



Diagnose

AHU Diagnostic Report

Problems	Simultaneous Htg/Clg High Discharge Air Temp
Root Cause	Leaking HW Valve
Avoidable Cost	$350 per day



Ongoing Commissioning and Building Analytics

955
PM checklists per **YEAR**

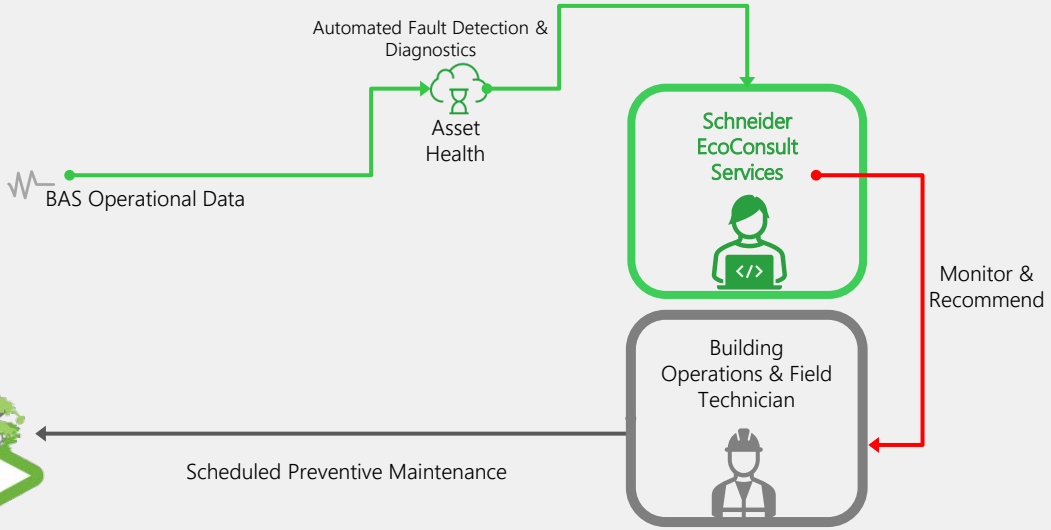
vs.

>4,000
automated checks every **DAY**

	Equip. count	Daily	Monthly	Quarterly	Semi-annually	Annually	Total PMs per year
Cooling towers	3		✓	✓	✓	✓	57
Chillers	3		✓	✓	✓	✓	57
Boilers	3		✓	✓	✓	✓	57
Air handlers	12			✓	✓	✓	84
VAV Boxes	100				✓	✓	700

75% of your service technician's time goes into discovering and diagnosing equipment issues.

Automated Commissioning – The Human Element



Benefits from Automated Commissioning and Building Analytics

Maintenance
Prioritize issues to fix based on impact on energy, comfort and equipment

Comfort
Identify IAQ issues leading to discomfort or unhealthy environment

Performance
Detect energy waste due to inefficient HVAC, diagnose and take corrective action

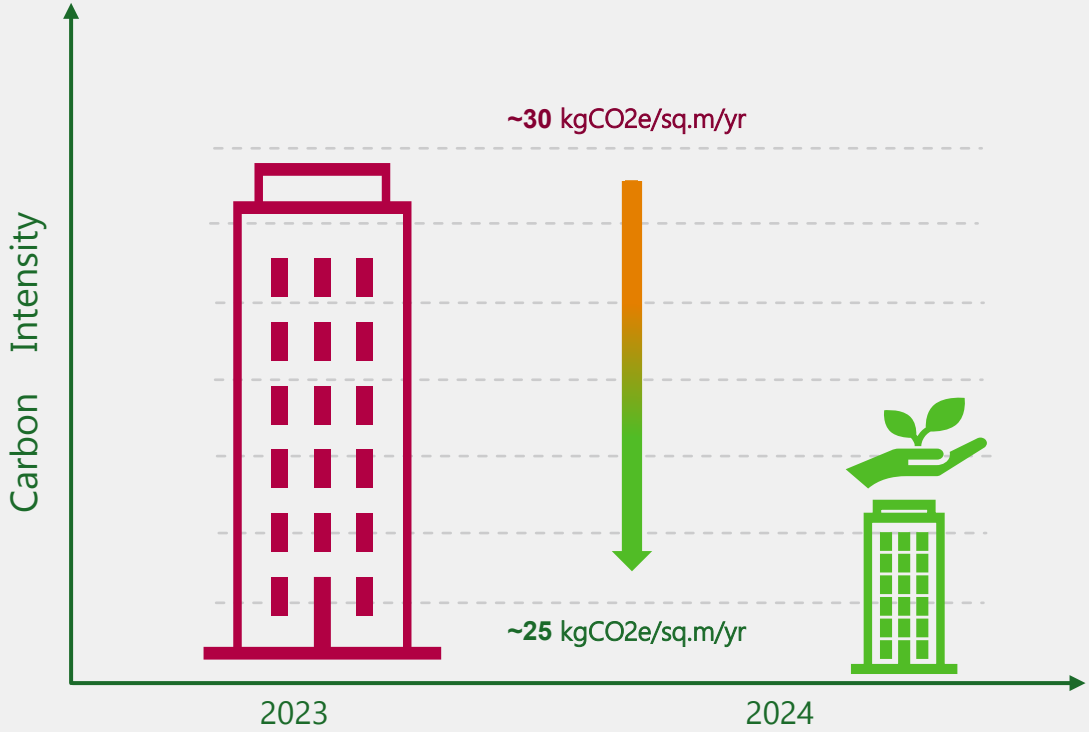
Asset Life
Identify critical issues before they escalate to failures via condition-based monitoring

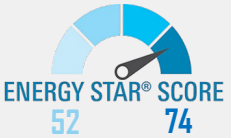
~ 29% decrease in unscheduled maintenance

~ 33% fewer occupant complaints

Up to 20% energy cost reduction

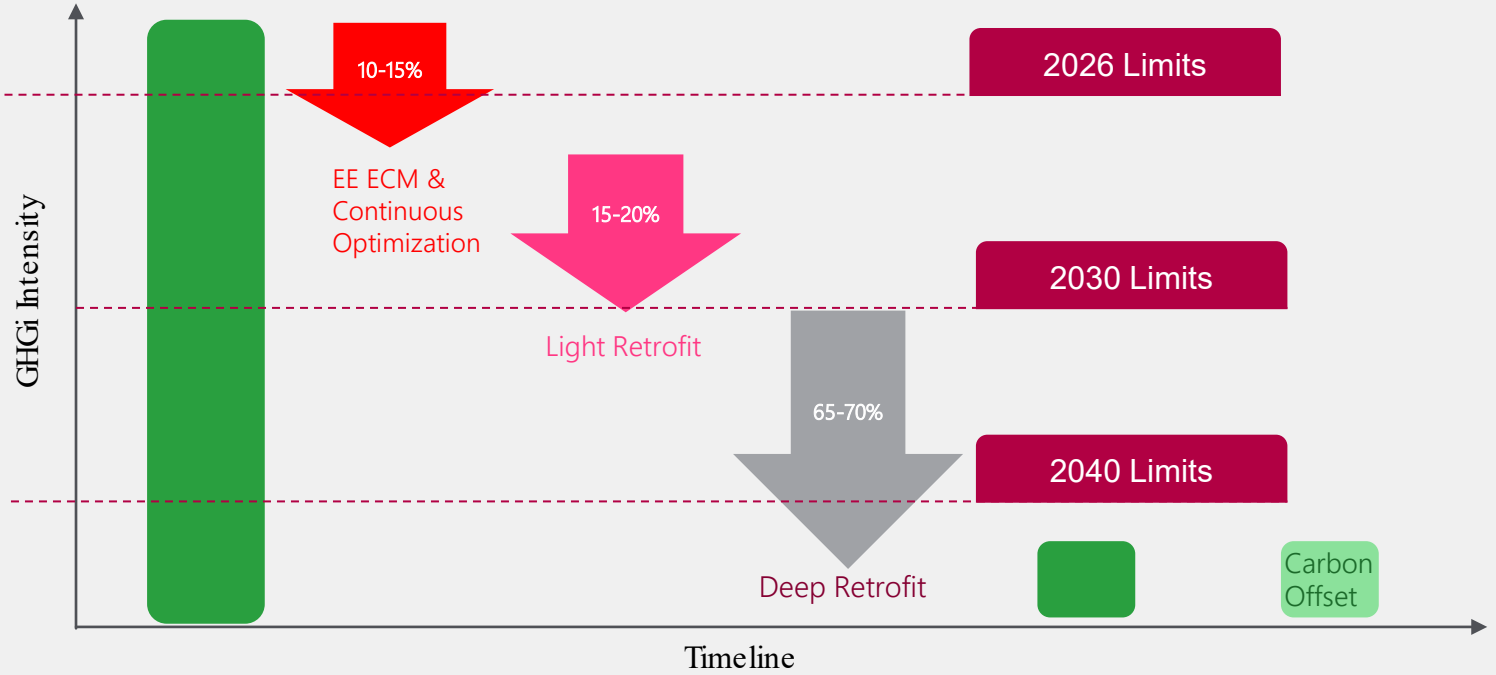
Ongoing Optimization : Case Study





Savings = ~$35,000/yr

What could it look like for your building?



What Next?

Strategies for Effective Decarbonization in Commercial Buildings

- Simplify the process. Focusing on taking one step at a time.
- Choose a reliable tracking mechanism.
- Ask for expert advice.
- Set an immediate goal.
- Identify a project that makes sense based on budget, resources, and priorities.
- Each project gets you one step closer.