GREENING HEALTH CARE
working together for healthier communities

CLIMATE CHALLENGE NETWORK

Energy and Emissions Reductions – Planning for Success

February 7, 2024

In Partnership With:

CHES SCISS
Canadian Healthcare Engineering Society
Société canadienne d'ingénierie des services de santé

Program Sponsors:

BELIMO
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SAVE ON ENERGY POWER WHAT'S NEXT
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THERMOGENICS

Technical Direction:

Enerlife consulting

Join the conversation! Please use Q & A to submit your questions.

Land Acknowledgement

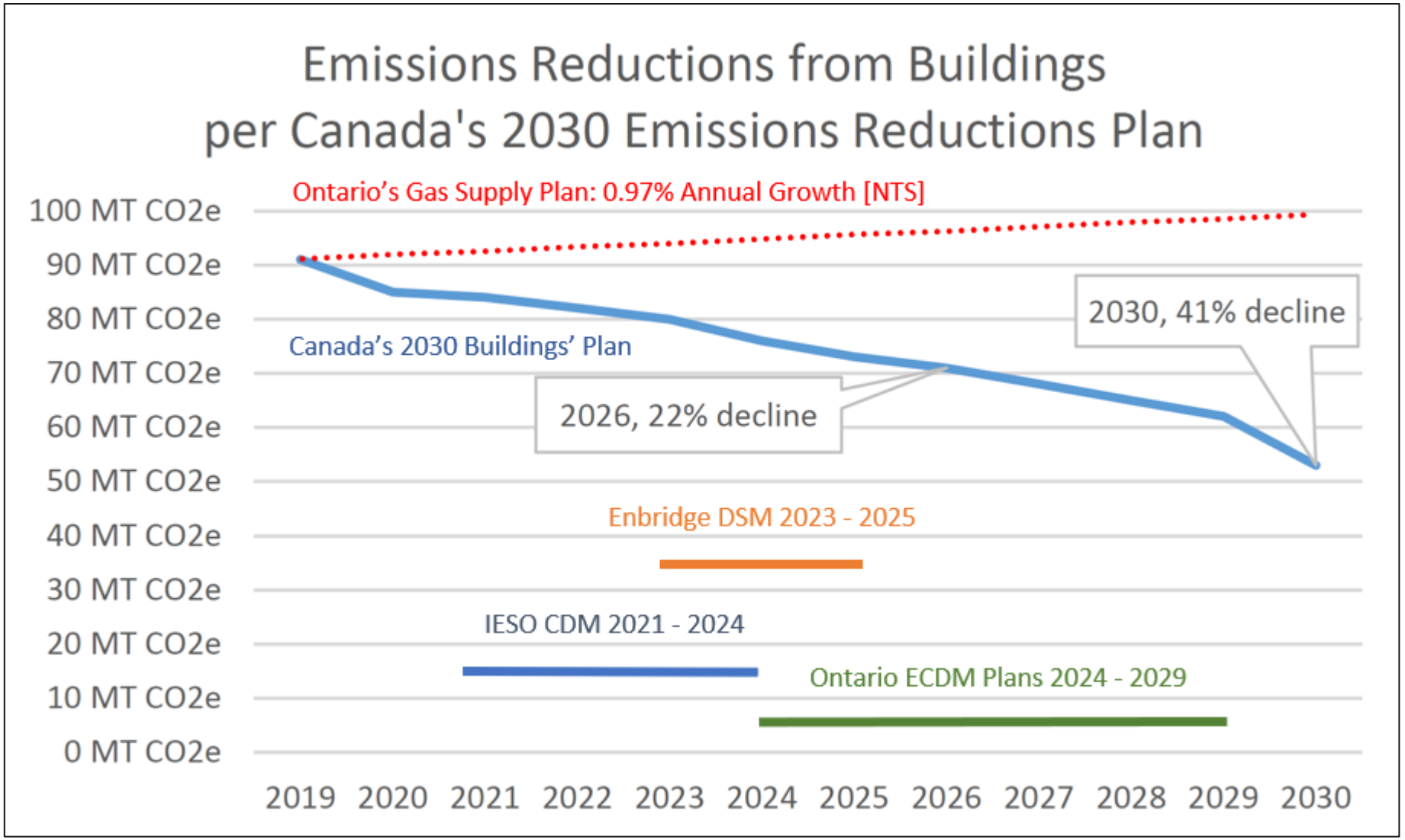
We acknowledge with respect the ancestral and unceded territory of the Inuit, Métis, and First Nations people that share these lands with us. While we meet today on a virtual platform, I am speaking from the traditional homes of the Huron-Wendat, Haudenosaunee, Anishinaabe and the Mississaugas of the Credit River. We hope that this work contributes to our common responsibility as stewards of the environment.

Agenda

- **Welcome and Introduction**
- **Energy Planning Essentials**
  - Clear and achievable targets
  - Looking back for lessons learned
  - Operational and retrofit measures
  - Executive commitment, organizational alignment and resources required for success
- **Here to Help**
  - Grants and incentives
- **Panel Discussion**
  - Planning for Success – what will it take?

Introduction and Context

Running Out of Time



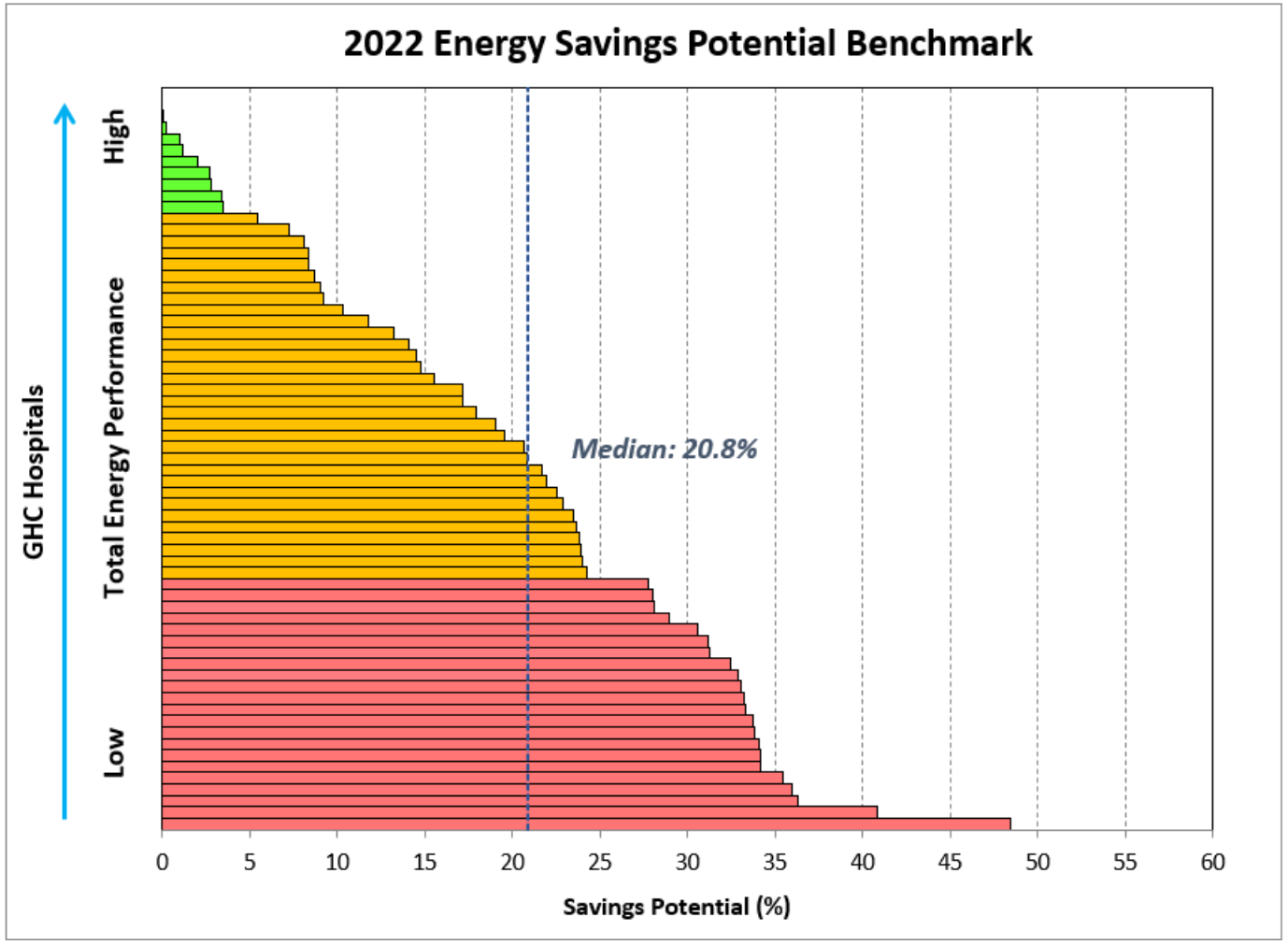
Ontario's goal is to reduce GHGs by 80% below 1990 levels by 2050. Canada's goal is net zero by 2050

Context

1. Climate change is the defining issue of our times, which will disproportionately impact the healthcare sector.
2. Despite government policy and best intentions, emissions due to hospital facility operations continue to climb. ***With the present trajectory we will miss 2030 targets by a wide margin.***
3. Think globally but act locally. Every hospital has a role to play in closing the gap.

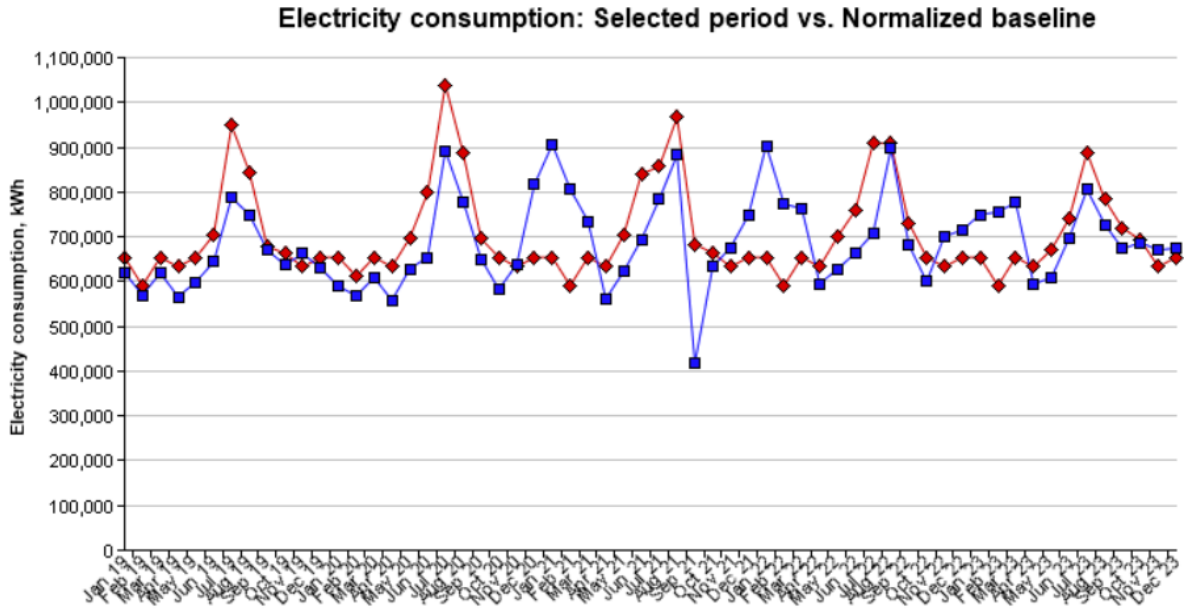
Energy Planning Essentials

Clear and Achievable Targets



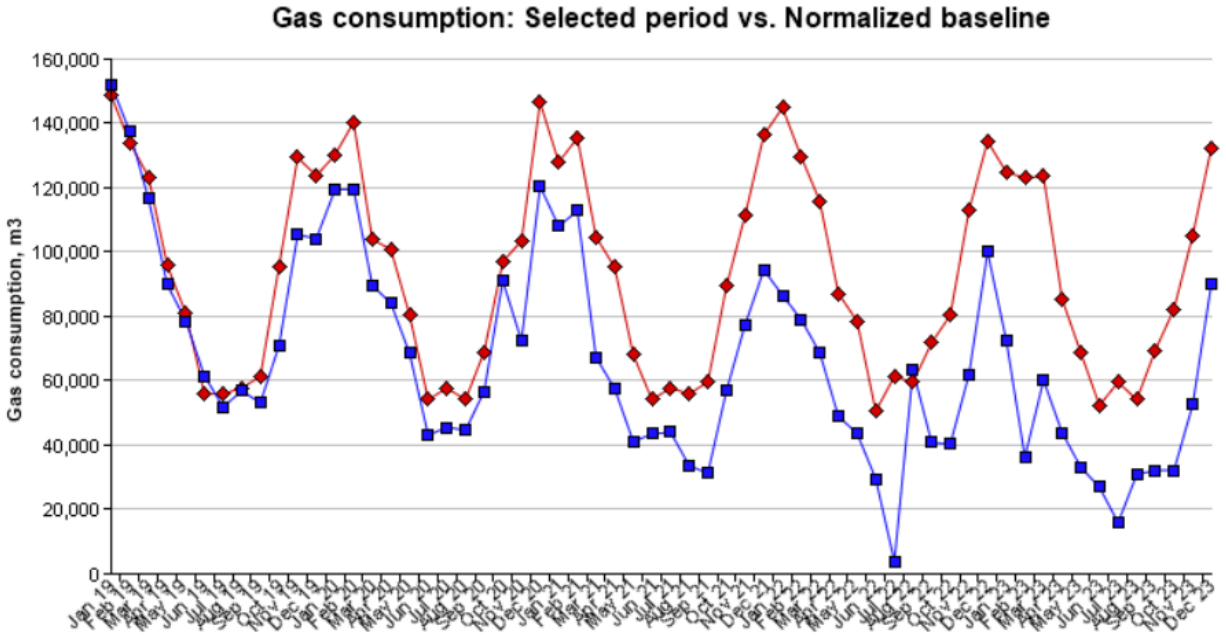
- Your benchmark ranking
- Your Greening Health Care energy target
- Your emissions and utility cost savings potential – making the business case for action
- Your unexpected energy increases – the cost of falling back

5-Year Savings Trends



Electricity 2023 vs 2018 Baseline	
Savings (increases), kWh	-105,451
Savings (increases), $	-9,385
%	-1.3
GHG savings, tonnes	-3

Gas 2023 vs 2018 Baseline	
Savings (increases), m3	554,295
Savings (increases), $	252,735
%	51.3
GHG savings, tonnes	1,062



- Baseline Jan-Dec 2018

Progress with the 2019 Plan

Year	Measures	Comments
19/20	**Lighting**	
	LED retrofit - patient rooms	Completed
19/21	**Ventilation**	
	Scheduling	Air handler scheduling initiative completed.
	Testing and air balancing, refurbish ductwork/dampers	Not completed, but has started with building 7 completed and building 8 in progress as of February 2024.
	Install Variable Frequency Drives	Not completed, business case not approved or funded.
20/22	**Building Automation and Lighting Controls**	It is tied to VFD project and will be implemented with VFD installation project.
	System upgrade	
	Reprogramming	
20/21	**Heating plant**	
	Testing, concept analysis, reconfiguration	Completed, steam plant decommissioning project started in 2022, as of February 2024 all mechanical work and sequence changes have been completed, currently troubleshooting and optimizing new systems.
	Kitchen dishwasher	Completed in 2019
	Heat Recovery Chiller	Not completed. Focus was on optimizing CHP operation and up-time, and then decommissioning of the steam plant.
20/21	**Cooling Plant**	
	Testing & optimization	Testing and first phase of optimization is complete. Second phase optimization is planned in 2024-2029 ECDM plan.
20/21	**Water (associated with heating / cooling projects)**	
22/23	**Building Envelope**	
	Thermographic Analysis	Complete
	Air Sealing, Re-insulation	Not complete due to financial and project capacity issues as well as pandemic constraints and project backlog.

5-Year Lessons Learned

- WHAT worked well with the operational improvement and projects we implemented?

- WHY did some projects not happen?
  - business case not good enough
  - funding not approved
  - lack of project development/management band width

- WHO was not engaged but should have been?
  - organizational review

2024 Plan: What to do (the easier part)

Energy efficiency improvements

- Building system scheduling
- HVAC testing and rebalancing
- Boiler plant operations
- BAS upgrades and programming
- Enhanced operations and maintenance
- Cost effective mechanical and electrical retrofits
- Sub-metering

Low-carbon capital planning

- Hospital redevelopment
- Infrastructure renewal
- Anticipate tougher energy codes and standards
- Peak demand reduction
- Exhaust air heat recovery
- Heat pumps and electrification
- Building envelope upgrades
- Renewable energy readiness

Greening Health Care Checklists

(GHC Member Portal)

- Boiler Plant Checklist
- Pumping Energy Checklist
- OR Ventilation Checklist
- Ventilation System Checklist
- Recommissioning Checklist
- BAS Checklist
- Steam System Checklist
- Heating & Building Envelope Checklist
- Lighting System Checklist
- Cooling System Checklist

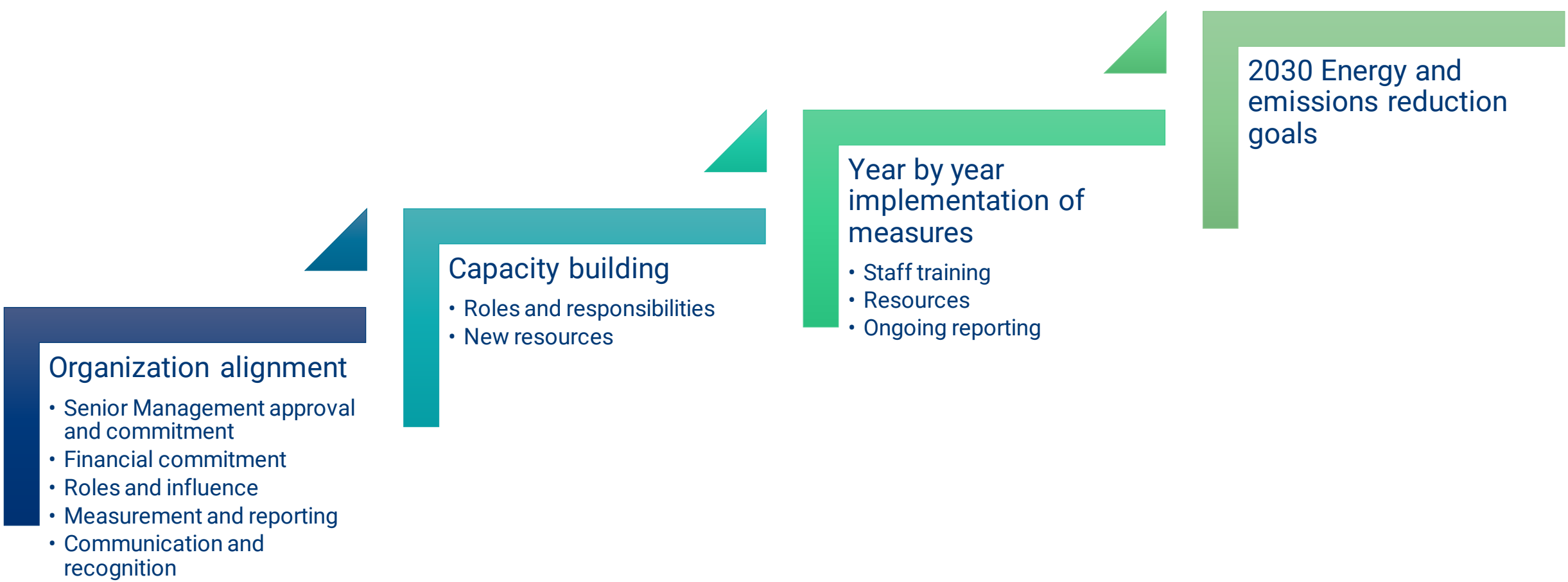
2024 Technical Measures Plan

Measures	Implementation Year	New Funding Required	Savings	Incentives	Payback (with incentives)	GHG emissions reductions (tonnes CO2e/year)
Ventilation						
Scheduling	**24/25**	$50,750	$43,540	$27,369	6.0	63
Install Variable Frequency Drives	**24/25**	$350,000	$8,410	$5,413		
Testing and air balancing, refurbish ductwork/dampers	**24/25**	$162,875	$32,950	$20,751		
Building Automation and Lighting Controls						
System upgrade	**24/25**	$116,250	$63,750	$42,100	3.5	118
Reprogramming	**24/25**	$147,500				
Heating plant						
Heat Recovery Chiller SWT>160°F	**25/26**	$495,938	$45,622	$33,658	10.1	259
Pump Testing and Upgrades	**24/25**	$13,000	-	-	-	
CHP						
Optimization						
Cooling Plant						
Testing & optimization	**24/25**	$21,875	$3,614	$2,259	5.4	1
Total		**$1,794,205**	**$208,309**	**$138,966**	**7.9**	**483**

2024 Plan: How to do it (the harder part)

Governance	Time, Resources and Money	Organizational Alignment	Knowledge
• Board, executive commitment • Goals and accountability	• Business case for investment • Finance • Procurement	• Roles, responsibilities • Key performance indicators (KPIs) • Accountabilities • Clinical staff engagement • Staff training and communications	• Best practice guides, case studies, standards • Well informed service providers • Continuous feedback and learning

The HOW: Requirements for Success



Organizational Alignment

Position

- Board/SLT
- Foundation
- Director of Services
- Facility Management
- Facility Team
- Redevelopment
- Finance
- Capital Planning
- Procurement
- Clinicians
- IPAC
- IT
- HR
- Communications
- Green Team

Role

- Strategic direction
- Decision-maker
- Influencer
- Facilitator

Strategies

- Inform Board, Foundation and senior management
  - Ranking and trends
  - Compelling business case
  - Environmental imperative
- Good news stories
  - Awards
  - Grants and incentives
- Engage influencers
  - Strategic support
  - Overcome barriers

Organizational Roadmap

Functions	Responsibilities	Roles/notes	Opportunities
Governance - Board	CEO Chair	Board very forward thinking. Ontario Shores wants to be best mental health facility. Know they are a leader.	
Senior management	VP, Clinical Services + COO	More conservative, very narrow view. Responsible for approval of capital requests and of ECDM plan.	Capital requests are done every year so have to re-present annually. Projects compete against clinical initiatives. Opportunity to present 5 year plan and get longer term approval of vision and projects.
Immediate supervisor	Director of Services	ECDM plan and requests for funding are presented to SMT (Senior Management Team) by Director of Services. Very supportive of energy efficiency projects and initiatives.	
Finance	Finance and Support Services	Only project not completed last ECDM did not meet 5 year payback requirements from Finance	Introduce/present life cycle costing, longer paybacks. Need to make the case for energy efficiency projects.
Capital	Capital Team Manager	Good capital team but small (2 people). Limited capacity to take on projects. Under the Support Services umbrella. Manager of Capital team also manages purchasing. BCAs done (Per dium) and contribute to roadmap/10 year plan. Refreshed every 2 years.	Have had situations where project is approved but capital team does not have capacity. COVID put a halt to a lot of projects. Got way behind. If they had a bigger team, it would speed up projects. Opportunity for another capital project resource to support projects.
Facility Management	Facilities Manager	Presents projects annually with Director of Services to Senior Management. Well connected with projects, performance and opportunities. Leader in energy efficiency.	
Facility Team	12 staff that include building operators and carpenters.	3 staff can do BAS programming, or are trained to do it but don't have a lot of opportunity. Everything is communicated to the team. Quarterly reports.	Not a lot of opportunity to utilize BAS programming training. Opportunity to identify situations where operators can practice BAS programming.
Clinicians		Not engaged in energy efficiency.	
IPAC		Not engaged in energy efficiency.	
Procurement	Capital Team Manager	See Capital Team	
IT		Involved but not a hurdle for implementation. BAS sits on the corporate network.	
Communications		Weekly newsletter will communicate awards and achievements. Monthly all-staff forum with CEO. Annual awards for innovation and achievement.	Opportunity to communicate and highlight achievements, progress and targets.
Green Team	Manager of Environmental	Started one but sputtered out for a while with COVID. Last meeting Winter 2019	

Capacity Building

Function

- Energy performance reporting
- Utility incentives
- BAS:
  - Operations and scheduling
  - Upgrades and reprogramming
- HVAC
  - Testing and balancing
  - Optimization
  - Repairs
- Central plant
- Lighting and electrical
- Project management

Resources

- Facilities managers
- Operators
- Designated energy manager
- Intern
- Redevelopment team
- Service contractors
  - BAS
  - Boiler plant
  - Chiller plant
  - HVAC TAB
- Engineering consultant
- Energy consultant
- Procurement service provider

Strategies

- Job descriptions
- Staff training
- Reporting systems
- Outcomes-based service agreements
- Standard specifications
- VOR procurement

Capacity Building

Functions	Title	Capacity (who is currently doing this within your hospital)											
		Development Requirements (gap or opportunity)	Capital Project Management	Energy Project Management	Energy Performance Reporting	Utility Incentives	BAS Operations + Scheduling	BAS Upgrades + Reprogramming	HVAC Testing	HVAC Optimization	HVAC Repairs	Central Plant Optimization	Lighting Retrofits and Controls
Director Facilities	Director of Services												
Manager Facilities	Manager, Facilities												
Capital project team	Manager of Capital Infrastructure, Planning, & Purchasing	Greater project manager capacity for energy efficiency		Limited project manager capacity									
Operators								3 operators are able to program and update BAS but don't get opportunity					
Engineering consultant													
Service Contractor - BAS													
Service Contractor 2													
Service Contractor 3													
Energy Consultant													
Intern													

The 5-Year Plan

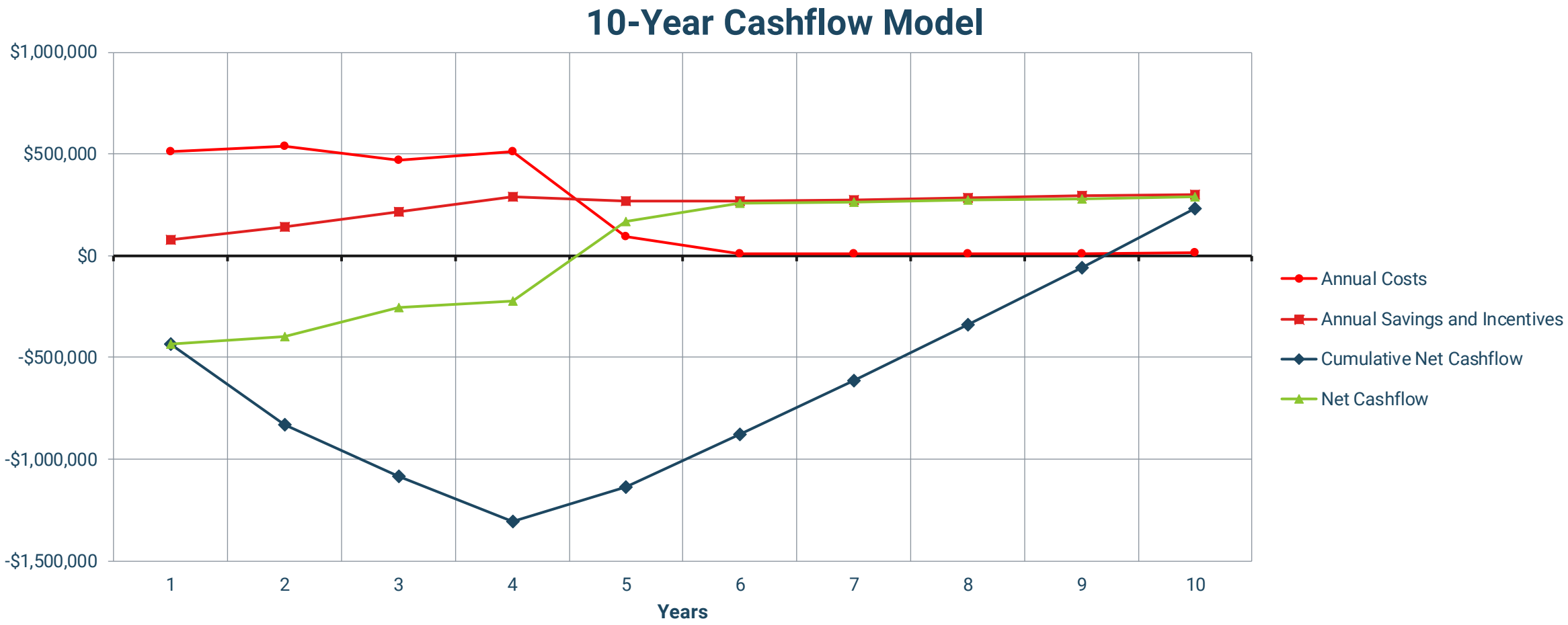
5 1-Year Plans!!

- Financial:
  - Capital spend
  - Utility cost savings and incentives
  - Cost of additional resources
- Organizational:
  - Change #1
  - Change #2
- Capacity-Building
  - Additional resource #1
  - Additional resource #2
- Management and Accountability
  - Quarterly and annual reviews and reporting

The 2024 5 x 1-year plans

	Year 1	Year 2	Year 3	Year 4	Year 5	Total
	2024	2025	2026	2027	2028	2024-2028
Total Capital Spending:	$1,223,268	$570,938	$0	$0	$0	$1,794,206
Total Savings:	$152,264	$234,877	$248,899	$261,344	$274,411	$1,171,795
Total Incentives:	$97,892	$41,074	$0	$0	$0	$138,966
Total Additional Resources:	$25,000	$100,000	$103,000	$106,090	$109,273	$443,363
Net Cost:	**$998,112**	**$394,987**	**-$145,899**	**-$155,254**	**-$165,139**	**$926,807**
Capital Spending						
Ventilation - Scheduling, Rebalancing, Upgrades	$924,643					$924,643
Building Automation Optimization and Lighting Controls	$263,750					$263,750
Heating Plant Optimization	$13,000	$495,938				$508,938
Cooling Plant Optimization	$21,875	$0				$21,875
Building Envelope	$0	$75,000				$75,000
Total Capital Spending:	**$1,223,268**	**$570,938**	**$0**	**$0**	**$0**	**$1,794,206**
Savings						
Ventilation - Scheduling, Rebalancing, Upgrades	$84,900	$89,145	$93,602	$98,282	$103,196	$469,126
Building Automation Optimization and Lighting Controls	$63,750	$66,938	$70,284	$73,799	$77,489	$352,259
Heating Plant Optimization	$0	$75,000	$78,750	$82,688	$86,822	$323,259
Cooling Plant Optimization	$3,614	$3,795	$3,984	$4,184	$4,393	$19,970
Building Envelope	$0	$0	$2,278	$2,392	$2,511	$7,181
Total Savings:	**$152,264**	**$234,877**	**$248,899**	**$261,344**	**$274,411**	**$1,171,795**
Incentives						
Ventilation - Scheduling, Rebalancing, Upgrades	$53,533					$53,533
Building Automation Optimization and Lighting Controls	$42,100					$42,100
Heating Plant Optimization	$0	$33,658				$33,658
Cooling Plant Optimization	$2,259	$0				$2,259
Building Envelope	$0	$7,416				$7,416
Total Incentives:	**$97,892**	**$41,074**	**$0**	**$0**	**$0**	**$138,966**
Organizational Development						
Description of organizational change 1	X					
Description of organizational change 2			X			
Description of organizational change 3				X		
Capacity Building (Additional Resources)						
New Project Manager	$25,000	$100,000	$103,000	$106,090	$109,273	$443,363
Description of capacity change 2		X				
Description of capacity change 3					X	
Total Additional Resources:	**$25,000**	**$100,000**	**$103,000**	**$106,090**	**$109,273**	**$443,363**

Life Cycle Costing




Carrots vs
Sticks

Grants and Incentives

- IESO – Michael Oriahi Michael.Oriahi@ieso.ca
- Enbridge Gas – Adam Trela adam.trela@enbridge.com
- Scanning North America

Save on Energy Program Updates

- **Retrofit program** prescriptive incentives for most **non-lighting measures** increased as of October 30, 2023. Many **doubled**, including for air source heat pumps. Visit the Retrofit program website for the updated measures and incentives.
- The **Instant Discounts program** for lighting launched **December 18, 2023.** Program incentives are directly to distributors, enabling them to offer instant point-of-sale discounts on energy-efficiency lighting to customers.
- **Strategic Energy Management program** offers a two-year, cohort-based learning model to organizations with at least 3,000,000 kWh annual energy consumption.
- The **Existing Building Commissioning program** provides financial incentives for businesses to hire qualified commissioning providers and to receive pay-for-performance incentives for savings achieved.

Save on Energy Training and Support

- **Save on Energy's Training and Support program** delivers webinars, coaching workshops and information resources to energy professionals across Ontario on a range of topics, including energy data, efficient electrification and heat pumps, all at no cost to participants.
- We also offer **incentives of up to 50% for 18 energy-efficiency training courses** and of up to 75% to Enbridge customers for several courses.
- All of our training and support resources, including webinar recordings, information sheets, guides and case studies can be found on the **Training and Support page** of the Save on Energy website. For more information reach out to us at trainingandsupport@ieso.ca

2024 Commercial Energy Efficiency Program

Greening Health Care – Planning for Success

Adam Trela, Sr. Advisor
Commercial Energy Solutions

ENBRIDGE
Life Takes Energy

Custom incentive offers

Year-round offers for institutional projects

1 Energy assessment incentives

Pre-approval required. Eligible assessments:

- HVAC/controls audits (ASHRAE Level 2 minimum)
- Facility air-balances
- Benchmarking activities
- Thermal surveys
- Steam trap audits

Previous year consumption per address (m^3)	Up to 50 percent of eligible costs, to maximum incentive stated (per address per year)
100,000 – 300,000	$1,500
300,000 – 1,500,000	$2,500
1,500,000 – 3,000,000	$6,000
3,000,000 or greater	$10,000

2 Implementation incentives

For institutional projects at universities, colleges, hospitals, military bases and buildings connected to district energy. Custom projects such as:

- Waste heat recovery
- Boiler and controls upgrades
- Air-to-water heat pumps

$0.25/$m^3$ for first 400,000 m^3 of gas saved

$0.10/$m^3$ for subsequent m^3 of gas saved

Up to 50 percent of upgrade costs*, to a maximum of **$0.5 million per project**.

* Upgrade costs are the difference between the equipment and implementation costs of the energy-efficient option and those of the alternate option considered.

Conserve energy on your net-zero journey

Contact us as early as possible in your planning. We can help you:

Assess options from a holistic cost/benefit perspective

- We offer audit/study incentives, if scope is reviewed and approved by an Enbridge Gas Energy Advisor.

Qualify your project for energy efficiency incentives

- Enbridge Gas incentive can be stacked with SaveOnEnergy incentives, if applicable.
- To qualify, our support and incentives must have helped you decide to pursue the project.

Here to Help Everywhere

- Manitoba – Manitoba Hydro Programs – Lighting, envelope, HVAC, new construction, commissioning, energy audits
- Alberta – Building Energy Innovators Council - High efficiency upgrades, custom energy solutions
- British Columbia – BC Hydro – Lighting, HVAC, Refrigeration, Mechanical Technologies (up to 25% of upgrade), FortisBC Gas – rebates on air units
- New York – NYSERDA – energy studies, energy manager, building O & M training programs. Various utilities programs

Panel Discussion: Planning for Success

Chris Mackey
Director Facilities Management
Providence Care, Kingston ON

Rob Simpson
Manager, Facilities
Ontario Shores Centre, Whitby ON

Servanne Fowlds
P3 Contract Manager, Redevelopment
Centre for Addiction and Mental Health, Toronto ON

- *Successes and challenges*
- *Sources of objective advice*
- *Making the business case*
- *Internal allies and support*


Greening
Health Care
2024: Join
Us!

2024 Calendar of Events

Events are posted on greeninghc.com and webinar registrations are open

Webinars – times in EST/EDT

- February 7: 12:30 – 1:30 pm Energy and Emissions Reductions – Planning for Success
- April 10: 12:30 – 1:30 pm Picking the Low Hanging Fruit
- July 31: 12:30 – 1:30 pm Energy Savings Leaderboard
- September 25: 12:30 – 1:30 pm New Hospital Performance

In-person Events

- June 3 or 10: (date and location TBC) – Summer Workshop
- November 4: 8:00 am to 6:00 pm, Delta Hotel, Toronto – GHC Forum 2024

Membership and Support

GREENING HEALTH CARE
working together for healthier communities

CLIMATE CHALLENGE NETWORK

Staying in Touch

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Visit greeninghc.com to learn more.