



UHN

Toronto General
Toronto Western
Princess Margaret
Toronto Rehab

Embedding Health Benefits into Evaluation of Energy Projects

Supporting Our Purpose & Values Through Sustainability

Presentation Objectives

- Describe UHN's Energy Management program.
- Demonstrate the non-energy value the program brings to UHN.

Who Is The University Health Network?

- acute care, rehabilitation, research and teaching hospital located throughout Toronto
- 15,000 staff and 1,200 beds
- over 6.5 million ft² of buildings
- \$36 M annual utility spend



Who Is The University Health Network?

UHN's Purpose

Transforming lives and communities through excellence
in care, discovery and learning

Our Primary Value and above all else,

the needs of patients come first

Values

Safety, Compassion, Teamwork, Integrity, Stewardship



UHN's Energy & Environment Program

Guiding Principle

- Environmental sustainability is a health issue.

Mission Statement

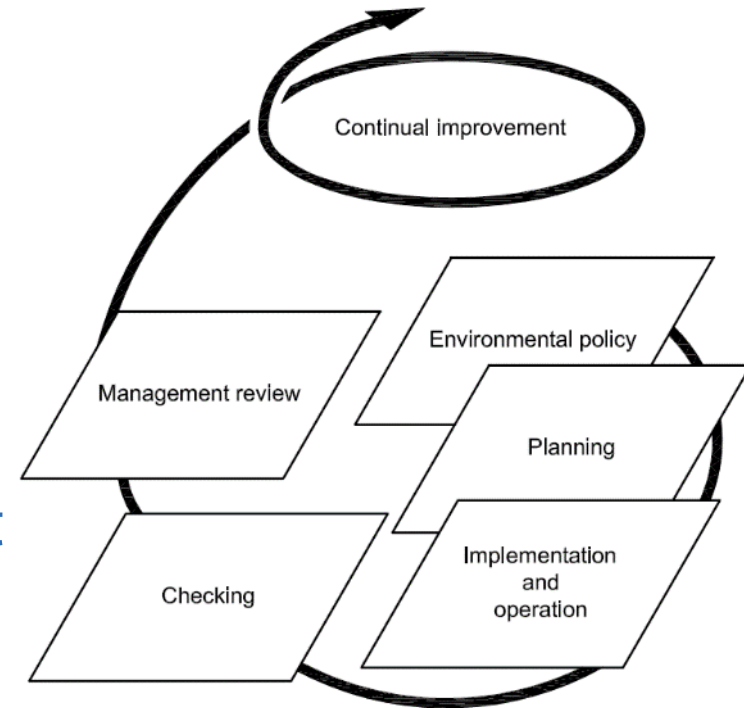
- Supporting patient care through a sustainable environment.



UHN's Energy & Environment Program

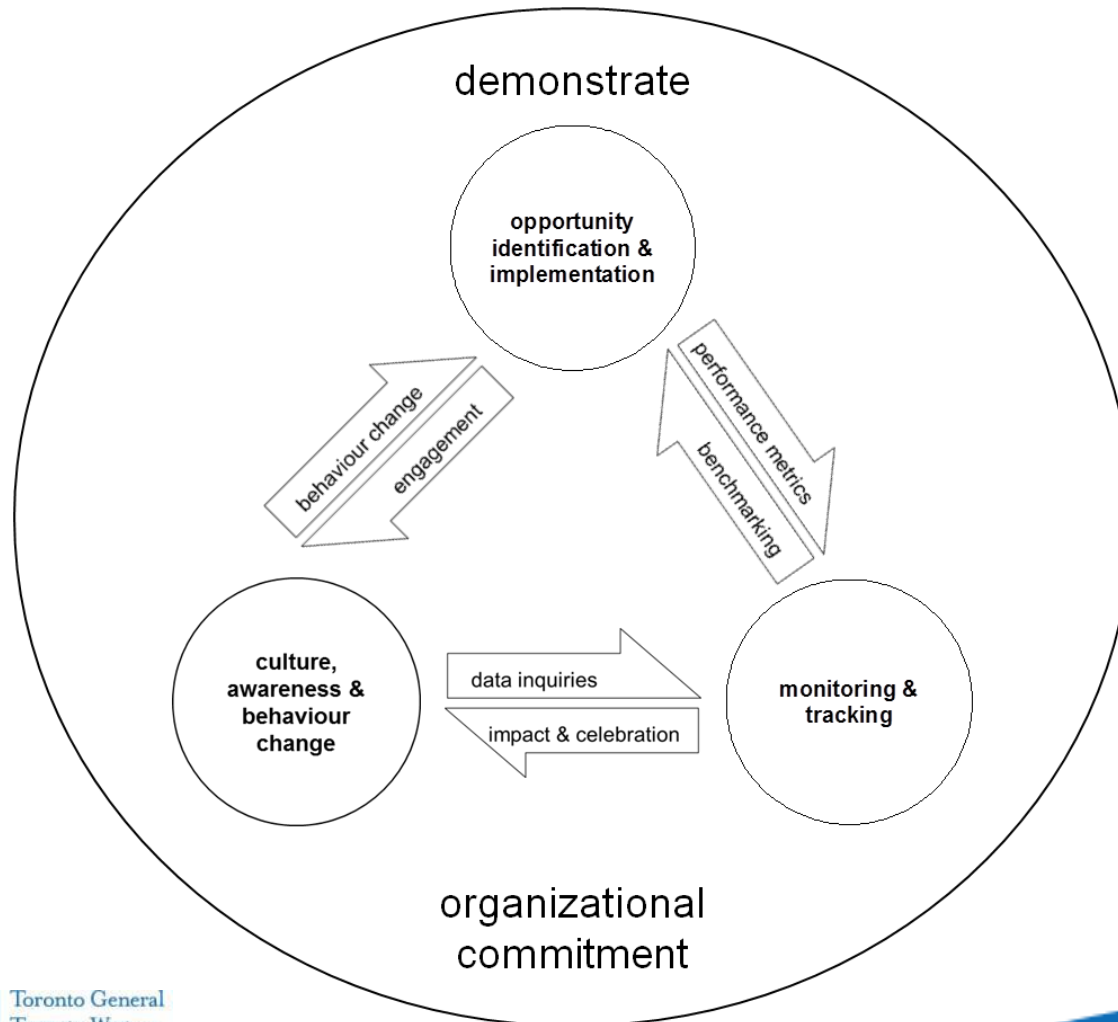
The Management Framework

- ISO 14001: Environmental management systems – Requirements with guidance for use
- based on the Plan-Do-Check-Act methodology.



UHN's Energy & Environment Program

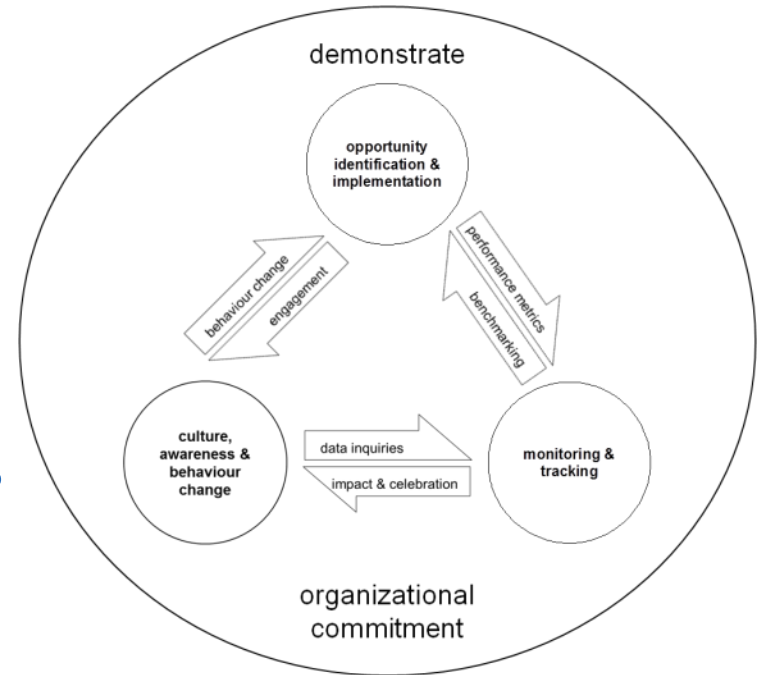
The Strategic Approach



UHN's Energy & Environment Program

The Strategic Approach

- utilizes
 - systems approach
 - design thinking
 - collective impact
 - developmental evaluation
- resulting in a framework that is
 - flexible
 - scalable
 - transferable



UHN's Energy & Environment Program

The Strategic Approach

Culture, Awareness & Behaviour Change

- utilizes behaviour change theory
- empowering, two-way communication
- **allows for identification of opportunities with health/energy overlap**



Opportunity Identification & Implementation

- embedded monitoring & tracking
- implementation stories used to drive culture change
- **compliance, risk & data driven**



UHN's Energy & Environment Program

The Strategic Approach

Monitoring & Tracking

- internal & 3rd party audits
- utility meters & invoices
- surveys & “informal” feedback
- **triple bottom line accounting**



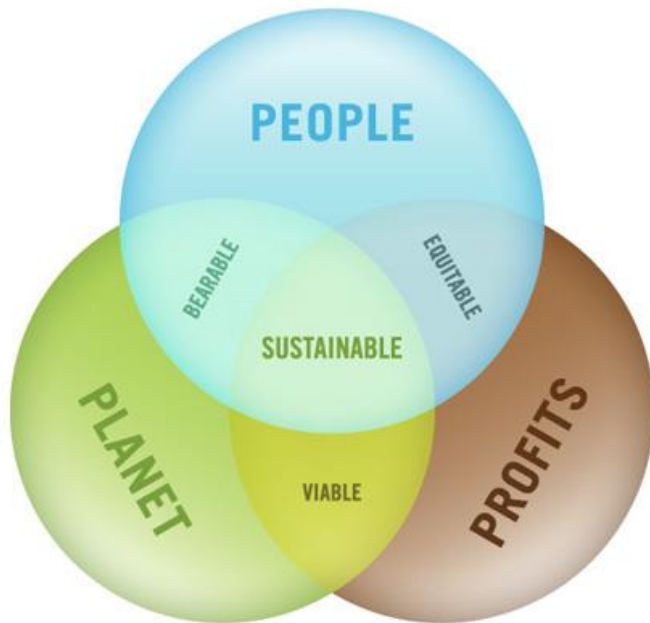
Demonstrate Organizational Commitment

- “glue” that holds everything together
- creates opportunities internally & externally
- **provides avenue to link energy projects back to Purpose & Values**



Evaluating Energy Opportunities

Looking Beyond Finance



Evaluate how projects impact:

- safety & comfort
- resiliency & redundancy
- broader operations & risk

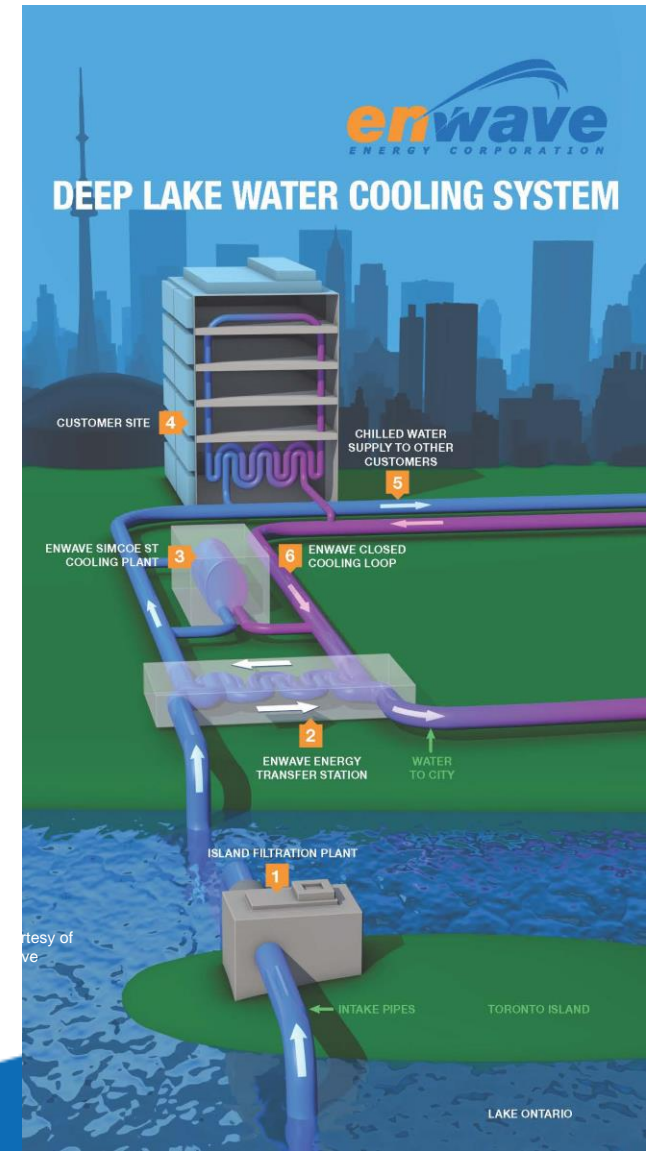
Requires:

- data
- time & resources
- broad engagement
- commitment

Case Studies

TGH Deep Lake Water Cooling (DLWC)

- extensive data collection & modelling
- multiple scenarios evaluated
- third party review engineers and cost consultants retained
- significant involvement of Building Operators and Facilities Staff



Case Studies

TGH Deep Lake Water Cooling (DLWC)

- cost savings: \$22M over 20 years
- cooling on emergency power
- quieter cooling mechanical room
- GHG reduction
 - 300 – 600 MT/year
- other benefits
 - full cooling redundancy
 - increased cooling capacity
 - improved control of cooling
 - transfer of operational risk



Case Studies

PM Domestic Water Pump Replacement

- integrated approach with infection control
- review of entire water system prior to construction
- temporary booster pump and pipe freezing to avoid water system shutdown during construction
- post replacement “flush plan”
- added redundancy & reliability
- extra work increased payback by ~1 year



Case Studies

KDT Demand Control Ventilation System

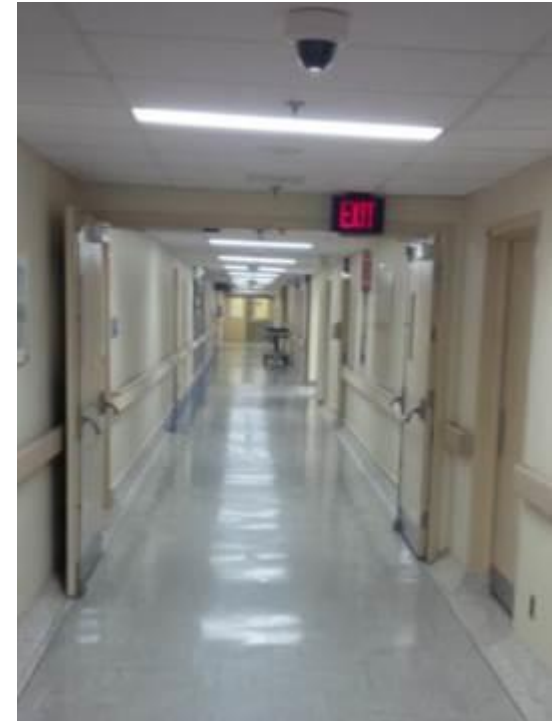
- building was already LEED silver
- air sampled throughout labs at least every 10 minutes
 - good picture of air quality and events
- high maintenance requirements
- \$240K/year savings
 - cost ~ \$1M
 - 1.4 M kWh/year reduction
 - 400K m³/year natural gas reduction
 - CO₂ reduction of 794 tons/year



Case Studies

Other Projects

- LED lighting conversion
 - extensive bench and pilot testing
 - least expensive lights not chosen
 - improved lighting quality and quantity
- TWH East Wing CAV to VAV conversion
 - air balancing study before and after implementation
 - extensive consultation with clinical areas within the building
 - 50% of areas had improper air flow



Case Studies

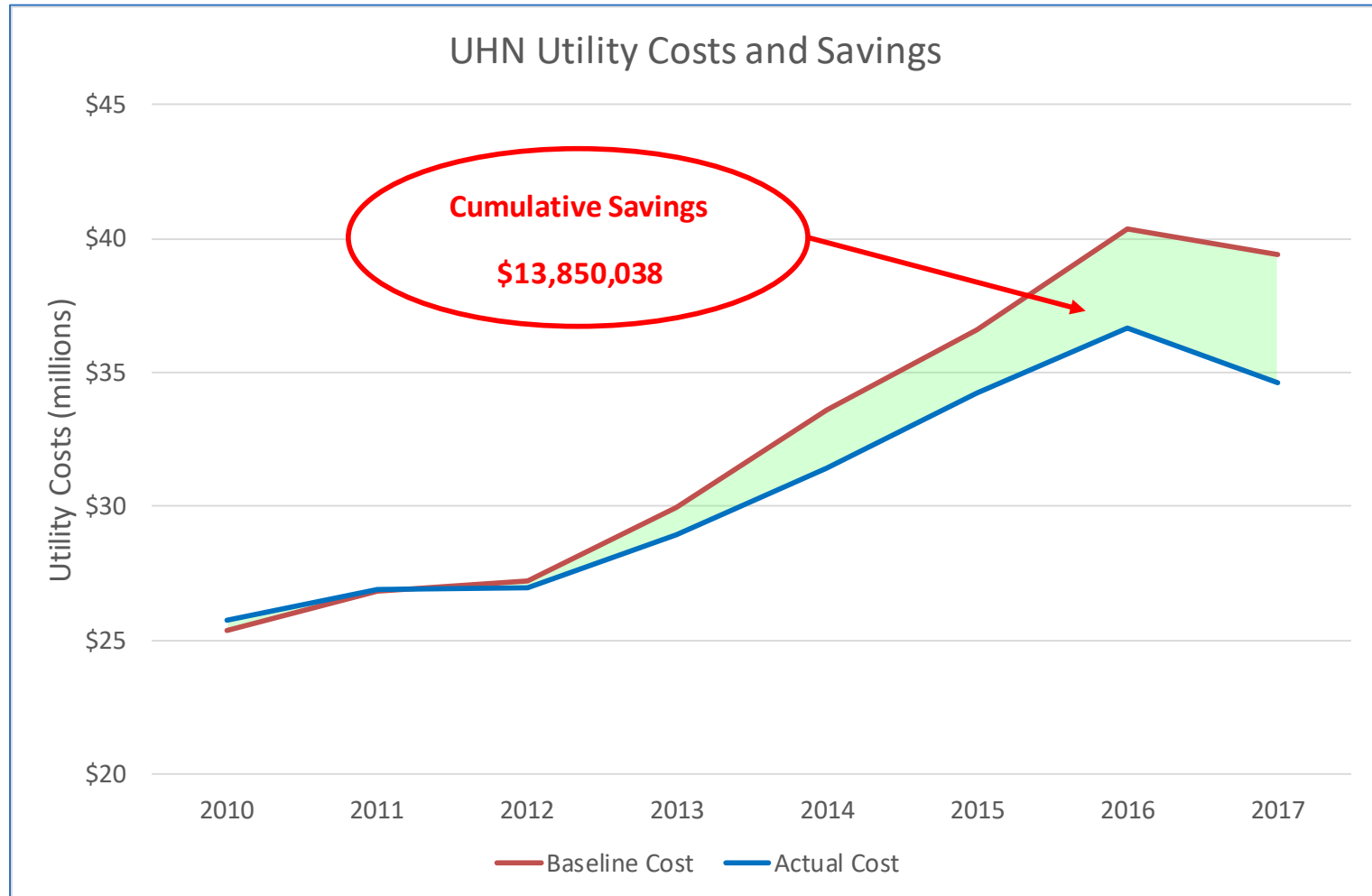
Other Projects

- ongoing building automation system upgrades
- ongoing mechanical room insulation
- combined heat & power investigations
- upcoming
 - TGH operating room cooling
 - TWH surgical services upgrade



Results

Safety & Stewardship



Thank You

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