



Thermal Metering in North America

Impacts and Outlook



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MMM GROUP LIMITED

- Founded in 1952
- Over 2,000 staff across Canada
- Integrated service delivery of all engineering disciplines and project management, including **energy and sustainability**
- Recognized Canadian leaders in alternative delivery, program/project management (perennial Canadian Consulting Engineer PM award winner)
- Extensive experience in Alternate Project Delivery (PM, PC, ORS, PDC, BF and DBFM roles)
- Active in **public, private, P3 sectors** with focus on **Buildings, Communities, Transportation and Infrastructure**



ENERCARE CONNECTIONS INC.

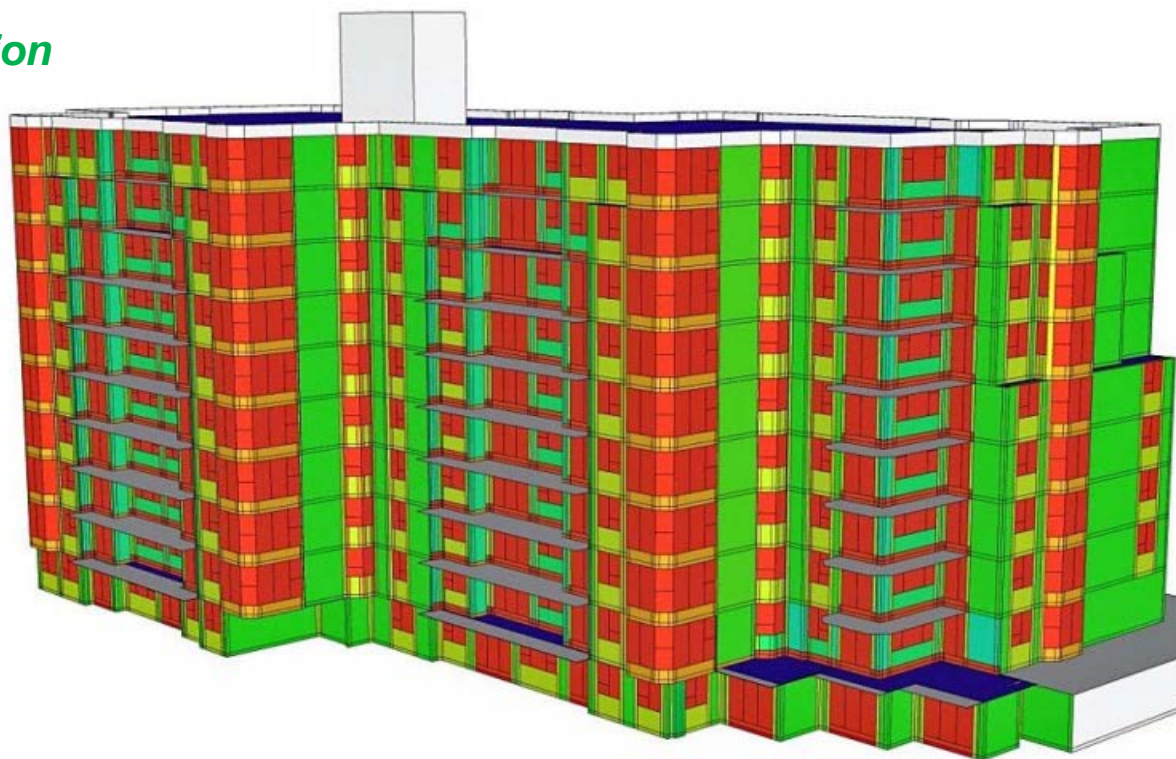
Project Management Services:

- Design Preparation, Coordination and Implementation
- Electrical, Water, Thermal Metering Installations
- Installation Review
- Commissioning Coordination
- Billing / Account Set-Up
- Closeout
- Ongoing Support Following Handover



WHY THERMAL METERING?

- *Natural industry progression* based on energy trends
- *COMPLETE utilities bill* based on consumption for *Electricity, Water* and *Thermal*
- *Simple allocation* of common area bill by condo corporation
- Energy *Savings*
- *Regulation and Legislation*



THERMAL METERING IN NORTH AMERICA



ENERGY
TRENDS

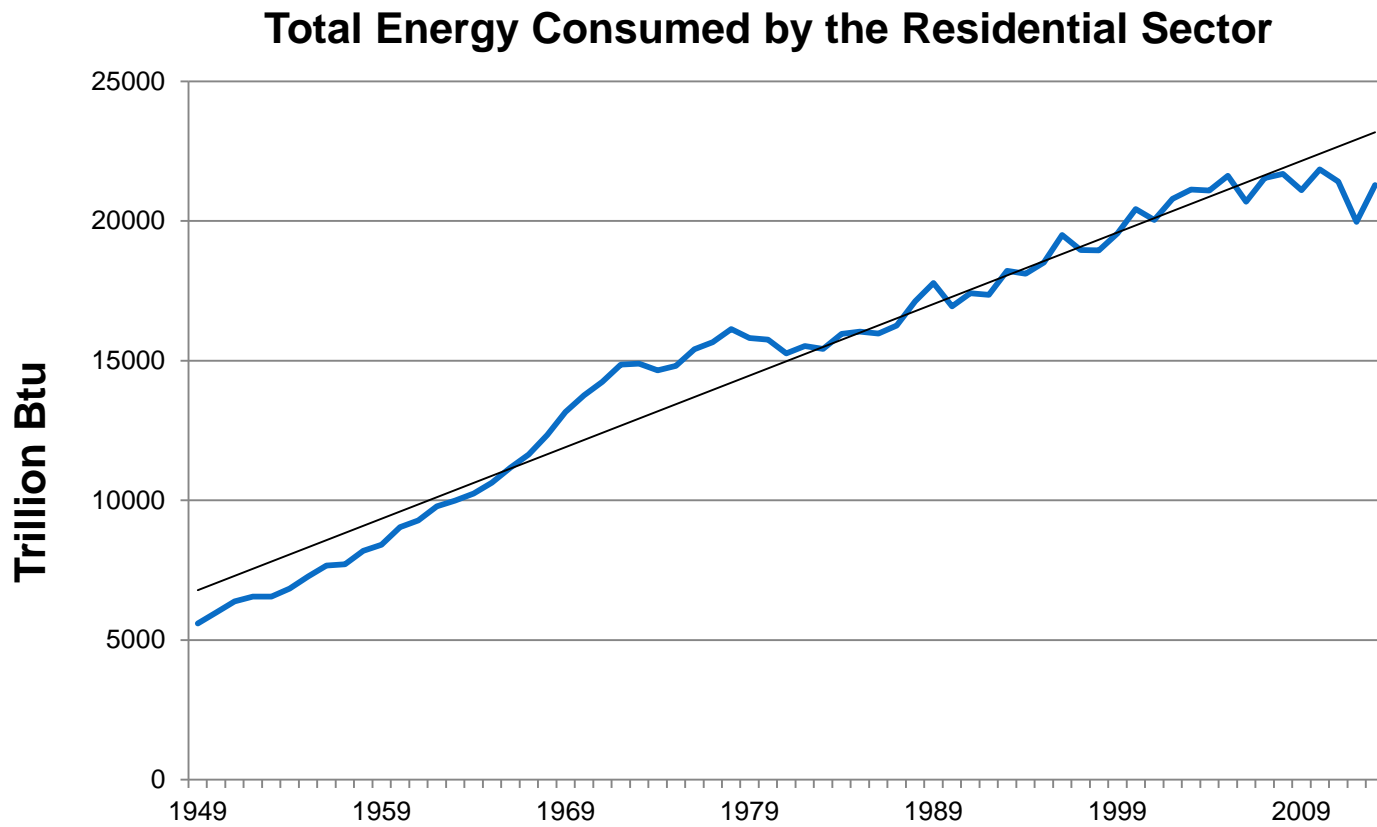


IMPACTS OF
THERMAL
METERING



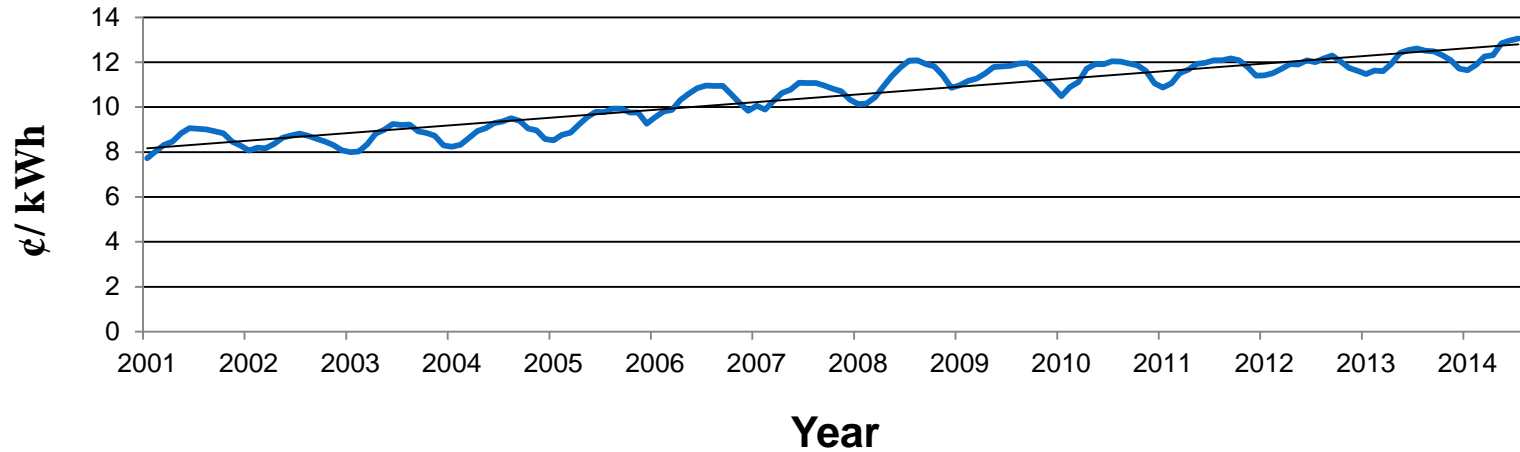
FUTURE
OUTLOOK

ENERGY TRENDS

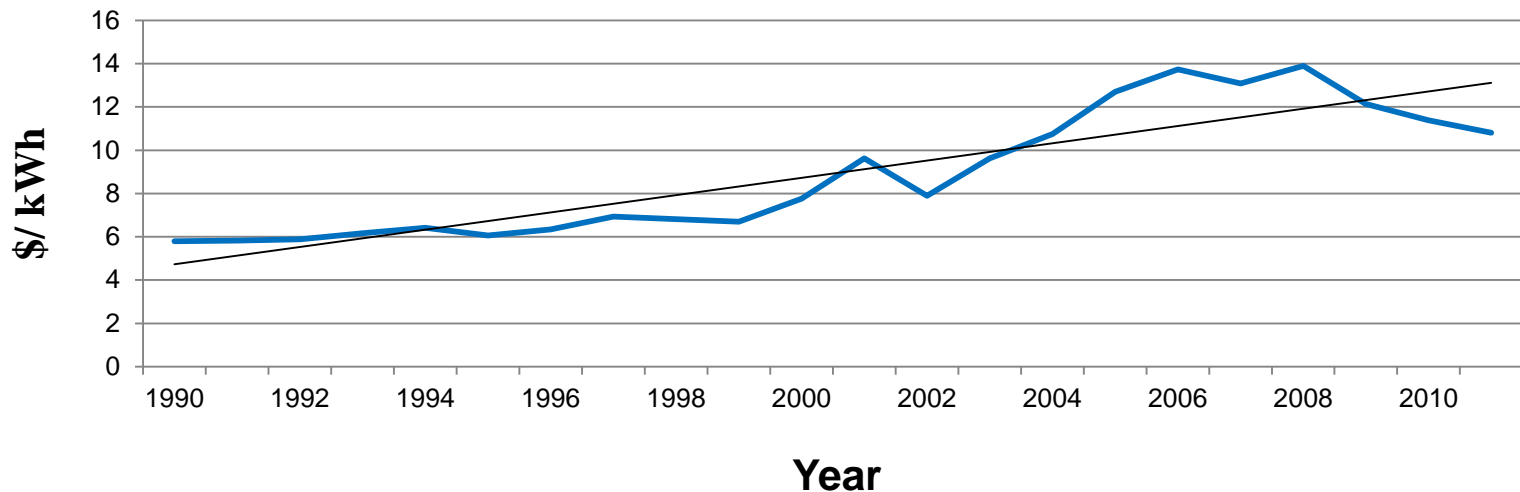


ENERGY TRENDS

U.S. Price of Electricity Delivered to Residential Consumers

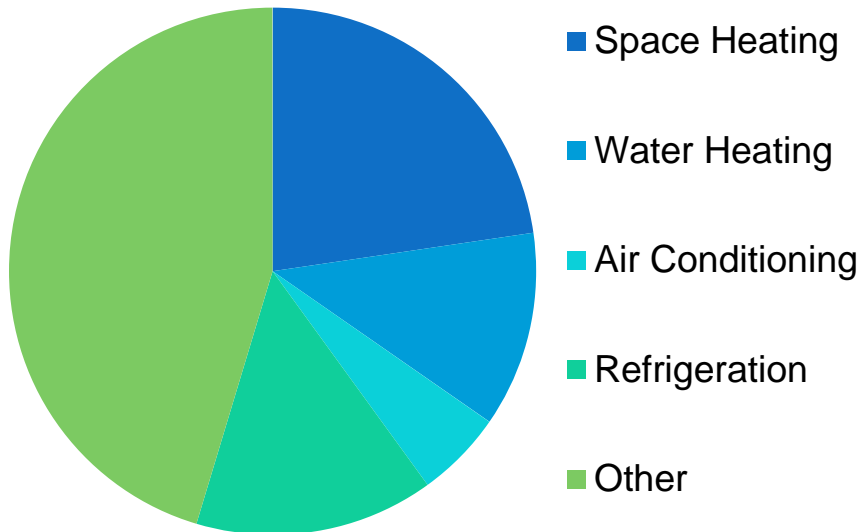


U.S. Price of Natural Gas Delivered to Residential Consumers

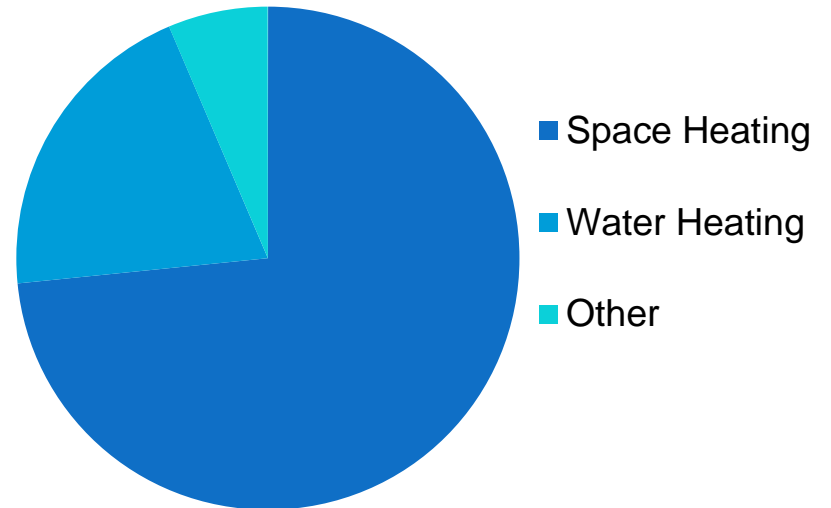


ENERGY TRENDS

U.S Electricity Use in Multi-Unit Buildings



U.S Natural Gas Use in Multi-Unit Buildings

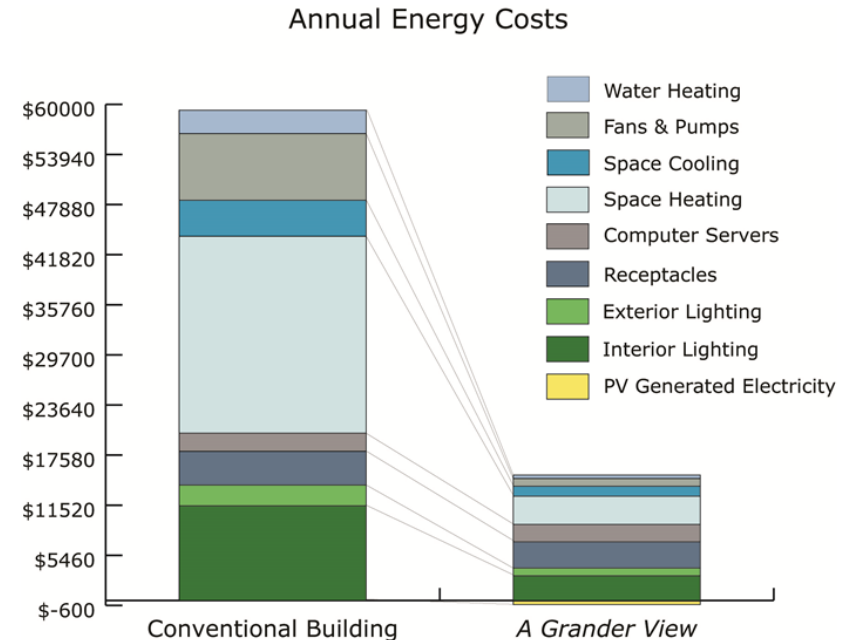


ENERGY MANAGEMENT AND SAVINGS

- Tracking energy consumption trends promotes **energy literacy** and empowers consumers to better manage their energy consumption (and avoid “**rebound effect**”)
- Studies indicate that savings due to **behavioural change** based on actual consumption of heat can often reach up to 30%
- Case Study :: A Grander View (MMM Group Kitchener Office)

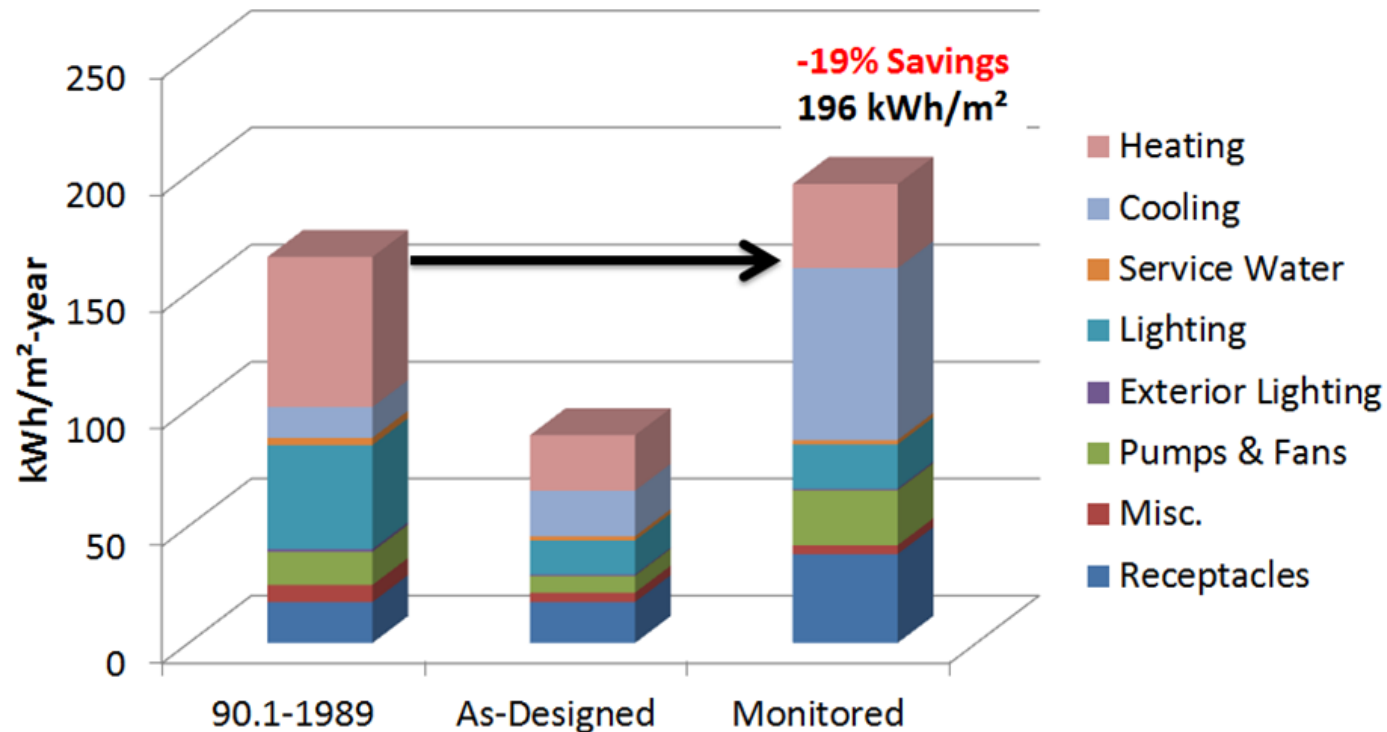


80% energy savings
80% water savings
61 LEED points



OPERATIONAL SUSTAINABILITY

- Improving overall building design and construction process
- Improving product design and availability
- Case Study :: Green on the Grand



CURRENT PRACTICES AND REGULATION TRENDS

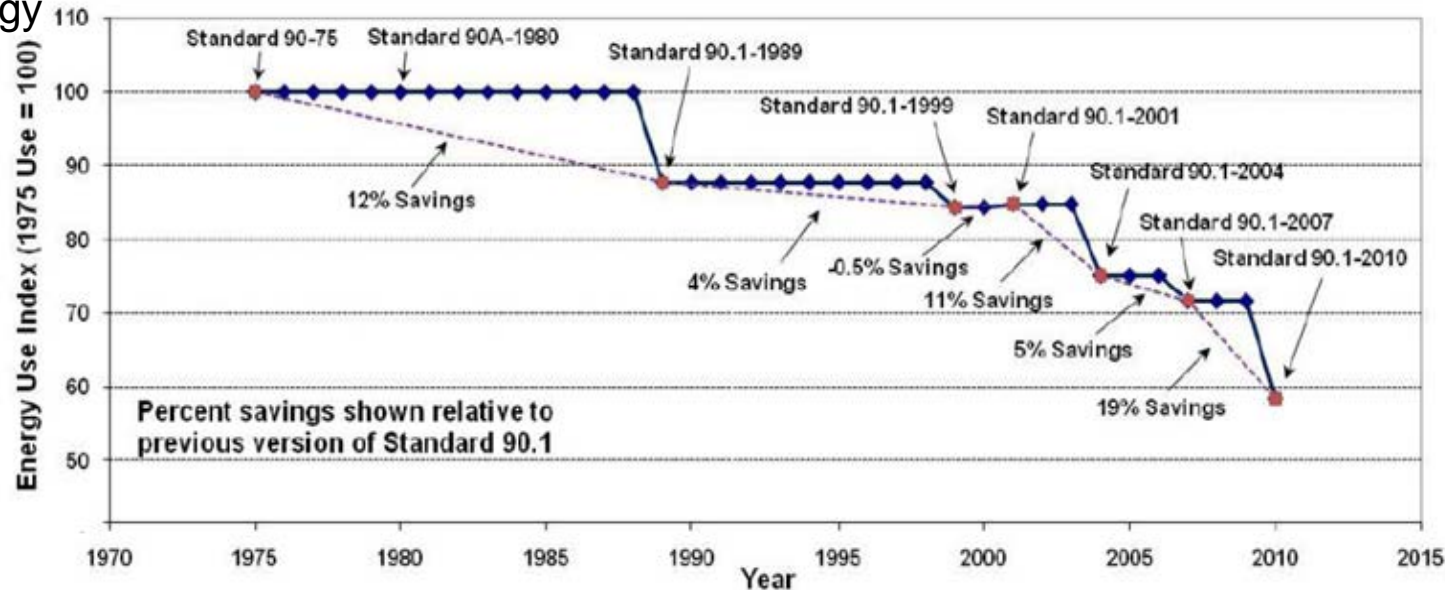
ASHRAE

90.1. 2013

- Used widely across US / Canada
- Building-level thermal metering

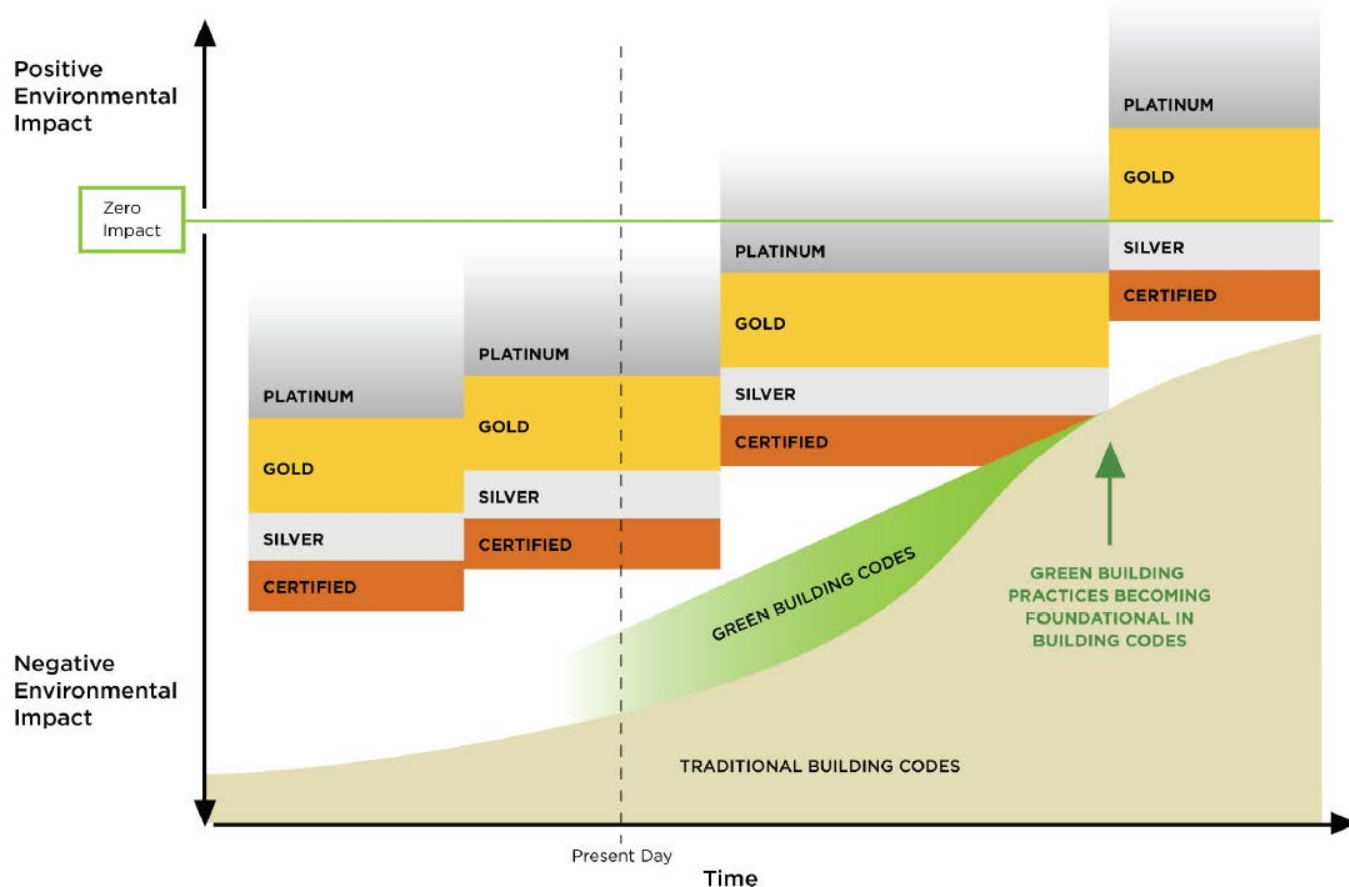
189.1 – High Performance Green Building Standard

- First Code-intended high-performance green building standard
- Unit-level thermal metering
- 30% less energy



CURRENT PRACTICES AND REGULATION TRENDS

- New Construction: **LEED Measurement and Verification EA Credit 5.2 (3 points)**
- *Excerpt : Install the necessary metering and sub-metering equipment to measure energy use. Develop and implement an M&V plan that can be utilized and expanded by the tenant and that compares predicted savings to actual energy performance.*



CURRENT PRACTICES AND REGULATION TRENDS

TORONTO

Waterfront Toronto's Minimum Green Building Requirements

- Includes and builds upon LEED Certification

Toronto Green Standard

- Tier 2 (Voluntary)– Developer Charge Refund (up to 20%) is on average \$500k for typical high rise condominium

TORONTO GREEN STANDARD – CHECKLIST

For New Mid-High Rise Residential, Commercial, Industrial and Institutional Development (4 storeys and higher).

Complete in conjunction with the [full](#) Toronto Green Standard and Specifications.



TIER 2 OPTIONAL (SELECT 3)

Section	Development Feature	Tier 2 Voluntary Performance Measure Summary	Description (How is this performance measure being met?)	Reference the Plans, Drawings or Reports
AQ 2.2	Cycling Infrastructure	Enhanced bicycle parking rates provided		Site Plan # <input type="text"/> Underground Garage Plan # <input type="text"/> Other # <input type="text"/>
GHG 1.3	Minimum Energy Performance	Certified in-suite smart metres installed in all residential units		<input type="checkbox"/> Declaration template

FUTURE OUTLOOK

- **Energy Efficiency & Product Improvements**
- **Allocated Billing**
- **Other Thermal Metering Applications**
 - *P3 Projects (Energy Performance Guarantees)*
 - *Power Generation*
 - *Central Plant Monitoring*
 - *Managed Data Centers and Colocation Facilities*
- **Following Europe?**
 - *European Commission – Energy Efficiency Directive*
 - *Individual thermal/cool/hot water consumption meters in multi-apartment buildings by 31/12/2016*



WHY THERMAL METERING?

- Energy *efficient* green buildings
- Increase of *transparency, accountability and fairness* for individual owners
- Seamless *allocation of utilities bill* by condo corporation
- More *desirable* to purchasers





Thank You!

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