

# DECARBONIZATION IN BRAMPTON: CURRENT INITIATIVES AND FUTURE PLANS

Peter Love

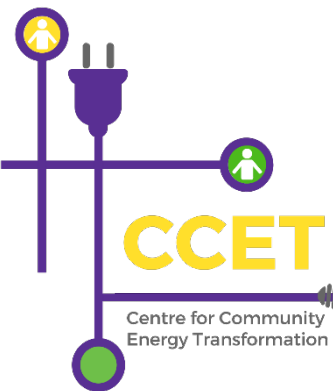
Chair, Centre for Community Energy Transformation  
Brampton Board of Trade Energy & Environment Forum

April 18, 2023



# PRESENTATION OUTLINE

- Climate Change & Energy
- Approaches to Decarbonization
- Targets for Brampton
- Current Initiatives in Brampton
- Future Initiatives
- Discussion

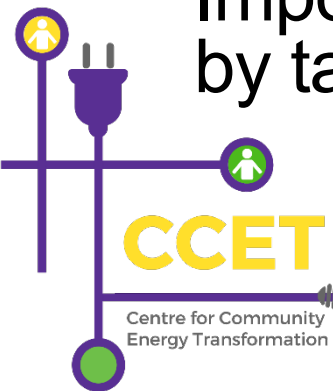


# CLIMATE CHANGE SCIENCE 101

## Climate Change 101

- It's warming
- It's us
- We're sure
- It's bad
- We can fix it

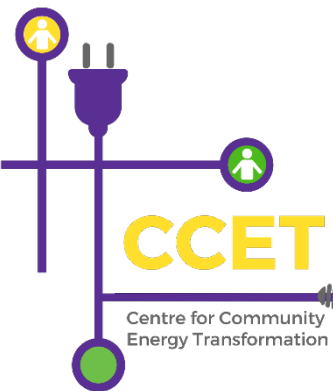
Important to focus on solutions: Martin Luther King inspired a nation by talking about his dream, not his nightmare



# CHALLENGES OF TALKING ABOUT CLIMATE CHANGE

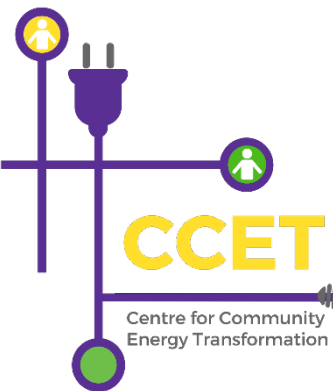
- Not where I live
- Not in my lifetime
- Not in my term in office
- Other people/countries worse
- It's too cold anyway

[https://www.youtube.com/watch?v=ka\\_kQUvojel](https://www.youtube.com/watch?v=ka_kQUvojel)

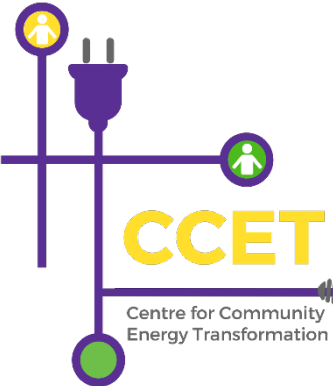
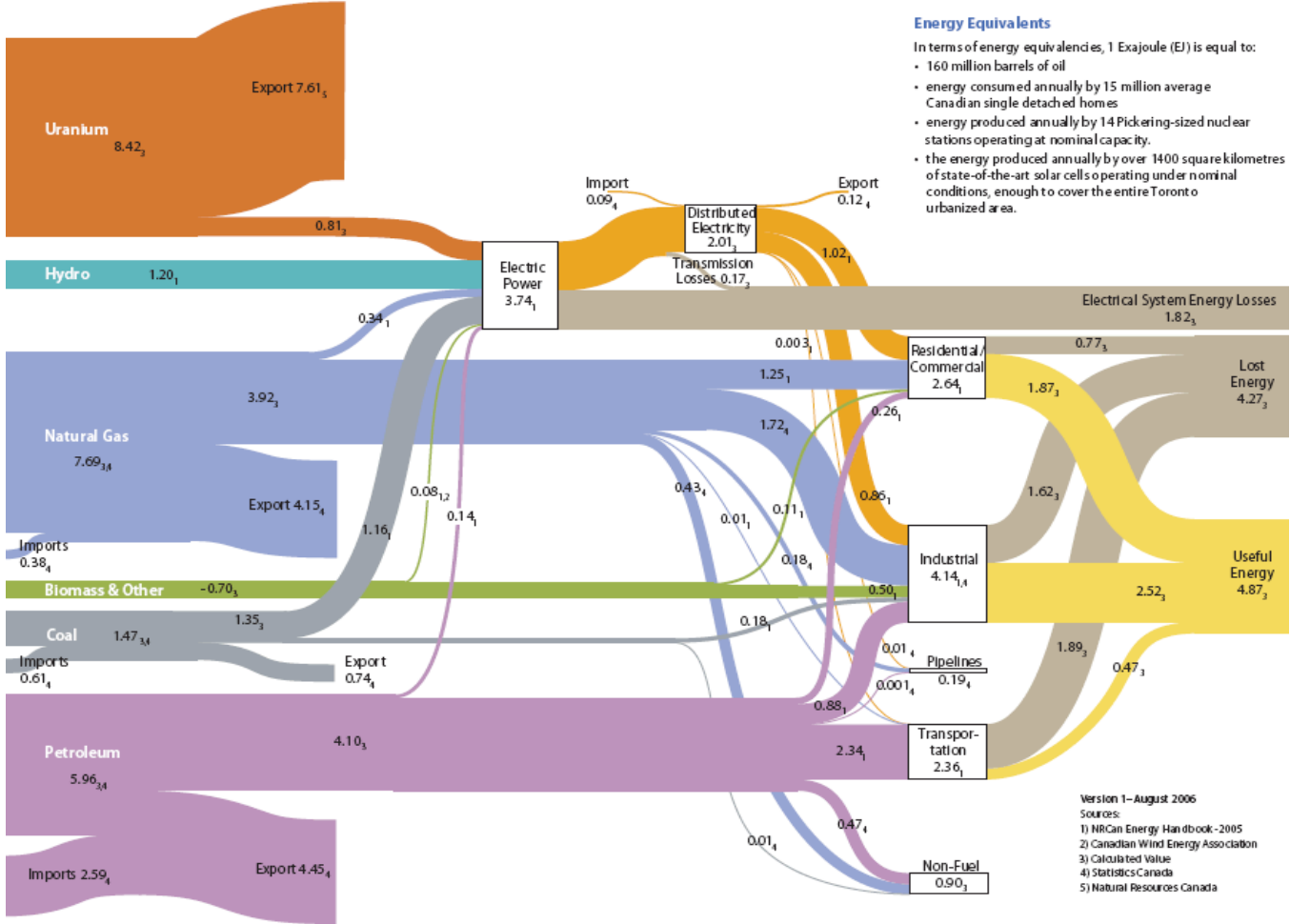


# CLIMATE CHANGE IN CANADA

**82%** of Canada's anthropogenic  
GHG from production and use of energy



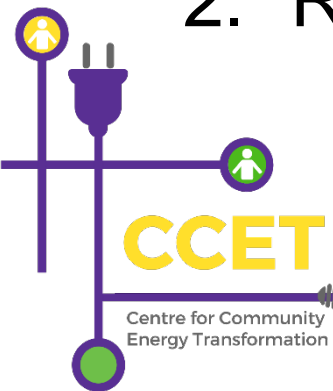
# ALMOST 60% ENERGY LOST IN CONVERSION



Version 1 - August 2006  
Sources:  
1) NRCan Energy Handbook-2005  
2) Canadian Wind Energy Association  
3) Calculated Value  
4) Statistics Canada  
5) Natural Resources Canada

# TWO ENERGY SOLUTIONS

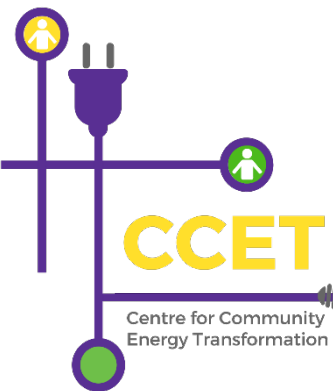
1. Vast majority of media & discussions on energy focus supply side issues
  - New Pipelines (Keystone, TM, Line 3, Energy East)
  - Oil Tanker Traffic
  - LNG
  - Oil/tar sands (bitumen)
  - Solar collectors/wind farms
  - Canada Energy Regulator (formerly National Energy Board)
2. Relatively little on demand side



# ENERGY EFFICIENCY

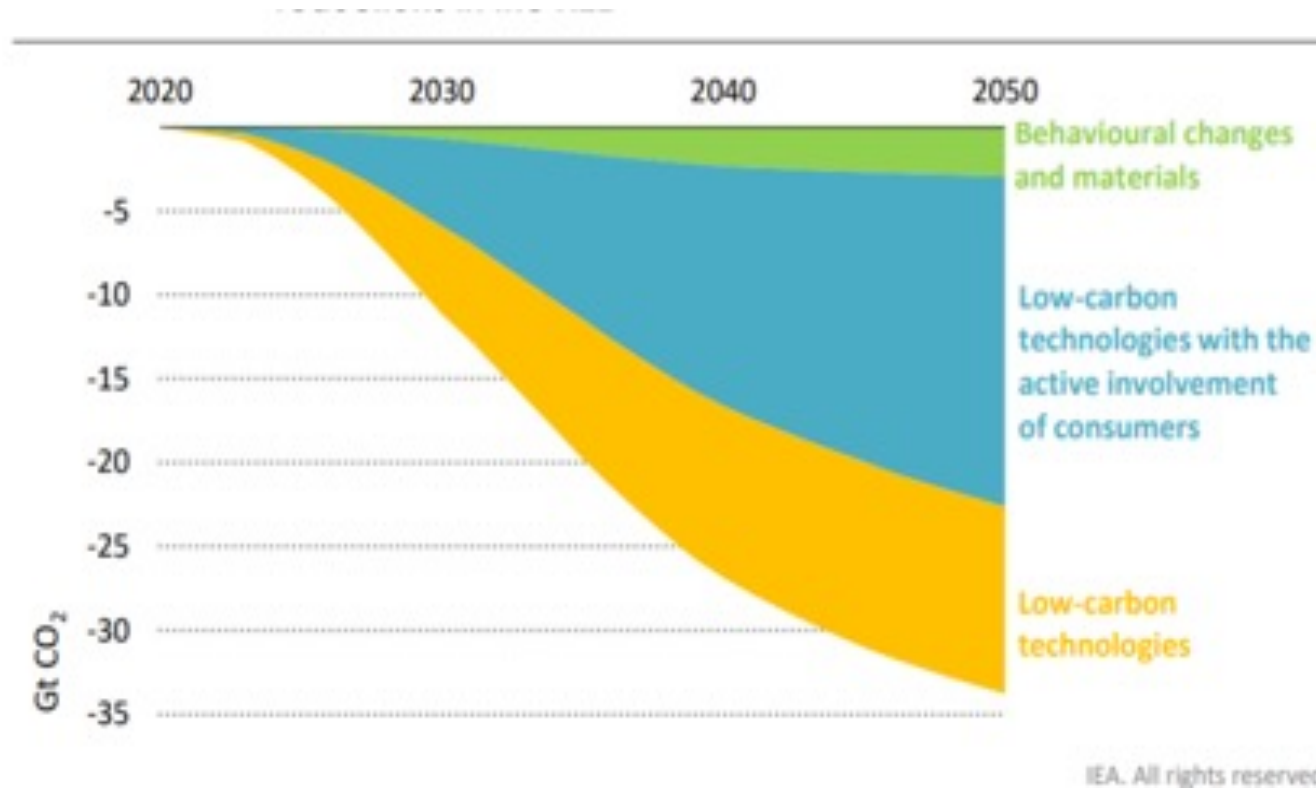
## Six Types

- Behavioural Conservation (no change in technology)
- System Operations (operation of large buildings)
- New Technology (LED lights, LEED buildings, etc)
- Demand Response (time of use)
- Fuel substitution (heat pumps in buildings and Evs on roads))
- On-site generation (< 10 kW)





# 65% POTENTIAL REDUCTIONS DRIVEN BY CONSUMERS (IEA)



# CHALLENGES OF CONSERVATION

## IT'S HARD TO SEE



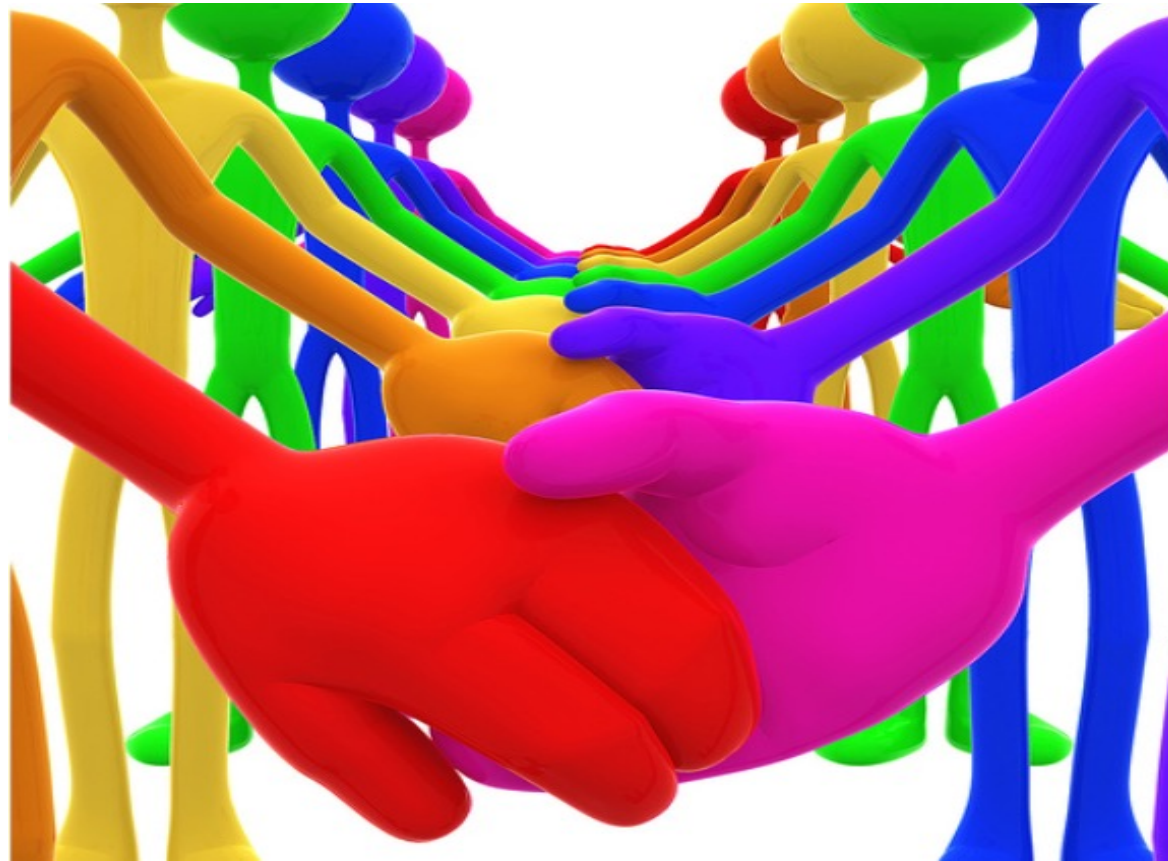
# CHALLENGES OF CONSERVATION

## IT'S HARD TO MEASURE



# ENERGY CONSERVATION

## REQUIRES EFFORT FROM ALL OF US



# BARRIERS & POLICIES TO ENERGY CONSERVATION

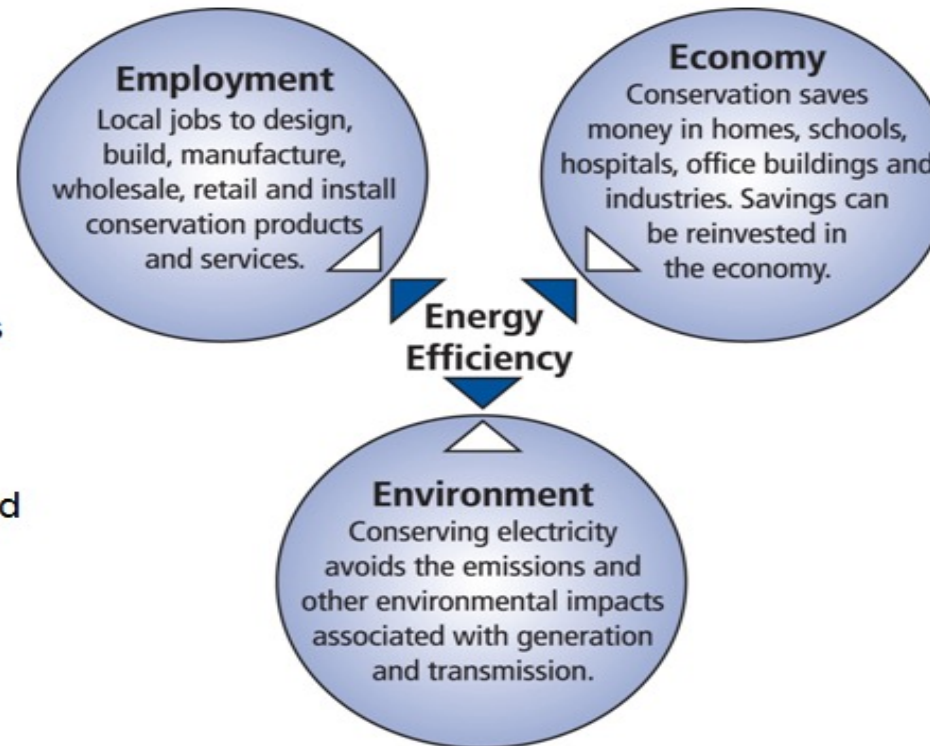


# BENEFITS OF CONSERVATION IN CANADA

## Benefits of Conservation

### The Three “Es”:

- **Employment** benefits: labour-intensive, local jobs
- **Economic** benefits: cost-effective for households and makes private sector more competitive
- **Environmental/health** benefits: reduced GHGs, acid rain, smog



# ESTIMATED ECONOMIC BENEFITS OF ENERGY EFFICIENCY

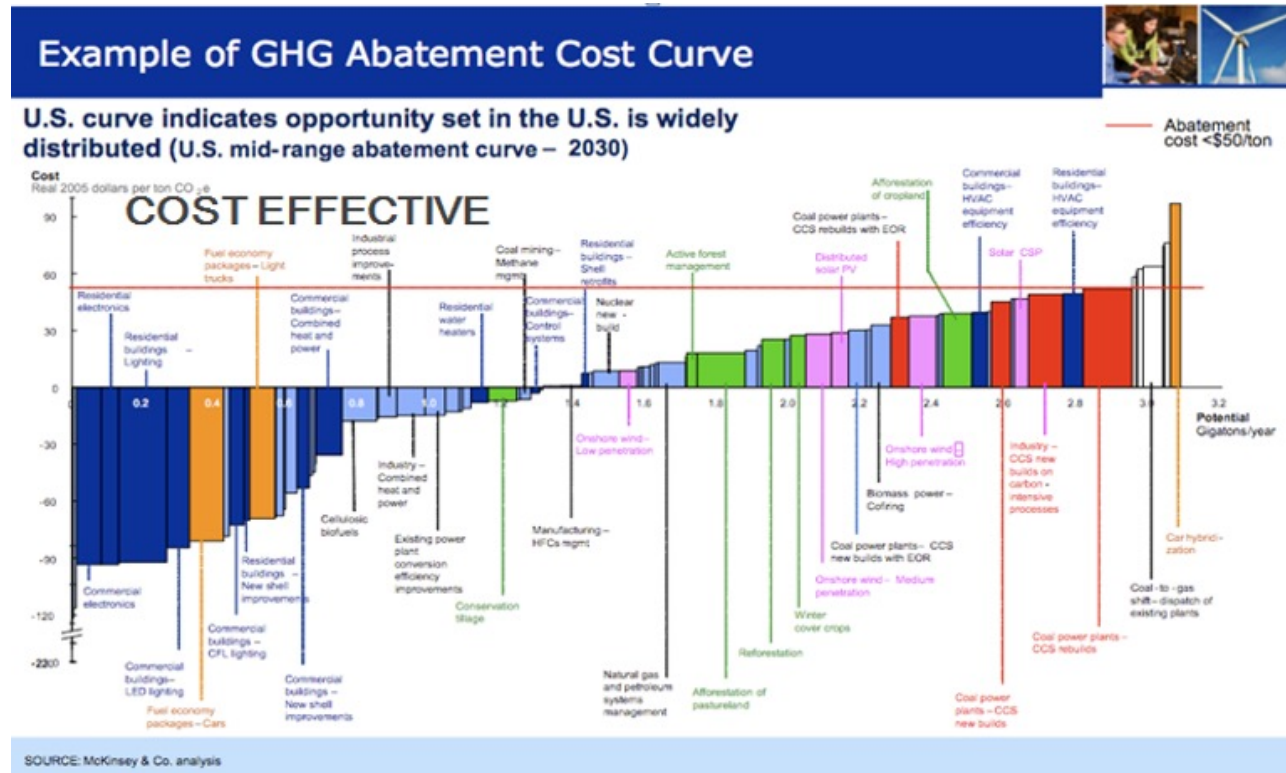


- Over next 14 years
- GDP – up \$54 billion
- Save \$114/house/yr
- Net jobs – 118,000/yr
- ¼ required Canadian GHG emission reductions

Source: Efficiency Canada <sup>11</sup>

# DEMAND SIDE OPTIONS FAR LESS EXPENSIVE THAN SUPPLY SIDE

- Cost abatement curves done by Mckinsey consistently show demand side options (blue options) are cost effective compared to supply side (other colours)

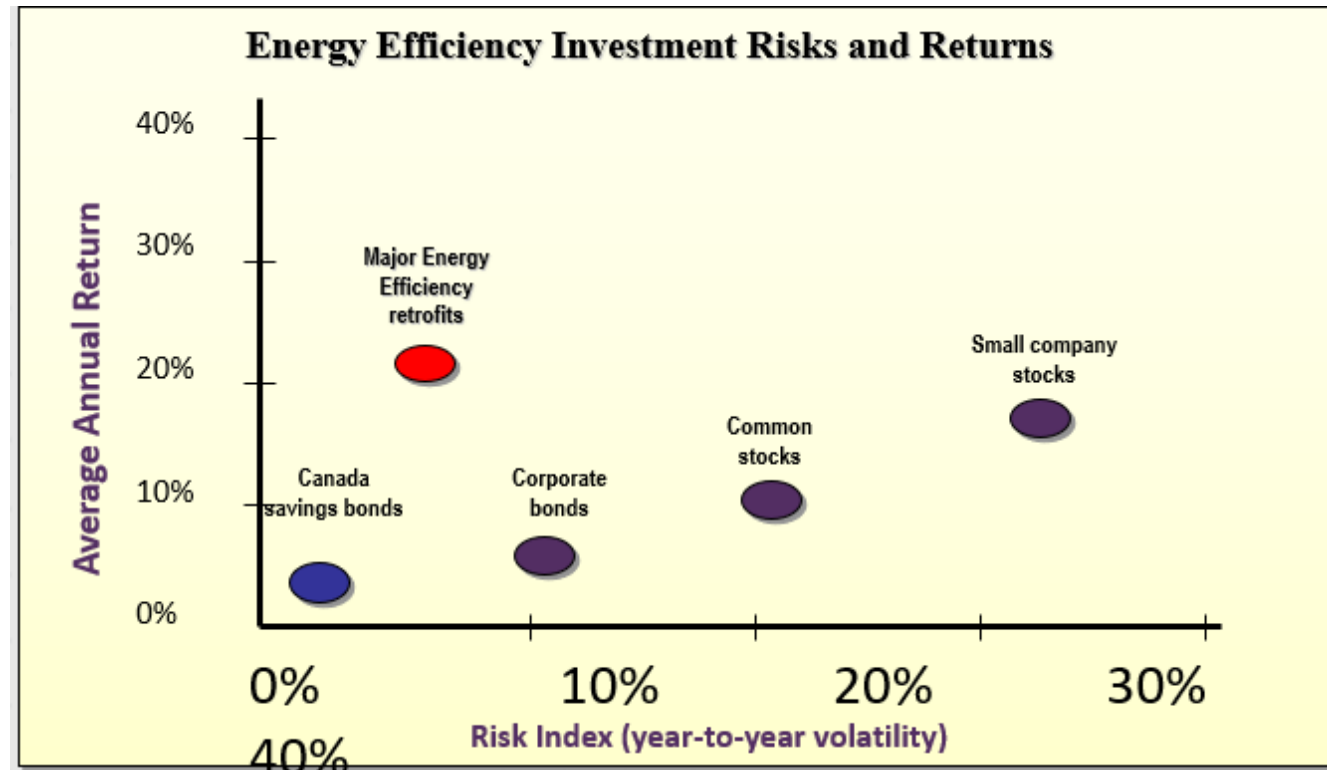




# ECONOMY OF ENERGY CONSERVATION

## ECONOMY

- High return, low risk
- Money saved can be reinvested in more energy efficiency
- Typical payback periods<sup>11</sup>
  - Controls 2-5 years
  - Mechanical 2-4 years
  - HVAC 2-10 years
  - Lighting 1-5 years
- Increase GDP by \$595 billion<sup>10</sup>

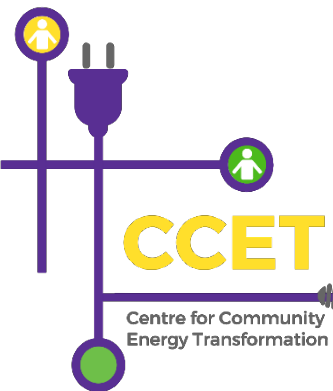
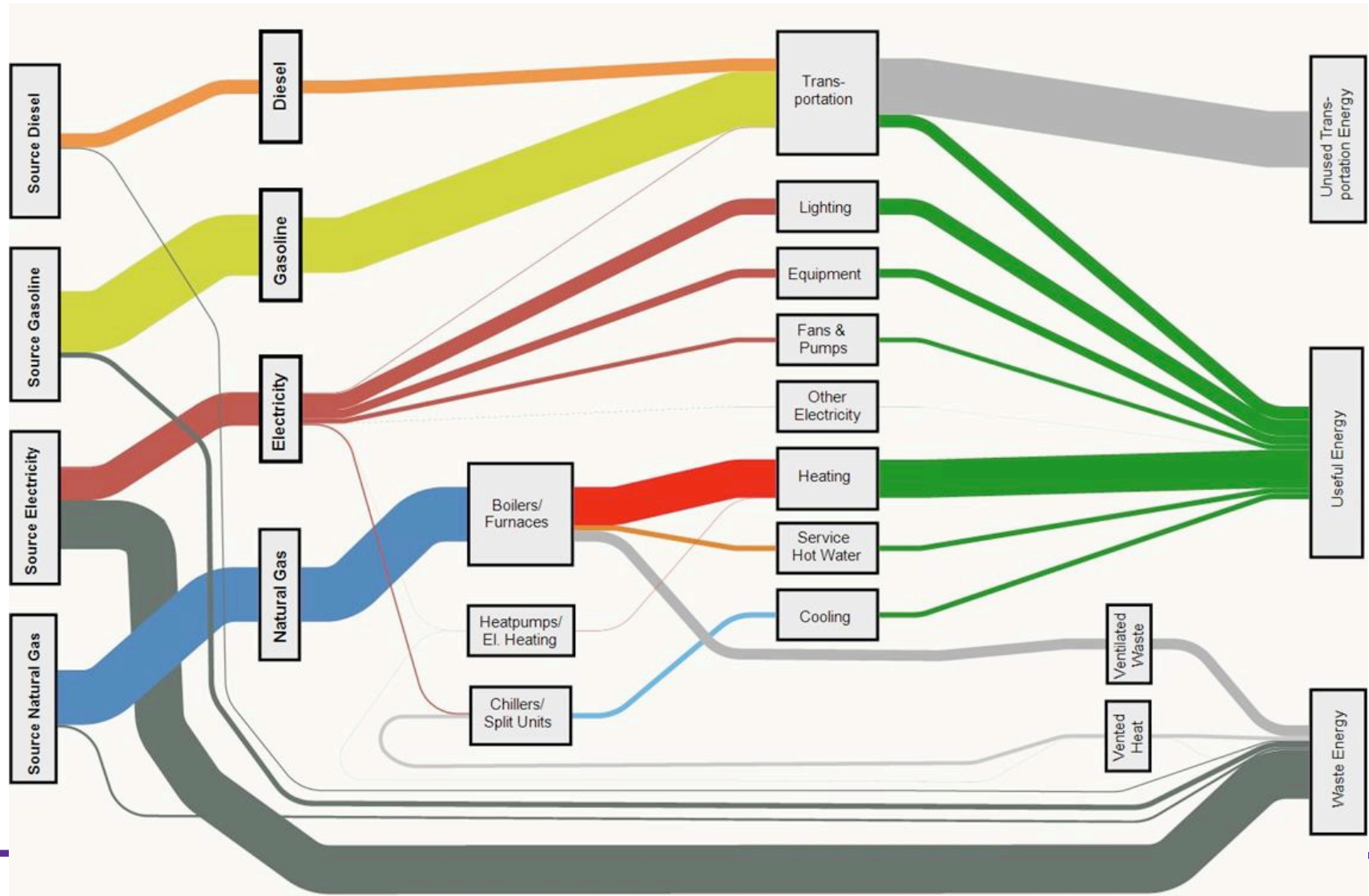


Source: American Council for an Energy Efficient Economy <sup>11</sup>

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# BRAMPTON SANKEY DIAGRAM FOR 2016 BASELINE ENERGY USE



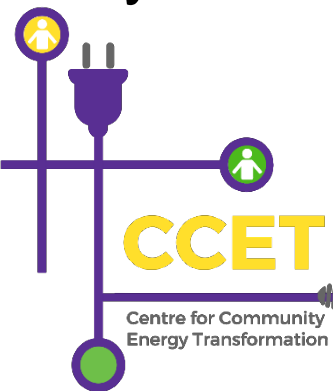
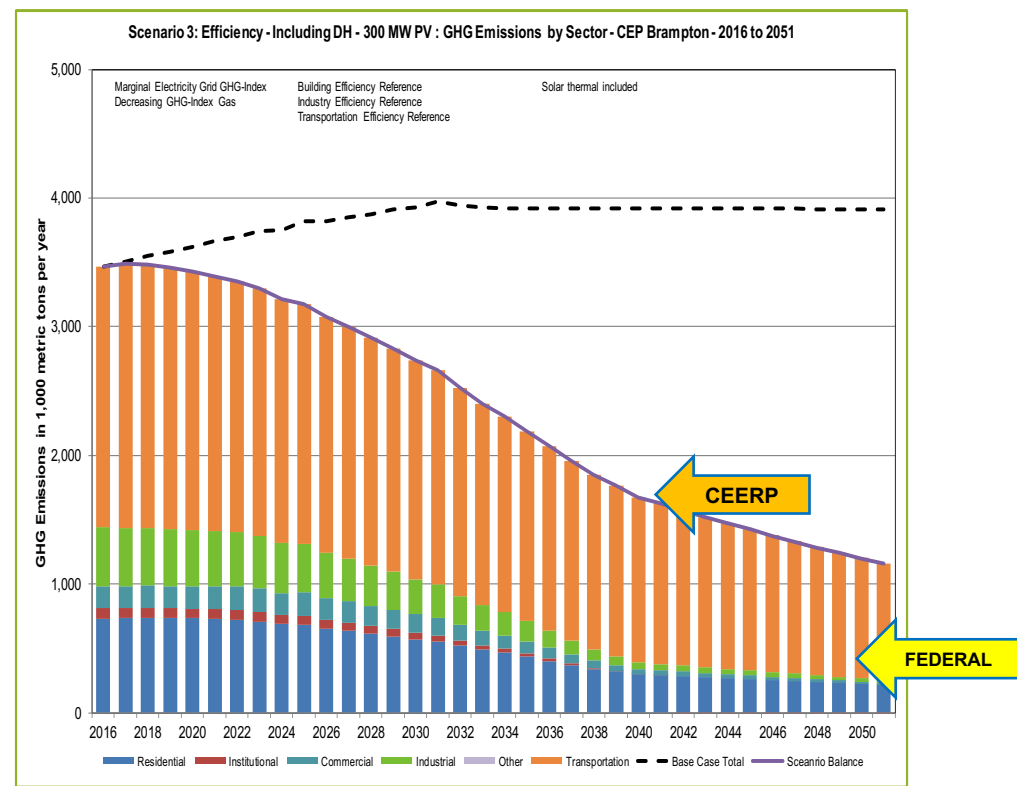
# BRAMPTON'S CLIMATE CHANGE TARGETS

2030: ↓ GHG emissions 30% below 2016

2040: ↓ GHG emissions 50% below 2016

2050: ↓ GHG emissions 80% below 2016

- Transportation accounts for almost 60% of Brampton's GHG emissions
- Almost **80%** of energy spending leaves Brampton
- Potential cumulative energy savings of **\$26 billion** by 2040



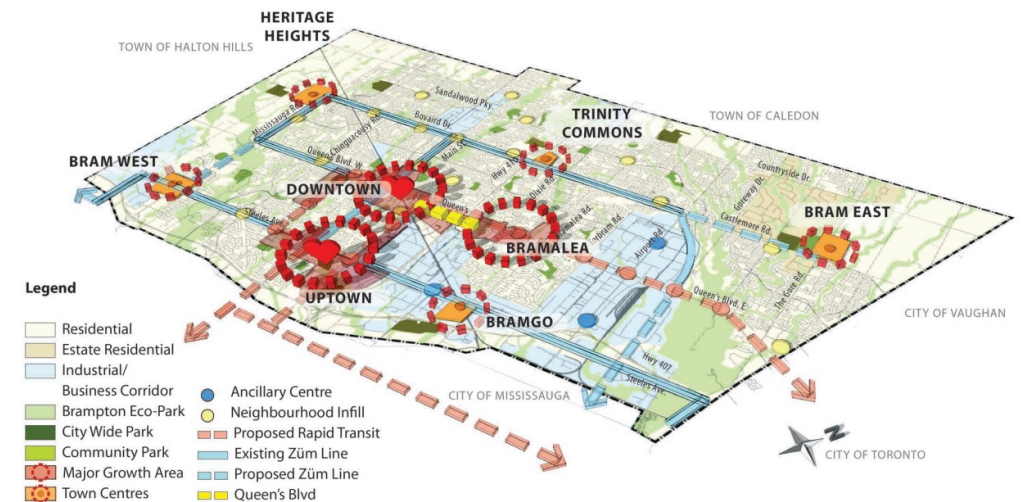
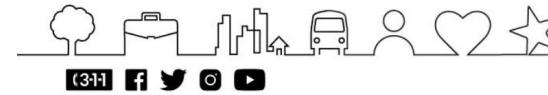
# PRIORITY PROJECTS: NEW OFFICIAL PLAN

Official Plan updated to reflect the principles, goals, strategic directions and targets of the 2040 Vision and Community Energy & Emissions Reduction Plan

Sampling of new policies:

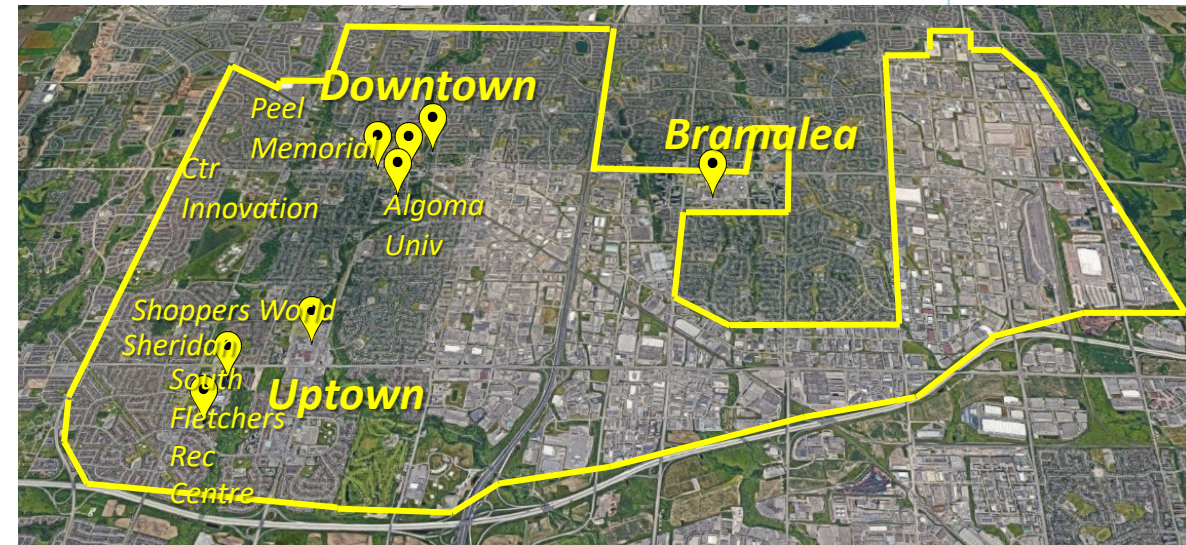
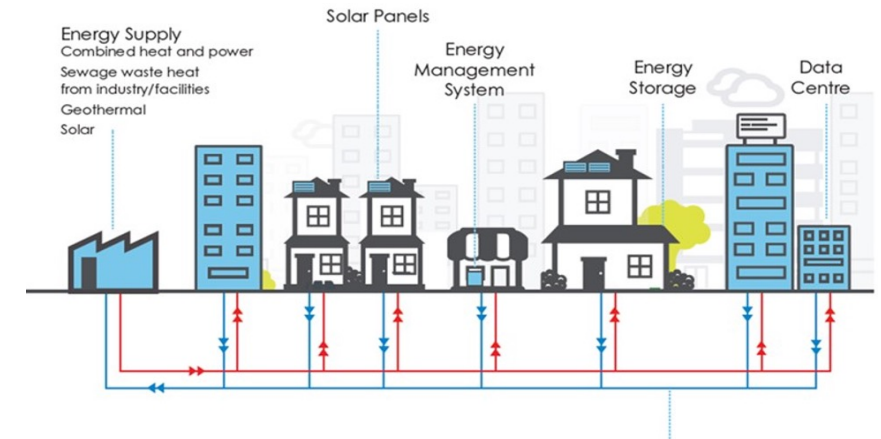
- Community GHG and energy targets
- Energy performance for new buildings
- Community design to facilitate near net-zero communities, active transportation and transit
- EV charging infrastructure
- District energy for Urban and Town Centres
- Submission of Integrated Energy Plans, Climate Adaptation Plans, and Transit Feasibility Studies for new development

## BRAMPTON 2040 PLAN



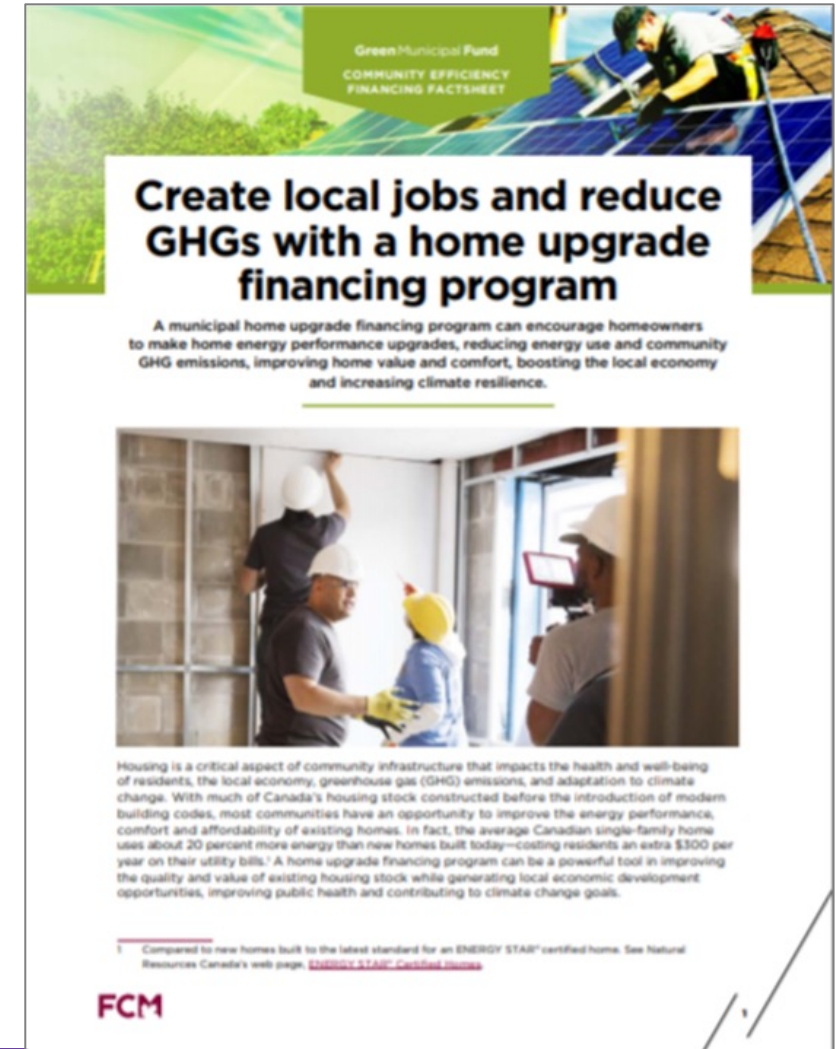
# PRIORITY PROJECTS: INTEGRATED ENERGY PLANNING: URBAN AND TOWN CENTRES

- ✓ Shoppers World District Energy Business Case
- ✓ Heritage Heights District Energy Business Case
- Future District Energy Feasibility Studies
  - Downtown
  - Bramalea
  - Uptown



# PRIORITY PROJECTS: RESIDENTIAL ENERGY EFFICIENCY PROGRAM


- Homes and buildings in Brampton are approx. half as efficient as global benchmarks
- Residential buildings: 2<sup>nd</sup> highest energy use, energy cost and emissions
- Funding from the Federation of Canadian Municipalities (FCM) to design a home retrofit program
- Partnership with Mississauga and Caledon
- Developing the **Peel Residential Energy Program (PREP)** to utilize a PACE-model program with a 3<sup>rd</sup> Party administrator



Green Municipal Fund  
COMMUNITY EFFICIENCY  
FINANCING FACTSHEET

## Create local jobs and reduce GHGs with a home upgrade financing program

A municipal home upgrade financing program can encourage homeowners to make home energy performance upgrades, reducing energy use and community GHG emissions, improving home value and comfort, boosting the local economy and increasing climate resilience.



Housing is a critical aspect of community infrastructure that impacts the health and well-being of residents, the local economy, greenhouse gas (GHG) emissions, and adaptation to climate change. With much of Canada's housing stock constructed before the introduction of modern building codes, most communities have an opportunity to improve the energy performance, comfort and affordability of existing homes. In fact, the average Canadian single-family home uses about 20 percent more energy than new homes built today—costing residents an extra \$300 per year on their utility bills.<sup>1</sup> A home upgrade financing program can be a powerful tool in improving the quality and value of existing housing stock while generating local economic development opportunities, improving public health and contributing to climate change goals.

<sup>1</sup> Compared to new homes built to the latest standard for an ENERGY STAR® certified home. See Natural Resources Canada's web page, [ENERGY STAR® Certified Homes](#)

FCM

# PRIORITY PROJECTS: TRANSPORTATION PLANNING

- Transportation Master Plan Update
- Main Street LRT Construction
- Queen Street BRT Lanes EA Study
- Bike Lane Expansion
- Electric Buses Pilot Project

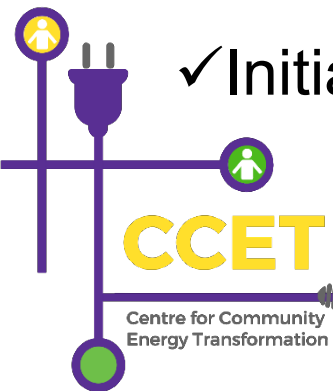
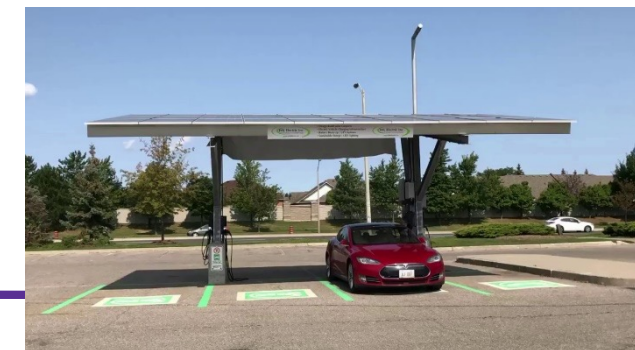


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# ADDITIONAL CLIMATE CHANGE ACCOMPLISHMENTS

- ✓ Updated Sustainability Metrics for new developments
- ✓ Design Susan Fennell Community Centre Net Zero Energy Retrofit
- ✓ Installed 52 EV Charging stations
- ✓ Completed a corporate Sustainable Fleet Strategy
- ✓ Initiated Zero Emission Transit Strategy
- ✓ 30 km of new bike lanes since 2020
- ✓ Sustainable Procurement Plan
- ✓ Initiated Climate Change Adaptation Plan

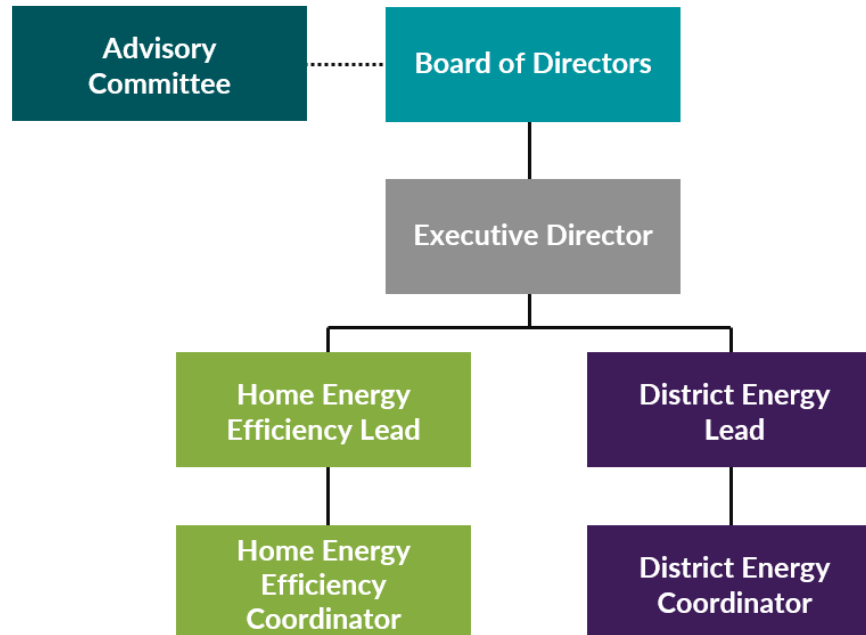




# CENTRE FOR COMMUNITY ENERGY TRANSFORMATION (CCET)

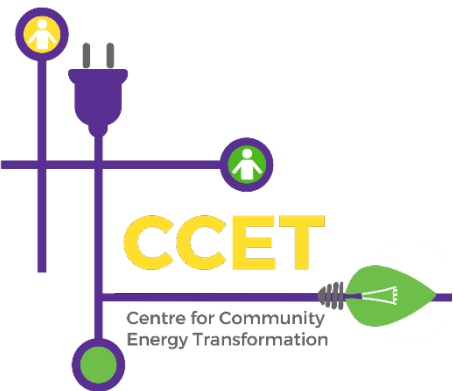
## Governance

- Volunteer skill-based Board for strategic oversight of CCET
- Advisory Committee of Stakeholders to work with the Board
- 5 staff members for day-to-day management and operations



## Funding

- CCET's projected budget is **\$1 million/year**
- Phased approach to funding:
  - Start Up – 2022
    - \$300,000 grant from City
    - Region of Peel grant
  - Operation – 2023 to 2026
    - Service Level Agreements with Brampton, Mississauga and Caledon
- Federal and Provincial funding
- Energy Service Fees
- Sponsorship



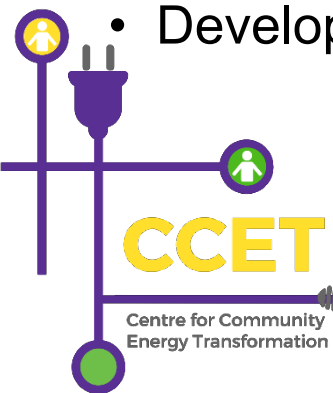
# ENERGY TRANSITION: CENTRE FOR COMMUNITY ENERGY TRANSFORMATION

- Non-profit Community Organization
- Focus on becoming a Regional Centre of Excellence in Energy
- Accelerate the achievement of municipal climate and energy goals
- Catalyst for significant, rapid transformation of our community energy systems
- Collaborate with businesses, developers, utilities, governments, institutions, non-profits, and homeowners
- Develop and deliver energy transformation projects

## WHAT IS CCET ? A COMMUNITY ENERGY HUB

CCET will be a non-profit community organization envisioned as a regional centre of excellence that will accelerate Brampton's energy transformation by:

- ✓ Delivering priority projects from Brampton's Community Energy and Emissions Reduction Plan (CEERP)
- ✓ Collaborating with businesses, developers, utilities, governments, institutions, non-profits, and homeowners
- ✓ Pursuing federal and provincial energy investment opportunities



# WHY CCET?

- Leadership
- Acceleration
- Agility
- Independence
- Access
- Collaboration
- Funding
- Investment

Accelerating towards a sustainable energy future

## INVESTING IN CCET WILL UNLOCK ECONOMIC GROWTH



Every \$1 spent on energy efficiency programs

Generates \$7 of GDP in Canada<sup>1</sup>

### Households savings



↓ \$114+ yearly with energy efficiency programs<sup>2</sup>

= \$10.2 MILLION saved annually by retrofitting 90,000 Brampton homes



Energy efficiency program investments will create

↑ 800+ green jobs in Brampton by 2030<sup>3</sup>

## INVESTING IN CCET WILL STRENGTHEN SOCIAL EQUITY

Energy advocacy supports social equity



20% of Brampton homes experience energy poverty annually<sup>4</sup>

↑ Community engagement and education

↑ Public and private partnerships

## INVESTING IN CCET WILL PROMOTE ENVIRONMENTAL GOALS



Reduce green house gas emissions by

↓ 50% from 2016 levels by 2041

Meeting our CEERP targets supports climate resilience

CCET

Centre for Community Energy Transformation

# Centre for Community Energy Transformation (CCET)



CCET is a not-for-profit, community-based organization focused on accelerating towards a low-carbon future



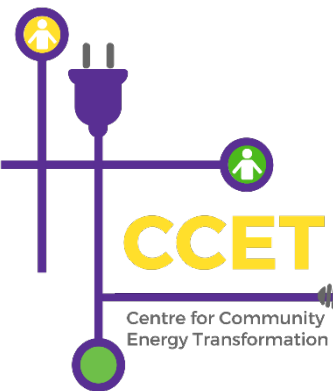
[www.energytransform.ca](http://www.energytransform.ca)



Centre for Community Energy Transformation (CCET)



[info@energytransform.ca](mailto:info@energytransform.ca)



# CULTURE OF CONSERVATION



We have changed our attitudes on...



# FINAL THOUGHTS

You must be the change you wish to see in the world.

Mahatma Gandhi

Never doubt that a small group of thoughtful, committed citizens can change the world; indeed, it is the only thing that ever has.

Margret Mead

I call upon you not to be detached spectators but involved participants in this great drama that is taking place

Martin Luther King

