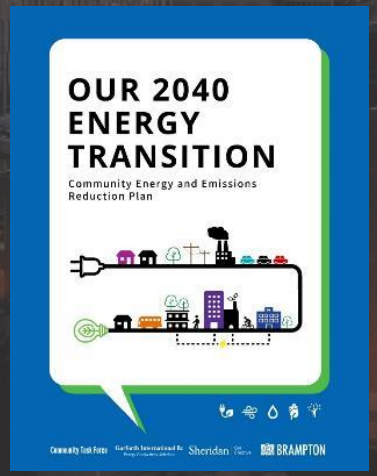
Embedding Energy Planning in Brampton's 2040 Vision



11th International Conference on Improving Energy Efficiency in Commercial Buildings and Smart Communities

December 2, 2020

Peter Garforth
Garforth International LLC

Introduction & Acknowledgements

Michael Hoy **M.PI. RPP, MCIP**

Supervisor, Environmental Planning

City of Brampton

Lead responsibilities:

- Community Energy & Emissions Reduction Plan
- Sustainable Development Guidelines
- Environmental Impact Review of New Development
- Environmental and Sustainability Policy Development
- Sustainable Planning for Existing Communities

Doug Whillans

City Councillor

Wards 2 and 6

City of Brampton

Peter Garforth

Principal

Garforth International LLC

Ohio, USA

Brampton, Ontario

LOWEST AVERAGE AGE IN CANADA

YOUNG, MULTICULTURAL WORKFORCE
234 different cultures, speaking 115 languages

115
234

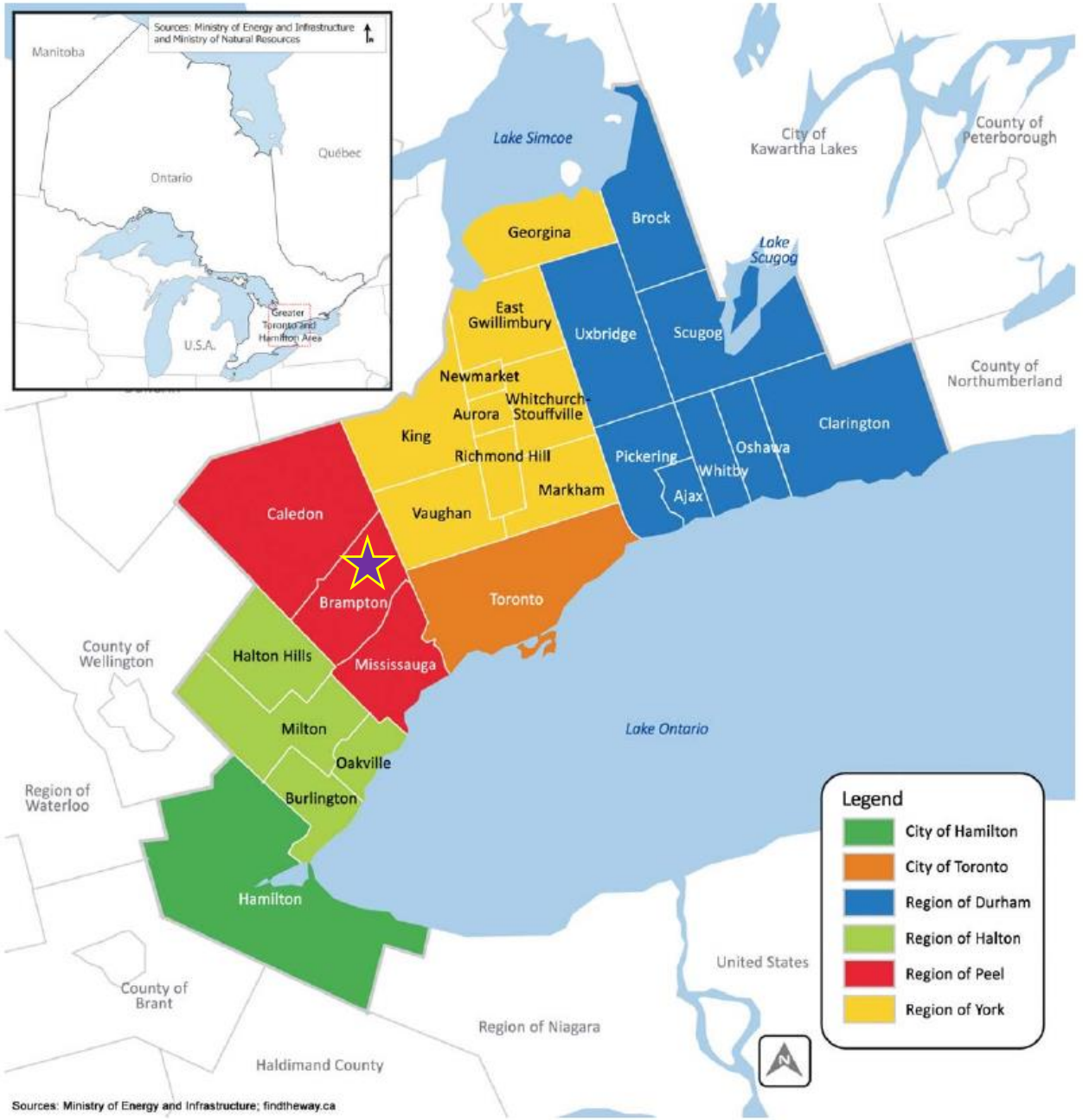
LARGE PROPORTION OF GROUND BASED DWELLINGS

HOME TO MAJOR INDUSTRIES
Fiat-Chrysler, Amazon, Canon, O-I, Coca Cola, Loblaws

2ND FASTEST GROWING CITY IN CANADA
650,000 population with approx. 14,000 new residents per year

CENTRALLY LOCATED
in the middle of Canada's Super Innovation Corridor

DIVERSE ECONOMIC BASE WITH OVER 70,000 BUSINESSES

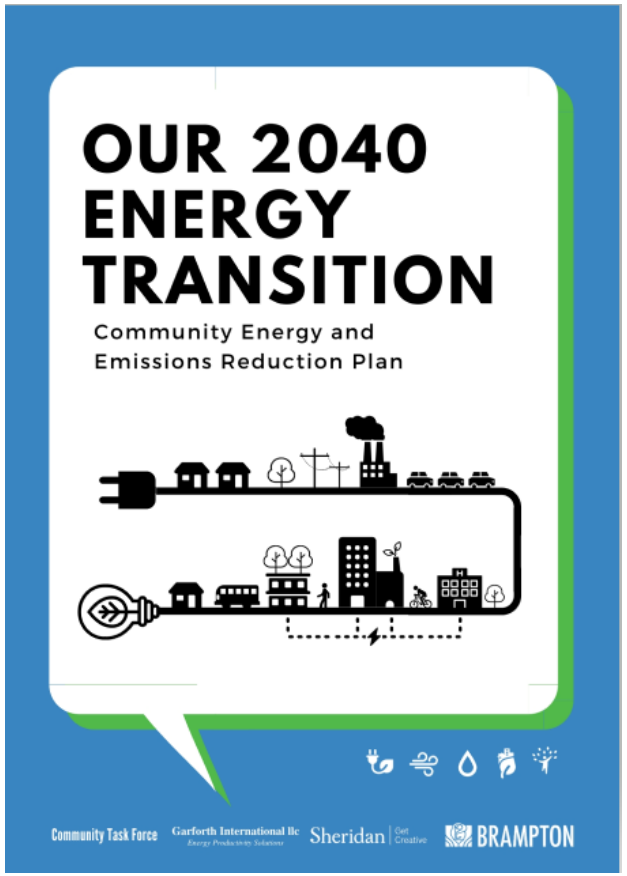


The Climate Emergency: Threats and Opportunities

Changes	Effects	Community Impact
Increase in average summer temperatures More frequent and longer heat waves	Heat islands Health issues	Increased costs to cool buildings Increased healthcare costs Increased socioeconomic disparity
Increase in rainfall More intense storms	Flooding Erosion	Cost of disaster relief Cost of infrastructure upgrades Decrease in water quality Potential for loss of land Displacement of residents
More unpredictable seasons	Disrupted growing season Desertification of agricultural fields Disrupted season-dependent industries	Increased cost of food Increased food insecurity Reduced equity and health Disrupted economy More economic uncertainty
Increase in winter storm severity	Snow dumps Cold snaps	Cost of snow removal Higher infrastructure and maintenance costs Less economic activity Increase in social disparity Increase in energy use and associated costs
Milder winters	More disease-spreading pests survive More invasive species survive	More human diseases and illnesses Negative economic impact for industries (e.g. agriculture, lumber)
Increase in average temperatures Changes to local climate	Displacement and changes to geographic range of wildlife Changes in distribution of resources Changes in how species interact	More suitable habitat for invasive species Species extirpation or extinction Loss of ecosystem services Increase cost of local infrastructure and city services More human-animal interactions More disease outbreaks

Mitigating Climate Change: Relearning Old Lessons

Urban Transition → 2040 Vision



Energy Transition
→ Community Energy & Emissions Reduction Plan

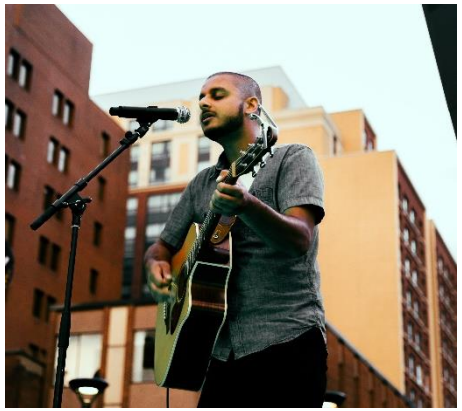
Developing the Brampton 2040 Vision

- 2017: development of Vision commences
- 18-month process
- 13,000 people engaged
- 20 intense workshops
- 65 community events
- Two weekend-long workshops
- Peer reviewed

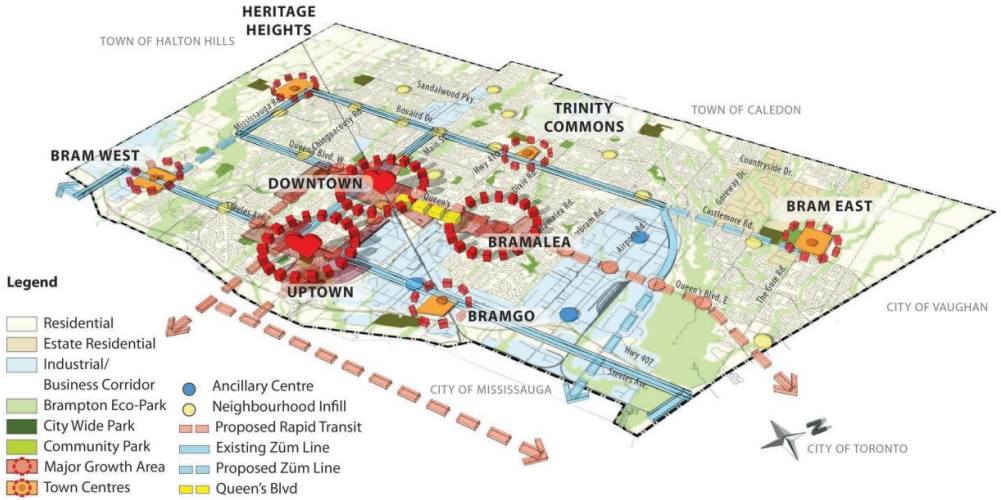
Brampton 2040 Vision

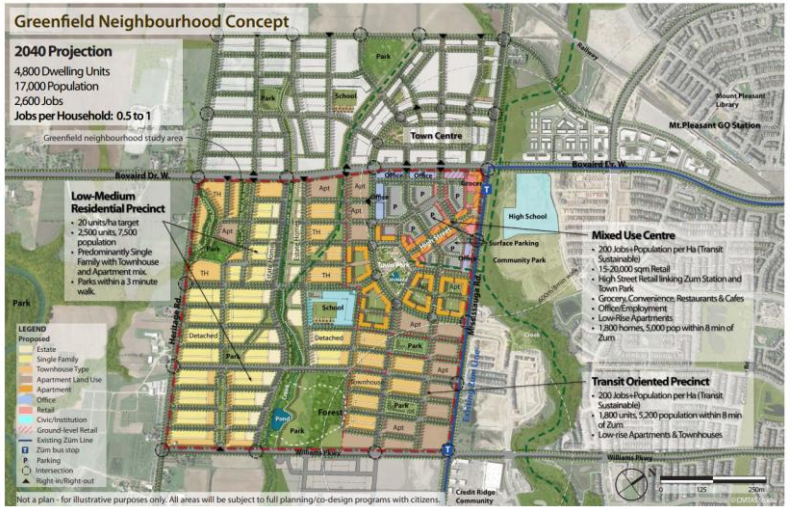
7 Vision Statements:

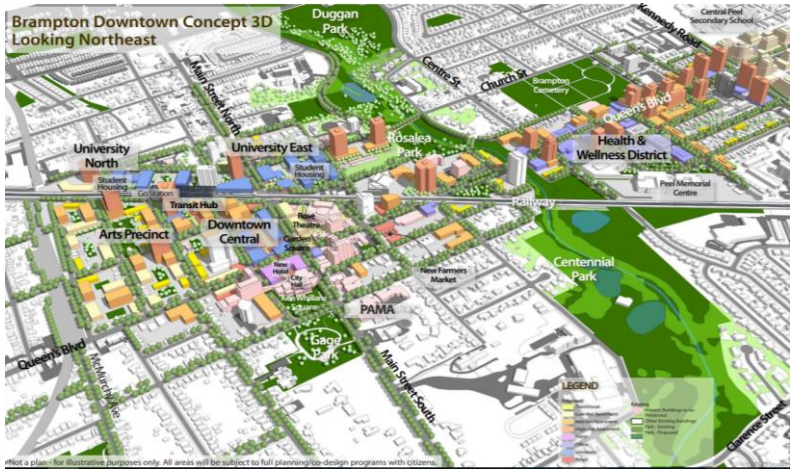
- Environment
- Jobs and Living Centres
- Neighbourhoods
- Transportation
- Health
- Culture



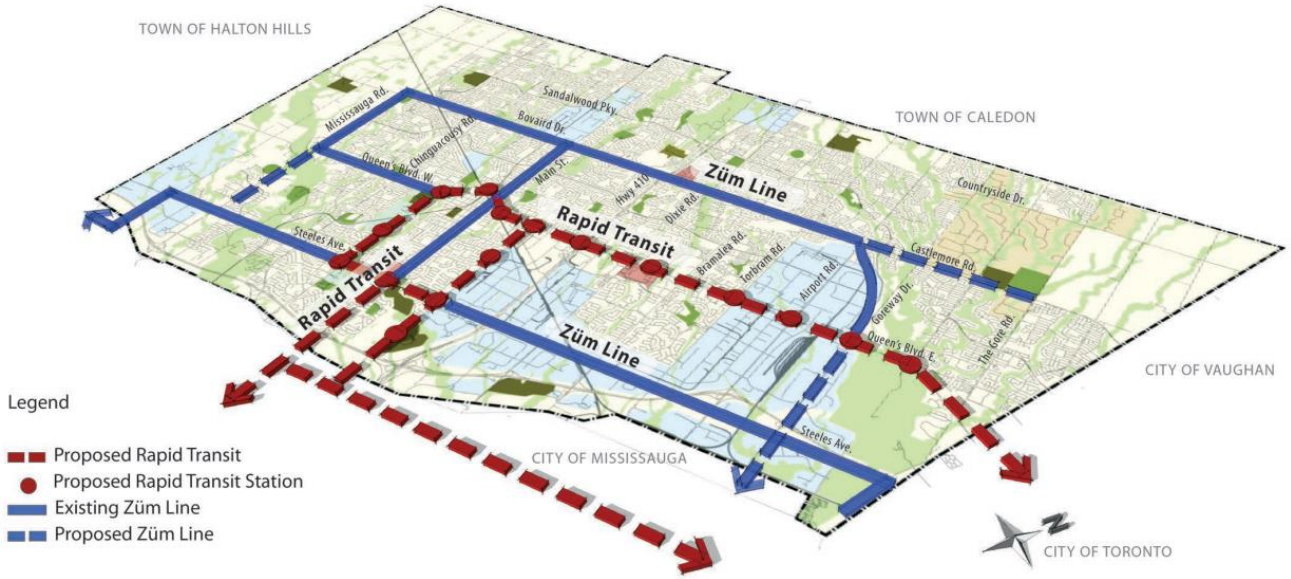
Urban Centres and Town Centres

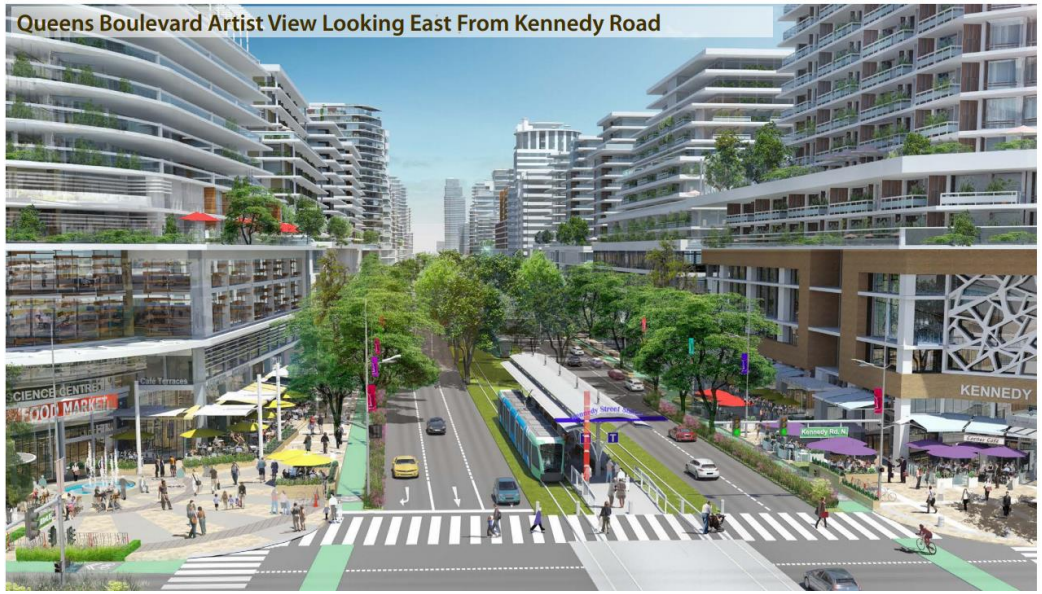






Transportation

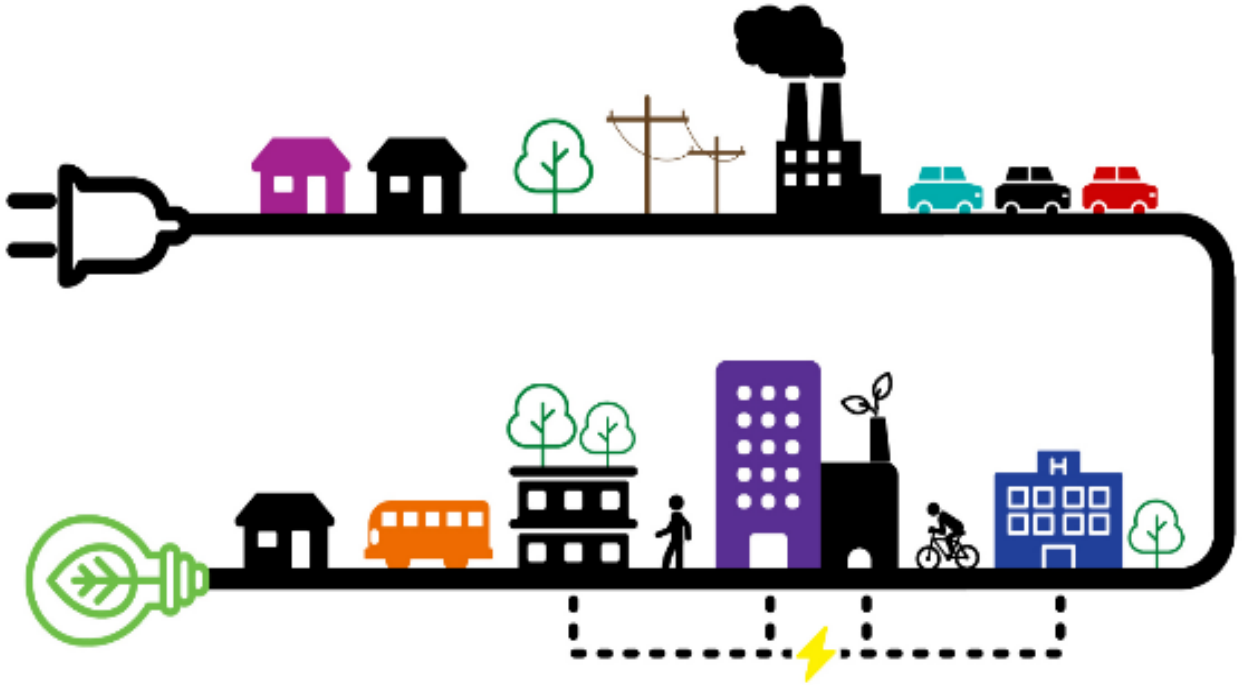




Community Energy and Emission Reduction Plan (CEERP)

CEERP takes an integrated approach to energy planning to achieve world-class performance by focusing actions on:

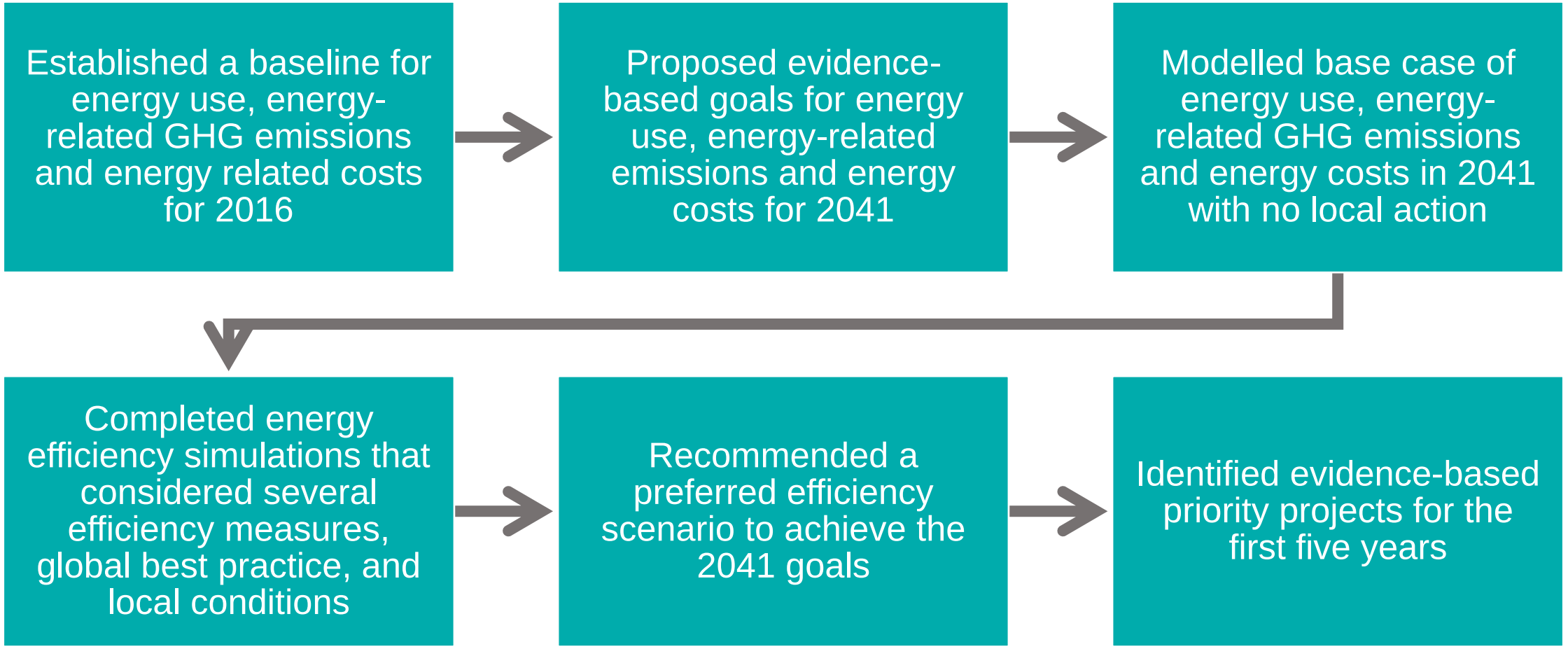
- Urban transition
- Energy transition
- Community commitment and collaboration



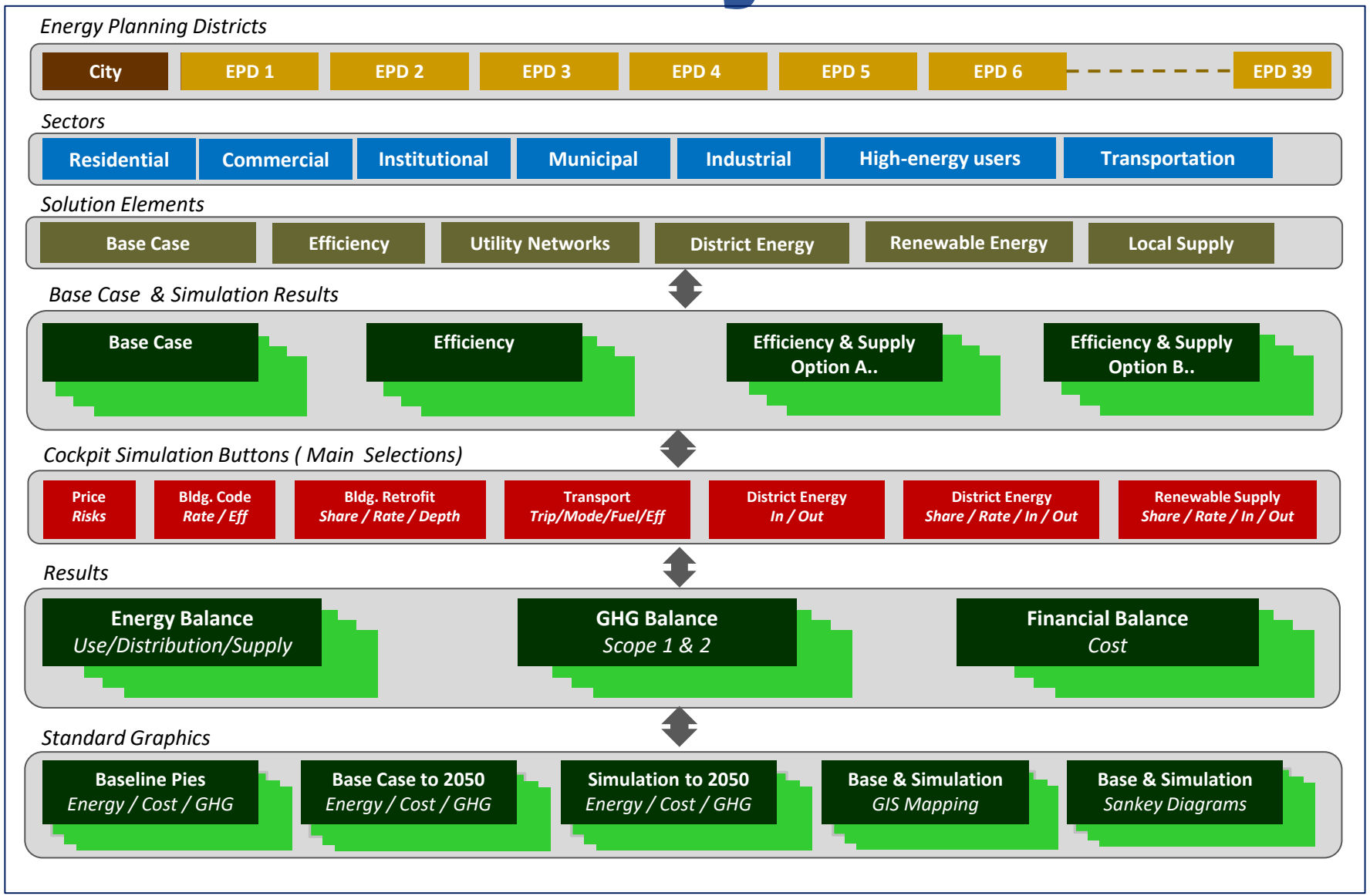
Community Task Force

To gain the community's ongoing input and support for the approval and implementation of the Community Energy & Emissions Reduction Plan

CEERP: Evidence Based Process

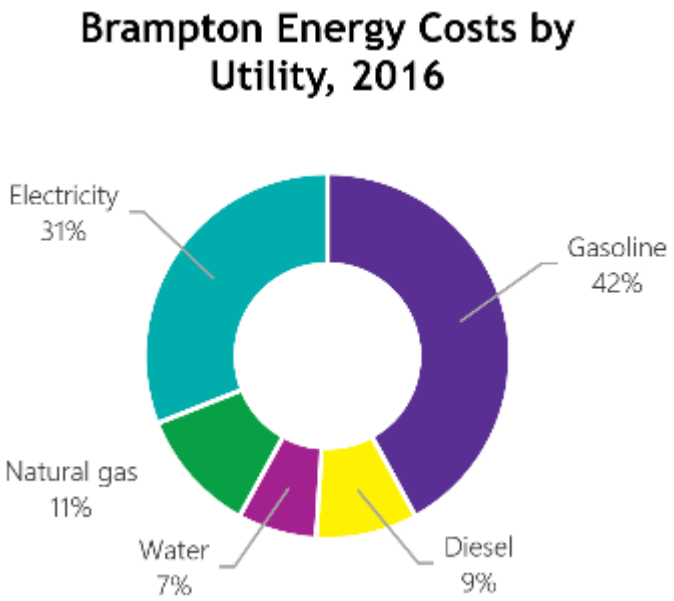


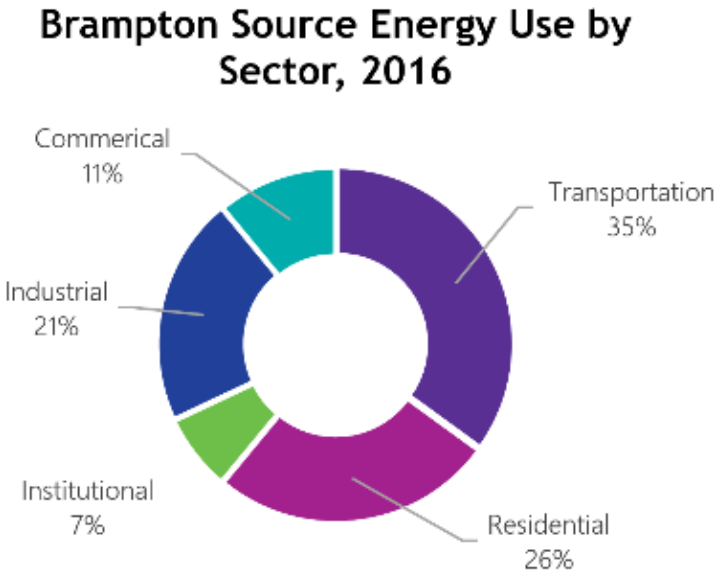
CEERP: Whole City Simulation

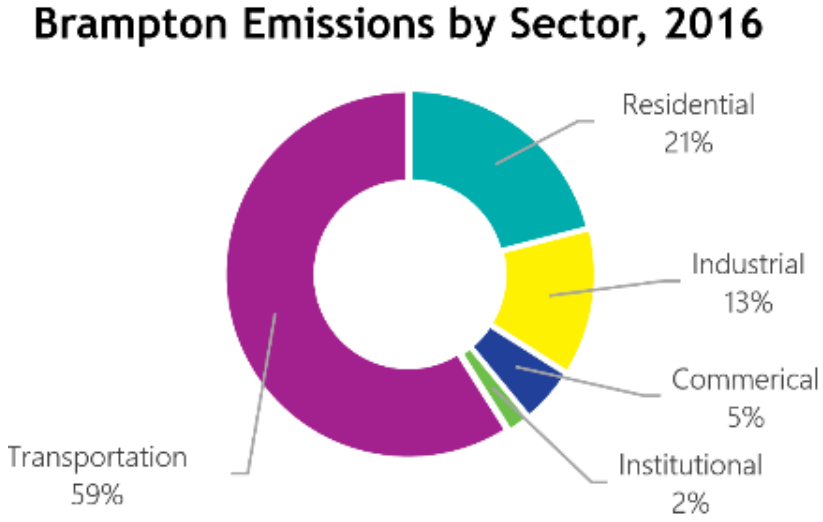


CEERP: Energy and Emissions

- $1.8 billion spent on energy
- ~ 80% of energy dollars leave the city
- Energy costs projected to quadruple by 2050
- 5.6 tonnes CO2e of GHG per resident
- Brampton buildings ½ as efficient as global best practices
- Transportation almost 60% of GHGs







CEERP: Principles and Goals

ENVIRONMENTAL

Work towards climate neutrality

ENERGY

Benchmark energy performance against global best practice

ECONOMIC

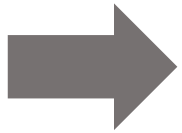
All energy related public and private sector investments will meet acceptable risk-adjusted returns

Energy costs will be competitive compared to comparable North American communities

Local employment will be generated

RELIABILITY

Energy systems will be designed to meet the challenges of changing user expectations, climate uncertainty and new technology options



Improve city-wide energy efficiency by 50% from 2016 by 2040

To reduce GHG emissions by:

- 30% from 2016 levels by 2030;
- 50% from 2016 levels by 2040
- 80% by 2050

To retain $26 billion in energy dollars by 2040

CEERP: Strategic Directions

GREEN COMMUNITIES

TRANSPORTATION EFFICIENCY

HOME AND BUILDING EFFICIENCY

LOCAL ENERGY SUPPLY AND DISTRIBUTION

INDUSTRIAL EFFICIENCY

GREEN INFRASTRUCTURE

COMMUNICATION, ENGAGEMENT, AND MONITORING

CEERP: 2041 Targets

Green Communities

- Near net-zero GHG emissions for new communities and buildings in Town Centres and City Centres

Home and Building Energy Efficiency

- Retrofit 80% of homes to achieve a 35% efficiency gain

Transportation

- Reduce trip lengths by 3.75%
- Increase Active Transportation to 7%
- Increase trips using Brampton Transit to 9%
- Increase trips using GO transit to 8.5%

CEERP: 2041 Targets

Industrial Efficiency

- 20% industrial sector efficiency gain from 2016 levels

Energy Supply and Distribution

- Increase solar energy by 8%
- Serve 80% of new growth areas with district energy
- Serve 70% of existing high growth areas with district energy

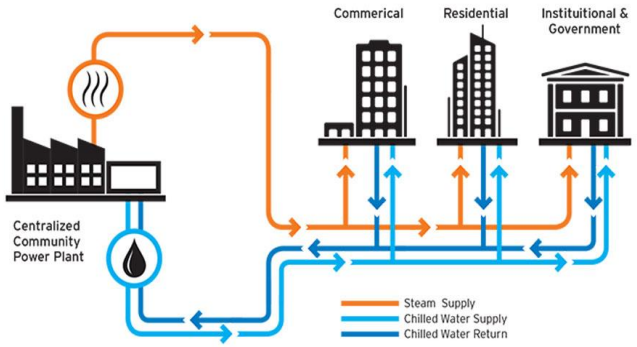
Green Infrastructure

- Plant 1 million trees by 2040
- Increase restoration and enhancement management to 45 ha/year
- Determine dollar value for the city's natural assets

CEERP: Priority Projects

1. Ensure City of Brampton policies and programs are aligned with supporting the CEERP objectives and targets;
2. Establish a system to deliver standardized retrofits to Brampton homes;
3. Update the Transportation Master Plan (TMP) to reflect complete streets and the integrated nature of mobility and built form;
4. Integrate District Energy Systems in appropriate locations within Brampton;
5. Develop Integrated Energy Master Plans for public facilities and private development; and
6. Establish a Community Organization to lead the development and implementation of select priority projects (CCET).

CCET
Centre for Community Energy Transformation

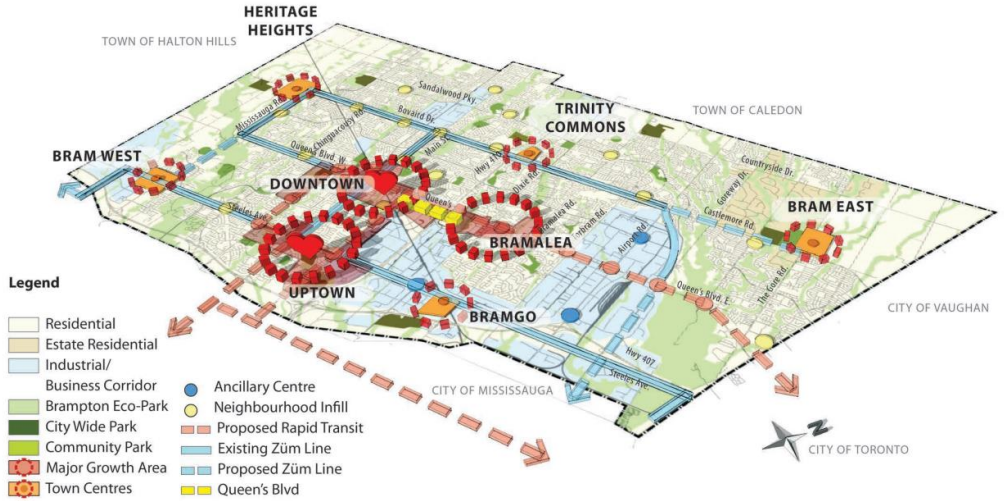


Official Plan and CEERP

Brampton's Official Plan will be revised to reflect the principles, goals, strategic directions and targets of the Community Energy and Emissions Reduction Plan

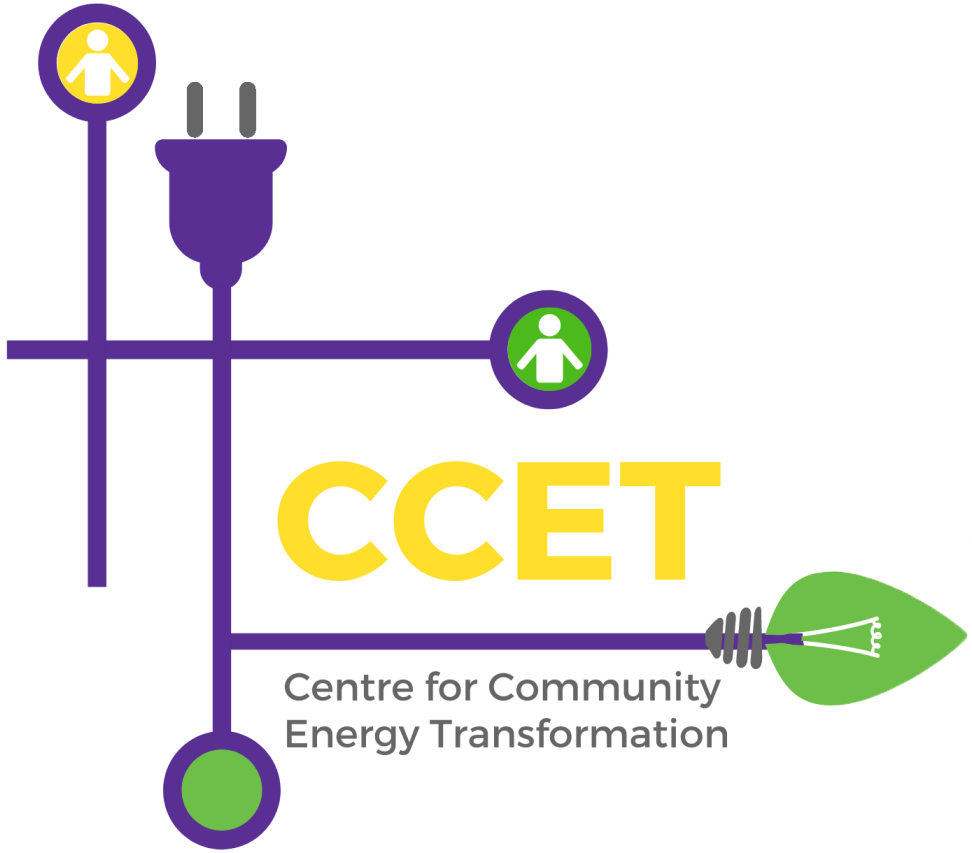
Sampling of new policies:

- Community GHG and Energy Targets
- Energy performance targets for new buildings
- Community design to facilitate near net-zero communities, active transportation and transit
- Requirement for EV charging infrastructure
- District energy opportunities for urban and town centres
- Submission of Integrated Energy Plans and Transit Feasibility Studies for new development



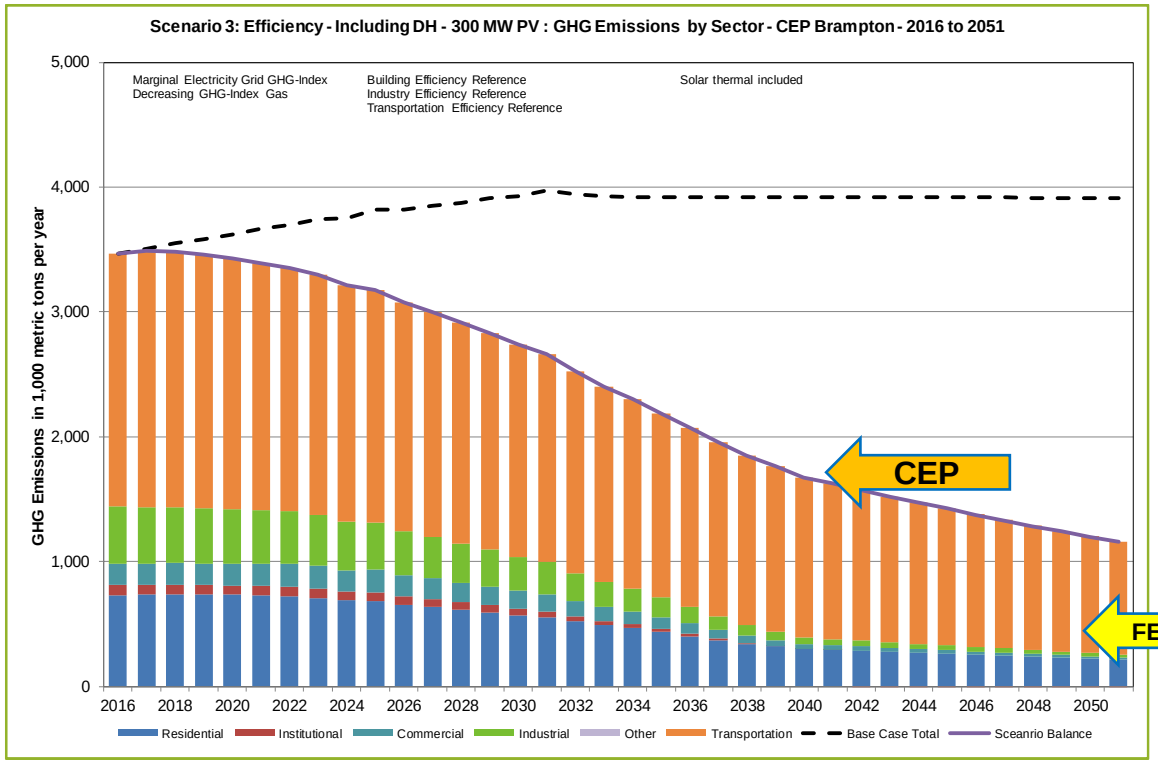
Centre for Community Energy Transformation

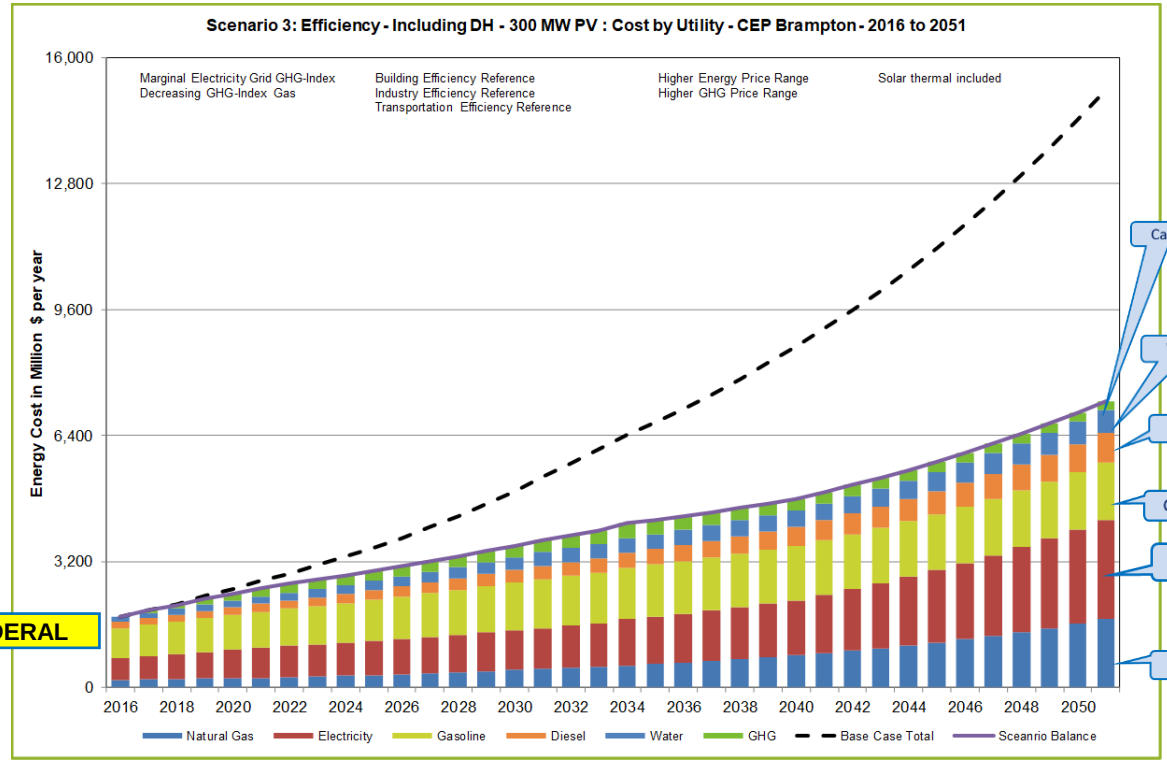
- Non-profit community organization
- Focused on becoming a centre of excellence in energy
- Support Brampton in meeting its climate change targets
- Facilitate community actions to accelerate Brampton's energy transformation
- Collaborate with businesses, developers, utilities, governments, institutions, non-profits, and homeowners
- Develop and deliver energy transformation projects



CEERP: Outcomes

- GHG Emission reduction of 50% by 2040
- Potential cumulative energy savings of $26 billion by 2040





CEERP: Outputs

- Environmental
- Social
- Health
- Economic

Thank You

Questions?