

# Adapting to Climate Change in Guelph

Building a clean, prosperous, and  
resilient city for everyone



# Coming up...

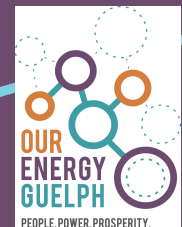
- Our Energy Guelph: Who we are
- Division of labour
- The economic case for community energy
- Pathway to Net Zero Carbon: An exciting opportunity
- Next steps

# Coming up...

- Our Energy Guelph: Who we are
  - Meet the Board of OEG
- Yin and yang: Mitigation and adaptation
- Community Energy Initiative Update 2018
  - The economic case for community energy
  - Outcomes of the CEI Update
- Pathway to Net Zero Carbon 2019
  - An exciting opportunity
  - Collateral benefits
- Yang: Climate change adaptation and resilience
  - Adaptation benefits of mitigation actions
  - Managing the unavoidable

# Our Energy Guelph: Who we are

- Launched as the Community Energy Initiative (CEI) Update Task Force in 2016
- Rebranded “Our Energy Guelph” in 2017
  - Putting the “community” back into “Community Energy Initiative”
- Delivered the CEI update to Guelph City Council (more below) in May 2018
- Delivered the Pathway to Net Zero Carbon to Council (more below) in May 2019
- Incorporated as an Ontario not-for-profit enterprise, also in May 2019
- First Board of Directors meeting July 2019
- Signed service agreement with City, providing 77% of operating budget for first five years, in August 2019
- Hired Alex Chapman as Executive Director (and first employee) in November 2019



# Left brain, right brain

Our Energy Guelph

25 technical actions

10 organizational actions

Capital financing

Program execution

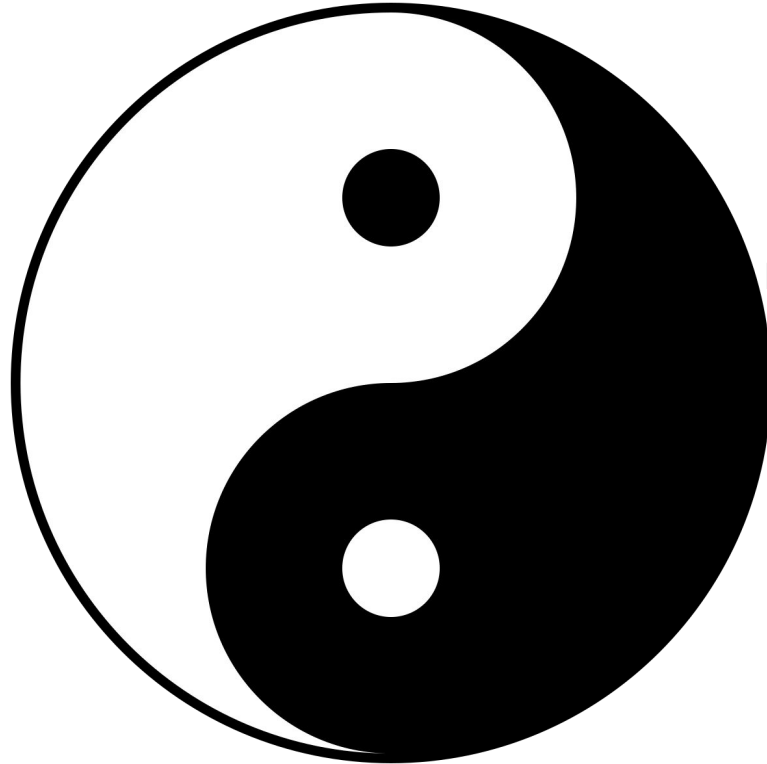
Public support

Behaviour change

# Meet the Board of Our Energy Guelph

<b>Jonathan Knowles</b> (President), Energy efficiency entrepreneur	<b>Kirby Calvert</b> (Chair), University of Guelph Dept. of Geography	<b>Mark Colvin</b> (Treasurer), eMerge Guelph Sustainability
<b>Kristen Tilley</b> (Secretary), Chamber of Commerce	<b>Alex Ciccone</b> , Attorney	<b>Mike Darmon</b> , Guelph Coalition for Active Transportation
<b>Ceana Fan</b> , Guelph Youth Council	<b>Vicki Gagnon</b> , Independent Electricity System Operator	<b>Sara Ganowski</b> , Alectra GRE&T Centre
<b>Mike Kazmaier</b> , Sub-metering entrepreneur	<b>Indigo Kim</b> , Guelph Youth Council	<b>Helen Loftin</b> , City of Guelph Business Development & Enterprise
<b>Anne Toner Fung</b> , Innovation Guelph	<b>Brandon Raco</b> , University of Guelph Sustainability Office	<b>Dave Sabola</b> , Energy manager

# Yin and yang



Climate mitigation:  
Avoiding the unmanageable

The Community Energy  
Initiative

The Pathway to  
Net Zero Carbon

Climate adaptation:  
Managing the unavoidable

Climate adaptation and  
resilience planning

Emergency Response  
Planning

# Climate mitigation: Avoiding the unmanageable

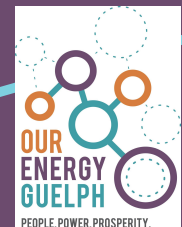
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# Community Energy Initiative Update 2018

## Three elements:

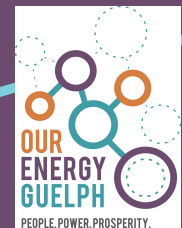
1. Rationale for a new emissions target
  - Baseline and Business-As-Usual report showed that if Guelph relies on the marketplace and other orders of government, 2050 emissions will be the same as today
  - Community engagement results showed that the community values, and wants to maintain, Guelph's leadership position on climate action
  - Sectoral scan identified the range of targets in other communities
2. New target
  - A Net Zero Carbon community by 2050
3. Next steps
  - Top five technical actions
  - Ten capacity-building actions
  - Detailed plan to achieve the goal was to be a subsequent phase; not certain that Council would agree to the new target



# CEI Update 2018: The economic case for community energy

- The community of Guelph spends nearly \$500M per year on energy
- Nearly all of this money leaves the community, never to return
  - Oil/gasoline/diesel (Alberta and overseas)
  - Electricity (Bruce Nuclear, Niagara Falls)
  - Natural gas (Dakotas, Appalachia, etc.)
- Energy efficiency could cut this in half\*
- Fuel switching achieves further efficiencies
- Maximizing local renewable energy generation means more of the remainder is spent in the community
  - Some German communities have driven this below the line, so that they are net energy exporters
- Energy spending can be transformed from a bleed into a boon

*\* Based on energy intensity of leading countries*



# Outcomes of CEI Update

## Council

- Endorsed the Net Zero Carbon community target
- Adopted 100RE (100% of energy needs to be supplied by renewable sources) target for its own corporate operations
- Acknowledged the role of OEG as City partner in implementing the CEI

## Our Energy Guelph

- Established a transitional board
- Commissioned a consultant to develop the plan to achieve the NZC target (the Pathway to Net Zero)
- Began the process of incorporation as a not-for-profit

# The Pathway to Net Zero Carbon 2019

Examples of 25 technical actions in the pathway:

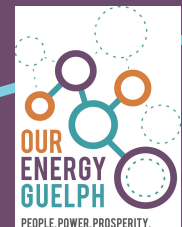
By 2030:

- All new homes net zero
- All new ICI\* buildings passive house

By 2050:

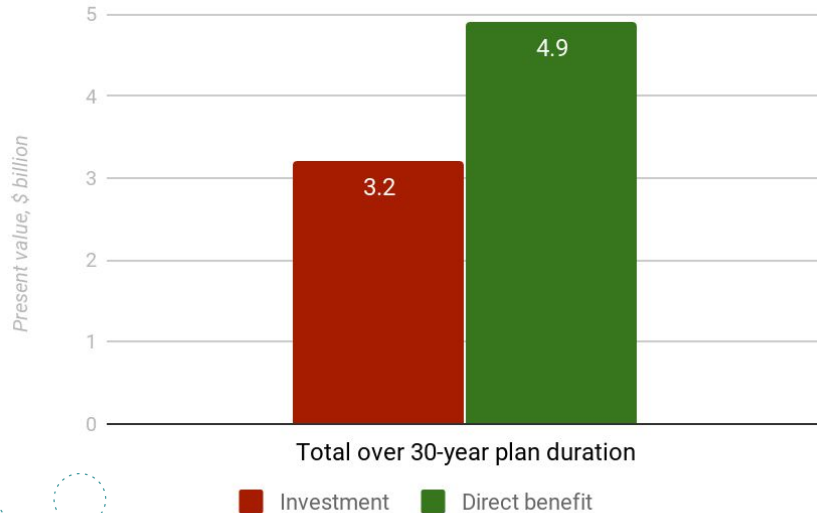
- Retrofit 98% of pre-1980 homes
- Retrofit 98% of post-1980 homes
- Retrofit 98% of ICI buildings
- Recommission all buildings every 10 yrs
- 70% of buildings to have heat pumps
- Rooftop solar PV on 80% of buildings
- Hot water heat pumps in 80% of homes and 50% of ICI
- 20MW ground-mount solar PV/year
- 16MW district heating system in downtown
- 67MW energy storage
- 50MW wind energy
- Maximize renewable natural gas
- Add new transit
- Electrify transit
- Increase cycling and walking
- Double ridesharing
- Car-free downtown

\* *Industrial, commercial, institutional*



# Net Zero Carbon: An exciting opportunity

## Economics of the Pathway to Net Zero Carbon



Net Present Value \$1.7B  
Internal Rate of Return ~9%  
1,300 jobs

Only 3 direct benefits were quantified:

- Savings from energy efficiency
- Revenues from energy generation
- Savings from reduced maintenance

Myth	Reality
Climate action will be expensive	It will be - but like an RRSP, not a gas bill
Climate action will require government expenditure, diverted from other existing programs or financed by additional debt	It will be an attractive investment opportunity better than many alternatives, with no need for public sector funding

# Net Zero Carbon: Collateral benefits

- Improved air quality
- Increased physical activity due to increased active transportation mode share
- Decreased engine noise
- Improved accessibility
- Improved buildings (indoor air quality, energy performance)
- New employment opportunities
- Improved household incomes
- Emergence of major new economic sectors
- Improved financial stability of some municipal services
- Stimulated innovation
- Enhanced city reputation
- Improved social interactions and sense of community due to mixed-use development, increased walking/cycling
- Reduced cost of transportation
- Decreased burden on future generations; stranded costs are avoided

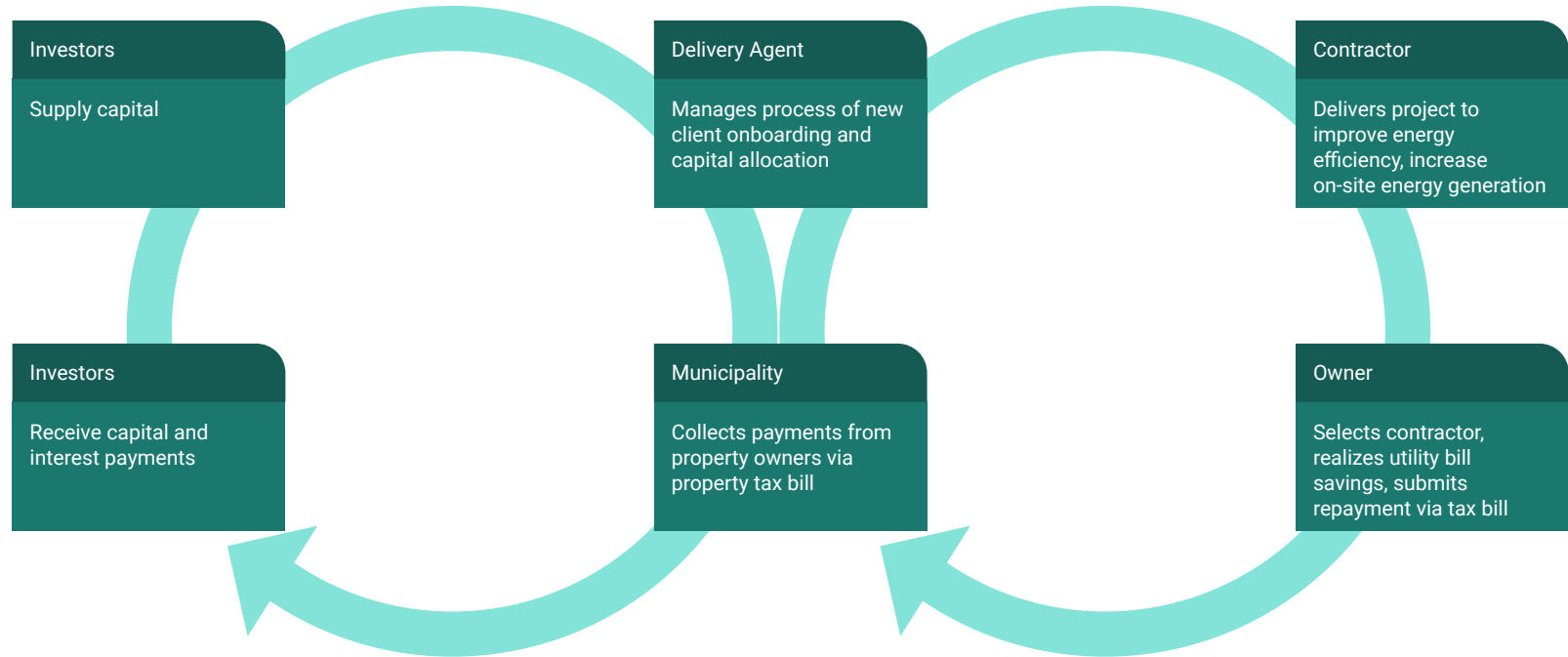
*None of the above benefits were included in the calculation of the direct economic value of the Pathway to Net Zero carbon.*

The first order of business:

## Guelph Energy Efficiency Retrofit Strategy (GEERS)

- Innovative financing method for energy efficiency retrofits
- Based on US Property Assessed Clean Energy (PACE), which has over \$6B in aggregate investment to date
- Attaches the “loan” to the property, rather than the property owner
- Principal and interest paid via the tax roll
- On sale of the property, the “loan” transfers to the new owner unless paid out
- Savings on energy bills offsets repayment
- Effectively, the municipality acts as the billing and collections provider
- Removes initial capital outlay as the primary barrier to projects
- Enabler for eight of the 25 technical actions in the Pathway to Net Zero Carbon
- Initial focus on multi-unit residential
- To be pitched to Council in January 2020

# GEERS business model





# Getting the money moving

- OEG will hold a summit: Capital finance for the Pathway to Net Zero Carbon
- Identify the appropriate corporate, legal, and organizational structures to support capital finance
- Support goal of enhancing local prosperity
- Transition to ongoing capital finance advisory committee
- Begin mobilizing capital ASAP
- Enable OEG to expand to other communities



\* Environmental, economic, and social

# Climate adaptation: Managing the unavoidable

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# Adaptation and resilience: Adapting by mitigating

- The hidden advantage of Net Zero Homes



- Shortening supply lines, enhancing self-sufficiency



- Reaching the vulnerable:  
Two squeals from the same pig

# Adapting by greening

- Trees: Our secret weapon against extreme heat
- Building better: Hurricane ties, reinforced bay doors
- Green infrastructure: Slow it down, keep it clean, soak it in
  - Rain gardens
  - Infiltration galleries
  - Permeable pavement
  - Bioswales
- Our achilles heel: Road salt in a groundwater-dependent community

# When worst comes to worst...

Preparing for emergencies



Anticipating cascading failures



Connecting with the most vulnerable



# The Pathway to Net Zero Carbon

Building a clean, healthy,  
prosperous, and resilient  
city for everyone

