Durham Community Energy Plan

Presentation to Regional Council

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DURHAM REGION

Service Excellence for our Communities

Outline

1. Introduction
2. Background
3. Purpose
4. Scope
5. The Process
6. The Results to Date
7. Programs (preliminary)
8. Schedule

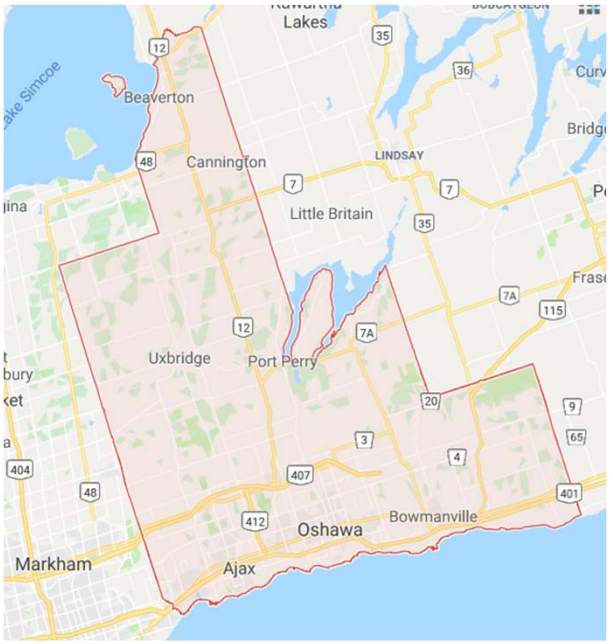
DURHAM COMMUNITY ENERGY PLAN

Background on DCEP

- Proposal to Ministry of Energy Municipal Energy Planning Program in spring 2016
- Approved in May 2016 for $90,000; matching funding from local partners
- Project approved by Regional Council in June 2016
- 3 stages: Stakeholder Engagement, Baseline Data Study, Plan Development
- 3 separate consultants hired for their expertise:
  - Monarch Park Group,
  - Durham Sustain Ability,
  - Sustainability Solutions Group with Whatlf Technologies and Ralph Torrie

Background on DCEP

- Durham Region: Regional Government, 8 local municipalities, 5 local utilities
- Population is about 760,000, set to double between 2015 and 2050
- Climate plans:
  - Local Action Plan 2012
  - Climate Adaptation Plan 2016
- Durham Community **Energy** Plan – designed to essentially replace the LAP



Purpose

The Durham Community Energy Plan (DCEP) seeks to accelerate the transition to a clean energy economy in Durham, while simultaneously achieving multiple economic, environmental and social benefits.

Scope of DCEP

- All forms of energy (supply, demand, storage and transmittal)
- The entire Region of Durham and all 8 local municipalities
- All sectors of the economy
- Time frame for Plan: 2015 to 2050 (implications)
- Broad community stakeholder involvement
- Project time frame: June 2016 to March 2018 (extended to March 2019)
- Budget: $238,000 (started at $180,000)
- Steering Committee of all partners (has met 15 times to date)

Project Partners

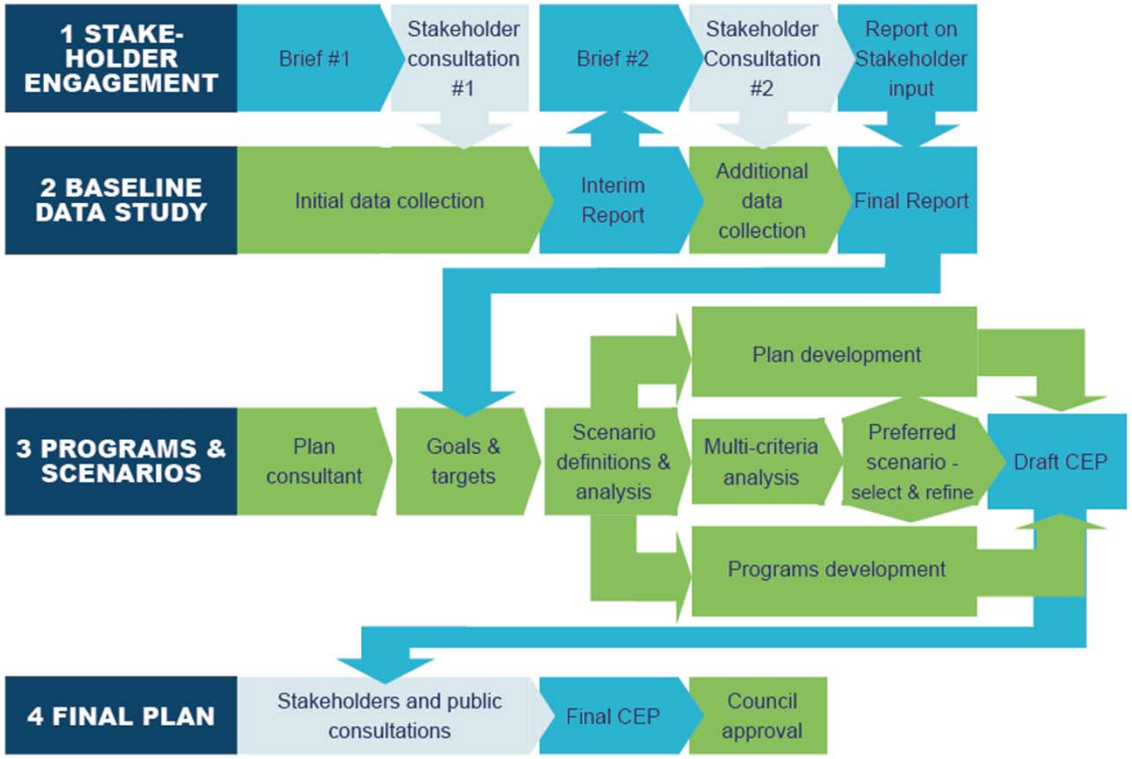
The Government of Ontario

Region of Durham

Ajax, Brock, Clarington, Oshawa, Pickering, Scugog, Uxbridge, Whitby

Enbridge, Oshawa PUC, Veridian, Whitby Hydro

DCEP Process



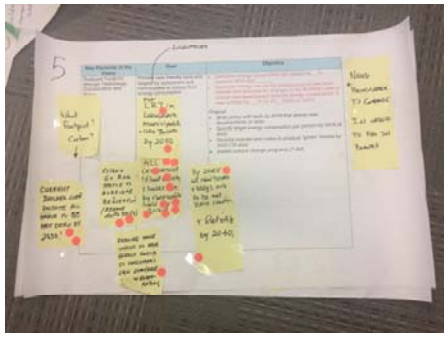
Stakeholder Engagement

Two stakeholder engagement sessions were held early in the planning process:

- September 20, 2016: 44 participants
- February 28, 2017: 63 participants

A third session was held on :

- November 22, 2018: 36 participants



Elements of the Vision

- Innovative, smart and diversified energy solutions
- Transparent, accountable and committed to the vision
- Reduced carbon footprint
- Economic prosperity, and community and environmental health
- Reliable, resilient, integrated, sustainable and financially viable energy sources
- Affordable for all
- Community collaboration for innovative solutions

Stakeholder Feedback - Key Messages

Key Messages

- Need for community partnerships
- Desire for self-sufficiency – diversify energy sources including renewable energy and decrease consumption
- Education and communication are important re. energy literacy, benefits, measures
- Need for policy, process and regulatory changes to remove administrative barriers
- Need for financial incentives and disincentives
- Transportation is key – more electric vehicles; increase transit re. DRT, GO, LRT and cycling, walking
- Community design needs to be walkable, integrated, mixed-use
- Local employment is important – green with telecommuting to reduce travel
- DCEP should decrease GHG emissions and link to the Durham Community Climate Adaptation Plan

Infographic, Baseline Energy Data

GHG Emissions: (7.5 tonnes per capita)

- 49% gasoline and diesel
- 33% natural gas
- 5% electricity

Energy Use by Sector:

- 36% transportation
- 30% residential
- 19% industrial

Energy Costs: ($2.3 billion/yr.)

- 48% gasoline and diesel
- 39% electricity
- 9% natural gas

Energy Supply: (9% renewable)

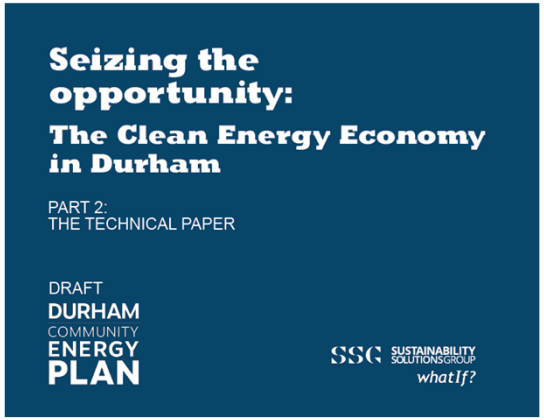
- 37% gasoline and diesel
- 35% natural gas
- 17% electricity

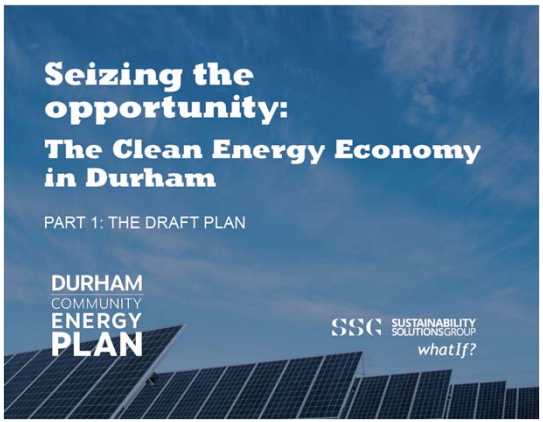
Three Energy Scenarios

Business as Usual (BAU)

Business as Planned (BAP)

Low Carbon Pathway (LCP)





Description of Energy Scenarios

BAU: Business as Usual

- Current patterns of energy consumption extrapolated out until 2050
- Accounts for population increases, federal fuel efficiency standards and the impacts of climate change on heating and cooling buildings

BAP: Business as Planned

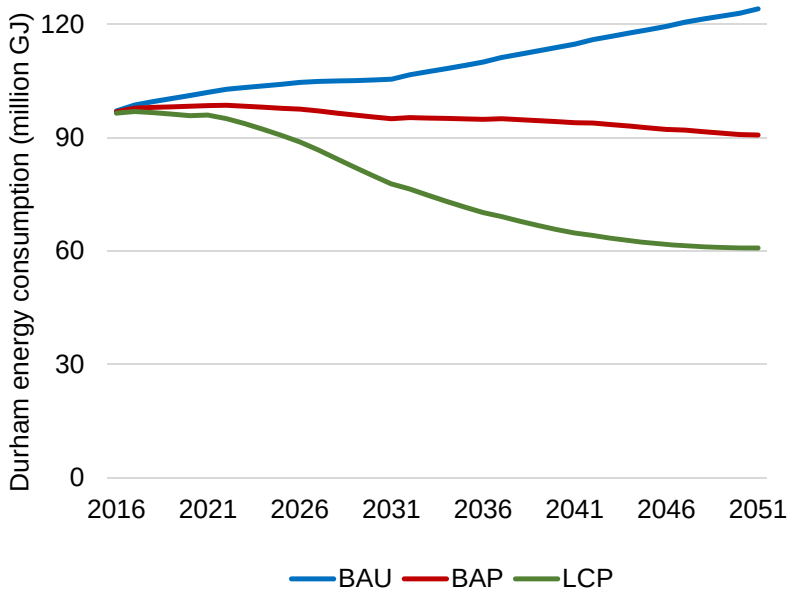
- Includes the assumptions in the BAP
- Projected increases in provincial building codes, a slight increase in building retrofits in the residential and commercial sectors
- Increased adoption of building scale solar photovoltaic systems
- An increase in electric vehicle use
- A modest increase in local large scale solar and wind generation

Description of Energy Scenarios

LCP: Low Carbon Pathway

- A composite of 22 ambitious actions designed to achieve Durham Region's GHG targets. These include new building efficiency standards, extensive building retrofit programs, installation of heat pumps, photovoltaic and wind generation, energy storage, electrification of personal, commercial and transit vehicles, land-use changes and industrial efficiencies.

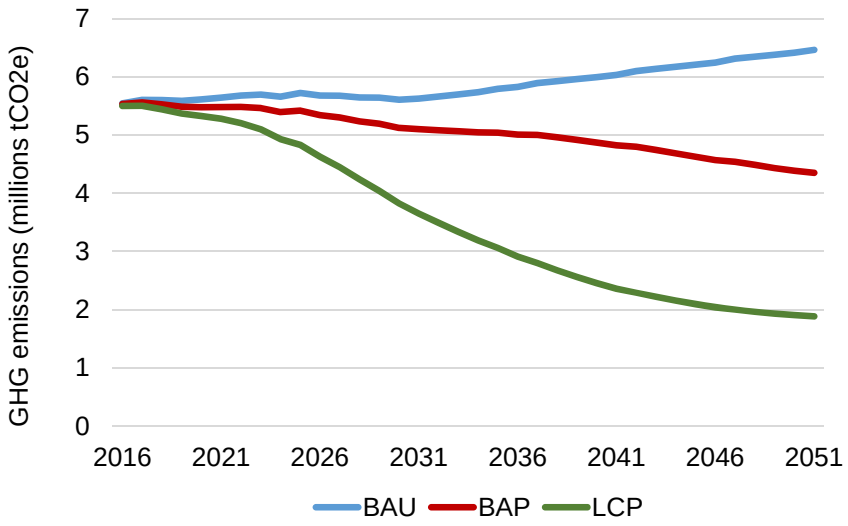
Energy Consumption by Scenario



Reduced energy use

Durham's total energy use declines 51% compared to the BAU scenario. All of this reduction results from improved energy efficiency, despite a doubling of population

GHG Emissions by Scenario



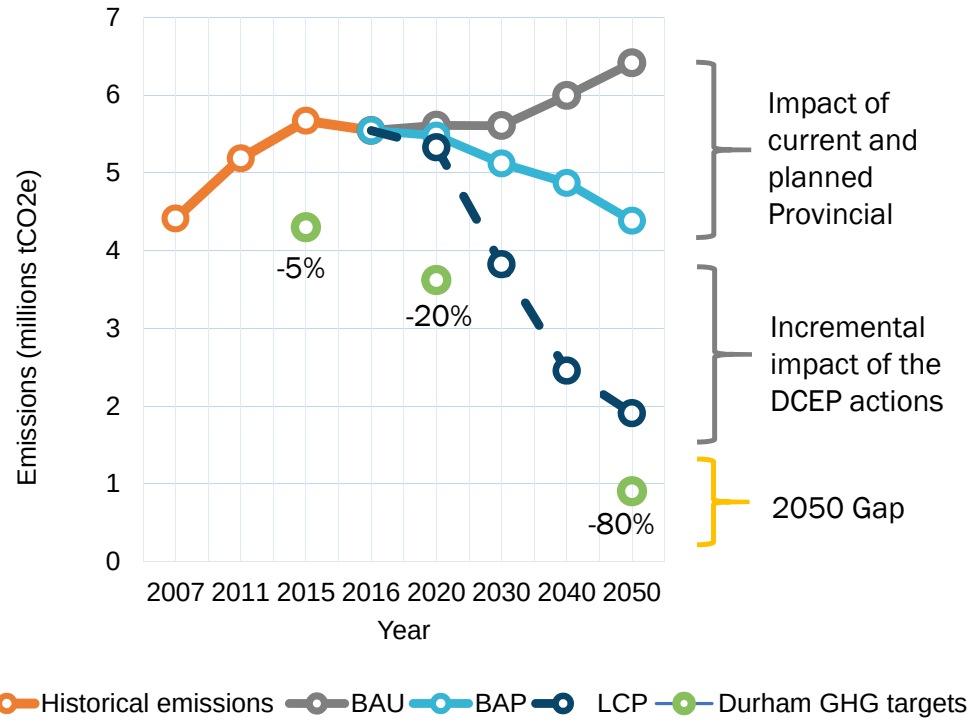
Lower GHG emissions

Durham's greenhouse gas (GHG) emissions are 70% lower in 2050 than under the BAU scenario (and 66% lower than in 2016)

Lower air pollution = better health

Air pollution emissions from energy use decline about 70%, especially in the transportation sector. This means easier breathing for everyone

GHG Emissions



Lower GHG emissions

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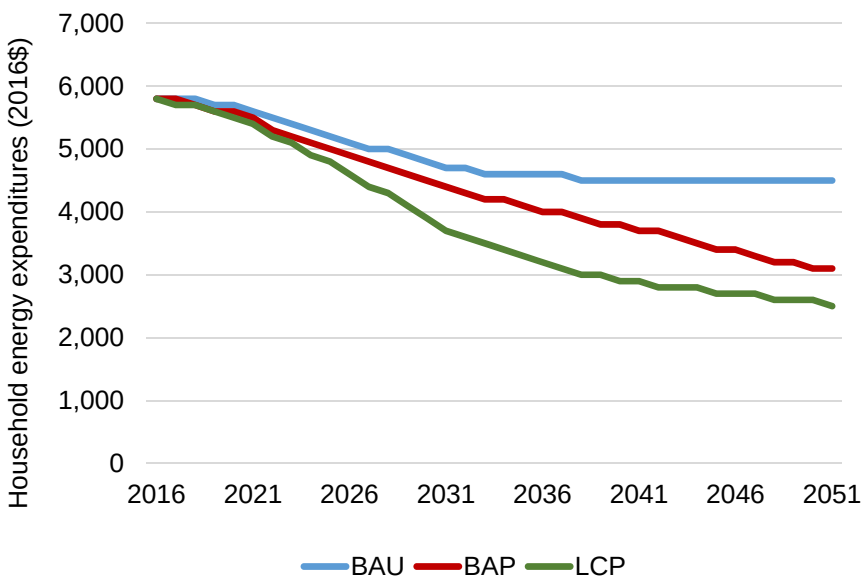
Durham's target is an absolute reduction of 80% from 2007 levels, so we fall about 10% short of our target. Note doubling of population over the period

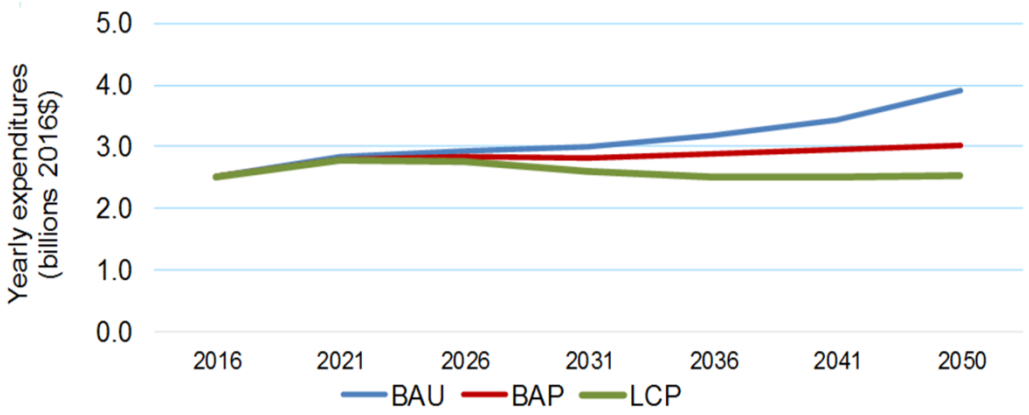
Household Energy Expenditures



Lower household energy costs

Average annual household energy costs (home and vehicle) decline from $5,800 currently (in 2016) to $2,650 in 2050. Over the period, households will each save $34,600 on energy expenditures

Total Energy Expenditures by Scenario

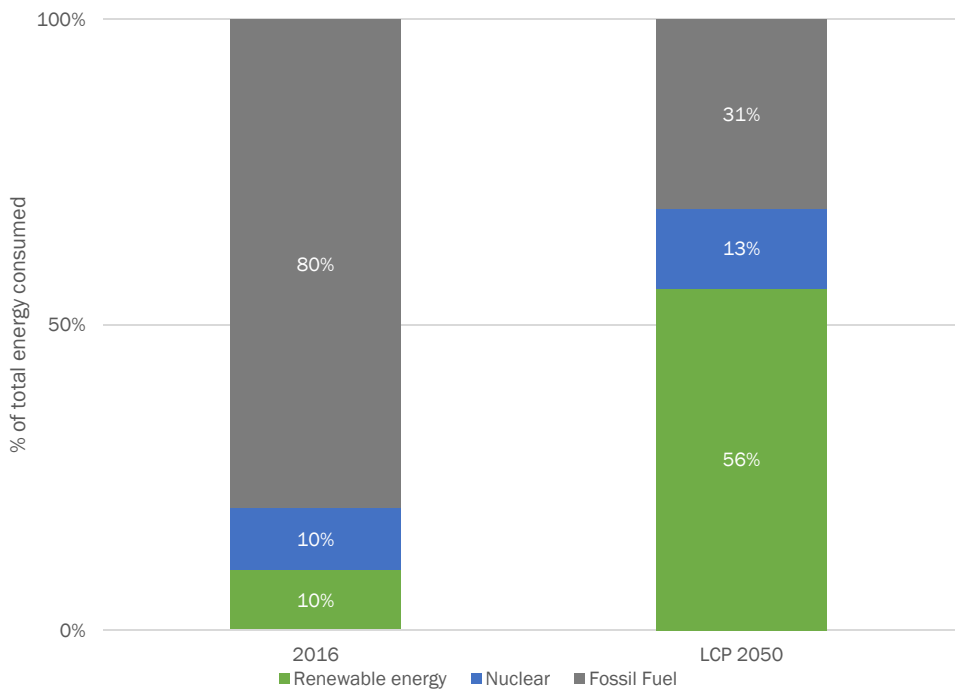


Lower total energy expenditures

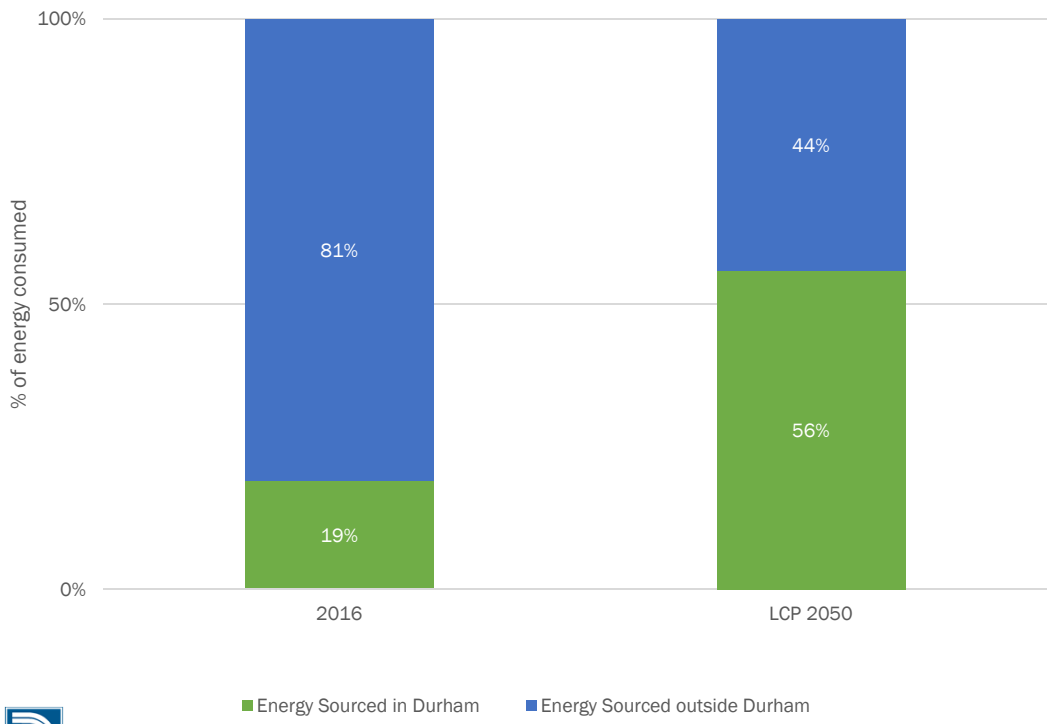
The Low Carbon Pathway reduces energy expenditures across the region by $1.4 billion (35%) in 2050 compared to the BAU scenario. This is a saving of $20 billion over the period

More Renewable Energy

Renewable energy's share of Durham's supply increases from 10% in 2016 to 56% in 2050 under the LCP scenario. Most of this renewable energy is from local sources such as solar, wind and biomass. Fossil fuel use drops from 80% to 31% over the period. Nuclear energy's share increases slightly from 10% to 13%



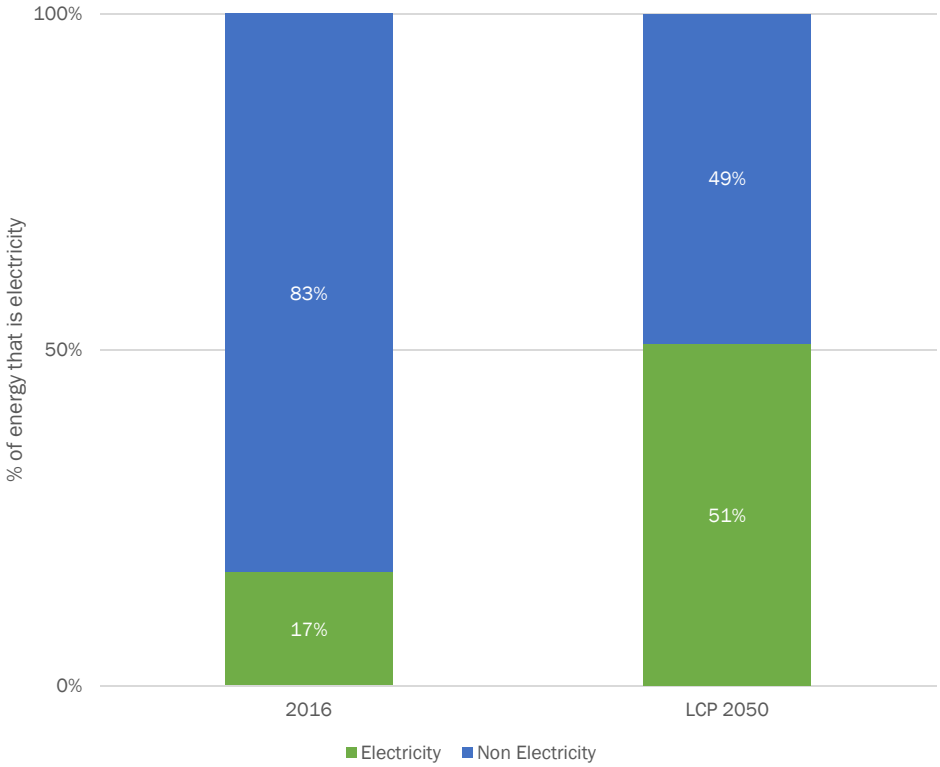
Increased Self-Sufficiency



Currently Durham is about 19% self-sufficient in energy (due mostly to nuclear generation in the Region). Under the LCP, this level of self-sufficiency increases to about 56%. Thus, we would be less subject to energy supply disruptions and economic shocks to the national or global energy system

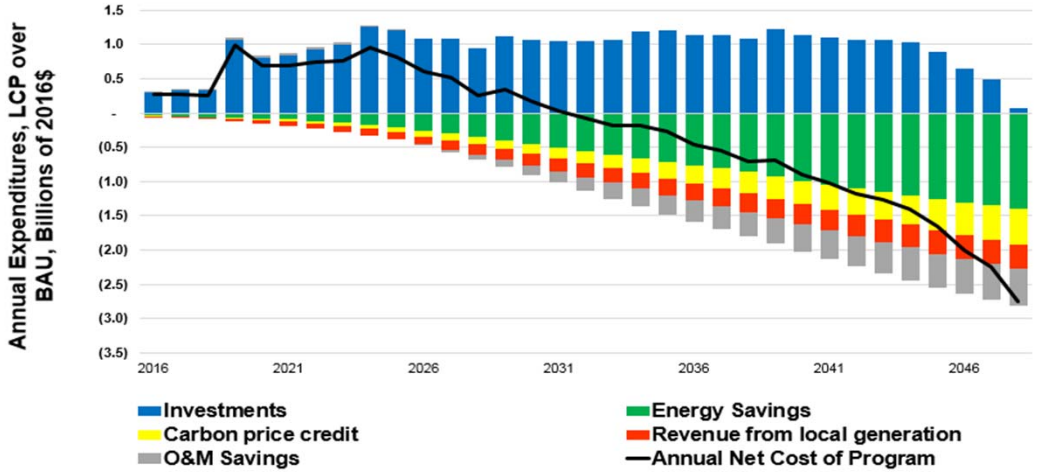
Electrification of the Economy

Currently 17% of our total energy consumption is electric. Under the LCP this increases to 51% in 2050, due mostly to electric vehicles and the use of electricity in space heating (through efficient heat pumps). This switch toward clean and efficient electricity allows us to achieve dramatic GHG reductions, improved air quality and overall cost reductions



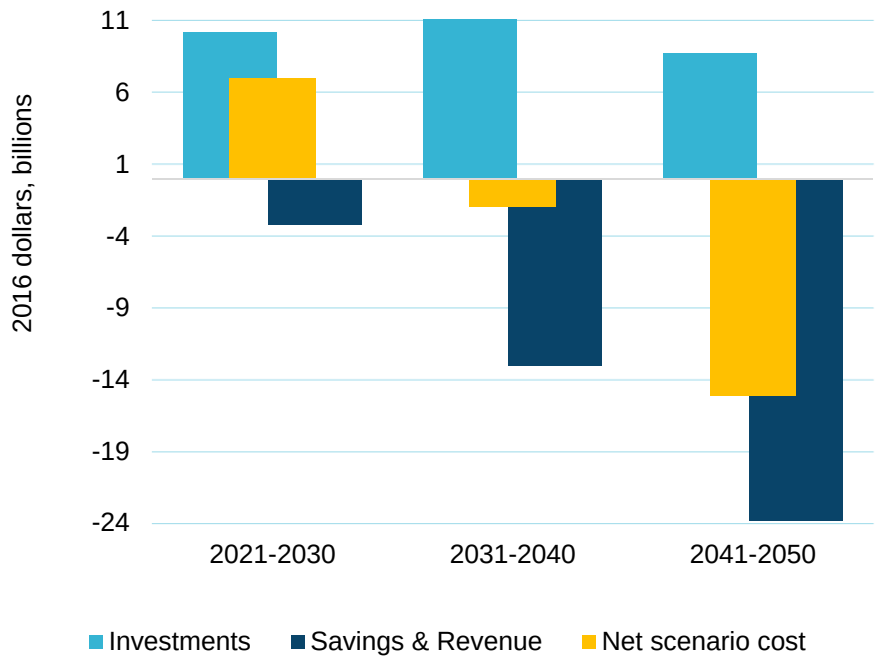
Local Energy Investment

The investment required for the Low Carbon Pathway is $31 billion over the period; total savings and revenue generation is $40 billion. The incremental investment in Durham's clean energy system is about $1 billion per year, on an existing base of about $5 billion per year



Expenditures, savings and revenues from LCP, Relative to Business-as-usual. (values are presented as costs in the figure, so expenditures are above the line and savings and revenue are below the line).

Energy Investments and Savings by Decade



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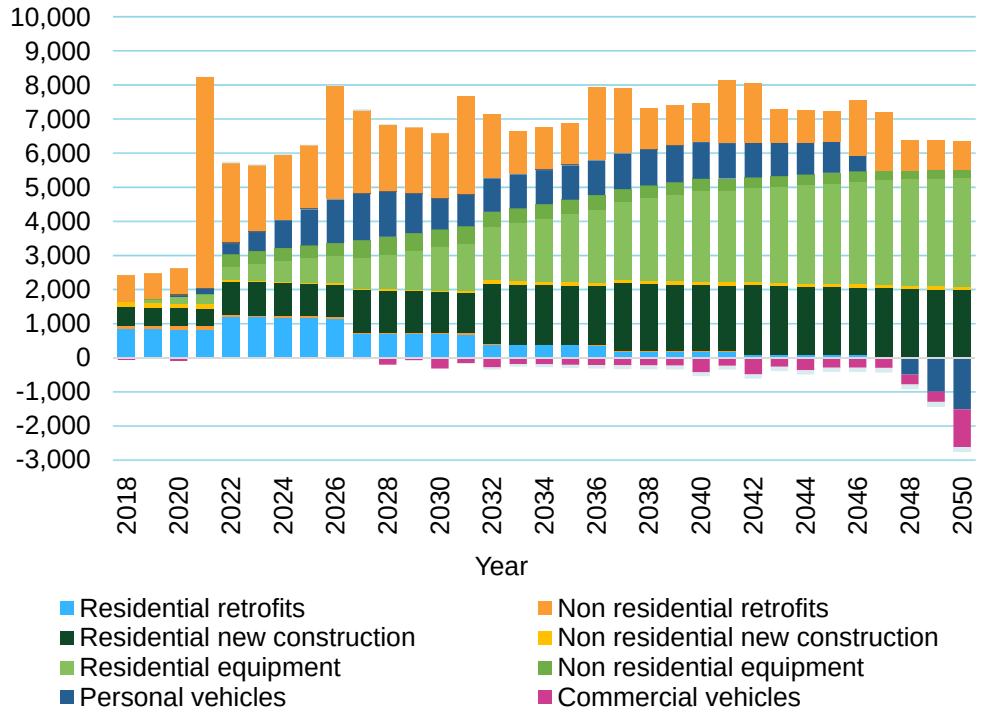
Sources of Capital Investment

- Mostly private sector capital, not public sector
- Green bonds/debentures
- Institutional investors
- Pension funds
- Role of local government – to create the conditions to attract and facilitate private investment in our clean energy future

Employment Impacts of Low Carbon Scenario



Local jobs created

Local employment is created from investments in energy efficiency and energy generation activities – about 210,000 person-years of employment over the period. That's an average of 7,000 jobs per year

Programs

1) **Durham Green Standard:** Enhanced energy performance for new buildings

2) **Durham Deep Retrofit Program:** Transforming existing buildings

3) **Renewable Energy Co-operative:** Stimulating local renewable energy projects

Thermal Shell Retrofit

Guelph Net Zero Energy Home

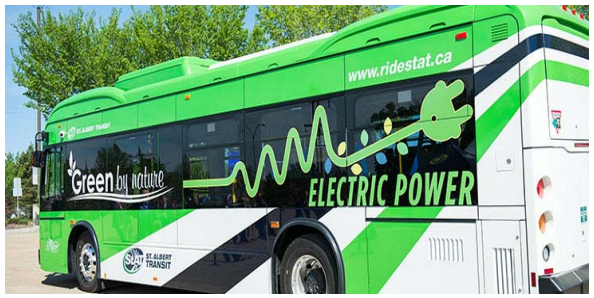
Photovoltaic and Wind Power Generation

Net Zero Energy Houses

Guelph Net Zero Energy Home

- Net-Zero Energy Homes program developed by Canadian Home Builders' Association (CHBA)
- Net-Zero Energy Houses built in Guelph in 2015/16, briefing to DRRCC in May 2016
- Currently Net-Zero Energy housing being built in London, Waterloo, Kitchener and Kingston in Ontario (8 developments)
- More than 200 other initiatives across Canada
- Recent report funded by FCM identifies "Municipal Tools for Catalyzing Net-Zero Energy Development"

Programs



Electric Bus

Electric Car

Coordinated Planning

4) Electric Vehicle Joint Venture Program: Happy motoring

5) Education and Outreach Program: Engaging the community

6) Coordinating Land-use Policies: Sustainable growth

Schedule

- DRRCC Approval in Principle – March 15 ✓
- F&A Committee Approval in Principle – April 9 ✓
- Regional Council Approval in Principle – April 24
- File for final installment of provincial funds – April 26
- Seek local municipal and utility endorsement in 2019
- Program implementation proposals starting in 2019

Questions and Discussion

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