



# **City of Markham's Municipal Energy Plan – Introduction**

**General Committee  
March 5, 2018**

**Presented by: Graham Seaman  
Director, Sustainability & Asset Management**

# Agenda

1. Markham's Energy Leadership
  - City
  - Community
2. Municipal Energy Plan (MEP)
3. 2011 Municipal Energy Plan Baseline Results
4. Next Steps
5. Recommendation

# 1. Markham's Energy Leadership

- Markham is recognized for its leadership in energy conservation & efficiency, renewable energy and zero emission vehicles in Ontario
- Energy conservation and renewable energy projects have a positive financial impact of \$1.5M/year

# 1. Energy Leadership – Policies and Partnerships

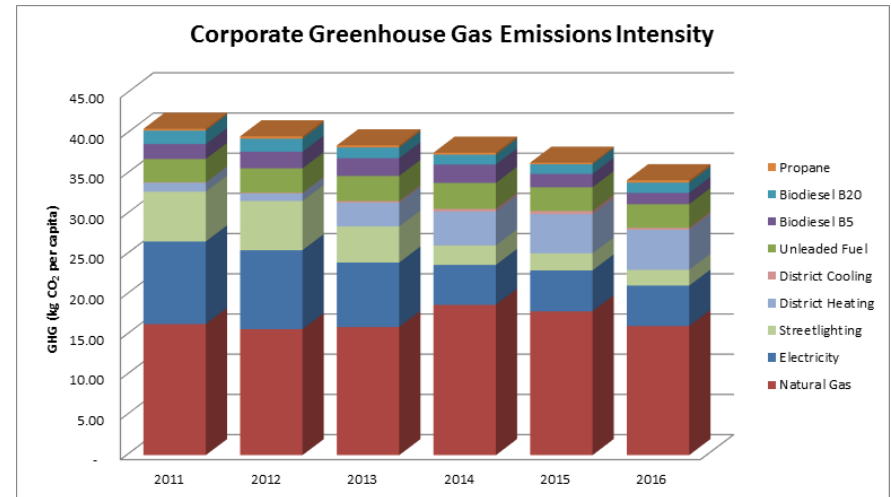
- The Greenprint, Markham's Community Sustainability Plan was endorsed in 2011 and is still considered a ground-breaking plan with the Energy & Climate goal of: **net zero energy, water, waste and emissions by 2050**
- Markham's Official Plan policies push for new communities that:
  - are Compact, pedestrian supportive and mixed use
  - are served by active transportation and public transportation
  - promote green infrastructure and resource conservation
  - promote innovative technology, including electric vehicle infrastructure
- Markham is a Shareholder in Alectra and owner of Markham District Energy, two leading, award-winning utilities.



# 1. Energy Leadership – Conservation & Efficiency

From 2012-2016, under the Corporate Energy Management Plan, even with the addition of two new community centres, the City has achieved:

- 13.7% per capita reduction in Greenhouse Gas (GHG) emissions for municipal facility and fleet operations
- 6% total electricity reduction (equivalent to the annual use of almost 200 homes)
- \$1.2M/year of avoided utility costs from energy conservation and efficiency efforts



# 1. Energy Leadership – Renewable Energy

2011 – First 250kW roof top solar array hosted by an Ontario municipality operational and generating Feed-In Tariff (FIT) revenue

2017 – Second only to Toronto with nine solar roof tops (currently) capable of powering 260 homes and generating \$300k/year of revenue



Location	Array Size (KWAC)
8100 Warden	250
Civic Centre	9.6
Fire Station 99	10
Angus Glen CC	250
Milliken Mills CC	100
Mount Joy CC	285
RJ Clatworthy	120
Thornhill CC	350
Pan-Am Centre	450
<i>Aaniin CC*</i>	300
<i>Cornell CC*</i>	100
<b>Total</b>	<b>2,225</b>

\* to be constructed Summer 2018

# 1. Energy Leadership – Zero Emission Vehicles

2015 – First municipality to install a Level-3 fast electric vehicle (EV) charger

2017 – Added an electric vehicle to our Fleet

2018 – Installed 17 new EV chargers as part of an intelligent control pilot that will minimize electricity grid impact and peak energy costs to the city while ensuring users have their desired charge at the end of the work day



# 1. Energy Leadership – Community Initiatives

- Working with North District (FUA) Developers to establish a Community Energy Plan, as required by Markham and York Region Official Plans, that will move aggressively toward target of net zero by 2050
- Partnered with Alectra and Enbridge to develop Net Zero Energy Emissions, an integrated power and heating/cooling system for retrofit and new homes - pilot installs underway
- Submitted six projects with various partners requesting \$24M to the Ministry of Environment and Climate Change's \$100M Municipal GHG Challenge Fund program
- Supporting various other partnerships and projects seeking funding and support to reduce emissions in Markham



# 1. Energy Leadership – Municipal Energy Plan (MEP)

- City of Markham's energy use represents approximately 1.5% of our community's total energy use
- In 2013, staff identified the need for a long term Municipal Energy Plan for our community to achieve the Greenprint's goal of net zero energy, water, waste and emissions by 2050.
- This plan will continue to leverage partners, our experience in energy conservation & efficiency, renewable energy, zero emission vehicles and planning policies to guide our community to net zero 2050

## 2. Municipal Energy Plan

- In 2014, Markham was selected as one of the first eight municipalities in Ontario to receive a \$90,000 grant from the Ministry of Energy to develop a Municipal Energy Plan.
- Council committed an additional \$90,000 to the plan's development in the 2014 budget.
- Through a competitive RFP, a municipal energy planning consulting organization – Sustainability Solutions Group (SSG) was retained to develop the plan.
- Over the next three years, staff and SSG followed the three stage process prescribed by the Province:
  1. Stakeholder engagement – established and continued to work with the 65 member Stakeholder Working Group
  2. Energy Mapping & Study
  3. Energy Plan Development
- Today, more than 30 municipalities have received the same grant and the Province is taking steps to encourage more MEPs



## 2. Municipal Energy Plan – Net Zero 2050

The result is **Getting to Zero – City of Markham’s Municipal Energy Plan**, which has four main components:

1. **Baseline** energy map and resulting Greenhouse Gas (GHG) – our current state
2. **Projection of Business As Usual** into the future – what our energy and emissions would look like if we did nothing new
3. **Future goal** for energy and emissions to Net Zero 2050
4. **Road map to our future goal** – what needs to happen for Markham to achieve Net Zero

## 3. 2011 Baseline Summary

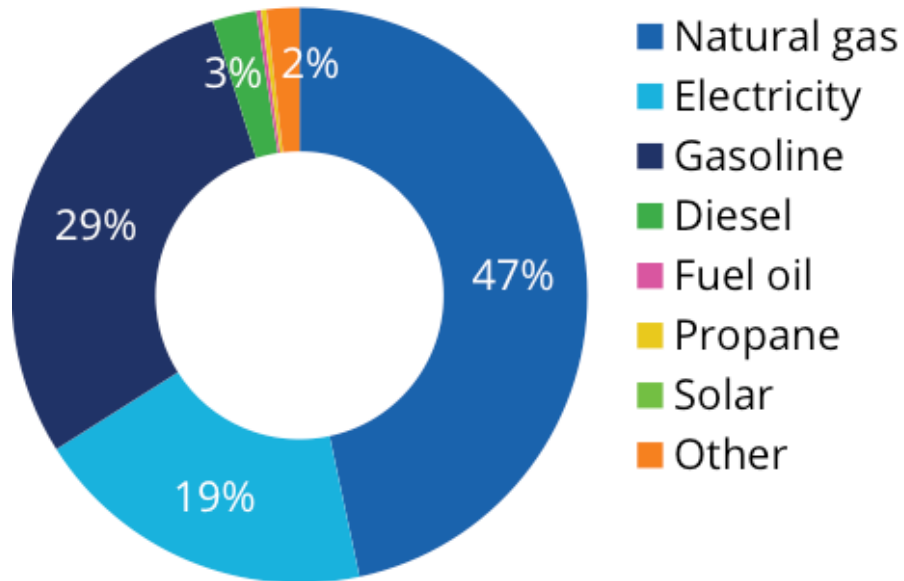
- \$695,000,000 per year spent on energy in Markham; \$2,309 per year per person
- Total energy use in Markham – 8,241,000,000 ekWh (29,670,000 GJ)
- Total energy use per person – 27,000 ekWh (98GJ)
- 1,778,000 tCO<sub>2</sub>e per year emitted –
  - To offset, a forest 40 times the total area of Markham would need to be planted (8,475 km<sup>2</sup>) \*
- GHG emissions per person – 5.9 tCO<sub>2</sub>e per year
  - To offset, 153 tree seedlings for each resident would need to be planted every year\*

Note – equivalent kilo-watt hour (ekWh), giga-joule (GJ), tonnes equivalent CO<sub>2</sub> (tCO<sub>2</sub>e)

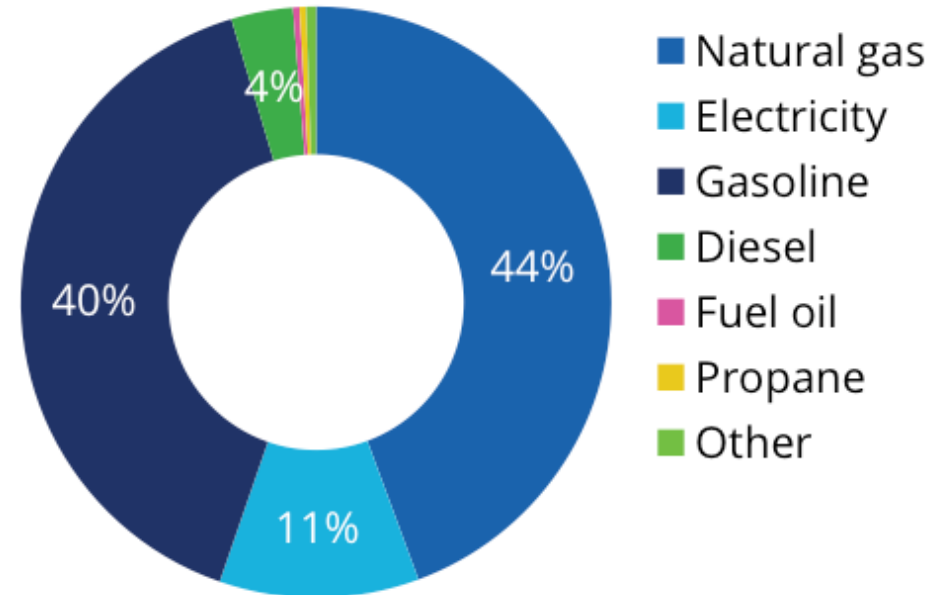
\*per EPA Greenhouse Gas Equivalencies Calculator

# 3. 2011 Baseline – Energy and Emissions by Fuel

ENERGY USE BY FUEL



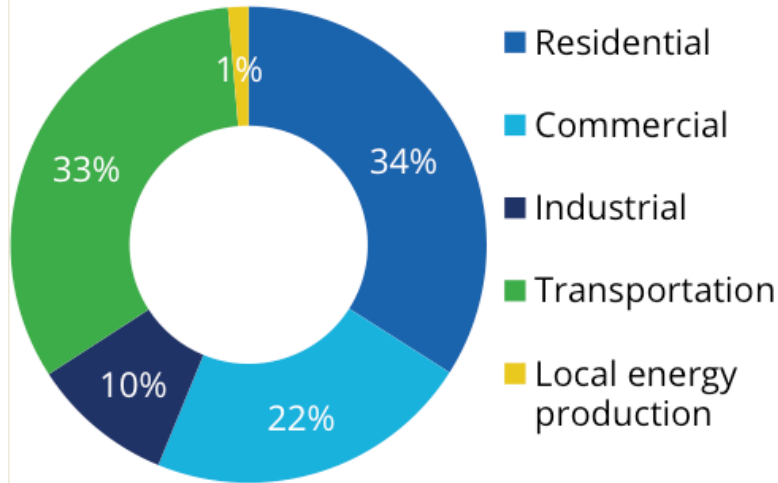
EMISSIONS BY FUEL



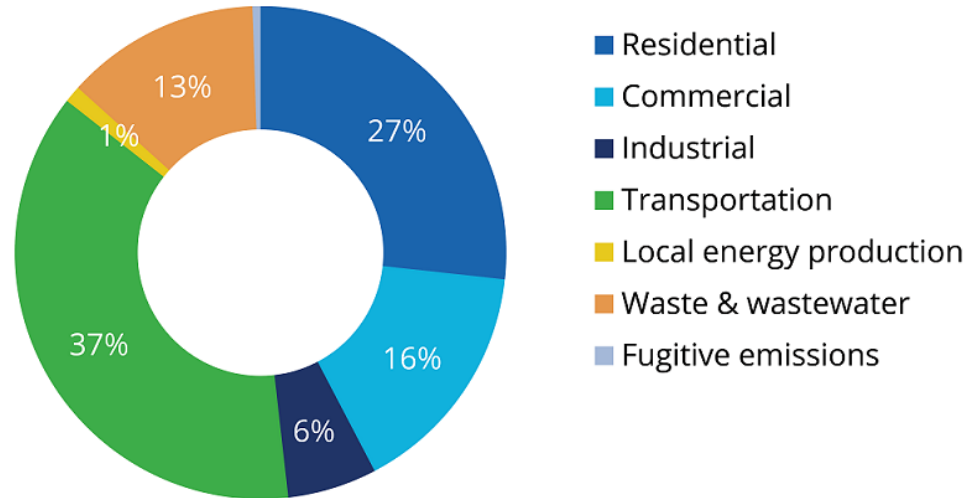


# 3. 2011 Baseline - Energy and Emissions by Sector

ENERGY USE BY SECTOR



EMISSIONS BY SECTOR



## 4. Next Steps

- Presentation and Staff Report to General Committee recommending endorsement of Markham's Municipal Energy Plan - May 2018

## 5. Recommendation

1. That the presentation “City of Markham’s Municipal Energy Plan – Introduction” be received;