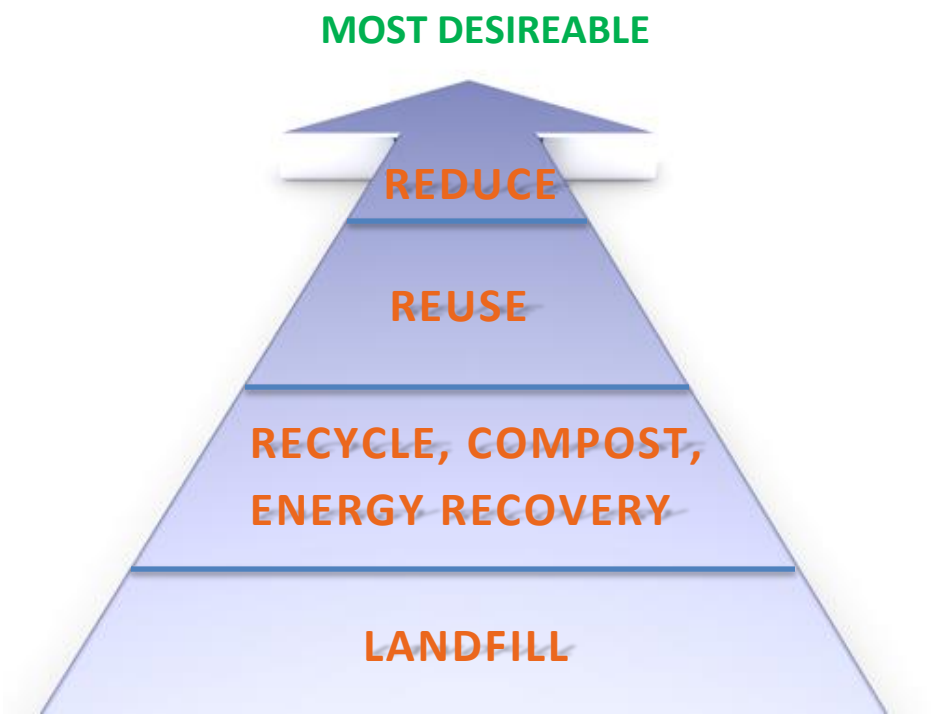
Municipal Solid Waste
a
Renewable Resource
for
Energy Recovery



"Electricity Review" Submission

By:

The Municipality of the County of Colchester

December 4th, 2014

AN APPLICATION TO HAVE POST RECYCLED MUNICIPAL SOLID WASTE RECOGNIZED AS A RENEWABLE SOURCE OF ENERGY THROUGH THE ELECTRICITY REVIEW:

BACKGROUND:

In the mid 1990's, Nova Scotia became a leader in the North American waste management revolution under the leadership of the Nova Scotia Department of Environment. The Municipality of the County of Colchester was a proud participant in and an integral component of this wave of reform, through establishment of a second generation landfill at Kemptown, Nova Scotia in 1995. This was followed the very next year with an "in-vessel" Compost Facility as well as a Material Recovery Facility.

Today, the business of managing waste is almost unrecognizable from the methods employed only a few decades ago. Gone are the local "dumps" where everything unwanted was discarded without thought or care of the impact many of the harmful materials would have on our fragile environment. Gone is the practice of open burning of garbage for the sole purpose of reducing its volume. We now know the incredible, irreparable harm that these practices impart to our ground water, soil and atmosphere.

The County of Colchester, through its Solid Waste Department remains committed to responsible waste management guided by Municipal Council. The philosophy of the Solid waste Department is to never be satisfied with the status quo, to pursue continuous improvement in all aspects of waste management. It is this philosophy that led to the exploration of MSW as a renewable source of energy almost six years ago. Throughout this period and continuing today and into the future, the commitment to the waste hierarchy remains strong. Although we have been exploring WTE and consider WTE an important component of waste management, our commitment to "Reduce, Reuse and Recycle" is evident. In 2010 the Colchester Solid Waste Department distributed over 6,300 "green carts" to areas of the county which until that time had no outlet for their "green waste" other than backyard composting. Today, in excess of 20,000 green carts are in service providing curbside collection of source separated organics to every home and seasonal residence throughout the jurisdiction of the County of Colchester.

To further encourage recycling and waste reduction, the County of Colchester has imposed a limit of six (6) bags of garbage per bi-weekly collection per household. Additional steps to increase source separation were taken in 2012. In January of that year, the Municipality of Colchester began enforcing a "clear bag" policy. All garbage placed at curbside for pick up or brought directly to the Balefill Facility was required to be in clear, transparent bags. This resulted in a dramatic reduction

in waste going to the landfill with corresponding increases in organic waste and recyclables.

The Municipality of the County of Colchester continues to invest heavily in all aspects of responsible waste management. Our educational staff is deeply devoted to the continuous and ongoing education of Colchester's residents as well as institutional, commercial and industrial establishments in regard to the 3 R's of "Reduce, Reuse and Recycle". We continue to strive to make our Material Recovery Facility more effective and efficient and recently installed a new baler. Further evidence of the County's commitment to "Reduce, Reuse and Recycle" is the construction of a new Compost Facility which will be commissioned in December of this year. This facility was several years in planning and design and can be described as a "state of the art", low tech, low impact facility that will produce a marketable Grade "A" compost returning valuable nutrient to the soil. This new facility has attracted considerable attention nationally and was featured as the cover story in the October 2014 issue of "Recycling Product News".

A serious commitment to responsible, sustainable waste management leads to the obvious next step: What to do with the post recycled MSW or how to reuse or recover this material for a beneficial use rather than disposal by burying. The accepted practice in areas of the world that have now become the leaders in waste management, such as Europe and Japan, is to convert this material into energy in the form of district heating, electricity or combined heat and energy through WTE facilities.

SUPPORT:

There are numerous reasons that this practice should not only be accepted in Nova Scotia but should be encouraged. Not least among them is the offset of one tonne of greenhouse gases for every one tonne of MSW processed at a waste to energy facility. The production of energy in the form of electricity, heat or a combination of both reduces consumption of fossil fuels. The importance of the ability to reduce our dependence on landfills should not be understated.

Financial Burden:

Landfills may never truly disappear but should always be considered as the "last resort". They are the last remnant of an archaic practice of waste management where we just want the waste to go away. "Out of sight - Out of mind". Besides the negative physical environmental risk that landfills pose, there are also negative consequences to the economic and social environment. Each new "second generation" cell costs millions of tax payer's dollars to build and millions of dollars to operate and maintain.

Environmental Liability:

Long after they are closed, landfills continue to be an environmental liability that municipalities have to bear. Currently, there are four closed landfills within Colchester County that are constantly and continuously monitored by "third party" certified laboratory facilities to detect and prevent potential environmental mishaps. This liability is an unending responsibility of the Municipality and extends to active landfills as well. In an active landfill, there is the ever present danger of a landfill fire and in spite of our best efforts to prevent them, landfill fires do occur. Anyone involved in the solid waste industry understands full well the devastating economic and environmental damage that can be caused by a landfill fire. Finally, the gradual breakdown of MSW in a landfill produces methane gas. Because the breakdown of the waste material is so gradual, methane gas can be produced in a landfill for as long as sixty years or even longer. It is broadly accepted that methane gas has 21times the effect of CO_2 in our atmosphere. World-wide, landfills are the second largest producers of methane and it is estimated that they account for forty million tonnes of fugitive CH_4 annually.

Each year, with the current volume of MSW that is being deposited in the Colchester Landfill, approximately 147,000 m^3 of methane will be produced. In the following year, this same material will be producing slightly less methane - approximately 140,000 m^3. As can be seen in the chart in "Figure 1", material deposited in the landfill in 2015 will continue to produce methane gas in decreasing amounts over a period of 20 years. If the same volume of MSW is deposited in the landfill every year for the next 20 years that material will have generated approximately 23 million m^3 of methane. Processing of this material in a Waste to Energy facility would capture this methane and convert it to a useable form of energy. These calculations were provided by Lockheed Martin based on projected incoming volumes of MSW and using Colchester waste characteristics as provided by RRFB waste audits.

Social Impact:

Society today is ever increasingly resistant to the creation and operation of a landfill in the neighbourhood. One need look no further than the current controversy concerning the Otter Lake Landfill in Halifax. This "Not in My Backyard" (NIMBY) factor is causing new landfills to be located more and more remotely from populated areas where the majority of waste is generated. This is cause for increased transportation costs and an increased carbon footprint due to the burning of additional fossil fuels.

The evidence before us today suggests that landfilling will continue to have far reaching negative impacts on the physical, economic and social environment. Through a combination of recycling and WTE, countries such as Germany, the Netherlands, Belgium, Sweden and Denmark have reduced their dependency on landfills to less than 5%.

Landfills are a "***non-sustainable***" use of land and resources.

A study by the Goddard Institute of Space Studies of NASA and the Earth Engineering Center of Columbia in 2007 concluded that: The only two options for decreasing the emissions of methane in landfill gas are replacing landfilling by thermal treatment of MSW and also increasing landfill gas capture in the interim period.

The case for recognizing Municipal Solid Waste as a Renewable Source of Energy

- WTE facilities have the potential of preventing millions of tonnes of fugitive methane escaping from landfills.
- For every one tonne of MSW processed at a WTE facility, one tonne of GHG is offset.
- Eliminates or reduces the need for landfills
- Existing WTE facilities operate at greater than 90% availability on a 24 hour, 7 day a week basis regardless of weather conditions.
- WTE plants have been named "one of the cleanest sources of energy" by the USEPA
- A recent poll by "Nielsen" indicates that the vast majority of Canadians favourably view WTE using MSW.

Entities that recognize MSW as a renewable source of energy are:

- U.S. EPA
- U.S. Conference of Mayors
- The Intergovernmental Panel on Climate Change (IPCC)
- World Economic Forum
- Democratic Governors Association – Center for Innovative Policy
- American Society of Mechanical Engineers (ASME)
- The European Union Directive on Renewable Energy Sources recognizes the biogenic portion of MSW as a renewable energy source.
- The Province of British Columbia

Many jurisdictions around the world including over 24 states and the District of Columbia in the United States have recognized MSW as a renewable source of energy.

The United states Environmental Protection Agency has stated that: "Converting non-recyclable waste materials into electricity and heat generates a renewable energy source and reduces carbon emissions by offsetting the need for energy from fossil sources and reduces methane generation from landfills"

In 1994 the U.S. EPA launched the Landfill Methane Outreach Program (LMOP). This is a voluntary program that helps reduce GHG from landfills by encouraging the recovery and use of Landfill Gas as a renewable energy resource. The LMOP forms partnerships with communities, local governments, utilities, power marketers, states, project developers and non-profit organizations to overcome barriers to project development. Perhaps a model that the Nova Scotia Government could explore. The EPA also states that promotion of landfill gas energy is ***not in conflict with promotion of waste diversion and does not compete with waste reduction, recycling and composting***.

Rick Brandes, the retired chief of the Energy Recovery and Waste Management Branch at the U.S. Environmental Protection Agency states: Under any practical definition, energy recovered from MSW is renewable energy and should be legally defined as such.

In 2005 the Unite states Conference of Mayors adopted a Resolution on Comprehensive Solid Waste Disposal Management wherein it states **"*Generation of energy from municipal solid waste in a waste-to-energy facility not only offers significant environmental and renewable benefits but also provides greater energy diversity and increased energy security for our nation*."**

Waste is not going to disappear no matter how diligent we are in our efforts. We are an affluent society. We purchase goods and materials to satisfy our "wants" not just our needs. In 2015, it's time for Nova Scotia to take the lead again in a meaningful manner. It is time for a pragmatic, not an idealistic approach to "Waste to Energy" and to recognize "Municipal Solid waste as a Renewable Source of Energy".

RECOMMENDATION:

The Solid Waste Department of the Municipality of the County of Colchester, with unanimous support of Municipal Council, strongly recommends classification of "Post Recycled" Municipal Solid Waste as a "RENEWABLE SOURCE OF ENERGY" under the "Electricity Review" without regard to the technology employed to extract that energy, without regard to the form of that energy such as heat, a derived fuel or electricity and without regard to the proportion of biogenic and anthropogenic components of the MSW.

Respectfully submitted:

Wayne R. Wamboldt, *Director of Waste Management*
Municipality of the County of Colchester

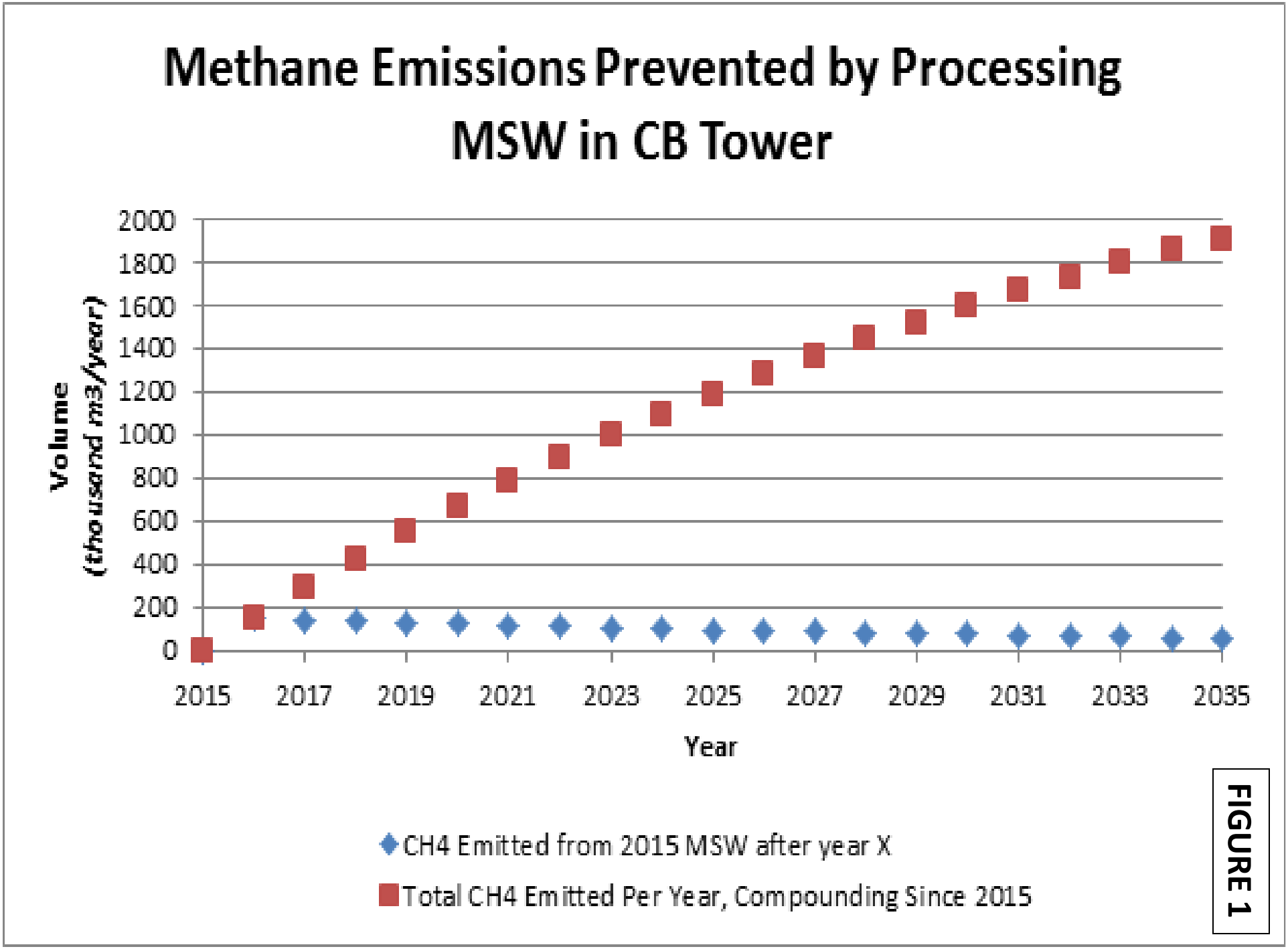

Methane Emissions Prevented by Processing MSW in CB Tower
Volume (thousand m3/year)
2000
1800
1600
1400
1200
1000
800
600
400
200
0
2015
2017
2019
2021
2023
2025
2027
2029
2031
2033
2035
Year
CH4 Emitted from 2015 MSW after year X
Total CH4 Emitted Per Year, Compounding Since 2015

FIGURE 1