



SOUTHERN ONTARIO WATER CONSORTIUM

LE CONSORTIUM POUR L'EAU
DU SUD DE L'ONTARIO

Getting to Net Zero: Value Generation from Municipal Wastewater Treatment



Opportunities to generate “value” from biosolids



Minimize Volume:

Anaerobic digestion, pre-treatment, post-treatment, wastewater treatment plant processes and optimization.

Derive Value:

Realize beneficial use as agricultural and non-agricultural fertilizer, alternative fuels, syngas, biochar, bio-oil.

Recover Energy:

Capturing and using biogas generated by anaerobic digestion.

Why this? Why now?

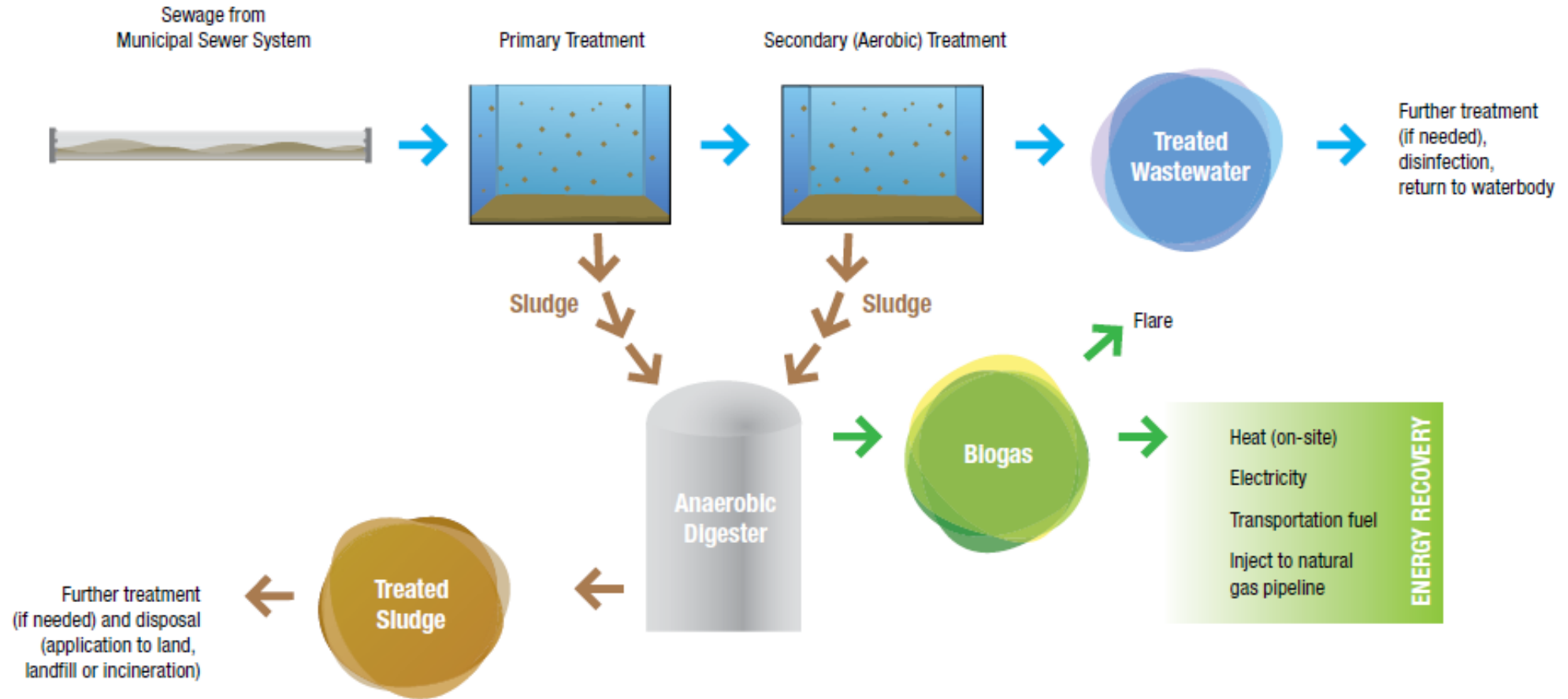


Position Ontario as the leading global region for biosolids reduction, energy recovery and beneficial use, including:


1. Technology research, development, and commercialization
2. World class expertise
3. Supportive policy, regulatory and funding environment

...with innovative provincial and municipal government leadership!

What is “net zero energy”?



Source: Every Drop Counts, 2017. Environment Commissioner of Ontario.



There's a lot of energy (and GHGs) in wastewater

Why not turn sewage plants into energy centres?

Abstract

The organic material in wastewater is a valuable source of energy that is currently mostly wasted. It produces both carbon dioxide and methane, which is an even more powerful greenhouse gas.

Anaerobic digestion is a proven technology to produce and capture methane from such organic material. This biogas, following clean-up, can be burned for on-site heating or combined heat and power, used as a fuel for fleets, or injected into the local natural gas utility pipelines as renewable natural gas.

“To achieve Ontario’s goal of reducing greenhouse gas emissions, **anaerobic digestion** and **energy recovery** should become standard at wastewater treatment plants whenever practical. Even better, treatment plants could become “**energy centres**” that also produce and capture methane from a wide range of supplemental organic wastes.”

Asset Management Plan (AMP) Regulation:



Propose to require that municipalities prepare an **AMP**:

Phase 1: Jan. 1, 2020
(current “levels of service”)

Phase 2: Jan. 1, 2021

Phase 3: Jan. 1, 2023
(proposed “levels of service”)

Require a **Strategic Asset Management Policy** by Jan. 1, 2019

Wastewater Assets

Service attribute	Applicable FIR categories	Community levels of service (qualitative descriptions, images, or maps that describe end-user experience)	Technical levels of service (metrics that describe what the municipality provides)
Scope	<ul style="list-style-type: none"> Wastewater treatment / disposal Wastewater collection / conveyance 	<ul style="list-style-type: none"> Map(s) and/or description of which user groups or areas of the community (e.g., residential, commercial, industrial, agricultural, institutional, mixed-use) are connected to the municipal wastewater system 	<ul style="list-style-type: none"> % of properties serviced by the municipal wastewater system
Reliability	<p><i>Combined sewer / storm systems:</i></p> <ul style="list-style-type: none"> Wastewater treatment / disposal Wastewater collection / conveyance 	<ul style="list-style-type: none"> Explanation of how combined sewer systems are designed with overflow structures in place to intentionally overflow during storm events to prevent backups into homes Description of the frequency and volume of overflows occurring in habitable areas and/or beaches. 	<ul style="list-style-type: none"> # of events per year where wastewater overflow exceeds approved overflow capacity # connection-days of backups per year # of MOECC effluent violations per year due to wastewater discharge
Reliability	<p><i>Separate systems</i></p> <ul style="list-style-type: none"> Wastewater treatment / disposal Wastewater collection / conveyance 	<ul style="list-style-type: none"> Explanation of how stormwater can get into sewers that are cracked, causing sewage to overflow into streets or backup into basements. Description of how resilient infrastructure is to avoid this. 	<ul style="list-style-type: none"> # of MOECC effluent violations per year due to wastewater discharge # connection-days of backups per year.

Organics Action Plan:



A screenshot of the Environmental Registry website. The header includes the 'Environmental Registry' logo and the Ontario Government logo. A navigation bar contains links for 'About the Registry', 'Search', 'How do I...?', 'MyEBR', 'FAQs', 'Links', and 'Contact'. Below the navigation bar, a 'Policy Proposal Notice' section is highlighted. The notice title is 'Discussion Paper: Addressing Food and Organic Waste in Ontario'. To the right, it lists 'EBR Registry Number: 0094', 'Ministry: Ministry of the Environment and Climate Change', and 'Date Proposal to Registry: May 31, 2017'. At the bottom, it states 'Keyword(s): Waste Diversion | Waste' and 'Related Act(s): Resource Recovery and Circular Economy Act, 2016'. A final line of text reads 'The comment period for this proposal is now over.'

Provincial priorities:

- Waste as a resource
- Diversion from landfill
- High value end uses

SOWC Working Group recommendations:

- Integrated approach (include biosolids)
- Ban landfilling
- Biosolids management master plans
- Support RNG targets
- **Optimize capacity at WWTPs**

Parker and Jin (2017) Report – key conclusions:



- No central tracking data
- Little disposition data
- 55 entries that indicated landfilling as at least part of the disposition
- 77 plants surveyed (of the 486 total) in Ontario use anaerobic digestion
- 16% (78 of 486 plants) used a thickening process before stabilization

Municipal GHG
Challenge Fund



PROGRAM GUIDE

Climate Change
Action Plan



Prerequisite: GHG emission reduction plan

“GHG emission reduction strategies/plans can come in a variety of forms, such as Climate Change Action Plans, Community Energy Plans, Municipal Energy Plans, Official Plans and Asset Management Plans containing climate change policies.”

LOW-CARBON INNOVATION FUND (LCIF) 2017-18 Program Guidelines

What is the Low-Carbon Innovation Fund?

The Low-Carbon Innovation Fund (LCIF) is a discretionary, non-entitlement granting program administered by the Ministry of Research, Innovation and Science. The program focuses on emerging, innovative technologies that will play a significant role in assisting the Government of Ontario in meeting its Greenhouse Gas (GHG) reduction goals as part of Ontario's Climate Change Action Plan.

Purpose:

“support proof-of-concept, prototyping and pilot demonstration projects that will lead to the commercialization of processes and/or products in Ontario that are globally competitive and help reduce GHG emissions.”

**Proven & emerging
technologies**

**Supportive policy
environment**

Academic expertise

Funding

Leadership

