ANNUAL REPORT

2020

SAEWA

Southern Alberta Energy from Waste Association

CHAIRPERSON'S INTRODUCTION

Dear SAEWA Members,

We have worked so hard to get here, let's not lose site of the goal as we are closer than we have ever been. We have had victories and challenges. At times more challenges than victories but we have managed to stay strong through our membership and focus in finding a solution to landfilling.

With our commitment to this process and the scientific research, we are paving the way for an Energy from Waste Facility to be built in Southern Alberta that will be the solution to landfilling for our members.

I know we are all faced with great economic challenges as we go into our 2021 budget process and we have bigger challenges than we have ever had or at least through my tenor. While we are tasked with bringing forward the leanest budgets possible SAEWA respects the difficult choices we all have to make and we ask that you consider that we are almost at the goal post and we need the support of your membership to get to the finish line. The development of the facility will benefit all of us, it has been one of our most important investments through the membership fees you have invested since 2012. The return will be exceptional, as it will benefit through job creation to the count of 480 plus jobs during construction and 50 plus post professional jobs, attracting investment, supply chain and services, co-generation partnerships, sale of energy and process steam, sale of ash and minerals, carbon credits, and opportunities to attract innovation in the treatment and monitoring systems for EfW. I remind you of projects like the Lacombe Biorefinex that our Province has committed $10 million towards – with the announcement of 50 jobs. So, to give you an idea of the type of impact the SAEWA EfW Facility will bring economically is huge and the environmental clean energy impacts of this project will put this Province back in the green. (Please see appendix 1 and 2 inserted into the report.)

It has never been more important that we bring investment to Alberta. Your commitment in support of moving towards the finish line has never been more important either so I honor your participation and strength in staying committed towards the vision to see the EfW Facility built in Southern Alberta within our footprint.

Thank you to all our members, our supporters, and our champions!

Tom Grant, SAEWA Chair

Dear SAEWA Board of Directors,

If I were to compare two years in the history of the organization, few would define our progress as much as 2019 and 2020 have. We managed to trail blaze through a Transportation Study, Lifecycle Analysis for EfW, Detailed Business Planning, a precedent setting Site Selection Study where we received 11 Expressions of Interest which has been unheard-of wanting to compete to host an EfW Facility, and after an extensive scientific process of review & analysis of the potential sites a preferred site was successfully selected in co-location of the Newell County Landfill.

We are now seeing more and more business proposals coming forward wanting to work with SAEWA to see the project concept come to commercialization.

As we lean in on co-generation potential for EfW and the partnership opportunities the value of this project continues to increase – this Province needs bold potential in the form of Clean Energy and Job Creation to stimulate our economy if we are going to perform triage on the systemic effects of Pandemic and tumbling Oil & Gas revenues effects on the economy.

I have seen how this membership group bounds together to make change to move the project forward against all odds. There were many who for whatever reason have thought that SAEWA would not accomplish taking the project development this far.

As we frame the discussions going forward around investment and financing, we are watching the EfW Facility development unfold and come to life. Together **we will** make this happen!

I am honored to have worked with you along the journey – and yes they say its not a race it's a marathon….it has been that, but it has been worth all the work, perseverance and tenacity and many late nights emails, I admit I have worked many late hours and apologize for the late emails however that is why we have made such as great team as we have pushed through all challenges, and most importantly we continue to remove the obstacles to find the solutions we require.

Thank you all, I am proud of the energy we have brought together in moving this project forward!

Sherry Poole
SAEWA, Executive Director

Reflection – 2019

Thanks to the support of the Province of Alberta Community Partnership Fund making it possible for SAEWA to accomplish some of the most important work that involved analysing 11 potential municipal sites all wanting to host the Energy from Waste Facility, we even had one submission from a past member. The engineering study and field testing took over a year to complete with several weather threat risks. After a very intense review process SAEWA did successfully select a preferred site co-located to Newell County Landfill noting that the Vulcan County Site submission #2 was rated as equally promising however the benefits co-location to the JBS Facility did place the Newell Site for stronger consideration.

We know the journey has been long, we hear the frustration and share it equally but also optimistically as we have accomplished 8 years (2012 – 2020) of project engineering development and feasibility proving science that has brought us cautiously but continually along in proof of the concept of EfW as a solution to landfilling.

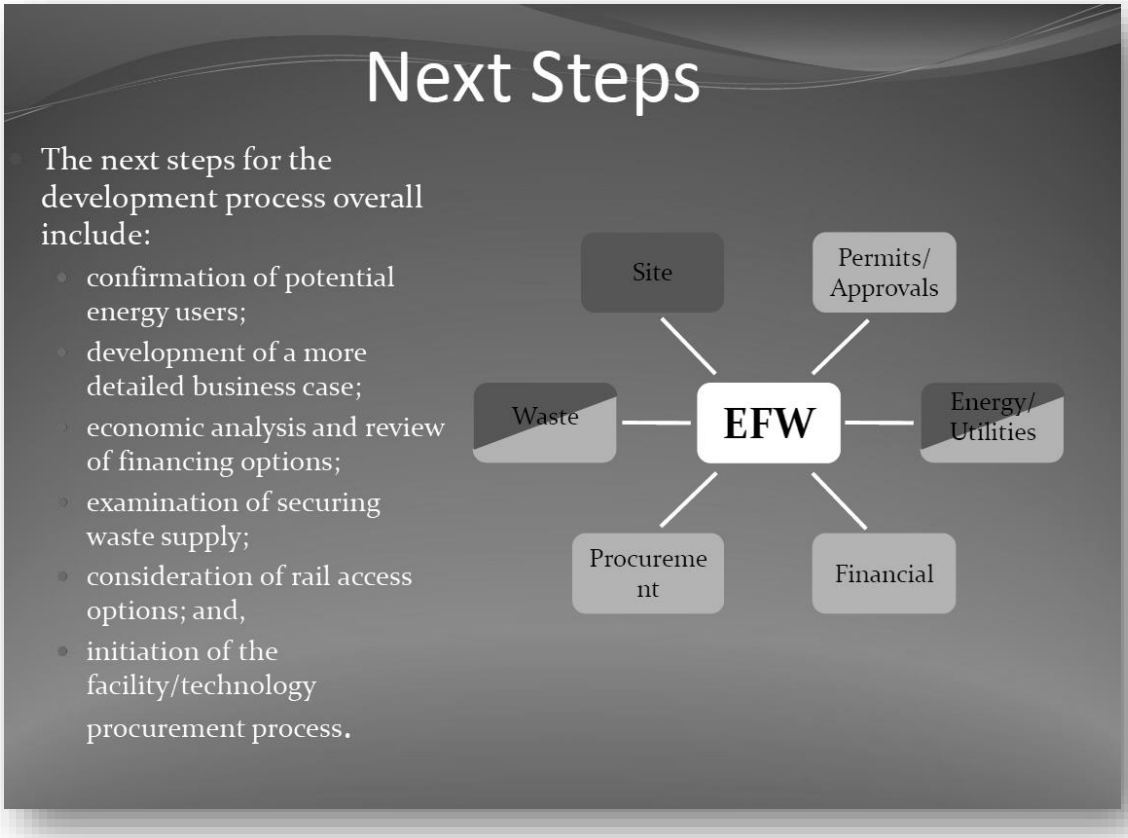
Pathway to Success – work completed:
($1.5 million dollars engineering work completed)

2012 – Energy from Waste Feasibility Study
- Task 1: Waste Generation and Sizing
- Task 2: Combustion Technology Evaluation
- Task 3: Waste Collection, Transportation and Handling
- Task 4: Heat Recovery and Cogeneration Options
- Task 5: Air Emissions GHG & Control Options
- Task 6: Permitting Requirements
- Task 7: Capital and Operating Costs

2013 – Energy from Waste Process Planning & Communication Plan
2014 – SAEWA Initial Business Plan
2015 – SAEWA Member Waste Characterization Study and Report
2016 – SAEWA Detailed Business Plan
2017 – U of A Transportation Study and Tool completed
2018 – Energy from Waste Life Cycle Analysis (LCA) completed proving 300, 000 tonnes waste conversion to mitigation of 7 million tonnes GHG
2019 - Siting Expression of Interests and Site Study Analysis and Geo Testing
2020- Siting Selection Review & Analysis and Newell County Site Announcement

Moving Forward with Confidence - 2020

With the siting selection completed we have made significant headway in moving the project towards commercialization. The timing for completion was pivotal to the project not being slowed down due to the pandemic crisis we have been faced with. We were very fortunate to have completed the work prior to Spring 2020 allowing SAEWA to forge ahead.



The greatest challenge has always been sourcing grant funding to complete the work. Paul Ryan, SAEWA's Vice Chair and Project Lead has said it best: "If someone came along with deep pockets we would have had the project built years ago" we understand the frustration with delays and those frustrations are all of ours.

We require a budget of $1.8 million to move forward with commercialization of the project that involves next steps:

1. Confirmation of potential energy users;
2. Development of a more detailed business case;
3. Economic analysis and review of financing options;
4. Examinations of securing waste supply;
5. Consideration of rail access options, and
6. Initiation of the facility / technology

To push the project forward to procurement.

Similar projects with private funds have taken 11 – 13 years to get where SAEWA is. Durham / York Covanta (DYEC) followed the same timelines.

Check out the Durham / York Covanta Tour - https://www.youvisit.com/tour/covanta/94489

We thank all our members for their support.

Summary of Environmental Benefits of EFW Facilities

Through application of advanced technologies, solid waste can now be considered a resource to create energy and other materials. Doing so allows conservation of natural resources that would otherwise be used. As populations increase, the amount of residual waste requiring disposal is expected to increase proportionately, limited only by the impact of up-stream "reduce" and "recycle" actions to lessen the amount of waste destined for landfills. Failure to capitalize on using waste as a resource can negatively impact the environment through:

- increased consumption of natural resources, such as fossil fuels;
- increased emissions of pollutants including greenhouse gases (GHGs); and
- increased permanent loss of land used for landfills.

Allowing resources to go to landfill as waste increases GHG emissions associated with landfill operations and emissions of landfill gas produced by the decomposing waste. Methane, a powerful GHG with more than 30 times the 100 year global warming potential of carbon dioxide, is a major component of landfill gas.

Many tonnes of natural resources must be used to replace each tonne of material that is disposed of in a landfill. Extraction and refining of natural resources are responsible for the majority of the energy inputs and pollution emissions (including GHGs) associated with consumer products.

The objectives of Energy from Waste (EFW) facilities are diversion of waste from landfill to minimize the impact on the environment, and use of wastes as a resource for energy production and the recovery of recyclable materials.

The environmental benefits of an EFW facility are:

- reduction in volume of waste sent to landfill;
- reduction in fossil fuel consumption for on-site landfill equipment operations;
- recovery of ferrous and non-ferrous metals from waste (resource recovery);
- reduction in use of natural resources;
- reduction in land used for landfills;
- reduction in waste-related GHG emissions;
- generation of electricity for use on-site and/or for sale to the grid;
- potential generation of steam energy for sale to nearby consumers;
- potential creation of marketable materials from EFW residues; and,
- return of the land to a useful purpose at the end of the EFW's facility's life-span.

Resource recovery also has socio-economic benefits. Studies have shown that recycling can create up to seven times more employment than landfilling.

Various EFW technologies were evaluated based on feasibility for use in the SAEWA system. These included refuse derived fuel with combustion; mass burn combustion; gasification; and plasma arc gasification. An evaluation was completed for each of the technologies to compare the potential environmental impacts from each technology option against those from landfill disposal for the same quantity of waste. Based on the evaluation, when compared to landfill disposal, use of a 300,000 tonne/year mass burn EFW facility in the SAEWA waste system results in the following estimated environmental benefits:

- a reduction of approximately 218,000 L/yr in on-site equipment fuel usage (a 62% reduction);
- a reduction of approximately 120,000 tonnes/yr of waste to landfill (a 60% reduction);
- an increase of approximately 5,400 tonnes/yr of ferrous and non-ferrous metals recovery from waste;
- an increase of approximately 205 MWh/yr of electrical energy generated; and,
- an average reduction of approximately 236,000 tonnes CO_2E/yr of GHG emissions (a 95% reduction), which equates to 7,098,166 tonnes of CO_2E reductions achieved over an assumed 30 year life-span of the EFW facility.

Socio-Economic Impact of a Proposed Energy-from-Waste Facility in Newell County

A Better Waste Management Alternative

- The proposed Energy-from-Waste facility to be located in Newell County, is planned to process a maximum of 300,000 metric tonnes of municipal solid waste per year from various SAEWA member municipalities and other waste generators across southern Alberta.
- The primary purpose of the facility is to divert waste streams from landfill sites resulting in GHG emission reductions estimated at 7 million metric tons of CO2-equivalents – equivalent to taking over 53,000 vehicles off the road, and currently valued at $75 million over the lifecycle of the project.
- The facility would generate approximately 205,000 MWh of electricity per year – enough to power over 28,000 homes, resulting in annual revenues of at least $11 million per year. Additionally, alternative energy sales opportunities such as selling steam to neighbouring industrial facilities could also prove to be even more valuable.
- The facility is also estimated to recover 5,400 metric tonnes of metal annually for recycling.
- Other waste streams could also be processed at the facility, including railway ties, specified risk materials, and other unique waste streams from local industrial facilities.

Economic Impacts

- Development of the 300,000 tonne scale EfW facility in Southern Alberta will stimulate the energy and value-add economy which directly represents key pillar priorities framed within the Province's Recovery Plan economic diversification and energy innovation goals.
- The construction of the facility will create approx. 490 high-paying jobs over 3 years (1,471 job-years) generating approx. $108 million in employment income, generate approx. $442 million in business revenues (mainly in Alberta), and add approx. $183 million in GDP.
- The ongoing operations of the facility will create an additional approx. 57 direct permanent jobs and approx. 69 indirect jobs (for a total of 126), generating approx. $11 million in employment income.
- The EFW facility will spur additional economic development. The facility has the ability to use steam energy for district heating enabling co-location such as greenhouse, agricultural production, anaerobic digestion facilities and further providing energy to nearby industries such as meat packing plants.

Detailed Economic Impact Estimates

Table 1: Impact of Facility Construction, Cumulative over Construction Period

Type of Effect	Output, $M	GDP, $M	Employment Income, $M	Jobs (Job-Years)	Average Salary, $
Direct	$281.1	$89.5	$60.2	762.4	$78,927
Indirect	$106.7	$55.7	$33.6	435.4	$77,146
Induced	$54.3	$38.1	$14.0	273.4	$51,337
Total	**$442.2**	**$183.3**	**$107.8**	**1,471.3**	$73,272

Note: monetary values are in 2015 dollars.

Table 2: Impact of Facility Operations, Average Annual

Type of Effect	Output, $M	GDP, $M	Employment Income, $M	Jobs	Average Salary, $
Direct	$24.7	$12.2	$5.9	56.8	$104,429
Indirect	$14.0	$6.9	$3.5	42.6	$81,355
Induced	$5.3	$3.7	$1.4	26.6	$51,389
Total	**$44.0**	**$22.8**	**$10.8**	**126.0**	$85,421

Note: monetary values are in 2015 dollars.