CITY OF EDMONDS

CITY COUNCIL PRESENTATION

MAY 26, 2020

These projects have been completed in partnership with:

PRESENTATION GOALS

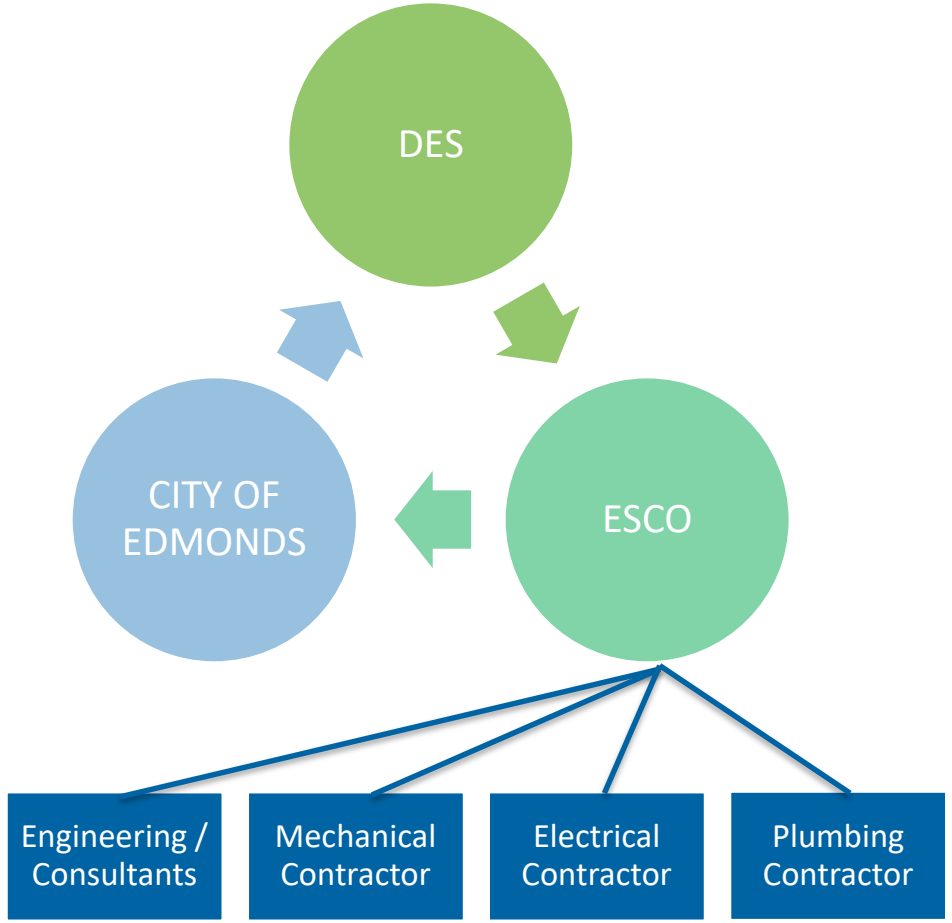
- Conduct a brief overview of the various energy programs the WWTP has participated in since 2012.
- Provide a brief overview of the ESCO process
- Discuss ESCO Phase 6 – including the Carbon Recovery process, Resolution 1389 impacts, O&M expenses, and the ESPC contracting methods
- Share evaluation of Project A and B
- Share staff recommendation and independent engineering review
- Answer questions.

These projects have been completed in partnership with:

ENERGY SAVINGS PERFORMANCE CONTRACTING (ESPC)

- An ESPC is a contract between an energy services company (ESCO) and the Washington State Department of Enterprise Services (DES), under which the ESCO guarantees a not-to-exceed cost, system performance, and energy savings to the client (Edmonds).

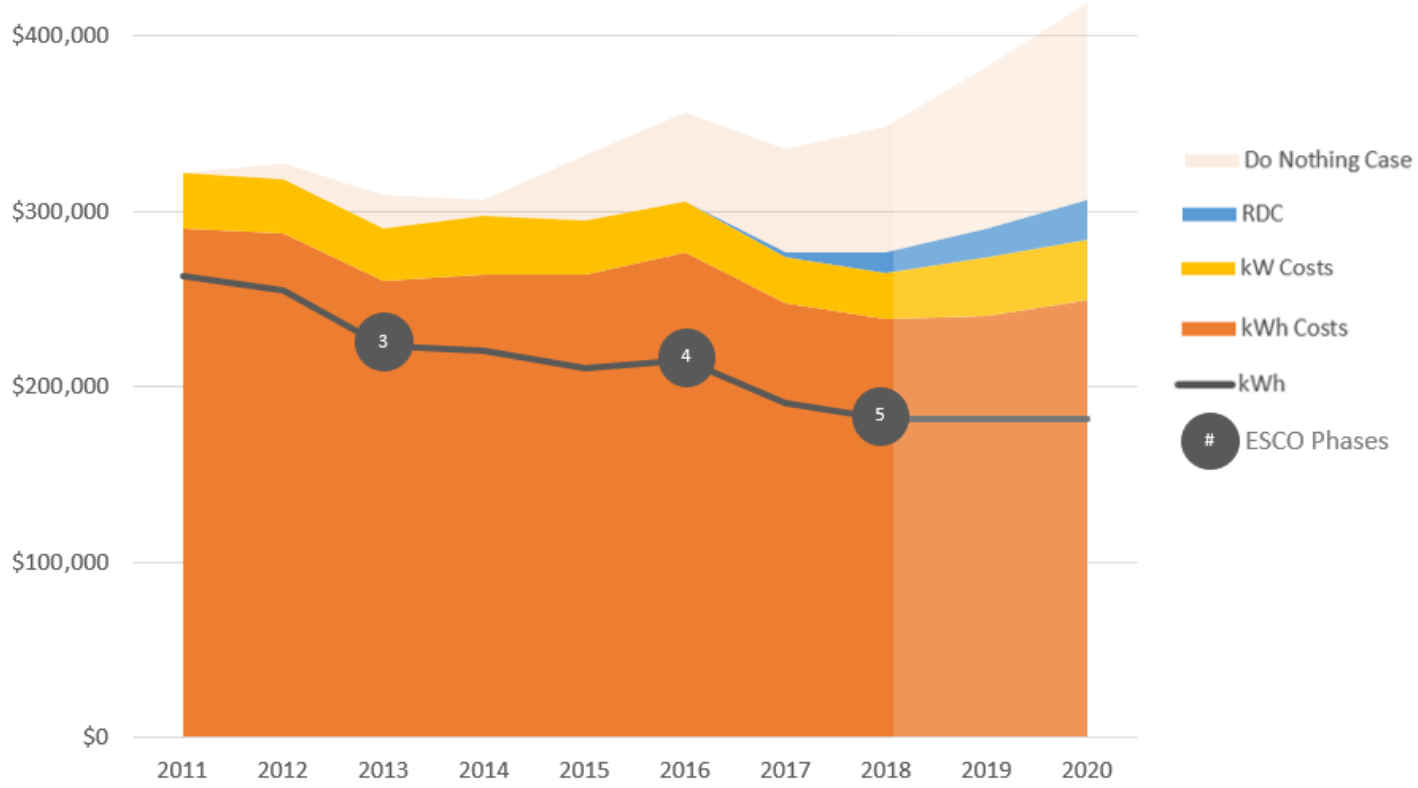
- Under this program:
  - Major project risks are shifted from client to the ESCO.
  - ESCO provides single-source of accountability and enhances customer control of equipment & sub-contractor selection.
  - DES manages contract and provides oversight
  - Reduces future energy costs and uses the savings to pay for infrastructure improvements implemented today.



These projects have been completed in partnership with:

PLANT ENERGY AND COST TRENDS RESULTING FROM ENERGY PROJECTS

Energy usage & demand trending downward,
while costs are trending upward due to RDC charges and rate increases



ENERGY INCENTIVES, GRANTS, AND PERFORMANCE

- 2010 Plant staff began working with SNO PUD and entered into an Energy Challenge – since then we have received approximately $304,000 in PUD revenue to complete energy efficiency projects. We anticipate the Carbon Recovery project incentive is estimated to be $20,000.

- The project will receive a $250,000 grant from the Department of Commence.

- We anticipate another round of Department of Commerce funding this year. The project should rank very high.

These projects have been completed in partnership with:

CITY COUNCIL OVERSIGHT – PATH TO SUSTAINABILITY

- August 2014: Staff laid out a long-term plan in a presentation titled “Putting it all Together”. The long-term plan included a staged approach outlining a pathway for this next project.
- After successful completion of Phase 3 & 4 energy projects, we approached City Council with the Phase 5 project which outlined the necessity of upgrading solids handling equipment in preparation for the future Carbon Recovery.
- April 10, 2018: Parks and Public Works Committee reviewed the project and recommended it be placed on the April 17th City Council agenda for presentation, discussion, and action.
- April 17, 2018: City Council approved the predesign effort. The work was completed on time and within budget during 2018.
- City Council authorized funding for the design of the WWTP Phase 6 Energy Conservation Project - Carbon Recovery in the 2019 budget.
- In early 2019, the project team began development of Project B. Project B can reduce construction cost significantly, does not require a new building, increases carbon recovery and reduces the environmental impact of odor control .

These projects have been completed in partnership with:

PATHWAY TO SUSTAINABILITY

High Efficiency Blower

Project saves: $33,909/yr. and 345 tons CO_2, equivalent to:

- 36.5 home's energy use for one year
- 799 barrels of oil consumed

Aeration & Blower

Project saves: $34,062/yr. and 264 tons CO_2, equivalent to:

- 27.9 home's energy use for one year
- 611 barrels of oil consumed

Dewatering

Project saves: $133,211/yr. and 537 tons CO_2, equivalent to:

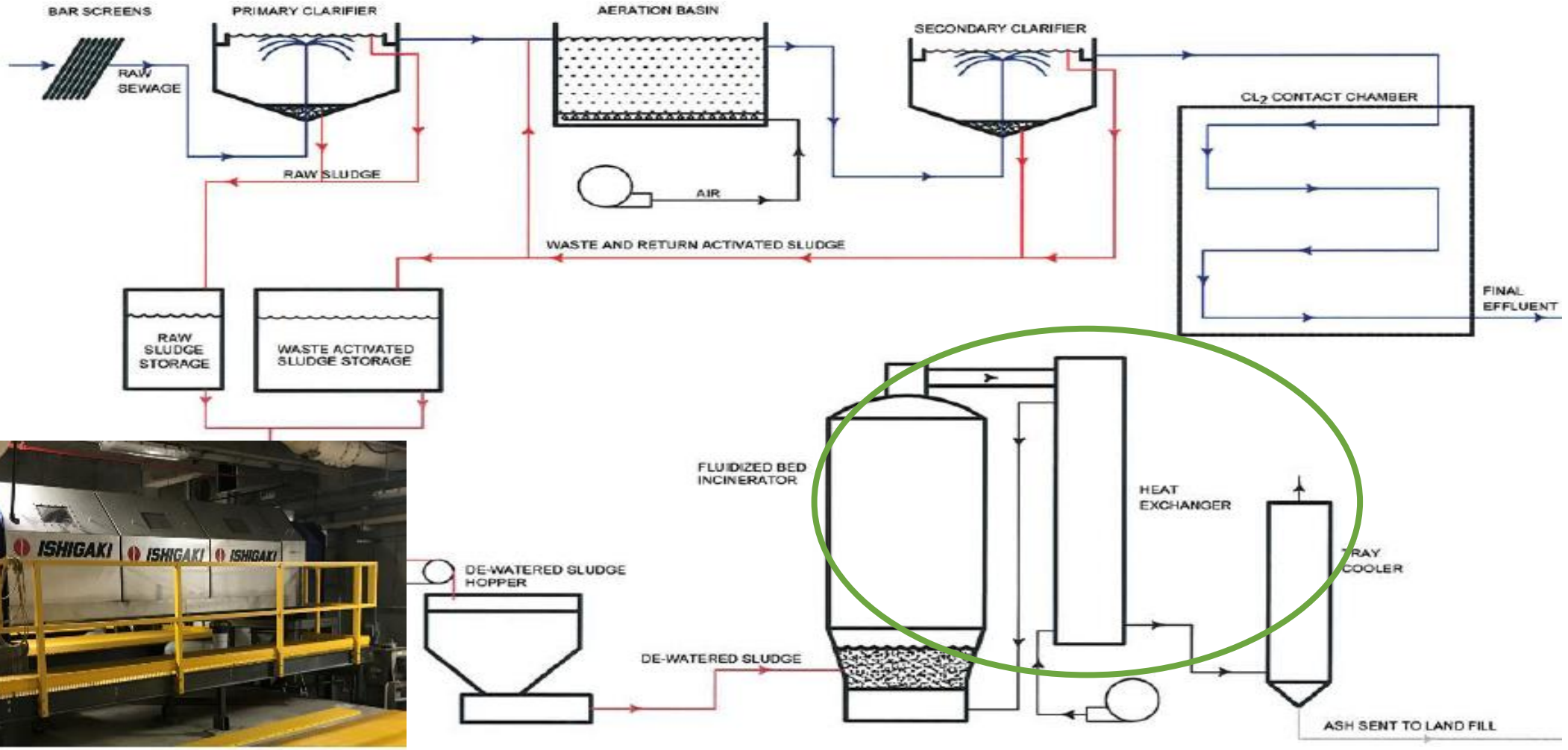
- 56.7 home's energy use for one year
- 1,243 barrels of oil consumed

Carbon Recovery

This phase will focus on the sewage sludge incinerator efficiency. We are evaluating options to reduce operational costs and the environmental footprint. Opportunities include clean gasification and drying the biosolids to create a high-nutrient soil amendment product.

These projects have been completed in partnership with:

EDMONDS WWTP PROCESS FLOW



These projects have been completed in partnership with:

PROJECT DRIVERS

- Equipment has high O&M cost in terms of electrical usage, disposal costs, operations staffing, repair & maintenance and emission controls - over $700,000/year
- The equipment is currently operating significantly beyond its useful life expectancy – **in operation 30 years.**
- The equipment was installed at a time when the need to reduce energy and reuse of bi-products was the not a focus.
- Regulatory burden has significantly increased with the new sludge incinerator regulations under 40CFR Part 60 Subpart O.
- § 60.150 states compliance with new emissions standards must be met… *"When the cumulative cost of the changes over the life of the unit exceeds 50 percent of the original cost of building and installing the unit (not including the cost of land) updated to current costs."*

These projects have been completed in partnership with:

REGULATORY TRIGGER FOR REPLACEMENT

- Must meet New Source Performance Standards for air emissions (USEPA) at the point where total investments in an existing, grandfathered incinerator (Edmonds) exceed 50% of its original cost after factoring in inflation
- Analysis of Edmonds WWTP Incinerator repair & maintenance history shows we are nearing 43% at this time
- Spreadsheet calculations for this requirement are attached in agenda packet

These projects have been completed in partnership with:

BASIC OPTIONS AVAILABLE FOR REPLACEMENT

- Replace with a new incinerator
  - Appeared to be the second most expensive option after initial screening
  - Does not measurably improve environmental performance including Carbon footprint
  - Regulations on incineration may well continue to get more stringent
- Build conventional digesters followed by production of EQ Biosolids for land application
  - Most common current approach
  - Edmonds does not have space for digesters on site
  - Any expansion of our footprint in downtown would be very difficult
  - Likely the most expensive option
  - Wintertime management of land application systems
  - Long-term costs of hauling and possibly storage are very high and energy intensive
  - Does not address PFAS residues

These projects have been completed in partnership with:

BASIC OPTIONS AVAILABLE

- Pyrolysis/Gasification options
  - Can produce a range of useable end products
  - More energy efficient
  - Reduce carbon emissions
  - These approaches have been commercially available for many years
  - Most installations in this Country have been for organic wastes like agricultural manures, wood chips, and other feedstocks. Examples using Municipal biosolids are limited but growing

Comparison of these two approaches environmentally and financially is the focus of this presentation

These projects have been completed in partnership with:

OPTIONS A & B

- Option A – Pyrolysis
  - Bioforcetech/Centrisys
  - Produces dry, pelletized biochar
  - One existing WWTP biosolids installation

- Option B
  - Ecoremedy
  - Can potentially produce either Exceptional Quality (EQ) biosolids for direct land application, Biochar, or mineral intensive dry residue with little to no remaining carbon
  - One existing WWTP biosolids installation

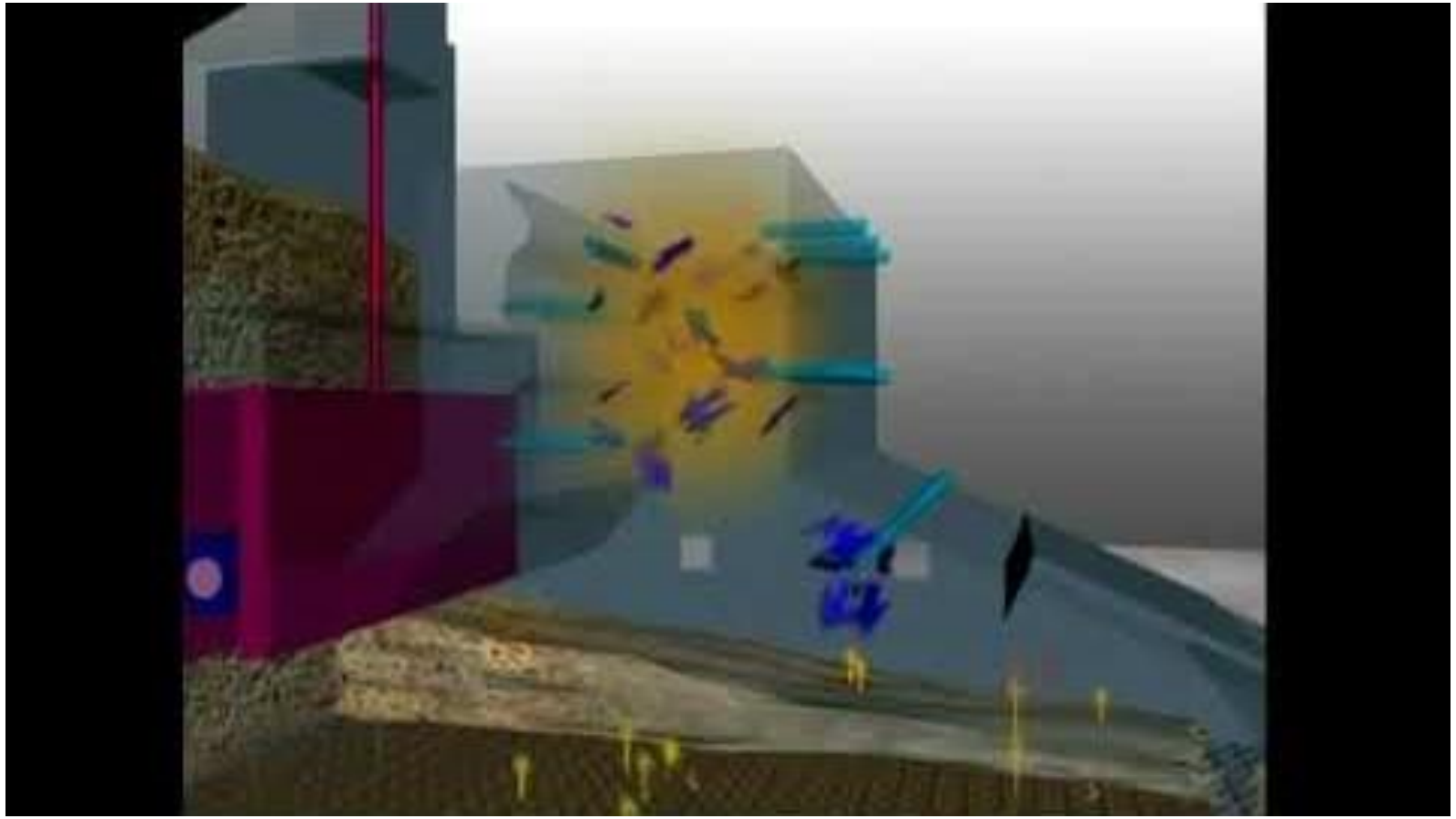
These projects have been completed in partnership with:

PROJECT A - PYROLYSIS

- To be added

These projects have been completed in partnership with:

CITY STAFF RECOMMENDATION – PROJECT B



Utilities	Existing Incinerator (Baseline)	Project A Pyrolysis Centrisys	Project B Gasification Ecoremedy	Unit
Utilities	$163,566	$193,479	$126,666	Total $/yr
Odor Control Chemicals	$47,768	$74,826	$3,009	Total $/yr
Polymer	$160,000	$160,000	$56,000	Total $/yr
Screenings				tal $/yr
Labor				tal $/yr
Annual Maintenance	$89,951	$52,000	$35,000	Total $/yr
Regulatory	$172,183	$120,000	$60,000	Total $/yr
Hauling	$36,000	$0	$36,000	Total $/yr
Sub Total All Costs $/yr	$991,193	$957,575	$649,946	Total $/yr

Savings of $341,247 can provide the revenue stream to cover $5,250,000 in debt Service (2.7% @ 20 years levelized)

These projects have been completed in partnership with:

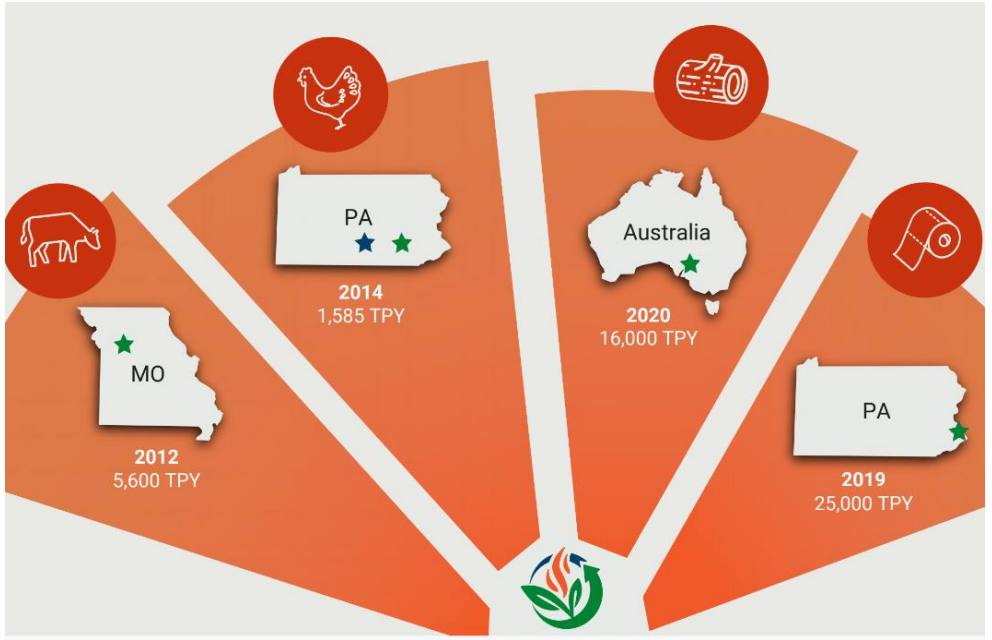
CARBON RECOVERY PROJECT COMPARISON

	Project A	Project B
Price – Construction Est.	Higher construction costs.	Lower construction and installation costs.
Utility Cost to Operate, annually	$190,630 (higher than baseline)	$123,468 (lower than baseline)
One-time incentive from PUD	$0	$20,000 estimated from utility
Carbon Footprint	Increased natural gas to dry biosolids.	Increases carbon recovery. Utilizes screenings and biosolids as fuel.
O&M Cost	Higher trucking and chemical costs.	Lower trucking and chemical costs.
Ease of Construction	Requires new building.	Uses existing building footprint.
Simplicity of System	Integrates 12 vendor packages. Double pieces of equipment needed.	Meets City standards for controls, less equipment. Turn-key supplier.
Warrantee/ Risk	Lower startup period.	Single-source technology supplier. Longer start-up and commission period. Ongoing optimization included.

These projects have been completed in partnership with:

BENEFITS OF PROJECT B - GASIFICATION

- Most efficient, affordable to implement and lowest cost to operate.
- Produces environmentally –friendly end product (biochar) while generating its own thermal conversion from the biosolids. This will move the City closer to achieving the goals established in Resolution 1389
- No acidic side stream or hazardous waste is produced
- Biochar will be purchased for land application in eastern WA.
- The technology has been permitted by EPA as a non-incineration process in other regions.



Ecoremedy successful biomass projects.

These projects have been completed in partnership with:

FUTURE ENERGY PROJECTS

- Influent pump replacement
- High efficiency motors for fans and pumps
- Energy management page and development of KPI’s for daily monitoring
- Continued lighting upgrades
- Replace effluent gravity valve

These projects have been completed in partnership with:

ACTION – NEXT STEPS

Request that the City Council instruct staff:

- To return next week with a specific set of performance guarantees and a Gmax price to replace Edmonds' aging SSI with a gasification system supplied by Ecoremedy (Project B).

- The requested action at that time would be to authorize the Mayor to sign an agreement with the Department of Enterprise Systems for delivery of this project.

- Further Council action in 2020 will likely include selling revenue bonds to support the project.


Questions?