

Notes

Energy Smart Industrial

Utility Focus Group Meeting

January 11, 2022

Facilitator:

Eric Mullendore
Commercial and Industrial Sector Lead
Energy Efficiency
Bonneville Power Administration

Attendees



<u>Name:</u>	<u>Company Name:</u>
Alan Fraser	Tacoma Power
Ashley Stahl	City of Centralia
Brandy Neff	PNGC Power
Charlie DeSalvo	Columbia REA
Eli Volem	EWEB
Elliott Zimmermann	Seattle City Light
Eric Hector	Grant PUD
Eric Miller	Benton REA
Grant Weaver	Clean Water Ops
Jason Bird	City of Idaho Falls
Jen Langdon	Cowlitz PUD
Jon Kloor	Consumers Power
Kelly Haugh	Big Bend Electric
Kelsey Lewis	Snohomish PUD
Lori Froehlich	Clark Public Utilities
Matt Walker	Tacoma Power
Maurilio Lopez	Franklin PUD
Mike Arend	Columbia River PUD
Rich Cole	Grant PUD
Robert Frost	Benton PUD
Ryan Westman	City of Milton-Freewater
Tara Maynard	Grays Harbor PUD
Ted Brown	Seattle City Light
Terry Mapes	Benton PUD
Zeecha Van Hoose	Clark Public Utilities

<u>Name:</u>	<u>Company Name:</u>
Brice Lang	BPA, Contract Officers' Technical Rep
Eric Mullendore	BPA, C&I Sector Lead
Jacob Schroeder	Cascade, Energy Management Manager
Jennifer Wood	BPA, Contracted Program Specialist
Josh Rice	BPA, Student Intern
Kyle Barton	BPA, ESI Program Manager
Margaret Lewis	BPA, EE Programs Manager
Mark Ralston	BPA, Energy Efficiency Representative
Max Reichlin	Cascade, ESIP
Nathan Kelly	BPA, Engineer
Richard Jackson-Gistelli	Cascade, Wastewater Sector Specialist
Ryan LeBaron	BPA, Energy Efficiency Representative
Shelley Layton	Cascade, Program Specialist
Steve Martin	Cascade, ESI Operations Manager
Todd Amundson	BPA, Industrial Technical Lead & Engineer
Tony Simon	Cascade, ESIP/ESIP Lead

Eric Mullendore: Welcomed everyone, reviewed the meeting agenda

Agenda		Energy Smart Industrial
BPA EE and ESI program updates <ul style="list-style-type: none">• Safety Update• BPA and ESI program updates• Upcoming training opportunity	Eric Mullendore Steve Martin Richard Jackson-Gistelli	11:00 – 11:20
Utility updates and project spotlight <ul style="list-style-type: none">• Snohomish PUD• Seattle City Light	Kelsey Lewis Ted Brown, Elliott Zimmerman	11:20-11:40
UFG Open Forum	All	Remaining time

4

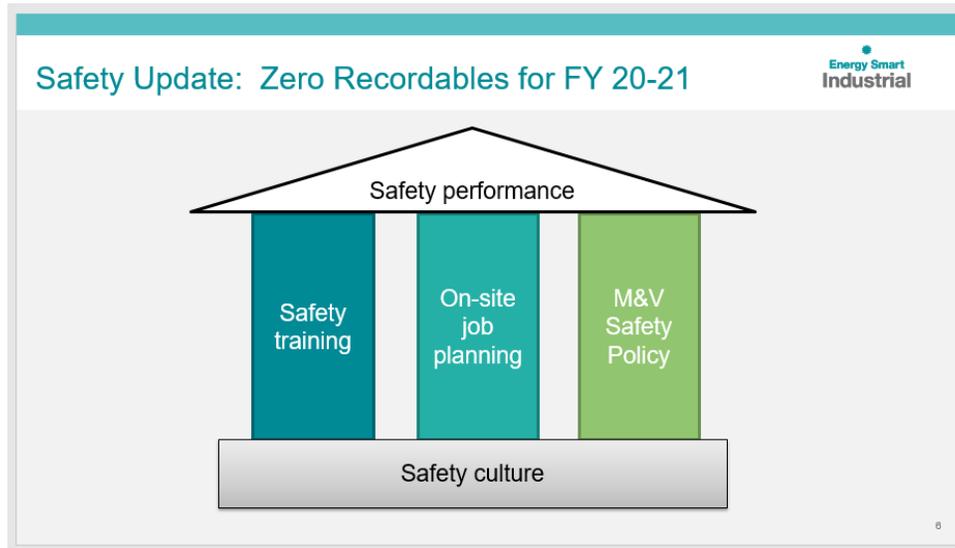
Join me in welcoming a few new faces to this group...

Welcome New UFG Participants!		Energy Smart Industrial
 Ryan Westman		 Mike Arend  COLUMBIA RIVER PUD A COMMUNITY-OWNED UTILITY

5

Steve Martin: Safety Update [Slide 6]

Safety is a shared value by everyone on this call...top value, extremely critical.



ESI promotes a culture of safety. We cover the topic of safety (timely topics) during our weekly staff meetings. On January 7, Tony Simon (ESIP) lead a discussion on winter driving, we've included a link to the information – from the National Highway Traffic Safety Administration <https://www.nhtsa.gov/winter-driving-tips> -

Our safety program is based upon three main pillars:

- Regular safety training: electrical safety, fall protection, ergonomics for office work, etc.
- On-site job planning: task hazard analysis, lock-out /tag-out, etc.
- M&V Safety Policy: Which limits exposure to energized equipment. De-energize or find another way to log energy use.

All three of these are to keep everyone safe and we were able to achieve zero reportable incidents over the last rate period.

Steve M.: COVID commitments [Slide 7]

It's almost two years since COVID-19 emerged and the ESI program has adapted by following these four commitments. These commitments were originally shared with UFG members during our July 2020 presentation.

Our team began to ramp up field work to help industries get the work done.

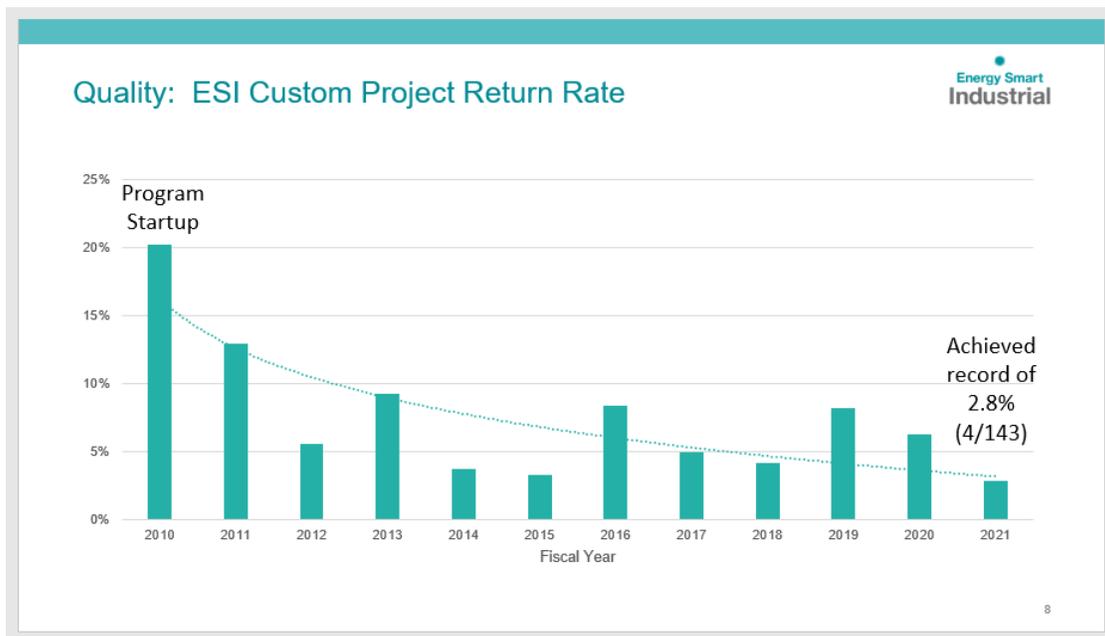
Our ongoing commitments

- Compliance with local, state, and federal regulations
- Coordination with utility staff before site visits
- On-site mask wearing and social distancing for the protection of others
- Staff performing site visits have no known symptoms or exposures

7

Custom Project Quality [Slide 8]

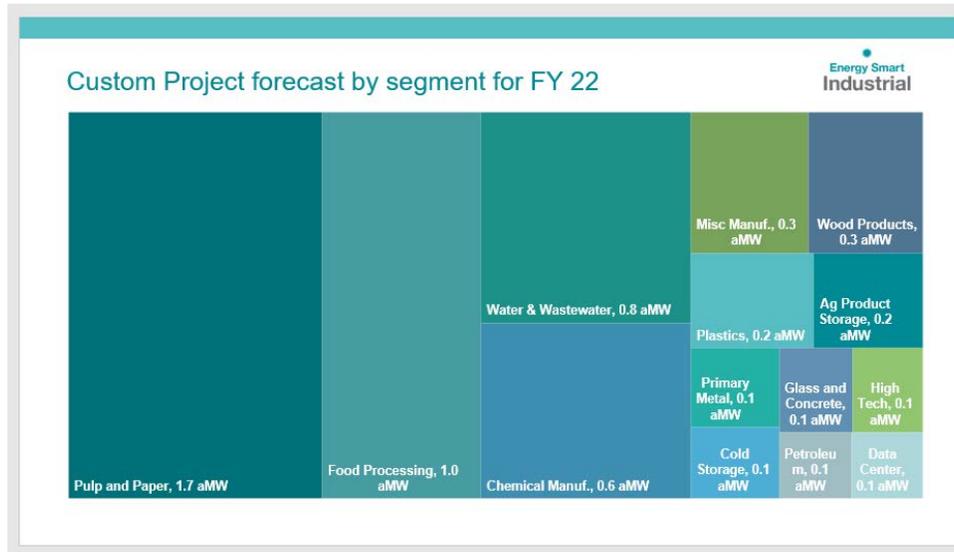
Our objective is for projects to be technically sound and meet all IM requirements. Any projects returned for modification is what is tracked. Last year was the best year. We are looking for ways to improve.



The Impact evaluation and your feedback should help us continue to improve.

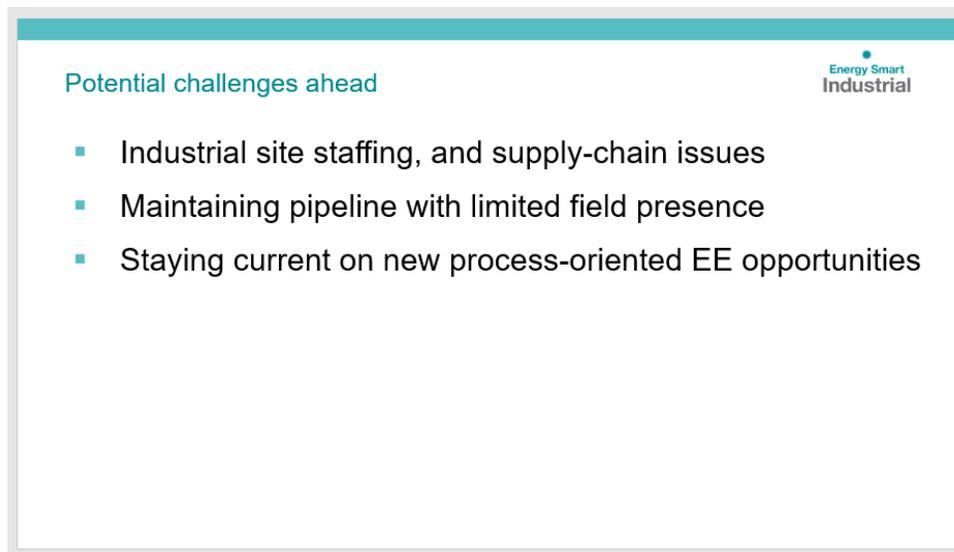
Steve M.: FY22 CP Forecast [Slide 9]

The Industrial sector is fun – we get to work with many different industries and industry segments...this slide shows our top 14 segments. Pulp and paper – has kept the top spot – many are being retooled to become box plants. Food processing #2 and Water/Wastewater #3 on the rise, as a result of SEM cohort participation and their need to improve infrastructure.



Challenges [Slide 10]

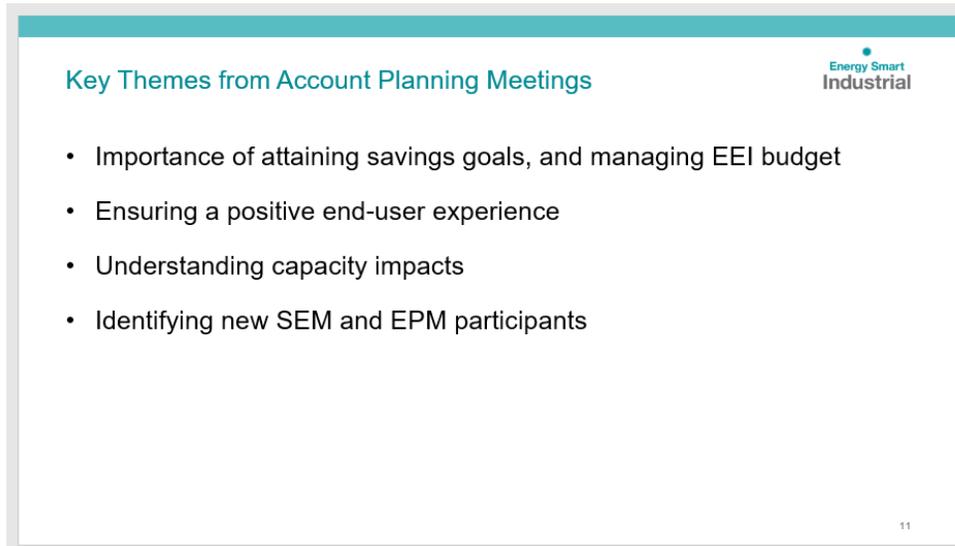
The project pipeline is healthy – but the implementation environment can be very challenging, especially with the latest Omicron variant. Only a few project have been cancelled – what's more common has been prolonged lead times, commissioning delays, facility staffing and supply chain issues.



We need to be resourceful and with existing relationships we can start looking deeper into core processes.

Steve M.: Key Themes [Slide 11]

One key goal is achieving program savings targets – below are other key themes from the account planning process. Helping you manage your EEI budgets – we are here to support your end-users ensuring they have a positive experience with the ESI Program. Capacity impacts are becoming a growing interest – not just magnitude but also when it hits. And there are new opportunities for placing Energy Project Managers, with the new SEM and EPM measures – especially with the reduction of energy savings thresholds from 1 million kWh down to 200,000 kWh.



Energy Smart Industrial

Key Themes from Account Planning Meetings

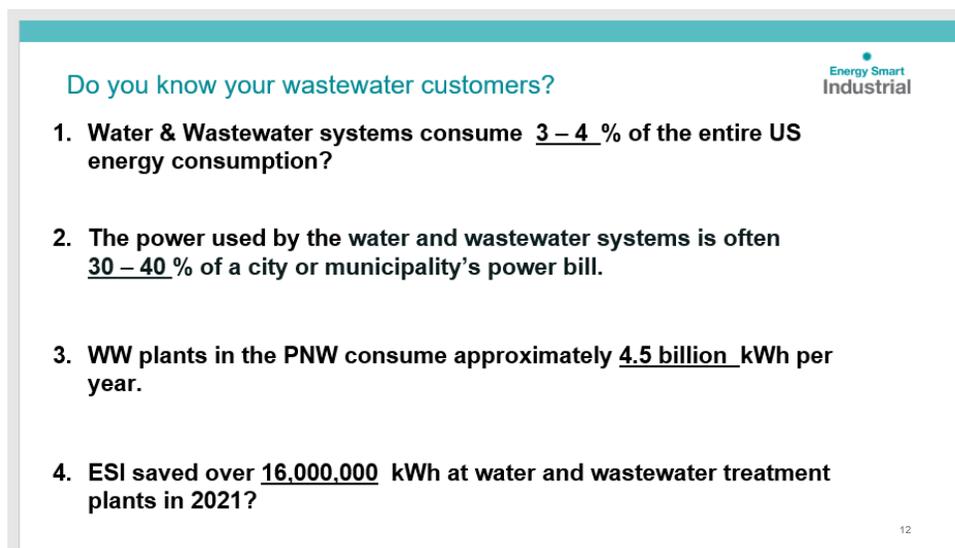
- Importance of attaining savings goals, and managing EEI budget
- Ensuring a positive end-user experience
- Understanding capacity impacts
- Identifying new SEM and EPM participants

11

There will also be industrial training opportunities to be offered such as last year's Compressed Air training. The ESI program has developed a Municipal Wastewater training. Richard Jackson-Gistelli was formerly an ESIP down in Southern Oregon, and he will be delivering the training in February. He is here to talk more about it, Richard...

Richard Jackson-Gistelli: Wastewater Quiz [Slide 12]

Some of you may know me from my days working at Emerald PUD...been doing energy efficiency for a LONG time.



Energy Smart Industrial

Do you know your wastewater customers?

1. **Water & Wastewater systems consume 3 – 4 % of the entire US energy consumption?**
2. **The power used by the water and wastewater systems is often 30 – 40 % of a city or municipality's power bill.**
3. **WW plants in the PNW consume approximately 4.5 billion kWh per year.**
4. **ESI saved over 16,000,000 kWh at water and wastewater treatment plants in 2021?**

12

Richard J-G.: If anyone did not know one of those answers, I would encourage you to attend.

Energy Smart Industrial – Wastewater Training [Slide 13]

ESI's Wastewater Training

Energy Smart Industrial

- **Training for Utility Energy Services Personnel**
 - What happens at a Wastewater Treatment Plant (WWTP)?
 - Why do WWTPs they consume so much energy?
 - How do we engage with our Wastewater customers?
 - What opportunities are there for energy efficiency at a WWTP?
 - What is DO, BOD, RAS & WAS, and UV?
 - What is activated sludge?
 - What is an Oxidation Ditch?

13

This training is for Utility Energy Services Personnel – here are some questions that will be covered/answered during the training.

Richard J-G.: How to Participate [Slide 14]

The ESI program will be offering three different trainings, next month:



How to participate

Energy Smart Industrial

- All workshops will be held using a MS Teams meeting
- Workshops will start at 11:00 AM PST.
- The tentative dates & topics are:
 - February 9th, 2022: Wastewater Plant, Process, and Industry Overview
 - February 16th, 2022: Energy Efficiency Opportunities @ WWTPs
 - February 23rd, 2022: Engaging with Your Wastewater customers

14

We'd like to share some awesome wastewater examples. Kelsey Lewis, SEM Program Manager for Snohomish PUD.

Kelsey L.: Wastewater Nutrient Removal Pilot Program [Slide 15]



Wastewater Nutrient Removal Pilot Program

ESI Quarterly Utility Focus Group, January 11, 2022

Kelsey Lewis
SEM Program Manager, Snohomish County PUD

Kelsey L.: Wastewater Energy Cohort [Slide 16]

Snohomish PUD had end-users participate... we wanted end-users to have persistent savings... We started to hear these sites were concerned whether energy savings could affect their permit. Through their participation, they discovered energy savings measures that also improved their processes.

Wastewater Energy Cohort

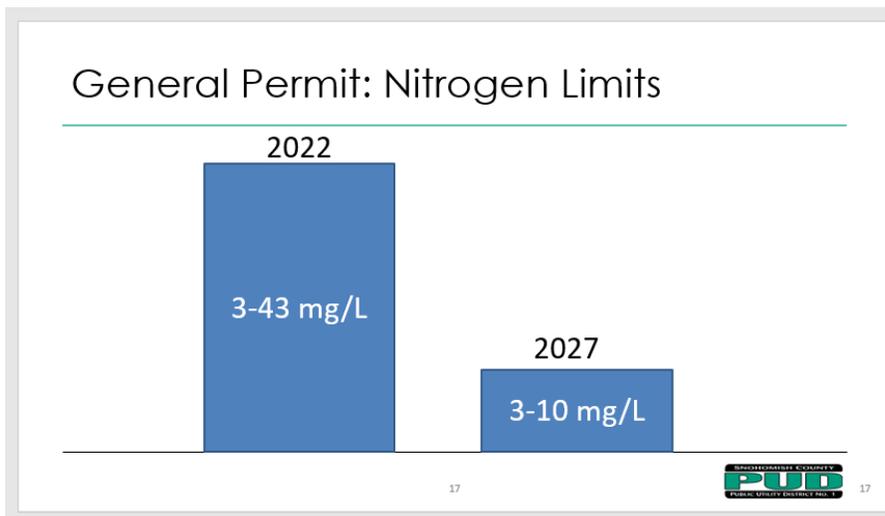
- ❑ 2017 Launch
- ❑ 6 participants
- ❑ Average 5.5 million kWh saved/year
- ❑ Energy efficiency -> Process Improvement



16  16

General Permit [Slide 17]

We believe everyone is meeting current [Inorganic Nitrogen Discharge Concentration] permit limits, with 2022 limits established; however 2027 will be more stringent. Some facilities face huge capital investments to meet these limits that would also increase energy consumption.



Kelsey L.: [Slide 18] Our engineer Allison Grinczel heard Grant Weaver speak at a WEC workshop – he talked about how to remove nitrogen through O&M changes that also reduce energy.

Grant Weaver – Grant Tech Inc.



- ❑ Nitrogen removal can be achieved by creating the right balance of anoxic and aerobic zones
- ❑ Anoxic zone created by turning aerators off or down
- ❑ Less aeration = less energy

 18

[Slide 19] Snohomish PUD partnered with Grant to create webinars, one-on-one calls, site visits and one year of support for interested sites. Here is an overview of the PUD's Nutrient Removal Sponsorship webinar – we could see the potential in reducing aeration and increasing energy savings.

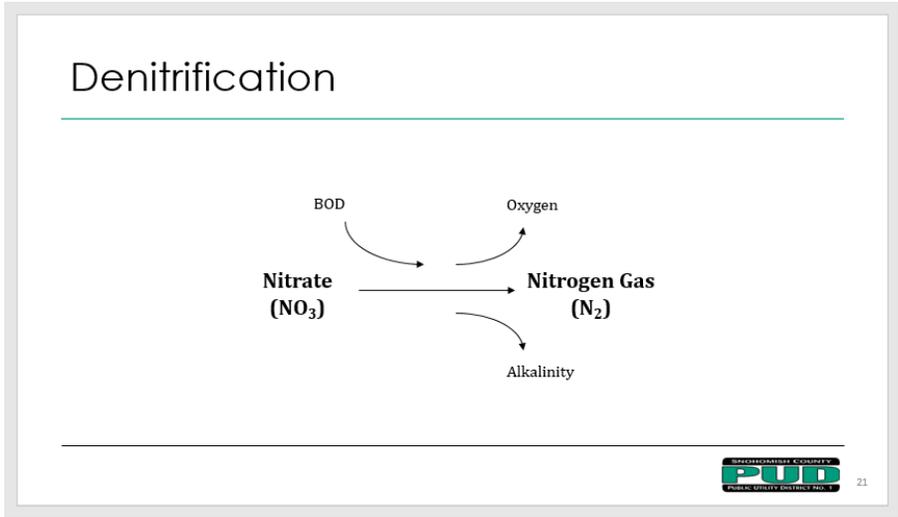
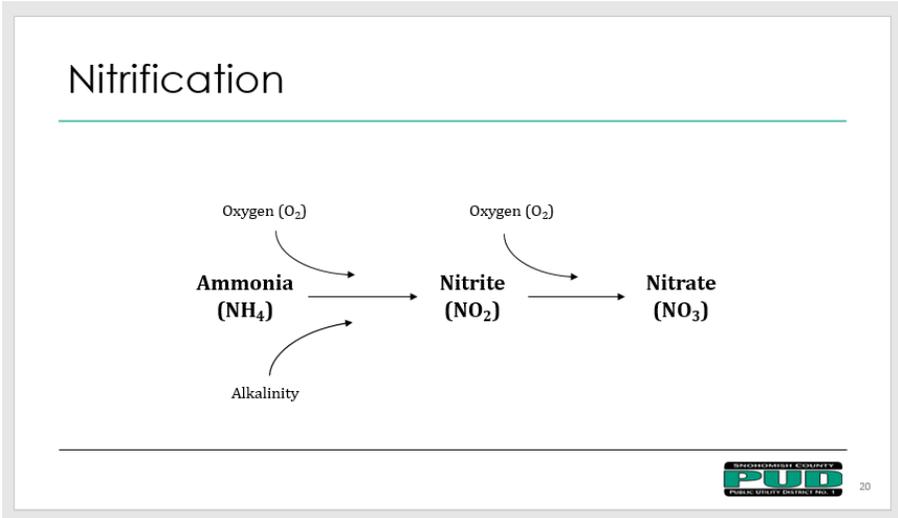
Webinars

Overview of
PUD's
Nutrient
Removal
Sponsorship*

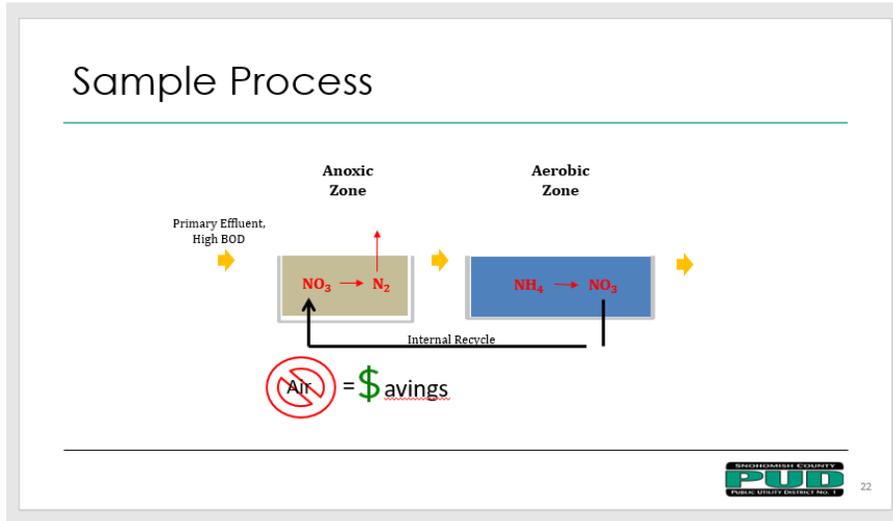
- Goal is to support sites through Department of Ecology's upcoming Nutrient Management Plan
- We have contracted with Grant Weaver to provide education and determine who might be eligible to pursue an O&M nutrient removal strategy
- Including
 - **Webinars (5)**
 - **1-on-1 Calls (2)**
 - Site-Specific Plans
 - Site Visits (4)
 - Remote Support (1 year)

 19

Kelsey L.: [Slides 20 / 21] Describes a simplified process of nitrification and de-nitrification. To find the right balance to aerobic to anoxic. Basically, adding, increasing anoxic zone, turn off air and equals savings.

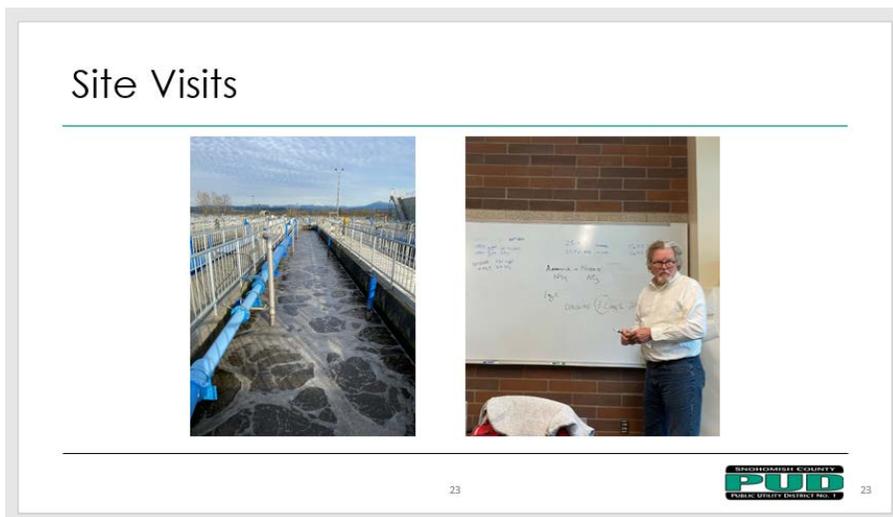


Kelsey L.: [Slide 22] New to the utility and wastewater, it was a great to tour...Grant Weaver helped sites with small experiments determine next steps. Has experience in MT and TN, Cookeville in particular.



Energy Savings in Anoxic Zone – air/money animation

[Slide 23] Seven sites were visited and four sites are continuing with pilot.



Kelsey L.: [Slide 24] Our path forward. This pilot is also a great way to stay connected with our graduating WEC participants as they continue to face new challenges.

Path Forward

- 4 sites continuing in the pilot
- Site plans, remote support, quarterly site visits
- Goal is to understand
 - Opportunities for optimization
 - Nitrogen Removal
 - Energy Efficiency
 - How close can optimization get them to permit limits

 24

[Slide 25] Does anyone have any questions?

Questions?

 25

Steve Martin: Let's hold all questions to the last 10 minutes of the call. Thank you Kelsey, this sounds like a great way for those sites to meet permit requirements. Now, let's go 30 miles to the south of Snohomish...to Seattle City Light.

Next, let's hear from Ted Brown and Elliott Zimmermann about one of Seattle City Light's projects.

Ted B.: [Slide 26] We'll look at a project from the vault. Ash Grove Cement Rolling Mill is a great customer.

Ash Grove Cement Rolling Mill
Upgrade project recap

January 11, 2022

Ted Brown ted.brown@seattle.gov
Elliott Zimmerman elliott.zimmermann@seattle.gov

Seattle City Light WE POWER SEATTLE

[Slide 27] Service territory... you can see that it goes beyond Seattle.

Service Area

- Seattle plus adjacent suburban cities:
 - Seattle, Burien, Lake Forest Park, Normandy Park, SeaTac, Shoreline
 - Portions of Renton and unincorporated King County
- 400,000+ residential customers
- 50,000+ commercial customers

SERVICE AREA AND SUBSTATIONS

Substations
Seattle City Limits

Map labels: To Bothell Substation, Shoreline, Viewland-Hoffman, North, University, Lake Washington, Denny, East Pine, Union, Massachusetts, South, DeHidige, Duwamish, Creston-Nelkin, Puget Sound, Broad, Canal, University.

Ted B.: [Slide 28] Ash Grove Cement – Duwamish industrial zone for a long time. Long-term project to do all of the M&V. Ash Grove was a SEM participant from 2011-2021.

Background

- Ash Grove Cement Seattle Plant
 - Located in SODO/ Duwamish industrial zone since 1920's
 - Annual production of ~750,000 tons
 - Participated in ESI SEM 2017 – 2021 “Graduated”
- Roller mill seals upgrade project 2017 - 2019



[Slide 29] Raw mill, mix products to make the cement...fairly complex process. Grinding, induction fans, cyclones separate large pieces to be re-rolled. Dust gets reheated and sent to bag house. Lots going on.

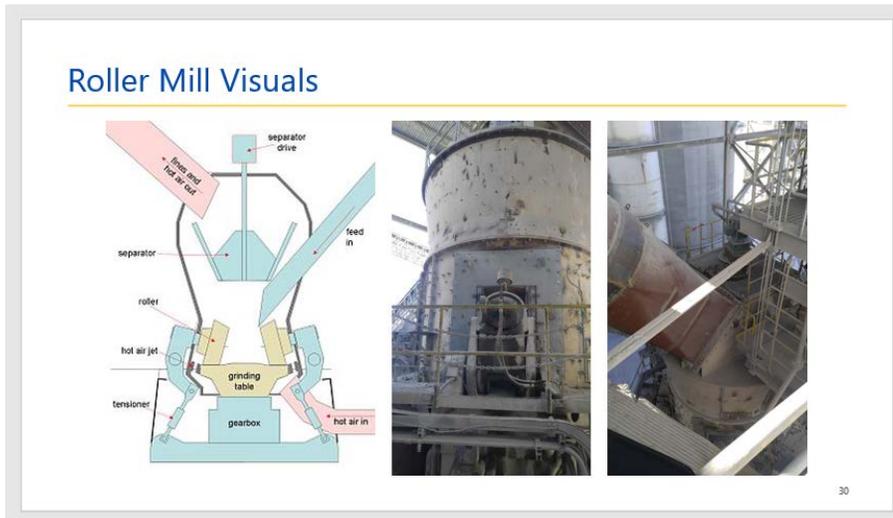
Project Overview

- Roller mill grinds raw materials for production of cement
- Project involved replacing seals around roller wheel actuator arms reducing infiltration of ambient air into mill
 - New seals an improved design (tested at another plant)
- Energy savings from reduced fan speeds
 - 1,500 HP mill induction fan
 - 500 HP bag house fan

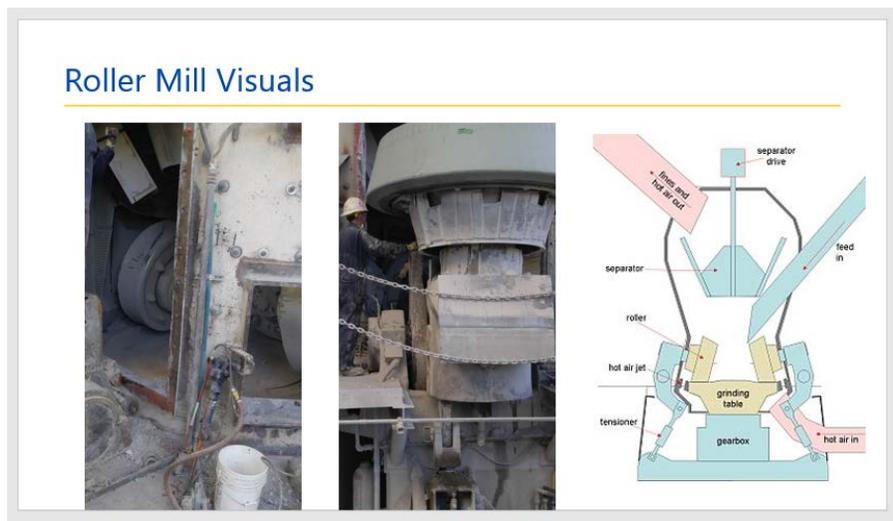


29

Ted B.: [Slide 30] The seals around the rollers was the project. Arms go through holes in the steel casing...inside the roller mill container is below atmospheric...any holes requires more fan energy.



[Slide 31] The mill assembly pic on far right.



Ted B.: [Slide 32] Baseline Analysis – quick flyby of the project.

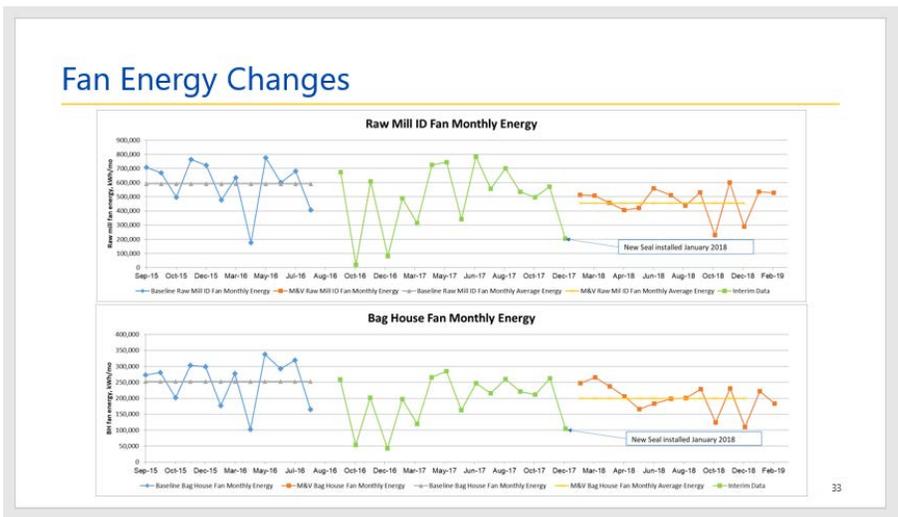
Baseline Analysis

- 1,620 kW baseline fan power draw determined by Ash Grove and ESI TSP metering (1,191 kW raw mill, 429 kW bag house)
- 5,479 annual operating hrs
- Historical measurements of O₂ concentration of mill inlet and exhaust air used to estimate leakage of actuator arm seals (3.5% Δ)
 - 10% of total airflow estimated to result from air leakage at roller actuator door seals
- 75% of infiltration estimated to be reduced by new seal design
 - Reduce fan speed by 7.5%; fan power by 19%
 - 307.8 kW reduced fan power
 - 1,686,436 kWh annual savings estimate
- \$154,494 estimated project cost



Elliott Z.: A lot of work and time went into developing this project. Data that was kept by Ash Grove...kept historical measurements...to estimate and track the load and savings verifications. Leakage around the door seals...a similar project was implemented in the Midwest, which helped the Seattle location to move forward with project.

Ted B.: [Slide 33] Tracked results



Ted B.: [Slide 34] Final project results

Final Results

- 1,412 kW combined fan power
 - 208 kW Reduction
 - 10% Reduced hours in final project analysis (5,375 vs. 5,966)
 - Fan speed (airflows) reduced by 5.7% in raw mill, 3.0% in bag house
- Δ of O₂ between mill inlet and exhaust air reduced by 11.4% (3.5% to 3.1%)
- 1,213,263 annual kWh savings (adj. for reduced operating hrs)
- \$121,164 Final project cost
- \$ 84,815 incentive (capped at 70% cost)



34

[Slide 35] Final takeaways... very successful – in spite of being a complex project that spanned extra time.

Takeaways

- Complex project spanning almost three years with many intricacies
- Successful due to customer's previous SEM participation and monitoring of production processes
 - Allowed for performance-based incentive based on engineering estimates
- Technical Service Provider support essential



35

Elliott Z.: This capital project was unlikely if we hadn't been in close contact because of their participation in SEM cohorts over an 8 or 9 year period time. We are formally setting up quarterly meetings to capture future capital projects.

THANK YOU



Zeecha VH.: This question is for Kelsey – How are you funding the de-nitro work?

Kelsey L.: We are funding it through the utility – we have flexibility for a pilot program.

Zeecha VH.: This question is for Ted - were these seals maintenance or was this a new product or application? Or are they considered a wear part?

Ted B.: This was a new seal design – totally customized.

Eric Mullendore: Because we're getting short on time, any other questions please send to Jenn Wood and they'll get routed to be answered.

[Slide 37] Reminder: the unique SEM cohort opportunity that will kick-off in April 2022. This hybrid model allows us to recruit from across the region. We are currently recruiting for a blended Industrial SEM cohort (targeting 10-12 participants) – good participants – sufficient load, stable processes, staffing that can dedicate time and are motivated to stick with it.

Reach out to ESIP if you are interested.



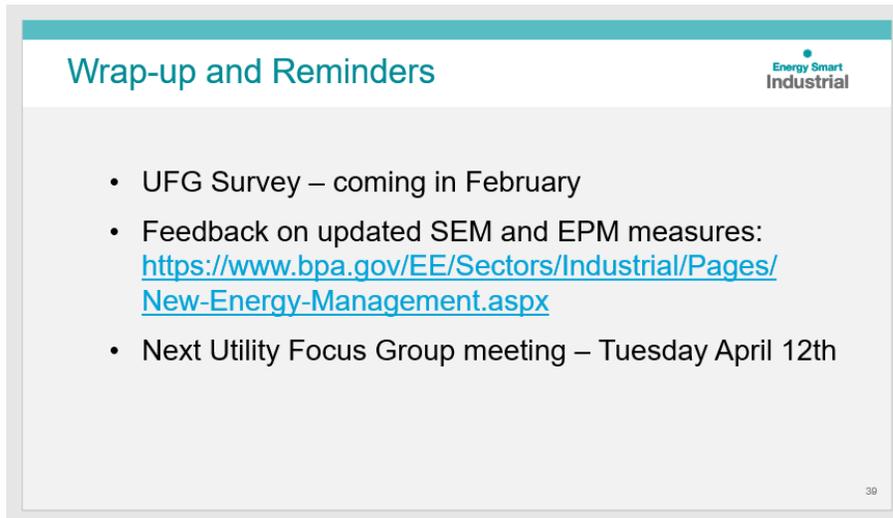
The slide features a teal header with the text "Blended Industrial SEM Delivery" on the left and the "Energy Smart Industrial" logo on the right. Below the header, there are two main visual elements. On the left, there is an icon of a person wearing a hard hat and a person sitting at a desk with a laptop. Below this icon is the text "Hybrid Remote/On-site Delivery". On the right, there is a dark teal silhouette of a map of the Pacific Northwest region, divided into state boundaries. Below this map is the text "Recruiting Across the Region".

NOTE: The ESI program hosted a webinar on 01/26/2022 to share more information about the Hybrid SEM Cohort.

Eric M.: UFG Open Forum [Slide 38] Please reach out to ESIP or directly if you have a topic or project success that you would like to share. We know that the path is not always a “straight line” to get to completed.



[Slide 39] We will be sending out a UFG Survey in February – to get your feedback on how it's going and what you'd like to see.



Updated SEM and EPM measures – check out the website. Any questions reach out to your EER or ESIP.

Next UFG... April 12. Thank you for a good hour of sharing.

Meeting adjourned: 12:01 pm