



Snohomish PUD SEM Cohorts Update

Powerful Facility Energy Conference, March 17th 2022

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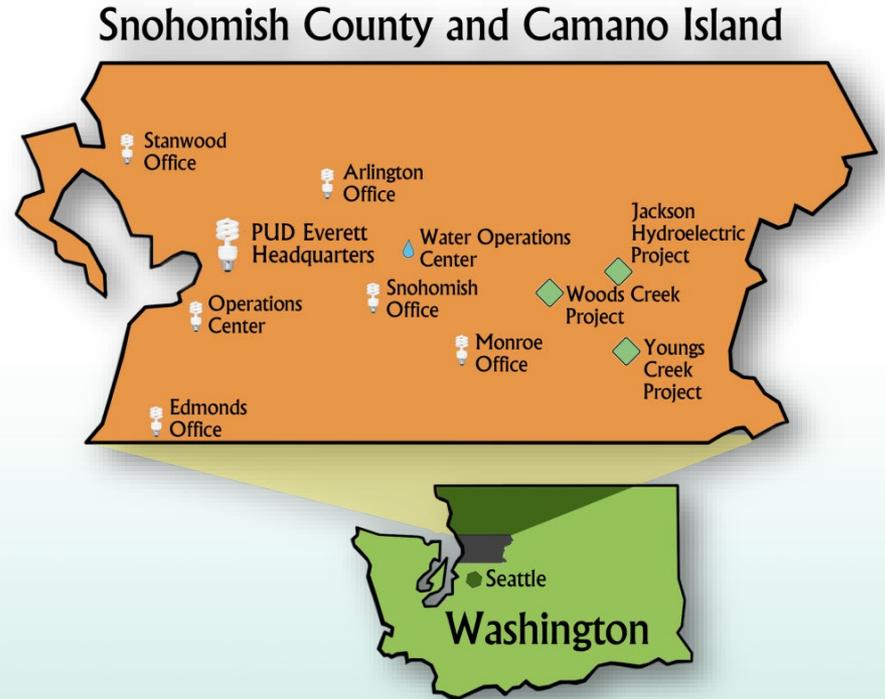
Agenda

- ❑ Snohomish PUD and Energy Efficiency
- ❑ SEM Overview
- ❑ Recruiting – Relationships, Lessons Learned
- ❑ Cohorts – Overview, Results, Project Highlights
- ❑ Pilot Programs
 - ❑ Nutrient Removal
 - ❑ Clean Buildings Accelerator Pilot

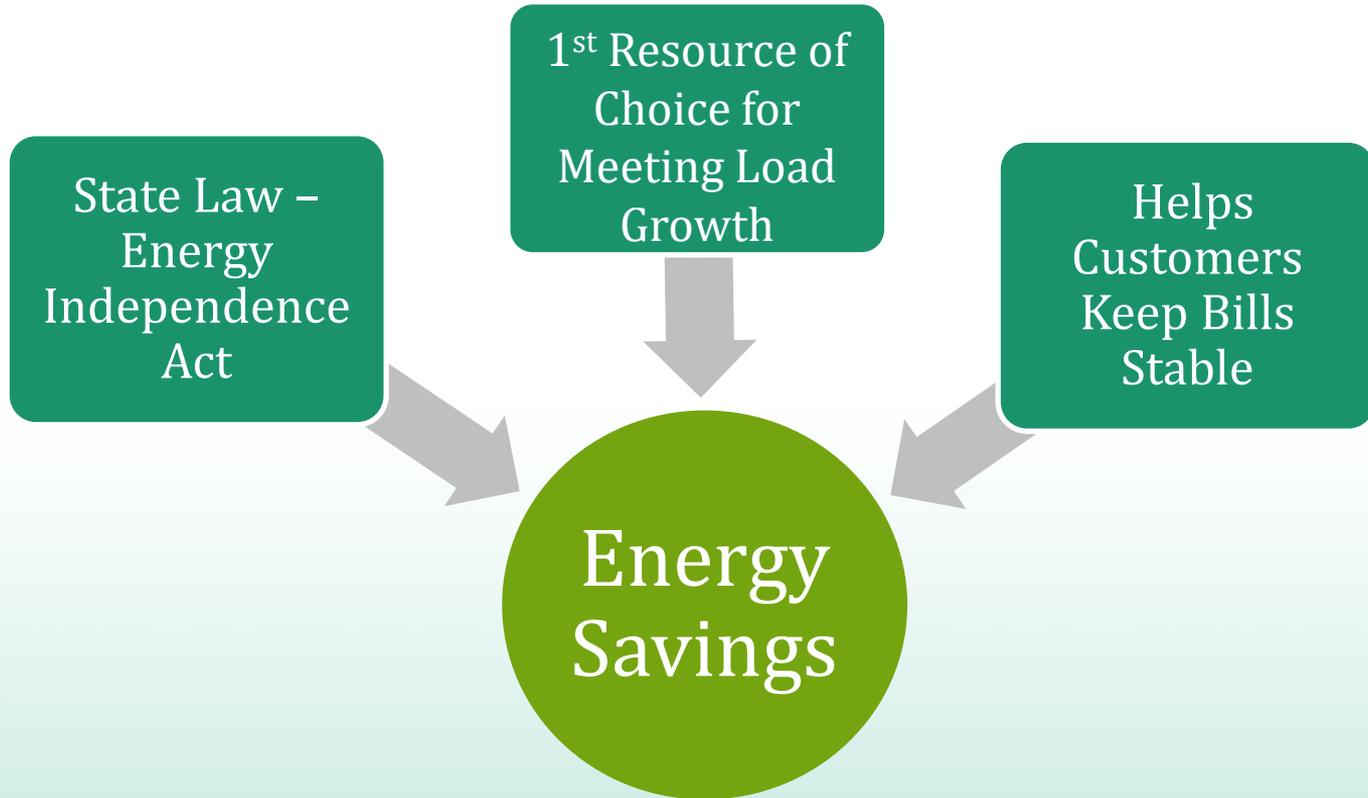


Snohomish County PUD

- Largest Public Utility District in Washington
- BPA's largest customer
- 361,000 customers
- 2,200 miles service area
- Active in Energy Efficiency since 1982

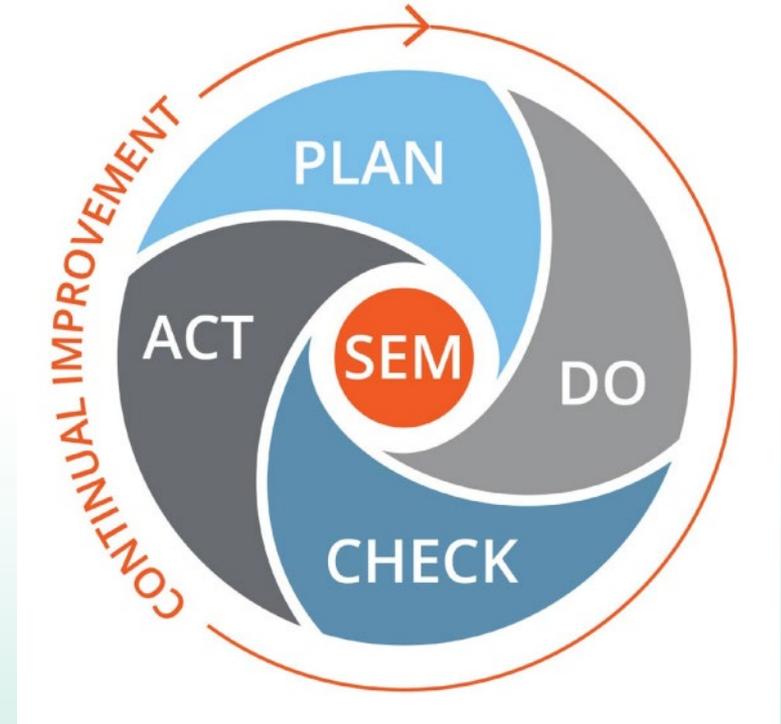


Why Energy Efficiency?



Strategic Energy Management (SEM)

Creates a culture of **continuous energy improvement** that empowers employees to achieve persistent energy savings in operational processes



Strategic Energy Management (SEM)

- SEM is an energy management process that helps:



Strategic Energy Management (SEM)

- ❑ People make SEM work
 - ❑ Recruiting good candidates with key team members
 - ❑ Working with skilled SEM service provider
 - ❑ Offering O&M incentives for kWh savings



SEM Cohorts at the PUD

- ❑ Collaboration with Energy Smart Industrial – SEM of BPA
- ❑ Free to participant in exchange for an investment of their time, creativity, focus, and energy
- ❑ Benefits
 - ❑ Technical Assistance: Model, Energy Scan, Workshops, Coaching
 - ❑ Funding for energy measurement equipment (\$5K-10K/year)
 - ❑ Incentive of \$.025/kWh saved



Recruitment

❑ Foundation

- ❑ Strong customer relationships established over time
- ❑ Characteristics indicate SEM readiness
 - ❑ Load
 - ❑ Resources
 - ❑ Management Commitment
- ❑ SEM evolved from long history of EE capital projects



Metrics

- ❑ Bigger Load is Better
 - ❑ More consumption = more kWh savings opportunity
 - ❑ Cost Effectiveness
- ❑ EE history with utility
 - ❑ Commitment to managing energy costs
 - ❑ Staffing to implement
- ❑ Load Profile Meters
 - ❑ Analyze energy usage patterns
 - ❑ Raw data energy modeling and baseline



Positive Indicators

- ❑ Established, trusted customer relationship
 - ❑ Strong relationships allow to stick with long-term SEM commitment
- ❑ Customer Resources
- ❑ Continuous Improvement programs
- ❑ Upper Management support
- ❑ Designated “Energy Champion”



Sometimes Customers Are Just Not Ready

- ❑ Major renovation underway or planned near future
- ❑ Limited staffing and resources
- ❑ No strong commitment from top management



Motivations for Sites to Join SEM

- ❑ Do the right thing for community or company and environment – ‘good stewards’
- ❑ “Green” value
- ❑ Reduce operating costs
- ❑ Expand individual’s skills, encourage teamwork
- ❑ Networking with similar organizations



Differing Motivations based on Industry

❑ Manufacturing – Private Entities

- ❑ Competitive

- ❑ Quick to adapt

❑ Wastewater and Clean Water – Public Entities

- ❑ More collaborative

- ❑ Risk averse



Manufacturing Energy Cohort

- 2017 Launch
- 8 participants

Average 3.1 million
kWh savings/year
=
Enough to power 276
homes for a year

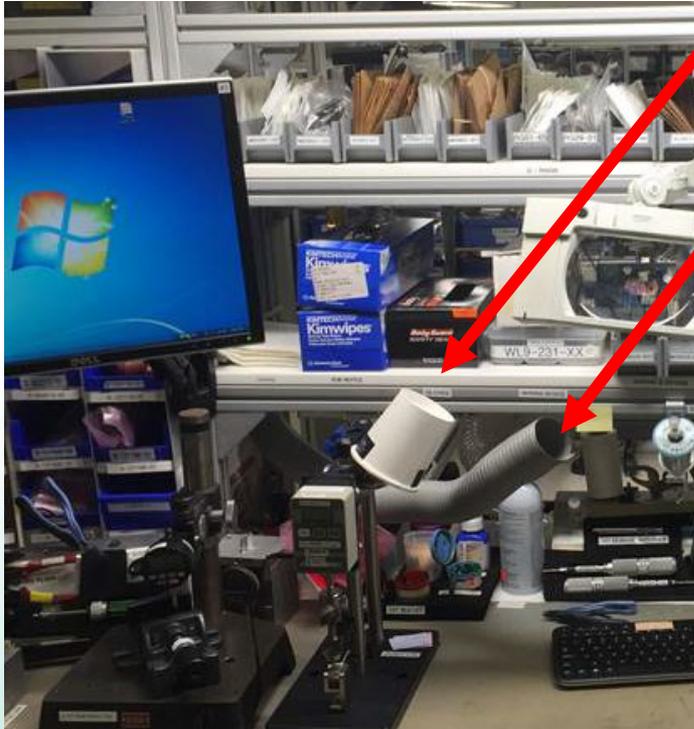


Project Highlight: Roller Temps at Achilles

- ❑ Noticed high roller temps during Energy Scan
- ❑ Rented Data Loggers from Free Tool Lending Library
- ❑ Reduced Temp by 50°F
- ❑ \$25,000/year in reduced energy costs

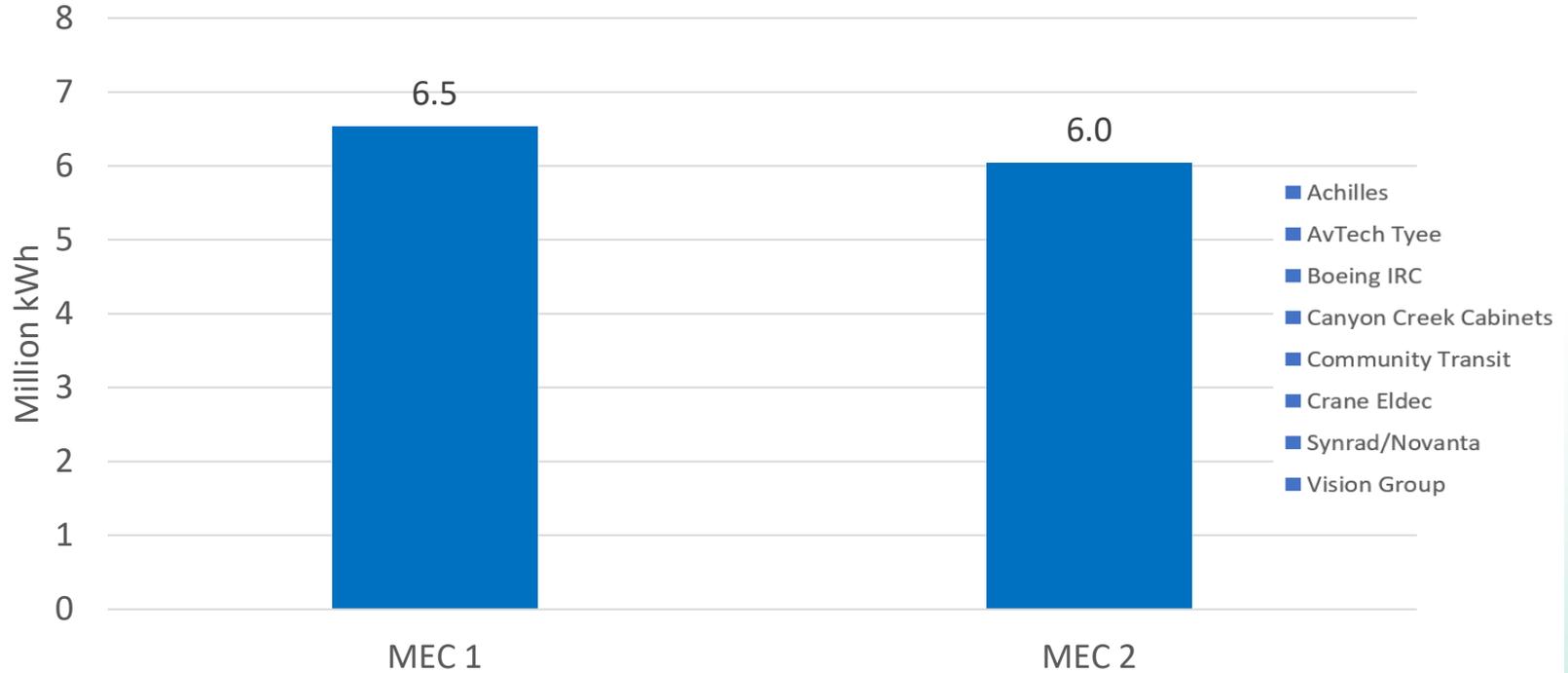


Project Highlight: Scupper Cups at Crane Aerospace



Manufacturing Energy Cohort Performance

2017-2020 MEC Performance



WEC Recruiting – Implementation Plan

- ❑ PUD/ESI - regular recruitment strategy meetings:
 - ❑ Flyer: “Want to Lower Your Energy Bill?”
 - ❑ Conferences and networking
 - ❑ Interested WWTPs were willing to help recruit others
 - ❑ WEC outreach lunch
 - ❑ City of Kennewick WWTP presentation
 - ❑ PUD WWTP customer presentation
 - ❑ Site visits



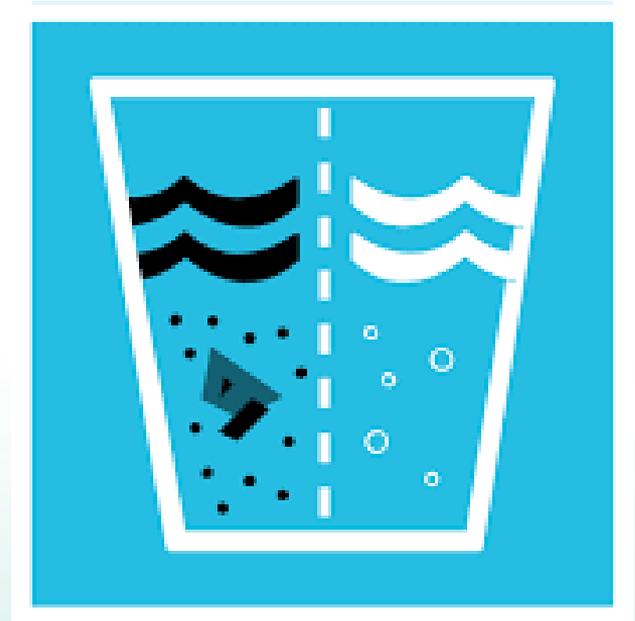
Benefits – More than \$ Saved

- ❑ WEC Cohorts - collaborative and collegial
- ❑ Share information and process techniques
- ❑ Mission
 - ❑ Protect the environment – “Water Quality Business”
 - ❑ Good stewards of ratepayer resources
- ❑ WEC is opportunity to not only improve the plant’s operations
 - ❑ Learn/share with fellow operators
 - ❑ Expand their resource network



WWTP Operators are Risk Averse

- ❑ Existing procedures are meeting permit standards
 - ❑ 'If it's not broken, don't fix it.'
- ❑ WEC will not ask or require operators to do anything that could put their plants permit compliance in danger



WEC Coaches – Credibility Counts

- ❑ Former WWTP design engineers
- ❑ Decades of experience improving WWTP energy efficiency
- ❑ While maintaining or in some cases improving the facility's water quality



WEC Recruiting Summary

- ❑ WWTP operators can save significant amounts of money for their facility and maintain plant reliability and water quality
- ❑ Environment and Ratepayers win



Participant Highlight: Everett WPCF

Projects Implemented

2017 - 2021

- 1 Aeration Optimization**
Added controls to adjust aerator runtimes based on DO levels.
- 2 Plant Reuse Water Usage Reduction**
Turned off half the secondary clarifier sprays and added controls to lower reuse pump pressure.
- 3 Primary Sludge Pumping Optimization**
Reduced the number of primary sludge pumps from three at a time to just one by adjusting sludge hopper operating strategy.
- 4 SEPS vs FEN Effluent Pumping**
Allows the plant to use gravity and 60 hp pumps instead of pumping over the hill with 300 hp pumps.



10,500,000+

Total Net kWh Saved



\$840,000+

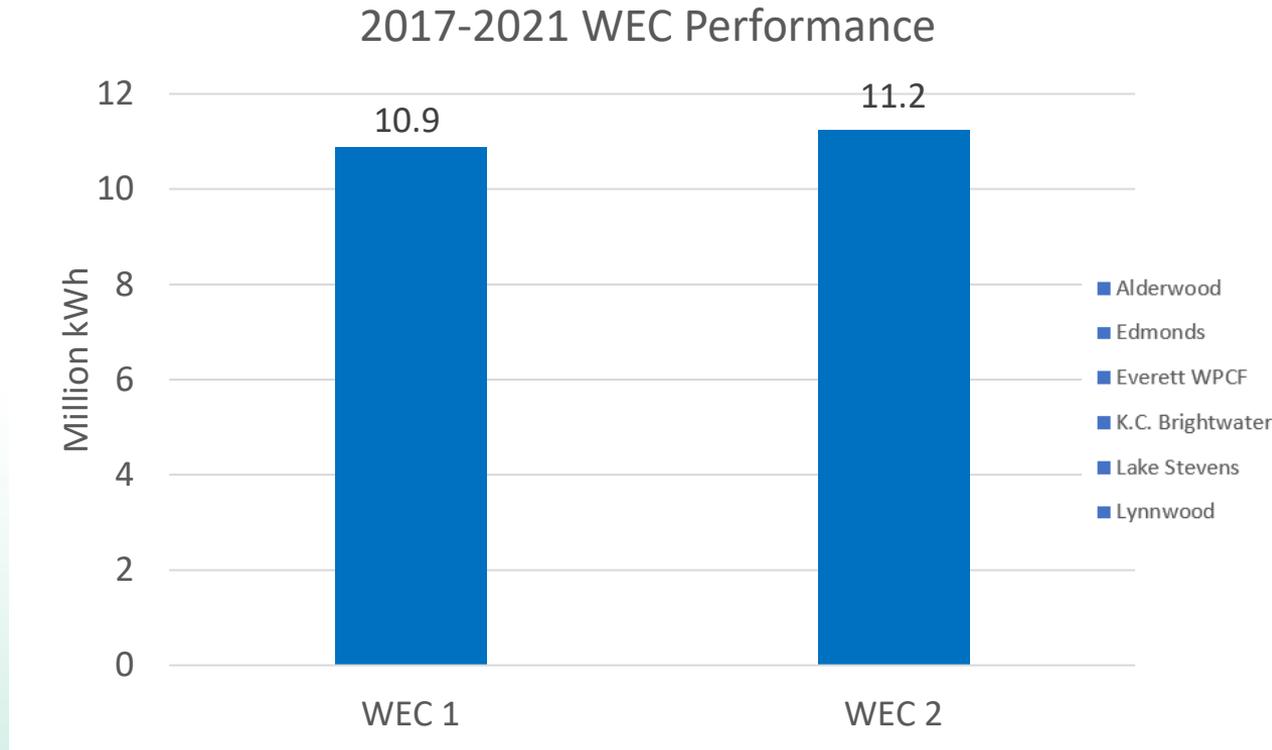
Total Energy Cost Avoided



Members of the Everett team (L to R): Aston Palacios, Ezikiel Barkley, John Smit, Vic Bryant, Joe Ferguson, Matt Gagner, Eddie Jones, Michele Johnson, Boris Tutubalin, Derek Kerlee, Doug Nance, Casey Mullins, Jeff Marrs, Von McLaughlin, Joy Bell, Dakota Coomes, Cliff Ocwieja.



Wastewater Energy Cohort Performance



General Permit: Nitrogen Limits

2022

3-43 mg/L

2027

3-10 mg/L



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



Webinars

Overview of PUD's Nutrient Removal Sponsorship*

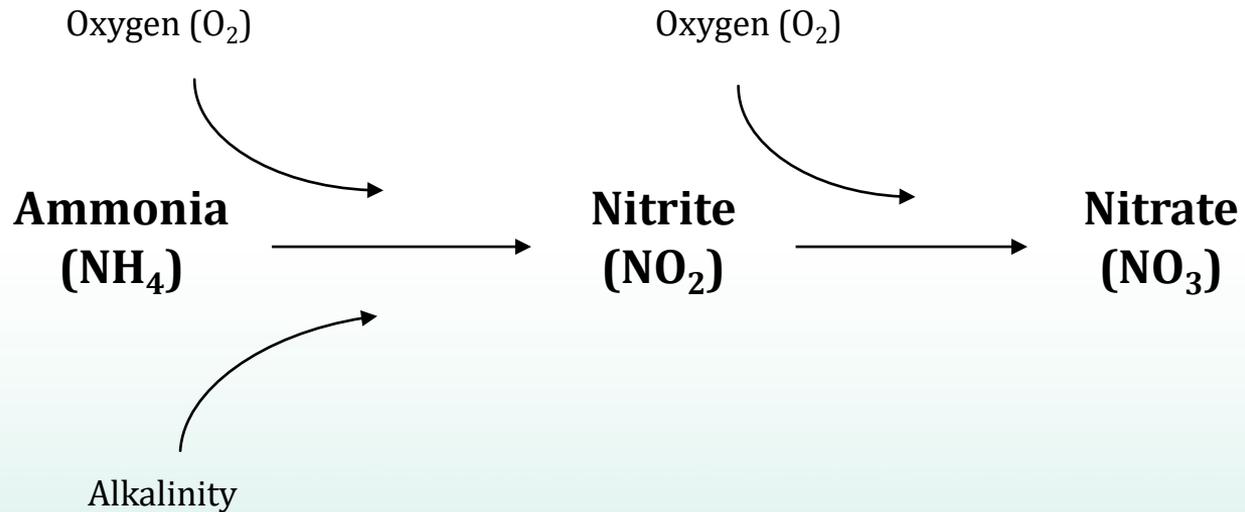
*for PUD customers

- 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)

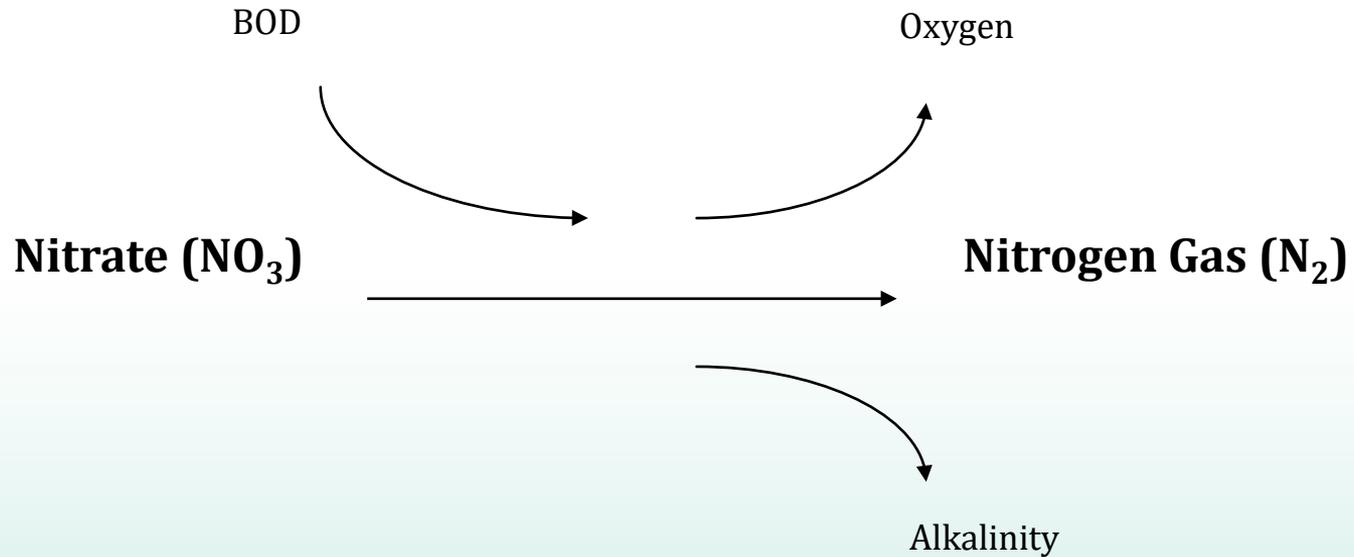
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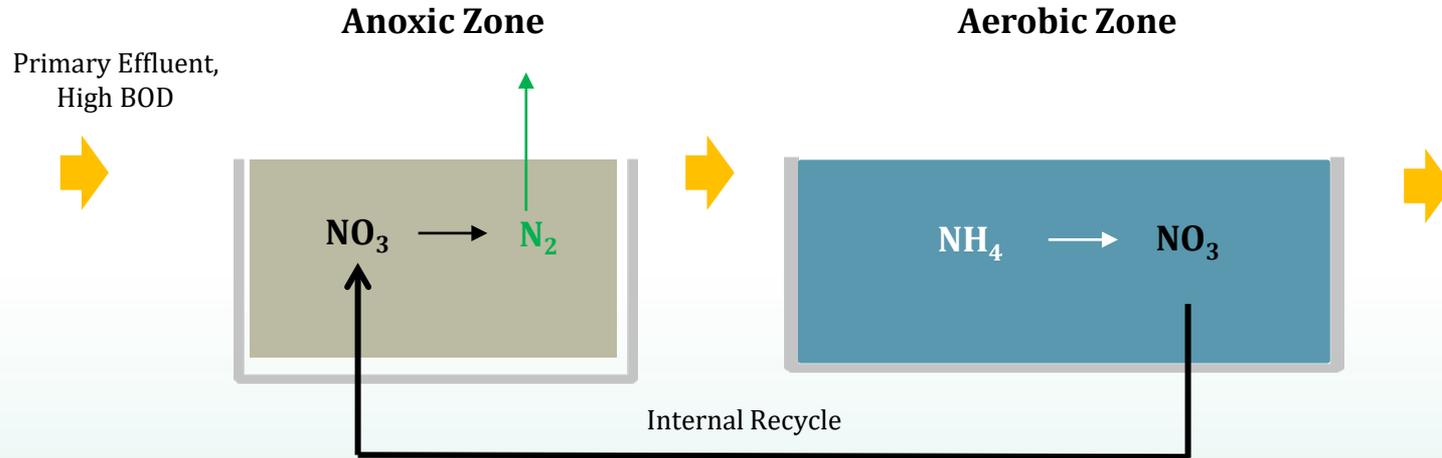
Nitrification



Denitrification



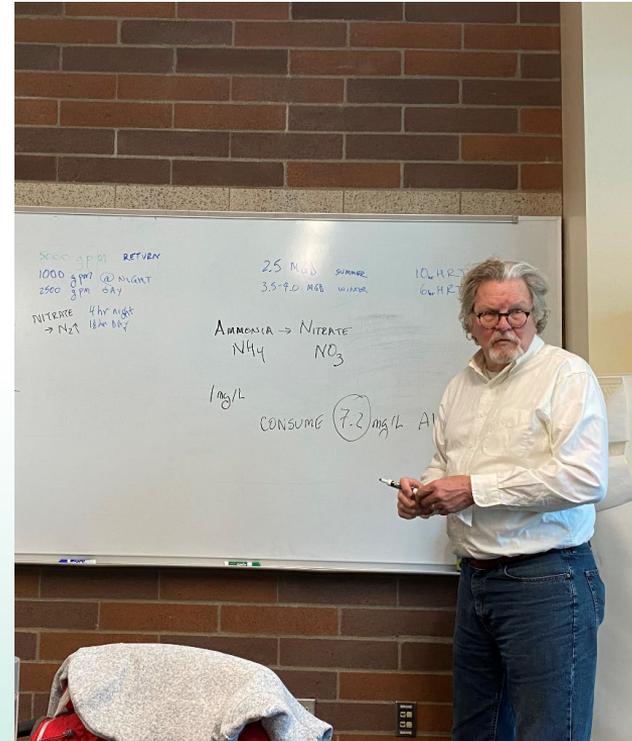
Sample Process



~~Air~~ = \$avings



Site Visits



Nutrient Removal 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



Clean Water Energy Cohort

- ❑ Alderwood
- ❑ Everett
- ❑ Marysville
- ❑ Snohomish PUD Water
- ❑ Launched in 2021
- ❑ Estimated Savings: 1 million kWh in first year



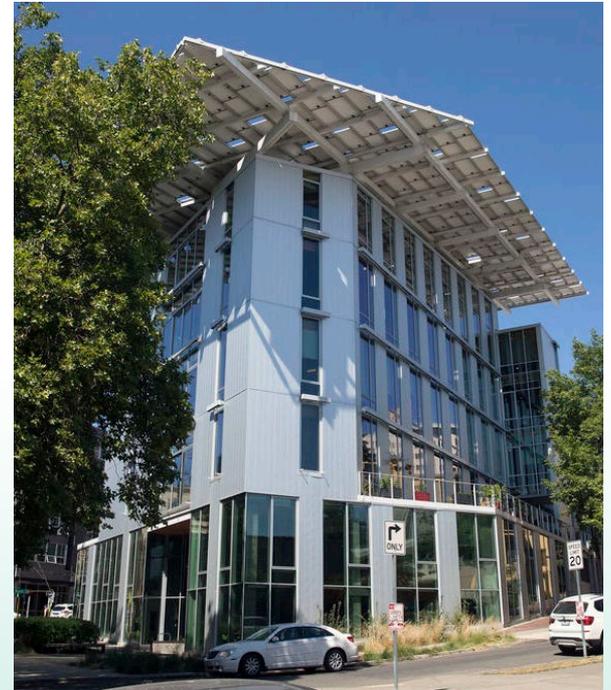
Clean Buildings Law

- ❑ Buildings over 50,000 sq ft required to meet EUI targets
- ❑ Largest buildings need to comply by 2026



Clean Buildings Accelerator Pilot

- ❑ SEM-type program to help commercial customers navigate the law
- ❑ Currently in recruiting phase



Summary

- ❑ SEM is a low/no-cost energy management system that impacts an organization's culture
- ❑ Cohorts continue and evolve
- ❑ Recruiting is an ongoing effort
- ❑ Pilots help us understand future possibilities
- ❑ Goal is to serve our customer owners



Questions?

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