Agenda - Renewable Energy Advisory Council

Wednesday, May 9, 2018: 9:30 a.m. – 11:45 a.m.
Special joint RAC/CAC lunch meeting to follow at noon - 1:30pm

Energy Trust conference room Kilowatt
421 SW Oak St., Suite 300, Portland, Oregon 97204

9:30 **Welcome, introductions, announcements** **Information**

9:35 **City of Salem biogas project** **Decision**

- Staff will present the City of Salem's proposed cogeneration biogas project at their Willow Lake Water Pollution Control Facility (0.87aMW, $3 million proposed incentive).

10:15 **Energy Trust Strategic Planning update** **Information**

- Energy Trust is beginning work on its next five-year strategic plan. Staff will discuss implications of the 2025 sunset of SB1149 for work during the 2020 – 2024 strategic plan period.

10:35 **Break**

10:45 **Solar peak reduction** **Information**

- For the 2017 annual report, staff developed a methodology to estimate the effects of solar installations on utility system energy peaks. Staff will present the results and discuss possible applications of the methodology.

11:15 **Public Comment**

- Suzanne Leta of SunPower would like to discuss Energy Trust's role in Oregon's solar + storage market. Suzanne will also be available to answer questions about the SunPower acquisition of SolarWorld.

11:45 **Adjourn**

Noon – 1:30PM - Joint RAC/CAC lunch presentation on Budget Review Project
For the past year, an internal Energy Trust team has been reviewing the way the organization develops its annual budget, including interviews with staff and stakeholders. The team has developed a proposal that we will go over at this joint lunch, including findings and recommendations. Staff are seeking feedback and first impressions. Lunch will be provided for RAC and CAC members.

You can view this agenda and notes from previous meetings at:
http://www.energytrust.org/about/public-meetings/renewable-energy-advisory-council-meetings/.
If you have comments on meeting notes, please alert Jed Jorgensen at jed.jorgensen@energytrust.org.

Next RAC meeting: Wednesday, June 20, 2018

Willow Lake Biogas Project

May 2, 2018

Summary

The Willow Lake Water Pollution Control Facility is a wastewater treatment plant operated by the City of Salem. The facility currently operates a 30 year-old 650 kW rich-burn cogeneration system which is at the end of its useful life. The City is proposing to install and operate a new lean-burn cogeneration system with increased capacity to use excess biogas that is currently flared. The $9.73 million Willow Lake Biogas Project would have a nameplate capacity of 1,176 kW and be capable of generating 7,610 MWh annually (0.87 aMW). The project is sized to accommodate future population growth in the Salem area and would offset power delivered to the facility by Portland General Electric (PGE) under a net-metering agreement.

Staff and an independent, third-party consultant evaluated the project and found that it aligns with Energy Trust's goals and falls within industry norms in design, expected costs, and proposed operation. The project is proposed by an experienced municipality, would use industry standard equipment, and has eliminated most risks through a thorough and well-informed development process.

Staff propose a $3 million installation incentive to cover 85% of the project's above-market costs. Staff suggest one payment of $500,000 be made upon commercial operation and additional payments be made on a quarterly basis at a rate of $0.25 per kWh based on actual generation. Energy Trust would ask for a minimum of 85% of the renewable energy certificates (RECs) generated by the project over a 20 year term.

Energy Trust Goals

- The Willow Lake Biogas Project supports Goal 2 of the 2015-2019 Strategic Plan: to accelerate the rate at which renewable energy resources are acquired.
- This project will add to the portfolio of five operational wastewater treatment biogas projects Energy Trust has supported, currently representing 5 MW of capacity and 4.1 average megawatts (aMW) of generation.

Background

- In November 2017, Energy Trust began a competitive process to allocate up to $4.0 million in incentives for renewable energy facilities in Portland General Electric service territory and $2 million in Pacific Power territory. Two applications were received, one hydropower and the City of Salem's Willow Lake Biogas Project. The hydro project is not ready for an incentive at this time.
- The City of Salem uses anaerobic digestion processes to treat municipal wastewater at its Willow Lake Water Pollution Control Facility in Keizer, Oregon. The facility processes an average of 25 million gallons of wastewater per day. The City expects the volume of wastewater to grow slowly but steadily into the future.
- A by-product of the anaerobic digestion process is biogas, a methane-rich renewable fuel. The facility has used its biogas resource to generate electricity and heat with a cogeneration system (cogen) for more than 30 years. The current 650 kW cogen is at the end of its service life and does not have the capacity to burn significant quantities of excess biogas created by the facility's digesters. At present, excess biogas is flared.

- Energy Trust has supported the City in developing this project since 2014, providing $200,000 in project development assistance to aid in feasibility and design. Energy Trust staff also helped the City secure a $3 million incentive from PGE's Renewable Development Fund.
- The proposed Willow Lake Biogas Project would include an 1,176 kW Caterpillar cogeneration engine by Peterson Power Systems, with an expected average annual generation of 7,610 MWh. Prior to combustion, the biogas would be scrubbed of contaminants that could foul the engine by a gas treatment and cleaning system. Generation from the new system would save the City about $300,000 a year. Heat from the engine would be used to heat the facility's primary digesters.
- Project construction is expected to begin in winter 2018. The City anticipates commissioning and testing to start in fall 2019 with commercial operation occurring in winter of 2019.

Staff Evaluation

For projects eligible for incentives, Energy Trust staff thoroughly evaluate the following prior to performing an above-market cost analysis:

- Site control
- Development and operational team expertise
- Resource sufficiency and control
- Energy conversion technology and estimated generation
- Permitting
- Interconnection
- Power purchase agreement
- Project capital costs
- Operational and maintenance expenses
- Financing
- Project revenues

Staff's evaluation found the following:

- The project meets key qualifications for funding from Energy Trust: it is less than 20MW in capacity, it offsets electricity demand from PGE and it meets the requirements of a qualifying biopower project.

<u>Site Control, Development Team, Resource and Generation Estimates, and Permitting</u>

- The City owns the site and has full site control.
- City staff include a proven team capable of executing on project development, and the experience to operate the project when complete. City staff, with support from Energy Trust, deeply engaged other municipal biogas facility staff in their development process, ensuring best practices were observed in facility design and development choices.
- The currently available biogas resource is sufficient to support the estimated generation and the chosen engine has a wide operational range that is well matched for daily and seasonal production variations with minimal flaring. The chosen cogen engine is sized appropriately to immediately use all available biogas while maintaining reserve capacity to manage future municipal growth or the addition of other feedstocks that could boost biogas production.

- As is the norm with complex facilities, generation from the new cogen would be expected to ramp up over the first three years of operation, from approximately 5,800 MWh in year one to approximately 7,000 MWh in year three. Generation would then be expected to grow gradually according to municipal growth trends. Maximum expected generation would occur in years 19 and 20, at approximately 8,649 MWh. Over 20 years, the average annual generation is expected to be 7,610 MWh.
- The City has successfully engaged in or completed all required local, county, and state permitting processes. Energy Trust staff have no concerns about the City's ability to successfully complete remaining county construction permitting processes.

Power Purchase and Interconnection

- The City plans enter into a Schedule 89 Net Metering agreement with PGE, offsetting their energy use at their existing retail rate. Energy Trust has no concerns with the City's ability to execute this agreement with PGE. The City's current retail power rate at the facility is 7.6 cents per kWh (energy only, all other charges excluded). Energy Trust modeled the City's power rate growing at a standard 2% annually over the project life.

- The City has been in contact with PGE about the planned facility upgrade and intends to submit a Level 3 Net-Metering application in June 2018, once a few remaining elements of the electrical design have been coordinated with the utility. PGE will then conduct a System Impact Study to determine final interconnection requirements and costs. This is one of two remaining areas of risk for the project.

- PGE has notified the City that they may require "transfer trip" capabilities which would allow the utility to remotely control and shut down the cogen system during outages or other necessary situations for safety purposes. Transfer trip typically requires a fiber optic connection back to the nearest substation which, in this case, is over a mile away across the Willamette River. Fiber optic lines are very costly to install and the City estimates the installation could cost approximately $120,000. Transfer trip has not been required at other similar facilities and operators at other treatment plants have provided a number of lower cost alternatives to provide the same safety and control abilities for the utility. Energy Trust is working closely with the City to help them through this process and we believe a less costly solution will be found. That said, full interconnection costs are not likely to be known before fall and Energy Trust staff will remain engaged with City staff to see how costs differ from current estimates, which are currently in line with what we have seen at other facilities.

Project Costs, Expenses, and Financing

- Total capital costs for the project are estimated at $9.73 million, the largest costs being the cogeneration engine package and the new building to house the cogen. Equipment costs are actual bids while construction costs are engineering estimates. All costs are within the expected ranges for a facility of this size and scope, with building costs at the upper end of the expected range. The existing cogen building does not meet current codes, therefore new construction is required. Current code requirements are driving the costs on the cogen building to the higher end of the range. Energy Trust staff subtract Project Development Assistance incentive dollars from the total project costs to account for our assistance in modeling above-market costs.

- Construction costs are the other area of remaining risk for the project. The City expects to go to bid on construction this summer. In the current competitive construction market, bids could come back higher than expected. However, the cogen project is part of a larger facility upgrade. Packaging cogen construction as part of the larger upgrade is a strategic move for the City to try and keep construction costs on the lower side. Energy Trust staff will closely monitor final construction costs, which will not be known until later in the summer, and follow up with City staff if problems arise.
- Estimated capital costs:

Engineering and design	$	1,200,665
New cogen building	$	2,664,529
Engine and controls package	$	1,842,416
Gas treatment	$	1,518,867
Project management, general conditions, contractor overhead	$	2,052,532
Contingency	$	649,022
Energy Trust Project Development Assistance	*($*	*200,000)*
Total Estimated Cost	**$**	**9,728,031**

- For initial operations and maintenance the City awarded a contract to Peterson Power Systems to maintain and manage the performance of the engine for the first five years of commercial operation. City staff will be trained on new engine maintenance and will learn how to operate the new cogeneration system from Peterson Power Systems employees.

- Salem's application, perhaps informed by their current experience with an expensive-to-operate, end-of-life cogen system, listed higher-than-expected operations and maintenance (O&M) costs when compared to industry norms. Energy Trust staff are sympathetic to the City's concerns about high O&M costs but the experiences of Salem's peers in Gresham and at Clean Water Services lead us to believe they are being overly conservative in their estimates. Energy Trust staff reduced the City's O&M costs to be within accepted ranges (normally expected to be around 2.5 to 3 cents per kWh of generation). In addition, Energy Trust added a $500,000 expense for major overhauls over the 20-year life of the project.

- Expected O&M expenses are listed in the table below:

Estimated Annual Operations and Maintenance Costs		
Annual maintenance	$	78,000
Engine oil changes	$	15,000
Pump and valve maintenance and repair	$	28,000
Gas treatment skid operations and maintenance	$	88,345
Total	**$**	**209,345**
Major overhauls over 20 years	*$*	*500,000*

- The City intends to fund the project through a combination of wastewater utility rates and grant funding. Two years ago, with assistance from Energy Trust staff, the City secured a $3,000,000 grant from PGE's Renewable Development Fund. The grant from PGE is contingent upon Energy Trust also funding the project. The City has also applied for a $250,000 Renewable Energy Development (RED) grant from the Oregon Department of Energy. The RED grant is competitive and in recent years no projects have been awarded more than $175,000. Energy Trust modeled the finances of the project both with and without

a RED grant and found above-market costs in both scenarios. The City has the remaining funds required to build the facility and will not need to incur any loans.

Above-Market Cost Analysis

Above-market costs are calculated as the difference between the cost to produce power over a specific term, and the market value of the power. Above-market costs are calculated on a present-value basis: all costs and revenues over the project term are discounted to their current value as if they existed today.

- Staff evaluated this project over a 20-year term. The length of the term was chosen to match what we have used for other municipally owned biogas facilities.
- The project was evaluated at an 8% discount rate, consistent with the 8-10% range of discount rates Energy Trust has applied when evaluating other municipally or government-owned projects.
- Staff included the PGE grant but not the RED grant in the modeled view shown below.
- The table below shows the financial summary for the project:

Project Cost	
Total Design & Construction	$9,728,031
Expenses	
NPV Total Project Expenses	$2,636,687
Total: Equity + Expense	**$12,364,718**
Revenues	
NPV Generated Energy	$6,376,230
NPV PGE Grant	$2,777,778
NPV Total Revenues	**$9,154,008**
Above Market Cost of Power	**($3,210,710)**
(Costs + Expenses - Revenues)	

Without an Energy Trust incentive the project has an Above Market Cost of $3,210,710, a 2% internal rate of return, and would reach a simple payback after 17 years. If the City is successful in their RED grant application with a $175,000 award the project's above-market cost would drop to $3,048,673.

Staff's Overall Evaluation and Recommendation

- The proposed project has significant strengths: it would be constructed by an entity with an existing cogeneration project; it would be municipally owned, long-lived infrastructure; and the City has secured a significant grant for the project. The project is well designed and has few remaining risks.

- The City of Salem is a returning customer, having pursued significant efficiency gains at the facility, and has diligently designed the proposed project with input from other regional facility operators. By taking the time to learn current best practices from others

(the cities of Gresham and Portland, as well as Clean Water Services) facility staff are well positioned to be successful with this project.

Energy Trust contracted with Tetra Tech to provide an independent analysis of the project. Tetra Tech evaluated the proposal's technical and financial feasibility and provided a written report. Their view of the project closely matches Energy Trust's evaluation, and they also believe the project holds a great deal of merit. They recommended supporting the project with an incentive and Energy Trust staff concur.

Proposed Incentive

- Staff proposes that Energy Trust provide an incentive of $3,000,000, matching the PGE grant, and paid partially based on actual production. We suggest an initial payment of $500,000 be made upon the project reaching commercial operation. We further suggest additional payments be made on a quarterly basis based on actual generation at a rate of $0.25 per kWh as long as the project achieves 75% of the expected generation over the quarter. Payments based on production give the City an incentive to maximize generation during the initial ramp-up period and enable the City to be fully paid sooner if performance exceeds expectations. If the project achieves its expected generation goals Energy Trust's full incentive would be paid by the end of the second year of commercial operation. A $3,000,000 incentive would give the project a 6.8% internal rate of return and an 11-year payback.
- On a present-value basis (paid over time within two years), Energy Trust's incentive would be worth $2,706,790 representing approximately 85% of the project's above-market cost without a RED grant or 88% with a RED grant. At $3.45 million/aMW, the incentive is in the range of incentive costs for biogas projects we have supported in the past.
- Consistent with Energy Trust's policy on Renewable Energy Certificates (RECs), we would ask for a minimum of 85% to 88% of the project's RECs, equivalent to 129,374 RECs over 20 years.
- Staff proposes to negotiate a contract with the City with milestones to allow Energy Trust to withdraw funding if the project is unable to move forward.
- Funds for the project are within the 2017 Other Renewables program budget.

ENERGY TRUST BUDGET PROPOSAL CONCEPT OVERVIEW

In March 2017, a cross-organizational Budget Review Project team was chartered to identify an option for an alternative budget process that could deliver critical value in a more efficient, effective and flexible manner than the current process. The project team performed a deep review of budget processes and outcomes, including many internal and external interviews and surveys to identify root causes of issues and identify opportunities for improvements.

External interviews with OPUC and utility stakeholders uncovered dissatisfaction with many parts of the budget process. All parties noted that budgeting is complex and represents significant workload. Some parties questioned if they have an influence in development of the budget. Participants want more background on assumptions, a better understanding of how we arrive at goals, and earlier involvement to provide feedback and build the budget in partnership. In addition, all parties need more time to review budgets internally and respond to internal questions. The utilities gave strong feedback that they need to know before October if there are going to be significant changes. Utilities also prefer steady budgets with minor changes and they want our budget and goals to align with their Integrated Resource Plans.

Budget process proposal

To address the feedback noted above, the project team proposes a new process that would spread planning and budgeting work over a longer time period, with goals and utility rate impacts specified as ranges over three years. The proposed process has three components:

1. Separate long-term organizational strategy, program action plan and support group action plan processes from annual budget number approval processes.
2. Concentrate and extend strategy, tactics, planning efforts and associated engagement with utilities, the OPUC and stakeholders, into one heavy-lift year that would produce a range of savings and generation forecasts, and revenue requirements, for a three-year period, followed by:
3. Two years of light strategy updates to the plan created in the heavy-lift year, as needed based on market changes that could produce results outside of expectations set in the three-year plan. In the third year, the heavy-lift strategy and planning cycle would restart.

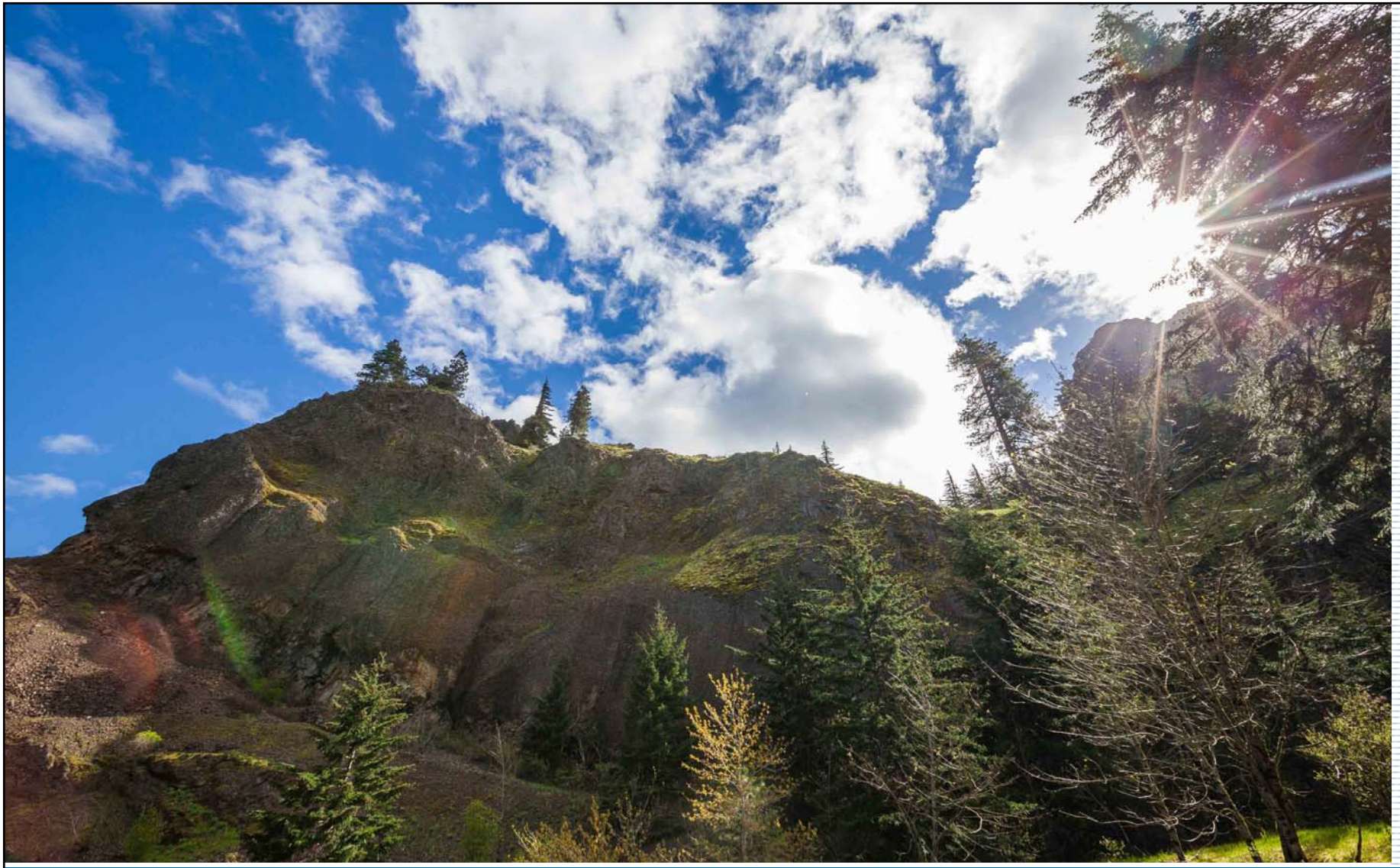
At the highest, most simplistic level, the proposed budget process concept is a repeating, adaptive, three-year process that revolves around two principles:

1. Get buy-in on the strategy and let the strategy drive the numbers, and

2. Plan the work for one year, work the plan for three years.

There are significant assumptions, risks and challenges related to the proposed process. To be successful the concept of ranges must be accepted by stakeholders. The process also assumes reduced need for replanning in the two years following the heavy-lift year. There would also be upfront investment in training, process design and tools.

While the proposal would be a significant change from existing processes, it retains many current budget components and the same organizational values and standards around transparency and accountability. Among other benefits, the project team believes the proposed process could bring significant improvements to engagement with the OPUC, utilities and stakeholders, and increase organizational flexibility.



Budget Review Project
Findings and Recommendations

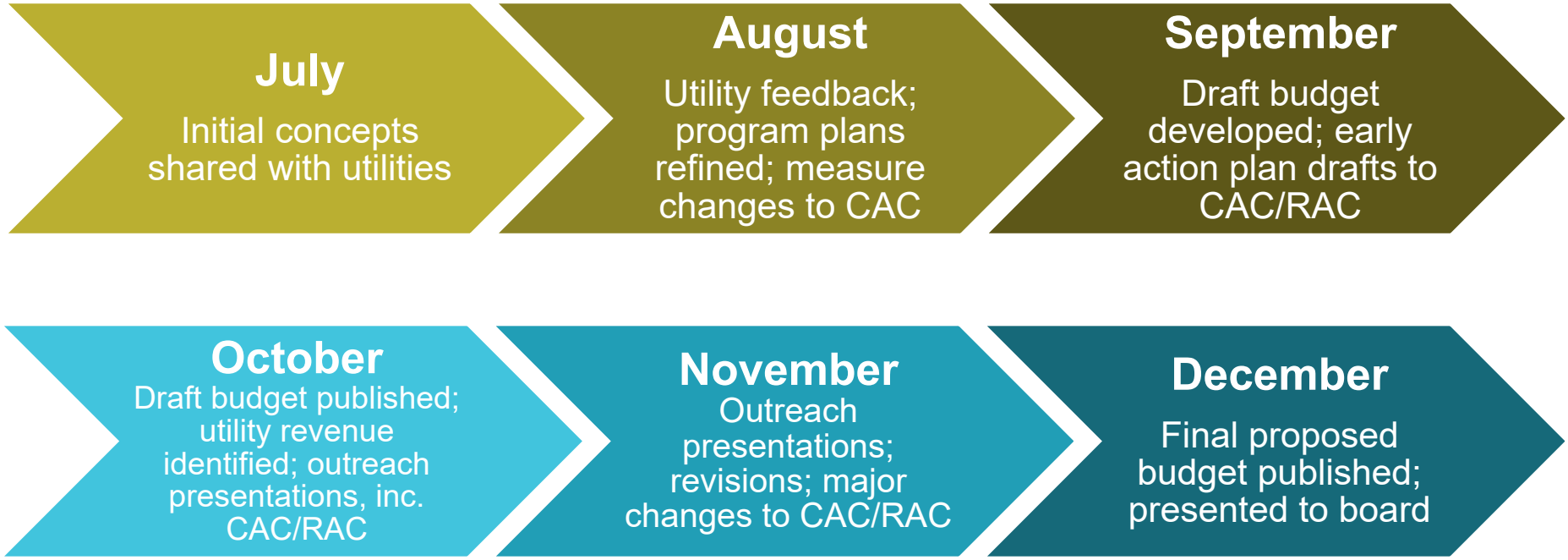
Joint RAC and CAC Meeting; May 9, 2018

Energy Trust of Oregon

Agenda

1. Purpose of the project
2. Project goals
3. Discovery process
4. Recommendations
5. Initial feedback and next steps
6. Q&A
   - Would this proposal work for your organization?
   - Does this proposal address concerns you may have?
   - Do you foresee any unintended consequences?
   - Did the team miss anything?

Process Used to Develop the 2018 Budget, 2018-2019 Action Plan



Purpose of the Project

The budget process at Energy Trust is a long and resource intensive process which is intended to accomplish stakeholder engagement, transparency and accountability, strategic planning, funding, energy savings acquisition and renewable generation, and financial management.

The mission and purpose of the review team is to identify an option for an alternative process that will deliver critical value in a more efficient, effective and flexible manner than the current process.

Discovery Process

1. Created Guiding Principles
2. Mapped and discussed current process
3. Sought feedback from staff and external stakeholders through interviews and surveys
4. Interviewed 5 external organizations
5. Arrived at budget recommendations

External Stakeholder Feedback

Overall Themes

Budgeting represents **significant workload** for all parties

Budget is complex and **the timing is not optimal**; the OPUC and utilities want more time to deliberate, earlier completion, and minimal rate changes.

External stakeholders question if they **have an influence in development of the budget**

External Stakeholder Suggestions

Stakeholders want **earlier involvement** to provide feedback and build the budget in partnership

Utilities need to **know of large pending changes before October**

Utilities want better **alignment with their IRPs;** the budget is not in sync with the 5 utilities' IRP updates and rate cycles

Utilities prefer **steady budgets with minor changes** over big rate swings; they want consistency and predictability

Internal Feedback

Overall Themes

Budgeting represents **significant workload** for all groups

Creating or **revising action plans each year is time consuming**

Very difficult to make changes in the development and implementation of the budget

A lot of work in Q3 and Q4 each year – no time to work on other efforts or projects

Tools are not sufficiently robust to manage programs or internal groups except at a very high level

Staff Suggestions

Better budgeting tools with an ability to make changes or model scenarios

More time for stakeholder input and review

Reduce churn and time required to make changes

More flexibility to move money between programs and sectors

Create staffing plans and strategy separate from annual budget process (budget should flow from staffing plan)

Mixed comments on desire for multi-year approach – some staff want longer-term planning timeframe, while others prefer the flexibility of an annual timeframe

Proposed Process

Background on the Current Process

Proposed Process Components, Defined

Workgroups

Key Drivers

Feedback Suggested Separating Planning from Budgeting

Planning & Budgeting

Goals of the Proposed Process

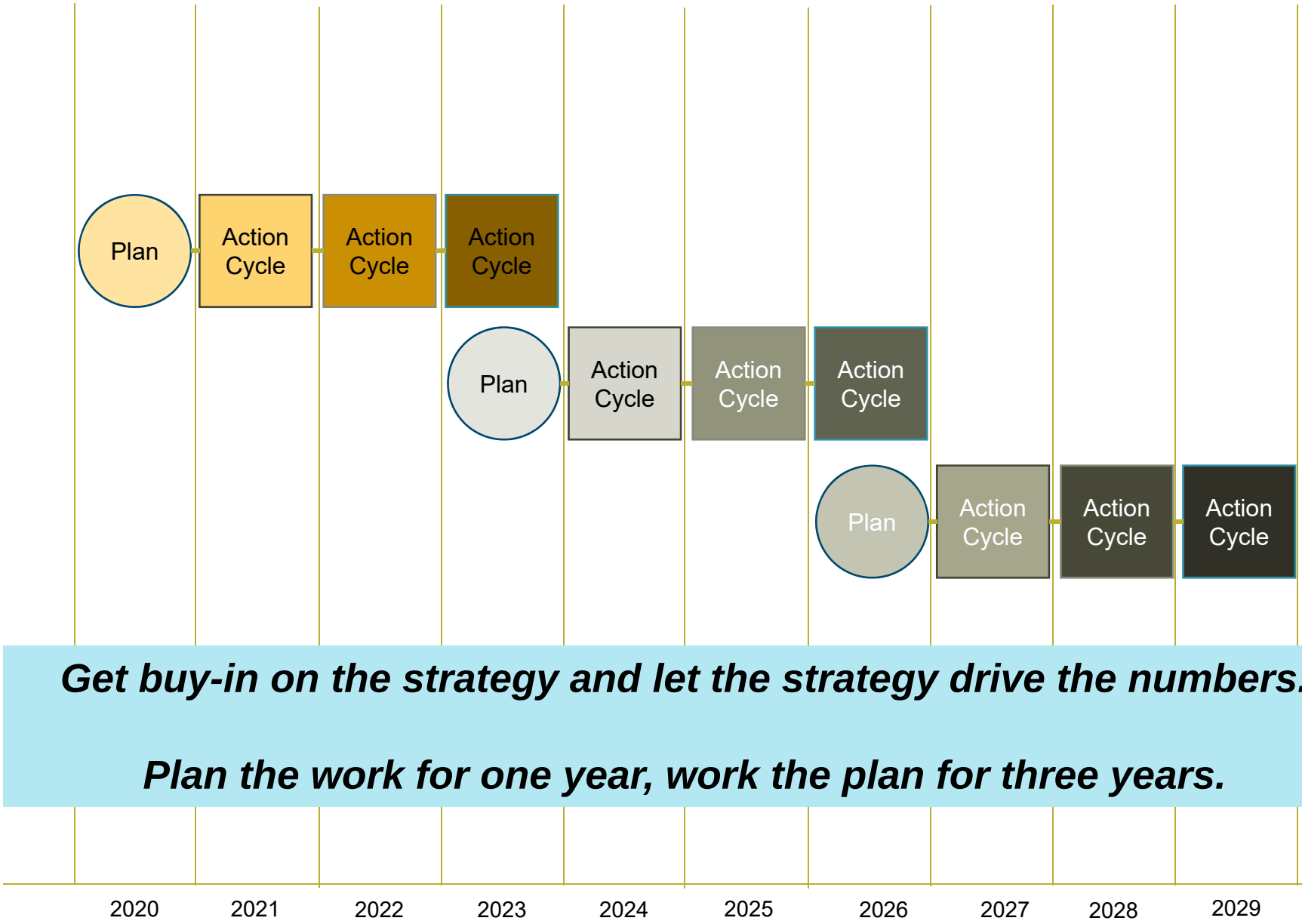
Increase stakeholder participation (via workgroups) in early planning work

Achieve broad stakeholder agreement on

- Key drivers
- Savings and generation ranges over a longer planning period
- Budget ranges required to achieve those projections

Refocusing stakeholder feedback in subsequent years to changing market factors and opportunities.

Additional Process Components



Get buy-in on the strategy and let the strategy drive the numbers.

Plan the work for one year, work the plan for three years.

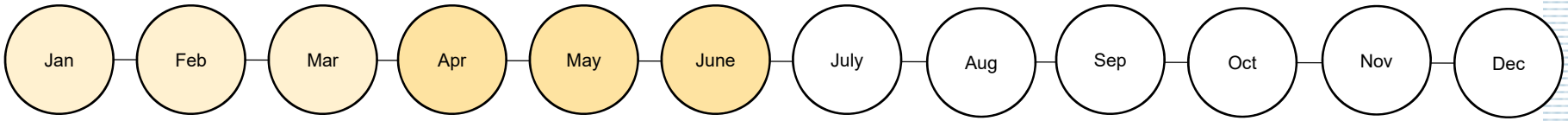
Strategy/Planning Year (2020)

January-March

- Analysis of past year's results
- Engage workgroups
- Draft 3-year Sector Strategies

April-June

- Continue workgroups
- Stakeholder feedback on Sector Strategies
- Finalize measure development for 2021
- Sector Strategies finalized
- Draft 3 year Program and Support Action Plans and budget ranges

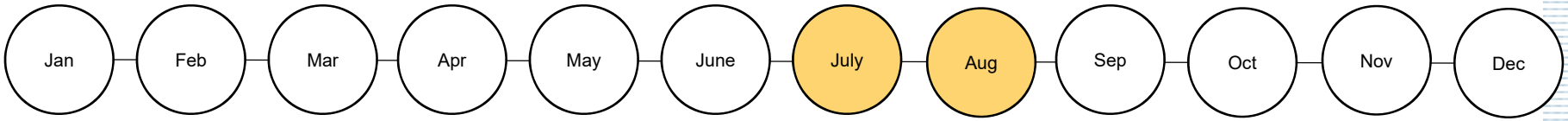


Strategy/Planning Year (2020)

At this point we have 3-year Sector Strategies with draft 3-year action plans and budget ranges

July-August

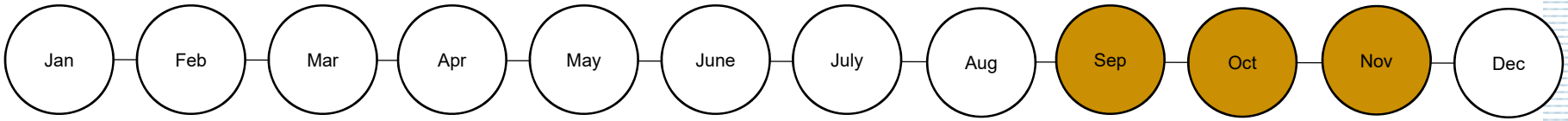
- Comprehensive 3-year plan presented to stakeholders, including workgroups, OPUC, Board and CAC/RAC
- Once approved, this becomes the Business Plan
- Program staff make 2021 budget edits



Strategy/Planning Year (2020)

September-November

- 2021 Annual Budget refined based on feedback
- Final Proposed Budget presentations
- Public comment on Annual Budget
- Final 2021 Budget



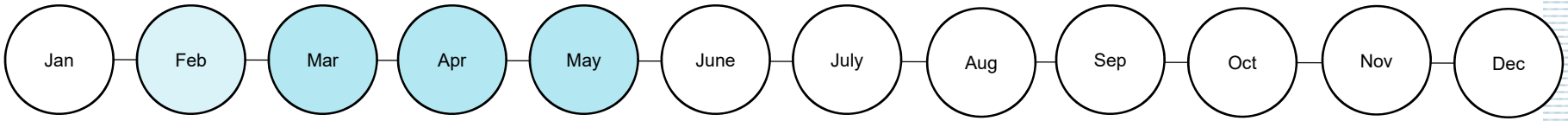
Action Year 1 (2021)

February

- Analysis of past year's results

March-May

- Staff review key drivers and current forecasts against expected Business Plan ranges
- Staff document findings and make recommendations for review by stakeholder workgroups



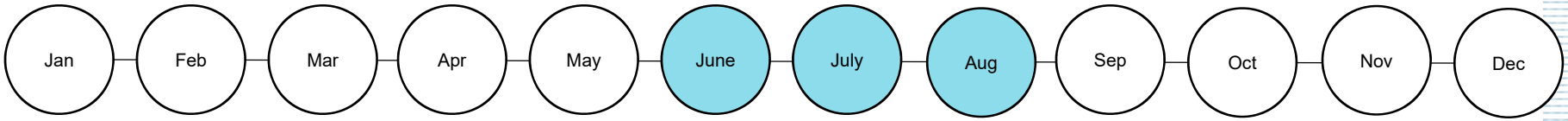
Action Year 1 (2021)

June - August

- If key drivers / metrics indicate potential for deviation from Business Plan ranges, staff analyze impacts and bring recommendation to CAC/RAC
- Staff then update Business Plan, reforecasting savings, generation and budget ranges

-or-

- If Business Plan is within ranges, staff note appropriate changes for draft 2022 budget and notify workgroups/RAC/CAC
- Staff update 2022 budget, incorporating new information from major or minor changes reviewed by workgroups



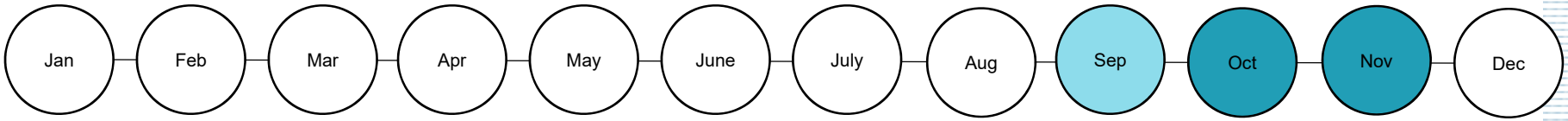
Action Year 1 (2021)

September

- Stakeholder review (OPUC, Board, CAC/RAC, etc.) review 2022 budget
- Public comment period opens

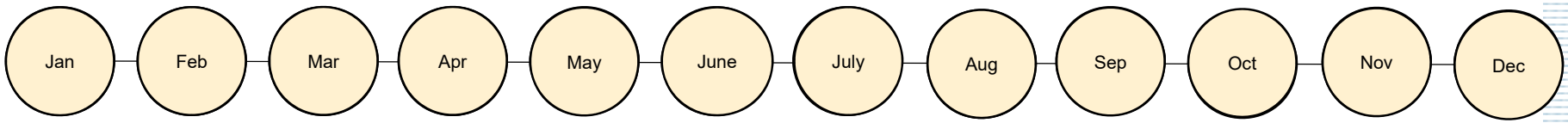
October-November

- Public comment period closes
- Board approval of 2022 budget



Action Year 2 (2022)

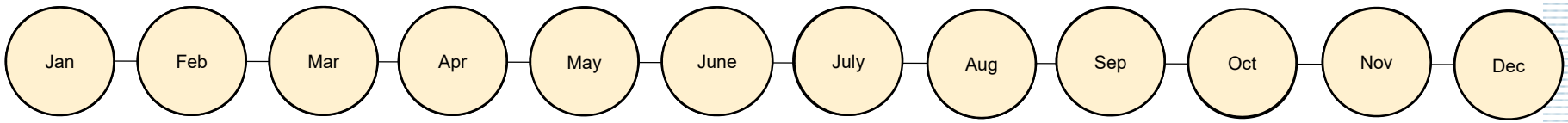
Same as Action Year 1



Action Year 3 (2023)

Executing Year 3 of Business Plan for 2021-2023

Beginning planning process for 2024-2026 Business Plan.



Success Factors and Benefits

Critical Success Factors

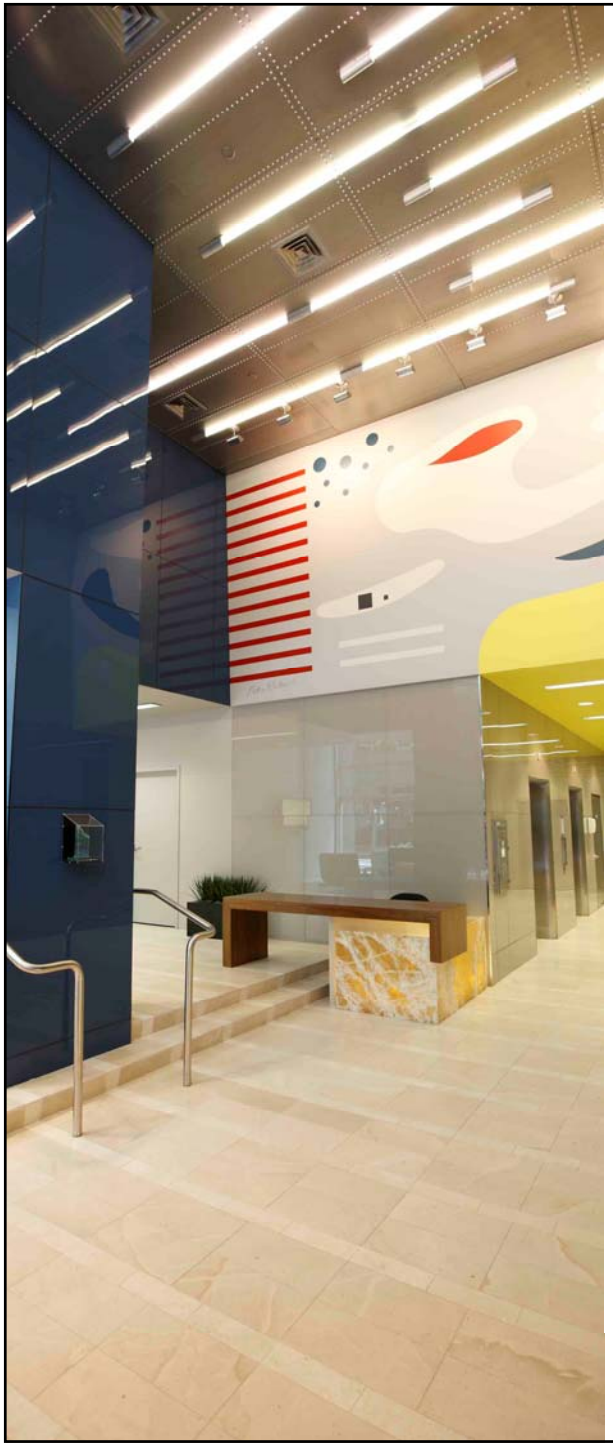
Stakeholder support

Forecasting abilities good enough to support planning

Increased flexibility in use of reserves

Appropriate levels of reserves

New budgeting software



Benefits

Increase stakeholder engagement

Concentrate work on planning, while eliminating some work on subsequent budget periods

Increase program flexibility

Increase strategic perspective of budget planning

Initial Feedback and Next Steps

Report Out Process

Presented to internal Management Team and kept staff apprised

Shared the concept with the OPUC

Presented to all of the utilities

Made a brief update to the Board of Directors and Board Finance Committee

Will bring to full Board on June 6

What we've heard so far

Many questions about the workgroups, with both support and concerns expressed

Cost of the changes

Impact to reserves

Concerns about the accuracy of three-year forecasts in a dynamic market

Next Steps

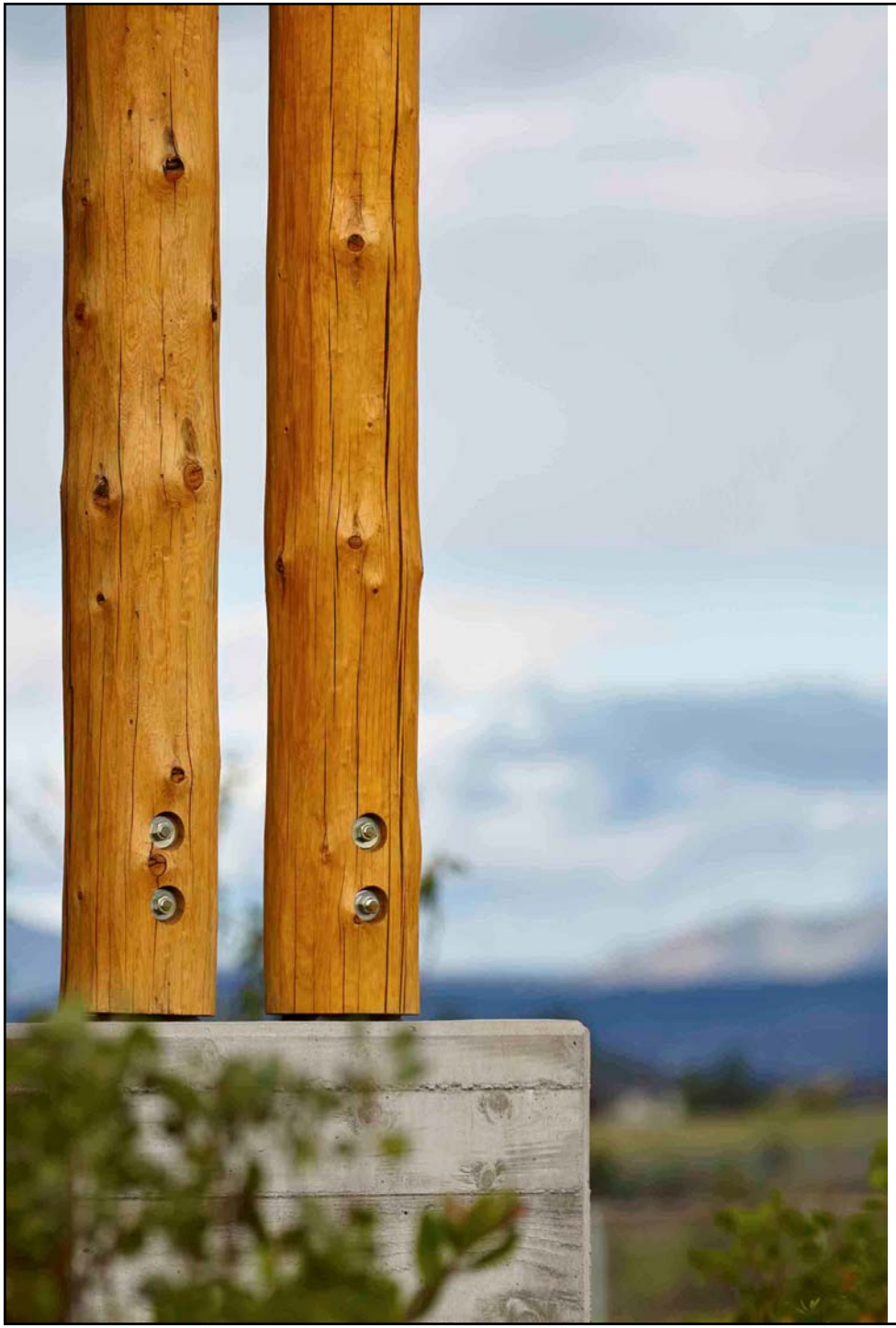
If the recommendations are approved by the Board, the current project would close and a Budget Implementation Planning Team would be created. The new team would work with staff and stakeholders through the remainder of 2018.

In 2019 an Implementation Team would create concrete implementation processes, guidelines and staffing plans.

In 2020, the process would begin.

Questions and Answers

- Would this proposal work for your organization?
  - What works? What doesn't work?
- Does this proposal address concerns you may have raised in the June 2017 survey or elsewhere?
- Do you foresee any unintended consequences?
- Did the team miss anything?



Thank You

Budget Review Team Representatives:

Jed Jorgensen

Oliver Kesting

Pati Presnail

Energy Trust of Oregon