It is Emerald’s mission to provide safe, reliable, low-cost power in an environmentally responsible manner.

Long-Term Strategic Plan 2020

Approved by Emerald People’s Utility District’s Board of Directors, July 21, 2020
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Executive Summary

This 2020 strategic plan has been developed with a long-term perspective in mind. Building on the strategic goals from the 2015 plan, the utility can reference this document to ensure it sticks to a common set of priorities over time and remains focused on Emerald’s customers.

Strategic Goals
The plan’s first two strategic goals, Customer Partner and Energy Services Provider of Choice, are carried over from the previous plan. Customer partnership has been a feature in everything from resource development to rate design, and the utility will seek to learn from these experiences to do an even better job on this front moving forward. Striving to be the provider of choice keeps the idea of future competition at the forefront, forcing Emerald to up its game for the day when it is no longer the only viable option for customers.

The third strategic goal, Industry Leader, is updated from the 2015 plan and reflects a broader view of the industry. Rather than focusing on just its predecessor, the utility will seek to stand out among all of its peers. Underneath these goals is a new set of six initiatives intended to reflect Emerald’s greatest needs moving forward.

Six Strategic Initiatives

1. Distribution System Enhancements is an effort to place a major emphasis on increased service reliability. Although Emerald has invested in its system over the years, there is room to do more and this plan lays out a new set of projects to achieve fewer outages of shorter duration.

2. Load Factor Improvement is a broad effort to encourage efficient use of Emerald’s system. Given the utility’s current “peaky” load profile, this initiative has great potential to avoid higher costs in the future and increase revenue from existing system assets. Every aspect of this initiative relies on customer partnership and provides new opportunities for customers to share in cost savings.

3. Cost of Service Rate Design is intended to ensure equity within retail rates. Aligning rates with Emerald’s actual cost of service over time will not only give customers a sense of confidence that everyone is paying their fair share, it will also allow the utility to emphasize its public power business model.

4. Organizational Resiliency consists of preparing Emerald for adverse events in the future. From earthquakes and wildfires to pandemics and cyber attacks, the utility is facing significant threats to its business model. Dealing with these threats effectively will go a long way toward executing on the rest of this plan moving forward.

5. Customer Facing Programs builds on Emerald’s initial Grid Management Initiative by rolling out programs of direct benefit to customers. Spanning a variety of areas, from outage management to billing, these programs will further strengthen the utility-customer relationship.

6. Finance ties all these pieces together. Emerald’s use of revenue financing over more than the past decade has strengthened its balance sheet, presenting an opportunity to make use of borrowing to complete the new work described in this plan. This approach has several advantages, including spreading out payments for these investments so future customers share in the cost.
Emerald People’s Utility District is a not-for-profit, consumer-owned utility that serves approximately 22,000 customers in rural Lane County. About 19,210 accounts are residential. Emerald is governed by a five-person, locally-elected Board of Directors that sets policy to be carried out by a staff of roughly 80 employees. EPUD hires locally whenever possible and offers a competitive pay and benefits package. The utility’s service area spans 550 square miles. As of December 31, 2019, Emerald’s electric system utilizes approximately 829 miles of overhead primary line, 353 miles of underground primary line, and 20 miles of transmission line.

Service Area
Coburg, Veneta, Junction City, Pleasant Hill, Marcola, Mohawk Valley, Cottage Grove, and Creswell

Customer Mix
Approximately 60% residential, 40% commercial/industrial

Major Industries
Wood products, pulp and paper, manufacturing, and agriculture

Manufactured/Mobile Homes
These account for nearly 20% of Emerald’s housing stock.

Emerald at a Glance
Emerald People’s Utility District is a not-for-profit, consumer-owned utility that serves approximately 22,000 customers in rural Lane County. About 19,210 accounts are residential. Emerald is governed by a five-person, locally-elected Board of Directors that sets policy to be carried out by a staff of roughly 80 employees. EPUD hires locally whenever possible and offers a competitive pay and benefits package. The utility’s service area spans 550 square miles. As of December 31, 2019, Emerald’s electric system utilizes approximately 829 miles of overhead primary line, 353 miles of underground primary line, and 20 miles of transmission line.

Emerald’s History
Emerald’s original Board of Directors was focused on putting customers first. They knew what the community wanted from their new utility after years of fighting to bring Emerald PUD into existence: they wanted reliable service and lower rates. Our directors set out to deliver that and much more to the people they were honored to serve. In 1983, the Board documented the utility’s original mission and vision:

To improve the lives of our Customer-Owners by delivering reliable utility services.

To put people first, with innovative utility leadership and exceptional customer service.

Through the years, these values have been passed down through generations of staff and continue to thrive today. You can see it in our programs and services—from community solar and electric vehicles to prepaid power and student scholarships. Emerald’s unwavering dedication to its community shines through.

As the utility industry evolves and technology advances, and even through the trying and uncertain times of the pandemic, today’s staff and Board remain focused on our customers. To this day, we are honored to serve. And we think our original directors would be proud.
Emerald’s previous Strategic Plan was adopted on October 13, 2015, with a mid-term update in July 2018. This plan laid out a vision for how the utility would continue achieving its mission in a rapidly changing industry and focused on three strategic goals:

- Being a **Customer Partner**
- Becoming the **Energy Services Provider of Choice**
- Remaining **Superior to our Predecessor**

To attain these goals, the utility defined a broad set of strategic initiatives in the areas of Human Resources, Power Distribution, Power Resources, Rates, Technology, and Finance. At the heart of these initiatives was a long-term investment in technology and systems, termed the “Grid Management Initiative” or “GMI”. The GMI involved a 10-year plan to upgrade nearly all business technology at the utility, including new systems in the following areas: Advanced Metering Infrastructure (AMI), Mapping and Geographic Information System (GIS), Outage Management System (OMS), Work Order and Staking, and Enterprise Software.

Emerald staff began work on this upgrade process in late 2016, with the first major milestone achieved in late 2018 when Residential AMI meter installations were completed. Commercial and Industrial AMI conversions followed throughout 2019 and into 2020.

On the GIS front, Emerald chose to adopt a forward-looking approach in the form of a next generation standard known as the Utility Network Model (UNM). Started in 2019 in conjunction with a physical survey of system assets, the UNM conversion remains ongoing in 2020 but is already showing benefits for Emerald staff.

Beyond GMI activities, the utility has also made progress on other areas of the 2015 plan.

**Human Resources**
Emerald managed through a wave of retirements over the past five years, including the loss of several 30+ year employees. The utility surveyed its workforce multiple times prior to these retirements, ensuring a relatively seamless process of succession.

Staff also provided additional overlap opportunities for departing employees to cross-train their replacements, with positive feedback from nearly everyone involved. More broadly, Emerald has continued to promote from within and hire locally whenever possible. A summary of hiring is included in the table below.

**Total Employee Vacancies by Year**

<table>
<thead>
<tr>
<th>Year</th>
<th>Vacancies</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>16</td>
</tr>
<tr>
<td>2016</td>
<td>14</td>
</tr>
<tr>
<td>2017</td>
<td>12</td>
</tr>
<tr>
<td>2018</td>
<td>10</td>
</tr>
<tr>
<td>2019</td>
<td>8</td>
</tr>
<tr>
<td>2020</td>
<td>4</td>
</tr>
</tbody>
</table>

**Internal Promotions**
**Local Hires (External)**

**EMPLOYEE DEVELOPMENT**
Emerald believes that by developing the skills of current employees, we help the utility maintain a talented and committed workforce.

By cultivating abilities through our apprenticeship program and promoting employees internally, we ensure the continued delivery of reliable service and excellent customer care.

**APPRENTICESHIP PROGRAM**
Emerald’s line and tree crew positions require skills that take many years to acquire. Rather than relying on other organizations to provide this specialized training, Emerald believes it’s important to bring up new crew members through its own apprenticeship program. This not only ensures that proper technical training is provided, it also results in each apprentice sharing Emerald’s culture of safety and teamwork.

Since 2015, Emerald has supported, on average, 4 apprenticeships per year. This includes positions for line and tree crews, as well as a substation and metering technician.
Power Distribution
Emerald has made major investments to increase both the reliability and operability of the system. The utility obtained a new industrial customer in the south end of the service territory in 2016, requiring system improvements. To support the customer’s expansion and its anticipated economic boost to the city, Emerald responded quickly. Maintenance projects intensified and capital improvements that were planned to begin at a later time began immediately:

- Vegetation Management – Tree crews took a more aggressive approach to controlling the vegetation in Cottage Grove’s densely forested terrain.
- Reconductoring Project – This project has allowed Emerald to quickly switch to an alternate power source during an outage to restore power significantly faster.
- Recloser Installations – Reclosers are small electronic devices capable of preventing lengthy power outages. In locations where a recloser is installed, a minor fault will cause the device to open before the fuse and close a few seconds later. If the fault has cleared, power is restored, resulting in only a momentary outage.

Since 2015, Emerald has also replaced two aged and undersized transformers. The first was in Creswell in 2015, and more recently, a new transformer was installed at the Elmira Substation in 2019. By equipping the substations with two transformers, the job of reducing voltage is divided between the units, with each one carrying half the load. In the event one transformer is taken out of service, the other transformer can carry the entire load without interrupting service to customers. This two-transformer configuration delivers greater reliability, essentially providing a failsafe against an extended transformer-related outage. If there was only one transformer and it was out of service, the substation would be unable to deliver power until the transformer was either fixed or replaced.

Power Resources
Emerald remained active on this front, carrying out several of the initiatives discussed in the 2015 plan. The utility’s load growth far exceeded projections included at that time, with 2019 customer usage eclipsing 2015 customer usage by nearly 10%. Emerald’s staff and Board responded by increasing its investments in energy efficiency, resulting in savings achievements of 0.46 aMW/year over this period versus an original target of 0.25 aMW/year. Utility staff also analyzed its BPA Slice/Block product as part of a product off-ramp decision in 2016 and recommended continuing with the current structure.

GREEN GRANT PROGRAM
In 2015, Emerald introduced its first GREEN Grant winner. Short for Giving Renewable Energy to Emerald Neighborhoods, the GREEN program funds local renewable generation projects at non-profit locations. The program is paid for with proceeds from Emerald customers who voluntarily contribute $0.008/kWh more on their bill each month. Program participants vote on winning grant proposals each cycle. Since the program was launched, renewable energy projects have been completed at Community Food for Creswell, Lost Valley Education & Events Center, Pleasant Hill Elementary School, Mid-Lane Cares, and The Love Project Food Pantry.

In 2018, Emerald was also proud to sell out its first Community Solar project, Sharing Sun, including a first-of-its-kind low-income component. Through this program, customers are able to subscribe to receive a credit on their bill each month equal to their share of the project. Emerald also facilitated a second Community Solar project at the Saginaw Mobile Home Park. In partnership with St. Vincent de Paul, the utility provides residents of this park a bill credit according to the generation produced by a 100 kW ground mount solar system at the site. Total generation between the two community solar projects is about 220,000 kWh per year.
Rates
The utility also carried out several initiatives within the area of Rates. To help deal with the unprecedented load growth described above, Emerald adopted a tiered rate structure for residential customers in April 2017. Although this effort did result in some energy savings and new insight about residential usage, the customer response was such that this was discontinued by the Board as of October 2019.

The utility has continued making progress toward matching its Cost of Service Analysis (COSA) rate modeling, making interclass adjustments in 2017, 2018, and 2019. As part of this, the residential Electric System Charge increased from $20/month to $31/month, as shown in the chart below.

**Electric System Charge Changes**

<table>
<thead>
<tr>
<th>Month</th>
<th>Charge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apr 2015</td>
<td>$20</td>
</tr>
<tr>
<td>May 2016</td>
<td>$23</td>
</tr>
<tr>
<td>Apr 2017</td>
<td>$26.75</td>
</tr>
<tr>
<td>Apr 2018</td>
<td>$28</td>
</tr>
<tr>
<td>Apr 2019</td>
<td>$31</td>
</tr>
<tr>
<td>Oct 2019</td>
<td>$31</td>
</tr>
</tbody>
</table>

**ELECTRIC SYSTEM CHARGE**
Emerald’s Electric System Charge helps recover the utility’s costs of maintaining a reliable electric system. This includes the cost of equipment and line maintenance, tree trimming, outage restoration, property taxes, insurance, customer service, and general administration.

These costs are generally fixed and must be paid regardless of the amount of electricity used by our customers.

Recovering a portion of these costs through a flat monthly charge, instead of through charges that vary by level of energy use, ensures the costs are distributed fairly among all customers.

**DID YOU KNOW?**
Following February 2019’s “Storm of the Century,” the cost of repairs totaled approximately $4.3 million, making it the most costly storm in Emerald's history. To minimize the impact of repair costs on customer-owners, Emerald pursued funding from the Federal Emergency Management Agency (FEMA). FEMA has since provided financial assistance to the District for about 75 percent of the repair costs, or roughly $3.2 million.

Finance
Finally, in the area of Finance, Emerald’s financial strength continues to grow. This can be evidenced by the chart below comparing Emerald’s growing net electric plant assets as compared to its declining long-term debt:

**Net Electric Plant Assets vs. Net Long-Term Debt**

Net electric plant assets consists of the value of Emerald's total electric plant assets less depreciation and amortization, while net long-term debt consists of long-term debt and associated unamortized premiums. The growing net utility plant assets demonstrates Emerald's commitment to investing in and improving its distribution system. The declining net long-term debt shows that Emerald has paid down existing long-term debt and has not borrowed any new money. Further, it shows that all of the increases in net electric plant assets have been funded through revenue. Over the last several years, in addition to building a very strong balance sheet and investing in its system, the utility has been able to keep rate increases at modest levels close to or below inflationary levels.

The combination of extreme weather events and low wholesale market pricing resulted in moderately increased revenue collection which, combined with a drawdown in cash reserves, allowed the utility to fund most of the investments described above. This was also managed despite significant outlays from two large storms in 2016 and 2019, which were only partially reimbursed through FEMA.
Industry Outlook

In 2020, several trends are impacting the electric utility industry, some of which were anticipated in the 2015 plan and some of which are new. On the regulatory side, today’s energy supply mix continues to be driven by state legislatures. Nearly every western state has adopted some form of a low-carbon mandate, resulting in a dramatic decrease in traditional baseload resources (notably thermal units such as coal and natural gas). Continued retirements are expected throughout the next decade, with replacement energy coming from renewable resources, such as wind and solar.

The impact of this shift from firm, baseload power resources to variable, non-firm renewable resources will impact Emerald in several ways. First, wholesale market pricing has already started to rise, and the kind of firm capacity products Emerald has purchased in the past are scarce or non-existent during much of the year. Second, oversupply of renewable energy has become commonplace during certain parts of the day, as predicted in the 2015 plan and shown in the updated “Duck Chart” below. These two factors combined make it imperative for the utility to improve its load factor, as discussed in further detail later in this report.

The 2015 plan anticipated a proliferation of Distributed Energy Resources (DERs), allowing customers choice beyond their traditional utility. While customer-sited generation has continued to develop, the growth has been slower than expected in the Northwest. Several of the potential competitors (including Solar City) have either scaled back their operations or been sold to larger firms. And while the cost of residential solar and storage has continued to fall, it remains beyond the reach of many customers. However, the consolidation in the off-grid market indicates larger players with deeper pockets now have a stake in the space. As two examples, Tesla has acquired Solar City with plans to continue its residential offerings, and Shell has acquired Sonnen Battery as a means to sell home energy systems. Clearly, those with access to significant capital believe the utility space is ripe for disruption.

Recent reliability events also lend support to a future that involves DERs at the consumer level. California has been plagued by wildfire mitigation efforts over the past two years, leading to multiple Public Safety Power Shutoff (PSPS) events throughout the state. These events have left millions of people without power at times. Seizing on this opportunity, several home storage vendors have ramped up their efforts during this time. Closer to home, Oregon has dealt with both fire mitigation and two severe snowstorms in 2016 and 2019 that resulted in prolonged outages for Emerald customers. Continued investment in Emerald’s distribution system to limit the exposure to these types of events will be key to fending off outside competition in the years ahead.
A significant new trend not anticipated in the 2015 plan is the wider availability and promotion of Electric Vehicles (EVs). Several lower-cost options have been introduced by vehicle manufacturers over the past several years, including the Tesla Model 3 and the Chevrolet Bolt.

Government programs have also heavily incentivized EVs, including direct programs for utilities such as the State of Oregon’s Clean Fuels Program. Through this program, Emerald has received credit for registered EVs and charging activity in its service territory, and has been able to monetize these for significant revenue. This revenue, in turn, has been spent to install EV infrastructure, offer customer incentives, and roll out an EV business grant program.

EV adoption has been particularly high in Emerald’s service territory, as shown below.

### ELECTRIC VEHICLES BY UTILITY TOP 25 RANKING

<table>
<thead>
<tr>
<th>Rank</th>
<th>Utility</th>
<th>2018 Average Customer Count</th>
<th># of Plug-In Vehicles (12/19)</th>
<th>% of Customers Driving EVs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>City of Ashland</td>
<td>11,979</td>
<td>773</td>
<td>6.45%</td>
</tr>
<tr>
<td>2</td>
<td>Portland General Electric (PGE)</td>
<td>881,766</td>
<td>17,783</td>
<td>2.02%</td>
</tr>
<tr>
<td>3</td>
<td>Emerald PUD</td>
<td>21,484</td>
<td>345</td>
<td>1.61%</td>
</tr>
<tr>
<td>4</td>
<td>Consumers Power Inc.</td>
<td>22,655</td>
<td>353</td>
<td>1.56%</td>
</tr>
<tr>
<td>5</td>
<td>Forest Grove</td>
<td>10,126</td>
<td>149</td>
<td>1.47%</td>
</tr>
<tr>
<td>6</td>
<td>Eugene Water and Electric Board</td>
<td>93,428</td>
<td>1,328</td>
<td>1.42%</td>
</tr>
<tr>
<td>7</td>
<td>Lane Electric Cooperative</td>
<td>12,850</td>
<td>172</td>
<td>1.34%</td>
</tr>
<tr>
<td>8</td>
<td>City of Cascade Locks</td>
<td>911</td>
<td>12</td>
<td>1.32%</td>
</tr>
<tr>
<td>9</td>
<td>Salem Electric</td>
<td>19,822</td>
<td>240</td>
<td>1.21%</td>
</tr>
<tr>
<td>10</td>
<td>Columbia River PUD</td>
<td>19,443</td>
<td>223</td>
<td>1.15%</td>
</tr>
<tr>
<td>11</td>
<td>Canby Utility Board</td>
<td>7,522</td>
<td>75</td>
<td>1.00%</td>
</tr>
<tr>
<td>12</td>
<td>McMinnville Water &amp; Light</td>
<td>16,416</td>
<td>150</td>
<td>0.91%</td>
</tr>
<tr>
<td>13</td>
<td>Central Electric</td>
<td>34,508</td>
<td>298</td>
<td>0.86%</td>
</tr>
<tr>
<td>14</td>
<td>PacifiCorp</td>
<td>587,365</td>
<td>4,988</td>
<td>0.85%</td>
</tr>
<tr>
<td>15</td>
<td>Blachly-Lane Electrical Cooperative</td>
<td>3,616</td>
<td>26</td>
<td>0.72%</td>
</tr>
<tr>
<td>16</td>
<td>City of Monmouth Power &amp; Light</td>
<td>4,596</td>
<td>30</td>
<td>0.65%</td>
</tr>
<tr>
<td>17</td>
<td>Central Lincoln PUD</td>
<td>39,191</td>
<td>241</td>
<td>0.61%</td>
</tr>
<tr>
<td>18</td>
<td>West Oregon Electric Cooperative</td>
<td>4,391</td>
<td>26</td>
<td>0.59%</td>
</tr>
<tr>
<td>19</td>
<td>Springfield Utility Board</td>
<td>32,276</td>
<td>180</td>
<td>0.56%</td>
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<tr>
<td>20</td>
<td>City of Bandon</td>
<td>3,773</td>
<td>21</td>
<td>0.56%</td>
</tr>
<tr>
<td>21</td>
<td>Northern Wasco Co PUD</td>
<td>11,224</td>
<td>62</td>
<td>0.55%</td>
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<tr>
<td>22</td>
<td>Coos-Curry Electric Cooperative</td>
<td>17,878</td>
<td>98</td>
<td>0.55%</td>
</tr>
<tr>
<td>23</td>
<td>Clatskanie PUD</td>
<td>4,262</td>
<td>23</td>
<td>0.54%</td>
</tr>
<tr>
<td>24</td>
<td>Hood River Electric Cooperative</td>
<td>3,844</td>
<td>20</td>
<td>0.52%</td>
</tr>
<tr>
<td>25</td>
<td>Tillamook PUD</td>
<td>21,242</td>
<td>98</td>
<td>0.46%</td>
</tr>
</tbody>
</table>
While Emerald has made significant progress as a utility since 2015, much work remains to ensure the utility can deliver on its mission well into the future. Customer expectations continue to increase, both in terms of reliability and service offerings. Many of Emerald’s customers no longer remember the days of the utility’s founding, and the benefits of a consumer-owned utility are less well known than in previous decades. The utility serves a population that has grown accustomed to few, if any, service interruptions, and that also desires the ability to have more information on-demand.

In addition, while distributed energy resource (DER) adoption may be slower than expected, the industry at large remains susceptible to disruption from outside competition. As illustrated by the relatively higher rate of EV adoption described above, Emerald’s customers are willing to use new technologies if existing products and services fail to meet their needs. The utility must be prepared for the day when customers have greater choice in where their energy comes from.

As discussed above, Emerald also faces new challenges in the form of volatile wholesale power markets and regional capacity shortfalls. If not managed properly, these issues will create upward cost pressure at a time when customers expect efficient operations and continued low rates.

Market pricing in the Northwest has become much more volatile in recent years due to a shift away from baseload fossil fuel resources to variable renewable resources. The impact of this shift is seen in recent market price spikes.
The “perfect storm” future scenario involves escalating resource costs and higher utility rates just as new competitors breakthrough with reliable, on-site generation. In such a world, fewer and fewer of Emerald’s remaining customers would be left to pay higher and higher costs.

**Emerald’s staff and Board are committed to positioning the utility to deal with these challenges.**

To do so, the utility will build on the framework of the 2015 Strategic Plan, carrying forward the key strategic goals but developing a new set of initiatives more relevant to the next five years.

The 2020 Strategic Plan framework is shown below.
Emerald People's Utility District

2020 Strategic Plan

STRATEGIC GOALS

Customer Partner ............................................. 28
Energy Services Provider of Choice ....................... 30
Industry Leader .................................................. 32
Since the earliest days of the utility, Emerald has sought to work with its customers to improve service and keep costs low. In the late 1970s this meant borrowing local office space and asking for volunteers to help with community outreach. In more recent times, this has meant working with customers to perform energy efficiency projects that help Emerald avoid long-term power purchases. In either case, the goal was the same: leverage the strong relationship we have with our customers to the mutual benefit of both parties. This idea forms the basis for the first goal of this strategic plan: **Commit to being a Customer Partner.**

As a starting point, Emerald hopes to partner with customers in two key areas: resource development and cost management. The industry continues to move toward customers having a greater ability to develop their own resources. In an effort to evolve with this trend, Emerald will strive to be open to new and innovative service requests—everything from solar panels and home storage to biogas and grid-connected appliances. Emerald will also utilize customer load as a demand-side resource when possible.

Of particular concern in the next five years is the idea of capacity resources, or firm power supply during times of Emerald’s peak demand. Recent regional policy shifts have created a shortage of capacity, making it difficult for the utility to manage power needs during certain times of the day. Customer solutions that help to solve this problem are described in detail under the “Load Factor Improvement” initiative.

Over the past five years, Emerald has worked with customers on local resource development, most notably in the form a Community Solar project at the utility’s headquarters. Known as Sharing Sun, this program allowed a total of 72 customers to purchase a share of the output from a 77 kW solar array. In addition to Sharing Sun, Emerald now has the following local resources on its distribution system:

- 1 landfill gas generator with enough generation to power 1,200 homes
- 146 residential scale solar arrays
- 28 commercial scale solar arrays
- 1 additional low-income community solar project helping power 42 manufactured homes
- Over 7 average megawatts of energy efficiency—enough to power 4,200 homes

The concept of customer partnership can also extend far beyond just resource development and will be mentioned throughout the other initiatives in this plan. On the Human Resources front, this can mean hiring from our local service territory. In the area of Distribution System Enhancements, it can mean developing custom vegetation management solutions on customer property to help with service reliability. Or, in the area of Rate Design, this could mean allowing customers to lower their bill through a Time of Use rate schedule. All of these ideas, rooted in customer partnership, are at the foundation of this strategic plan.
Although the future remains unclear, this plan assumes that competition in the home energy space—in some form—is inevitable. With this as a baseline, Emerald must give its customers a reason to want to engage with the utility. The old model of a monopoly provider that offers service on its terms and communicates once per month is destined for failure in the changing energy industry. Rather, Emerald must carry out the customer partnership model by striving to be the Energy Services Provider of Choice among its customers.

This second strategic goal involves positioning the utility as the first place customers think of for all things energy, a major shift from Emerald's traditional role as a power distribution provider. The utility has gained experience with this model over the past five years, significantly expanding service offerings in energy efficiency, renewable resources, and electric vehicles. In many cases, Emerald's staff has embraced the role of consultant for customers curious about a new technology. This was particularly evident in the utility's Electric Vehicle and Community Solar projects, both of which required a "hands on" approach to educate and assist customers. Similarly, new energy efficiency offerings such as Heat Pump Water Heaters required significant outreach but ultimately provided tremendous customer benefits.

Moving forward, Emerald must build on this experience and remain open to services that might previously have been deemed outside its scope. Recently, for example, customers have begun to inquire about home storage solutions. Emerald is unlikely to be installing batteries itself, however its staff can play a leading role in helping customers find the right solutions. The goal here is to help customers make optimal decisions for themselves and for Emerald. Without this input, external parties will be driving the conversation with customers, leaving the utility and customers to deal with the results. Ultimately, Emerald will focus on enabling positive customer experiences, whether as a direct provider or simply a partner.

As discussed in 2015, promotion and outreach is key to achieving this strategic goal. Customers must associate the Emerald brand with a much wider set of service offerings than has previously been the case. Given today's changing consumer preferences, this will require a new and innovative approach to communication—everything from targeted online marketing to attending new community events.
Over the years, Emerald has carried forward the tradition of standing out amongst its peers. From its earliest days in the 1980s, the utility offered energy efficiency programs to its customers. Although many in the industry questioned this practice back then, Emerald’s Board and staff knew it was the right long-term decision to help customers and take advantage of a least-cost resource.

Later that decade, the utility was the first in the West to generate electricity from landfill gas. Emerald partnered with Lane County to construct a plant at the Short Mountain landfill, providing a renewable, local resource for its customers. Although unorthodox in its time, this type of generation is now highly sought after within the industry.

More recently, in 2011, Emerald began to purchase the Slice product from the Bonneville Power Administration. Slice allows public power utilities to balance their own loads and resources each hour, accessing the wholesale power markets as needed. Although typically thought of as a tool for large utilities, Emerald was attracted to Slice for the greater local control it provides. In the years since, the utility has realized numerous benefits from Slice, including lower cost and the ability to offer innovative customer programs.

This rich history has been formally recognized on multiple occasions. Early in its existence, Emerald was awarded the highest honor among public power utilities: The American Public Power Association’s E.F. Scattergood System Achievement Award. Emerald was presented with this award in 1987 for being “a community-owned utility that has enhanced the prestige of public power through outstanding service to customers.” Happily, the story doesn’t end there. For its more recent efforts in assisting customers and offering innovative service, Emerald was again named a Scattergood Award winner in 2018!

The final strategic goal is a slight change from 2015, but still represents an outcome of the first two goals. That is, if Emerald commits to being a customer partner and is thus able to become the energy services provider of choice, the utility will keep its status as an Industry Leader. As in the last plan, the goal here is to capture a broad array of performance areas, from rates and reliability to customer service and safety, but the comparison this time is much broader in nature. Rather than focusing on just our predecessor, Emerald will compare itself to the industry as a whole.

This change in focus is being made for several reasons. First, the public power business model is necessarily different than that of the investor owned utility. With local governance, Emerald has much greater flexibility to set rates and make necessary system investments, and the benchmark for these areas should reach beyond a single utility that is regulated by the Public Utility Commission. Second, consumers have access to large amounts of information about other utilities, both locally and regionally. Emerald should strive to stand out against all of these. As mentioned previously, a large share of the utility’s customers no longer remember its founding and the predecessor comparison has in many ways run its course. A modern vision of leading within the entire industry is something all Emerald stakeholders can relate to.

Emerald will continue to leverage its status as a small and nimble organization, leveraging this advantage to increase efficiency and improve service to its customers. Rather than running decisions through a corporate office, or any larger bureaucracy, Emerald can focus on local decision-making to benefit its specific service territory. System investments or customer programs that in other organizations might require layers of approval or that might compete against other geographical areas can be prioritized quickly to benefit Emerald’s sole focus: its local customers.

Although “leadership” remains a subjective measure, this strategic goal will serve as an aspirational target across all aspects of the utility. Whether in operations, engineering, finance, power resources, or customer service, Emerald will always look to do more than the average utility. Achieving the goals laid out above will require nothing less.
STRATEGIC INITIATIVES

Distribution System Enhancements
Load Factor Improvement
Cost of Service Rate Design
Organizational Resiliency
Customer Facing Programs
Finance
Strategic Initiatives

Substations
Emerald's eight substations serve as the entry points into its distribution system and play a critical role in system reliability. At each substation, power is received from high voltage transmission lines, stepped down via large transformers, and delivered to Emerald’s customers over its distribution lines. Any issues that arise in this process impact thousands of customers at a time, underlying the importance of this equipment.

Substation investments will be made to achieve three primary objectives:

1. **Strengthen existing substation infrastructure.** Priority will be given to equipment nearing end of life over the coming 5-10 years to provide sufficient buffer against failure due to aging.

2. **Prepare for future growth.** Growth in Emerald’s service territory is expected to be driven by the expansion of urban growth boundaries and the maturation of new industries (e.g., indoor agriculture). These drivers will guide investment decisions in new substation equipment.

3. **Provide redundancy for areas currently lacking.** Much of Emerald’s distribution system is radial, making it difficult to transfer service to alternate feeds. New substation investments will be prioritized to increase redundancy where economically and operationally feasible.

**Example Substation Projects:** Replacement of aging substation transformer (2022), new substation build to increase redundancy (2021-2023).

For a distribution utility like Emerald, system reliability is the most important factor in delivering a positive customer experience. This is likely to be even truer in the future, with customer expectations increasing at the same time as new competitors enter the marketplace. This will open up a window of opportunity for Emerald to take advantage of its incumbent advantage as a highly reliable power provider, with availability nearly every hour of every day. This level of service will be difficult, if not impossible, for new technologies—particularly solar and storage—to match.

The utility starts from a position of strength, having invested steadily in its system over the years. This includes regular maintenance of all major facilities (substations, transformers, etc.), pole testing and treatment on a rotating basis, vegetation management across the entire district, and strategic upgrades where required (e.g., new substation transformers). Current service levels are dramatically improved from those provided when the utility took over service in 1983.

The key to maintaining Emerald’s reliability advantage against future competition is to “play offense” by implementing this plan’s first major initiative: distribution system enhancements. The goal is to increase investment levels in key areas, striving for fewer outages of shorter duration while also adding flexibility to respond to events as they occur. These outcomes will provide a true strategic advantage for the utility in the years ahead.

To accomplish this, Emerald will increase its investment in the following areas:

- **Substations**
- **Distribution Facility System Refresh**
- **Distribution System Operational Improvements**
- **Right of Way Management**

**Distribution System Enhancements**
Distribution System Facility Refresh

The core of Emerald's distribution system consists of the thousands of poles lining the utility's right-of-way along with the miles of wire hanging in air and buried underground. As with any physical materials, this equipment has a finite life and must eventually be replaced. The important task for the utility is to avoid having too much failure occur all at once, leading to longer and more disruptive outages.

Investments in distribution system facility “refresh” projects will be made to achieve the following objectives:

1. Replace underground cables proactively. Emerald inherited a system with original underground cable that was largely unprotected in the way that today's equipment is. These cables are beginning to fail at an increasing rate, which leads to difficult troubleshooting and expensive repairs. To avoid these repeated, long-duration outages, the utility will be proactive in replacing underground cable near end-of-life.

2. Replace weak overhead wire proactively. Emerald's system also contains original overhead wire that often leads to outages when vegetation or other objects come into contact with it. This includes existing single-strand copper wire as well as multi-strand aluminum wire with corroded steel cores. Replacing this equipment with new wire will be done proactively to avoid more frequent outages.

Example Distribution System Facility Refresh Projects:

Distribution System Operational Improvements

Beyond the replacements necessary to continue delivering reliable service, Emerald also has opportunities to invest in new types of equipment that can prevent or reduce the duration of certain outages. In addition to “hardening” the system to increase its ability to withstand external events, this equipment will add new dimensions of operational flexibility.

Investments in distribution system operational improvements will be made according to the following objectives:

1. Increase installation of tree wire and spacer cable. Overhead cabling has seen several innovations in recent times, including wire with heavily covered conductors that allow intermittent contact with ground points. In some products, this wire is strung in an open configuration while in others it's separated and hung by spacers. In either case, the goal is to eliminate temporary faults due to contact with vegetation and/or animals. Emerald has installed small sections of this wire and found it to dramatically reduce outages resulting from these causes. Moving forward, the utility will expand its use of tree wire and spacer cable when appropriate in areas prone to outages due to vegetation.

2. Replace manual switches with advanced devices such as automated reclosers. In its current configuration, much of Emerald’s distribution system relies on physical switches that must be activated on-site by a staff person. This makes it difficult to quickly respond to outages by switching from one source to another. In recent years, Emerald has begun to install more advanced recloser equipment that automates and provides for remote control of the switching process. Not only does this lessen the duration of outages, it also provides for additional protection of crews by taking manual steps out of the switching process. In future years, the utility will strategically deploy additional reclosers to enhance the flexibility and safety of the system.

3. Increase installation of regulators. Voltage regulators present another tool to help improve the quality of service and potentially reduce service interruptions. These devices can be deployed on the system at a substation or along distribution lines to automatically maintain a constant voltage level regardless of how much power is being drawn. Regulators have the added benefit of allowing Emerald to serve more customers from alternate sources. The utility will deploy these at various points throughout its system over the next several years.

Example Distribution System Operational Improvement Projects:
Increased tree wire and spacer cable (2022-2030), recloser and regulator device installation (2021-2030).
Right of Way Management

Emerald maintains approximately 850 miles of right-of-way throughout its service territory, much of which requires near constant maintenance due to ongoing vegetation growth. By a wide margin, vegetation falling into the utility’s lines accounts for the largest number of outages on the system each year. Furthermore, this vegetation poses a significant wildfire risk during the summer months. To combat this, the utility employs a team of tree crews to perform regular trimming in each sub-district. Building on these efforts, Emerald will make additional investments according to the following objectives:

1. Keep trees clear of lines for reliability and fire mitigation. The utility’s tree crews will implement more aggressive trimming practices where possible and economic to do so. In many cases, this will involve taking trees down to the stump to prevent future growth. In addition, Emerald will utilize herbicide treatments in targeted locations that are costly or difficult to trim. In doing so, the utility will follow Lane County’s Integrated Vegetation Management Policy, included in Appendices A and B for reference.

2. Maintain areas around substations and field devices. Critical field infrastructure will be protected using the trimming and treatment options described above. This will ensure access for Emerald staff and minimize the impact on system operability in the case of major events. This will be particularly important to protect against wildfires, which can quickly consume vital equipment if not controlled.

Example Right of Way Management Projects: Aggressive tree trimming (2021-2030), targeted herbicide use following Lane County (2021-2030).

Wildfire Risk

Since 2015, the threat of destructive wildfires has become a reality for the entire West Coast. Although multiple events occurred over this period, perhaps the most extreme case happened in California in 2018. In late summer, the Carr and Mendicino Complex Fires ravaged both the northern and southern parts of the state, while in November a second wave that included the Woolsey and Camp Fires did even greater damage. All told, the state incurred billions of dollars in damages, along with 103 civilian deaths. Pacific Gas & Electric was found to be liable for damages caused by multiple fires started by its equipment in 2017 and 2018. As a result, the company was forced to declare bankruptcy in January 2019.

Oregon dealt with its own significant wildfires during this time, with the 2018 season resulting in a record high of $514 million in damages. Although the causes differed from the California fires, Oregon utilities face a very real risk moving forward if they fail to maintain their right-of-ways.
Emerald's customers use significantly more during the summertime than during the winter. This usage shape is often defined as a utility's load factor, which is a measure of how efficiently its system is being used. Emerald tends to have a relatively low load factor of around 30% annually, meaning its customers use, on average, only 30% of their total potential usage throughout the year. The program tools available in this effort include:

- Focused Energy Efficiency, Time of Use Rates, Demand Response, Electric Vehicles, and Storage/Microgrids

This low load factor, represented by the ups and downs in the chart above, makes it difficult to build a power supply portfolio and distribution system that can serve the large peaks in demand. The utility must decide how much to over-acquire and over-build just to serve the high-demand periods. All of this extra supply and equipment then goes unused during the off-peak hours. Without intervention, this situation has the potential to get even worse in the future, particularly in the world of power supply. As mentioned above, the region is facing a shortfall of firm capacity resources needed to deal with peak demand events. As a result, when Emerald looks to acquire resources to serve peak demand, it will be facing a highly volatile and expensive marketplace. This situation is already beginning to show in today's markets, as evidenced by significant market pricing excursions in 2018 and 2019 (as shown on page 21).

While challenging, this situation presents a unique opportunity for Emerald in the form of this plan's second initiative: load factor improvement. For starters, this effort will serve as an insurance policy against cost increases that could place Emerald at a disadvantage against future competition. Beyond this, however, a higher load factor will provide numerous other benefits, including:

- Greater utilization (and revenue) from existing system assets
- Smaller build out of long-term distribution system assets
- Longer equipment life (less heat generated from running near maximum capacity)

Given Emerald’s current low load factor, this initiative offers perhaps the most upside of any opportunity listed in this strategic plan. Notably, improving the utility’s load factor will require a strong level of customer engagement. Successfully implementing the programs below can thus be a means to enhance customer partnership, emphasize the utility’s role as an expert on energy topics, and maintain its status as an industry leader.

The program tools available in this effort include:

Focused Energy Efficiency

Emerald has offered energy efficiency programs since its founding, viewing this function as both a power resource and a customer service. Like others in the Northwest, the utility offers a common set of programs authorized by the Bonneville Power Administration. Typically, these involve a financial incentive to customers in exchange for the annual energy savings performance of some measure. Examples include residential home upgrades (heat pumps, windows, attic insulation, etc.) as well as commercial and industrial upgrades (LED lighting, compressed air solutions, etc.).

Moving forward, Emerald will look beyond just the annual energy savings benefits from these programs. It’s just as important to determine when a measure saves energy as it is to determine how much that measure saves in any average year. Going forward the utility will determine which measures reduce usage the most during times of peak demand and focus on offering higher incentives for these. Often this will mean pursuing programs that minimize or eliminates the use of electric resistance heat in order to save more energy during weekday morning hours. To illustrate this concept, the usage profile of an electric resistance (“ER”) water heater is compared to a heat pump water heater (“HPWH”) below. This shows the greatest difference between the two, thus the greatest peak savings potential, occurs during Emerald’s peak demand hours.

![Graph showing daily energy use comparison between electric resistance and heat pump water heaters.]

In addition to saving energy at times of peak demand, focused energy efficiency allows Emerald to pursue measures that help minimize exposure to increasingly volatile wholesale power markets. Other examples of “high value programs” under this focused energy efficiency model include heat pump space heating upgrades, weatherization measures, LED street lighting upgrades, and localized voltage optimization. Through new outreach and education about the value of these programs, Emerald can drive home its role as a trusted energy advisor and customer partner.

Time of Use Rates

With the implementation of Advanced Metering Infrastructure, Emerald now has greater capabilities in the area of rate design. Specifically, the utility can now charge customers according to the time of day in which they use energy. Known as Time of Use rate design, this approach has existed in other parts of the country for some time but is still relatively new to the Pacific Northwest. An example time of use rate schedule is shown below.

As illustrated in the chart, most Time of Use rate schedules define distinct “Peak” and “Off Peak” periods, with some differential in rates to incentives shifting usage from the former to the latter. There is often a seasonal aspect to this rate design to account for a difference in load shape between winter and summer.

Based on the experience of others in the industry, Time of Use programs have the potential to shift somewhere between 8%-12% of usage from peak periods into off-peak periods. This will vary greatly between customers, however, and it’s important to note that Time of Use is not for everyone. It tends to be best suited for flexible loads such as water heating and electric vehicle charging, and less advantageous for non-electrically heated homes.

Given Emerald’s prior experience with tiered rates, the utility will take a cautious approach to Time of Use. The intention is to make any Time of Use program voluntary. In this way, the onus will be on Emerald to sell the benefits of the program by showing customers the savings potential. The utility will prioritize communications and marketing efforts that encourage customers to look to the utility as a partner in saving both energy and money.
Demand Response

Another approach to peak demand reduction is known as Demand Response. Loosely defined as any program that allows the utility to reduce load on demand, Demand Response programs often provide direct control over appliances or other devices within a home or business. In other cases, the utility and customer(s) sign load curtailment agreements whereby the utility can request a reduction in demand within a specified period.

Example Programs

| Connected Thermostats | Water Heater Switches | Direct Management of EV Charging |

Emerald has analyzed Demand Response potential with two residential pilot programs in recent years. In both cases, controllers were installed in customer homes that allowed direct load control over water heaters and/or thermostats. In general, while the utility found strong potential for managing peak demand with these devices, the cost to enroll customers was significant. Moreover, any meaningful residential Demand Response program would require a multi-year effort to retrofit thousands of legacy appliances throughout Emerald’s service territory.

The utility has also made efforts to establish load curtailment agreements with commercial and industrial customers, most recently during the March 2019 wholesale market price excursion. The customer response has been lukewarm at best, with most citing the low compensation offered as inadequate for the trouble of stopping production.

Demand Response, particularly in the Residential class, has potential for Emerald in the future. For it to be economically viable, however, significant groundwork will need to be laid over a longer period of time. As a result, Emerald will focus its work in this space on regional efforts to establish standards that will make Demand Response “plug and play” on all new devices. As of 2020, this includes the CTA-2045 switches for new space and water heating, as well as Electric Vehicle charging. Whenever possible, the utility will also work directly with manufacturers and the Northwest Energy Efficiency Alliance (NEEA) to promote the adoption of Demand Response ready products.

Electric Vehicles (Flexible Load)

Although distinct from the first three programs, Electric Vehicles present a unique opportunity for Emerald to work the opposite end of the peak demand curve. Electric Vehicle charging is an extremely flexible load, with the potential to consume energy during non-peak hours (mid-day/overnight). As a result, Electric Vehicles can help to fill the “valleys” in Emerald’s load shape. The result will be greater utilization of existing system assets (i.e. increased revenues without a proportionate increase in cost).

The key is to ensure Electric Vehicle charging happens during the right times of day. If customers charge in peak hours, this only exacerbates Emerald’s load factor issues. On the other hand, the utility stands to benefit considerably if it can incentivize customers to perform home charging during overnight periods and workplace charging during the afternoon hours. This load shift is illustrated in the chart below.

Emerald has been active in the Electric Vehicle space since 2017 and will build on its existing program lineup. Moving forward, customers will be incentivized to acquire and use Electric Vehicles in a manner that benefits both them and the utility. Current programs to continue or expand include:

- Residential Level 2 Charger Incentives (requires Time of Use)
- Business Charging Infrastructure Grants
- Public Charging Investments (e.g. schools)
- Outreach and Education Programs
Storage and Microgrids

A final area with potential to assist in load factor improvement is that of storage and microgrid solutions. Although much effort has gone into these technologies in recent years, they remain uneconomic for many use cases as of 2020. However, with technology rapidly developing, Emerald expects new options in the future at both the customer and utility levels. Emerald will continue to watch this space in the coming years, positioning itself to leverage any breakthroughs and stay current on customer preferences.

Residential battery storage, in particular, has potential for peak reduction when combined with a Time of Use rate program. Batteries can be very quick to respond to momentary pricing incentives, and these systems provide Emerald the chance to partner with customers to reduce load during high use periods. Competitors are expected to market residential storage solutions heavily in the coming years in response to emergency events such as Public Safety Power Shutoffs. In response, Emerald will provide customers with support to install these systems in a way that can benefit both parties.

Microgrids present a larger scale solution to load factor issues, often involving a local generation source that can be ramped up or down to assist with peaking needs. Microgrids are intended to operate independently of the larger electric grid and benefit from less reliance on transmission. Moving forward, Emerald will remain open to microgrid solutions proposed by its customers. The utility will also pursue potential grant funding to assist with a proof-of-concept pilot project.

Approximate Program Timeline

Each of these programs will be rolled out in different phases over the coming years. An approximate timeline of these activities is included below for reference.
Emerald People’s Utility District

2020 Strategic Plan

Cost of Service Rate Design

Although “low-cost power” is only one aspect of Emerald’s mission, the utility’s rate structure can often play an outsized role in the minds of customers. As such, it’s vitally important that customers have confidence they are being charged fairly for their electric service. In general, this means that rates should reflect the actual costs incurred to serve each customer class.

The primary tool to determine how Emerald’s costs should be allocated is known as a Cost of Service Analysis (COSA). In general, Emerald performs a COSA once every five years in partnership with a third-party consultant. COSAs are far from an exact science, relying on allocation assumptions to equitably split costs. However, over time a set of generally accepted methodologies has been developed to ensure consistency in the process.

Leveraging the utility’s COSA work forms the basis for this plan’s third initiative: cost of service rate design. Although no rate design will please everyone, reflecting actual cost of service in rates will go a long way toward helping Emerald achieve its strategic goals.

Cost-based rates appeal to a sense of fairness, and Emerald can emphasize its role as customer partner by ensuring everyone pays for their share of the system, and no more. This has the potential to increase a sense of shared ownership across the utility in a way that no private energy provider can match. This approach also allows the utility to remind customers of its public power business model, emphasizing the lack of a profit motive or subsidies across customers. In addition, offering cost of service rates will put Emerald ahead of many in the industry, most notably investor owned utilities that are unable to do the same.

Summary of Cost of Service Analysis

In general, rates for most customer classes are appropriate, with the residential, commercial, and industrial classes all within 10% of cost of service levels. Results for individual commercial and industrial customers varied.

The two largest disparities in the 2020 COSA are both longstanding issues at Emerald and within the industry at large. First, the cost to serve irrigation customers is much higher than is currently being reflected in retail rates. Although efforts were made in 2017 and 2018 to partially correct this imbalance, irrigation customers remain between 35% (single-phase) and 105% (poly-phase) under-charged.
Second, Emerald’s rate components remain out of alignment, with the Electric System (basic) charges generally too low for all classes. This situation is illustrated in the table below.

**EPUD COSA Results: Electric System Charge**

<table>
<thead>
<tr>
<th>CUSTOMER CLASS</th>
<th>RATE SCHEDULE</th>
<th>PRESENT</th>
<th>2016 COSA</th>
<th>2020 COSA</th>
<th>VAR PRESENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>4 &amp; 4a</td>
<td>$31.00</td>
<td>$38.70</td>
<td>$41.93</td>
<td>$10.93</td>
</tr>
<tr>
<td></td>
<td>4s</td>
<td>$14.00</td>
<td>$38.70</td>
<td>$41.93</td>
<td>$27.93</td>
</tr>
<tr>
<td>Commercial</td>
<td>Single Phase, &lt;50 kW</td>
<td>$31.00</td>
<td>$38.70</td>
<td>$41.93</td>
<td>$10.93</td>
</tr>
<tr>
<td></td>
<td>Single Phase, &gt;50 kW</td>
<td>$70.15</td>
<td>$38.70</td>
<td>$41.93</td>
<td>-$28.22</td>
</tr>
<tr>
<td></td>
<td>Three Phase, &lt;50 kW</td>
<td>$31.00</td>
<td>$47.30</td>
<td>$51.75</td>
<td>$20.75</td>
</tr>
<tr>
<td></td>
<td>Three Phase, &gt;50 kW</td>
<td>$70.15</td>
<td>$54.47</td>
<td>$59.93</td>
<td>-$10.22</td>
</tr>
<tr>
<td>School Service</td>
<td>25E</td>
<td>$31.00</td>
<td>$47.30</td>
<td>$51.75</td>
<td>$20.75</td>
</tr>
<tr>
<td>Agricultural/</td>
<td>Single Phase</td>
<td>$31.00</td>
<td>$38.70</td>
<td>$41.93</td>
<td>$10.93</td>
</tr>
<tr>
<td>Irrigation*</td>
<td>Three Phase</td>
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<td>$46.97</td>
<td>$51.25</td>
<td>$9.67</td>
</tr>
<tr>
<td>Industrial</td>
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<td>$207.00</td>
<td>$162.34</td>
<td>$177.69</td>
<td>-$29.31</td>
</tr>
</tbody>
</table>

*Three phase charge was analyzed in total rather than by rate class. These blended totals are included for reference.

Emerald has made greater progress on this front over the past five years, particularly on the residential side. Since 2010, the residential Electric System Charge has increased from $10 to $31, and now stands just $10.93 below the cost of service level. This movement follows a general public power trend over the past ten years toward higher monthly fixed charges.

**Future Guidance**

Moving forward, Emerald will operate with the following guidance regarding rate modifications:

- Rate schedules should reflect 100% of cost of service
- Adjustments will be made over a 5-10 year time period to reach this goal
- Adjustments will be made in combination with annual rate changes (if applicable)
- No rate schedule will be adjusted by more than 10% in any given year

In addition to these four principles, Emerald will also pursue new ways of communicating the value of cost-based rates to its customers. The utility will seek to highlight the value of the not-for-profit business model as well as Emerald’s role in preventing cross-subsidization and providing greater stability in customer bills.

**Importance of Fixed Charges**

Properly reflecting a utility’s fixed costs in retail rates is important for two primary reasons. Most notably, it prevents cross-subsidization between different customer classes that can occur when fixed charges are too low. This is illustrated in Appendix C: Fixed Charge Analysis at the end of this plan. Accurately charging fixed costs to customers also provides greater stability in monthly bills, which benefits both customers and utility.
In recent years, disaster preparedness and emergency planning have become mainstream topics in the Pacific Northwest. This new awareness is driven by a diverse set of factors, including:

- New research on the earthquake dangers within the Cascadian subduction zone
- Increased frequency and severity of wildfires along the west coast
- More sophisticated cyber-attacks against public agencies (e.g., ransomware)
- Public health emergencies, such as the COVID-19 pandemic

In response to these threats, industry leaders are beginning to think strategically about their ability to handle adverse events. Rather than just creating a policy to sit on a shelf, they are investing resources to ensure their operations can continue under even the worst circumstances. While the specific actions differ among organizations, the common feature is a commitment to plan ahead like never before.

By engaging in this type of planning, Emerald will carry out its fourth strategic initiative: organizational resiliency. Over the next several years, the utility will make the necessary investments to ensure it can deliver power reliably even in the face of major disruptions.

In addition to being the right business move, this initiative will also support the utility’s strategic goals. Part of any resiliency plan involves a strong and vibrant workforce, and Emerald will continue partnering with its communities to develop local candidates. Increasing resiliency will also be a direct answer to future competitors that claim to be a better choice during emergencies (e.g., home storage “energy independence” solutions).

Emerald will focus its resiliency efforts in four primary areas: Human Resources, Distribution System, Facility and Building, and Information Technology.
Distribution System Resiliency

As described earlier in this plan, Emerald is committed to making significant investments in its distribution system to improve reliability in the coming years. Beyond these efforts, however, the utility will prioritize opportunities that help to withstand natural disasters.

Historically, winter storms (wind, snow, and ice) have been responsible for the largest number of major outages on Emerald’s system. When tree limbs fall during unfavorable weather, Emerald’s equipment is all too often in their path. By strategically rolling out tree wire and spacer cable that can stand up to this debris, and by taking a more aggressive vegetation management approach to keep limbs out of the right-of-way, the utility can avoid many of these disruptions in the future.

As a utility in the middle of the Cascadian Subduction Zone, Emerald’s system is also vulnerable to major earthquakes. In response, the utility has already engaged with a consultant to assess how its substations will perform under such an event. In the near future, Emerald will use this knowledge to retrofit major substation equipment to meet current seismic standards. Moving forward, the utility will perform analysis of its other field equipment to determine whether additional seismic upgrades are necessary.

As recent summer events confirm, Emerald’s system is also susceptible to damage from future wildfires. In fact, this threat is even starker in that Emerald’s equipment is actually capable of starting a fire under the right circumstances. Vegetation management is at the heart of prevention efforts on both fronts, as any dry trees or brush near power lines can create hazardous conditions. The utility will make a point to target high-risk areas, employing both aggressive trimming as well as herbicide treatment when necessary.

Facility and Building Resiliency

In a recent review of the utility’s substations, all equipment was found to be secured with the exceptions of the transformers and metalclad switchgear buildings. In the coming years, the utility will work with a consultant to invest in upgrades to ensure at least a minimal level of functionality during a Cascadia-level event. The transformers will be secured using one of three methods depending on the individual design of the transformer. Substation buildings will be secured using newly fabricated anchor plates, and the rigid bus will be replaced with wire on the hi-side of the transformers so the bus doesn’t cause the bushings to break during a seismic event.

The work to secure the large equipment and buildings will be completed by early 2021, pending budget approval, and the rigid bus replacement should be done by late summer this year.

Similar to work done at its substations, Emerald is committed to making seismic upgrades to the headquarters building. Emerald’s headquarters building, along with its warehouse and yard, serves as a critical path through which the utility dispatches crews, manages inventory, and performs other critical administrative functions. Maintaining access to the facility, and ensuring the safety of employees working within it, are among Emerald’s highest priorities. This may, for example, prioritize keeping vehicles stocked and fueled even if other parts of the property are out of service.

Despite these efforts, there may be events outside of the utility’s control that render the headquarters building either unusable or inaccessible. The property is near a floodplain, and a major river event, for example, could prevent employees from reaching the site. To prepare for this potential disruption, Emerald will explore options up to, and including, developing a backup location in another part of its service territory.
Information Technology Resiliency

Another crucial aspect of organization resiliency has to do with Information Technology (IT) capabilities. In pursuing the Grid Management Initiative, Emerald has moved to an even greater reliance on IT systems over the past several years. IT resiliency consists of 1) ensuring employees have access to Emerald’s systems and data at all times and 2) ensuring the integrity and confidentiality of said systems and data.

Ensuring access to Emerald’s systems and data from any location is a key feature of the still-in-progress Grid Management Initiative, and includes moving to an electronic, mobile device friendly work management process for operations and system continuity through strategic use of on-premises and cloud-based technologies. This will ensure that in the event of the loss of a site for any reason secondary systems will be able to be in place to quickly take over.

Data is at the heart of the GMI, and the integrity and confidentiality of ours and our customers’ data is paramount. Emerald recognizes that both systems and processes are required to accomplish this task and will implement staff training and new security technology to avoid exposure and mitigate cyber risk.

Emerald has steadily increased its internal IT capabilities in recent years, including adding a separate department with experienced staff. The utility will leverage this group to ensure the organization stays current with the best IT practices.
Strategic Initiatives

ACHIEVING OUR GOALS

Customer Partnership: Offering customers new programs and tools will provide them a sense of control over their electric service and increase opportunities for engagement.

Provider of Choice: Increasing customer loyalty through innovative program benefits will place the utility in a strong position against future products offered by competitors.

Industry Leader: As an early adopter of many technologies, Emerald can pass along unique benefits to its customers that will be difficult for other utilities to match.

Customer Facing Programs

As mentioned above, the Grid Management Initiative has already resulted in significant benefits to the utility. Emerald’s Operations staff is now able to respond to outages almost instantly, in some cases before customers even know they are out of power. Likewise, the utility can dispatch and monitor crews more efficiently using new mapping solutions.

The majority of the benefits to date, however, have been realized at the internal staff level. While these are crucial to improving “behind the scenes” service, Emerald is also committed to leveraging new technology for the direct benefit of customers. The utility has taken some early steps in this direction, most notably through the rollout of the SmartHub portal, which allows customers to monitor their hourly energy usage. The customer response to this effort has been extremely positive and the utility is committed to building on this moving forward.

This commitment forms the basis for Emerald’s fifth strategic initiative: customer facing programs. With a strong technology foundation now in place, Emerald will leverage this investment to provide customers new tools to engage with the utility and control their energy usage. Doing so will make a critical contribution toward meeting the utility’s strategic goals.

The new tools being proposed will open up more opportunities for customer partnership, whether through joint management of energy usage or the exchange of information in new ways. Crucially, these programs will also increase customer loyalty and head off future product offerings from new competitors. In addition, given Emerald’s early adoption of these technologies, customers will find themselves with visible advantages when compared to offerings from other utilities.

The following areas will be targeted for customer facing programs in the years ahead: Billing and Communications, Energy Usage, Outage Management, New Service Requests, Advanced Analytics.

Billing and Communications

By leveraging its Advanced Metering Infrastructure investment, Emerald has the opportunity to change the way customers interact with the utility. Billing is a core customer service, and has been largely the same experience for decades. That is, customers receive a bill in the mail once per month and make a payment either manually or electronically.

One option to change this paradigm is an expanded pre-payment program, whereby customers purchase a block of energy at the beginning of the month and can “refill” the balance as needed. In addition to encouraging conservation and increasing customer interest in their energy usage, this program can remove the need for large new service deposits.

What is Prepaid Power?

Prepaid Power is a simple, “pay-as-you-go” alternative to traditional monthly billing. This flexible plan gives you the freedom to decide how often and how much to pay. Plus, you’ll have access to real-time usage data, making it easy to save power and money.

Prepaid Power offers BIG BENEFITS!

- • No credit required!
- • No late fees!
- • No deposit!
- • No monthly bill!

Another customer facing program in this category is the ability to choose a billing date. Emerald has the potential to allow customers to decide when they are billed and required to submit payment each month. This can assist customers with cash flow needs throughout the month, enhancing a sense of control over their utility experience.

Beyond the billing process, Emerald can also improve its general customer communications by leveraging the new systems. Opportunities for targeted messaging via email, text, or app notification can all be utilized to provide more “real time” communication. This will be particularly useful during outages and to offer custom promotions, such as special energy efficiency programs. Emerald can also facilitate customer feedback via these new channels, which can be particularly helpful during outages to alleviate phone call volume.

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**Outage Management**

Outages, while disruptive, create a unique opportunity for Emerald to enhance its image as a customer partner and provider of choice. When service is interrupted, customer attention on the utility is at a high point and Emerald’s image is often defined by its ability to provide information and help the customer through the experience.

Emerald’s new systems provide capabilities to keep customers informed during outage situations. In the future, the utility will seek to provide more custom information about particular outage locations, including estimated restoration times. In addition, high-level maps can be produced to reveal general outage locations for customers to stay up-to-date on restoration progress.

**New Service Requests**

Another area that will benefit from technology upgrades in the coming years is Emerald’s process for new service requests. Currently, when customers request new or modified service from the utility, Emerald staff carries out a variety of manual steps to process the information, design changes to the distribution system, and relay the results to the customer.

In the future the utility will be able to leverage its new mapping system and additional technology investments to automate much of this process. The result will be shorter turnaround time for customers and a more predictable experience.

**Advanced Analytics**

One of the most exciting new developments in the utility space is the use of advanced analytics solutions. Leveraging systems that produce details such as usage and voltage readings, advanced analytics work is focused on producing useful information out of large quantities of data. Emerald has already been active with advanced analytics at the utility level, including a pilot project to improve its energy efficiency programs. Moving forward, the utility hopes to rollout advanced analytics programs for the direct benefit of its customers.

This service could take many forms, including identifying trends in usage, troubleshooting high or low voltage issues, and tracking customer generation and/or storage activity in the home. Emerald will look for opportunities to develop custom solutions for its customers, emphasizing its role as energy expert and provider of choice.
Finance

Deliberate management of cash reserves, meeting increasing revenue requirements through prudent rate setting, and utilizing strategic borrowing continue to be primary considerations of Emerald’s strategic planning. The impact of decision making in any one of these areas must be analyzed in terms of the impact on the other two areas. All three of these areas must be carefully considered and coordinated with the other areas.

Cash Reserves

Maintaining an appropriate level of cash reserves gives Emerald flexibility in future planning, and for unplanned events, like the 2019 “Storm of the Century.” Thanks to a healthy level of cash reserves and a FEMA reimbursement of 75% of the cost, Emerald was able to weather this $4.3 million storm without taking drastic short-term measures like an emergency rate increase or borrowing.

The Board approved Financial Parameter calls for maintaining at least 151 days of cash on hand (with a maximum of 250 days cash on hand), including general reserves, rate stabilization reserve, and available line of credit. As of the end of 2019, Emerald was not compliant with this parameter at 81 days cash on hand. The FEMA reimbursement of $3.2 million brought this number up and is forecast to be 132 days at the end of 2020, still short of the 151 day minimum.

Days Cash on Hand

Historical Rate Increases

An early action item of this plan is to obtain a line of credit to help increase the level of reserves available. As the District goes down this path, the Board may want to consider adapting the days cash on hand financial parameter to segregate days cash on hand due to available line of credit from actual cash on hand.

Rate Setting

Emerald has been able to maintain its goal of small, periodic rate increases to keep up with inflation, while keeping rates as low as possible as costs continue to increase. To that end, Emerald did not have a general rate increase in 2020 for the first time since 2011. The rate setting process relies on a cost-based approach, which create more stability in customer bills and prevents cross subsidies from happening.

Borrowing

Emerald has relied predominantly on revenue financed capital funding for many years thereby not issuing any new long-term debt. Emerald’s strong balance sheet and financial parameter results reflect this dedication. However, there are many reasons why borrowing may be in the best interest of Emerald and its ratepayers.

Emerald’s most recent borrowing history includes bank borrowings in 2014 to front-load some much needed catch-up on an aging fleet. Also, Emerald did an advanced refunding of its bonds in 2013, which in laymen’s terms could be compared to a refinancing of previous debt with more desirable terms. As a result of the advanced refunding, Emerald’s annual debt service payments decreased, and no new money came in during this process. Prior to these activities, the District’s most recent new bond issuance was in 2006.
One of the Board approved financial parameters is a total debt to total assets ratio of 50% or lower. This financial parameter measures the level of assets being funded by debt. At its highest level in 1988, Emerald’s total debt to total assets was 96%. Recent levels are much lower than the 50% maximum and are forecasted to continue to decrease to zero if no new borrowing occurs within the next five years:

**Emerald’s Debt to Assets Ratio: No New Borrowing**

One of the benefits of long-term borrowing is the ability to more closely match the life span of the assets procured as a result of the borrowing with the time period over which the cost of the asset is passed on to customers through rates. For example, a substation transformer was procured in 2019 at a cost of almost $700K and is expected to last about forty years. By revenue financing the transformer, the full burden of this asset was included in the 2019 budget and passed on to current customers. Over the lifespan of this substation transformer, future customers will benefit from the use of the asset while 2019’s customers funded the asset. This means that current customers are paying today for assets that have lifespans of many years, or decades.

Current estimates are that increased spending to achieve the goals in the Distribution System Enhancements section of this plan total nearly $14 million over the next five years. This is the additional capital investment above and beyond normal capital spending. If Emerald were to borrow the amount equal to or even more to cover part of its normal capital program, total debt to total assets is forecast to remain well under the 50% target. Below is another scenario where Emerald borrows $13.9 million in 2021 and all other assumptions remain the same as above:

At the time of the writing of this plan, long-term borrowing looks attractive due to historically low interest rates. Also, it is a prudent utility practice to spread the cost of long-term assets over the lifespan of the asset. Finally, borrowing is a tool that can be used to balance rate setting and the need to maintain or increase cash reserves.
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Special Projects

Emerald will also be pursuing two special projects in the coming years, neither of which fits under one of the strategic initiative as defined above. Rather, these projects have the potential to impact the utility on a macro scale, with large potential benefits or risks if not managed correctly. Each project will therefore involve its own lengthy process of discussion and decision making between Emerald’s staff, Board of Directors, and Citizen’s Advisory Committees. The descriptions below are intended to serve as a placeholder for these future conversations and to ensure work on these projects aligns with the utility’s strategic goals.

Long-Term Power Supply Contract

Emerald is under contract to purchase the majority of its power supply from the Bonneville Power Administration (BPA) through September 2028. After this point, the utility will need a new agreement from either BPA or another provider to purchase firm power. Although 2028 may sound far off, the negotiations for any such agreement could begin as soon as 2021.

This contract negotiation presents a rare opportunity to realize additional benefits for Emerald’s customers. The current agreement with BPA was negotiated well over ten years ago, when market power prices were much higher and public power customers were largely “price takers” without other cost effective options. Today, this situation has largely reversed itself, with market prices equal to or below BPA’s cost-based Tier 1 rate and new competitors preparing to offer similar carbon-free products.

BPA has been a tremendous partner for Emerald over the years and the utility will give it strong consideration before signing any new agreement. However, two major issues with the current agreement will need to be addressed before the utility is willing to continue this partnership, including:

- **Rate Certainty**: Under the current agreement, BPA is able to adjust its rates every two years based on various cost drivers that are litigated through ongoing rate cases. Ultimately, this provides BPA with near unilateral authority to charge Emerald whatever rate it deems necessary. Early in the contract, the result was a set of large rate increases that ultimately had to be passed on to Emerald’s customers. In a future agreement, Emerald will require certainty in the rate it pays for power supply over a longer period of time.
- **Product Flexibility**: Emerald currently purchases BPA’s Slice/Block product, which provides numerous benefits: resource integration, local control of risk management decisions, and the ability to offer innovative customer programs like the Business Energy Rate Incentive (BERI). Most of these benefits, however, come from Emerald’s ability to access the wholesale power market, rather than anything truly unique about Slice.

Moreover, the Slice product also comes with an array of complications that erode some of these benefits. Significant investments in software and 24x7 labor are required to operate the product, and the “ramping” flexibility afforded by Slice is not nearly enough to meet Emerald’s peak demand needs. Rather, the utility has used the market to balance the majority of its peak loads over the years, and would likely be better off purchasing a flat Block product rather than Slice. However, BPA’s Block product is currently extremely inflexible and does not allow excess power to be re-marketed. In addition, in an effort to meet the letter of its statutory obligations, BPA threatens to impose large fines on its customers if certain arbitrary product tests are not met.

In a future agreement, Emerald will seek a power supply that is simpler to manage (e.g., a flat block), maintains access to the wholesale market for balancing, and allows for remarketing of any excess power without restriction. These requirements are likely to be met by most any provider in the industry, and Emerald will expect BPA to offer a comparable product.

Any new agreement must also support the principles of this strategic plan. As one example, a new contract should support load factor improvement by allowing Emerald to continue balancing its own loads and resources. Similarly, a contract structure that provides ongoing access to the wholesale power markets will allow Emerald to easily integrate new customer resources, offer stronger retail rate incentives, and develop innovative programs for commercial and industrial customers.

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**Business Energy Rate Incentive (BERI) Program**

In the early 2010s, wholesale market pricing dropped to historically low levels. At the same time, Emerald’s commercial and industrial customers were dealing with the after effects of the Great Recession. Rather than continuing to sell exclusively into a low secondary market, Emerald turned to its customer partnerships to develop an alternative option to help the utility recover a portion of its power costs while also assisting our businesses.

Offered during parts of 2013 and 2015, the Business Expansion Rate Incentive (BERI) program allowed Emerald’s larger customers the opportunity to purchase surplus energy at a rate lower than retail. The discounted rate was applied to any incremental load beyond expected levels, as agreed upon by the utility and customer. In this way, Emerald encouraged economic expansion, while selling its surplus energy at a slight markup from other wholesale markets.

The BERI program was enabled in large part by Emerald’s access to the wholesale power markets as part of the BPA Slice product. Because the amount of energy made available via Slice often exceeds the utility’s retail load, Emerald has the local decision-making flexibility to offer this surplus to the wholesale market, or to its own customers.
Emerald's decision to pursue electricity generation from landfill gas back in the 1980s was both innovative and highly beneficial for its customers. Over the years, the Short Mountain facility has provided a local, renewable, and stable source of power that meets approximately 4% of the utility's needs. Emerald's gas utilization agreement with Lane County was updated in 2018 and provides the utility with continued access to this resource through 2043.

In recent years, state and federal policies have led to the development of new markets for landfill gas. At the federal level, the Renewable Fuel Standard (RFS) program has been in place since 2005, but began to dramatically impact landfill gas markets only about five years ago. During the same period, state Low Carbon Fuel Standards in California and Oregon have opened up additional revenue streams on top of the national program. In recent years, short-term contracts for landfill gas have traded at several multiples over the standard commodity price of natural gas. This, in turn, has caused many landfills to relook at their options for capturing and disposing of the methane gas created as their facilities.

The current trend within the industry is to convert landfill gas into pure methane, inject the "cleaned gas" into a wholesale pipeline, and sell the rights to the output to a third party as Renewable Natural Gas (RNG). Although historically this was uneconomic for all but the largest landfill sites, the new renewable markets have led to prices that support even smaller projects.

In response, Emerald commissioned a feasibility study in 2018 to determine the costs and potential revenues involved in converting Short Mountain to an RNG project. Although the price tag was significant, the potential revenues were large enough to give this idea serious consideration. At that time, however, there was virtually no market for long-term off-take agreements. Rather, those making the investments in RNG facilities were forced to rely on short-term markets, which carried the risk that policy changes or other external forces could drop the price at any time. Ultimately, this lack of revenue certainty was enough to cause Emerald to put any plans on the shelf.

More recent events have opened this topic for discussion once again. In 2019, the Oregon legislature passed Senate Bill 98, which created a renewable natural gas standard for the state. Although the standard is voluntary, this legislation is more significant in that it allows Oregon's natural gas utilities to increase its direct investments in RNG facilities. This may include, for instance, assisting with capital build outs or engaging in long-term off-take agreements with facility owners. For Emerald, this has the potential to provide the revenue certainty that was lacking in its previous attempt at RNG.

Moving forward, Emerald will continue to engage with parties to determine if RNG makes sense at the Short Mountain facility. The utility will seek to maximize the value of its landfill gas rights to the benefit of its customers, while also continuing to promote local, renewable sources of energy. If Emerald does move forward with an RNG product, replacement power will be sourced in a way that contributes to the utility’s load factor improvement initiative and meets additional criteria for lowest-cost, renewable, and local (if possible).
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LANE COUNTY INTEGRATED VEGETATION MANAGEMENT POLICY

INTEGRATED VEGETATION MANAGEMENT PROGRAM

Lane County’s Road Maintenance Division is responsible for managing vegetation in the right-of-way along our 1400 miles of county roads which span from the Pacific Coast to the Cascade Mountains. Our Integrated Vegetation Management Program strives to promote practices that emphasize environmental protection, promote public safety and sustain road system integrity, all while serving as a positive model for environmental stewardship. By working with a data-driven management approach through planning, monitoring and annual review of our management activities, Lane County looks to use the right tool for the right job to achieve a cost-effective use of resources while protecting the environment. This integrated and adaptive approach manages vegetation in the right-of-way using a combination of mechanical and chemical methods of control.

Mowing
The vast majority of our vegetation work is conducted by tractors with flail or brush mower attachments. We strive to complete a ‘safety strip’ mow of the right-of-way in spring/summer and a ‘full-width’ mow in summer/fall.

Herbicide Use
In October 2016, the Board of County Commissioners adopted Ordinance 16-07, the Roadside Integrated Vegetation Management Policy, which was developed from consensus-based recommendations of the Vegetation Management Task Force for limited, data-driven herbicide use within our road right-of-ways. This action was based on years of planning and public engagement as outlined on our Vegetation Program Background page.

Application areas will focus on overgrown guardrails, noxious weed management and control, as well as direct stump applications for “stump-sprouting” tree species. Any herbicide use within these high priority areas derives from a Permitted Product List approved by the Public Health Advisory Committee. We at Lane County are committed to a targeted, limited herbicide-use program using control methods that emphasize environmental protection and public health and safety.

Interactive Map of 2019 Herbicide Application Areas
This interactive map allows you to review Herbicide treatments applied by Lane County Public Works along Lane County guardrails and roads.

No Spray Area Program
Lane County manages a No Spray Area Program for residents along county roadways as an additional buffer from any of our limited herbicide applications.

Applications for enrollment into the No Spray Area Program for Lane County roads were mailed June 2018 to all former enrollees. The current application period is for January 2018 through December 2020; all enrollments will expire at the end of 2020 regardless of when the application is received. The No Spray Areas are based on tax lots and apply only to Lane County roadways. Upon expiration in December 2020, you will be required to re-enroll for an additional three year time period. Program staff will mail renewal reminder letters to program participants upon expiration every three years.

New to the No Spray Area Program? Apply today!
There are two ways to apply. Click the link below:

[INTERESTED IN ENROLLING IN THE NO SPRAY AREA PROGRAM?]

Property owners along County-maintained roads are welcome to apply.


Starting in 2017, herbicide applications may occur in the LANE COUNTY right-of-way in a few, limited scenarios such as guardrails and noxious weeds.

[INTEGRATED VEGETATION MANAGEMENT PROGRAM]

Road and Bridge Maintenance Division
Lane County Public Works
www.lancounty.org, (541)682-8521

or use this No Spray Application fillable form to print and mail to:

No Spray Program
Lane County Public Works
3040 N. Delta Hwy
Eugene, OR 97408

Guiding Principles
The primary objectives for vegetation management within Lane County’s right-of-ways are to establish vegetation conditions that promote public safety, reduce maintenance costs, sustain road system integrity and promote environmental stewardship. We are committed to both worker safety and good neighbor values, while striving to efficiently maintain our roads and bridges to the highest standards.

If you have any questions, please call:
Natural Resource Specialist (541) 682-8521
**APPENDIX B: LC15.500-15.530**

**LANE CODE: ROADSIDE INTEGRATION VEGETATION MANAGEMENT POLICY**

15.320 **Correction of Address.**
Address corrections may be initiated at the request of the property owner, or authorized agent, or the Department when it is demonstrated that incorrect addresses jeopardize the safety of the dwelling(s) affected. (Revised by Ordinance No. 13-84, Effective 11.9.84)

15.325 **Exceptions.**
The County may choose not to assign addresses in certain areas adjacent to any municipality where the municipality has extended its numbering system beyond its incorporated limits. (Revised by Ordinance No. 13-84, Effective 11.9.84)

15.330 **Responsibility.**
The Department shall be charged with the responsibility of notifying affected agencies of assigned addresses. (Revised by Ordinance No. 13-84, Effective 11.9.84)

15.335 **Fees.**
All applications and requests for address assignment shall be accompanied by the fee amount established by separate order of the Board. (Revised by Ordinance No. 13-84, Effective 11.9.84)

**ROADSIDE INTEGRATION VEGETATION MANAGEMENT POLICY**

15.500 **Purpose**
(1) Lane County promotes roadside vegetation management practices that emphasize environmental protection, promote health and safety of the public and County employees in order to support vibrant communities and preserve infrastructure. Lane County shall serve as a positive model for environmental stewardship.

(2) The County shall use non-herbicidal control methods, including prevention, as its preferred tools for roadside vegetation management. Permitted herbicides may be used when other methods/options have been ineffective. (Revised by Ordinance No. 12-03, Effective 9.11.03; 16-07, 10.27.16)

15.505 **Definitions.**
As used in this chapter, the following terms have the following meanings:
- **Emergency** means any public health, economic or other event deemed an emergency by County, State, or Federal declaration.
- **Herbicide** means any substance or mixture of substances intended for preventing, destroying, repelling or mitigating any plant from growing where unwanted.
- **Permitted Product** means an herbicide listed on the Permitted Product list identified in LC 15.510(6).
- **Threshold** means the point at which maintenance is required to ensure set standards are maintained. (Revised by Ordinance No. 12-03, Effective 9.11.03; 16-07, 10.27.16)

15.510 **Roadside Vegetation Management Plan.**
Lane County’s primary roadside vegetation control methods will be data driven. Preferred options will be based on efficacy and promotion of public and environmental health and safety. Mechanical and manual methods will continue to be the primary tools within the program.

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**15.510** Lane Code 15.510
(1) **Prevention Techniques.** Vegetation prevention techniques encourage the desired plants, animals, and other organisms and discourage unwanted ones. Prevention techniques and least-toxic pest controls include:
- (a) Maintaining a monitoring program sufficient to enable a data driven process promoting effective and timely vegetation management practices.
- (b) Increasing vegetation tolerance thresholds, while maintaining current roadside safety an infrastructure standards.

(2) **Mechanical, Manual, and Other Alternative Vegetation Control Methods** evaluate and address existing vegetation problems or problems that may develop on county roadsides in spite of prevention techniques, the Department of Public Works shall follow the approach outlined below:
- (a) Monitor roadside vegetation growth to determine if thresholds have been exceeded and whether control is needed.
- (b) Use physical, mechanical, and other alternative methods to control vegetation to prevent impairments or damages to roadways.

(3) **Use of Herbicide Products.**
- (a) County staff may use only those herbicides listed on the Permitted Product List or as otherwise authorized by the Board of Health under this section 15.510(3).
- (b) County staff shall submit to the Board of Health for consideration and adoption a Permitted Products list for use of herbicides by the Department of Public Works for roadside management. County staff, on behalf of the Board of Health, shall solicit review and comment from staff and the Public Health Administrator who will work with the Public Health Advisory Committee.
- (b) The Board of Health may periodically review the Permitted Products list and after receiving public comment, add products to that list that meet the criteria in this chapter or delete products if new information becomes available indicating that the products do not meet those criteria.
- (c) The Board of Health may authorize the use of non-listed herbicides on county roadsides when the director of Public Works has determined that a condition or emergency exists where herbicides on the permitted list have been tried without satisfactory result.
- (d) Prior to the authorization, the Director of Public Works shall review in writing the following considerations with the Board of Health:
- (i) The nature of the problem and the reason to use the non-listed herbicide.
- (ii) Determinations made after reviewing current information sources and databases to determine the most effective herbicide(s) with the least impact to human and environmental health pursuant to criteria in section 6 – Permitted Product List Criteria.
- (iii) Description of the specific non-listed herbicide, persistence in the environment (length of soil half-life), currently designated toxicity levels, and all known potential risks with regard to public health and safety, and to the environment.
- (iv) Proposed date, target species, method of application, public notification, and specific steps that will be taken to minimize risks to human health and the environment.
- (v) An evaluation of all feasible alternatives including non-herbicidal control methods and no action alternatives.
- (vi) Any legal requirements that are applicable.
The Board of Health may approve or deny the use of non-listed herbicides when the use of Permitted Products has proven to be ineffective in particular applications, either on a one-time basis, or for a limited time to be specified by the Board of Health.

(4) Application Methods and Buffers.
(a) Herbicide applications adjacent to waterways or bodies of water that occur within 100 feet must adhere to Management Prescription Plan guidelines in order to protect water quality, aquatic species, and associated habitats from potential impacts.
(b) Herbicide applications within 200 feet of known or identified school bus stops or within 500 feet of a school must adhere to Management Prescription Plan guidelines in order to protect human health.
(c) Other areas determined to present risk to children or the environment as determined by the Director of Public Works shall be added to the guidelines within the Management Prescription Plan.

The County’s Department of Public Works staff shall continue to review research regarding alternative vegetation control methods to evaluate their effectiveness and potential for use in County roadside vegetation management operations.

(5) Environment.
(a) The listing of Willamette River Steelhead and Chinook Salmon under the Endangered Species Act has heightened awareness of the impact that common herbicides in area streams and effects of herbicides on salmon point to the need for public agencies to serve as models of environmental stewardship in landscape management.

(b) Impacts to other species, including pollinators and amphibians, should be considered in maintenance activities.

(6) Permitted Product List Criteria.
(a) Permitted herbicide products must meet all of the following criteria (all active ingredients, known inerts, and other additives, should be identified so that they can be screened using this criteria):
   (i) A known, likely, or probable carcinogen;
   (ii) Reproductive toxicants;
   (iii) Known or probable endocrine disruptors;
   (iv) A substance acutely toxic to humans or labeled as DANGER or POISON;
   (v) Nervous system toxicants (ingredients that are cholinesterase inhibitors and/or are listed as neurotoxic);
   (vi) Substances harmful to pollinators and aquatic species, including fish, birds, invertebrates or domestic animals.

(b) In addition, consideration shall be given to the following:
   (i) Active ingredients have soil half-life of 30 days or less (exception for minerals).
   (ii) Active ingredient has extremely low or very low mobility in soils.
   (iii) Product is not found in US EPA Office of Pesticide Programs Registration Eligibility Decisions (REDs, IREDs, and TREDs) to exceed a level of concern for fish, aquatic insects, aquatic and semi-aquatic plants, or wildlife; and
   (iv) Active ingredients have not been detected in waters at a level harmful to aquatic life.

(c) These criteria will be reviewed by the Public Health Advisory Committee annually. The findings and recommendations of the Committee will be reported to the Board of Health and the Director or Health and Human Services. (Revised by Ordinance No. 12-03, Effective 9.11.03; 16-07, 10.27.16)

15.515 Training, Education, and Implementation.
(1) The Department of Public Works staff involved in roadside vegetation management shall attend at least once a year available trainings in prevention and other vegetation management techniques outlined in this chapter if appropriate to their area of work.
(2) The Director of Public Works shall designate a staff member to be responsible for the implementation of this chapter. (Revised by Ordinance No. 12-03, Effective 9.11.03; 16-07, 10.27.16)

15.517 Data Collection and Analysis.
(1) Noxious and Invasive species management will be supported by inventories and roadside monitoring on a three year cycle. County inventories will be made available to the public.
(2) Collaborative efforts will be south where possible to share information and resources from other agencies, public members, and partners.
(3) Maintenance methods and tools will be selected based upon findings of results and prioritization within a defined decision matrix as part of the Management Prescription Plan. (Revised by Ordinance 16-07, Effective 10.27.16)

15.520 Public Notification.
The Department of Public Works shall comply with the following notification procedures for all roadside herbicide applications:
(1) Orange road signs 48 inches will be posted on both ends of all County roadways with proposed herbicide applications at least seven days prior to any application. All signs will be left in place following any applications for a minimum of three days. All signs will have the words “HERBICIDE APPLICATION,” proposed dates of application and a phone number that the public can contact for further information.
(2) Public notification of herbicide use along roadways maintained by Lane County shall be listed on Lane County’s website.
(3) During the herbicide application process, additional temporary roadwork signs shall be placed around the work site. The signs will be at least two feet square and say “HERBICIDE APPLICATION AHEAD.” Herbicide application tanks will be labeled with the word “herbicide.”
(4) The County will maintain an updated website of all pending and completed herbicide applications along county maintained roadsides. The public will be able to access information on the internet at least seven days prior to the proposed applications and for at least seven days post application. (Revised by Ordinance No. 12-03, Effective 9.11.03; 16-07, 10.27.16)

15.525 Record Keeping.
County staff shall maintain publicly accessible information with records of herbicides used on county roadways for a minimum of six years. In addition to complying with all record keeping requirements imposed by state and federal law, the information recorded must include the date and location of the application; the product name, active ingredients, additional known inert ingredient(s), other chemicals mixed with the product, and actual costs of application. These records must also include an EPA registration number; the target vegetation type, quantity and concentration of each herbicide product applied, the weather conditions including rain predictions, temperature, wind speed and direction, and the applicator’s name and operator license number. At the time of
application any known problems with handling and storage, equipment cleaning, disposal, toxic waste, and off target drift, spills runoff or migration must also be included on the record. (Revised by Ordinance No. 12-03, Effective 9.11.03; 16-07, 10.27.16)

15.530 Annual Report (Reporting). On a yearly basis at a public meeting of the Board of Health, the Department of Public Works shall present a report that includes:

1. The quantity and concentration of each herbicide product applied during the previous year, a list of any non-listed herbicides proposed for use in the coming year, and under what circumstances herbicide uses might occur, and the actual cost of application for the previous year;
2. Control methods that have replaced herbicide use in the previous year;
3. Control methods that have been proven ineffective;
4. What non-herbicide control methods the Department of Public Works intends to use in the plan year. County staff shall post the report on the County website and make copies available to the public. (Revised by Ordinance No. 12-03, Effective 9.11.03; 16-07, 10.27.16)

LEVYING, COLLECTING AND ENFORCING SPECIAL ASSESSMENTS

15.600 Authority. The following provisions relating to the application of a special assessment policy for public improvements are hereby adopted pursuant to the authority granted to Lane County by the Lane County Home Rule Charter. Except as expressly modified in this subchapter, the provisions of ORS Chapter 371 are applicable in Lane County. (Revised by Ordinance No. 11-73, Effective 9.28.73)

15.605 Purpose. The requirements set forth herein are for the purpose of defining policies, conditions and procedures whereby specially benefited property owners shall be assessed for the costs of road improvements. Remonstrance procedures included in Section 9 of the Lane County Home Rule Charter are not repeated herein, but apply in full. The procedures set forth in this subchapter shall constitute a determination by the Board, absent the express determination inconsistent with these procedures, of the extent to which the cost of road improvements in Lane County is to be defrayed by special assessments on property to be specially benefited. (Revised by Ordinance No. 11-73, Effective 9.28.73; 10-04, 6.4.04)

15.610 Application. The provisions herein apply to all County roads, Public Roads as defined in LC 15.010(35) and platted streets within the unincorporated areas of Lane County and under the jurisdiction of Lane County. These provisions shall also apply to the following County roads within the limits of incorporated cities:

1. Connecting roads maintained under the authority of ORS Chapter 373;
2. County roads subject to an intergovernmental agreement under the authority of ORS 373.260;
3. County roads within the limits of incorporated cities not covered by LC 15.610(1) and (2) above and for which the city involved has not requested surrender in accordance with ORS 373.270. (Revised by Ordinance No. 11-73, Effective 9.28.73; 7-82, 7-982, 10-04, 6.4.04)
Fixed Charge Analysis

Example Scenario: Cross Subsidization

Note: This example was originally prepared for an industry group in order to demonstrate the cross-subsidization that occurs when a utility’s monthly (basic) charge is lower than actual cost of service.

Summary

- Utilities that do not properly assign fixed and variable costs based on cost of service will create inequities between customers
- Customers that choose to participate in solar or energy efficiency projects will be subsidized by others
- Low and moderate income customers are less likely to participate in these types of projects, and will therefore be most likely to suffer an unfair cost shift

Example

- A utility has two customers, Customer 1 and Customer 2
- Both customers use 1,200 kWh per month
- The utility’s revenue requirement is $200
  - $80 is fixed cost
  - $120 is variable cost
- Utility’s rates are out of alignment with actual cost of service:

<table>
<thead>
<tr>
<th></th>
<th>Rates</th>
<th>Cost of Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Charge</td>
<td>$10.00</td>
<td>$10.00</td>
</tr>
<tr>
<td>Energy Charge</td>
<td>$0.0750</td>
<td>$0.0500</td>
</tr>
</tbody>
</table>

Monthly Customer Bills - Initial

- Utility’s revenue requirement ($200) is met, but…
  - Only $20 of the $80 fixed cost is recovered in the basic charge. The rest is collected from the variable energy charge.
Assumptions – Solar Project

- Now suppose Customer 2 installs a solar array
  - This customer’s net usage drops to only 300 kWh per month
- The utility’s revenue requirement is now lower ($155)
  - $80 is fixed cost
  - $75 is variable cost
- However, now revenue is not enough to fully cover fixed costs

### Monthly Customer Bills – With Solar

- **Customer 1**
  - Basic Charge: $10.00
  - Energy Charge: $108.00
  - Total Bill: $118.00
- **Customer 2 Solar**
  - Basic Charge: $22.50
  - Energy Charge: $10.00
  - Total Bill: $32.50

Only $132.50 is being collected, short of the new revenue requirement of $155.

Lower usage means less revenue is available to cover fixed costs.

Assumptions – Energy Rate Adjustment Only

- This situation would require a rate increase
  - Necessary to collect the new revenue requirement of $155
- Assume the increase is applied only to the Energy Rate

<table>
<thead>
<tr>
<th></th>
<th>Actual</th>
<th>COSA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Charge</td>
<td>$10.00</td>
<td>$40.00</td>
</tr>
<tr>
<td>Energy Charge</td>
<td>$0.0900</td>
<td>$0.0500</td>
</tr>
</tbody>
</table>

### Monthly Bills – With Solar, New Rates

- **Customer 1**
  - Basic Charge: $10.00
  - Energy Charge: $10.00
  - Total Bill: $20.00

Now the proper revenue requirement is being collected ($155).

But Customer 1 has been greatly impacted, having to pay an additional $18 per month due to Customer 2’s solar array and resulting drop in usage.

- **Customer 2 Solar**
  - Basic Charge: $0.00
  - Energy Charge: $0.00
  - Total Bill: $0.00
Assumptions – Cost of Service Rates

- Now assume the utility charges according to its cost of service
  - Basic Charge: $40
  - Energy Charge: $0.0500

- In this case, the fixed costs of the utility ($80) are recovered regardless of Customer 2’s energy use

Monthly Bills – Cost of Service Rates

<table>
<thead>
<tr>
<th>Customer</th>
<th>Basic Charge</th>
<th>Energy Charge</th>
<th>Total Bill</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer 1</td>
<td>$40.00</td>
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</tr>
<tr>
<td>Customer 2</td>
<td>$40.00</td>
<td>$15.00</td>
<td>$55.00</td>
</tr>
</tbody>
</table>

Utility’s revenue requirement ($200) is met, and...

The full $80 in fixed costs is collected through the basic charge.

Even with Customer 2 putting in solar and dropping usage, the new revenue requirement ($155) is met...

And Customer 1 has not been adversely impacted. The $18 they were overcharged before is now being paid by Customer 2 due to the higher basic charge.

Monthly Bills – Fair Cost of Service Rates, Solar

<table>
<thead>
<tr>
<th>Customer</th>
<th>Basic Charge</th>
<th>Energy Charge</th>
<th>Total Bill</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer 1</td>
<td>$40.00</td>
<td>$60.00</td>
<td>$100.00</td>
</tr>
<tr>
<td>Customer 2 Solar</td>
<td>$40.00</td>
<td>$15.00</td>
<td>$55.00</td>
</tr>
</tbody>
</table>
Be It Enacted by the People of the State of Oregon:

Relating to renewable natural gas; and prescribing an effective date.

SECTION 1. Sections 2 to 6 of this 2019 Act are added to and made a part of ORS chapter 757.

SECTION 2. (1) The Legislative Assembly finds and declares that:

(a) Natural gas utilities can reduce emissions from the direct use of natural gas by procuring renewable natural gas and investing in renewable natural gas infrastructure;

(b) Regulatory guidelines for the procurement of renewable natural gas and investments in renewable natural gas infrastructure should enable the procurements and investments while also protecting Oregon consumers; and

(c) Methane gas derived from any combination of:

(A) Biogas;

(B) Hydrogen gas derived from renewable energy sources; or

(C) Waste carbon dioxide.

(D) “Renewable natural gas” means any of the following products processed to meet pipeline quality standards or transportation fuel grade requirements:

(a) Biogas that is upgraded to meet natural gas pipeline quality standards such that it may blend with, or substitute for, geologic natural gas;

(b) Hydrogen gas derived from renewable energy sources; or

(c) Methane gas derived from any combination of:

(A) Biogas;

(B) Hydrogen gas or carbon oxides derived from renewable energy sources; or

(C) Waste carbon dioxide.

(E) Renewable natural gas infrastructure means all equipment and facilities for the production, processing, pipeline interconnection and distribution of renewable natural gas to be furnished to Oregon customers.

(f) “Small natural gas utility” means a natural gas utility with fewer than 200,000 customer accounts in Oregon.

SECTION 3. As used in sections 2 to 6 of this 2019 Act:

(1) “Biogas” means a mixture of carbon dioxide and hydrocarbons, primarily methane gas, released from the biological decomposition of organic materials.

(2) “Biomass” has the meaning given that term in ORS 315.141.

(3) “Large natural gas utility” means a natural gas utility with 200,000 or more customer accounts in Oregon.

(4) “Natural gas utility” means a public utility providing natural gas service to customers.

NOTE: Matter in boldfaced type is new; matter in italics and bracketed is existing law to be omitted. New sections are in boldfaced type.

LC 2019 A-Eng. SB 98

A BILL FOR AN ACT

Printed pursuant to Senate Interim Rule 213.28 by order of the President of the Senate in conformance with pre-session filing rules, indicating neither advocacy nor opposition on the part of the President (at the request of Senate Interim Committee on Environment and Natural Resources)
large natural gas utility for distribution to retail natural gas customers in Oregon that is renewable natural gas:
(a) In each of the calendar years 2020 through 2024, five percent may be renewable natural gas;
(b) In each of the calendar years 2025 through 2029, ten percent may be renewable natural gas;
(c) In each of the calendar years 2030 through 2034, fifteen percent may be renewable natural gas;
(d) In each of the calendar years 2035 through 2039, twenty percent may be renewable natural gas;
(e) In each of the calendar years 2040 through 2044, twenty-five percent may be renewable natural gas; and
(f) In each of the calendar years 2045 through 2050, thirty percent may be renewable natural gas.
(2) The commission shall adopt ratemaking mechanisms that ensure the recovery of all prudently incurred costs that contribute to the large natural gas utility’s meeting the targets set forth in subsection (1) of this section. Pursuant to the ratemaking mechanisms adopted under this subsection:
(a) Qualified investments and operating costs associated with qualified investments that contribute to the large natural gas utility meeting the targets set forth in subsection (1) of this section shall be recovered by means of an automatic adjustment clause, as defined in ORS 757.210.
(b) Costs of procurement of renewable natural gas from third parties that contribute to the large natural gas utility meeting the targets set forth in subsection (1) of this section may be recovered by means of an automatic adjustment clause, as defined in ORS 757.210, or another recovery mechanism authorized by rule.
(3) When a large natural gas utility makes a qualified investment in the production of renewable natural gas, the costs associated with the qualified investment shall include the cost of capital established by the commission in the large natural gas utility’s most recent general rate case.
(4) Before making a qualified investment in biogas production that is upstream of conditioning equipment, pipeline interconnection or gas cleaning, a large natural gas utility shall engage in a competitive bidding process.
(5) If the large natural gas utility’s total incremental annual cost to meet the targets of the large renewable natural gas program exceeds five percent of the large natural gas utility’s total revenue requirement for an individual year, the large natural gas utility may no longer be authorized to make additional qualified investments under the large renewable natural gas program for that year without approval from the commission.
(6) The total incremental annual cost to meet the targets of the large renewable natural gas program must account for:
(a) Any value received by a large natural gas utility upon any resale of renewable natural gas, including any environmental credits that the renewable natural gas producer chooses to include with the sale of the renewable natural gas to the large natural gas utility; and
(b) Any savings achieved through avoidance of conventional gas purchases or development, such as avoided pipeline costs or carbon costs.

SECTION 6. (1) Upon a filing by a small natural gas utility to participate in the small renewable natural gas program adopted by rule by the Public Utility Commission under section 4(2) of this 2019 Act, the commission shall establish a rate cap limiting the small natural gas utility’s costs of procuring renewable natural gas from third parties and qualified investments in renewable natural gas infrastructure. The rate cap must be expressed as a percentage of the small natural gas utility’s total revenue requirement as approved by the commission in the public utility’s most recent general rate case. For the purposes of establishing a rate cap under this subsection, the commission shall account for:
(a) Any value received by the small natural gas utility upon any resale of renewable natural gas, including any environmental credits that the renewable natural gas producer chooses to include with the sale of renewable natural gas to the small natural gas utility; and
(b) Any savings achieved through avoidance of conventional gas purchases or development, such as avoided pipeline costs or carbon costs.
(2)(a) A filing by a small natural gas utility under subsection (1) of this section must include, but need not be limited to:
(A) A proposal to procure a total volume of renewable natural gas over a specific period; and
(B) Identification of the qualified investments that the small natural gas utility may make in renewable natural gas infrastructure.
(b) A small natural gas utility may from time to time revise the filing submitted to the commission under this section.
(3) Any prudently incurred costs incurred by a small natural gas utility pursuant to a filing submitted under this section may be recovered by means of an automatic adjustment clause, as defined in ORS 757.210.
(4) When a small natural gas utility makes a qualified investment in the production of renewable natural gas, the costs associated with that qualified investment shall include the cost of capital established by the commission in the small natural gas utility’s most recent general rate case.

SECTION 8. This 2019 Act takes effect on the 91st day after the date on which the 2019 regular session of the Eightieth Legislative Assembly adjourns sine die.
Service that Shines

This Strategic Plan identifies Emerald’s prioritized goals and outlines a clear path to achieving them. As a Customer Partner, Energy Services Provider of Choice, and Industry Leader, Emerald and its dedicated staff remain focused on customers while creating new, innovative ways to deliver exceptional service and light the way for the utility industry.

We are service that shines. We are Emerald PUD.