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Senate Environment & Natural Resources Committee
900 Court St. NE
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Chair Dingfelder and Members of the Committee:

At the request of the Committee Administrator, Energy Trust of Oregon is submitting written testimony regarding Senate Bill 837 for the Senate Environment & Natural Resources Committee. Energy Trust is an independent nonprofit that helps utility customers benefit from energy efficiency and renewable energy. We provide information, technical assistance, and cash incentives to help customers save energy and generate renewable energy. Our renewable energy programs support development and installation of small scale solar, wind, hydroelectric, biopower, and geothermal energy systems. **Energy Trust does not take positions in support or opposition to legislation. We do provide information and technical expertise when asked. As such, Energy Trust neither supports nor opposes Senate Bill 837.**

For over a year Energy Trust has participated in a technical role as a member of the fish passage working group convened by the Governor's office. Members of the working group proposed a solution that would create a fee in-lieu of providing fish passage for conduit hydroelectric projects where the up-front cost of fish passage would preclude the hydroelectric project from being developed.

As a member of the working group Energy Trust offered suggestions as to how such a fee could be structured equitably among a wide variety of hydroelectric projects. In addition, Energy Trust analyzed the proposed fee both as a cost to a hydroelectric project and for the purposes of understanding how much fee revenue could be raised over time.

Energy Trust's testimony was requested to help explain some of the technical aspects of the fee contemplated in the legislation and the legislative concept developed by the working group. In this testimony Energy Trust provides the following:

- 1) Background on conduit hydroelectric projects,
- 2) An examination of the broad goals that the members of the group sought to address via the proposed fee,
- 3) An exploration of how the proposed the fee meets those goals,
- 4) A look at the details of how the proposed fee works, and
- 5) An example of the fee in the context of a hydroelectric project.

Background: Conduit hydroelectric projects generate electricity utilizing existing, man-made water conveyances, such as pipes or canals, built for purposes other than power production. There are three common examples seen in Oregon:

- 1) Irrigation districts may pipe a section of open canal. If the piping produces pressurized water a turbine may be installed at the end of the pipe to generate electricity. The Central Oregon Irrigation District built a 5,000 kilowatt plant like this near Bend in 2010. That plant generates enough electricity to power over 1,000 homes and sells its energy to the utility via a wholesale power purchase agreement.
- 2) Individual irrigators may have the opportunity to do the same thing as above but on a much smaller scale. In 2011 a rancher in Wallowa County installed an 11 kilowatt system utilizing irrigation water. The power from that system is net metered, much like a residential solar photovoltaic system, and is used to offset other energy uses at the ranch.
- 3) Municipalities often utilize gravity fed systems to deliver their potable water. As a pipe goes downhill it may generate excess pressure, requiring a pressure reduction valve to be installed. A hydroelectric turbine may be installed in parallel with a pressure reduction valve to generate electricity while reducing the water pressure to the desired level. In 2012 the City of Portland installed a 25 kilowatt system like this at its Vernon Water Park in Northeast Portland. Energy from these kinds of systems is usually sold at wholesale rates to the utility.

The majority of conduit hydroelectric projects in Oregon sell their energy back to the utility at wholesale prices. Most projects enter into 15-20 year power purchase agreements utilizing a utility's published avoided cost prices. These prices are set at published rates for 15 years. In the early years prices are usually very low and they typically escalate over time.

In general, low power prices and diminishing state and federal incentives challenge the financial performance of conduit hydroelectric projects.

Observed Goals for the proposed fee: Energy Trust noted three common goals for the proposed fee from members of the working group:

- 1) *Over time, provide a meaningful amount of revenue that can be spent on fish passage projects.*

In working group meetings the Oregon Department of Fish and Wildlife estimated the average cost of a fish passage project to be \$200,000 but noted that the actual cost for any given project could be much more or much less. In addition, the department noted that it can take several years and numerous studies to determine the best solution to a fish passage problem. Cost uncertainty is a disincentive for hydroelectric projects. Members of the working group expressed interest in maximizing benefits for fish given the costs and time issues involved in passage projects.

- 2) *Size the fee so hydroelectric projects remain financially viable.*

The proposed fee would eliminate the up-front cost barrier which has prevented some conduit hydroelectric projects from being developed. In exchange, the project would pay an annual fee to provide for fish passage benefits. Members of the group recognized that if the

annual fee is too large it will also be a barrier to project development and will not collect funds for fish passage.

3) *Make the fee equitable to projects that only operate for part of the year.*

Many potential conduit hydroelectric projects would utilize irrigation water rights which are only available for part of the year. As such, those projects generate less energy than projects which are able to utilize year round water rights. Members of the group sought a way to make the fee equitable, as a percentage of gross revenues, among projects that operate for different amounts of time over the course of a year.

How the proposed fee meets these goals:

1) *Over time, provide a meaningful amount of revenue that can be spent on fish passage projects.*

As structured in the legislative concept and compared against currently published avoided cost rates, the fee would collect approximately 2% of the gross revenues of a project.

Energy Trust analyzed 30 known potential conduit hydroelectric projects with a combined capacity of 23 megawatts that could reach commercial operation by 2016. If all of those projects reach commercial operation, approximately \$2.3 million in fee revenue could be collected over the next 20 years. This estimate does not attempt to account for future projects that could be identified and bring additional revenues into the fund.

2) *Size the fee so projects remain financially viable.*

The proposed fee is designed to match a project's revenue stream by starting small and growing larger as power prices increase. The smallest projects would pay a minimum fee of \$100.

3) *Make the fee equitable to projects that only operate for part of the year.*

Irrigation district and on-farm projects represent a growth area for hydroelectric but most systems only operate during the irrigation season, approximately 60% of the year. The fee would be reduced by 40% for projects that do not operate year round, keeping the overall percentage of gross revenues consistent with projects that do operate all year.

How the fee works:

Hydropower projects pay an existing annual fee to the Oregon Water Resources Department. Except for small projects paying the minimum fee, the existing annual fee would be used as a "base fee" to calculate the fish passage fund fee. Oregon Water Resources Department staff identified this method as being the easiest and requiring the least staff resources to implement.

The base fee would be subject to a multiplier. The multiplier goes up in year 6 and year 11. This escalation ties the fee to the way a project's revenues go up over time. The multiplier is

set at 4 initially and goes up to 8 in year six and 15 in year 11. These multiplier values yield the approximate 2% share of gross revenues from a project.

If a project does not operate year round the fee would be reduced by 40% (multiplied by three-fifths). This makes the fee more equitable for projects that only operate for part of the year.

There would be a \$100 minimum fee that would not be subject to any multipliers. At \$100, the minimum fee would apply to projects that are approximately 35 kilowatts and smaller.

As the working group members agreed to in the legislative concept, the fee for a project would continue into perpetuity unless one of the follow situations occurs:

- 1) Fish passage is installed,
- 2) An agreement is entered into with the Oregon Department of Fish and Wildlife to provide for fish passage, or
- 3) The project is issued a waiver or exemption under ORS 509.585.

Fee example (not adjusted for future inflation): A 300 kilowatt irrigation hydroelectric project operates for 200 days annually, generating 1,350,000 kilowatt hours per year. The project's current annual hydropower fee is \$230. The project's annual fee for fish passage would be:

Years 1-5: \$552 annual fee ($\$230 \times 4 \times 0.6$) raising \$2,760 total.

Years 6-10: \$1,104 annual fee ($\$230 \times 8 \times 0.6$) raising \$5,520 total.

Thereafter: \$2,070 annual fee ($\$230 \times 15 \times 0.6$) raising \$20,700 over the next 10 years.

The project would raise \$28,980 in fee revenue over 20 years. Over the same time the project would earn an estimated \$1.7 million in revenue at current power prices.

In practice, the fee would also be adjusted for inflation. For the sake of simplicity inflation has not been calculated in this example.

Energy Trust respectfully submits this testimony and hopes it is useful to the committee.

Sincerely,



Jed Jorgensen
Program Manager