

December 14, 2010

BEFORE THE STATE OF WASHINGTON
ENERGY FACILITY SITE EVALUATION COUNCIL

Application No. 2009-01

WHISTLING RIDGE ENERGY PROJECT, LLC

SUPPLEMENTAL PREFILED TESTIMONY OF ROBERT J. MICHAELS, PH.D

I. INTRODUCTION

A. Purpose of Testimony

Q. Please state your name and address.

A. My name is Robert J. Michaels. My business address is 1440 N. Harbor Blvd., Suite 900, Fullerton, California 92834. My email is energy.ace@att.net.

Q. Are you the same Robert J. Michaels who previously testified in this proceeding?

A. Yes.

Q. What is the purpose of this supplemental testimony?

A. I have been asked to respond to material in the prefiled direct testimonies of Tony Usibelli and Howard Schwartz [Washington State Department of Commerce, Exhibits 34.00 and 35.00]; Eric D. Hovee [Skamania County Economic Development Council, Exhibit 41.00]; Robert Wittenberg, Jr. [Skamania County Public Utility District No. 1, Exhibit 43.00]; John McSherry [Port of Skamania County, Exhibit 44.00]; and Michael Canon and Chuck Covert [Klickitat County Public Economic Development Authority, Exhibits 48.00 and 49.00].

Q. On what aspects of these testimonies will you be testifying?

A. I will evaluate assertions made by several of the above-named witnesses on the economic impacts of the Whistling Ridge Energy ("WRE") project, and on the need for the project and its incremental value to Washington State.

Q. Please outline the plan of your discussion on economic impacts.

A. I will begin with the "Economic and Fiscal Benefits Memorandum" produced by witness Eric D. Hovee for the Skamania County Economic Development Council (Exhibit 41.02). I will show that Mr. Hovee's optimistic claims for the project come from an inappropriate model whose conclusions are built into it – the only mathematically possible result of his calculations is that WRE will have favorable consequences. But even if the model were economically and structurally valid, the numerical data he uses as inputs are rife with mismeasurements and optimistic biases. Mr. Hovee has failed to adhere to normal standards of economic research. He has chosen not to supply much of the detailed data used in his calculation, or even provide references for their sources. On the basis of available data, however, I have been able to conclude that his estimates of job creation and tax collections are so biased as to be worthless for evaluating WRE.

I then evaluate claims by Washington Department of Commerce witness Tony Usibelli regarding "green jobs" at the state level. The first of his two relevant exhibits (41.04) consists of a single page from a 56 page report on such jobs by the Washington State Employment Security Department. When examined in the context of the entire document, his sanguine conclusions about WRE's economic impact become doubtful at best. His second exhibit consists of 19 pages from a 92-page report to the Washington Clean Energy Leadership Council produced by Navigant Consulting (Exhibit 34.05). Here too, we find that WRE is at best peripheral to any state policies that would encourage the growth of employment in clean energy. I then evaluate several claims by local witnesses (other than Mr. Hovee) regarding the favorable effects of wind development in Klickitat County and at the Port of Skamania. I find the testimonies to be impressionistic, unsupported by available data, and devoid of any evidence that wind power is responsible for favorable economic outcomes. I also examine Mr. Wittenberg's discussion of WRE's contribution to reliability in light of the pending breach of Condit Dam.

Q. Please outline the plan of your discussion on the need for WRE and its possible impact on electrical operations.

A. I will begin by questioning Dr. Schwartz's qualifications to express optimism on operational aspects of integrating WRE, including the project's allegedly favorable effects on reliability. I then examine Mr. Usibelli's quantitative discussion of how compliance with Renewable Portfolio Standards (RPS) in Washington and Oregon will necessitate the construction of that facility. His estimates of the needed amounts of new wind capacity do not include any accounting for the large volumes of renewable capacity that utilities already own or contract for. They also do not account for the large volume of capacity that is under construction or has received construction permits. The amounts in question already more than suffice for compliance by all utilities in 2015, and their effects will be felt through 2020. Mr. Usibelli further fails to note the large volume of wind energy being purchased by California utilities seeking to satisfy their state's RPS.

II. ANALYSIS OF THE HOVEE STUDY

A. The basic method

Q. Before you discuss Mr. Hovee's findings, please provide an overview of his research methods.

A. Mr. Hovee's method is commonly used by those in his profession.. He takes certain economic and related data, uses it as input into one of several commercially available regional "input-output" models, and claims that the results of its computations are valid estimators of the project's economic impacts.¹ The more important of these impacts take the form of "job creation," increases in incomes and business activity, and changes in taxes collected and available for spending by local governments.

A fairly comprehensive input-output model of an economy or region requires masses of data, since it must portray the economic interactions among a large number of production sectors.² The underlying concept is simple, but the numerical calculations are complex. An

¹ Mr. Hovee uses a standard model known as IMPLAN. Its creators correctly describe it as based on a "Social Accounting Matrix," rather than an "Input-Output" table. The difference is that the latter only examines market-based transactions, while the former includes such non-market flows as tax collections and various types of government spending. For simplicity I disregard this complication and refer to IMPLAN as an Input-Output model. More details about IMPLAN can be found at https://implan.com/V4/index.php?option=com_content&view=article&id=282:what-is-implan&catid=152:implan-appliance-&Itemid=2

² Hovee does not specify the number of sectors in his calculations, but says that he used inter-industry transactions "between all segments of the Skamania County economy." See Ex. 41.02 at 4.

input-output table ("matrix") shows the amounts of various inputs required to produce a unit (a dollar's worth) of some output commodity. That output, however, can itself be an input into the production of some of these inputs. (Making more steel requires the use of more trucks, but making more trucks also absorbs part of the economy's (region's) output of steel.) In addition, the production of an extra unit of any commodity requires employment of some additional quantity of labor.

Q. What are the "direct" and "indirect" effects of (e.g.) some new construction project as estimated by a model like IMPLAN?

A. In an input-output model, a dollar of new spending on some good provides additional income to workers who make that good, as well as suppliers of goods that are used as inputs into it. If for the moment we disregard regionality, in the construction phase of a project like this the "direct" or "primary" impact would include both incomes paid to those working on it, and incomes made by those from whom the contractor purchases various materials that are embodied in the project. The workers and materials suppliers, however, will respense some of the funds they have received, for consumer goods and to replenish their inventories of building materials. Of course the people who receive incomes from these transactions will themselves respense parts of them, and in principle the respensing process can go on indefinitely. The math that underlies the input-output table allows us to add up all of the interactions like these that take place after the direct impact occurs. These totals are known as "indirect" or "secondary" impacts.

A typical study like Hovee's then constructs a "multiplier," defined as the ratio of total direct plus indirect spending to total direct spending. By definition a multiplier must exceed 1 in value. One can also construct other multipliers, as is commonly done for labor, by examining the amount (person-hours) of labor hired as a result of the direct spending and the additional labor hired as a result of the indirect effects.

B. Effects on employment

Q. Why is the size of the multiplier important, and what is the significance of the fact that it will always exceed 1.0 in value?

A. This fact tells us that the model's favorable conclusions are built into the underlying math. An increase in expenditure from outside the area cannot possibly decrease employment in the area. A consultant who uses this sort of model can only produce one kind of result.

Q. But what's wrong with the reasoning? Isn't it obvious that an increase in governmental or private spending in a region will increase employment there?

A. Even if we accept the logic of the input-output model, we are left with the question of where the money comes from. Assume it comes from investors who have evaluated alternative uses for their funds and concluded that this project offers them the best risk-adjusted returns. Spending the money on this project means that it is not spent on some other project – by the logic of the input-output model some people who would have worked on the latter will not have jobs. If the government spends tax revenues on this project, those who would have worked on other government projects will not be employed on them.³ Looking at the economy as a whole, the outcome of this reasoning is a "wash" – spending on A rather than B increases employment in A (which may be a diffuse set of activities) and decreases it in B.

Q. But what if the workers hired for A were unemployed at the time? Doesn't that create jobs?

A. This reasoning might be correct under certain economic conditions, but those conditions hardly exist even in today's recessionary situation. They may have existed in the 1930s, when unemployment reached almost 30 percent of the labor force and spells of unemployment were of extreme duration. That sort of unemployment, however, does not resemble today's. Unemployment now is predominantly people searching for work that they eventually find, people in transitions between known jobs, and people on temporary layoff who can expect to be rehired with a high probability.⁴

Q. Does WRE provide any examples that might illustrate these principles?

A. Yes. The Draft Environmental Impact Statement (DEIS) expects that "[b]etween 65 and 75 percent of the construction labor force would most likely be hired from the cities of Portland and Vancouver...The remaining 25 to 35 percent of the work force would most likely be residents of Skamania, Klickitat, and Hood River Counties."⁵ Construction workers have relatively high unemployment rates compared to the national average, because many of them work at relatively short-lived jobs and must then take the time and effort to search for another opening.

³ The same holds if the government engages in deficit spending, but the reasoning is more complex and provides no additional insights into the subject matter of this docket.

⁴ See Steven J. **Davis et al**, "The Flow Approach to Labor Markets: New Data Sources and Micro-Macro Links," *Journal of Economic Perspectives* 20(2006), 1. .

⁵ Draft Environmental Impact Statement (DEIS), 3-227.

(They do make higher wages when working that compensate for the off-time.) It is hard to believe that Mr. Hovee is saying that if WRE did not exist, over 100 construction workers in the Portland area would be spending the year in utter idleness. WRE must compete with other projects for these workers, although recessionary conditions may make the competition less vigorous than it would have been in more prosperous times, and may lengthen between-job spells of unemployment.

C. The Hovee Report's data and assumptions

1. Expenditures and value added

Q. Earlier you noted that Mr. Hovee counted amounts spent locally on materials and indirect expenditures (e.g. by workers for consumer goods in local stores) as benefits of the project to Skamania County. Is this reasoning valid?

A. No. Even if we accept his model for the time being, Mr. Hovee's measures of such benefits are gross overstatements. In some cases his measures are 1,000 percent higher than would have been found by a correct calculation. Such a calculation would have used "value added" by the local supplier rather than the gross revenue from selling the product.

Q. Please provide an illustration of your point.

A. Certainly. Assume that new workers arrive at a store and make \$1,000 of purchases that would not have been made by locals. Mr. Hovee counts the benefit as \$1,000, but should not. Assume that the store owner actually paid \$900 for the goods at wholesale. The remaining \$100 is value added, and is payment earned by the store for the services of existing, maintaining inventories, being open convenient hours, etc. That, rather than \$1,000 is the gain to Skamania County from selling the goods. Some of the \$100 may, of course be costs to the store that are earned as income by other locals – the hourly pay of the sales clerk.

Q. What might be some relevant percentages to indicate the size of the bias in Mr. Hovee's calculations?

A. The U.S. Department of Commerce's Bureau of Economic Analysis publishes annual data that allow us to compare gross output and value added among industries under the North American Industry Classification System (NAICS). The latest available data are for 2008. For retail trade as a whole, they show a gross output (an approximate analogue of Mr. Hovee's

figure) of \$1.285 trillion. Value added by that industry, however, was \$0.866 trillion, i.e. 67 percent of the gross total. Similarly, among other localized benefits Mr. Hovee includes expenses on construction, which should include both wages and materials that local contractors must purchase. For construction as a whole, value added in 2008 was \$0.639 trillion and gross output was \$1.278 trillion, i.e. the former is only 50 percent of the latter.⁶ Mr. Hovee provides no evidence that any important material inputs are produced in Skamania County.

2. Taxes and their geographic impacts.

Q. Mr. Hovee's report counts certain tax payments as benefits of WRE. Please evaluate his analysis and estimates.

A. In the first paragraph of Exhibit 41.02, Mr. Hovee states that he was retained to examine WRE's impacts, "focused on effects most readily attributable to Skamania County." If so, it is important to isolate benefits that will actually accrue to Skamania County from the total taxes that will be paid in connection with WRE. Mr. Hovee, however, presents a summary of "Fiscal Benefits" (Ex. 41.02, 9) broken into effects on Washington State and "Local Jurisdictions" or "Local Areas." Of \$126,000 in sales taxes levied during construction (for workers' retail purchases, etc.), Local Jurisdictions will receive only \$9,000, i.e. less than \$1 per capita in Skamania County. Only \$3,330 of annual sales taxes levied when the project is operating will remain in that area.⁷ Using a method that I cannot replicate with available data, Mr. Hovee also estimates that the local area will enjoy \$472,420 per year in property taxes, 77.5 percent of those levied when the plant is operating. After the itemization, he conjectures that residents will benefit because "property taxes generated by the wind facility will represent partial replacement of property taxes already paid by existing ratepayers and [provide] added bonding capacity." (Ex. 41.02, 9) This statement is an unverified conjecture, since Mr. Hovee provides no examples of residents in counties with large amounts of wind generation paying reduced property taxes.

Q. A substantial amount of research has recently appeared that attempts to measure the impact of wind installations on the value of nearby properties, and thus on assessments and

⁶ See U.S. Department of Commerce, Bureau of Economic Analysis, Industry Economic Accounts, "Gross Domestic Product by Industry Data" at http://www.bea.gov/industry/gdpbyind_data.htm

⁷ Mr. Hovee notes that these figures may be conservative because they are based only on direct spending and do not include any additional activities induced by the multiplier.

property taxes. Some researchers claim little or no impact, while others find substantial decreases in property values. Has Mr. Hovee cited any of this literature in his discussion of property taxes?

A. He provides no indication that he has done so, other than a reference to the Kittitas docket, in which a survey of assessors found no effects of wind on property values.

Q. Does Mr. Hovee account for any additional costs that WRE might impose, e.g. in the form of increased expenditures on public services?

A. Mr. Hovee in fact admits that he simply chose to "assume" that "primary fiscal benefits accru[e] to directly affected local jurisdictions in Skamania County." (Ex. 41.02 at 8) Although the DEIS and WRE's application claim these effects will be minimal, Mr. Hovee has made no attempt to verify assertions made in them.

Q. What evidence does Mr. Hovee use to show the reasonableness of his estimate of sales taxes that will remain in the Skamania County area?

A. He claims that 10 percent of a total construction payroll of \$18.0 million will be spent in the local economy (Ex. 41.02, 3) but provides no details of the calculation. A footnote asserts without further references that this estimate is "conservative".

Q. According to the DEIS (at 3-227), 65 to 75 percent of the workers are expected to commute daily to the site from Portland and Vancouver. Has Mr. Hovee accounted for this fact in his assumptions about sales tax revenues in Skamania County?

A. His report provides no information on this point, although WRE's Amended Application before EFSEC notes (at 4.2-19) that those workers will be mostly commuters who will have little impact on the housing market and retail trade near WRE.

Q. Why might it affect the estimates?

A. First, the workers from Portland will mostly be residents of Oregon, which has no sales tax. They may well attempt to allocate their expenditures away from Washington businesses toward those in Oregon. This could even hold in the area of the job site, since the south bank of the Columbia contains a population center of roughly the same size as Skamania County's.⁸

⁸ See DEIS, 3-245 – 3-246 for details on the area's population and its geographic distribution.

3. Other economic and demographic data

Q. Please explain the importance of assumptions about worker earnings in computing the benefits of a project like WRE.

A. Workers receive earnings for their contributions to construction and operations, which they then utilize for purchases of local goods and services, other purchases, saving, and personal taxes. Increases in earnings bring increases in such expenditures, and as described above the value added by local business constitutes a local benefit. It is thus important to use accurate and timely measures of these earnings, and adjust them as necessary for work hours and taxes.

Q. Please summarize Mr. Hovee's assumptions about earnings of workers who will construct and operate WRE.

A. Mr. Hovee describes these assumptions in two basic paragraphs (Ex. 41.02, 6):

The wind power generation investment is expected to support an average of 143 full- and part-time jobs during the construction period of up to one year; approximately 330 workers will help construct the project, with peak on-site employment estimated at 265. These jobs are phased in over the entire construction period. Construction jobs will likely be supported by as many as another 27 jobs in the local economy for a total of 170 jobs over the duration of construction.

Based on information provided by pertinent public and private sources, construction workers, on average, are anticipated to earn approximately \$125,900 per worker, generating a total construction payroll of \$18.0 million. This construction payroll is projected to stimulate another approximately \$3.4 million of household income within the Skamania County economy during the construction phase, for a total combined payroll benefit of \$21.4 million.

Q. Are his assumptions about worker earnings consistent with other economic data?

A. To the extent that these passages are comprehensible, Mr. Hovee's figures are far higher than reality. Begin with his claim that "construction workers, on average, are anticipated to earn approximately \$125,900 per worker," and his expectation that these will support "an average of 143 full- and part-time jobs during the construction period of up to one year." Multiplying the earnings per worker by 143, we get a total construction labor cost of approximately \$18 million. If 143 is the average number of workers on-site during the year, divide by 50 to get average weekly earnings of approximately \$2,517 for a full-time worker.

Employment and Earnings, a monthly statistical publication of the U. S. Department of Labor's Bureau of Labor Statistics tells us that average weekly earnings (seasonally adjusted) of

all construction workers were \$905.58 in September 2010.⁹ Mr. Hovee's figure is 177 percent higher than a nationwide average. Since construction workers who are employed work an average of 38.5 hours per week, we can be confident that the national average is not biased downward due to a large number of part-time workers.¹⁰

Q. How would the use of a federal earnings statistic rather than his own alter Mr. Hovee's conclusions about income and job creation?

A. It is safe to say that lower average earnings would mean less spending and respending and yield less optimistic economic consequences. Beyond that, however, we cannot say much, because Mr. Hovee's study provides few citations to data sources. To get measures of direct and induced spending, Mr. Hovee says that he has made certain assumptions about workers' discretionary income and its allocation. Unfortunately he provides no definition of discretionary income, and to my knowledge there is also no official U.S. government definition. By far the most important apparent divergence from reality lies in his assumptions about worker earnings, and he provides no explanation whatsoever about why they so differ from official data. Instead he says that his numbers came from "pertinent public and private sources," and from "[r]epresentatives from pertinent private industry sources and public agencies."¹¹ None of his sources are identified by name.

Q. Are there any other errors or ambiguities similar to the above In Mr. Hovee's calculations?

A. Such a difficulty appears in his estimate of post-construction earnings. Regarding the on-site workers, he assumes that their average annual wage inclusive of benefits is \$166,000 per year. Again, this is far higher than earnings of construction workers with similar skills, and Mr. Hovee has provided no evidence that the requisite skills are so rare as to justify such a wage premium over a national average for construction workers.

Mr. Hovee provides another implausible earnings figure when discussing the induced increases in local employment that will come with construction expenditures on WRE. Specifically, he estimates \$3.4 million of additional "household income" that will be associated with 27 people who gain employment as a result. Assuming that these people get jobs for the year in which construction takes place, an equal division of the extra income among them yields

⁹ *Employment and Earnings*, Nov. 2010, 74.

¹⁰ *Employment and Earnings*, Nov. 2010, 125.

¹¹ Ex. 41.02, 3 and 6.

per-person earnings of \$125,900 per year. While this is less than Mr. Hovee's estimate for construction workers, the likely types of labor in this group make such a high figure unlikely. We cannot go definitively further, but can examine earnings of some possible occupations. For example, *Employment and Earnings* shows U.S. average September 2010 weekly earnings in retail trade of \$627.71. Because average hours in this sector were only 30.2, we can increase the figure by 33 percent to get \$834.85. Multiplying it by 50 weeks gives estimated annual full-time equivalent earnings of \$41,742 per year, only 33 percent of the amount assumed by Mr. Hovee. Since Skamania County has an unemployment rate above the national average, we might reasonably expect that average earnings in it are also relatively lower on that account.

Q. Are there any general factors to note about Mr. Hovee's calculations?

A. I advise any non-economist reader to question the seeming precision of his result, and his relatively frequent choice of the number or rhetoric that favors his conclusions when he is faced with a range of possible computational results. An example of the seeming precision occurs during his discussions of the workforce that will operate WRE after construction. Without further discussion he chooses a high-end estimate that there will be nine of them, seven of whom will live in the region and two of whom might be from outside of it. The latter two "are assumed to eventually relocate to the gorge" (Ex. 41.02, 3) for reasons that Mr. Hovee does not specify. More generally, he often settles on a single number for such highly uncertain variables as the number of newly employed locals that will be produced by construction and operation. At minimum, he should have produced a plausible range of outcomes, particularly in light of major problems in his other calculations.

III. "GREEN JOBS"

A. Testimony of Witness Usibelli

1. Data from the Washington State Employment Security Department, Ex. 34.04

Q. Please summarize Mr. Usibelli's assertions regarding the effects of WRE on employment in Washington.

A. Mr. Usibelli claims that "[c]onstruction of the WREP will create clean jobs (during construction and operation) and expand the clean energy economy of Washington." (Ex. 34.00,

8) In particular, "[m]uch of the state's effort to address climate change ... is foreseen to be through the development of green jobs and a green economy."

Q. What is the factual basis on which Mr. Usibelli makes these assertions?

A. He provides an exhibit (34.04) from the State Employment Security Department that provides data on 2009 green jobs in the state, and another from an October 2010 report to the state's Clean Energy Leadership Council from Navigant Consulting (Ex. 34.05). That report outlines a "Leadership Plan" to "grow" clean energy in the state, to be implemented by a small surcharge on utility bills.

Q. What facts and data has Mr. Usibelli found in Ex. 34.04 that indicate that construction and operation of WRE will create clean jobs?

A. His sole reference to this exhibit is to a table showing that "[t]he study identified more than 3,400 renewable energy jobs in the state, with nearly 450 of those in the South Central region, which includes Skamania County." (It also includes Klickitat, Yakima and Kittitas Counties.)

Q. Please evaluate the significance of this testimony in the current proceeding.

A. Mr. Usibelli's exhibit consists of the cover and a single page of a 56 page document. The entire study counts 99,319 green jobs in the state; 38,894 (39.2 percent) are in energy efficiency, 46,004 (46.3 percent) are in pollution prevention and reduction, and 11,617 (11.7 percent) are in mitigation and cleanup. Adding the regional figures, we find 3,463 jobs in renewable power production, only 3.5 percent of the all green jobs. Most of those in renewables are construction jobs of short duration, consistent with Mr. Hovee's forecasts for WRE. Thirty-five percent of the jobs in renewables are held by part-time workers, a higher proportion than in any of the other three fields. (Ex. 34.02, 30). Relative to the state's total work force, the 99,319 total green jobs (summed over the public and private sectors) are 3.3 percent of a total of 3,005,549 total covered positions.¹² Total jobs in renewable power are slightly over one one-thousandth of all jobs in the state.

Q. If a major goal of state policy is to increase jobs classified as "green," what do you conclude from the above data and Mr. Hovee's findings?

¹² Ex. 34.02, 14. Note that the total green jobs in South Central on this page (4,885) is not the same as on the Appendix table supplied by Mr. Usibelli. It cannot be determined which (if either) figure is correct.

A. Employment in renewable energy is small and disproportionately in short-lived construction jobs, rather than permanent positions. Further, renewables such as wind energy are highly capital intensive, i.e. the amount of investment required to support a full-time job is very high relative to the typical amounts in other "green" areas. Additionally, Ex. 34.02 says that a high fraction of jobs in renewable power are part-time, rather than the permanent, full-time jobs that are often the goal of employment policy. Even if one believes that green investments can create substantial amounts of new employment, those investments would often be better allocated to green areas other than renewable energy production.

Q. Does Ex. 34.02 provide any other support for Mr. Usibelli's claim that the construction and operation of WRE will have salutary effects on employment?

A. No, in fact discussion of wind energy is almost totally absent from the document, save for passing mentions.

2. Report to the Washington Clean Energy Leadership Council by Navigant Consulting (Ex. 34.05)

Q. Mr. Usibelli provides a portion of Ex. 34.05 in support of his claims that "[c]onstruction of the WREP will create clean jobs (during construction and operation) and expand the clean energy economy of Washington" and that "[m]uch of the state's effort to address climate change ... is foreseen to be through the development of green jobs and a green economy." (Ex. 34.00, 8) Please describe the origins and content of that document.

A. "Washington State Clean Energy Leadership Plan Report" was produced by Navigant Consulting for the Washington Clean Energy Leadership Council, an appointed body of "23 representatives from the private, public and non-profit sectors active in the clean energy industry in the state."¹³ The Report outlines a legislatively mandated plan that will "[t]ransform the market for clean energy in Washington and greatly enhance in-state clean energy businesses and jobs," without which "Washington will continue to fall further behind other states in clean energy jobs per capita."¹⁴

Q. Of what relevance is this report to WRE's case at EFSEC?

¹³ Washington Clean Energy Leadership Council, <http://washingtoncelc.org/>

¹⁴ Ex. 34.05, 1.

A. It is of little if any relevance. It does not mention WRE, and instead stresses that Washington's renewable energy policies should be directed toward developing improved integration techniques and storage technologies for intermittent sources such as wind.¹⁵ While the report urges reduction of barriers to the siting and permitting of wind projects (at 41), Figure 8-2 in the document in fact makes the same points about the relative importance of renewable projects in the state's employment picture.¹⁶ Like Exhibit 34.04 it sees jobs in renewables as a relatively small percentage of all green jobs, and the growth of wind power itself will not substantially affect the number of those jobs over the long term:

However, as the wind energy installation reaches an assumed peak, those jobs evolve into a lower wind energy O&M [operation and maintenance] job market that is far less job intensive. Those construction level jobs are replaced in part with longer-term wind and solar energy integration solution jobs that serve markets outside Washington, but at a lower long-term increased job level.¹⁷

Q. What conclusions do you draw from Ex. 34.05?

A. Like Ex. 34.04, it provides no evidence that the construction of WRE will advance any of the state's policy goals regarding its green industries.

B. Testimonies of Local Witnesses

1. Robert Wittenberg, Jr., for Skamania Public Utility District

Q. WRE has submitted testimonies from persons and organizations in the project's locality that touch on the economic effects of the project, in addition to Mr. Hovee's report discussed above. Please summarize the relevant economic claims in the testimony of Robert Wittenberg, Jr. on behalf of Skamania County Public Utility District No. 1, Exhibit 43.00.

A. Mr. Wittenberg's testimony describes the value of WRE to his utility in light of the removal of Condit Dam scheduled for 2011. Currently that dam serves as the sole backup source to the single line from Bonneville Dam that currently serves the District's territory.¹⁸ He claims that the

¹⁵ Ex. 34.05, 8, 13, 35, and App. A.

¹⁶ Navigant Report, 55 - 56. Mr. Usibelli did not submit this page as part of Exhibit 34.05.

¹⁷ Navigant Report, 56.

¹⁸ Mr. Wittenberg notes that "generators are available for limited emergency backup." They are not, however, "a reliable permanent backup plan for a huge area of the county, either technologically, environmentally or financially." I have been unable to track down any information about the types of generators, their capacity, or their historical operation.

construction of a substation serving WRE is necessary to maintain reliability and redundancy, and this serves as further rationale for approval of WRE's application.

Q. Do you agree that Mr. Wittenberg's testimony is dispositive as to the reliability aspects of constructing WRE?

A. I believe that it is incomplete at best. Mr. Wittenberg notes (Ex. 43.00, 2) that Condit Dam "has long been scheduled for removal next year, in 2011." In reality the initial agreement among PacifiCorp, environmentalists and representatives of Indian tribes was reached in September, 1999.¹⁹ There is no evidence that Skamania County Public Utility District was concerned about Condit Dam as a secondary power source at the time, although the breach was originally scheduled for 2006.²⁰ That breach was later postponed until 2008 and again until 2011. Prior to 2009, however, Skamania Public Utility District's only stated concerns were about fishing and waterfront properties that would be dry land in the event of the dam's destruction. Only in 2009 did the P.U.D. publicly state that construction of WRE would give it a secondary delivery point to replace the one that would be lost after Condit was breached. It is, however, clear that WRE was known to be in planning as early as 2007, since its proposers were at that time forecasting the jobs it would create.²¹ There is no available evidence that prior to 2009 Skamania had told either state or federal regulators of the project's value as backup, or that WRE's proposers had made such a statement before a regulatory body. There is also no evidence that Skamania was considering any alternative backup arrangements between 1999 and 2009, beyond Mr. Wittenberg's assertion (Ex. 43.00, 6) that Skamania had looked into developing its own generation but found it infeasible. He provides no documentary support for that assertion. In any case, in October 2010 PacifiCorp tentatively settled with Klickitat and Skamania counties for the value of property losses expected from breach of the dam.²² There was no analogous settlement compensating Skamania Public Utility District for the loss in reliability (if any) that might result from losing the secondary feed from Condit.

¹⁹ "Plan to Remove Dam Runs into Delays," *The Columbian*, May 18, 2001.

²⁰ "Dam May Face Doom So Fish Can Avoid It," *The Columbian*, June 3, 2001; "Blasting Condit Dam Wins Early Backing," *The Columbian*, Jan. 31, 2002

²¹ "Wind Power Project Good Fit for Skamania, Official Says," *The Columbian*, Dec. 9, 2007.

²² "Condit Dam Removal Clears Hurdle," *The Columbian*, Nov. 12, 2010.

Q. During the years when Skamania knew that the breach of Condit was under consideration, did it mention its alleged reliability problems in filings at the Federal Energy Regulatory Commission (FERC)?

A. FERC maintains a publicly available library of all filings and orders connected with this proceeding. While I have not performed an exhaustive check, during the course of my research I failed to encounter any document from Skamania showing concern about a loss of backup capability if Condit is breached. Instead, these filings appear to be concerned exclusively with environmental and tourism issues, to the complete exclusion of transmission and reliability.²³ Since FERC has primary jurisdiction over hydroelectric licensing, interstate transmission and wholesale power transactions (sales of power intended for resale to ultimate consumers, even within the same state), it would have been the logical forum in which Skamania could express its concerns.

2. John McSherry, for Port of Skamania County

Q. Please summarize Mr. McSherry's testimony regarding WRE.

A. Mr. McSherry asserts that sales and use taxes are in part responsible for funding the Port's operations and capital expenditures. Perhaps unsurprisingly, he declares that the construction of WRE would increase sales and property tax revenues for the port, and with them its bonding capacity.

Q. Please comment on the significance of his assertion.

A. Any project that increased property values and sales tax revenues could benefit the Port in much the same way as Mr. McSherry hypothesizes. Likewise, if WRE is built there are surely many other actual and potential public projects deserving of allocations from these higher taxes. Whether expansion of the Port is itself desirable is a question beyond the reach of this proceeding. In any case, Mr. McSherry provides no numerical data that could be of use in evaluating his claims.

3. Chuck Covert, for Klickitat County Public Economic Development Authority

Q. Please summarize Mr. Covert's testimony as regards WRE.

²³ See, e.g., Response of Klickitat and Skamania Counties to PacifiCorp's Petition for Declaratory Order on Preemption, FERC Docket No. P-2342-000 (Nov. 14, 2005). This is attached as Exhibit 30.20.

A. Mr. Covert is Manager of Columbia Gorge Regional Airport. His testimony describes the airport's financial and regulatory situation, and the status of economic development around it.

Q. Is this testimony likely to be of any value in helping EFSEC make a better-informed decision about whether to approve WRE?

A. The testimony makes no mention of WRE, and provides no other information that might improve the quality of EFSEC's decision.

4. Michael Canon, for Klickitat County Public Economic Development Authority

Q. Please summarize Mr. Canon's testimony as regards WRE.

A. Mr. Canon is Director of the Authority. His testimony begins with a description of the "energy overlay" policy that has facilitated the construction of wind power projects in the county. He briefly describes these projects, and then notes that they have provided the county with additional ("induced") jobs and businesses as a result of local respending of incomes and increases in tax revenues. He also notes that a local wine industry has emerged, and has apparently suffered no ill effects (and possibly some salutary ones) as a result of the wind projects.

Q. Is Mr. Canon's testimony likely to be of any value to EFSEC in its evaluation of the WRE application?

A. Like the other witnesses, Mr. Canon states that construction of wind projects could produce local benefits in employment and taxing capability. Like them (excepting Mr. Hovee) he provides no quantitative data that links specific business formations to the wind installations. There are many possible ways to develop a depressed county, and Mr. Canon himself acknowledges the gains that have probably accompanied the growth of the wine industry. His testimony does not address the relatively small quantitative effects of wind power development as described in the testimonies of Messrs. Hovee and Usibelli, or consider any possibly relevant differences between Klickitat and Skamania Counties. I conclude that his testimony adds little to any possible economic case for WRE.

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IV. INTEGRATION OF WIND ENERGY

A. The Limits and Prospects for Integration

Q. Please summarize Dr. Schwartz's testimony on the integration of additional wind energy in the PNW.

A. Dr. Schwartz begins by citing BPA's September 2009 estimate that it could integrate at most 3,000 to 3,500 MW of wind using its hydro system. This figure nearly equals today's wind capacity in the region. Faced with a queue of integration requests that is possibly twice that amount, BPA has chosen to initiate four new transmission projects and has formed a Wind Integration Team. The team has moved forward with operating and forecasting projects that it expects will facilitate the integration of "upwards of double that amount (6,000 MW) ... over the next three years."²⁴

Q. What is the basis for the quoted assertion in the previous question?

A. Dr. Schwartz cites Exhibit 35.03, page 10, but that page contains no such statement. The exhibit contains a bar graph from BPA showing the growth of wind capacity in the recent past and three projections (high, low, and likely) of the amounts that will be "connected to BPA's transmission system" through FY (Fiscal Year) 2016.

Q. Does the exhibit contain any statement of BPA's ability to interconnect that capacity to its transmission system?

No. In fact it contains qualifying notes. One says that "projections beyond [fiscal year 2011] may be impacted or delayed due to a need for transmission system expansion," and another says that the figures are "projected totals based on previous experience and present growth factors." It cannot be read as asserting that integration of the future quantities on the graph will be feasible, or that BPA "expects to be able to integrate it over the next 3 years." To my knowledge Dr. Schwartz has produced no documented statements from BPA regarding certainty of interconnection.

Q. Does Dr. Schwartz have any expert knowledge of the technological issues in interconnection of wind generation?

²⁴ Ex. 35.00, 8. It appears from the context that this means an additional 3,000 MW (see Ex. 35.00, 10) rather than an additional 6,000.

A. There is no evidence that he does. His doctorate is in political science, and the purpose of his testimony appears to be primarily informational, i.e. it is intended to inform EFSEC of BPA's efforts and preparations for the integration of additional wind capacity.

Q. Regarding operational difficulties, Dr. Schwartz cites Exhibit 35.08 (Michaels Exhibit 30.12) on high-water operations in June 2010. What conclusions does he draw from it?

A. Dr. Schwartz says that "BPA managed the event successfully,"²⁵ but gives no standards by which to judge success. There were important outages and deratings on Intertie lines to both British Columbia and California (Ex. 35.08, 10). PNW reliability was maintained, but only through extraordinary operational practices. Those practices adversely impacted power markets, to the extent that BPA energy at times sold for negative prices. Interconnections with large amounts of wind capacity did not ease the operational problems, and may have aggravated them.

Q. Dr. Schwartz states that "[n]otably, four of the six programs [being introduced by the Wind Integration Team] might have helped manage the event had they all been implemented." (Ex. 35.00, 9). Does he provide any foundation for this statement?

A. No. His expertise is not in electrical operations, and I have found no statement in his exhibits to this effect.

B. Possible Benefits of Integrating WRE

Q. Dr. Schwartz uses a quotation from the Draft Environmental Impact Statement (Ex. 35.09) and claims that "BPA testified in the DEIS, that [WRE] itself, because of its diverse location (60 miles west of the majority of the wind farms) actually provides some system benefits. Is this quotation of importance for EFSEC's decision on WRE?

A. Exhibit 35.09 consists of three pages from the text of a document containing several hundred pages. Chapter 2 of the DEIS is devoted to comparison of the "proposed action" (constructing WRE) with a "no action alternative." Table 2-5 summarizes BPA's estimate of the outcomes of the two choices as they relate to "BPA purposes." One of those purposes is "[maintaining] the electrical stability and reliability of the [Federal Columbia River Transmission System]. If WRE is built and interconnected, the interconnection "would be designed to ensure

²⁵ BPA also states that "[t]his year, the existing tools for addressing high water were stretched to manage successfully through a relatively short high-water period in an otherwise dry year." (Ex. 35.08, 12)

that the electrical stability and reliability of BPA's transmission system is maintained, and contractual terms would be put in place to ensure that project operations do not adversely affect electrical stability and reliability." In the "no action" alternative, if WRE goes unbuilt and unconnected, "[n]ot granting an interconnection would have no effect on the electrical stability and reliability of BPA's transmission system."²⁶

Q. If WRE's absence will be unimportant for BPA's stability and reliability, what is the significance of Dr. Schwartz's quotation?

A. From the context it appears that the statement is only about the possible impact of WRE on fish movements, rather than broader electrical operations. It also appears to be entirely hypothetical, since it provides no evidence of episodes in which the absence of generation in WRE's vicinity reduced BPA's ability to discharge its fish responsibilities.

Q. According to Dr. Schwartz, "BPA will not allow [WRE] to be interconnected if they believe there is a high probability of risk to the system by doing so." Assuming this is true, what is the significance of his discussion (Ex. 35.00, 10-11) of BPA's current development of integration programs, prospects for demand management, proposals for regional operation and improvements in wind forecasting, and the relative smallness of WRE?

A. I see no significance whatsoever for EFSEC's decision on WRE. These possibilities may or may not affect its chances of a favorable integration decision from BPA, but are unrelated to the standards by which EFSEC is to evaluate whether its construction and operation will be in the public interest. Again, we should recall that Dr. Schwartz is a political scientist rather than an expert on electric systems.

C. Compliance with Renewable Portfolio Standards

1. Washington

Q. For the moment disregard any difficulties in integrating the mass of wind capacity that is under construction, permitted or seeking permits. How does Mr. Usibelli calculate the wind capacity required for compliance with Washington's RPS?

A. Mr. Usibelli's Ex. 34.02 takes data from utility filings on their projected loads and compliance measures. Five years ahead, 9 percent of the projected 10,375 MWa load, i.e. 933 MWa must

²⁶ DEIS, Chapter 2, 25. BPA's purposes are described in DEIS, Chapter 1, 1-4.

come from renewable capacity. In 10 years this figure must be 15 percent of 11,241 MWa, or 1,686 MWa. He goes on to assume that 70 percent of the target loads in both 2015 (i.e. 650 MWa) and 2020 (1,180 MWa).²⁷ He then assumes that wind units have a capacity factor of .32, so that 2,031 MWa of nominal wind capacity will be required in 2015 and 3,688 in 2020.

Q. Do Mr. Usibelli's figures for required wind capacity represent units that must be constructed between today and 2015 or 2020?

A. No. Some of the necessary capacity already exists and is operational. It is important to note that all renewables built since March of 1999 are eligible for compliance with Washington's RPS. Since Washington had no wind units in operation at that date, much if not all of the 2,224.2 MW of nominal wind capacity built since then is potentially available for compliance. (Exhibit 30.08, 1) If all of that amount has been or can be claimed by Washington utilities, more than the 2,031 nominal megawatts of wind capacity claimed necessary by Mr. Usibelli for 2015 compliance is already in place. Likewise, Mr. Usibelli claims that 3,688 MW will be required for 2020 compliance, but the total wind facilities existing or under construction currently equal 3,574.9 MW. (Ex. 30.08, 1) Adding those that have been approved but not initiated construction brings the total to 4868.9 MW. Even if some of these units go unbuilt, Washington's currently available capacity, capacity under construction, and projects with permits more than cover Mr. Usibelli's stated requirement for compliance by all of its affected utilities by 2020. In addition, as shown below, there are numerous projects in neighboring Oregon that satisfy the location requirements of I-937 and may be available to Washington utilities.

Q. Do these data suffice for a conclusion re the need for additional capacity to meet Washington's RPS?

A. No, because they do not consider the actual availability of the facilities to the utilities. The output of a facility may already be committed to a particular utility, meaning that it is unavailable to other utilities for compliance. In addition, some projects are selling or intend to sell their power to California rather than entities in the PNW. To determine a utility's actual holdings and needs requires more detailed examination of its planning documents. Unfortunately, Washington contains 17 utilities that are subject to I-937 and time and data availability do not allow me to construct an exhaustive database of their holdings and commitments.

²⁷ Mr. Usibelli provides no foundation for this assumption, but I will accept his figure for purposes of this testimony. If it is shown to be incorrect, my text and conclusions are subject to change.

Q. Can you provide an example of new wind investments that Washington utilities have determined will be necessary?

A. As one example, Puget Sound Energy, the state's largest utility, currently has two wind facilities in operation. Hopkins Ridge has a nameplate (nominal) capacity of 157 MW and began operating in 2005, and Wild Horse's 229 nameplate MW came on line in 2006, and will expand by 49 MW in 2010. Together the units suffice to serve approximately 5 percent of the company's overall energy load, well above the 3 percent that will be required for RPS compliance in 2012.²⁸ The Company's resource plan then estimates future requirements using scenario analyses. The wind build between now and then consistent with least cost planning depends on many variables such as regional growth and energy prices. Between today and 2015, extrapolated 2007 trends would entail construction of 300 MW of new wind capacity, as would several other scenarios. In the "low gas price" scenario, however, the company would build no additional wind units over the period, i.e. PSE's existing fleet plus committed additions would be sufficient to meet the 2015 goal specified in I-937. Between 2009 and 2020, depending on the scenario the efficient wind builds range from 600 to 800 MW. (Resource Plan, 5-41 and 5-43) Again, it is important to note that these amounts may be greater than the requirements imposed by Washington's RPS.

Q. What conclusions do you draw from examples such as these?

A. Although the examples include some generation whose sales are committed to non-Washington entities, there is no reason to believe that the state's utilities face scarcities of potential wind resources that large amounts of them must be built in the near future if they are to have any hope of compliance with I-937.

Q. Does Mr. Usibelli explicitly state that there is a need for WRE to be built if Washington utilities are to achieve compliance with their RPS?

A. No. He provides some statements about state law and regulation, and probably can be interpreted as claiming that construction of WRE is consistent with their goals.²⁹

²⁸ Puget Sound Energy, 2009 Integrated Resource Plan, Chapter 5, 5-12. http://www.pse.com/SiteCollectionDocuments/2009IRP/Chap5_IRP09.pdf This chapter is attached as Exhibit 30.21.

²⁹ Ex. 34.00, 4 – 8.

2. Oregon

Q. Why should one also track present and probable future wind capacity in Oregon?

A. Washington and Oregon are the states in which most of the wind generated in the PNW will be used. Combining an estimate of its future wind generation with one for Washington will allow us to compare regional need for it with the amount likely to be put in place. In addition, Washington utilities are restricted to facilities in the PNW for compliance, or facilities whose power is delivered into Washington on a real-time, no-services basis.

Q. What are Oregon's requirements?

A. The prime impact of the law is on "large" utilities that serve over 3 percent of the state's load, namely Portland General Electric (PGE), PacifiCorp, and the Eugene Water and Electric Board (EWEB). Although the law has provisions for smaller utilities, these three serve a very large share of the state's load. Since the smaller utilities have significantly lower renewable requirements and are a very small part of state load I do not consider them further in this calculation. The large utilities must obtain 5 percent of their energy from renewables in 2011, 15 percent in 2015, 20 percent in 2020, and 25 percent by 2025.

Q. What amounts of renewable energy will be required for compliance with these requirements?

A. Two of Oregon's three large utilities are investor-owned and must file reports with state regulators. The third is a much smaller municipal system and will be discussed below. The two large utilities have each filed implementation plans with the Public Utility Commission of Oregon that provide lists of the current and upcoming resources whose capacity will bring them into compliance. Unfortunately, the available plans do not provide data or estimates for years beyond 2015. The implementation plans do, however, specify individual plants, their capacities and their expected MWh production.

Portland General Electric's forecast compliance target for 2015 is 3,302,250 MWh.³⁰ Under Oregon law, the company is allowed to use "banked" output credits from renewables put in place before it went into effect. PGE will in fact obtain 83.8 percent of 2015 compliance from

³⁰ All figures are taken from PGE's 2009 Renewable Portfolio Implementation Plan, PUCO Docket No. 1466, Dec. 31, 2009. <http://edocs.puc.state.or.us/efdocs/HAA/um1466haa82110.pdf> A copy of this document is attached as Exhibit 30.22.

banked credits. (The remainder is to come from an otherwise unspecified "IRP Project 1" scheduled for operation in 2012.). Existing wind capacity or capacity in construction is expected to produce 51.6 percent of 2015 compliance energy, the remainder coming from existing small hydro and solar.

PacifiCorp's 2015 forecast target is 2,228,292 MWh.³¹ Of these, the company will produce 1,224,674 MWh in 2015, of which 1,204,907 (98 percent) come from wind, all from units put into service in 2010 or earlier. The remainder of its credits will come from its banked holdings. In short, PacifiCorp's existing wind capacity will more than suffice to keep the company in compliance up to 2015, even if no wind plants are added to its fleet between now and that date.

Finally, the relatively small Eugene Water and Electric Board obtained 3 percent of its energy from wind resources and 1 percent from biomass in 2008. Data are not available to construct a forecast of its future wind needs. EWEB has, however, informed us that it has "acquired new renewable resources ahead of need, and now are well positioned to be in compliance for many years in the future."³²

Q. Please summarize available data on wind generation capacity in Oregon.

A. Exhibit 30.08 shows that currently 2,301 nominal MW of wind capacity are operating in the state, and 1,307 are under construction, for a total of 3,608. In addition 593 MW have been approved but not yet begun construction. Although some of the existing capacity is held or contracted to Oregon utilities, the bulk of it is not necessary for compliance with the state's RPS.

3. Conclusion

Q. What do you conclude on the basis of the Washington and Oregon data?

A. I conclude that the area already has abundant and growing wind capacity, and that current and projected amounts more than suffice for RPS compliance over a time horizon of five years, and possibly ten.

³¹ All figures are taken from PacifiCorp's Renewable Portfolio Standard Oregon Implementation Plan, PUCO Docket No. 1467, Dec. 31, 2009. <http://edocs.puc.state.or.us/efdocs/HAA/um1467haa164449.pdf> Since PacifiCorp covers several states, all of these figures are Oregon's pro rata shares of capacity and energy. A copy is attached as Exhibit 30.23r.

³² The quotation is from Exhibit 30.24r, a December 14, 2010 email from Catherine Gray, Energy Resource Analyst at EWEB, to Aramburu & Eustis.

Q. What happens to wind power produced in the PNW that is not used by local utilities?

A. Data on the disposition of this power are not publicly available. It does appear, however, that a substantial fraction of existing output is or will be committed to purchasers in California to satisfy their state's RPS. As noted in my Prefiled Testimony (Ex. 30.00, 27). BPA has testified at FERC that by the end of 2010, 47 percent of wind generation attached to its system will be contracted to California utilities.

V. Summary and Conclusions

Q. Please summarize the conclusions you have reached in your testimony.

A. I consider the major topics of the testifying witnesses:

1. Regarding the economic effects of WRE, I have concluded that Mr. Hovee's analysis of WRE's effects on employment, income, and taxes in its area are of little or no value to EFSEC. The underlying economic model must as a matter of mathematics generate favorable impacts, but that model is unreal in both its assumptions and in the reasoning by which it derives those conclusions. He makes conceptual errors that include a confusion between gross sales and retail-value-added that bias his findings upward, and his treatments of state and local taxes are at odds with important facts. He provides no sources for his assumptions about worker incomes, despite the fact that these are sometimes over 200 percent of those found in federal statistics.

2. Mr. Usibelli's own exhibits are selective extracts from two documents, but even they point up the fact that most of the "green jobs" that WRE might produce will be short-lived, and their benefits to Skamania County (if they exist at all) will be minimal. Renewable power is capital-intensive relative to other sectors of the green economy, and thus creates few positions per dollar invested. Even if we believe in job creation by green projects, Mr. Usibelli's own sources confirm that the funds would create many more employment opportunities in areas such as energy efficiency and the mitigation of pollution.

3. The testimonies offered by local witnesses are of no value for determining either the need for WRE's power or its economic effects. They contain no numerical data on the local economy, and under their reasoning any project that entailed higher local spending could in principle

generate the same benefits as WRE. Mr. Wittenberg's description of how construction of WRE will mitigate the effects of breaching Condit Dam is historically inaccurate and electrically questionable.

4. The integration of large amounts of wind energy is an important technical and policy issue in several regions. Dr. Schwartz's testimony consists of a summary of BPA's situation and the actions it is undertaking to integrate more wind and the likelihood of success in the near future. He has no known expertise in the engineering matters on which he is testifying, and in fact works for the Washington Department of Commerce rather than BPA. Similarly, Mr. Usibelli's descriptions of how legal and regulatory developments warrant the construction of WRE appear equally applicable to any other generation project, and also applicable to projects that would increase the efficiency with which consumers utilize electricity.

5. Mr. Usibelli's description of the need for additional wind resources to facilitate compliance by Washington utilities with their state's RPS program is incomplete at best and misleading at worst. He calculates the amounts of wind capacity that will be necessary for Washington utilities to meet the requirements in 2015 and 2020. He does not, however, inform the reader about the existing volume of wind generation that is either operating or under construction, a significant portion of which is already being used by utilities to meet present and future RPS obligations. Additionally, he fails to discuss the amount of wind generation that will likely materialize over the next decade and may also be available to satisfy RPS. He treats Washington as a standalone entity, when in fact its RPS also allows utilities to accept power from Oregon's growing number of plants.

Q. Does this conclude your Supplemental Testimony?

A. Yes, it does.