

**STATE OF VERMONT
PUBLIC SERVICE BOARD**

Amended Petition of Entergy Nuclear Vermont Yankee, LLC, and)
Entergy Nuclear Operations, Inc. for amendment of their)
Certificate of Public Good and other approvals required under 30)
V.S.A. § 231(a) for authority to continue after March 21, 2012,)
operation of the Vermont Yankee Nuclear Power Station, including)
the storage of spent nuclear fuel)

Docket No. 7862

DIRECT TESTIMONY OF NICOLAS O. ROCKLER
ON BEHALF OF THE
VERMONT DEPARTMENT OF PUBLIC SERVICE

October 22, 2012

Summary: Mr. Rockler’s testimony addresses the economic impact of three future scenarios regarding the potential relicensing, operation and decommissioning of the Vermont Yankee Nuclear Power Station in Vernon, Vermont. His testimony analyzes the prefiled testimony of Richard Heaps submitted in this proceeding, including the report entitled “The Economic Impact of the VY Station on Windham County and Vermont.” Mr. Rockler identifies numerous misapplications in the economic impact analysis offered by Mr. Heaps, and concludes that the adverse impacts to Vermont of closure of the plant stated in Mr. Heaps’ testimony and report are unreliable and potentially misleading.

Mr. Rockler sponsors the following exhibits:

Exhibit PSD-NOR-1

Resume of Nicolas O. Rockler

1 Q1. Please state your name and occupation.

2 A1. My name is Nicolas O. Rockler. I am the Chief Executive Officer and Partner in
3 the economic consulting firm, Kavet, Rockler & Associates, LLC (“KRA”).
4

5 Q2. Please describe your educational and professional background.

6 A2. I completed my Ph.D. at MIT in Urban and Regional Planning with a dissertation
7 entitled, “Regional Economic Performance and Public Infrastructure Investment.”
8 I received B.A. and M.A. degrees in regional science at the University of
9 Pennsylvania. Following studies at the Massachusetts Institute of Technology
10 (“MIT”), I served on the staff of the Multiregional Planning Group at MIT and
11 taught classes in regional economic modeling there. I served on a special panel to
12 review economic models and impact estimation methodologies for the U.S. Army
13 Corps of Engineers-Institute for Water Resources in connection with Hurricane
14 Katrina. I have conducted extensive research on the long-run impact of public
15 infrastructure investment for the U.S. Economic Development Administration for
16 the Joyce Foundation and the National Institute of Standards and Technology
17 (“NIST”). Current research projects include input-output economic impact of
18 NASA-funded research and development and analysis of transportation
19 infrastructure investment policy for São Paulo, Brazil.

20 Prior to my studies and work at MIT, I was a senior economist at Data
21 Resources, Inc. (DRI, now IHS Global Insight, Inc.) and F.W. Dodge, both
22 subsidiaries of McGraw-Hill at the time. During that time, I developed time

1 series estimates of capital stocks for all U.S. counties and led the development of
2 DRI's Metropolitan Area Forecasting Service, Construction Information Service,
3 and Real Estate Analysis and Planning Service. Before working at DRI, I worked
4 as an economic analyst at Abt Associates, Inc., contributing to economic program
5 evaluation studies for various federal agencies. I also worked as a regional
6 economist at an architecture, engineering, and planning firm in Roanoke,
7 Virginia, where I prepared economic impact estimates for public works projects
8 on behalf of the U.S. Army Corps of Engineers. A more detailed resume and
9 partial client list is attached hereto as Exhibit PSD-NOR-1.

10

11 Q3. Please describe your qualifications and experience.

12 A3. I have been a professional economist and economic consultant specializing in
13 regional economic impact measurement, modeling, and assessment for the past 35
14 years. During my career, I developed the first general purpose metropolitan area
15 econometric and forecasting models, developed numerous regional input-output
16 models for customized applications, including analyzing employment stimulus
17 programs, building materials demand and economic development planning in U.S.
18 and international locations. In addition to building customized regional economic
19 models, I am intimately familiar with the most widely used commercial economic
20 models, such as those produced by Regional Dynamics, Inc. (REDYN). I have
21 worked with the principals at REDYN in designing and improving their model
22 and performed joint contract research with the principals at REDYN. I have used

1 REDYN and other regional economic models in my role at KRA as Principal
2 Economic Advisor to the Vermont State Legislature.

3

4 Q4. Have you previously testified before the Public Service Board or in other judicial
5 or administrative proceedings?

6 A4. I have not previously testified before the Vermont Public Service Board. I have
7 testified before Vermont State legislative committees on many occasions and at
8 Act 250 and other public hearings and administrative proceedings.

9

10 Q5. What is the purpose of your testimony?

11 A5. My testimony addresses the economic impact of three future scenarios regarding
12 the potential relicensing, operation, and decommissioning of the Vermont Yankee
13 Nuclear Power Plant in Vernon, Vermont (the “VY Station”). My testimony
14 analyzes the prefiled testimony of Richard Heaps, submitted on behalf of Entergy
15 Nuclear Vermont Yankee, LLC, and Entergy Nuclear Operations, Inc. (“Entergy”) in
16 this proceeding, including the report entitled “The Economic Impact of the VY
17 Station on Windham County and Vermont,” (hereinafter, the “Entergy Report”) introduced
18 as Exhibit EN-RWH-3.

19 In the testimony of Mr. Heaps and the Entergy Report the purported
20 economic impacts on Windham County and the state of Vermont associated with
21 three closure scenarios for the VY Station are developed and presented. I also
22 examined other supporting documentation, notably the economic model input

1 tables prepared by Mr. Heaps and the “Decommissioning Cost Analysis for the
2 Vermont Yankee Nuclear Power Station” (the “TLG Report”) prepared by TLG
3 Services, Inc. on behalf of Entergy and introduced in this proceeding as Exhibit
4 EN-TLG-2.

5

6 Q6. What are the three future scenarios addressed by the Entergy Report?

7 A6. These reports address the following potential scenarios:

- 8 • A baseline scenario which assumes the VY Station is shut down at the end of
9 2012, as required under the current state operating license. This scenario assumes
10 that beginning in 2013 almost all operating personnel are laid off except those
11 persons needed to maintain security during the shutdown. This scenario also
12 assumes that the plant, although closed, remains intact with spent nuclear fuel
13 stored onsite until 2032. Finally, the scenario assumes that the plant is fully
14 demolished and all site remediation is completed by 2082.
- 15 • A “prompt” decommissioning scenario, in which the VY Station’s state operating
16 license is renewed until 2032 and the plant is assumed to operate with the same
17 capital and labor as it currently does until that time. Under this scenario, the plant
18 is assumed to shut down in 2032, with stored waste removed thereafter as per the
19 schedule set forth in the TLG Report. The plant is assumed to be fully demolished
20 and site remediation completed by 2083.

- 1 • A “deferred” decommissioning scenario, which assumes the same initial shutdown
2 schedule in 2032 as in the prompt decommissioning scenario, but with plant
3 demolition completed 10 years later, by 2093.

4

5 Q7. Please summarize the purpose and methodology of the Entergy report.

6 A7. The stated purpose of the Entergy Report was to estimate the economic
7 consequences on Windham County and the State of Vermont of the three
8 scenarios described above—baseline, prompt decommissioning, and deferred
9 decommissioning. The Entergy Report considers the employment, site use, and
10 other economic impacts that would result from closure of the VY Station under
11 each of the three scenarios.

12 The Entergy Report draws much of its data concerning cost schedules for
13 the three scenarios from the TLG Report, specifically Tables 3.2, 3.4, and 3.5 of
14 the TLG Report. These tables provide the estimated annual costs of the entire
15 plant closure process, including estimated costs for labor, equipment and
16 materials, energy, waste disposal, and other (not elsewhere classified) costs
17 required to secure the site, deliver radioactive wastes to appropriate storage sites,
18 and demolish and dispose of all plant and equipment, leaving the site in fully
19 restored condition. Layoff costs associated with operating personnel are not
20 provided explicitly, although I did ascertain the current level of plant employment
21 from figures cited in the analysis, specifically employment figures that identify
22 the residence location of current plant employees (given as town and state of

1 residence). The TLG Report also provides the total cumulative cost of more
2 detailed cost elements for each of the three scenarios in its Appendix C. An
3 example of such cost estimates are shown in Appendix Table C-2 to the TLG
4 Report, found at Exhibit EN-TLG-2. Unfortunately, the TLG Report does not
5 specify the timing of these detailed expenditures. They are, however, consistent
6 in total with the annual expenditures that are the major cost components of the
7 demolition and remediation work, including labor, equipment, material, disposal,
8 purchased electricity, and other services.

9 Using the Regional Dynamics, Inc. (REDYN) model and the data from the
10 TLG Report, as well as other inputs, the Entergy Report predicts how closure of
11 the VY Station under each of the three scenarios will impact the economy of both
12 Windham County and the State of Vermont.

13

14 Q8. Are you familiar with the REDYN model?

15 A8. Yes, I am very familiar with the REDYN model. I worked with the principals at
16 REDYN in designing and improving their model and performed joint contract
17 research with the principals at REDYN. I have used REDYN and other regional
18 economic models in my role at KRA as Principal Economic Advisor to the
19 Vermont State Legislature.

20

21

22

1 Q9. How does the REDYN model compare to other available economic models?

2 A9. In view of the differential times at which closure costs are incurred under the
3 three scenarios, analyzing these impacts using a regional economic model that has
4 a time series approach is critical. There are two readily available commercial
5 model choices featuring time series. The most widely used regional model is
6 produced by Regional Economic Models, Inc. (REMI) of Amherst, MA, and the
7 other is REDYN. These models are comparable in structure, however the
8 REDYN model has not been regularly or recently updated and thus requires
9 special care in both model input specification and output interpretation.

10 For example, the REDYN population data for Vermont was last updated
11 using census data from July 2004. Because of this, the REDYN baseline
12 population estimates are older projections and do not reflect the actual population
13 count given in the 2010 Census, nor the Bureau of the Census updated annual
14 estimates for 2001-2011. This results in a REDYN baseline population estimate
15 for Vermont in 2011 of 658,712 persons, nearly 33,000 more people than the
16 current census estimate of 626,431. There is no year in the REDYN baseline,
17 which starts in 2001, that corresponds to current Census Bureau data. By
18 contrast, the REMI model uses baseline historical data through 2009, and is
19 updated at least once a year.¹

¹ The REDYN model does not indicate the date that constitutes the start of the forecast period, whereas the REMI model clearly identifies the forecast start date. Comparing the REDYN model data for employment and income against the source data available on federal statistics websites (e.g., those of the U.S. Bureau of Economic Analysis, the U.S. Bureau of Labor Statistics, and the U.S. Bureau of the Census), most REDYN data diverges from the current federal figures beginning in 2006, which indicates that REDYN has not been fully updated for a number of years.

1 The persistent baseline errors—especially when a model is run to 2055—
2 will skew model inputs. For example, the initial overestimate of the state
3 population by 4.5 percent in 2010 will generate a 27 percent upward deviation of
4 the 2025 value (as measured using a forecast with up-to-date population
5 information), a figure which further grows to 29 percent in 2050. Similarly, the
6 11 percent overestimate of 2010 employment generates an 8 percent overestimate
7 in 2025 (again measured against a corrected forecast that uses current data), and
8 which remains too high by 7 percent by 2050.

9 Most baseline data in the REDYN model are pre-2006 data and thus
10 require adjustment prior to model runs so as to ensure model accuracy.

11

12 Q10. Does the Entergy Report contain baseline adjustments to the REDYN model to
13 account for some of the model's deficiencies?

14 A10. No. The model is set up to perform such adjustments, but none were made in the
15 analysis by Mr. Heaps.

16

17 Q11. Please describe your conclusions regarding the validity of the economic impact
18 estimates contained in the Entergy Report for the baseline scenario, the prompt
19 decommissioning scenario, and the deferred decommissioning scenario.

20 A11. My technical review of the Entergy Report concludes that the report suffers from
21 many significant flaws that call into question the validity of both the analysis and

1 the conclusions. I have organized my discussion of the Entergy Report around the
2 following four topics:

- 3 • The completeness and thoroughness of the approach to the analysis, in light of the
4 available data;
- 5 • The clarity and reasonableness of the assumptions used in preparation of the
6 model inputs;
- 7 • Appropriate use of the selected model(s), demonstrating thorough understanding
8 of the model's working and limitations; and
- 9 • Presentation and discussion of estimated impacts.

10

11 Q12. Please explain what you mean by your first point of analysis, “completeness and
12 thoroughness of the approach.”

13 A12. As discussed above, because the data in the REDYN model has not been kept
14 current, special care is required in both model input specification and output
15 interpretation when using this model. Mr. Heaps' failure to adjust for any of these
16 known baseline deficiencies represents a fundamental model specification error
17 and affects all model output levels cited in the Entergy Report and Mr. Heaps'
18 testimony. As a result, none of the model output expressed as levels can be
19 considered credible estimates of the potential impacts associated with the closure
20 of the VY Station.

21 In addition, REDYN, like other models, has the capability to be run with
22 either highly aggregated data concerning “direct” changes—for example, a lump

1 sum investment in a generating plant versus detailed cost estimates that transform
2 the investment into expenditures for labor, materials, overhead, etc. Both
3 approaches use the same total value of the initial observable effect of a particular
4 occurrence on the local and/or state economies to estimate secondary or “indirect”
5 effects on the local and state economies. The essential difference between the two
6 sets of input data is that the more detailed ones will yield a more accurate
7 depiction of the secondary effects because they are derived from component costs
8 specific to the project and not a generic decomposition that applies to all
9 structures. Economic models, including REDYN, permit the modeler to use
10 detailed data about these costs to more accurately allocate direct impact figures to
11 the specific local or state sector that will be affected. Although the models can
12 be operated with aggregate figures, secondary impact estimates (e.g., indirect and
13 induced impacts) will better depict conditions if direct effects are as disaggregated
14 as both the model and the direct impact estimates can accommodate.

15 This is especially important in the case of a nuclear-powered generation
16 plant and nuclear plant site remediation, because unless otherwise “instructed,”
17 economic models by default “want” to handle the VY Station closure as a change
18 affecting typical electrical generation plants (with no fuel source distinction), and
19 the site remediation as if it were typical demolition (or worse, new construction,
20 as it was reflected in the Entergy Report) involving generic nonresidential
21 structures and generic waste disposal. None of those generic conditions apply
22 here.

1 Despite the availability of input details, the Entergy Report did not take
2 advantage of this level of model specificity. Although the REDYN model permits
3 a time-series analysis of impacts, the model implementation used to generate the
4 Entergy Report does not appropriately adjust the baseline data or model inputs nor
5 does it account for the unique geographic and sectoral impact of the VY Station.
6 As a result, the impact estimates in the Entergy Report are not reliable to gauge
7 the likely economic consequences of the three scenarios described above.

8

9 Q13. Please describe what is meant by your second point of analysis, “clarity and
10 reasonableness of the assumptions used in preparation of model inputs.”

11 A13. The output from any regional economic model is only as good as the quality and
12 accuracy of the inputs, and in this case detailed input data was not properly
13 utilized. In several different respects, Mr. Heaps used improper assumption in his
14 inputs to the model. This is particularly apparent in the inputs concerning
15 employment data and the allocation of that data in the modeling used to generate
16 the Entergy Report.

17

18 Q14. How did the Entergy Report allocate employment data in the REDYN model?

19 A14. In modeling the direct employment change at the VY Station upon closure
20 (whether in 2013 under the baseline scenario, or 2032 under the prompt or
21 deferred decommissioning options), the Entergy Report imposed an employment
22 loss on the electrical generation sector and reduced wage income by the size of

1 the plant payroll, approximately \$66 million in 2011. No further adjustments
2 were made other than the loss of 632 jobs in Windham County, Vermont,
3 beginning in the scenario year of the shutdown.

4

5 Q15. Is allocation of the loss of 632 jobs solely in Windham County an accurate or
6 appropriate use of the model?

7 A15. No. The Bureau of Economic Analysis (“BEA”) measures personal income using
8 two definitions, income by place of work and income by place of residence. In
9 allocating the effect of lost jobs entirely to Windham County, the Entergy Report
10 relies on the REDYN model to transform the changes in personal income by place
11 of work—stemming from the plant closure—to changes in personal income by
12 place of residence. REDYN applies a “residence adjustment” to redistribute such
13 personal income changes based on a factor drawn from BEA personal income
14 data. Under the model as implemented by Mr. Heaps, REDYN baseline data
15 would reflect this redistribution as a 3% reduction in Windham County personal
16 income. However, over 60% of the VY Station workforce resides outside of
17 Windham County. The reliance on the REDYN model to make the adjustment
18 yields secondary impact estimates that inaccurately represent the employment and
19 personal income impact of the plant closure on Windham County. I also note that
20 REDYN’s old residence adjustment rate of -21% for the State of Vermont is
21 sizably smaller than the current BEA of -31%. This again serves to misrepresent

1 the impact of the VY Station closure by inaccurately estimating the share of
2 Vermont's income by place of residence.

3 A more accurate way to operate the REDYN model would have been to
4 enter the total plant employment change (of negative 632) in Windham County,
5 which would have changed only output levels with local displacement—e.g., that
6 local output shortfalls will need to be replaced by outside suppliers. The wage
7 change should be entered separately without concurrent output level changes
8 (already dealt with in the employment change estimate, such that Windham
9 County loses only the 42% of total wages paid by the VY Station on a place of
10 residence basis). Finally, the 58% of wage income generated by the VY Station
11 paid to residents outside of Windham County should be entered as personal
12 income impacts in those locations, not Windham County, again on a place of
13 residence basis.

14 When the employment data are properly allocated by place of residence,
15 the income impact to Windham County is significantly less—57% of the payroll
16 value—than suggested by the Entergy Report, which shifts the income impact
17 only 3% based on the residence adjustment evident in the baseline data. Thus, the
18 unique distribution of employment and income associated with the VY Station's
19 high proportion of out-of-county-resident employees needs to be more accurately
20 handled for the estimates to be credible. The result of this inaccurate modeling is
21 to misrepresent the induced impacts of closure of the VY Station both in
22 Windham County and in the state as a whole.

1 Q16. Does the Entergy Report properly identify the economic impacts of site
2 demolition and remediation of the VY Station?

3 A16. No. In modeling these impacts, the Entergy Report used the TLG Report's total
4 restoration cost without disaggregating the cost components. In addition, the
5 Entergy Report allocates the restoration efforts as new nonresidential
6 construction, rather than demolition.² The Entergy Report therefore treats all
7 remediation and waste disposal costs that will be incurred in connection with the
8 VY Station decommissioning as if it was nonresidential construction. In other
9 words, run this way, the REDYN model treats the shutdown, demolition, and
10 disposal costs of the VY Station in the same way it would treat costs incurred in
11 connection with the construction of an average nonresidential building, using the
12 same components, materials, and technology as would be required to build a
13 school, office building, or highway. The failure to properly identify or allocate
14 costs for labor, equipment and materials, energy (replacement electricity), and
15 waste disposal that will be incurred in connection with decommissioning—costs
16 that will primarily benefit Windham County in terms of revenues and
17 employment—results in a significant understatement of the employment and other
18 benefits that would accompany decommissioning.

19

20 Q17. How should the costs associated with decommissioning be specified in the
21 REDYN model?

² See, e.g., Attachment A, DPS:EN.2-21.1.

- 1 A17. Optimally, the expenditures should be specified in the REDYN model as follows:
- 2 • Labor costs, which represent more than one-half of the total costs, should be
3 entered as a construction wage income increase with an option to make implicit
4 employment changes commensurate with the wage income increase.
- 5 • Equipment and materials can be handled in a number of ways, but in the absence
6 of more detailed information concerning the materials required for demolition, this
7 is most accurately specified by allocating the total material and equipment amount
8 to the equipment leasing sector and materials suppliers (wholesale and retail trade
9 margins to construction) in proportion to their input shares for heavy construction,
10 the normal classification for power plant construction. The input proportions
11 taken from the most recent BEA input-output table show these margins as 0.19 for
12 leasing firms and .81 for trade.
- 13 • Energy costs are for electricity to power the site once the plant is shut down,
14 meaning purchased electricity from the distribution system. This represents an
15 increase in demand for electrical output and should be entered as such into the
16 REDYN model.
- 17 • Waste disposal is an expense paid to out-of-state disposal site operators in Utah
18 and Texas, and thus has virtually no Vermont impact. These expenditures can be
19 effectively ignored for the instant purpose, except for the transportation
20 component of these costs. The most recent input-output table reflects that
21 transportation (air, water, truck, and rail combined) represents 1.0% of waste
22 disposal and remediation costs. Thus, depending on the scenario, transportation

1 demand associated with waste disposal could be estimated to increase by between
2 \$6.8 million and \$9.5 million (in 2011 dollars). It is certainly possible that these
3 transportation costs could amount to a larger share of the waste disposal costs,
4 inasmuch as they would require specialized equipment and more costly
5 procedures, although the majority of actual disposal charges will be incurred
6 outside of Vermont, with no attendant impact on employment or incomes.

- 7 • The “other” costs consist of post shutdown insurance, legal fees, and taxes. These
8 are provided (without the time dimension) in the TLG Report appendices and can
9 be used to split the “total other” costs into sector specific components, some of
10 which the REDYN model will treat as affecting the Windham County and state
11 economies.

12
13 Q18. What is your opinion on how those costs, if properly allocated in the REDYN
14 model, would affect the economic impacts associated with closure of the VY
15 Station on Windham County and Vermont?

16 A18. If the cost estimates from the TLG Report were included as demolition and
17 disposal costs in the REDYN model, rather than misattributed as nonresidential
18 construction, the conclusions of the Entergy Report would be significantly
19 different. Additionally, because decommissioning of the VY Station would
20 require skilled engineering personnel, rather than ordinary construction labor as in
21 the Entergy Report model, proper operation of the model would result in 70%

1 more personal income attributed to the decommissioning than the Entergy Report
2 reflects.

3

4 Q19. Please explain your third review criterion, “appropriate use of the selected
5 model(s), demonstrating thorough understanding of the model’s working and
6 limitations.”

7 A19. There are three areas of methodological concern arising from the implementation
8 of the REDYN model in the Entergy Report.

9 First, Mr. Heaps failed to update basic REDYN data to current values, or
10 scale inputs and outputs based on the difference between known actual and
11 REDYN baseline data, making the reported impact estimates inaccurate in their
12 magnitude.

13 Second, the REDYN fiscal model is not an accurate representation of the
14 current Vermont tax structure and the resulting estimates of fiscal impact are not
15 accurate.

16 Third, all data entered into the REDYN model require conversion to a
17 2002 constant dollar basis. From the spreadsheets submitted in support of the
18 Entergy Report, it appears that the Mr. Heaps transformed his input to a 2005
19 constant dollar basis. This skews estimated impacts, regardless of how the
20 subsequent analysis was approached. Further, the Entergy Report and supporting
21 documentation provide no explanation as to the deflator series used to adjust any

1 of the model inputs. At a minimum, a source, if one exists, for such a significant
2 adjustment to the TLG Report cost estimate is warranted.

3

4 Q20. What problems are presented by the REDYN model's use of certain baseline
5 data?

6 A20. Updating certain of REDYN's baseline values is essential given that the model's
7 baseline values predate the massive recession of 2007-2009 and the longer effect
8 of the recession on employment and output. Although it may be argued that
9 updating the values will not affect impact estimates expressed in relative terms,
10 e.g., percentage changes, the Entergy Report widely cites absolute values for
11 employment and income change. These absolute values are affected by
12 inaccuracies—actual versus forecast values for the 2001-2011 period—for
13 population and employment.

14 For example, in addition to the total state population discrepancy cited
15 earlier, total Vermont employment in REDYN for 2011 is given as 476,980, when
16 the actual 2011 BEA value is 421,906. Since these baseline values affect
17 historical relationships between the relative productivity of factors, internal
18 migration, and other factors that affect long run growth, the absence of corrections
19 to the REDYN baseline significantly bias the model output. Inaccurate historical
20 demographic, employment, and income data that ignore the last 6 years of history,
21 including the effects of a massive recession, can and should be updated prior to
22 any REDYN model run. These updates need not represent an enormous

1 undertaking, and REDYN has the capability of allowing updates of the so-called
2 “baseline value” data. At a minimum, the Entergy Report should have updated
3 baseline values for population, 2-digit NAICS industries, and wage income by
4 place of residence. This would have allowed the model to “revise” personal
5 income, output, and the residential adjustment factor, all of which affect the
6 accuracy of the county and state-level impact estimates.

7

8 Q21. What are the limitations of the REDYN model with respect to the fiscal impacts
9 discussed in the Entergy Report?

10 A21. REDYN’s fiscal model specifications are drawn from standardized aggregate
11 categories reported by the U.S. Bureau of the Census’ “Annual Survey of
12 Government Finances.” These statistics are reported for all states and localities,
13 largely ignoring unique circumstances, such as the Vermont power generation tax
14 and property taxes used to fund education.

15 In fact, fiscal impact information given for Vermont in the REDYN model
16 bears little resemblance to what state tax reports show. Table 1 appended hereto
17 provides a comparison of the REDYN baseline and Joint Fiscal Office (JFO)
18 figures for calendar year 2011. Although total tax revenues are reasonably close,
19 the component parts, cited in the Entergy Report, are often widely divergent.
20 Notable differences are property taxes, for which the JFO figures are nearly one-
21 third larger than the REDYN figures; personal income taxes, in which actual
22 receipts are nearly 20% lower than REDYN estimates; corporate income taxes,

1 which are 30% higher than REDYN; tobacco taxes, which are more than 50%
2 higher than REDYN; and wide divergences in basic sales taxes.

3 At a minimum, the Entergy Report's fiscal impact estimates are generated
4 using data that is not consistent with standard state fiscal reports by category or
5 absolute value. The Entergy Report's failure to account for this fact leads to
6 conclusions regarding fiscal impacts that are unreliable and likely misleading.

7

8 Q22. Please describe what is meant by your fourth review criterion "presentation and
9 discussion of estimated impacts."

10 A22. The method and assumptions used in the Entergy Report to calculate impact
11 estimates for the 2056-2093 interval, which is beyond the REDYN model's
12 standard forecast horizon ending in 2055, are entirely unexplained. Because of
13 the timing of some of the direct impact values that occur only outside the REDYN
14 forecast period, some mix of extrapolation of 2013-2055 values may have been
15 merged with the impact estimates of subsequent time periods that were simulated
16 at some point within the REDYN forecast interval. However, given the lack of
17 explanation, it is impossible to tell for certain how these estimates were generated.

18 A clear explanation of the methodology and assumptions used to generate
19 the forecasting estimates contained in the Entergy Report is necessary to prove its
20 credibility. Extrapolations performed on unrevised, obsolete historical data may
21 generate serious compounding errors over a long time interval. This may, for
22 example, account for the Entergy Report's estimate of the "simple sum" wages

1 received in Windham County as a result of clean-up activities of \$331,840 million
2 (in 2011 dollars) for the 2012-2093 period, reported as an annual average income
3 figure of \$4.047 billion.³ This is more than four times the actual value given by
4 BEA for 2010. Naturally, the present value figures, on which these are based,
5 may have even more extreme problems associated with simple extrapolation.
6

7 Q23. Please summarize the results of your review of the Entergy Report.

8 A23. For the reasons enumerated above, I conclude that the Entergy Report does not
9 provide reliable economic impact estimates associated with closure and clean-up
10 scenarios for the VY Station. The Entergy Report should have utilized proper
11 cost estimates to provide more accurate inputs into the REDYN model.
12 Specifically, the detail and categories used to estimate direct impacts for each
13 scenario did not use the best available information, and the resulting estimates are
14 unreliable owing to the misclassification of the spatial distribution of the direct
15 impacts. Further, I conclude that failure to update historical baseline values and
16 enter data that reflects the important implications of over 60% of the plant
17 employees living outside of Vermont results in reporting unreliable state impact
18 estimates of the plant's closure. The fiscal impacts, drawn from census and not
19 state-sourced data, reflect the census' tax accounting procedures in 2005 that do
20 not match those used in Vermont. As a result, conclusions drawn in the Entergy
21 Report regarding reported impacts are not credible. Finally, the absence of

³ Entergy Report at page 22.

1 explanation of the means by which estimates were forecast beyond the time
2 dimensions of the REDYN model makes it impossible to assess the quality and
3 reliability of those estimates presented in the Entergy Report.

4

5 Q24. Does this conclude your testimony?

6 A24. Yes, at this time.

Table 1
 Vermont Tax Revenues, \$ millions (2011),
 REDYN (Calendar Year 2011*) versus Joint Fiscal Office (Calendar Year 2011)

TAX SOURCE	REDYN	Joint Fiscal Office
Total Tax Revenue	\$2,605.0	\$2,528.7
Property	670.3	917.2**
Sales and Gross Receipts	977.4	722.5
<i>General Sales Tax</i>	<i>368.4</i>	<i>335.6</i>
<i>Selective Sales</i>	<i>608.9</i>	<i>386.9</i>
<i>Motor Fuel</i>	<i>122.1</i>	<i>76.0</i>
<i>Alcoholic Beverage</i>	<i>26.7</i>	<i>16.5</i>
<i>Tobacco Products</i>	<i>45.6</i>	<i>69.6</i>
<i>Public Utilities</i>	<i>14.9</i>	<i>14.3</i>
<i>Other Selective Sales Taxes</i>	<i>399.6</i>	<i>210.5</i>
Individual Income	699.7	569.6
Corporate Income	64.0	83.0
Licenses	126.9	96.1
<i>Motor Vehicle Licenses</i>	<i>70.3</i>	<i>72.8</i>
<i>Other Licenses</i>	<i>56.6</i>	<i>23.3</i>
Other Taxes	66.9	140.2
Charges and Miscellaneous General Revenue	1,070.2	40.6

* REDYN data inflated to 2011 dollars using the GDP Implicit Price Deflator

** Fiscal year state property tax revenues were based on calendar 2011 assessed values