

**FINAL DRAFT**

***Executive Summary***  
**Study of Costs, Benefits and  
Alternatives to Grid West**

*Prepared for:*  
**Snohomish Public Utility District**

*With participation by:*  
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## EXECUTIVE SUMMARY

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Henwood Energy Services, Inc. (Henwood) was engaged by Snohomish County Public Utility District (Snohomish) to study the costs, benefits and alternatives to forming a new regional transmission organization in the Northwest, presently referred to as Grid West. This report details Henwood's analysis methodology, results and recommendations.

Grid West is a proposed regional transmission organization with a geographic footprint that would include the U.S. Pacific Northwest, British Columbia, Utah and parts of Wyoming, Nevada and Montana.<sup>1</sup> In response to the Federal Energy Regulatory Commission's (FERC's) Order 2000, the formation of Grid West has been under consideration by a coalition of transmission owners within the Grid West footprint since March 2000, with some involvement by the province of Alberta as well.

Henwood's approach to this report includes these topics:

- Review of cost experience of existing RTOs;
- Review of RTO status in the Northwest;
- Identify what elements can be modeled in a benefit study, perform analysis, and compare results to earlier Benefit/Cost study;
- Identify possible unintended consequences resulting from RTO formation; and
- Examine transmission issues in the Northwest today and ways to address these without forming an RTO

### **Cost Experience of Existing RTOs.**

In 2004, \$1.04 billion will be spent funding the operation of six RTOs – California ISO, NYISO, PJM, MISO, ISO-NE and ERCOT. Since 2000, total U.S. RTO operating expenses have increased by 143 percent, and are growing at an annualized rate of 20 percent per year, largely due to increases in operational size and scope. This data shows that the start-up and operational cost trends for RTOs are significant factors in the determination of an RTO's net benefits or costs.

For this report, Henwood has relied on a recent analysis of these matters prepared by Margot Lutzenhiser of the Public Power Council (PPC). As the numbers above reflect, Ms. Lutzenhiser's work shows a clear and substantial upward trend in the operating costs of each of the nation's RTOs. We have taken these costs, along with their history of escalation, into account when analyzing the potential net impact of Grid West.

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<sup>1</sup> There are many definitions of the Northwest. For purposes of this report, the Northwest shall be the geographic area defined by Public Law 96-501 (the states of Washington, Oregon, and Idaho, and parts of Montana and fringes of Wyoming, Utah and Nevada). When we refer to Grid West or Northwest Power Pool areas (which are defined elsewhere in the document) we will refer to them by name.

**RTO Status in the Northwest Power Pool Area**

The formation of RTO West/Grid West has been under consideration by a coalition of transmission owners within the Grid West footprint since March 2000.<sup>2</sup> As a result of significant regional dispute, the RTO West effort was put aside in the summer of 2003, and a modified approach (Grid West) was initiated in late 2003. The Grid West design was put forward as a new direction and fresh approach to dealing with the region’s transmission problems and opportunities, while still building on, refining and incorporating some of the elements of the initial RTO West effort. Over the past few months there has been an effort to draft both Developmental and Operational Bylaws for Grid West. At the same time, a risk/reward group has been established to perform preliminary risk/reward (cost/benefit) analysis prior to seating of a Developmental Board. Both of these efforts are still ongoing.

The question of whether the draft Developmental Bylaws should be adopted by the Grid West board of directors will be taken up on November 4<sup>th</sup>, 2004. Bonneville Power Administration is asking its customers to provide feedback by October 4<sup>th</sup> regarding whether it should support the adoption of the Developmental Bylaws. In the absence of any current or complete analysis of the costs and benefits of the Grid West proposal, and in light of the recent RTO operational cost data gathered at PPC, Snohomish engaged Henwood to fill this gap and to study the costs and benefits of an RTO in the Northwest.

**Henwood’s Grid West Benefit/Cost Study**

Henwood’s initial efforts included a review of previous RTO benefit/cost studies, focusing mainly on the study performed by Tabors Caramanis & Associates (“Tabors Caramanis” or “Tabors”) in 2002 under the RTO West effort, to identify commonly analyzed study parameters. These parameters include:

Potential RTO Benefits	Potential RTO Costs
Pancaked rates eliminated Operating reserve requirements met more efficiently Better maintenance coordination (Gen & Tx) Existing transmission capacity more fully utilized Improve congestion management Increased reliability Transmission planning based on regional look Provision of market monitoring	Start-up costs Operational costs Escalation rates for operational costs Individual utility costs Qualitative costs

Using these general study parameters as a guide, Henwood analyzed the net impacts to the region as a whole of moving from today’s environment to an end state where a regional transmission organization is in place and operating.

<sup>2</sup> Earlier efforts were also undertaken to examine the desire to have an independent system operator (IndeGO).

Henwood’s review of the Northwest regional transmission system and the proposed Grid West end state revealed the following set of assumptions<sup>3</sup> as applied to the common RTO study parameters and as compared to the recent Tabors study:

Study Parameters	Henwood Study Assumptions		Tabors Study Assumptions	
	Status Quo	End State	Status Quo	End State
Pancaked Wheeling Rates	For majority of transactions, no incremental transmission rate charges	Any existing pancaking for wheeling eliminated	Pancaked rates apply when moving power from generation in the East to loads in the West	Any existing pancaking for wheeling rates eliminated
Operating Reserve Requirements	Each control area meets its own reserve requirements (as tempered by a reserve sharing agreement) without being able to call upon economic, but unused, capabilities from other control areas. Each control area can utilize its contract supplies. Hydro spinning reserve capability may be fully utilized.	Most control areas are voluntarily combined such that all capabilities within the combined area are economically available.	Each control area meets its own reserve requirements without being able to call upon economic, but unused, capabilities from other control areas. Control areas are not able to use their contract supplies. Hydro spinning reserve capability is limited	Most control areas are voluntarily combined such that all capabilities within the combined area are economically available.
Gen & Tx Maintenance Coordination	Actual generation maintenance history used.	Actual generation maintenance history used (model revealed this was the optimized schedule)	Generation maintenance schedule around individual control area load patterns.	Modeled optimization of maintenance based on the combined area.
Transmission Capacity Allowed Utilization	Based on actual allowed utilization limits	Increase allowed utilization, not to exceed WECC rated amounts	Based on actual allowed utilization limits	Based on actual allowed utilization limit

<sup>3</sup> This list covers the key input assumptions and differences. More detail is available in the complete report.

Each of these assumptions will be discussed in more detail in Sections 1 and 3 of this report. However, a few comments about some of the significantly different assumptions are warranted here.

Henwood sees the system operation today as being much less inefficient than does Tabors Caramanis in the following three areas:

- 1) **Transmission rate pancaking.** Tabors Caramanis modeling assumes that there are pancaked rates when moving power from generation in the East to loads in the West. From an hourly dispatch point of view, this is simply not true. As Section 2.2 will explain, most transmission service in the Northwest is based on fixed fee type contracts that do not influence hourly dispatch decisions. Only in certain conditions (when BPA paths are full and other non-BPA facilities must be used) does the Henwood analysis reflect pancaked transmission rates. This does not happen very often today. However, in a “with RTO” case this would not happen at all, so in that case there may be savings in improved dispatch with an RTO.
- 2) **More efficient meeting of reserve requirements.**
  - a. Tabors did not make available to control areas the hydro spinning reserve capability that those control areas have contract rights to. Henwood modeling reflects the fact that control areas do in fact use the reserve capabilities available in their long term contract rights.
  - b. Tabors did not allow unused hydro to be fully counted toward reserve requirements. Henwood assumed that unused hydro could be fully counted toward reserve requirements if necessary. Henwood assumed further that the quantity of reserves that each control area needed to be held was determined through the Northwest reserve-sharing agreement and was limited to the 5%/7% criterion, not maximum single contingency outage.
  - c. Tabors Caramanis assumed that without the RTO, each control area would need to meet its own control area reserve requirements without being able to call upon economic, but unused, capabilities from other control areas. While Henwood believes that control areas do engage in short term bi-lateral contracts today to call upon economic, but unused, capabilities from other control areas; for this study Henwood assumed that this was not being done.<sup>4</sup>
- 3) **Generation Maintenance Scheduling.** Tabors Caramanis assumed that without an RTO, each of the many control areas that exist in the Northwest today would perform some analysis of control area loads in isolation and then schedule generation maintenance around those load patterns, irrespective of power-market conditions. By doing this, the Tabors Caramanis process had

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<sup>4</sup> Henwood is aware that short term bi-lateral contracting is done from time to time when certain control areas are in need of economic sources of reserves. However, Henwood does not have information on the extent of this type of bi-lateral contracting that occurs today. Therefore Henwood conservatively assumed it was not happening at all for purposes of this study.

thermal generation maintenance occurring in summer months when WECC power markets are expected to have the highest prices. Henwood's approach was to look at when thermal maintenance is actually being scheduled today and then allow the model to optimize the scheduling of thermal generation maintenance from a single control area standpoint. Henwood could not find a computer optimized schedule that provided better maintenance scheduling than those maintenance schedules occurring today. Therefore, Henwood incorporated historical maintenance scheduling patterns in both the Base Case and With Grid West case since the historical maintenance schedule was in fact the optimal maintenance schedule.

In addition, Tabors erroneously counted the reduction in some costs assigned to load-based transmission rates as true gains in economic welfare rather than transfer payments. Henwood corrected for this by simply calculating the change in Grid West generation cost between the with and without RTO state. Henwood did need to adjust for increases in generation in Grid West in the with RTO state. This adjustment involved applying an appropriate price to the increased export and then crediting the total to the change in power cost. The Henwood approach eliminated the analysis of transfer payments and only counted benefits or costs that represent true gains in economic welfare for the entire region. We estimate that Tabors erroneously counted \$157 million in transfer payments (WECC wide) as economic benefits in their analysis of RTO West. This estimate is the difference between the change in congestion rents and the change in production costs.

Largely as a result of these major differences in assumptions, Henwood has calculated benefits of only \$78 million per year from formation of an RTO in the Northwest.<sup>5</sup> This compares to Tabors Caramanis calculated benefits of \$410 million per year.

In addition, both Henwood and Tabors attempted to estimate the costs associated with ongoing RTO operations. Applying the 2004 weighted average carrying costs of the existing RTOs to Grid West's projected annual demand produces an estimated annual revenue requirement for Grid West of \$184 million per year in 2004. Adjusting this operating cost number for actual growth trends experienced by existing RTOs, Grid West's projected annual revenue requirement could increase to \$221 million per year by 2006. Given that Tabors Caramanis did not have as complete a cost history at the time of their study, the Tabors operating cost estimate was based on a much lower weighted average carrying cost and only amounted to \$135 million.

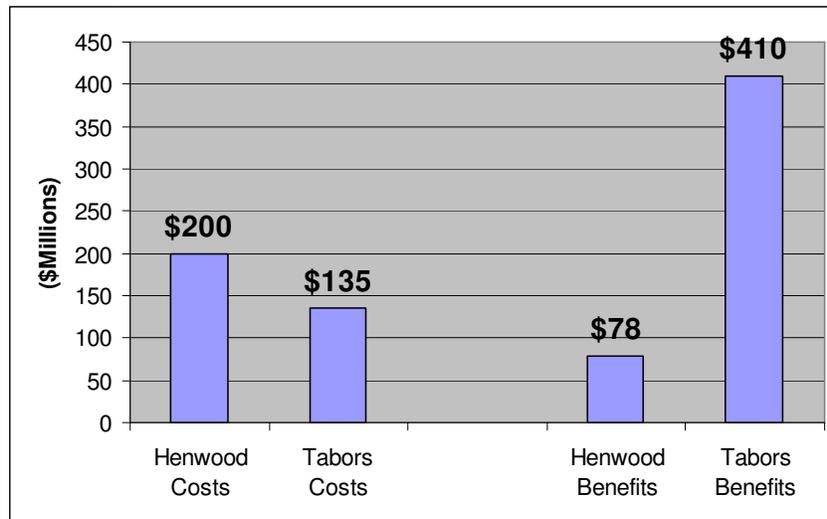
In summary, where Tabors calculated net benefits of RTO formation, this Henwood report shows an annual net cost of approximately \$122 million through RTO formation

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<sup>5</sup> The \$78 million is made up of \$73 million caused by assumed efficiencies gained by sharing operating reserves. The \$73 million operating reserve benefit assumes that control area operators are not performing short term bi-lateral contracting for ancillary services when needed to meet its control area reserves. Henwood knows that some such contracting is happening today, therefore this benefit is overstated. In the extreme, if control areas enter into short term contracts today every time they are in need, then this estimated \$73 million benefit would be reduced to zero.

[an average of \$200 million in annual costs less \$78 million in annual benefits]. Henwood believes that this \$78 million in benefits is generous given the assumption we made that control areas are not making economic short term reserve-associated short term bi-lateral contracts today. Further, these figures are based on the assumption that the alternative to Grid West is the status quo. If alternative institutions and/or agreements are reached to overcome some of the regional problems, the benefits to Grid West are reduced.

**Figure ES- 1  
Comparison of Henwood and Tabors Costs & Benefits**



**Other Potential Benefits and Costs**

One can speculate on a number of other possible benefits and costs of RTO formation. While some may argue that there would be fewer large power outages under an RTO, others can point to examples where the existence of an RTO seems to have contributed to, or at least done little to mitigate, failures of the power and transmission system. For example, the catastrophic outage experienced on August 14, 2003 by the Northeast that interrupted approximately 61,800 MW of load and affected an estimated 50 million people occurred in an established RTO environment. The Midwest ISO was charged with monitoring the system to ensure such outages did not happen. It has been stated that the Northeast outage was an unlikely combination of a number of events and that it would be highly unlikely for such a combination to occur again. Nevertheless, it is instructive to note that the events and outage occurred under an environment where MISO had been formed to help protect against such outcome. Another example of a large outage that occurred in an RTO environment is the outage that occurred on March 8, 2004, in California under the watchful eye of the California ISO. On that date the California ISO gave instruction for Southern California Edison to shed load for 20 minutes from 6:30 PM to 6:50 PM. The power outage affected about 70,000 SCE

customers. After a fact finding investigation, the California ISO determined that this curtailment was caused by errors made by its operators.<sup>6</sup>

Numerous examples can be drawn upon to make statements about whether RTOs actually increase or decrease outages and subsequently increase or decrease costs to ratepayers. What is important is to bear the risk of unintended consequences in mind when weighing the costs and benefits of a proposed RTO.

### **Ways to Address Existing Transmission Problems Without Forming an RTO**

Chapter 9 of this report identifies and discusses a number of problems associated with the Northwest transmission grid today. Some of the problems can be considered highly problematic, others are less so. The following list represents several of the transmission issues identified by the northwest's key stakeholders:<sup>7</sup>

- Transmission Rate Pancaking;
- Multiple transmission queues for long-term service and generation interconnection;
- Need for better regional transmission planning, reliability, and security;
- No single OASIS and no single point of information on available transmission capacity (ATC);
- Differences between contract-path ATC and flowbased capacity that leave capacity unavailable; and
- Transmission Rights

Chapter 10 of this report goes on to suggest a number of ways these existing problems can be addressed without the need to form a new organization. It only takes the resolve of the key players to solve the problems.

### **Conclusion**

The Northwest is unique in that 75 percent of the region's transmission is owned by one entity, BPA. Largely as a result of this singular situation, the analysis conducted by Henwood indicates that the costs of forming and operating an RTO in the Northwest will likely exceed the benefits. Moreover, there appears to be significant risk and unquantifiable costs associated with RTOs that the region should consider prior to moving forward with any proposed RTO structure. There are good reasons to address current transmission problems today, but this report suggests that focus should be in those areas rather than in an effort to form an RTO. Resolution of these immediate problems today will provide more benefits to residents of the Northwest than will an effort to form an RTO.

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<sup>6</sup> See CAISO press release dated March 15, 2004.

<sup>7</sup> There is not consensus among stakeholders that each item on this list is currently a problem.