

TRANSMISSION EXPANSION PLANNING

I. Background/Introduction

At the Western Electricity Coordinating Council (WECC) Board of Directors meeting on July 28-29, 2005, the Directors took the following action:

A motion by Ms. Case to accept for strategic direction, the proposal from PacifiCorp with direction to the WECC CEO to flesh out details and return to the Board for approval in October was seconded and approved unanimously by the Board. Details would include governance, timeframes, action steps, responsibilities, and member and stakeholder input.

Since the Board meeting in October the RPIC has taken further guidance on the development of this project through comments from the WECC membership. This white paper will continue to be refined until RPIC approves of its contents and presents it to the Board at a future meeting for approval.

This paper only addresses the proposed new economic transmission expansion planning functions and provides the additional detail called for by the WECC Board in the above motion for the Board's consideration. These functions do not include developing and implementing specific projects as this is the responsibility of WECC members and stakeholders.

II. WECC's Proposed Role in Transmission Expansion Planning

WECC traditionally has performed a transmission planning role as pertains to reliability of the western interconnection. WECC will continue this role and upon approval of this proposal, add new functions related to "economic" transmission expansion planning. This new function will provide WECC members, including state/provincial regulators and policy makers, and interested parties with impartial and reliable information on the value of expanding the transmission grid. Such information is necessary to enable economic transmission projects to be developed, financed and permitted.

WECC's proposed role is based on the proposal made by PacifiCorp to the Board in July of 2005, in which WECC was asked to expand its role in regional transmission planning. This white paper's proposal addresses the details of governance, timeframes, action steps and responsibilities for WECC in the economic transmission expansion planning process. It also addresses member and stakeholder input on how to implement the proposal.

WECC's main role in the economic transmission expansion planning proposal is to assist its members and provide impartial and reliable information to other interested parties. This role is more defined by three expanded functions: (1) transmission

database manager, (2) planning process facilitator, and (3) analytical/modeling lead for the economic transmission expansion planning in the western interconnection:

1. WECC will be the manager of the economic transmission expansion planning database of the western interconnection:

As manager of the database, WECC will forge with stakeholder participants, agreements on key assumptions and data requirements for planning studies and conduct a regional data collection process. WECC will involve regional experts in transmission planning to establish key assumptions and data needs. The database will include load, fuel price, resource, and transmission information (including control area geographic and scheduling information) to simulate regional production costs under various loads, gas prices, hydro and other scenarios. The database will also include investment and other fixed cost information. The goal is a comprehensive, current, and well validated database that WECC Members and others through confidentially agreements can readily use to identify transmission needs due to economic and congestion point of view and evaluate transmission alternatives across the region. Initially, the data collection activity will build upon the existing Seams Steering Group-Western Interconnection (SSG-WI) database. WECC will make full use of its existing data collection processes and enhance any processes to better meet the needs of transmission expansion planning.

The database will be:

- Systematically reviewed and validated by regional experts and stakeholders;
- Refreshed on a recurring schedule;
- Portable so that users can readily employ the data in their expansion planning work;
- Reciprocal, defined to mean that users bear an obligation to validate the data and submit corrections and updates to WECC through a data collection process;
- Publicly available, consistent with confidentiality requirements.

Integration of data collection with other WECC Committees

- ***Loads and Resources Subcommittee***

The process used to update the transmission database will be integrated with the reporting process currently used to collect the loads and resources information from control areas in the Western Interconnection. This information is collected for a variety of analytic and reporting purposes by the Loads and Resources Subcommittee (LRS) under the Planning Coordination Committee.

Currently the LRS collects these data:

- Existing and planned generation units

- Peak demand, resources, resource outages, transfers, and planning reserve
- Energy loads

LRS can request selected data to improve understanding and ensure consistency of assumptions and analyses in transmission expansion planning, integrated resource planning and related processes. The LRS can also modify future requests for data to meet the needs of the transmission expansion planning process.

Planning Coordination Committee (PCC) representatives are responsible for reporting the loads and resources information for their organizations.

2. WECC will act as the facilitator in the economic transmission expansion planning process for the western interconnection:

WECC will ensure that the transmission expansion planning process is:

- Strategically focused, for example, focused on developing and evaluating alternatives for designating national interest corridors or alternatives for moving remote low cost, and/or renewable generation to markets;
- Oriented toward maximizing regional benefits;
- Systematic, technically rigorous, and results-oriented
- Recurring (cyclical);
- Working with the western states (CREPC and WIEB) to assure the planning process takes place in an open stakeholder forum to assess transmission impacts of state electricity policy;
- Implemented with issues associated with transmission planning and specifically politically sensitive commercial issues;
- Integrated with and between sub-regional planning efforts;
- Impartial and transparent;
- Inclusive of stakeholders, including transmission providers, generators, LSEs, federal and state/provincial energy departments and regulatory bodies, tribal governments, end users, and environmental groups.

Products will include:

- A high level assessment of regional transmission congestion and congestion costs.
- A list of western interconnection projects that span multiple states, provinces and sub-regions that are, on a screening study basis, economically viable.
- A list of projects for further consideration by sub-regional groups, policy makers and WECC members.
- Study program scenario development that entails developing, coordinating and approving resource and transmission expansion alternatives to be studied. Also includes developing and approving sensitivities, such as fuel price, hydro condition and load sensitivities.
- Assessment reports as resource and transmission expansion alternatives are studied. On a region-wide basis, assessments should be performed biennially,

but may be performed more frequently depending upon need. An assessment report should be issued following each regional assessment. Assessments should draw from sub-regional studies whenever appropriate, and include:

- Forecasted congestion and congestion costs
- Economic implications of resource and transmission expansion alternatives. Among other things, alternatives may be targeted at relieving congestion, minimizing and stabilizing regional production costs, diversifying fuels, achieving renewable resource and clean energy goals, and improving market liquidity. Alternatives may draw from state energy plans, IRPs, sub-regional study recommendations and other sources
- Preliminary assessment of electrical performance of alternatives to verify that the alternatives are electrically viable, including the performance of limited power flow studies as necessary. Detailed design level power flow and stability analysis and demonstration of conformance with WECC reliability criteria will be performed by project sponsors or sub-regional planning groups.
- Implementation issues and next steps

Integration of case scenarios with other WECC Committees' studies

- Technical Studies Subcommittee and System Review Work Group

A review should be conducted each year of the Technical Studies Subcommittee (TSS) Data Bank Compilation Schedule and develop an integration scheme such that future scenario cases could parallel the base case power flow configurations portrayed in the schedule. Detailed case description sheets created by TSS, outlining the specific load conditions, scheduling patterns, or scenarios to be represented in each case are prepared by System Review Work Group (SRWG).

Also a review of the modified cases that are used for the development of the WECC Annual Study Program Report with the idea of developing parallel scenarios that could enhance the effectiveness of the report. The WECC Study Program Guidance Survey identifies concerns through studies of existing and new transmission projects, paths and new generation projects.

3. WECC will be the lead organization for western interconnection economic transmission expansion planning analyses/models and studies:

WECC will, in consultation with stakeholders and technical experts, adopt an analytical methodology and modeling tools for regional transmission expansion planning. SSG-WI's methodology and model will serve as a good starting point,

and CAISO's Transmission Economic Assessment Methodology (TEAM), and other methodologies and models will be considered for long-term use.

WECC will develop and evaluate the economics of resource and transmission alternatives collaboratively with members, stakeholders and other technical experts. WECC's data and analyses will draw from and serve as input to transmission expansion planning studies performed by sub-regional planning groups. Analyses and studies will focus on alternatives with broad Western Interconnection implications. WECC's economic transmission expansion planning role will replace SSG-WI's role once SSG-WI completes its 2005 planning program.

Note on the SSG-WI planning role:

SSG-WI's basic role has been to identify areas of potential future transmission congestion in the Western Interconnection, develop and analyze alternative solutions to relieve the transmission congestion and make this information available to all entities, including RTOs, SPGs, Transmission Providers, non-RTO members, LSEs, state agencies, generation owners and marketers. Since SSG-WI has no implementation authority, it is the role of these entities to review the SSG-WI analysis and to pursue project implementation for those projects that they determine have sufficient economic benefit. (Please see the attached graphic on WECC's Transmission Expansion Planning replacing SSG-WI's role)

WECC's new role will be steered by a Transmission Expansion Planning Policy Committee (TEPPC) with policy-level representation by a cross-section of state/provincial energy offices, regulators, transmission providers/operators, load serving entities (LSEs), end users and developers.

It is anticipated that sub-regional planning groups and others will make use of the WECC expansion planning database in their studies, and reciprocate by providing data corrections, updates, and improvements to WECC. Similarly, it is anticipated that sub-regional planning groups and others will factor WECC's analytical results into their studies, and reciprocate by providing their studies and analyses to WECC. The objective for this coordination is to continuously improve the quality of data and studies, and to engender consistency in transmission assessment methodologies and standards. Such standards include commercial adequacy (minimizing power cost and reducing price volatility caused by congestion), transmission cost effectiveness, and resource and transmission adequacy standards. Production cost modeling is but one component of the multitude of studies and work performed to develop an overall transmission expansion plan.

WECC's role will not include:

1. conducting sub-regional or detailed project-specific studies,
2. prioritizing and advocating specific economic expansion projects,
3. identifying potential "winners" and "losers¹,"
4. developing or advocating cost allocations,
5. developing or advocating cost allocation criteria,
6. providing mechanisms to obtain funding,
7. assigning transmission rights,
8. providing backstop permitting or approval authority, or
9. performing reliability analysis outside of what is being done today.

WECC members have the overall responsibility to plan, justify, develop, site, construct, operate, and maintain transmission facilities.

III. Near – Term Deliverables (2006)

The following are envisioned as the key deliverables from WECC's expanded role in economic transmission expansion planning. Additional detail regarding the contemplated deliverables and time frames are provided in Section VI "Time Frames and Action Steps." Completion of these deliverables will provide a measure of WECC's success in implementing an expanded role in the area of economic transmission expansion planning:

- A. Successful completion of one or more workshops resulting in stakeholder consensus regarding the scope of WECC's role in economic transmission expansion planning. The product of the consensus building exercise will be a West-wide Planning Process defining the respective roles and complementary relationships of WECC, the Sub-Regional Planning Groups, and other groups involved in economic transmission expansion planning.
- B. Establishment of a "formal" relationship with DOE to identify western national interest transmission corridors.
- C. Successful implementation of the regional transmission expansion planning database; selection, acquisition, and implementation of a production cost modeling platform' and adoptions of methodologies for performing analyses.
- D. Successful implementation of processes for updating and improving the regional economic transmission expansion planning database in a timely and quality manner and for making the database publicly available consistent with protecting critical energy infrastructure information. This includes collaborating with the LRS to make maximum use of the LRS data collection process.

¹ Although modeling must quantify economic gains and losses (probably by area and by load and generator category) – to inform potential sponsorship and project ownership

- E. Successful development of a study program for 2007, including a public process plan.
- F. Completion of an economic transmission expansion planning report to present findings regarding various transmission and resource scenarios, economic analyses of the scenarios, and appropriate recommendations consistent with WECC's role. (Note: WECC's role will not include conducting sub-regional or detailed project-specific studies, prioritizing and advocating specific economic expansion projects, identifying "winners" and losers," etc. as set forth above in Section II.C.)
- G. At year-end (December 2006), complete a progress report to the WECC Board on first year accomplishments and problems and set plans for the following year.

IV. Governance

WECC's role in transmission expansion planning will be highly visible, and it will require WECC to both employ and accommodate the skills and needs of Members, state, provincial and federal policy makers, resource and transmission developers and planners, regulators, and diverse interest groups. The expansion planning process will require the skills and participation of policy makers, regulatory representatives, experts in transmission and resource planning, designing, and building, economic analysts and modelers, and public process management.

The governance group to oversee WECC's expanded role in economic transmission expansion planning is envisioned to be a new committee, the "Transmission Expansion Planning Policy Committee," (TEPPC). TEPPC will report to the WECC Board of Directors, consistent with WECC Bylaws' requirements for Board level committees, and in this capacity will make recommendations to the Board regarding economic transmission expansion planning analysis issues including economic transmission and expansion planning.

TEPPC would focus on economic screening studies for resource and transmission expansion alternatives that have broad, regional implications. Once the TEPPC completes its work, sub-regional groups, WECC members, or others may choose to study further and to plan and develop actual projects. The Planning Coordination Committee (PCC) would address issues from project inception to in-service. Once projects are in-service, the Operating Committee (OC) and the Market Interface Committee (MIC) take the WECC reins. Consideration should be given to integrating the TEPPC's process and WECC's current regional planning process. This would involve moving the oversight of the Regional Planning Project Review phase of the Planning Coordination Committee's (PCC's) process² over to TEPPC to avoid duplication of effort. Communication links should also be formed between

² The PCC process is presented in the document entitled "Overview of Policies and Procedures for Regional Planning Project Review, Project Rating Review, and Progress Reports."

January 17, 2006 Version

TEPPC and PCC and the newly formed Loads and Resources Subcommittee to avoid possible duplication of effort and to avoid divergent models and assumptions

TEPPC would be charged with overall organization and steering of WECC's regional economic transmission planning roles, including WECC's new western interconnection planning database management, planning process management, and analytical leadership roles.

This includes:

- A. steering decisions on key assumptions and the process by which economic transmission expansion planning data are collected, coordinated and validated;
- B. selecting and overseeing the work of a facilitator for western interconnection economic transmission expansion planning and modeling efforts (see below);
- C. approving study plans, including study scope, objectives, priorities, overall methods/approach, deliverables, and schedules
- D. steering decisions on analytical methods and on selecting and implementing production cost and other similar models found necessary;
- E. ensuring the economic transmission expansion planning process is impartial, transparent, properly executed and well communicated;
- F. ensuring that regional experts and stakeholders participate, including state/provincial energy offices, regulators, resource and transmission developers, LSEs, end-user, environmental and consumer advocate stakeholders;
- G. supporting DOE's initiative to evaluate transmission congestion and identify national interest transmission corridors in order to maximize the utility of DOE's work for the Western Interconnection;
- H. steering report writing and other communications;
- I. advising the WECC Board on policy issues affecting economic transmission expansion planning;
- J. recommending budgets for WECC's economic transmission expansion planning process;
- K. organizing and coordinating activities among sub-regional planning processes; and
- L. approving recommendations to improve the economic transmission expansion planning process.

TEPPC will be comprised of persons (must be from a WECC member organization) that have the following associations or disciplines:

- Two WECC Board Members,
- One representative from each of the five WECC sub-regional planning groups, and one from the CAISO
- One representative from a Public Utility Commission,
- One representative from a State/Provincial Energy Department/Office,
- One expert in the IRP processes,
- One transmission owner,
- One load serving entity (LSE) representative,
- One end-user (as defined in WECC Bylaws),
- One environmental representative,
- One generator owner representative, and
- One wholesale market expert.

Seventeen total members will be on the new committee. The committee members are selected by RPIC and submitted to the WECC Board for approval.

The TEPPC would form an Analysis Advisory Group for interconnection-wide modeling efforts and database updates. The Analysis Advisory Group would report to TEPPC.

The primary functions of the Analysis Advisory Group:

- Work with WECC staff and stakeholders to develop and recommend to the TEPPC for approval:
 - key assumptions and the process by which data are collected, coordinated and validated;
 - study plans and priorities,
 - analytical methods and the selection and implementation of production cost and other models
 - design of the public process
 - study findings and reports
 - actions to improve WECC's expansion planning role and function
- Collect and help staff verify updates to the planning database, and ensure close coordination with the Loads and Resources Subcommittee
- Guide and support the public process
- Guide and help troubleshoot and validate studies
- Guide and support presentations and reports.

Over the past four years much has been learned about how to successfully execute stakeholder-driven, transparent economic transmission expansion planning. Economic transmission planning efforts must be open to the participation of the full range of interested parties, not just WECC members. Unlike the TEPPC, participation in the Analysis Advisory Group would not be limited to WECC

Members. The TEPPC will determine the criteria and process for participation on the Analysis Advisory Group. Suggested organized structure under the Advisory Committee should have three subgroups, such as a Generation subgroup, a Transmission Subgroup and a Load Subgroup.

V. Facilitator

A facilitator with expertise in generation and economic transmission expansion planning is essential. The facilitator would be retained on a temporary basis to help build consensus and help ensure the success of WECC's expanded role in economic transmission expansion planning. The facilitator would be a qualified individual, who is providing consulting services, or is a WECC member employee, or is a WECC staff member, or some other capacity. Staff support for the economic transmission expansion planning effort must be extremely responsive to the needs of the stakeholders, including revising analyses in response to discussions, and presenting and explaining the nuances of the models and impact of key variables.

The facilitator would facilitate discussions of economic transmission expansion planning among:

- Chairs of sub-regional planning groups
- Generators
- LSEs
- Transmission developers
- Public interest groups
- State/provincial energy and regulatory agencies
- Other interested parties

Much of the facilitator's work would be done with the Analysis Advisory Group.

VI. Staffing

To support the new economic transmission expansion planning role for WECC, increased staff support is needed. Staff support would include one senior engineer, one assistant engineer and one administrative coordinator. The WECC support staff personnel and any consultants retained to support this activity would conduct their work pursuant to policy guidance and direction from the Transmission Expansion Planning Policy Committee, consistent with Board direction.

Initially, WECC members will need to provide analytical and modeling assistance to the staff. Staffing requirements will be continuously reviewed over time as experience is gained and the scope of WECC's involvement becomes better defined.

VII. Time Frames and Action Steps

The following are the key time frames and action steps that have been completed and will be needed to implement WECC's new economic transmission expansion planning role:

- A. The WECC Board approved in the 2006 budget, funding requirements for WECC's new economic transmission expansion planning role. **Completed.**
- B. The finalized agreement with PacifiCorp enabled WECC to obtain the transmission planning database on January 1, 2006. **Completed.**
- C. RPIC is collecting interested and qualified representative's information for the Transmission Expansion Planning Policy Committee. Approval of the Transmission Expansion Planning Policy Committee representatives will be made at the April 2006 WECC Board meeting. The Board should designate the chair of the committee at this time also. **Ongoing.**
- D. While WECC's economic transmission expansion planning role is being defined, WECC has assumed on an interim basis the role of central point of contact with DOE in identifying western national interest corridors, utilizing work performed by SSG-WI and the Sub-regional Planning Groups. This function is being performed now to meet DOE's schedule defined under the Energy Bill. WECC's "formal" relationship with DOE will be developed by the Transmission Expansion Planning Policy Committee during 2006. **Ongoing.**
- E. RPIC is preparing a committee charter for approval by the Board in April 2006. **Ongoing**
- F. 1st Quarter 2006 – Depending upon workload, hire senior engineer personnel. The hiring of the assistant engineer could be postponed until later in the year based upon need.
- G. 1st Quarter 2006 – RPIC will hold a Transmission Planning Workshop.
 - Attended by the chairs of the sub-regional planning groups, generators, LSEs, transmission developers, public interest groups, state/provincial energy and regulatory agencies, and all interested WECC members to build consensus regarding WECC's new economic transmission expansion planning role. Through participation in the workshop, obtain stakeholder input regarding clear goals and deliverables, and seek to reconcile the scope and role of WECC and sub-regional studies. Consider the need for additional follow-up workshops. **Planned for February 15, 2006.**

H. Transmission Expansion Planning Policy Committee tasks.

1. Form the Analysis Advisory Group and define the specific duties of the group.
2. In conjunction with PCC Chair and Vice-Chair, Load and Resources Subcommittee Chair, and WECC Staff define the objectives, responsibilities, duties, and relationships between the Loads and Resources Subcommittee and the Analysis Advisory Group with respect to the development, maintenance, and use of the western interconnection economic transmission expansion planning database and the database to be used for assessment of resource adequacy
3. December 2006 – Design next Western Interconnection Economic Transmission Expansion planning process.
4. The Transmission Expansion Planning Policy Committee should finalize the process based upon stakeholder input from the economic transmission expansion planning workshop(s)
5. 4th Quarter 2006 – Adopt methodology for economic transmission expansion planning analyses.
6. Develop a methodology for Board approval. The existing SSG-WI methodology would serve as a starting point for this development.

WECC Planning Function's Interactions within the Western Interconnection

