

**Transmission Planning:
Institutional Issues in the West**

**Prepared for
The CREPC Transmission Planning and Expansion Work Group**

 **By
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Introduction

The transmission system, like the entire electric utility industry, is “affected with a public interest.”¹ Among other things:

- The grid has monopoly characteristics;
- Much of the grid is owned and operated by public entities, e.g. the power marketing agencies (BPA and Western) and public power utilities;
- The grid provides public values and benefits such as reliability and commerce;
- The grid has social and environmental costs;
- The grid is a network with laws of its own, laws different from the ones people sometimes pretend apply or the ones people want to apply.

Because of this public interest, the public has a stake in the investment, management, and operation of the grid. The public exercises this stake through state and federal regulation and many other policies.

The grid is capital intensive and investment in it competes with other uses of capital. If investment in the grid is too little, the public suffers real and opportunity costs—e.g. outages and market power. If investment in the grid is too much, other, more economical investments are foregone.

To have the optimal investment in the transmission grid, decision makers need good plans that help assure the right investment choices are made and will withstand the scrutiny the public applies.

The grid was developed in a time when the dominant paradigm was the vertically-integrated utility. Transmission was built from generators to loads. Today’s, and perhaps tomorrow’s, paradigm is a more disaggregated, network system, with many more actors and many more transactions, with the grid serving commercial activity as well as reliability.

Society needs to have the “right” system configuration optimized for the right balance of generation resources, transmission grid resources (including the right wires in the right places with the right rules and policies) and demand-side resources. However, making “right” decisions is easier said than done, as is knowing what is “right,” even in hindsight.

¹ 1876. In *Munn v. Illinois*, the U.S. Supreme Court applied the “public interest” concept to grain elevators and affirmed a state’s prerogative to regulate certain businesses. Thus began the era of utility regulation. 94 U.S. 113, 24 L. Ed. 77.

This paper examines transmission planning in the West, looks for gaps in the performance of transmission planning and expansion functions, and presents some options for filling them. It responds to the charge to the CREPC work groups issued November 12, 2003, by Chair Marsha Smith to address the following issues:²

1. Coming challenges ... to achieving the goal of providing reliable and affordable electric power in the Western Interconnection (situation analysis);
2. Whether there are any probable changes in the industry that would alter these challenges;
3. Whether any type of interstate cooperation or collaboration is needed to successfully address those challenges;
4. Whether any type of state/FERC cooperation or collaboration is needed to successfully address those challenges; and
5. Any ideas on how interstate or state/FERC cooperation or collaboration might occur.

It addresses this central question: will the best outcomes be achieved over time through today's pluralistic approach or through a more central, regional approach?

² 2003. Smith, Marsha. Next steps resulting from Las Vegas CREPC meeting. Committee on Regional Electric Power Cooperation. November 12.

Background—The Existing Transmission Planning Landscape

Many entities do transmission planning in the West. Their processes have certain characteristics; among the most important and those examined in the following sections are:

Geographic area. Is it Westwide, sub-regional, statewide, or utility-based?

Scope or criteria. Are all good alternatives, including non-transmission solutions, considered? Is the environment considered?

Authority. Is it statutory (state or federal)? Or is it based on investor opportunity?

Limitations. Do they have adequate resources and political savvy?

Participants. Who are they? What do they do? Do they provide funds? Do they perform studies and run models? Do they supply data? Do they provide governance of the process?

Resources. Who does the serious work, e.g. acquiring data, running models, and managing the process?

Process. Is it open to affected stakeholders? Is it flexible enough to accommodate actions beyond the planning entity's control or unforeseen events?

Product. What is the outcome of the planning process? Does it produce an actionable plan?

For these and other characteristics, this report examines planning in the West at several levels: West-wide, RTOs, and sub-regions.

Interconnection-wide Transmission Planning

Seams Steering Group-Western Interconnection (SSG-WI)

The West is haltingly inching toward RTOs, the vision of FERC's Order 2000.³ The California ISO has met FERC's RTO criteria with the exception of governance. RTO West (Pacific Northwest and northern Rockies) is in development and WestConnect (southwest) is pursuing a multi-phased approach that will not result in a full RTO filing until after 2010, if at all. FERC acceded to multiple RTOs in an interconnection if

³ <http://www.ferc.gov/industries/electric/indus-act/rto/iss-2000/order-2000/2000.pdf>

trading between them would be “seamless.” Hence, the formation of SSG-WI,⁴ a creature of the proposed RTOs and their transmission-owning and -operating members.

SSG-WI’s mission is to serve “as the discussion forum for facilitating the creation of a Seamless Western Market and for proposing resolutions for issues associated with differences in RTO practices and procedures.”³ SSG-WI is managed by a steering committee and has multiple work groups.

The goal of SSG-WI’s Planning Work Group is “to provide a forum to further the development of a robust West-wide interstate transmission system that is capable of supporting a competitive and seamless West-wide wholesale electricity market.”⁵

SSG-WI recently issued its “Framework for expansion of the western interconnection transmission system, October 2003.”⁶ The report presents the results of studies of transmission congestion to identify West-wide transmission needs for a range of possible (generation) futures and possible options to meet those needs. SSG-WI offers the results of the study for use by sub-regional planning efforts, RTOs, or project sponsors.

Table 1

Characteristics of SSG-WI	
Area	Western interconnection
Scope, criteria	Seams issues, congestion
Authority	Encouraged by FERC
Limitations	Weak authority, limited resources, complex situation; weak on load reduction or demand-side resource solutions
Participants	RTOs, state governments (CREPC), special interests
Role of participants	Guide process, add content
Source of resources	RTOs/member utilities
Manpower provider	Volunteers, especially PacifiCorp
Process	Open, flexible
Product or outcome	“Framework,” public data base

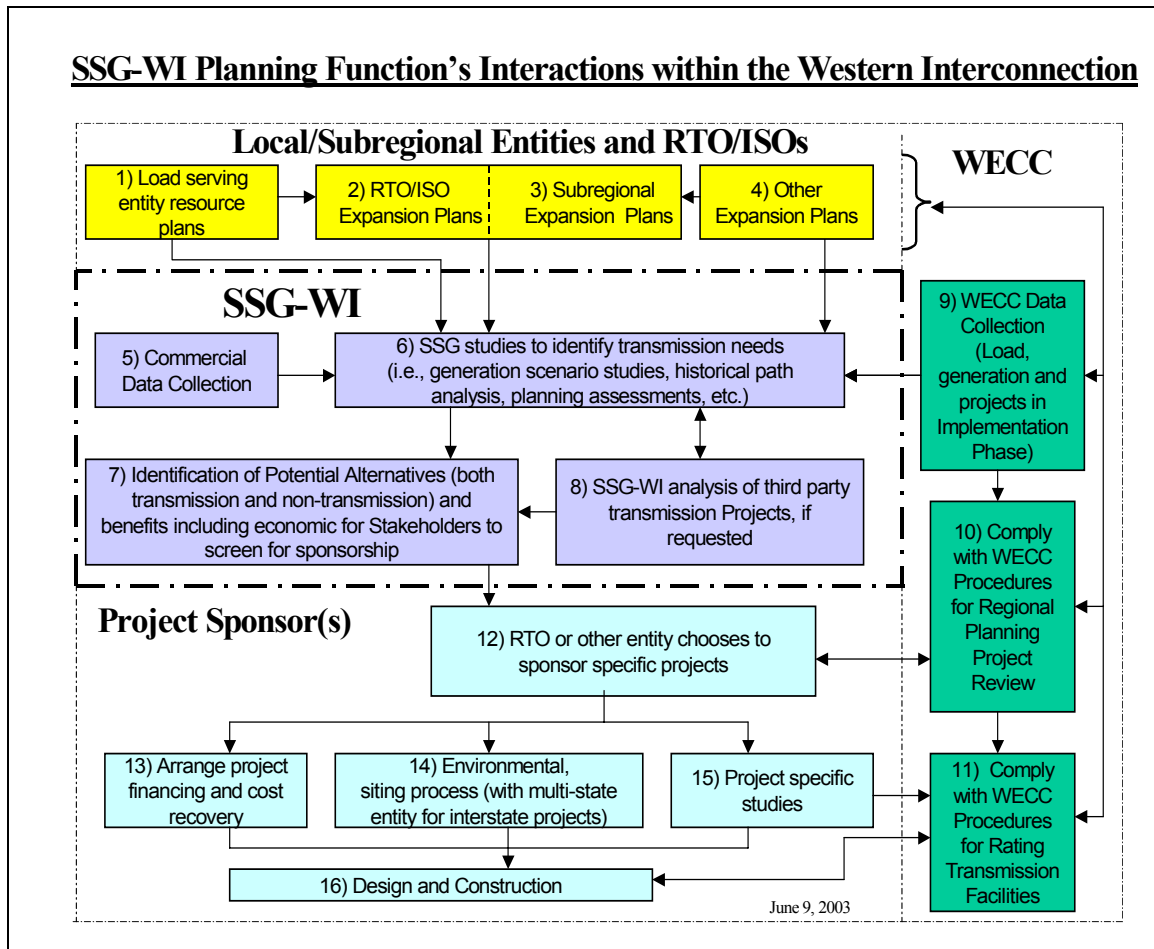
Figure 1 (from The “Framework”) shows SSG-WI’s view of its planning relationships with others in the region.

⁴ <http://www.ssg-wi.com/>

⁵ http://www.ssg-wi.com/GeneralWorkGroupDetails.asp?wg_id=3&wg_name=Planning

⁶ http://www.ssg-wi.com/documents/316-FERC_Filing_103103_FINAL_TransmissionReport.pdf

Figure 1



Western Electricity Coordinating Council (WECC)

The mission of WECC⁷ is to ensure the reliable performance of the Western interconnected grid, while facilitating competitive wholesale markets.

WECC “establishes planning and operation standards and certifies the capability of grid-operating entities. WECC also coordinates the planning efforts of its members, but does not have a primary role in system expansion planning. However, WECC may initiate system-wide studies that allow it to indicate when coordinated planning is failing to ensure the maintenance of grid reliability from an Interconnection-wide perspective.”⁸

⁷ <http://www.wecc.biz/main.html>

⁸ 2003. Draft report of the Western Electricity Coordination Council Governance and Nominating Committee regarding WECC organizational review.

<http://www.westgov.org/wieb/meetings/crepcf2003/briefing/WECCrpt.pdf>

WECC's Planning Coordination Committee:⁹

- Recommends system planning criteria;
- Compiles and disseminates information pertaining to planned generation and transmission facilities; and
- Performs studies to assess reliability of the WECC interconnected system.

WECC's planning standards are shared with NERC.¹⁰ There is no WECC transmission plan *per se*, although a 10-year Coordinated Plan Summary compiles projects planned by others.¹¹

WECC provides data to the SSG-WI and other planning processes, although under restrictive policies.

Table 2

Characteristics of WECC	
Area	Western interconnection
Scope, criteria	Reliability, commercial markets
Authority	Self-granted, voluntary membership
Limitations	Reactive; Active planning precluded in bylaws, weak on load reduction or demand-side resource solutions
Participants	Members
Role of participants	Work groups
Source of resources	Uplift fee
Manpower provider	WECC staff, member committees/volunteers
Process	Meetings public, data confidential
Product or outcome	Planning guidelines, project certification

Regional Transmission Organizations (RTOs)

In Order 2000,³ the FERC sought to prompt the formation of independent transmission operating entities, RTOs, to prevent utilities that owned both generation and transmission from discriminating against other entities for transmission access and pricing.

⁹ http://www.wecc.biz/documents/publications/WECC_10-Year_Coordinated_Plan_Summary_2002-2011.pdf

¹⁰ 2003, April. NERC/WECC planning standards. http://www.wecc.biz/WECC-NERC_Planning%20Standards_9-18-02.pdf

¹¹ 2003. 10-year coordinated plan summary. WECC. December. <http://www.wecc.biz/documents/publications/tenyr03.pdf>

FERC's ideal RTO would be interconnection-wide and would control and operate the grid, regardless of who owns it. It would replace the existing control areas. And it would plan for the system's future and have the clout to make it happen.

This vision is very slow to unfold. The only organization close to being an operating regional transmission entity in the West is the California ISO.¹² Others in development are RTO West (northwest and northern Rockies) and WestConnect (southwest).

California ISO (CAISO)

The California ISO¹³ was established to help implement deregulation after passage of AB 1890 in 1996, preceding FERC's Order 2000. It operates predominately in a single state, with jurisdiction over the IOUs. Some non-jurisdictional public power utilities have opted into the CAISO system.

The CAISO emphasizes: "Partnering" with our neighboring control areas to assess sub-regional benefits is a necessary step in the evolution of building a credible, long-term transmission plan between the Southwest, California, and Northwest sub-regions."¹⁴

In regional planning, the CAISO envisions:¹⁴

- Participating in and supporting STEP (see p. 10) and SSG-WI;
- Reaching out to the Northwest and supporting the formation of sub-regional planning between the northwest and California;
- Using the SSG-WI forum to address seams.

The CAISO annually reviews and approves the transmission plans prepared and submitted by the three large IOUs ("Participating Transmission Owners") in California.

The CAISO produces an annual transmission plan called the "Controlled Grid Study," last published in 2003.¹⁵ The Grid Study determines the need for transmission expansion projects.

In October, 2003, the CAISO published its first Five Year Assessment, which provides a baseline forecast of electricity loads, resources and transmission and recommends specific transmission expansion projects.¹⁶

The CAISO participates in regional and sub-regional planning processes.

¹² The California ISO has not been approved by FERC as an RTO.

¹³ <http://www.aiso.com/>

¹⁴ <http://www.aiso.com/docs/2003/07/23/200307230927142887.pdf>

¹⁵ 2003. 2002 California ISO Controlled Grid Study Report. May 9. California ISO. <http://www2.aiso.com/docs/2002/12/02/200212021600259660.html>

¹⁶ <http://www.aiso.com/docs/09003a6080/28/5b/09003a6080285b79.pdf>

Table 3

Characteristics of CAISO	
Area	California
Scope, criteria	Economics, environment
Authority	State statute, FERC delegation
Limitations	Lacks mandatory jurisdiction over municipal utilities, limited geographic scope
Participants	IOUs
Role of participants	Prepare and submit plans
Source of resources	Grid uplift charge
Manpower provider	CAISO
Process	Open
Product or outcome	Path 15 upgrade and other facility proposals, Controlled Grid Study, 5-year Assessment

RTO West

RTO West¹⁷ would include British Columbia, Washington, Oregon, Idaho, Utah, Nevada, and portions of Montana and Wyoming.

RTO West made its “Stage 2” filing in 2002. At a meeting scheduled for January 28, 2004, its Regional Representatives Group will consider how to approach further work on an independent transmission entity for the RTO West region. A proposal developed by a “Platform Group” envisions:¹⁸

- Creation of an independent organization (the Independent Entity) to manage the grid;
- Staged implementation, beginning with things that improve the integration of transmission service while building on the use of existing rights and scheduling processes;
- Greater flexibility to allow different forms of participation by interested parties;
- Additional voluntary features that supplement service under existing rights and scheduling processes;
- Regional accountability and governance.

RTO West continues to wrestle with fundamental issues such as revenues in a new pricing regime that eliminates pancaking (although the Stage 2 filing and the current proposal both assume that there will continue to be charges for through-and-out

¹⁷ <http://128.242.83.219>

¹⁸ December 24, 2003. http://www.rtowest.com/Doc/Narrative_Clean_Dec242003.pdf

transactions). A new regulatory filing, which could occur in 2004, will likely propose an organization that, at least initially, does not perform as broad a range of functions as contemplated in Stage 2 (at least not for all participating transmission owners). When an independent transmission entity would begin to perform transmission planning is unknown.

WestConnect

WestConnect,¹⁹ in the desert Southwest (Arizona, New Mexico, west Texas), is using a multi-phased approach. Initially it will participate in the common OASIS system and energy bulletin board being implemented by WestTTrans for utilities in the Desert Southwest and elsewhere in the West. The second and third phases will be implemented after a credible cost-benefit analysis shows sufficient benefits to retail and wholesale transmission customers. If WestConnect comes into being, it is likely to be many years (post 2010?) before it does robust transmission planning.

Sub-regional planning projects

The West is complex and unwieldy, both electrically and politically. No entity has the responsibility, authority, and resources to do robust interconnection-wide transmission planning, although WECC does system planning when some entity initiates a project and the potential RTOs (RTO West, CAISO, and WestConnect) have developed an interconnection-wide transmission planning process through SSG-WI. So, government and industry people whose companies and organizations feel responsible for the future of the transmission system have initiated planning at a “sub-regional” level. SSG-WI and the sub-regional groups are developing a cooperative, supportive and complementary working relationship.

Southwest Transmission Expansion Planning (STEP)

STEP,²⁰ along with CATS (see below), is the most advanced of the sub-regional efforts. It addresses transmission needs in Arizona, southern Nevada, southern California, and northern Mexico.

STEP’s goal is: “to provide a forum where all interested parties are encouraged to participate in the planning, coordination and implementation of a robust transmission system between the Arizona, Nevada, Mexico, and southern California areas that is capable of supporting a competitive, efficient and seamless west-wide wholesale electricity market while meeting established reliability standards. ... (W)ide participation is envisioned to result in a plan that meets a variety of needs and has a broad basis for support.”²¹

¹⁹ <http://www.westconnectrto.com/westconnectrto/default.htm>

²⁰ <http://www1.caiso.com/docs/2002/11/04/2002110417450022131.html>

²¹ <http://www1.caiso.com/docs/2003/01/22/2003012211380012544.pdf>

STEP has two processes:

Coordination—provides project sponsors with a forum for coordinating projects;
and

Study—actual studies.

Table 4

Characteristics of STEP	
Area	Arizona, southern Nevada, southern California, northern Mexico
Scope, criteria	Transmission and “viable” non-transmission alternatives
Authority	None
Limitations	Resources and commitment of voluntary participants, weak on load reduction or demand-side resource solutions
Participants	Stakeholders, project sponsors, transmission owners, regulatory agencies, RTOs/ISOs
Role of participants	Guidance, analysis
Source of resources	Voluntary
Manpower provider	Participants
Process	Open
Product or outcome	Biennial plan w/specific projects

Central Arizona Transmission Study (CATS)

CATS,²² which focuses on the Phoenix-Tucson area: “provides a framework for the participating entities to plan, coordinate, and locate transmission lines and bulk power stations to meet their objectives.”

Phase One,²³ finished in July, 2001, was a screening effort that evaluated transmission alternatives with generation expansion scenarios. Power flow studies assessed system performance with and without the various transmission alternatives. The most promising alternatives were retained and recommended for additional investigation in Phase Two.

The Phase Two study, completed in 2002, further refined the long-range merits of various transmission improvements. The final result was a conceptual long-range transmission plan consisting of a family of future transmission alternatives for Central Arizona.²⁴

²² <http://www.azpower.org/cats/default.asp>

²³ http://www.azpower.org/pdf/CATS_1_execsummary.pdf

²⁴ <http://www.azpower.org/cats/pdf/summary1.pdf>

The Phase Three study was conducted in 2003. A final report for this study effort is expected early in 2004. Any party proposing to construct a transmission line in Arizona is required to file a 10-year transmission plan with the Arizona Corporation Commission in January of each year. This phase of CATS studies investigated the system performance with all such planned transmission projects filed in January, 2003.

An additional outcome of Phase Three was a consensus recommendation to expand CATS future study scope to include transmission considerations beyond the Central Arizona footprint, e.g. transmission between Palo Verde and the Colorado River and from Central Arizona easterly to the Arizona state border. CATS is also exploring a CATS- and STEP-like sub-regional study forum with Colorado, New Mexico and West Texas electric industry stakeholders.

Table 5

Characteristics of CATS	
Area	Central Arizona
Scope, criteria	Planned transmission upgrades and additions
Authority	Voluntary
Limitations	Resources and commitment of participants, weak on load reduction or demand-side resource solutions
Participants	Utilities, WAPA, Arizona Corporation Commission staff, independent power producers, other special interests
Role of participants	Alternative proposals, study guidance, and analysis
Source of resources	Voluntary
Manpower provider	Participants
Process	Open
Product or outcome	Conceptual long range transmission plans and transmission project coordination

Rocky Mountain Area Transmission Study (RMATS)

Governors Freudenthal (WY) and Leavitt (UT) originated RMATS²⁵ because of a perceived need for transmission to link energy resources in Wyoming with loads in Utah. This planning process has been expanded to include the entire Rocky Mountain area.

RMATS' purpose is to identify, in an open public process, potential generation projects in the sub-region (Colorado, Idaho, Montana, Utah, and Wyoming) and the transmission needed to support them. With broad stakeholder involvement, it hopes to improve the Western Interconnection by identifying technical, financial, and environmentally viable

²⁵ <http://psc.state.wy.us/htdocs/sub-regional/home.htm>

projects for siting, investment and development in the near future and identify potential obstacles to prudent development of these needed projects.²⁶

RMATS goals are to:

- Identify generation projects with near-term potential for development;
- Identify the infrastructure needed to support them;
- Evaluate needs, alternatives, costs and benefits of generation and transmission;
- Identify obstacles to the siting and development of transmission;
- Identify financial and technical resources needed to enhance the development of transmission; and
- Develop information to enhance regulatory approval.

Table 6

Characteristics of RMATS	
Area	Colorado, Idaho, Montana, Utah, and Wyoming
Scope, criteria	Alternatives
Authority	Voluntary
Limitations	Volunteers' resources
Participants	Utilities, independent power producers, rural co-ops, transmission companies, wind and coal developers, state and federal regulators, consumer and environmental groups
Role of participants	Guidance
Source of resources	Wyoming, Utah, industry
Manpower provider	PacifiCorp
Process	Open
Product or outcome	Specific transmission projects

²⁶ <http://psc.state.wy.us/htdocs/subregional/charter.pdf>

Northwest Transmission Assessment Committee (NTAC)

NTAC,^{27,28} a recently organized sub-regional project for the Northwest Power Pool area, has as its mission: to be the open forum to address forward-looking planning and development for a robust and cost effective NWPP area transmission system. NTAC sees itself as a precursor to an RTO planning function.

Overall goals:

- Provide necessary information to maintain/enhance reliability;
- Identify expansion options to meet load growth;
- Develop a transmission assessment that identifies transmission constraints under a range of scenarios and suggests possible ways to relieve constraints (including alternatives);
- Identify options to increase the competitive supply of electricity;
- Coordinate with others in the West;
- Use an open process.

Transmission providers retain local planning responsibilities to ensure reliability.

Table 7

Characteristics of NTAC	
Area	Northwest Power Pool: Washington, Oregon, Idaho, Montana, Utah, W. Wyoming, N. Nevada, British Columbia and Alberta
Scope, criteria	Transmission and non-transmission alternatives
Authority	Voluntary
Limitations	Volunteers' commitment and resources
Participants	Utilities, independent generators, marketers, federal hydro operators, states
Role of participants	Guidance, work
Source of resources	Participants
Manpower provider	Utility volunteers
Process	Open
Product or outcome	Annual transmission expansion assessment for a 10-year horizon

²⁷ <http://www.nwpp.org/ntac/>

²⁸ 2003. Northwest Transmission Assessment Committee (NTAC) Scope of Work. Nov. 6. Presented to the Committee on Regional Electric Power Cooperation. Las Vegas, NV.
<http://www.nwpp.org/pdf/NTAC%202003%20aug%2028%20scope%20of%20work.doc>

Power Marketing Administrations (PMAs)

Bonneville Power Administration (BPA)

In the Pacific Northwest, BPA²⁹ owns and operates over 15,000 miles of high voltage lines, about 80% of the region's 500 kV mileage. BPA interconnects with Montana, Idaho, California and British Columbia.

In recent years, BPA has seen the volume of transactions on its transmission system increase dramatically. In response, BPA separated its transmission and power marketing business lines and upgraded its system controls.

BPA has the responsibility and authority to expand its system to make it adequate and has a planning process for doing so. That process includes serious consideration of non-wires solutions.³⁰

It lacks sufficient funds (congressionally-granted borrowing authority) to execute all its plans. BPA is guided by the 1980 Power Act, which created the Northwest Planning and Conservation Council.

BPA has identified many congested paths on its system and has sought from Congress an increase in its borrowing authority to relieve them. In 2001, Congress granted about \$700 million (of \$1.4 billion requested).

Table 8

Characteristics of BPA	
Area	Pacific Northwest
Scope, criteria	Transmission, non-transmission alternatives
Authority	1937 Bonneville Project Act, 1974 Columbia River Transmission Act, 1980 Power Act
Limitations	Complex politics, borrowing authority
Participants	Stakeholders
Role of participants	Advice
Source of resources	Transmission revenues within Federal borrowing limits
Manpower provider	BPA
Process	Open
Product or outcome	Project plans

²⁹ <http://www.bpa.gov/corporate/kc/home/index.cfm>

³⁰ http://www2.transmission.bpa.gov/PlanProj/Non-Construction_Round_Table/

Western Area Power Administration (Western)

Western,³¹ known by many as WAPA, owns and operates over 17,000 miles of high voltage transmission throughout the West, exclusive of the Pacific Northwest, making it the third largest transmission owner in the U.S.³²

Congress established Western on December 21, 1977, under Section 302 of the Department of Energy Organization Act. Under this statute, power marketing responsibilities and the transmission system assets previously managed by the Bureau of Reclamation were transferred to Western. Congress sets its budget. Western has no BPA-like federal statute and is not obligated to meet its customers' load growth nor to procure long-term generation resources. Western is participating in the upgrade of California's constrained Path 15.

An objective in Western's strategic plan is: To ensure long-term transmission system reliability and availability by participating in national and regional transmission studies.³³

Table 9

Characteristics of Western	
Area	The West, exclusive of the Pacific Northwest: Arizona, California, Colorado, Montana, Nevada, New Mexico, Utah and Wyoming
Scope, criteria	Transmission improvements within budgetary authorization
Authority	U.S. Congress
Limitations	Federal budgetary funds and participant funding, weak on load reduction or demand-side resource solutions
Participants	Transmission customers
Role of participants	Voluntary
Source of resources	Transmission revenues, requires Federal appropriation
Manpower provider	Western staff
Process	Open
Product or outcome	Corridor study [with BLM], transmission maintenance upgrades and participant funded improvements

³¹ <http://www.wapa.gov/>

³² <http://www.wapa.gov/geninfo/sysglance.htm>

³³ <http://www.wapa.gov/geninfo/pdf/stratplan.pdf>

Utilities

Much of the West's transmission is owned and operated by utilities, both investor- and customer-owned.

PacifiCorp

PacifiCorp³⁴ serves territories in six states (Pacific Power: Oregon, Washington, California; Utah Power: Idaho, Wyoming, Utah) and owns and operates an extensive transmission system among them. PacifiCorp participates actively in SSG-WI, RMATS, NTAC, and other planning processes, to which it contributes significant resources in the form of manpower, modeling, data base management, and funding. PacifiCorp periodically prepares integrated resource plans and files them with its jurisdictional state commissions.

California utilities

The large IOUs, or Transmission Owning Organizations—PG&E, Southern California Edison, and San Diego—prepare annual transmission plans, which are submitted to the CAISO for review and approval.

Others

Virtually all transmission-owning utilities, including BC Hydro, engage in some form of transmission planning, either on their own, or through sub-regional processes.

States

Some state public utility commissions, e.g. in California and Arizona, have transmission planning proceedings or require jurisdictional utilities to file transmission plans.

³⁴ <http://www.pacificorp.com/>

Situation Analysis—an Assessment of the West’s Transmission Planning

The previous section described the transmission planning activities in the West. To evaluate their efficacy, they should be based on sound principles and use good process.

Planning Principles

The most comprehensive set of transmission planning principles is under development by the National Wind Coordinating Committee, a multi-party stakeholder collaborative that supports increased wind development.³⁵ Not yet adopted by the full NWCC, these principles could be useful in testing the efficacy of any transmission planning process and its resulting plan. They are:

1. Transmission planning entities should be independent and publicly accountable.
2. The transmission planning entity should have the responsibility to identify needs and the authority to provide incentives for or directly implement solutions that may or may not be available to the market.
3. Transmission planning should be integrated with (generation) resource planning.
4. Transmission planning should be done on a broad, regional basis.
5. Transmission plans should fully integrate planning for reliability with planning for competitive markets.
6. Transmission planning processes should be transparent and facilitate the input of all stakeholders in the region.
7. Transmission planning should be based on an appropriate planning horizon and be proactive and responsive to needs of market participants.
8. Transmission planning should consider on an equal basis all types of resources available to meet planning goals and to address system resource needs and problems.
9. Electric system plans should be based on a life-cycle, least-cost standard including external costs such as environmental and societal impacts.
10. Transmission planners should use explicit, standardized methods and assumptions for evaluating all resources, including demand-side and intermittent generation technologies.
11. Planning results should clearly identify system needs and resource options so that market participants have the opportunity to propose and implement viable solutions.

³⁵ <http://www.nationalwind.org/>

A Comprehensive Planning Process

Certain activities are important to achieve an optimal result in electricity system planning. The ultimate goal is to optimize the system through the use of the most economic options available, whether they are supply-side, delivery-side, or demand-side solutions.

The following table highlights key steps in the process and the geographic or jurisdictional level suited to perform them.

Table 10

System Planning Process		
Task	Scope of Task	
	State/Local	Regional
1. End-use forecasts	LSE-level forecasts	Reconciliation of Local Forecasts
2. Identify existing/committed generation	Local Utility-level forecasts	Regional Forecast & Reconciliation of Local Forecasts
3. Identify existing/committed transmission	Intra-state/ Intra-utility forecasts	Regional Plan & Reconciliation of Intra-state/ Intra-Utility forecasts
4. Identify existing/committed demand-side resources	LSE-level forecasts	Reconciliation of Local Forecasts
5. Identify forecasted supply and demand gap	LSE-level Based on Preferred Portfolio	Reconciliation of Local Forecasts
6. Identify demand-side options and their total costs (including environmental costs)	LSE-level forecasts	Reconciliation of Local Forecasts
7. Identify supply-side options (generation & transmission) and their total costs (including environmental costs)	Vertically integrated utility forecast or other “special” local cases	Primary Supply Forecasts
8. Test resource options for balancing the system considering other criteria including testing for fuel cost risks, resource diversity, weather, etc. (i.e. Portfolio Management function)	Does the “case” meet LSE portfolio management requirements?	Does the “case” satisfy regional system needs and is it consistent with operations?
9. Iterate Steps 6, 7 and 8 until optimum results achieved	✓	✓
10. Implement Results through appropriate process (i.e. CCN, competitive bidding process, etc.)	✓	✓

Another critical aspect of planning is the planning horizon. In order to assure that all viable choices are fairly considered, the planning horizon should be as long-term as reasonably possible, recognizing the trade-offs—as the horizon is extended, the certainties decrease and the discounting effects of present values are reduced. Ideally, the planning horizon would extend as far as the life cycle of the choices being considered; however, as a practical matter forecasts beyond the 20-year range probably have declining value.

The planning process should be viewed as a continuous one that is never finished. As events occur and commitments are made, these become new inputs into the process and the plan is renewed. At any given time, the events identified in the first few months or years of the plan generally comprise an action plan to be implemented by the responsible participants.

Assessing Transmission Planning in the West

Using the NWCC planning principles and the process idealized above, the West's planning may be evaluated. There are significant ...

Strengths

1. SSG-WI's scope is interconnection-wide.
2. SSG-WI has significant resources and functioning work groups, including the Planning Work Group.
3. SSG-WI's process is open and flexible.
4. The SSG-WI Planning Work Group has completed development of a "public" database needed as input to transmission system assessment.
5. The SSG-WI Planning Work Group and PacifiCorp have run a model of the western interconnection with an LMP module.
6. SSG-WI has produced its first product, the 2003 Framework.
7. WECC is interconnection-wide.
8. WECC has accountability to a board with a public interest make-up, through its state, consumer, and unaffiliated members.
9. WECC's mission is to integrate reliability with commercial markets.
10. WECC is funded through an uplift charge, has a talented, knowledgeable, and engaged staff, and has active committees supported by staff resources of members.

11. WECC has regional planning “guidelines” which have been applied to real project proposals.
12. Sub-regional groups have formed and are flourishing, with the active support of transmission owners.
13. The sub-regional processes are open and flexible.
14. The Committee on Regional Electric Power Cooperation (CREPC) convenes twice a year to learn and share information about the West’s transmission system and efforts to address its problems, issues, and opportunities.

Despite these significant strengths, there are ...

Weaknesses

1. Neither SSG-WI nor WECC has the duty to perform transmission planning or the authority to implement a plan.
2. SSG-WI is an informal organization with tenuous membership and funding. SSG-WI’s Planning Work Group relies on volunteers.
3. SSG-WI’s plan is too general to provide strong guidance.
4. SSG-WI’s plan is based on future generation scenarios, but has no direct linkage to real generation planning.
5. SSG-WI’s plan does not consider alternatives to transmission, nor does it consider environmental or other external costs or benefits.
6. WECC’s authority is based on voluntary participation and compliance.
7. WECC’s planning is reactive and its bylaws preclude active transmission planning.
8. WECC’s planning does not integrate assessments of generation and transmission.
9. WECC has a restrictive policy on data availability.
10. Sub-regional planning process results lack accountability for interconnection-wide effects of their proposals.
11. In the absence of RTOs everywhere in the West, sub-regional processes lack authority in their sub-regions.
12. The region-wide and sub-regional studies and planning processes are enormously dependent on the contributions of staff and funds of a few utilities

and organizations. Reduction or withdrawal of these contributions would handicap or halt these processes.

13. CREPC lacks any formal structure, authority, decision-making power, or durable funding source.

Continuing Challenges

In recent years, much uncertainty has pervaded the electric utility industry. In the future, more challenges will certainly face transmission planners.

Environmental Impact

Perhaps the single largest challenge facing the electric industry is that of climate change and emissions issues.

Load and congestion growth

The existing transmission system has congested paths. The West has some high growth areas, e.g. Las Vegas, Arizona, and the Wasatch Front. Serving customers in these areas will probably increase congestion and require good planning, not only for transmission, but also for generation, distribution, and efficiency and load management.

Transmission congestion, *per se*, isn't undesirable. It merely reflects the difference in prices between two points and can represent a good allocation of society's resources. Congestion is undesirable when its costs exceed those of relieving it. When these conditions are met, the institutional framework should avoid barriers to those investments. Such barriers can include: wrong price signals; uncertainty about recovery of costs; misaligned incentives (the party with an incentive to reduce congestion and/or the party responsible for paying for congestion relief may not benefit from its reduction); and regulatory logjams or fear of the permitting and approval processes.

Uncertainty about new technology, investment recovery, and cost allocation

The region's future electricity system configuration is likely to be a combination of different models, among them:

- Large natural gas-fired power plants close to gas and electric transmission lines;
- Generation close to load;
- Distributed generation (near or at customers' sites);
- Wind generation remote from concentrations of load;
- Coal generation remote from concentrations of load; and
- Efficiency and load management.

The mix of these models will depend on many unknowable technological, political, economic, and environmental factors. Betting wrong on the mix could lead to excessive and potentially unrecoverable investment in transmission and generation assets, hence, the need for good planning.

The turbulence of the last few years made many transmission-owning companies risk averse. The fundamental structure of cost recovery for transmission was in play and rate cases were anathema. This situation persists. The costs of transmission expansion must be recovered from customers. But which ones? Some prefer rolling in the costs to all regional or sub-regional customers and/or generators. Others favor charging cost causers or voluntary funding by benefit receivers. In its White Paper,³⁶ the FERC asked the regions to decide, but the West hasn't put this issue on its agenda for action.

Investment climate

Poor investor (Wall Street) confidence in the industry resulted from the California crisis of 2000-2001, the collapse of Enron (and, with it, its business model and attitude), and the bankruptcy of utilities, generators and power suppliers. Investors seem to be restoring a sense of rationality about the electric utility industry, but their confidence depends on the resolution of uncertainty. If a project has a sound business plan and a practical political and regulatory strategy, financing will likely be forthcoming.

Political gridlock

The federal/state jurisdictional issue, illustrated by the states' resistance to FERC's SMD proposal, has not been resolved and will only be settled by Congress and/or the U.S. Supreme Court. Resolution of this issue, if it comes, will probably take many years.

Public opposition

Siting of new transmission can bring out strong local opposition, regardless of the merits of the proposal. Local citizens are often very vocal and effective at blocking any developments, especially if they don't perceive local benefits. Transmission has the characteristic of serving beneficiaries at some distance away and, because it is linear, affects many people along the way. In the ebb and flow of the balance between individual and public interests, the pendulum swung over to the individual interests in recent years. Regional leadership, as well as a strong planning process that develops well-supported options and good communication about the merits of those options, can affect this pendulum.

The WGA Transmission Siting Protocol attempts to address this issue by establishing a process for states to cooperate in evaluating proposals for projects that cross state boundaries.³⁷

³⁶ http://www.ferc.gov/industries/electric/indus-act/smd/white_paper.pdf

³⁷ http://www.westgov.org/wieb/electric/Transmission%20Protocol/wtp_page.htm

Implementation of non-transmission alternatives

If a transmission plan does a good job of considering alternatives, non-transmission options might be revealed to be more cost effective, especially if environmental externalities are considered. But those who perform transmission planning are not generally in the business of providing, and have no obligation to provide, these other options. Who is and who should? If no one steps forward, the favored option would be foregone and, either a sub-optimal transmission project would be built or the problem or issue would go unaddressed.

FERC's limitations

FERC perceives a dysfunction in wholesale electricity markets and has a vision for what is needed. However, FERC has been weakened by court decisions on RTOs and push-back to SMD, leaving unaddressed (or inconsistently addressed) some market issues such as discriminatory access, pricing, and cost allocation for new investment.

Probable changes in the industry

Given the unforeseen events and circumstances witnessed in the West over the last decade, it's risky to call anything in the future "probable." Some possibilities, however, can be considered.

RTOs

In FERC's vision, full-fledged RTOs would address some important issues, including: congestion pricing, cost allocation, uncertainty over investment recovery, and transmission planning and implementation.

The California ISO is functional and is likely to remain so. It is active in transmission planning and takes it seriously, but doesn't take direct responsibility for it.

RTO West and WestConnect are unlikely fulfill the envisioned transmission planning function in the near future.

Federal energy bill

Congress considered a major energy bill in November, 2003, but a cloture vote failed in the Senate. The bill will likely be back for consideration in 2004.

The bill includes some relevant policy provisions. For example, it would make reliability standards mandatory and authorize Regional Advisory Boards to help the new regional reliability organizations. It would also direct DOE to designate needed transmission corridors, authorize WAPA to build within those corridors, and provide for federal override of state siting in those corridors.

The bill does not address federal/state jurisdiction and postpones FERC's Standard Market Design until 2007.

Passage of a bill that includes the reliability title is probable in 2004.

FERC actions

Although many states and congressmen objected to SMD, the FERC seems steadfast in its clarity of vision for the wholesale market. If so, it will probably use old-fashioned methods such as tariff filings as well as seek new strategies to implement that vision.

State actions

Western states are in different circumstances with respect to restructuring. Some are still vertically integrated; others went down the path of deregulation, only to reverse course. In those states, divestiture of generation has made return to the old days, difficult, if not impossible; nevertheless, their utilities (LSEs) typically function as default providers, a role much like that of a vertical utility with an obligation to serve customers.

States can act individually or collectively.

A single state can engage in transmission planning, as the California PUC does, or require it, as the Arizona CC does, and/or indicate that it believes a transmission project is needed. That signal can take the form of a regulatory action (e.g. project certification or favorable rate treatment) or legislative action such as tax policy. Because of the regional nature of the grid, these are probably blunt, ineffective instruments.

States can be more effective acting collectively.

Western states did that with the WGA Western Siting Protocol.³⁷ This procedure is as yet untested, but could facilitate the interstate siting and permitting of new transmission.

The Need for Interstate Cooperation or Collaboration

The need for more interstate cooperation or collaboration depends on the resolution of some key issues.

Definition of a plan

What is a plan? What is the purpose of a planning process and what role will its plan have?

At one level, a plan is a study. It analyzes needs and possible solutions. The planning entity presents the “plan” and others do with it what they will.

At another level, a plan is “indicative.” It provides a direction for others and perhaps has some force of evidence in a regulatory proceeding.

A planning process can be reactive, as in the case of WECC, which applies guidelines to project proposals.

Or, a plan could be a decision document. A decision-making entity, e.g. a transmission-owning company or agency, makes investment decisions based on it.

In the region, there is no common acceptance of what a “plan” is and what its purpose and role are.

Integration

How can transmission planning be integrated with generation, demand management, reliability and commercial markets? Planning for one without considering the others creates unintended effects on the others and results in a more costly, sub-optimal result.

Culture of transmission planning

Who does transmission planning and who should do it?

Traditionally, transmission planning has been done by transmission engineers. The result is a robust and reliable grid. Should the planning process include more skill sets, e.g. disciplines such as business, economics, regulation, environmental sciences, and public involvement? Should transmission planners employ their skills under the direction of broad-based, established policy and goals?

Regulatory oversight and accountability

What entity, at what jurisdictional level, has and should have regulatory jurisdiction and authority over transmission planning?

It is beyond the scope of this paper to plumb the jurisdictional issue. In the federalist system of the United States, there is no regional government. That leaves the

management of regional enterprises like transmission to individual states acting in a cooperative way and to the federal government managing interstate commerce. In between, there are opportunities for cooperation and collaboration.

Regional or Pluralistic Planning

Are the best outcomes more likely to be achieved over time through something like today's pluralistic approach or through a more central, regional approach? Whether done through formal regional institutions or through more *ad hoc* organizations and committees, the end results will be optimal only if, on a comprehensive basis, all of the critical parts of a good planning process are functional and coordinated.

Conclusions

The West does not have a robust, regional transmission planning process and ways to develop the electricity system from a regional perspective because:

- No entity has that responsibility.
- No entity has the authority to expand the transmission system (or implement non-transmission alternatives) to meet regional needs.
- No regional entity has the regulatory job of holding the transmission system accountable for its investments and operation.
- No regional process assures that sub-regional ones will produce outcomes that are regionally optimal.
- The current pluralistic paradigm requires significant commitments from companies and organizations that could reduce those commitments if they don't lead to outcomes acceptable to them.
- West-wide RTOs and SSG-WI are not a certainty. With the probable exception of the California ISO, even if the others make progress toward formation, they could easily evaporate. If they fully form, it is likely to be years in the future.
- There is no regional public process for airing or reconciling the current planning processes or their results.
- There is no regional consensus on likely or possible future generation or demand management scenarios.
- For private investors, cost recovery for transmission investment is uncertain in the absence of policy guidance on cost allocation.

Constituent interests in the region may disagree with these conclusions or accept them. In either case they could choose to support the current pluralistic planning efforts in the belief that it is the best, or only available, approach.

Or, the region could accept these conclusions and address them by seeking ways to achieve a regional process of system planning and investment that overcomes the shortcomings of the existing framework of *ad hoc* entities.

It is impossible to know with certainty which approach will produce better outcomes over time. In the end, it's a judgment call, to be made by political leaders with the advice of CREPC.

Opportunities for Enhanced Interstate and Federal Cooperation and Collaboration

Policy makers and industry regulators in the region could conclude that more needs to be done to assure that the transmission grid of the future meets the region's needs.

A range of activities could be done at the regional level. Among them are (see Table 11, next page):

Communication/Collaboration. Currently, this is the mode of CREPC. For almost 20 years, CREPC has had a professional and respectful relationship with the utility industry. The Western Conference of Public Service Commissioners fits into this mode as well, but is less active than CREPC is.

Analysis. The 1980 Northwest Power Act requires the Northwest Power and Conservation Council to prepare a plan to guide BPA. The Council has added significant value to the region's policy dialog through its power plan and associated analyses. The Western Governors Association has performed studies as well.

Managing/Administering. Some regional functions are ministerial, not policy, in nature. An example is the tracking of renewable energy generation to satisfy policies such as renewable portfolio standards. Led by the California Energy Commission and the WGA, the region is developing a way to do this that could lead to the establishment of a new regional entity or the expansion of duties for an existing one.

Market monitoring. FERC, the RTOs, the states, and the regions are working together to develop a market monitoring function that draws on the strengths of all.

Advising/Advocating. Congress and the FERC need the advice of the region. Currently, the Western Governors Association, with the support and counsel of CREPC and WIEB, provides that advice. WGA decision making requires a majority of states voting, but political reality usually dictates consensus.

Planning. The Northwest Planning and Conservation Council prepares a power plan for the northwest. That plan has little authority, however, because BPA, which must act in conformance with it, is, along with the region, reassessing responsibility for its customers' future load growth.

Regulation. Except for FERC, which has authority over the bulk, wholesale market, there is no regional government or regulation. There might be opportunities, however, through FERC delegation or deference to a regional body or through joint state/FERC boards.

Decision making. There is no regional government in our federalist system. One could be envisioned, however. E.g., in approving an interstate compact, Congress could delegate some FERC authority, provided that the ultimate, backstop authority remained federal.

Table 11
Range of Regional Activities

Activities→	<u>Communi- cation/ Coordin- ation</u>	<u>Analysis</u>	<u>Managing/ Admin- istering</u>	<u>Market monitoring</u>	<u>Advising/ Advocating</u>	<u>Planning</u>	<u>Regulation</u>	<u>Decision- making</u>
Examples, govern- mental Entities →	CREPC, WCPS	WGA, NPCC	WREGIS ³⁸		WGA	NPCC	FERC	
Industry counter- parts →		SSG-WI	WECC			SSG-WI		
Increasing federal/state jurisdictional issues →								
Increasing governance issues →								

³⁸ The Western Renewable Energy Generation Information System is under development. It would manage the system for tracking renewable generation to satisfy states’ renewable portfolio standards and other policies.

Within the framework presented above, here are some options for the West to consider for the future, roughly increasing along the scale of the table above.

1. CREPC could continue in its current mode, but become more active. It could meet more frequently, take on more projects, and seek more funding.
2. CREPC could synthesize and communicate the many planning processes described in the Situation Analysis. A “process map” would incorporate all the western states’ rules and standards and show the regulatory “lay of the land” so developers can improve their decision making and chart a path through the regulatory maze and so others can participate constructively in planning and regulatory processes. A stable funding source would be required to support the work. Going a step further, the region could have an ombudsman or facilitator to help parties, including developers and public interest groups, use the map.
3. The West could establish an analytical function, similar to that of the Northwest Power and Conservation Council, to perform studies with an open process and database. This analytical function could enrich the existing, ongoing planning processes, add content and value to them, enable all stakeholders be more effective, and help the region understand to what extent these processes capture the regional public interest. It would require a reliable, dedicated source of funds. Its program would be accountable to the region through the governance of an existing or new entity.
4. The region could have a high-level (WGA) negotiation with the FERC about what is reasonable to accomplish and what roles the states, the RTOs, the FERC, and the region would play and what kinds of outcomes would be expected. This might first require that the region have an accepted vision of its future.
5. The region could form a new or reconstituted regional entity with the clout to confront and seek solutions for the weaknesses in interconnection-wide transmission planning. The scope, authority, responsibility, and governance of such an entity would require serious negotiations and the sanction of the WGA. An interstate compact, or the supplementary provision of the Western Interstate Nuclear Compact, might be required to make it functional. A stable revenue stream would be required.
6. The region could convene a process to address transmission cost allocation with the goal to establish a cost allocation policy for the west. If accepted by FERC, it would remove a major uncertainty for investors.
7. The region could begin the process of establishing a formal regional system planning entity, with the responsibility to determine the region’s future electricity system configuration and the authority to make it happen. Such an entity would require an interstate compact and the approval of Congress, as well as a stable funding source.