



**Oklahoma Electric Power
Transmission Task Force (OEPTTF)
Study Proposal**

Final Draft – December 18, 2007

Oklahoma Electric Power Transmission Task Force (OEPTTF) Study

As a minimum, SPP shall perform the following services on behalf of Customers:

SPP will supervise and be responsible for the Oklahoma Electric Power Transmission Task Force Study (the Study). The Study will consist of detailed seasonal cases for 2010 and 2020 transmission system scenario models to be developed by SPP.

The analysis will include:

- Develop appropriate load forecast, gas price forecast and generation development assumptions to be modeled.
- Develop appropriate topology assumptions to represent 2010 and 2020 cases
- Develop potential flowgates and monitored interfaces for economic modeling
- Development of an assessment payback period determination for ten to forty year return periods for specified projects (see scope below)
- Determine benefit of regional expansions for the state of Oklahoma
- Develop illustrative color contour maps demonstrating the anticipated results of the addition of these projects on wholesale prices in the region
- Advise OEPTTF of the possible implications across Oklahoma, SPP and neighboring systems for the projects studied.

The following is a description of the three transmission base models to be developed for this study:

- a) **Base Case Model:** The Base Case Model will include a year-end 2010 and 2020 base transmission network representation with a "best projected" topology as determined by SPP Staff. Major sensitivity cases will be developed to determine the impact of the X Plan. Alternatives will consider 345 or 765 kV expansion using single circuit or double circuit lines.
- b) **Oklahoma Wind Scenarios:**
 - **Moderate Wind Development** - These Scenario Models will reflect total wind development in Oklahoma at a level of 1000/2000 MW for 2010/2020, respectively. The majority of incremental wind development expansion will be assumed to occur in the Oklahoma Panhandle.
 - **High Wind Development** – These Scenario Models will reflect total wind development in Oklahoma at a level of 2000/6000 MW for 2010/2020, respectively. The majority of incremental wind development expansion will be assumed to occur in the Oklahoma Panhandle.

- **Note:** Additional wind assumptions used in the study are defined in the Economic Modeling Assumptions section of the Study Scope
- SPP will determine the expected production cost savings, as well as associated benefits of transmission expansion projects (see scope below) on each of these wind development scenarios.
- SPP may consider as part of the analysis any sensitivity and aggregate study projects that may affect the 2010 and 2020 Models, and the respective impact of other planned projects on the models
- Wind Scenario models will be developed by SPP (based on current SPP Wind Generation Interconnection requests and current high profile wind zones in Oklahoma) and approved by the OEPTTF.

Assumptions regarding wind development and transmission expansion in KS, TX and NM will have a major affect on this study for OEPTTF. Consistent assumptions will be used in the moderate and high wind development scenarios for OK and neighboring states in SPP with large wind development potential.

Costs / Summits

In the spirit of FERC Order 890 and the need for transparency and stakeholder engagement in expansion planning, SPP is proposing to perform this study without any charges to OEPTTF. This study is expected to require significant resources to create cases, perform studies and present results . SPP would propose that summits be held in Oklahoma City in mid/late January and mid-March for this study. The first summit would share project scope and preliminary reliability results with all affected stakeholders in advance of the report due to the Oklahoma legislature. The second summit would share final reliability and preliminary economic results, along with recommendations in advance of final report being issued in late March.

Important Note

Absent a special agreement, SPP must follow its FERC-approved Open Access Transmission Tariff for the provision of transmission service. While SPP will work with stakeholders on studies to evaluate and identify potential beneficial transmission expansion projects, SPP can not guarantee the availability of transmission capability to provide firm deliverability of resources without a specific request being evaluated and approved as a part of the aggregate study process for long-term transmission service requests.

OEPTTF Study Scope

Timeline

- Approve scope and assumptions – late December, 2007
- Contingency results – Mid-Late January, 2008
- FCITC results – Late January, 2008
- Economic Results – Late February, 2008
- Economic Fuel Sensitivity – Early March, 2008
- Final results/report published – Late March, 2008

Methodology

Cases (4 seasonal models for each year) -

- **Base Case:** Expected 2010 and 2020 topology assumptions
- **Moderate Wind Development Scenario:** Base Case with 1000/2000 MW of installed wind based on nameplate generating capabilities in Oklahoma in the years 2010/2020, respectively. The majority of incremental wind development expansion will be assumed to occur in the Oklahoma Panhandle. Assumptions for wind development in neighboring states in SPP will not be inconsistent with those for Oklahoma.
- **High Wind Development Scenario:** Base Case with 2000/6000 MW of installed wind capacity based on nameplate generating capabilities in Oklahoma in the years 2010/2020, respectively. The majority of incremental wind development expansion will be assumed to occur in the Oklahoma Panhandle. Assume 50% of incremental wind energy is moved off system and serves customers in the Southeastern Sub-region in SERC, which is primarily Southern Company. Assumptions for wind development in neighboring states in SPP will not be inconsistent with those for Oklahoma.

Economic Modeling Assumptions -

- Potential constraints added to case as interfaces from N-1 contingency analysis
- EMMTF unit data added to economic modeling database (*See EMMTF Report*).
- Economic Cases -
 - Wind Assumptions -
 - **Oklahoma Wind** – Existing wind farms in OK amount to 700 MW with another 400 MW with signed interconnection agreements. An additional 3,000 MW of potential wind farms in Oklahoma are currently under study at SPP with minimal developments in the Oklahoma Panhandle. OG&E announcement of 10/30 identifies plans to add another 600 MW of wind in OK for OG&E loads.

SPP is aware of only 120 MW of new wind farms being studied as a new resource and assumes that the remainder of OG&E's additions would be part of the 1,000 / 2,000 MW of new wind in Oklahoma for the moderate wind scenario with 2,000 / 6,000 MW of new wind for the high wind scenario in 2010 / 2020. The majority (75-80%) of new wind development in Oklahoma would be assumed to occur in the Oklahoma Panhandle.

- **Kansas Wind** – Wind in Kansas will be modeled on a 1,000 / 2,000 MW level in the 2010 / 2020 cases consistent with the KETA study.
 - **Texas/New Mexico Wind** – Wind from the Texas Panhandle/Eastern New Mexico region of SPP will be modeled at 1,500 / 3,000 MW levels in the 2010 / 2020 cases.
 - Wind generation located in each state will be used to serve retail customers on a 10% native load basis. This assumption is consistent with the recent Westar and OG&E's announcements to add 500 and 600 MW of new wind resources, respectively.
 - Assumptions regarding new wind developments in terms of injection amounts, timing and ultimate customers will be created and summarized as Attachment 1 based on the existing SPP GI queue and additional assumptions.
 - Modeling of wind resources as “price takers” in economic analyses can make production cost savings and project beneficiary analyses difficult. It is proposed that wind farms be modeled as profiled energy resources with costs of \$40/MWh in all cases. Sensitivities will be performed to quantify the impact of wind energy production costs in the range of \$30-50/MWh
- Economic assessments for one year periods of 2010 and 2020 consisting of hourly production cost simulations which capture unit commitment and economic dispatch impacts for each case
 - Collection facilities to aggregate wind farms and inject on the 345 kV+ systems can be material in any wind development plans. SPP would prefer that an adder of \$5-10/MWh be added to wind energy production prices to reflect the true economic impacts on

transmission expansion alternatives for wind development scenarios under study.

- Study Sensitivities –
 - Base and upgrade case runs will be reevaluated for low and high fuel price scenarios. Base natural gas price assumptions are based on the most recent EIA price forecasts and will be approximately \$7.25/MBtu in the base (2007\$ with escalation rates consistent with baseline inflation, e.g., 2.5-3%) with sensitivities of +/- 50% of base line price and escalators.
 - DC Tie Sensitivities – A sensitivity will be conducted to sink 600 / 1,200 MW of wind from SPP into ERCOT North via new DC Tie(s) in 2010 / 2020 cases. In the high wind scenario, the benefits of exporting 1,200 MW of wind from SPP into WECC via new DC ties in the 2020 cases.
 - High/moderate wind sensitivities for Oklahoma wind expansion as described above and shown in Attachment 1
 - Topology sensitivities involving the status and design of the X Plan considering several alternatives for a potential Hitchland/Guymon – Mooreland/Woodward expansion at single/double circuit 345 kV or 765 kV design.

Results –

- Assessment payback period determination for ten to forty year return periods on each potential expansion project for wind development and transmission expansion scenarios.
- Present benefits associated with transmission expansion alternatives for varying wind development scenarios with focus on benefits to all stakeholders with a particular focus on Oklahoma customers.
- Sequential processing of EHV transmission expansion “commitments” in SPP is so problematic, that SPP must first focus on development of the best long range expansion plan using a stakeholder process and then decide how we will address these commitments. SPP must follow its Tariff for generation interconnection and transmission service request in terms of facility enhancements and cost responsibilities. Flexibility is a key attribute of any plan. The location of the hub of the X Plan in SPP has yet to be decided despite the references to “Mooreland” in most planning studies. SPP would propose that the OEPTTF use “Mooreland/Woodward” as hub for the X Plan with potential interconnections to wind farms and existing 138 kV system in western Oklahoma going forward. The location of this hub should not affect the OEPTTF recommendations to create a long range plan for injecting and delivering wind on the 345 kV+ system as modeled.

Additional Details

Shown below are lists of general model assumptions that will be used in the OEPTTF Study.

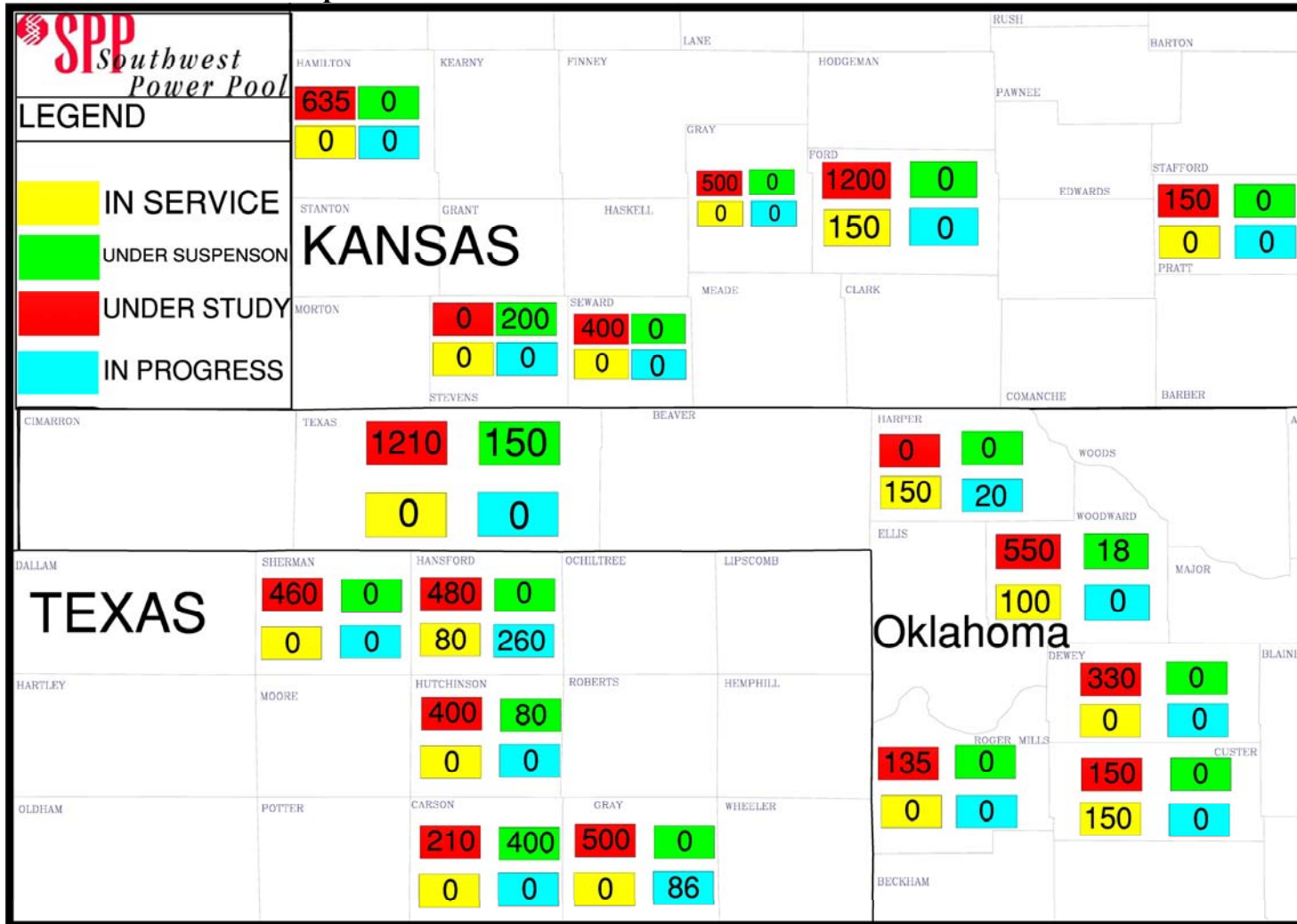
Base Wind Assumptions

Wind Type	Base Wind
	2010
Kansas	1,648
In-Service	460
On Schedule	750
Suspension (50%)	438
Oklahoma	903
In-Service	698
On Schedule	20
Suspension (50%)	185
N. Mexico/Texas	1,499
In-Service	605
On Schedule	654
Suspension (50%)	240
Grand Total	4,050

New Wind Locations and Injection Amounts

Injection Location	Standard Scenario		High Wind Scenario		Percent
	2010	2020	2010	2020	
Kansas	1,000	2,000	Same	Same	
Spearville	600	1,200	Same	Same	60%
Mingo	150	300	Same	Same	15%
Elk River	100	200	Same	Same	10%
Summit	150	300	Same	Same	15%
Oklahoma	1,000	2,000	2,000	6,000	
Hitchland (Panhandle)	750	1,500	1,500	4,500	75%
Lawton	100	200	200	600	10%
Mooreland/Woodward	150	300	300	900	15%
N. Mexico/Texas	1,500	3,000	Same	Same	
Potter	1,050	2,100	Same	Same	70%
Tuco	450	900	Same	Same	30%
Grand Total	3,500	7,000	4,500	11,000	

Current Wind Development in Panhandle -



Major Generation Additions (2010)

- Iatan 2
- Hempstead Co (Turk)
- Emporia (Lang)
- Hobbs
- Tontitown (Mattison)

Major Underlying Topology Assumptions (2010)

- 2007 STEP Reliability Plan
- Wichita – Reno Co. – Summit 345 kV
- Rose Hill – Sooner 345 kV
- Brookline – Summit 345 kV
- Blackberry – Chouteau – GRDA 1 345 kV

Major Underlying Topology Assumptions (2020)

- Spearville – Comanche Co – Wichita 345 kV (Comanche Co. – Wichita built 765 kV)
- Comanche Co. – Mooreland/Woodward 345 kV & 765kV (separate structures in adjacent ROW)
- Mooreland/Woodward. – Potter 345 kV