



Eastern Interconnection Planning Collaborative

Transmission Build-Out and Costing Methodology for Phase II DRAFT

Stakeholder Steering Committee
Meeting

May 18-19, 2011

Purpose

- Share initial thoughts on EIPC's Phase II work plans with Stakeholders.
- Outline information requirements for Task 7.

Outline

- Overview of Phase II from Statement of Project Objectives (SOPPO)
- Task 7 Input Requirements
- Use of NEEM Results in Task 7
- Transmission Overlay Development Process
- Schedule
- Questions

Overview of Phase II from Statement of Project Objectives (SOPO)

- Based upon final contract agreement with the Department of Energy, dated July 14, 2010

Phase II from SOPO

- Develop alternative transmission options (task 7), and perform reliability (task 8) and production cost (task 9) analyses to support the expansion scenarios selected during Phase I.
- Develop high-level cost estimates (task 10) for the generation and transmission expansion facilities for each scenario.

Task 7 – Interregional Transmission Options Development – SOPO

- EIPC will modify the Eastern Interconnection modeling developed in Task 2 to build interregional expansion models.
 - Stakeholder specified baseline infrastructure model will be utilized as the starting point.
- Task 7 will focus on transmission reinforcements to support the resources identified and interregional energy exchanges for each of the three Expansion Scenario(s) from Task 6.
- Task 7 deliverables:
 - Develop and/or adjust transmission reinforcements needed to support the Expansion Scenarios.
 - Develop Eastern Interconnection power flow model for each scenario.

Task 7 – Continued – SOPO

- EIPC will develop transmission expansion options focused on the EHV transmission network (230 kV and above).
 - Will also consider operating measures in lieu of new transmission such as special protection systems.
 - Will consider other potential solutions such as dynamic reactive support, phase angle regulators, and demand side resources.
- EIPC will consider the transmission facilities required to integrate new resources within a region using a similar high voltage focus.
 - Will not attempt to resolve potential local transmission issues.
 - Will consider high voltage collector system where appropriate.
 - Will include long generator lead lines if required.
- EIPC will leverage the expertise of EIPC's membership in considering high voltage direct current (HVDC) and advanced technologies in developing expansion options.

Task 7 – Continued – SOPO

- EIPC will identify transmission expansion options for each Expansion Scenario and the associated solved Eastern Interconnection modeling necessary to perform reliability and economic analyses.
- The transmission expansion options will align with the future study period selected for the Expansion Scenarios.
- These expansion options will not identify specific routing, siting, environmental, or other related issues associated with any potential enhancements to the grid.

Task 7 – Continued – SOPO

- EIPC will conduct stakeholder outreach and meetings to share preliminary results of potential transmission reinforcements needed to support the Expansion Scenarios and solicit input from the SSC and other stakeholders.
- Key inputs for Task 7 include the Expansion Scenarios from Task 6 and the Eastern Interconnection modeling from Task 2.

Task 8 – Reliability Review – SOPO

- EIPC will perform reliability analyses consistent with NERC reliability criteria for transmission planning
 - Assess each of the three final Eastern Interconnection transmission build-outs developed in Task 7 that support the three scenarios.
 - Make adjustments to the transmission build-outs to satisfy reliability tests.
- Key inputs for Task 8 are the Eastern Interconnection models from Task 7.

Task 8 – Deliverables – SOPO

- Review detailed transmission analysis results with the SSC and stakeholders.
- EIPC will develop flowgates for use in the production cost analysis of Task 9.

Task 9 – Production Cost Analysis of Each Scenario – SOPO

- Economic analysis will be performed using production cost modeling for each scenario based upon the power flow modeling and transmission expansion options developed in Task 7.
- Task 9 deliverables – production cost results for three scenarios with transmission specified in Task 8.

Task 10 – Generation and Transmission Cost Development – SOPO

- EIPC will provide high-level estimates of the capital costs of the three interregional generation resource and transmission systems finalized in Task 8.
- Transmission costs will be developed by EIPC using generic planning-type estimates referenced to the study year and will represent “overnight” costs.
- Costs associated with resource additions and retirements will be developed by EIPC and will be informed by SSC assumptions regarding technology characteristics and costs.
- Key inputs for Task 10 include the Interregional Expansion Options (generation and transmission) from Tasks 6, 7, and 8, and high-level, generic transmission cost information.

Task 7 Input Requirements

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- The stakeholder specified baseline infrastructure model as produced subsequent to the completion of Task 2.
- The stakeholder specified resource expansion, retirements, and load forecast by NEEM region for each of the three scenarios from Task 6.
- The stakeholder specified peak interregional energy exchanges that must be accommodated, region to region for each scenario (from Task 6).

Use of NEEM Results in Task 7

- The NEEM results provide the resource expansion by NEEM region, generation cost, and other parameters under conditions suitable for development of a transmission overlay.
 - For example, the NEEM cases model the resource adequacy requirements of the regions.
- Development of a scenario that is not based on one of the NEEM runs will require the specification of the same information used in the NEEM runs so that the economic factors (e.g. fuel costs) match the resource mix chosen.
 - Required for Task 9 production cost simulation.
- Therefore, the EIPC recommends that the three chosen scenarios be selected from the 80 NEEM runs.
- If scenarios are “blended” from different NEEM runs, they will still need the same level of information that a NEEM run provides – resource mix, transfer limits, etc. (Further discussion on this issue in July.)
 - Stakeholders should consider retention of up to three sensitivities to accommodate such blended scenarios.

Adjustment of NEEM Results

- Some modifications or customization within the NEEM results may be feasible.
 - For example, the NEEM runs provide generation expansion by technology for each region. Those inputs could be refined to distribute the technologies within a NEEM region (as opposed to across multiple NEEM regions.)
- However, the EIPC will need to model the location of the generation expansion resources at logical high-voltage locations to accommodate the overlay development and reliability analysis.
 - For example, where feasible, EIPC will model new generation adjacent to existing transmission facilities and/or at existing generation sites.

Transmission Overlay Development Process

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- Starting from the stakeholder specified baseline infrastructure model, each Planning Authority (PA) will identify a high level (230 kV and above) integration overlay for the specified resources within their respective regions.
- Affected PAs will develop coordinated interregional expansions to accommodate specified interregional energy exchanges (specifying parameters consistent with resource integration overlay).
- PAs will consider transmission options and advanced technology options, as appropriate.
- PAs will seek input and alternative ideas from stakeholders.

Transmission Overlay Development Process - Continued

- EIPC will provide interim results to the SSC and other stakeholders for review and input.
- PAs will modify overlays giving due consideration to stakeholder provided input.
- PAs will perform a high level DC transfer analysis of the overlay per scenario to assure resource delivery consistent with the scenario objectives.
- PAs will develop needed modifications to the overlays based on the high level analysis results.
- PAs will present the overlays for each scenario to the SSC and other stakeholders for review.

Phase II Schedule

(Subject to Revision Based on Completion of Phase I)

- Task 7 – January-July, 2012
- Task 8 – March-August, 2012
- Task 9 – June-September, 2012
- Task 10 – May-October, 2012
- Task 11 – May-October, 2012
- Task 12 – September-November, 2012

Questions

