



Eastern Interconnection Planning Collaborative

Coordination of MRN-NEEM Modeling and High Level Transmission Analysis in Task 5

Presentation at Macro Future Workshop
November 8-9, 2010

Project Objectives – Phase I

- The Roll-Up
- Macroeconomic analyses of 8 resource expansion futures
 - Original proposal was that the Roll-Up would serve as the starting point
 - Adoption of a different “baseline infrastructure” would change that – hold discussion of details for another time (with RUWG)
- Macroeconomic analyses will provide useful information to the SSC in determining the 3 expansion scenarios to be chosen in Task 6
- EIPC to provide high-level transmission analysis for the futures of interest in the 8 macroeconomic analyses

NEEM Model Background

The Model **Does**:

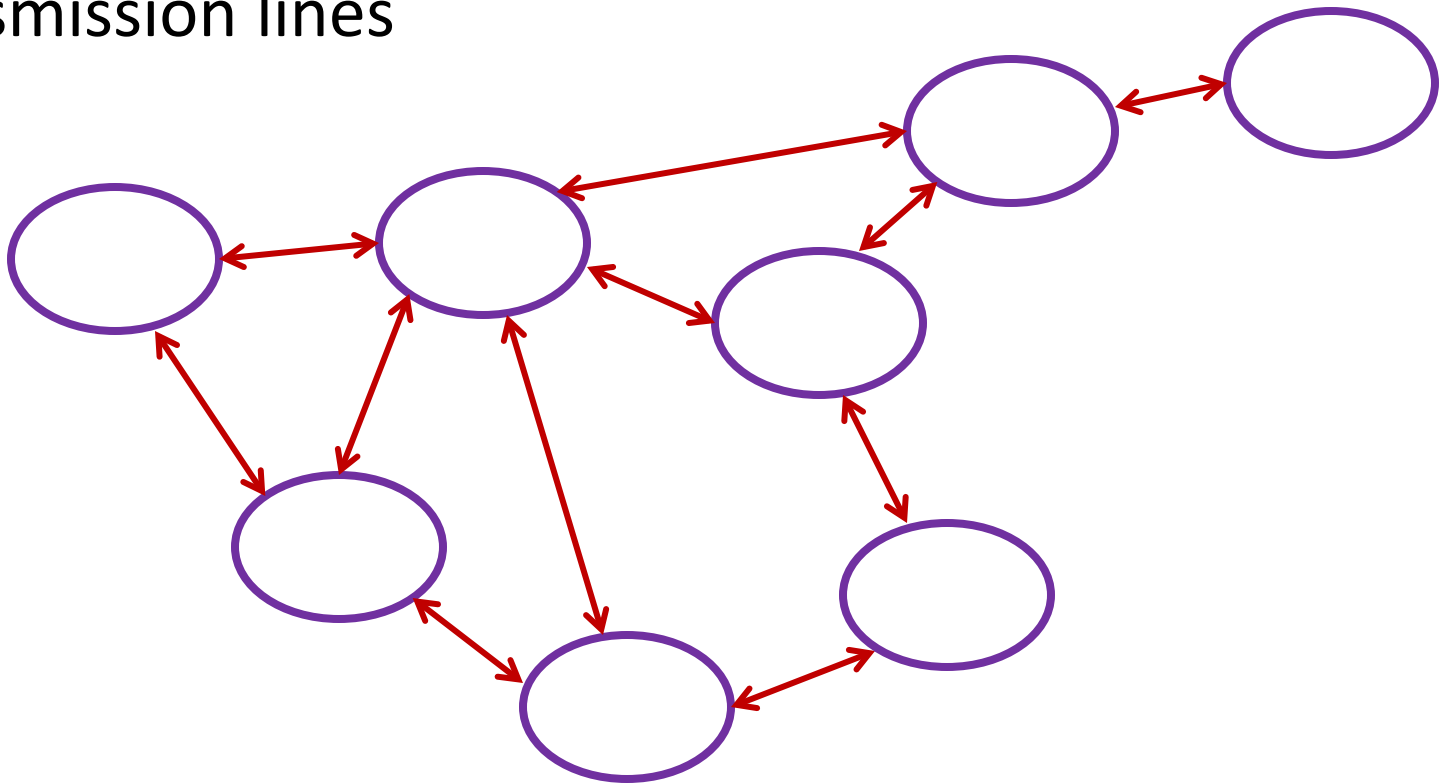
- Assess economics (prices, load impacts, generation expansion decisions) not transmission line power flows
- Produce resource expansion forecasts based upon economics over a long period of time (40 years)

The Model **Does Not**:

- Represent transmission lines, but instead represents transfer capabilities between regions
- Automatically alter transfer capability over the 40 year period (the transfer capability used is fixed)

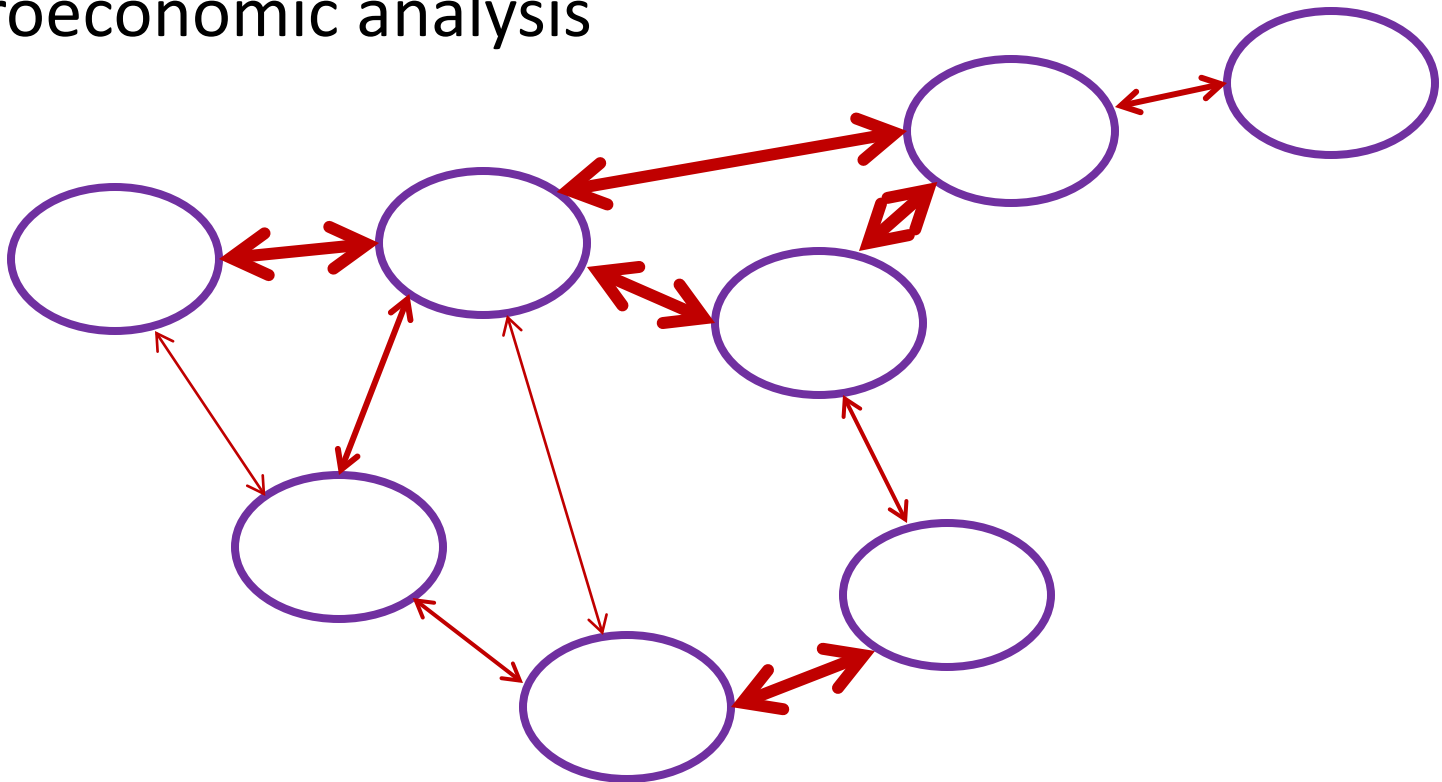
NEEM: Pipe and Bubble Example

- Red arrows depict transfer capability, not transmission lines



Pipe and Bubble Example

- Specific transfer limits can be expanded in the NEEM macroeconomic analysis



NEEM Model Initial Set-up – Step 1

- SSC provides any adjustments to the original NEEM regions
- **Resource additions** and retirements that are included in the Roll-Up case are confirmed or removed by SSC to develop the resource baseline infrastructure – e.g. removal of “less likely” resources
 - NEEM will pick resources to be added from that point
- Remember the focus of NEEM analysis is resource additions, not transmission

NEEM Model Initial Set-up – Step 2

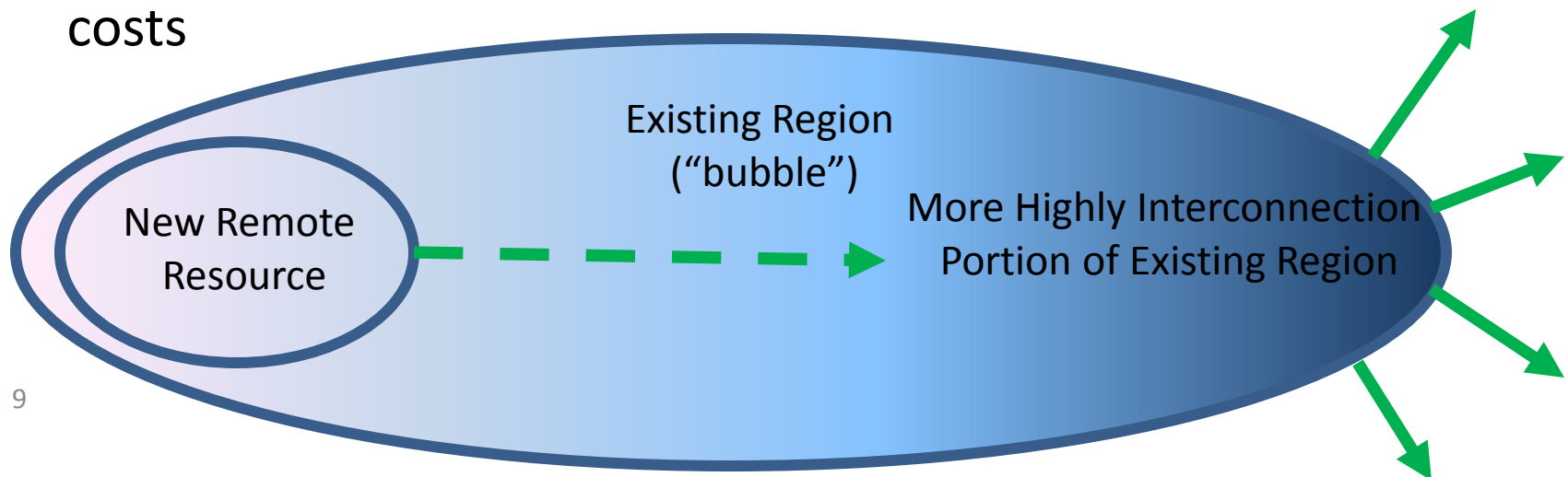
- **Transmission additions** and retirements that are included in the Roll-Up case are confirmed or removed by SSC to develop the transmission baseline infrastructure – e.g. removal of “less likely” facilities
 - EIPC calculates initial transfer limits (pipes) based upon the flowgate analysis from the Roll-Up or baseline infrastructure models using “regions” coordinated with the NEEM bubbles
 - Model solution and removal of reliability projects is a concern – to be addressed in baseline infrastructure discussion
 - Used as the same starting point for all macro runs

NEEM Model Initial Set-up – Step 3

- CRA and EIPC adjust regions and transfer limits in the NEEM model
 - SSC provided adjustments to the original NEEM regions
 - Adjust transfer limits based on the flowgate analysis
 - Used as the same starting point for all macro runs
- Transfer limit results from power flow shared with SSC and Work Groups

NEEM Model Initial Set-up – Step 4

- SSC has the option to define a resource within an existing region (bubble) but remote from the existing bulk system
 - Cost of interconnection to the bulk system added to the resource capacity cost
 - Important when there is a large difference in interconnection costs



MRN-NEEM Analysis and Possible Transmission Adjustment by SSC – Step 5

1. CRA performs the initial run of MRN-NEEM for each future macroeconomic case defined by the SSC
2. Results provided to SSC before any sensitivities are run:
 - Shadow prices for binding constraints (pipes)
 - Energy and capacity prices within regions
 - Number of binding hours on transfers between regions (pipes)
 - Average flow between regions (through pipes)
 - Future generation additions and retirements by region as bounded by all the inputs
3. SSC can determine if expanded transfer limits (pipes) are required for a particular future case, based on their assessment of the results – if so, this becomes sensitivity #1

Continue on next slide –

MRN-NEEM Analysis and Possible Transmission Adjustment by SSC – Step 5

4. CRA runs sensitivity #1 and provides results to SSC
5. SSC picks either (i) the initial starting point transfer limits used in the original future case run or (ii) those from sensitivity #1 for the remainder of the sensitivities
6. CRA proceeds with MRN-NEEM runs for the remaining sensitivities #2 through #9 using the locked down transfer limits selected by SSC after review of the results of sensitivity #1
7. EIPC will perform a high level transmission analysis of the expanded transfer limits and provide a cost estimate for transmission additions needed to reach the increased level of transfer

Questions and Discussion

