Lessons Learned and Recommendations

1) Background

The EIPC initiated a "Roll-Up" of ten-year transmission plans into one power flow model (for the year 2020), intending to use it as starting point for the transmission transfer limits between regions in the macro-economic modeling to be performed by CRA. The EIPC Roll-Up Working Group's review of the initial Draft Roll-Up data, which included descriptions of the different transmission planning processes the Planning Authorities used in the Eastern Interconnection, revealed a great deal of inconsistency among input data by the different transmission planning authorities in the EIPC. There may be valid reasons for differences, but it may also be true that some of the inconsistencies, with effort, can be eliminated.

In addition, because the EIPC Stakeholder Steering Committee did not believe that all of the proposed generation and transmission facilities included in the Roll-Up were reasonably certain to be constructed, the EIPC agreed on "baseline infrastructure criteria" to determine what standards would be applied to determine transmission transfer limits in the next stage of the EIPC process (the macro-economic modeling using Charles River Associates' MRN/NEEM model).

Note: to include reference to Baseline Infrastructure outgrowth and lessons there

2) Planning Processes
   a) The Roll-Up process, and the Roll-Up Report, revealed very useful information on the different planning processes in the Eastern Interconnection. To the extent that the EIPC process or some similar process continues in the future, the data compiled as part of the Roll-up process should be updated, and improved upon. The Regions have very different planning criteria, assumptions and processes, including the following:
      i) Annual load growth assumptions between regions were very different (-0.63% to 3% per year; in the first draft of the Roll-Up Report, they were initially -0.7% to 2.6% per year).
      ii) Describe/List different load growth estimation processes, sources, years, vintages, etc.
      iii) Energy Efficiency and Demand Response (EE/DR) assumptions are different. Some PAs develop load and energy forecasts without subtracting the effects of EE/DR, some develop net load and energy forecasts with EE/DR subtracted, and some may differentiate between passive and active EE/DR. Some Planning Authorities handle Energy Efficiency as a load adjustment and some as a resource adjustment. These differences should be described, and rationalized if possible.
      iv) Most of the planning authorities did not model the effect of demand response in its transmission planning/modeling
      v) List additional differences.
   b) The Regions do not have a standard market design. Summarize and discuss?

c) Planning Authorities do not treat the stipulated goals of state or federal laws consistently in their transmission planning process (such as state or federal energy efficiency, peak reduction, or RPS requirements).
d) There are differences in the way generation retirements and proposed new generation are handled in the planning processes among planning authorities.

3) Data
   a) Use of a shorter time horizon such as a 5 year Roll Up case to establish a Baseline Infrastructure Case would add confidence that the case is a truer representation of future conditions. This would help address stakeholders' concerns about the impact on the study of different planning processes among planning authorities.
   b) If a 5 year Roll-Up case is not used, hard cut-off criteria for the inclusion/exclusion of proposed facilities should be required to narrow differences between Roll-Up Infrastructure and Baseline Infrastructure (a/k/a Stakeholder Selected Infrastructure).
   c) Ex-ante rather than ex-post development of a rules based approach to cut off criteria before development of exercise will facilitate collaboration among stakeholders. (suggest rules to be used?)
   d) Use of a lowest common acceptable denominator (in-service date, phase of processing, etc) with an appeals process to address more specific concerns worked well in this case.
   e) Specify which facilities are in the Roll-Up data set, including use of publicly-known names like "Northern Pass". Explain which proposed facilities were excluded from the Roll-Up. Include the larger project of which the individual segment or facility is a part (i.e., identify all segments of a larger project in the description of the proposed new facility).
   f) The raw data, including the Future Project Map and Roll-Up cases, were not made available early enough for the stakeholders to have them reviewed by their experts. The linear transfer cases - and the results of the linear transfer analyses - were not provided.
   g) Include discussion of the baseline infrastructure model – how it was created, tested, and "solved".
   h) Discuss the NERC analyses performed to evaluate the Roll-Up base case and Baseline Infrastructure base case and get them to "solve" in the Siemens PSSE power flow model. What did they do to test it? NERC category A and B only? Any category C tests? How did they stress the system (i.e., the NERC "critical system stress") before they started the NERC contingency testing?
   i) Explain any changes to initial Planning Authority assumptions that were needed to develop successful Roll-up and Baseline Infrastructure Cases.
   j) Explain and discuss the "Gap Analysis".
   k) There should be a better understanding of the rationale for having data inconsistencies and different definitions among the Planning Authorities in the Roll-Up project list, to include:
      i) Some regions only included "reliability" transmission lines.
      ii) Other Regions include "multi value" or "economic" transmission projects.

iii) Some include “planned”, others “proposed”.
iv) Some reported on assumed transmission additions over 115 kV - others only over 230 kV.
v) Discuss differences in other important definitions, and terms, used in drafts of the Roll-Up report.

4) Scheduling
   a) There should be more time planned for review and comment periods among and between the various bodies: SSC, WG, and Planning Authorities. Perhaps due to perceived time constraints, the Planning Authorities were resistant to inputs by the Roll-Up WG after the initial publication of the Roll-Up report. It took EISPC to go through a process of petition in and petition out to accomplish that which the Roll-Up WG was charged with. In the future, sufficient time should be built into the schedule to allow meaningful input by the Roll-Up Working Group and the SSC before publication of the Roll-Up.
   b) Future analyses should include review and approval by SSC of WG products.
   c) Additional time should be allowed for development of the Baseline Infrastructure/Stakeholder Selected Infrastructure.
   d) Information on the linear transfer analyses and how that was “translated” into transmission transfer limits for use in the MRN/NEEM macroeconomic model was not completely provided, and the information that was provided was much too late to be useful for the stakeholders to provide meaningful input.
   e) The process used to obtain Critical Energy Infrastructure Information CEII clearance was too slow.

5) Regional/ Agency Coordination
   a) Need to understand why there is not more consistency in data and definition methodology among regions (EE, DR, etc.).
   b) Modest reforms to 890, FERC RM10-23-000, or elsewhere could provide more uniformity to the data while still permitting regional differences.
   c) It has been beneficial for stakeholders to see the Roll-up Report information, which provides a look into how other regions conduct their planning processes. This information should be used to determine if market or transmission planning changes should be considered by the Planning Authorities.

6) Transfer limits
   a) Basis for the transfer limits between regions used in the macro-economic modeling: Many questions about how this was done still exist among stakeholders. Perhaps better information other than "mutually agreed upon with neighboring areas" could have been provided. For each limit for example, it would be helpful to provide;
      i) basis or source (whether loadflow case, OASIS, PSSE MUST, other study, etc), the type of limit (voltage, stability or thermal),
      ii) the horizon years the limit is based on and the major tie lines (voltage level, from bus and to bus names) that comprise the interface in question.
      iii) The modeling (PSS/MUST, or other modeling) results.

iv) A more transparent and inclusive process should be used to explain how the linear transfer analyses that were performed were "translated" into transfer limits between the macro-economic modeling regions.

b) Interface definitions are significantly different from traditional Planning Authority interface definitions.
   i) It would be more effective if the actual line(s) comprising the new interfaces could be provided rather than using the Interface definition file to attempt explaining the composition of each interface. This would eliminate the need for stakeholders to try matching up interfaces in this exercise with the traditionally defined interfaces.
   ii) Provide more explanation and details on how the different interface definitions used in the transfer analyses were translated into transmission limits between the (different) NEEM regions.

7) Consistent definition of facilities
   a) Define clearly in advance what size level should be considered significant and require adherence to this definition by Planning Authorities.
   b) Define clearly in advance of data base development the purpose of the facilities, or
      i) Decide whether reliability, economic, and multi-value classification is necessary for this exercise.
   c) Define clearly in advance of data base development the status of the facilities e.g. planned, proposed, conceptual, and require adherence to this definition by Planning Authorities.
   d) Build adequate time in schedule for the Planning Authorities to provide uniform, quality assured data. Although this was a first ever exercise, many gaps existed in the initial data sets and were not discovered until a challenge process was initiated.
   e) Provide additional information on whether projects are "reasonably certain" to be built for the larger proposed generation and transmission facilities.