**Retrospective Analysis Guidelines Template**

**(STEPS Lookback Modeling Workshop 12/9/2015)**

Please look through and reflect on the following guidelines and questions prior to the workshop. We also welcome you to fill out or comment on the template: 1) as a reference for discussion, or 2) to return to us as feedback at the workshop (or thereafter) for (anonymous, non-attributed) incorporation into a planned workshop report.

Model name:

Modeling team (& disciplines represented):

* In a simple way, describe how the model works: what sorts of inputs are needed, the outputs of the model, and the processes that lead to a set of results. What’s the relevant timeframe? Geographic scope?
* What is the purpose of the model; for example, what sorts of questions does the model try to answer?
* Describe, if any, versions of the model as they have developed over time.
  + Were previous models addressing the same types of questions?
  + What sorts of changes were made in each model update, what was the motivation behind those changes?
  + Have the outcomes changed in the desired way through model evolution? What sorts of unexpected outcomes have arisen as a result of modeling changes, both positive and negative?
* Retrospective analysis on models comes in many forms, but a general idea is to draw on historical information (whether it be data for model baselines, calibration, or parameters, knowledge about scenarios/inputs, or outcomes amenable for comparison to model results) *to point to actions to improve modeling efforts*. Has any retrospective or lookback analysis been done, is any planned, or could any be done on the model?

*Lookback on model outcomes*

* + Are there any *a priori* expectations or intuitions about how the model may differ in its outcomes from real world values?
  + Have comparisons of outcomes with real world values been made? Could outcomes be usefully compared with real world values in the future?
  + What sorts of insights about the model did you glean from these differences (if this analysis was done) or might you expect to, and how (what methods)?

*Lookback on model inputs*

* + Has any comparison or updating of model inputs (for characterizing baselines as well as estimated parameters) been done? What’s the nature of the update (new data, new empirical work)?

*Lookback and modeling approach*

* + Have historical trends affected the modeling approach (e.g., model type) or scenarios of interest?
  + Have lookback analyses contributed insights to an understanding of or led to changes in model structure? If so, can you describe your experience or expectations of what kinds of insights?
  + How would you describe the role lookback analysis has played or could play in adding value to the model?

* \*More generally, do you consider retrospective analyses worth pursuing for your modeling efforts, and are you considering or would you consider applying retrospective analyses to modeling efforts? What kinds of purposes might be it most useful for, where less useful? How might current model iterations be affected?
* \*Better communication of modeling results, model limits, and model uses has been pointed to as a potential byproduct of undertaking a retrospective analysis in some form. The idea here is that looking back might help identify key model sensitivities but also key model limits or ‘blind spots’ – both of which are key to effectively communicating model results for broader feedback or use. This has become more important as models have grown larger in size and complexity. Has informal or formal lookback contributed to identification of key model limits or sensitivities? Does or should lookback have a role in framing communication about model results?
* \*Do you have any other comments about lookback analysis or how it might be implemented in transport energy modeling generally (or STEPS specifically)?

\*Workshop survey – We’d like your feedback/thoughts on retrospective analysis in light of the workshop and your own modeling experience and expertise.

Please take a moment to reflect on and respond to any part of the template, perhaps focusing on the last three questions above (marked with an asterisk). Or, describe key takeaways or messages about any specific themes of particular interest or import (e.g., data issues, uncertainty, error bounds/ “confidence intervals,” scenario development, role of quantitative and qualitative methods, model structure, resource constraints, communication and uses of modeling output).