

# SSGwi Economic Evaluation of Transmission Expansion

## Day-2 Modeling Workshop

September 14-15, 2004 Portland, Oregon

**BPA**



*SSGwi*

## Goals and underlying theme of today's conference:

- To improve our understanding of the analytical challenges we face in modeling long-term transmission expansion investment decisions...
- ...And, given the magnitude and scope of these challenges, share our thoughts on how vendors and users can collaborate to improve the tools and databases that will be used to aid our decision-making.

SSG-WI's October 2003 *Framework for Expansion of the Western Interconnection Transmission System* Report pointed to potential Areas of Analytical Improvement in Modeling:

- **Hydro Modeling**
- **Wind modeling**
- **Modeling of Uncertainty**
- **Modeling Resource Acquisitions**
- **Modeling Bus Bar Loads**
- **Modeling Game Theory**
- **Modeling Ownership/Property Rights**
- **Modeling Marginal Losses**
- **Modeling Uncertainty Across Space and Time - “The Curse of Dimensionality”**

## Panelists:

Jayson Antonoff

Green Energy

George Backus(not able to attend)

Policy Assessment Corporation

Luiz Barroso

PSR- Power Systems Research

Henry Chao

ABB (ASEA-Brown-Boveri)

Joe Eto

Lawrence Berkeley Lab

Carl Huppert

Henwood Energy Services

Gary Jordan

General Electric

Dale Nesbitt

Altos Management Partners

Norm Richardson

New Energy Associates

James Weber

Power World

## Moderator:

Edward G. Cazalet

The Cazalet Group

## **Panel 1 - Modeling Transmission**

**a) AC vs. DC vs. transport algorithms – What’s required for transmission expansion planning?**

**Henry Chao**                    **ABB**  
**Gary Jordan**                **General Electric**  
**James Weber**              **Power World**

**b) Bus bar loads, marginal losses, transmission-generation ownership, existing contracts – How much detail do we need to model? Where’s the data?**

**Gary Jordan**                **General Electric**  
**Norm Richardson**       **New Energy Associates**

**c) Q&A**                      **Audience & Panelists**

## **Panel 2 - Modeling Resources**

**a) Dynamic dispatch of cascaded hydro plants – What’s involved & is it necessary?**

**Luiz Barroso**

**PSR**

**Carl Huppert**

**Henwood Energy Services**

**b) Wind – Can we do a better job?**

**Jayson Antonoff**

**Green Energy**

**c) Resource-transmission adequacy/reliability – How should these issues-constraints be modeled?**

**Henry Chao**

**ABB**

**d) Gas/coal fuel supply infrastructure – Are we ignoring something?**

**Dale Nesbitt**

**Altos Management Partners**

**e) Resource expansion – hardwired scenarios or dynamic expansion logic?**

**Norm Richardson**

**New Energy Associates**

**f) Q&A**

**Audience & Panelists**

## **Panel 3 - Modeling Markets**

**a) Energy and ancillary service markets – Are real time markets enough? Do we need to model forward capacity and firm energy markets?**

**George Backus**

**Policy Assessment Corporation**

**b) Localized market power and imperfect markets – How can we simulate these effects in our models? Do our models reflect reality? What is a Nash-Cournot equilibrium?**

**James Weber**

**Power World**

**c) Q&A**

**Audience & Panelists**

## **Panel 4 - Modeling Uncertainty & The Curse of Dimensionality**

### **a) The strengths and weaknesses of scenario analysis**

**Carl Huppert**

**Henwood Energy Services**

**Dale Nesbitt**

**Altos Management Partners**

**b) Price volatility – In addition to imperfect markets, should we also incorporate load, fuel price, resource availability, hydro inflow and other “forecast” uncertainties into the internal decision logic of our models – In reality these uncertainties affect long-term resource expansion, hydro storage, annual maintenance scheduling and unit commitment decisions – so how can we model them?**

**Luiz Barroso**

**PSR**

### **c) “The Curse of Dimensionality” – The problem and potential solutions**

**Edward G. Cazalet**

**The Cazalet Group**

### **d) Q&A**

**Audience & Panelists**