

Cost-Benefit Analysis of Entergy and Cleco Power Joining the SPP RTO

Final Presentation and Summary of Findings

September 30, 2010

CRA Charles River
Associates



Introduction/Overview

- **The Cost-Benefit Analysis (“CBA”) of Entergy and Cleco Power joining the SPP RTO was performed by the Charles River Associates (“CRA”) and Resero Consulting team over a seven-month period starting in March.**
- **During this period, the CBA greatly benefited from the significant input and review provided by study stakeholders.**
 - There were open and collaborative discussions with stakeholders regarding:
 - *Study framework*
 - *Modeling approach*
 - *Input assumptions*
 - *Interim results*
 - *Qualitative concerns*
- **The findings and conclusions in the CBA are solely those of the CRA/Resero Consulting team. The opinions and views expressed in this analysis do not necessarily represent those of the Federal Energy Regulatory Commission, its Chairman or individual Commissioners, or its staff, and are not binding on the Commission.**

Alternatives Examined

- **Two alternatives were compared:**
 1. Status Quo Case
 - *Entergy and Cleco Power continue to operate as they do today*
 2. Join SPP Case
 - *Entergy and Cleco Power join the SPP RTO*
- **The study period covered 10 years, from 2013 to 2022**
- **Results were analyzed for:**
 - The SPP/Entergy region collectively.
 - *The load and generation in the current Entergy-SPP-Cleco Power transmission system footprint, including that of merchant generators and cooperative and municipal facilities.*
 - The SPP, Entergy and Cleco Power regions separately
 - *The load and generation in the transmission system footprint for each region.*

Benefits and Costs Quantified

- **Key Sources of Benefits of Entergy and Cleco Power joining the SPP RTO**
 - More efficient commitment and dispatch of generating resources leading to lower costs:
 - *Elimination of intra-SPP/Cleco/Entergy wheeling charges (depancaking)*
 - *Fully integrated regional market (e.g., joint commitment)*
 - *Entergy QF put options no longer applicable in a Day 2 market*
- **Key Sources of Costs of Entergy and Cleco Power joining the SPP RTO**
 - Additional Administrative Charges
 - *SPP Schedule 1A Charges*
 - *Internal staffing costs*
 - Lost Transmission Revenues

Net Benefits for the SPP/Entergy Region

- Entergy and Cleco Power joining the SPP RTO will yield significant economic benefits to the collective SPP/Entergy region.

**2013-2022 Benefits (Costs) to the SPP/Entergy Region
if Cleco Power and Entergy Join the SPP RTO**
(in millions of dollars; positive numbers are benefits)

	SPP/Entergy Region		
	Total Dollars	2010 Present Value	
1. Trade Benefits:			
- Decrease in Adjusted Production Costs	1,880	1,073	
- "Lost" Transmission Revenue	(451)	(256)	
<i>Subtotal</i>		1,428	817
2. Administrative Costs:			
- Additional RTO Administrative Costs net of Avoided ICT Costs	0	0	
- Additional Costs: Internal Staffing/FERC Charges	(138)	(78)	
<i>Subtotal</i>		(138)	(78)
3. Transmission Cost Allocation		0	0
Net Benefits (Costs)		1,290	739

Cost-Benefit Parameters

- **Adjusted Production Costs:**

→ Own-system generating unit costs (*fuel, variable O&M, emission allowances*)

plus “Off-system” Purchase Costs
minus “Off-System” Sales Revenue



- **Lost Transmission Revenue**

– *Wheeling charges no longer collected by transmission providers will have to be made up by additional charges to load.*

- **RTO Administrative Charges**

– *Charges assessed by SPP to run the Day 2 RTO market*

- **ICT Charges**

– *Charges incurred by SPP and paid by Entergy to run the ICT*

- **Internal Staffing Costs**

– *Costs incurred by Entergy and Cleco for additional staff and equipment to interface with RTO*

- **FERC Charges**

– *Additional FERC charges paid by Entergy and Cleco as members of an RTO*

- **Transmission Cost Allocation**

– *The allocation of RTO transmission expansion costs throughout the SPP RTO region*

CRA Modeling

- **To determine adjusted production costs, CRA used the GE MAPS model.**
 - GE MAPS is a detailed economic dispatch and production costing model that simulates the operation of the electric power system taking into account transmission topology.
 - *The entire Eastern Interconnect was modeled (i.e., all loads and generating units in the Eastern U.S. and Canada).*
 - *Outputs include hourly dispatch of generating units, transmission loading and locational marginal prices (LMPs) for all generators and load areas.*
 - Planned transmission improvements through 2022 for the SPP/Entergy regions were modeled by SPP and input into the GE MAPS model.
 - Hourly energy flows between regions and prevailing hourly energy prices from the GE MAPS simulations were used to value “off-system” purchases and sales.
- **Lost transmission revenue from depancaking was analyzed using actual data over the 2006 to 2009 period for the SPP, Entergy and Cleco transmission systems.**
 - On average, annual lost transmission revenue for the SPP/Entergy region of \$35.6 million
 - Offset by reduced wheeling costs paid by the SPP/Entergy region of \$33.4 million

Sensitivity Results

- The net benefits for the collective SPP/Entergy region remain substantially positive across the sensitivity scenarios examined.

**2013-2022 Benefits (Costs) to the SPP/Entergy Region
if Cleco Power and Entergy Join the SPP RTO**
(in millions of 2010 present value dollars, positive numbers are benefits)

Scenario	Total	Change from Base Scenario
Base	739	
<i>Sensitivity Scenarios:</i>		
• Low/High Gas Prices	540 / 858	-199 / +119
• High/Low Load Growth	713 / 758	-26 / +19
• Increased Wind in SPP	595	-144
• "Copper Sheet"	601	-138

Gas Prices: Higher gas prices increase the benefit of displacing gas through a more efficient regional RTO dispatch.

Load Growth: Load growth uses up capacity available to displace higher cost energy, reducing benefits of more efficient regional dispatch.

Increased Wind: If significant SPP wind is installed, then high cost energy is displaced throughout the region, allowing less headroom for RTO dispatch improvement. The increased wind provides significant benefits to Entergy in the Status Quo Case, potentially supporting a larger wind/transmission build-out if the SPP RTO covers a larger footprint.

Copper Sheet: Elimination of constraints allows for a more efficient Status Quo dispatch allowing less headroom for RTO improvement.

Net Benefits by Region

- The net benefits to the individual SPP, Entergy and Cleco Power regions if Entergy and Cleco join the SPP RTO are also positive, before consideration of transmission cost allocations.

2013-2022 Benefits (Costs) to the SPP, Entergy and Cleco Power Regions if Cleco Power and Entergy Join the SPP RTO, excluding Transmission Cost Allocation
(in millions of 2010 present value dollars; positive numbers are benefits)

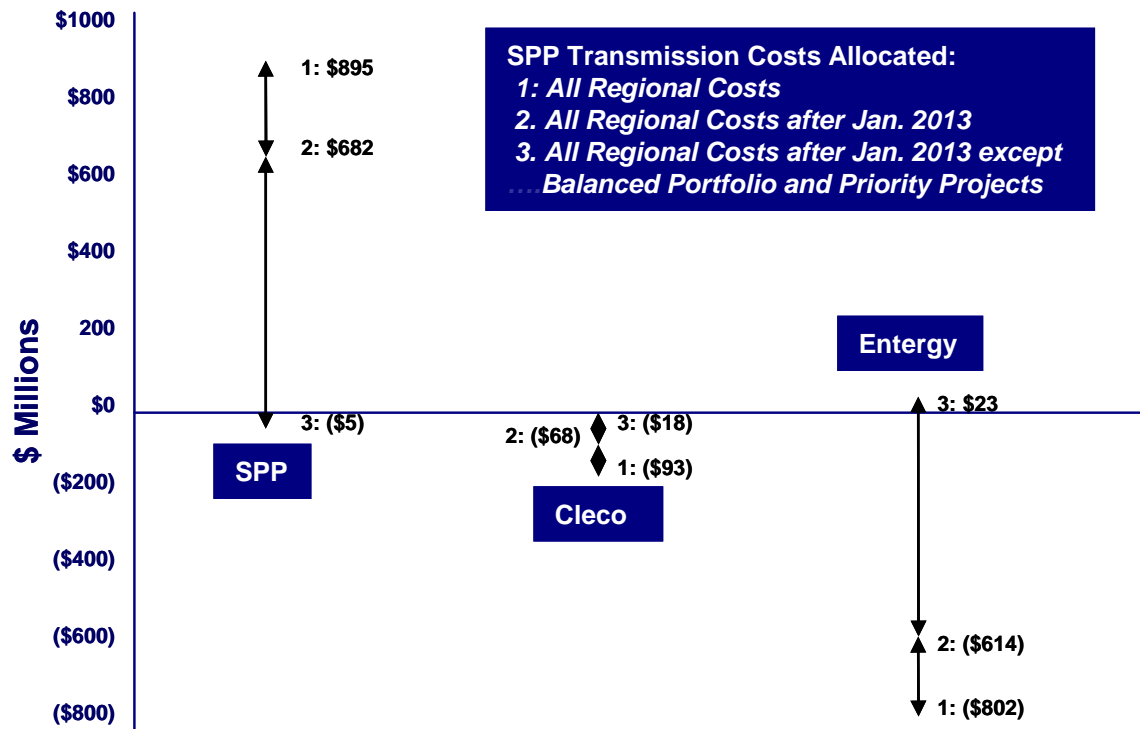
	SPP	Cleco	Entergy	Total
Trade Benefits	143	80	594	817
Admin Costs: RTO Administrative Costs net of Avoided ICT Charges	189	(25)	(164)	0
Admin Costs: Internal Staffing/FERC Charges	0	(12)	(65)	(78)
Subtotal Net Benefits	332	43	364	739

- The benefits to the Entergy and SPP regions remain substantially positive (exclusive of transmission cost allocation) across the sensitivity scenarios examined.
- The benefits to the smaller Cleco region are more heavily impacted by the changes in assumptions and become negative in three of the six sensitivities conducted.

Potential Transmission Expansion Cost Allocation

- SPP estimated the sharing of transmission expansion costs under three different approaches.

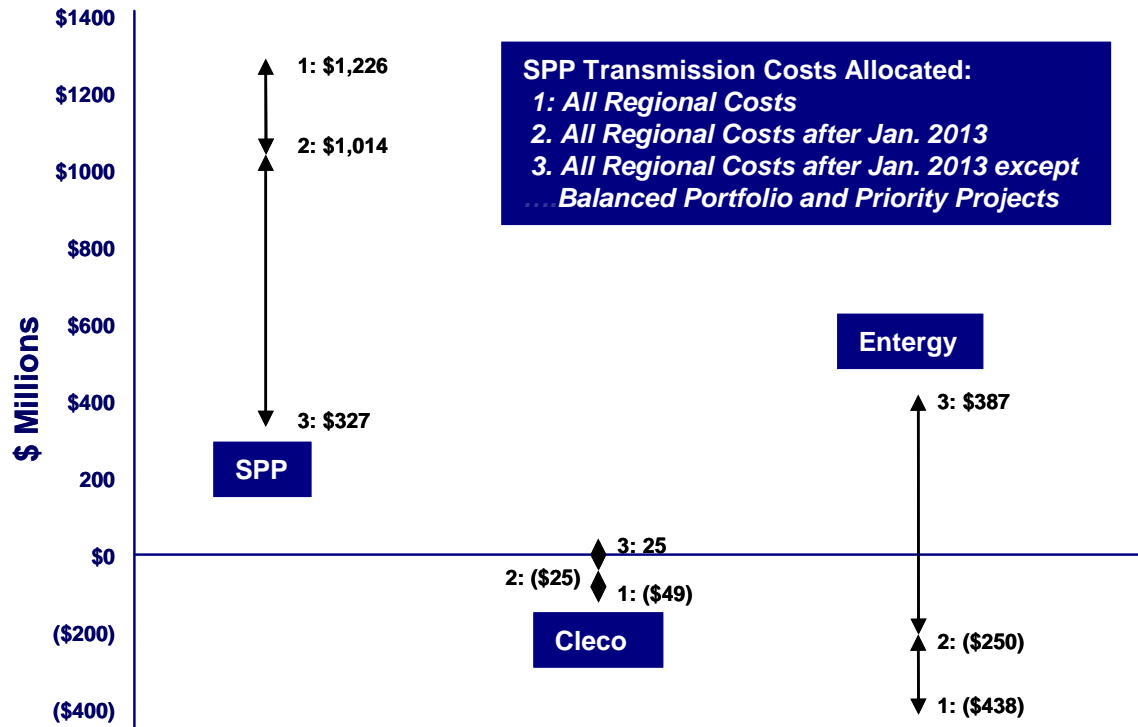
2013-2022 Transmission Cost Allocation Benefits (Costs) to the SPP, Entergy and Cleco Power Regions if Cleco Power and Entergy Join the SPP RTO
(in millions of 2010 present value dollars; positive numbers are benefits)



Net Benefits by Region including Transmission Cost Allocation

- The resulting net benefits to each region of Entergy and Cleco joining SPP vary depending on the transmission cost allocation approach.

2013-2022 Net Benefits (Costs) to the SPP, Entergy and Cleco Power Regions if Cleco Power and Entergy Join the SPP RTO
(in millions of 2010 present value dollars; positive numbers are benefits)



Qualitative Findings

- **To inform the CBA qualitative assessment led by Resero Consulting, a number of sources were used:**
 - Key documents
 - *Entergy and SPP OATTs*
 - *WPP and ICT working group materials*
 - Discussions with stakeholders
 - Written stakeholder comments

- **Qualitative issues examined included:**
 - Efficiency
 - Competitiveness
 - Transparency
 - Administrative burden and costs

Qualitative Findings

- **Substantial qualitative benefits were found to accrue to the Entergy and Cleco Power transmission customers as well as to SPP, including:**
 - Improved operational transparency
 - Improved competitiveness via resolution of base case overload issues
 - Improved efficiency through resolving various ICT and WPP issues
 - Improved transmission planning and interconnection process
 - Potentially lower regulation and capacity reserve requirements

Qualitative Findings

- **However, additional costs were also found to accrue primarily to the Entergy and Cleco Power, including:**
 - Cost risks associated with transmission system access
 - Day-2 market transitional risks
 - Imposition of SPP's governance structure
- **The qualitative analysis also recognizes that some of the impacts associated with the *Join SPP Case* may be achieved by continued actions of the E-RSC without Entergy's formal inclusion in SPP.**

Next Steps

- **A number of CBA “Addendum Studies” are on-going or planned:**
 - “EAI only” joins the SPP RTO
 - “Cleco Power only” joins the SPP RTO
 - Sensitivity studies planned:
 - *Changes to GE MAPS modeling inputs, including inter-regional hurdle rates and QF treatment*
 - *Entergy/EAI joining the Midwest ISO*
 - *Entergy/SPP depancaking only*
 - *Entergy/Cleco depancaking only*
 - *Climate change/carbon legislation*
 - *Delay in SPP Day 2 market*