



Eastern Interconnection Planning Collaborative

Eastern Interconnection Transmission Analysis Phase 1: Summary Phase 2: Status Update

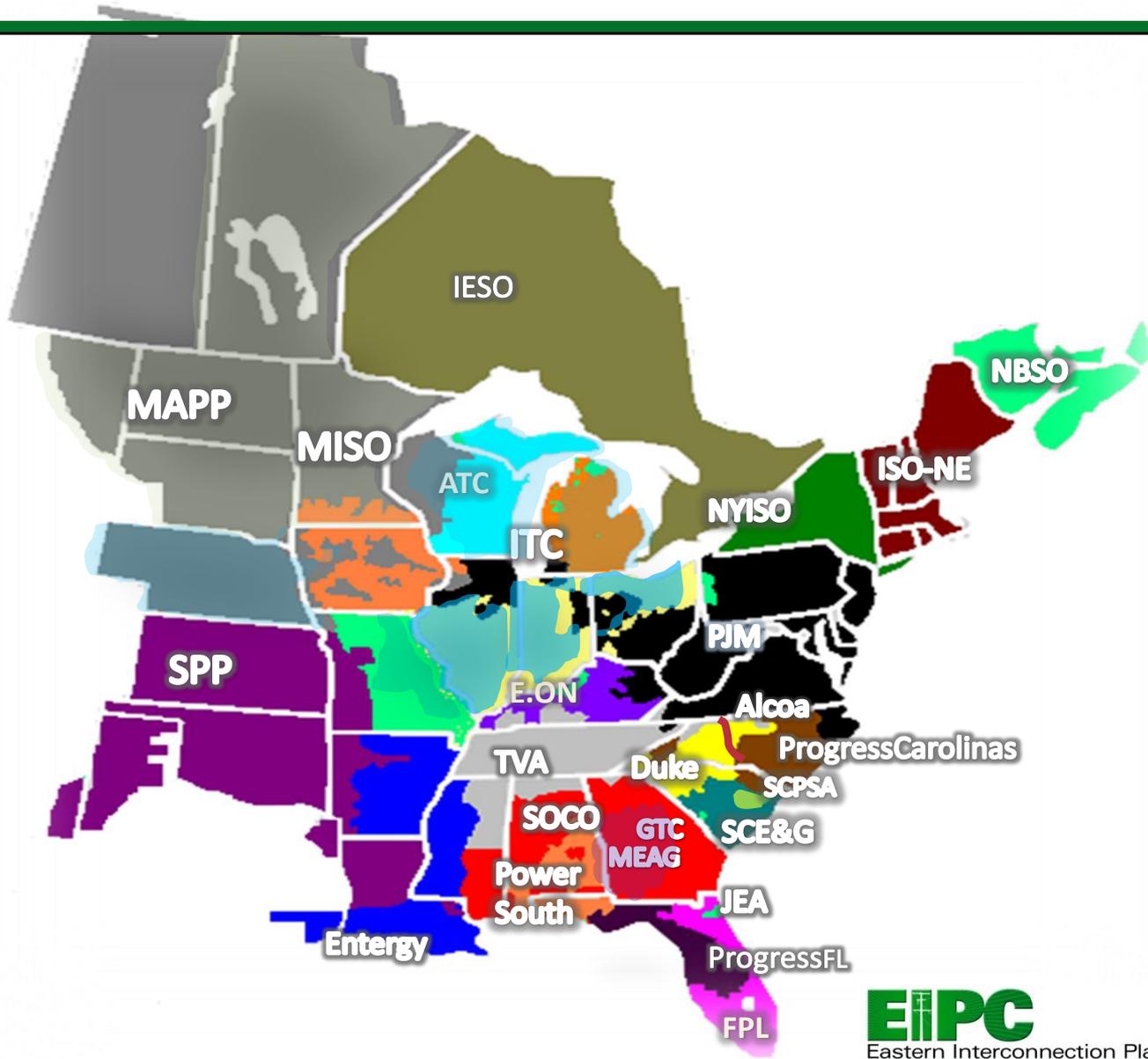
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**Joint IPTF/ESPWG Meeting
February 27, 2012
Albany, NY**

We have come a long way ...

- EIPC formed in the Spring of 2009
 - 26 Planning Authorities participated in 2011 – more than 95% U.S. customers in the Eastern Interconnection covered
 - DOE Interconnection Studies Project occupied EIPC's entire effort in 2010 and 2011
- The stakeholder process is functioning in a robust and active manner
 - Consensus based
 - Active and intense dialog
- An excellent working relationship has been established between the states (EISPC) and EIPC
- Phase 1 analysis is complete and an interim report was filed with DOE in December 2011

Planning Authorities in the Eastern Interconnection



Project Objective

The objective of the project is to prepare analyses of transmission requirements for the Eastern Interconnection under a broad range of alternative futures and develop long-term interconnection-wide transmission expansions in response to the alternative resource scenarios selected through the stakeholder process.

The process does not supplant the existing FERC Order 890 approved regional planning processes, rather the information gained from this project should help inform the 890 regional processes going forward.

Approach

- Two Phases
 - Identify possible future resources based on stakeholder policy inputs (Phase 1) then study possible transmission to support those future resource scenarios (Phase 2)
- No Optimization
 - Result is a transmission expansion for potential future resource mixes, but project scope and schedule prevent optimization
- Intention
 - What the future might bring under various energy policy alternatives and input assumptions, rather than what we believe will happen and is “the answer.” Will develop transmission options for each resource scenario—NOT a “plan”
- Desired Results
 - To provide technically sound input and information to policy makers and to provide feedback to regional planning processes (“bottom-up”)

Project Status

- Phase 1 Completed in December, 2011
- Phase 1 Report Final – posted at http://www.eipconline.com/Resource_Library.html
 - Lists eight resource futures
 - Lists three scenarios chosen for Phase 2
 - Includes observations and guidance for future studies
- Phase 2 Process Documents and Schedule Complete
- Transmission Options Task Force (TOTF) has been formed
- Phase 2 Model Development is Underway

Phase 1 Resource Expansion Futures

1. “Business as Usual”
 - This Future assumes that present trends continue into the future based on historical indices
2. Federal Carbon Constraint: National Implementation
3. Federal Carbon Constraint: Regional Implementation
4. Aggressive Energy Efficiency, Demand Response, Distributed Generation and Smart Grid
5. National RPS: National Implementation (top down)
6. National RPS: State and Regional Implementation
7. Nuclear Resurgence
8. Combined Federal Climate and Energy Policy Future

Three Scenarios: For Phase 2 Analysis

“Business As Usual”

No new policies or regulations on carbon, no new RPS, no new EPA regulations [F1S17]

“National RPS”

Regionally Implemented 30% National RPS [F6S10]

“Combined Federal Climate and Energy Policy”

National carbon constraint with 42% reduction in 2030 and 80% in 2050, 30% national RPS, increased Energy Efficiency/Demand Response/Distributed Generation/SmartGrid [F8S7]

Installed 2030 EI Capacity by Type: 3 Scenarios

		Installed Capacity in 2030		
		F1S17	F6S10	F8S7
	Total	BAU	Hard	Flat
	2010	Base	Limit	CO2
Coal	272	199	178	10
Nuclear	100	105	105	134
CC	133	202	157	208
CT	120	132	134	66
Steam Oil/Gas	75	36	38	4
Hydro	45	45	52	50
On-Shore Wind	19	68	159	261
Off-Shore Wind	0	2	38	2
Other Renewable	4	14	37	12
New HQ/Maritimes	0	0	1	5
Other	17	17	17	17
Total w/o DR	783	818	916	770
DR	33	71	71	152
Total w/DR	816	889	987	923
Peak Demand		718	700	586

Installed 2030 Capacity by Region

	New Builds			New CCs			New On-Sh Wind			Coal Retire		
	F1S17	F6S10	F8S7	F1S17	F6S10	F8S7	F1S17	F6S10	F8S7	F1S17	F6S10	F8S7
	BAU	Hard	Flat	BAU	Hard	Flat	BAU	Hard	Flat	BAU	Hard	Flat
	Base	Limit	CO2	Base	Limit	CO2	Base	Limit	CO2	Base	Limit	CO2
ENT	4	2	4	3	1	3	0	0	0	1	1	8
FRCC	16	9	31	13	4	11	0	0	0	1	1	9
IESO	5	5	5	1	1	1	2	2	2	6	6	6
MAPP_CA	2	5	4	2	0	0	0	0	0	1	2	2
MAPP_US	2	7	9	0	0	0	1	6	9	1	1	4
MISO_IN	5	1	20	3	0	8	0	0	11	1	1	15
MISO_MI	4	3	14	0	0	5	3	2	9	4	4	11
MISO_MO-IL	3	3	20	0	0	5	0	0	13	2	2	14
MISO_W	10	18	71	0	0	4	9	18	68	3	3	13
MISO_WUMS	6	14	8	4	0	4	1	1	3	3	3	8
NE	1	3	16	0	0	0	0	2	16	0	0	3
NEISO	9	8	9	2	2	2	5	4	5	3	3	3
NonRTO_Mid	1	1	6	1	0	6	0	0	0	1	2	10
NYISO_A-F	4	4	7	1	1	1	4	3	6	2	2	2
NYISO_G-I	1	0	0	1	0	0	0	0	0	0	0	0
NYISO_J-K	3	3	1	1	1	1	0	0	0	0	0	0
PJM_E	7	16	7	5	5	5	1	1	1	3	4	4
PJM_ROM	12	14	6	2	2	2	7	7	1	8	11	16
PJM_ROR	20	61	37	8	3	22	9	54	12	20	25	60
SOCO	10	14	21	8	5	12	0	0	0	9	11	25
SPP_N	3	11	42	2	0	0	0	11	42	0	1	8
SPP_S	7	26	43	2	0	0	3	24	41	2	2	13
TVA	8	10	8	4	1	6	0	0	0	5	6	15
VACAR	20	48	25	11	3	11	4	4	4	6	11	20
	165	286	416	75	30	108	49	141	243	82	102	270

2030 Energy Source: 3 Scenarios

- El generation as a percent of demand, El energy demand , and El CO₂ emissions are shown below for 2030

	BAU	Reg RPS	Nat'l CO2
	F1S17	F6S10	F8S7
CC	25%	13%	26%
Coal	38%	33%	0%
Nuclear	22%	23%	35%
On-Shore Wind	5%	13%	27%
Off-Shore Wind	0%	4%	0%
Hydro	5%	6%	8%
Total (Note1)	96%	91%	96%
Demand (TWh)	3702	3609	3008
<i>Change from BAU</i>		-3%	-19%
CO2 (MilMetricTons)	1716	1316	264
<i>Change from BAU</i>		-23%	-85%

Note 1: Does not include Steam Oil/Gas, New HQ/Maritimes, and Other Resources

Phase 2 – Transmission Analysis

- New Stakeholder Task Force for Technical Interface – ***Transmission Options Task Force (TOTF)***
 - NY Stakeholder Members: Diane Barney, Erin Hogan
 - NYISO Participants: John Buechler, Zach Smith
- The Study Year is 2030
 - Transmission options to meet reliability standards for three scenarios
 - Focus on 230kV and above
 - Consider HVAC and HVDC solutions
- Develop Transmission Options for Each Scenario (Task 7)
- Conduct Transmission Reliability Analysis for Each Scenario (Task 8)
- Perform a Production Cost Run for Each Scenario (Task 9)
- Estimate the Costs for Generation and Transmission Expansion (Task 10)
- Phase 2 – Scheduled to be Completed in 2012

- Deliverable:
 - ! **Transmission options to support each of the resource scenarios. NOT a “Plan.”**

Task 7: Transmission Options

PA Activities

- Developing a ***data set*** for each Scenario prior to load flow solution (Step 9)
- Set-up ***initial load flow*** for each Scenario (Initial Case Development) (Step 10)
- Perform ***gap analysis***, develop initial concepts for transmission additions, and possibly solve load flow for each Scenario (Step 11)

TOTF Activities

- Meetings: Jan 10-11th ; Feb 22-23rd
- Webinars: Nov 4th ; Jan 26th ; Feb 9th

Step 7: Model Development Status

	S1B1	S1B13	S2B1	S2B13	S3B1	Description
Step 9	Complete	Complete	Complete	Complete	Complete	Data Sets
Step 10	Complete	In-Progress	In-Progress	In-Progress	In-Progress	Initial Load Flow Case
Step 11	In-Progress	Not Started	Not Started	Not Started	Not Started	Gap Analysis

Phase 2 Schedule Update

Step	Activity	Original Schedule	Feb 23 rd Revision
9 to 11	Data, Load Flows, Gaps	Through 3/2/12	N/A
12	TOTF Meeting	2/22-23/12	N/A
13	Initial New Transmission	2/27/12 to 4/13/12	TBD
14	TOTF Meeting	3/28/12	TBD
15	SSC Meeting	4/17/12	TBD
16	Incorporate Feedback	4/23/12 to 5/11/12	TBD
17	TOTF Meeting	5/15/12	TBD
18	Final Transfers, Mods	5/21/12 to 6/1/12	TBD
19	Additional Feedback	6/4/12 to 6/8/12	TBD
20 to 26	Final Mods, Final Rx Testing, Final Cases	6/11/12 to 8/10/12	TBD

Questions and Discussion

