Eastern Interconnection Planning Collaborative

Interconnection-Wide Planning in the Eastern Interconnection

EIPC Update for the
DOE Electricity Advisory Committee
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Presentation Topics

- Update on process and structure
- Study results so far
- Value unlocked
- What's next

Update on Process and Structure

- EIPC – 26 EI Planning Authorities (Planning Coordinators)
  - Integrate and analyze approved regional plans
  - Develop interregional expansion scenarios to be studied
  - Develop interregional transmission expansion options
  - Consistent with Orders 890 and 1000
  - Self-funded
- Primary activity is DOE funded interconnection studies project – 2 phases

Who are the PAs?

- Alcoa Power Generating
- American Transmission Co.
- Duke Energy Carolinas
- Electric Energy Inc.
- Entergy *
- Florida Power & Light
- Georgia Transmission Corp.
- IESO (Ontario, Canada)
- International Transmission Co.
- ISO-New England *
- JEA (Jacksonville, Florida)
- LG&E/KU
- MAPPCOR *
- Midwest ISO *
- Municipal Electric Authority of Georgia
- New Brunswick ISO
- New York ISO *
- PJM Interconnection *
- PowerSouth Energy Coop.
- Progress Energy – Carolinas
- Progress Energy – Florida
- South Carolina Electric &Gas
- Santee Cooper
- Southern Company *
- Southwest Power Pool
- Tennessee Valley Authority *

*Principal investigators on DOE Project

DOE Project – Primary Tasks

Phase I

- Establish an open and inclusive Stakeholder process
- Complete an integration of existing Regional plans for the year 2020 to form an interconnection-wide model
- Develop potential “resource futures” (for time beyond 2020) through economic analyses conducted at the macro-level

Phase II

- Complete interconnection-wide transmission analyses to develop a transmission topology that supports stakeholder defined scenarios

DOE Project Status

- The stakeholder process is functioning in a robust and active manner
  - 29 member Steering Committee
  - Consensus based
  - Active and intense dialog
- The interface with the states (EISPC) is operating smoothly
- Phase I analysis nearing completion
  - Integrated load flow model for 2020 created
  - Resource “future” analyses for 2030 - 77 of 80 runs complete
  - Stakeholder choice of 3 scenarios near completion

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Phase I Study Results

- Integrated regional planning case for 2020
  - Also, a modified case based on stakeholder specifications
- Resource expansion futures for 2030
  - 8 futures defined
  - Policy driven input assumptions
  - Sensitivities to test input assumptions
  - Macroeconomic capacity expansion modeling
- Choice of 3 scenarios for transmission analysis based on the 2030 futures

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

Example Results – Future 2

- Eastern Interconnection capacity in 2030 is shown below by region for Future 2 in comparison to Future 1 "Business as Usual"

	Cum New Builds 2030				Cum New CCs 2030				Cum New On-Sh Wind 2030				Cum Coal Retire 2030			
	F1S3	F2B	F2S1	F2S2	F1S3	F2B	F2S1	F2S2	F1S3	F2B	F2S1	F2S2	F1S3	F2B	F2S1	F2S2
	BAU	Fed	75%	25%	BAU	Fed	75%	25%	BAU	Fed	75%	25%	BAU	Fed	75%	25%
	Base	CO2	Soft	Soft	Base	CO2	Soft	Soft	Base	CO2	Soft	Soft	Base	CO2	Soft	Soft
ENT	4	9	7	5	3	8	6	4	0	0	0	0	1	8	8	8
FRCC	16	30	32	31	13	12	13	13	0	0	0	0	1	8	8	9
IESO	5	5	5	5	1	1	1	1	2	2	2	2	6	6	6	6
MAPP_CA	2	4	5	5	2	0	0	0	0	0	0	0	1	2	2	2
MAPP_US	2	6	7	8	0	0	0	0	1	5	6	8	1	3	3	3
MISO_IN	5	57	60	3	4	14	16	1	0	42	42	0	1	11	11	11
MISO_MI	3	8	4	2	0	5	2	0	3	3	3	2	4	11	11	11
MISO_MO-IL	2	30	16	8	0	1	0	0	0	27	14	6	2	13	13	13
MISO_W	9	34	62	111	0	1	0	0	9	33	62	111	3	13	13	13
MISO_WUMS	10	18	16	27	4	6	7	25	1	11	8	1	3	6	6	6
NE	1	13	17	27	0	0	0	0	0	13	17	27	0	3	3	3
NEISO	9	9	9	9	2	2	2	2	5	5	5	5	3	3	3	3
NonRTO_Mid	1	6	6	7	1	5	5	4	0	0	0	0	1	9	8	9
NYISO_A-F	4	10	14	10	1	1	1	1	4	10	13	9	2	2	2	2
NYISO_G-I	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0
NYISO_J-K	3	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
PJM_E	7	7	7	7	5	5	5	5	1	1	1	1	4	3	3	3
PJM_ROM	12	6	6	7	2	2	2	2	7	1	1	1	8	16	16	16
PJM_ROR	20	71	44	33	8	28	24	20	9	40	16	9	20	54	53	52
SOCO	10	23	17	14	8	12	12	12	0	0	0	0	9	24	23	23
SPP_N	3	31	60	68	2	1	0	0	0	28	59	67	0	7	8	8
SPP_S	8	45	43	46	2	4	0	0	3	38	41	44	2	13	13	13
TVA	8	11	11	11	4	9	9	8	0	0	0	0	5	15	15	15
VACAR	20	28	29	28	11	15	15	15	4	4	4	4	6	19	19	19
	165	465	480	474	75	135	121	114	49	263	294	297	82	251	251	251

High Level Transmission Analyses

- Estimates of cost for increased inter-regional transmission capability provided by PAs
- Building block approach

Case	Total Miles of Transmission	Cost Estimate Range ($ billiion)	
		Low End	High End
Future 2	10,757	34.1	48.8
Future 3	1,171	1.7	2.7
Future 5	13,613	39.2	58.3
Future 6	650	2.1	3.1
Future 8	11,648	36.7	51.1

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Value of Interconnection Study Project

Observations of value from Phase I:

- Stakeholder process – balanced representation
- States process created through EISPC
- Interregional coordination and discussion
- Development of interregional 2020 case – what stakeholders believe and do not believe
- Education on planning processes, tools, language, study results, etc.
- Discussion on how to create a “20 year out” case

Challenges of Interconnection Study Project

- Dealing with integrating resource analyses and transmission analyses – previously known, but under appreciated
- Realizing you can't model everything at the same time
- Understanding how changes in input assumptions change the results
- Accommodating diverse input on what is important
- Translating detailed results into understandable statements that individuals see as valuable

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Phase II – Transmission Analysis

- Phase II will be conducted in 2012
- 3 Scenarios chosen by stakeholders will be analyzed:
  - The study year will be 2030
  - Transmission additions required to meet reliability standards
  - Focus on 230kV and above
  - Include a production cost run for each resulting system
  - Include an estimate of the costs for generation and transmission expansion in each scenario

Phase II – 3 Scenarios

1. National Carbon Constraint with Increased Energy Efficiency/Demand Response/Distributed Generation/SmartGrid
2. Regionally Implemented National RPS
3. "Business As Usual" – no new policies/ regulations on carbon, no new RPS, no new EPA regulations

For More Information …

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Questions and Discussion