Overview of Task 9 Activity for EIPC Production Cost Modeling

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Overview

- CRA is using the GE MAPS model to evaluate the 2030 production cost of Scenarios 1, 2, and 3, along with six additional sensitivities.
  - GE MAPS is a detailed economic dispatch and production cost model that simulates the operation of the electric power system taking into account transmission topology.
  - The model footprint comprises the Eastern Interconnect, and includes the generating units and the transmission load flow and flowgates for each scenario from Tasks 7 and 8.

- Using the EIPC stakeholder-approved input assumptions into GE MAPS as approved in July, and the results of Task 7 and 8, CRA has completed modeling of:
  - S3 Base (Business as Usual)
  - S2 Base (National RPS – State/Regional Implementation)
  - S1 Base (Combined Federal Climate and Energy Policy)

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High-Level Summary of Results

- Generation by Capacity Type for the EI in 2030 is shown below for S1 Base, S2 Base, and S3 Base
  - Overall results are fairly close to the Phase 1 Results
  - These updated results for S1 Base and S3 Base are very close to the preliminary results discussed at the SSC meeting on September 20.

	Generation (TWh)			% of Total Supply		
	S1 Base	S2 Base	S3 Base	S1 Base	S2 Base	S3 Base
Coal	40	1,095	1,399	1%	30%	38%
Nuclear	1,087	875	886	36%	24%	24%
CC	755	532	831	25%	15%	23%
CT	39	32	43	1%	1%	1%
Steam Oil/Gas	6	13	15	0%	0%	0%
Hydro	211	228	193	7%	6%	5%
On-Shore Wind	722	476	217	24%	13%	6%
Off-Shore Wind	6	92	6	0%	3%	0%
Other Renewable	65	253	66	2%	7%	2%
Pump Storage Net	-8	-6	-4	0%	0%	0%
DR	4	0	1	0%	0%	0%
Total Generation	2,927	3,590	3,653	98%	99%	99%
External Supply	51	31	34	2%	1%	1%
Total	2,979	3,621	3,687	100%	100%	100%

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High-Level Summary of Results

- Production Costs, Emissions, and Wind Curtailment for the EI in 2030 is shown below for S1 Base, S2 Base, and S3 Base
  - Wind is curtailed when prices (LMPs) at the unit's location falls below $1/MWh.

Production Costs (M$)			
	S1 Base	**S2 Base**	**S3 Base**
Fuel	41,442	73,789	85,057
Variable O&M	6,430	15,502	18,411
Total	47,871	89,291	103,469
CO2	45,340	126	154
Total w/CO2	93,212	89,416	103,622
Emissions (short tons)			
	S1 Base	**S2 Base**	**S3 Base**
SO2 (000)	93	873	1,122
NOx (000)	21	1,300	1,771
CO2 (millions)	358	1,391	1,792
Wind Curtailment			
	S1 Base	**S2 Base**	**S3 Base**
Wind Curtailment (TWh)	131	30	1
Percent Curtailed	15%	5%	0%

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High-Level Summary of Results

- Wind curtailment by NEEM region in S1 Base takes place predominately in three regions.

	Potential Wind Energy	Generated Onshore Wind Energy	Generated Offshore Wind Energy	Curtail-ment	Wind Generated as % of Demand	Curtail-ment Percent
ENT	1	1	0	0	0%	30%
FRCC	0	0	0	0	0%	
MAPP_US	32	28	0	4	97%	12%
MISO_IN	28	28	0	1	32%	2%
MISO_MI	24	24	0	0	27%	0%
MISO_MO-IL	32	23	0	8	25%	26%
MISO_W	261	196	0	65	150%	25%
MISO_WUMS	9	9	0	0	16%	1%
NE	55	33	0	22	109%	40%
NEISO	18	16	2	0	15%	2%
NonRTO_Midwest	0	0	0	0	0%	
NYISO_A-F	19	18	0	1	33%	5%
NYISO_G-I	1	1	0	0	4%	0%
NYISO_J-K	0	0	0	0	0%	
PJM_E	6	2	4	0	2%	1%
PJM_ROM	6	6	0	0	4%	0%
PJM_ROR	44	43	0	1	9%	1%
SOCO	0	0	0	0	0%	
SPP_N	146	125	0	21	163%	15%
SPP_S	148	143	0	5	92%	3%
TVA	0	0	0	0	0%	0%
VACAR	9	9	0	0	4%	0%
IESO	17	15	0	2	12%	13%
MAPP_CA	1	1	0	0	3%	0%
EI	859	722	6	131	24%	15%

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High-Level Summary of Results

- Wind curtailment by NEEM region in S2 Base takes place predominately in VACAR.

	Potential Wind Energy	Generated Onshore Wind Energy	Generated Offshore Wind Energy	Curtail-ment	Wind Generated as % of Demand	Curtail-ment Percent
ENT	0	0	0	0	0%	0%
FRCC	0	0	0	0	0%	
MAPP_US	25	25	0	0	69%	2%
MISO_IN	1	1	0	0	1%	0%
MISO_MI	9	9	0	0	8%	0%
MISO_MO-IL	3	3	0	0	2%	0%
MISO_W	86	81	0	5	48%	5%
MISO_WUMS	4	4	0	0	6%	0%
NE	9	9	0	0	22%	1%
NEISO	15	14	2	0	12%	0%
NonRTO_Midwest	0	0	0	0	0%	
NYISO_A-F	11	11	0	0	18%	0%
NYISO_G-I	0	0	0	0	1%	0%
NYISO_J-K	0	0	0	0	0%	
PJM_E	36	2	34	0	28%	0%
PJM_ROM	21	21	0	0	13%	0%
PJM_ROR	143	142	0	0	26%	0%
SOCO	1	1	0	0	0%	
SPP_N	40	39	0	1	40%	3%
SPP_S	93	90	0	4	46%	4%
TVA	0	0	0	0	0%	0%
VACAR	81	6	56	19	21%	24%
IESO	17	17	0	1	12%	3%
MAPP_CA	1	1	0	0	2%	2%
EI	598	476	92	30	16%	5%

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Next Steps

- SSC to identify six sensitivities to be conducted
- Complete sensitivities and issue results to stakeholders

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