

Entergy Arkansas, Inc. 2018 Integrated Resource Plan



Follow-Up Materials
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entergy-arkansas.com/IRP

Follow-up Materials to the 2018 IRP Stakeholder Meeting

The following information is provided as a supplement to the information presented during the June 6th Stakeholder Meeting and in response to stakeholder questions and feedback received.

Responses are grouped by category as presented and discussed during the Stakeholder Meeting.

Any additional requests for information may be sent to EAI at EAIRP@entergy.com.

2018 Integrated Resource Plan

FOLLOW-UP MATERIALS - RESPONSE SET 4

DSM Programs

- What is the meaning of “based on percentage of compliance with APSC EE goals”?
 - “Percentage of compliance with APSC EE goals” refers to compliance with APSC EE goals for self-direct customers. The provided savings represent the remaining potential. Additional detail is provided in the following slides.
- Do the portfolios represent scenarios in which EAI would offer EE programs to SD customers?
 - Yes, as designed by ICF.

DSM Programs

- What methodology was employed to quantify the number, peak demand and annual energy consumption of SD customers in the Low and High portfolios?
 - The number and annual energy consumption of self-direct customers were provided by EAI. ICF then used the annual energy consumption and applied it to a representative industrial load shape to develop the peak demand.

DSM Programs

- What methodology was employed to quantify the energy and demand savings of the SD customers in the Low and High scenarios?
 - The overall potential modeling approach was a bottom-up approach in which a set of industrial EE measures were modeled to quantify the overall energy and demand savings for the EAI self-direct customers. The two cases were modeled based on assumptions around compliance with APSC EE goals for self-direct customers. The provided savings represent the remaining potential.
 - In the high case ICF assumed that self-direct customers achieve 25% of the APSC EE goals on their own and in the low case assumed they achieve 50% of the APSC EE goals. For example, if the annual APSC goal for 2019 was 1% of electricity sales, ICF assumed that customers will achieve 0.25% of their 2019 consumption on their own without any energy efficiency programs in the high case.

DSM Programs

- What methodology was employed to quantify the incremental program costs of the Low and High portfolios?
 - As stated in the prior response, the two scenarios reflect the remaining potential for self-direct customers under two EE goal compliance rates. All other inputs including those required to develop program costs (\$/kWh) for both incentive and non-incentive costs were assumed to be the same between two scenarios.
- Please explain any differences between the Low and High portfolios pertaining to the cost per kWh savings assumptions.
 - See the prior response. The cost per kWh savings assumptions are not different.

DSM Programs

- Why are the Low/High EE portfolios described on Slide 84 restricted to scenarios of increased participation of Industrial customers as opposed to scenarios that allow for a general expansion of or additions to the Reference Case programs that are assumed to be operating through the planning horizon, as stated on Slide 51?
 - In response to feedback received during the 2015 IRP, EAI's Stakeholders requested that future model runs include DR and EE options for comparison to traditional supply-side resources. The referenced Low/High EE Portfolios were designed by ICF and are intended to represent stand-alone opportunities for demand-side resources available to meet future capacity needs in the AURORA capacity expansion model. This potential resource is distinct from EAI's existing EE portfolio, including a growth assumption, which is accounted for in the sales and load forecast. It is by design that these resource assumptions are distinct in order to prevent the possibility for double-counting.
 - Any actual future programs would be required to go through an RFP process and could differ from the program design contemplated in the current IRP's modeling.

DSM Programs

- Slide 86 presents the annual MW savings for the Low/High EE portfolios for the 2020 Start Date. Please provide the corresponding annual GWh savings and expenditures for both portfolios.
- Refer to the tables below.

Year	Low EE Portfolio (GWh)	High EE Portfolio (GWh)
2020	4.8	13.6
2021	7.0	24.5
2022	9.2	35.4
2023	10.9	41.5
2024	15.1	48.9
2025	20.7	56.9
2026	28.9	67.6
2027	40.3	81.6
2028	53.2	97.5
2029	66.7	114.2
2030	78.7	129.6
2031	94.8	149.0
2032	110.6	168.6
2033	126.4	187.9
2034	139.5	203.9
2035	144.7	210.3
2036	148.9	214.6
2037	149.1	216.9
2038	150.3	218.9
2039	150.8	221.4

**Annual GWh savings are cumulative*

Year	Low EE Portfolio (2020\$MM)	High EE Portfolio (2020\$MM)
2020	\$ 0.89	\$ 2.52
2021	\$ 0.41	\$ 2.04
2022	\$ 0.41	\$ 2.04
2023	\$ 0.74	\$ 2.36
2024	\$ 1.04	\$ 2.65
2025	\$ 1.35	\$ 2.98
2026	\$ 2.06	\$ 3.67
2027	\$ 2.84	\$ 4.45
2028	\$ 3.29	\$ 4.93
2029	\$ 3.78	\$ 5.38
2030	\$ 3.79	\$ 5.44
2031	\$ 4.72	\$ 6.33
2032	\$ 4.75	\$ 6.37
2033	\$ 4.93	\$ 6.65
2034	\$ 4.63	\$ 6.19
2035	\$ 3.55	\$ 5.28
2036	\$ 3.37	\$ 4.94
2037	\$ 2.82	\$ 4.56
2038	\$ 2.86	\$ 4.44
2039	\$ 2.68	\$ 4.31

**Annual program costs are incremental*

DSM Programs

- Please confirm that the Low/High EE portfolio energy/capacity savings and expenditures are incremental to the respective Reference Case MW and (260) GWH savings, and expenditures.
 - Yes; the referenced EE portfolios are prospective in nature and are incremental to existing program savings and expenditures.
- Slides 88 and 91 state that in the Reference Case and Low Growth Future the incremental Energy Efficiency Portfolio at the low level was selected (DSM Potential). What quantitative criterion was employed to select the Low portfolio instead of the High portfolio, or neither?
 - For the referenced futures, AURORA's Capacity Expansion model 1) identified the Low EE portfolio as an economic resource, and 2) identified the Low EE portfolio as more economic than the High EE portfolio. This was determined by evaluating the total cost of the portfolio against its capacity credit and production cost savings values.

DSM Programs

- Slide 94 states that in the Higher Growth Future the incremental Energy Efficiency Portfolio at the high level was selected. What accounts for the selection of the High EE portfolio in the Higher Growth Future but the Low EE portfolio in the Low Growth Future, assuming that both EE portfolios, by policy, could not be approved unless the net benefits were positive, i.e. they would have to reduce the cost of service.
- Given the varying input assumptions for each future, AURORA's Capacity Expansion model selected the most economic demand-side resource available. This outcome is logical given that the assumptions in the Higher Growth Future would drive higher LMPs, such as high gas and CO₂ prices, which would then increase the value of the production cost savings resulting from the EE (i.e. higher avoided energy cost).

DSM Programs

- Does the quantitative criterion employed to select a particular EE portfolio alternative account for the present value of the energy and capacity savings over the useful life of the EE measures?
 - Yes; the model takes the benefit over the entire useful life of the programs into account when making the selections.

Resource Planning

- Slide 6 on the Set 2 Follow-Up Materials shows that Independence Unit 1 would be deactivated in 2030. What does Entergy's reference case modeling assume for Independence Unit 2? When does Entergy expect Unit 2 to be deactivated?
 - The assumptions for Independence Unit 2 are the same as the assumptions shown in the IRP materials for Independence Unit 1.
- Did Entergy Arkansas model Independence Unit 2 at all, and if not, why not?
 - Independence Unit 2 is included in the AURORA model used in development of the IRP. Since EAI does not own Independence Unit 2, it is modeled as a market unit like any other non-EAI owned generator in the modeling footprint.

Resource Planning

- Slide 10 makes clear that environmental capital costs have not been included in the modeling done to date. Stakeholders may request additional modeling. Please provide both the capital and O&M compliance costs for each of the environmental requirements for which Entergy expects costs to be incurred for its generation units through 2030, and provide the approximate date on which costs are expected to be incurred.
- The referenced compliance costs are not available. That said, these costs would not impact the portfolios resulting from the capacity expansion modeling and would only impact the total production cost for each portfolio, which has yet to be completed.

Resource Planning

- Will the AURORA model select a low cost energy resource if no capacity need exists?
 - No; EAI's objective is to plan resources to reliably serve its customers at the lowest reasonable cost while balancing risk. To achieve this objective, the AURORA Capacity Expansion model has been configured to select/build resources based on capacity need. The AURORA model has also been configured to evaluate DSM resources based on economic merit to allow selection in AURORA regardless of capacity need.

Resource Planning

- What is the import capacity from SPP? How much is currently imported from SPP?
 - No import capacity from regions outside of MISO (e.g. SPP) is modeled in the AURORA model used to develop EAI's capacity expansion because that assumption is not needed to develop and evaluate resource portfolios to meet EAI's customers' needs. The IRP process is designed to identify the type and amount of resources that best meet EAI's customers' needs under a range of potential future outcomes, and not the location or structure of the specific resources.
 - According to MISO's website, imports from SPP to MISO (not just EAI) were approximately 625 MW per hour in 2017. That being said, that value is not necessarily representative of SPP generation being imported into MISO (not just EAI); it potentially includes loop flows between MISO regions.