

# EAC Research Questions

## ***What are South Carolina’s options for rate structures that better accommodate distributed energy resources while maintaining a modern, affordable and reliable grid?***

- (1) How does the basic facilities charge on the typical electric power tariff in South Carolina reflect the actual fixed costs of providing service?
  - a. What components do utilities currently include in the basic facilities charge, by utility?
  - b. What would a statewide average “base facilities cost” on a per customer basis, by rate class, look like that included the following components, as reported by utilities in filings with FERC or through equivalent reporting to other agencies:
    - i. Distribution Expenses- Operation
    - ii. Distribution Expenses – Maintenance
    - iii. Transmission Expenses – Operation
    - iv. Transmission Expenses – Maintenance
    - v. Generation Expenses – Operation (as the EAC deems appropriate)
    - vi. Generation Expenses - Maintenance (as the EAC deems appropriate)
    - vii. Customer Accounts Expense
    - viii. Customer Service and Information Expense
    - ix. General Expense
    - x. Administrative Expenses
    - xi. Interest Expense
    - xii. Principle Repayment – Long Term Debt
    - xiii. Depreciation
    - xiv. Required Margin or Allowed Return on Equity (calculated by different methods)
      - How should margin or its equivalent be measured for this calculation?
      - What is the weighted average cost of capital for the transmission and distribution components?
      - Should there be a leverage adjustment to the cost of capital based on the proportion of Long-Term Debt?
      - Should there be a capacity utilization adjustment, taking into account increasing and decreasing returns to scale and recognizing required capacity margins, to fixed costs?
  - c. How do the “basic facilities charge” and “base facilities cost” compare, as a statewide average, to data available from cost of service studies performed by utilities, where available?
  - d. For the purposes of a statewide comparison, which of the components or portions of the components in (b) would the EAC include in a minimum cost of infrastructure to provide service?
- (2) What alternative rate schedules could be available for consideration that better accommodate distributed generation technologies?

- a. What could a rate schedule look like that incorporates a “base facilities cost” as defined in (b) above, or as otherwise defined by the EAC ?
    - i. What would the impact of such a rate schedule be on an average monthly bill for a residential, commercial and industrial customer?
      - What would the variation of that be for an example lower and higher use customer within each rate class (what are the demographics of groups that tend to be lower and higher users of electricity within each rate class)?
      - What percentage of the bill for each of these examples is attributable to the “base facilities cost” as opposed to variable charges?
    - ii. What programs do other states have for low income consumers to help offset charges like the “base facilities cost”?
    - iii. How does electricity usage in rural and low density areas compare to electricity usage in more urban areas?
      - a. How would this be measured?
      - b. How would this make the average monthly bill for these customers look different?
  - b. What are some other options for rate schedules that better accommodate distributed generation technologies, including but not limited to the following examples?
    - i. Net billing
    - ii. Partial decoupling
    - iii. Net metering and interconnection updates
    - iv. Standby fees
    - v. Options in use by other states
- (3) At what point will retail rate parity for solar distributed generation be reached?
- (4) How do the characteristics of various forms of generation compare to those of distributed energy resources?

<b>Technologies to Compare</b>		
<b>Traditional</b>	<b>Renewable</b>	<b>Other Resources</b>
Natural Gas – Simple Cycle	Hydro – Impoundment	Demand Response
Natural Gas – Combined Cycle	Hydro – Run of River	Short Term Storage (<1 hour)
Nuclear – Existing	Biomass	Medium Term Storage (1-6 hours)
Nuclear – Future	Biogas	Long Term Storage (>6 hours)
Coal – Older Plants	Solar – PV	Energy Efficiency
Coal – Modern Plants	Solar – Thermal	Other Grid Benefit Technologies
Hydro – Pumped Storage	Solar – Concentrated	
	Solar - Distributed	
	Wind - Offshore	
	Wind - Onshore	
	Wind - Distributed	

- a. How do the generation characteristics of each of these types of technologies compare?
  - i. How do the generation characteristics of each of these types of technologies fit into the existing overall load duration curve of each utility?

- ii. What would the costs and benefits be from a distributed solar generation penetration percentage of 2%, 5%, 10%, 20%, 30% and 50% on each utility's system? What is it forecasted to look like for each of these penetrations of distributed solar generation in 2018 and 2023?
      - iii. What are some emerging technologies that may impact this analysis in the near future, including but not limited to the following examples?
        - "Plug and Play" renewables
        - Storage
    - b. What are some estimates, provided by utilities or publicly available sources, for the cost range per kWh to construct and operate each type of facility?
    - c. How do agencies such as the EPA attempt to quantify environmental costs and risk?
    - d. How can these technologies be ranked based on the following characteristics as compared to a simple cycle gas turbine?
      - i. Availability
      - ii. Reliability – Generation
      - iii. Reliability – Operational
      - iv. Correlation to Load
      - v. Capital Cost
      - vi. Operational Costs (including O&M, Fuel and Dispatch Costs)
      - vii. Impact on System Production Costs
      - viii. Environmental Cost
      - ix. Diversity
- (5) How does the Integrated Resource Planning process work for South Carolina utilities?
- a. How does/could an Integrated Resource Planning process in South Carolina incorporate the variety of technology options discussed in (4)?
- (6) What experience have other states had with the establishment of a REC market to meet Renewable Portfolio Standards or Energy Efficiency Portfolio Standards and how does this impact the viability of such a market in South Carolina?
- a. How do states operate REC certification, verification and tracking programs?
  - b. What are the average costs of these programs?
  - c. Does a market exist for out of state RECs?
  - d. Is there a potential market for in state RECs outside of utilities?
- (7) How does distributed generation through third-party sales of electricity interface or interact with the legal obligation to serve in South Carolina?
- a. What is the historical reasoning behind a utility's legal obligation to serve in South Carolina?
  - b. What impact would distributed generation have on these legal obligations to serve?
- (8) Regarding H.3425 specifically, what impacts would this bill have on South Carolina utilities in the areas of load, revenue, fuel savings, avoided system costs, diversification, and legal obligation to serve, as well as on the utility's choice of business model ?