



Thermoelectric Water Demand Technical Work Group Meeting Conference Call Summary

January 23, 2013 from 10 am-12 pm CST

The following summary was prepared by CDM Smith and is intended to capture the general topics, and discussion that was held and is not intended to be a verbatim transcription of the conference call. The following individuals participated in the call:

Stephen Cain – Arkansas Electric Cooperative Corporation
Greg Carter – American Electric Power
Tina Burt- Entergy
Bill Davis- CDM Smith
Mitch Horrie – CDM Smith
Terry Pugh – CDM Smith

The meeting began at 10 am CST time and followed the agenda.

Conclusions drawn from the Meeting

- Overall CDM Smith's suggested methodology as present in the Draft Thermoelectric Demand Forecast Paper is acceptable. Areas of further data exploration and analysis were noted and discussed.
- The U.S. Energy Information Administration (EIA) Annual Energy Outlook 2012 is the best source for projecting future statewide power generation needs.
- It is appropriate to establish projected statewide power needs and, in turn, thermoelectric water demand forecasts using the reference case, low growth, and high growth production scenarios by fuel type as developed by the EIA. However, it is recommended that the Work Group review of the assumptions used to create these scenarios in order to grant final approval. Furthermore, CDM Smith will begin analyzing the data to develop statewide power generation projections for the Group to review prior to forecasting water demands.
- Literature-based gallons per megawatt/kilowatt-hour rates should be approached with caution. In general the Group expressed confidence in a few known sources. CDM Smith will prepare a data table comparing the rates of withdrawal and consumption by fuel type/prime mover/cooling type combination for the Group to review.
- Water demand for power plants with once-through cooling should be tracked differently than other power plants. That is to say, regardless of level of power generation, a constant rate of withdrawal occurs at these facilities. Thus, it was recommended by the Group to assume that baseline withdrawals for once-through facilities remain constant into the future.
- The Group has provided industry information pertaining to recent acquisitions of power plants and how these acquisitions are likely to change operations at these facilities compared to past operations. For example, increased production at KGEN (now Hot Spring Energy Facility) compared to the past.
- The Group provided information on the specific cooling operations at a few facilities that warrants consideration with respect to how we characterize withdrawal and consumption rates.

The remainder of the summary provides the discussion items that support the above conclusions and overall direction provided to CDM Smith.



Opening Remarks/Review of Draft Thermoelectric Demand Forecast Paper:

- The overall purpose of this conference call is to obtain support from the Thermoelectric Water Demand Technical Working Group to have CDM Smith begin the development of the scenarios and assumptions, and completion of the draft thermoelectric water demand forecast.
- Goal is to determine best historical and current data to use for the creation of the baseline. This will incorporate the creation/establishment of best assumption/forecast method.
- The energy-based water demands will be developed first at the state-level and allocated to counties. Source of supply will be maintained in all calculations and reporting.

Questions:

- Is the EIA outlook report generated from information submitted by SERC and SPP?
 - EIA data is generated from submitted information. However, the Energy Outlook report develops production scenarios using different sets of assumptions that account for things like policy and regulations, fuel price, and demand for electricity.
 - Back checking EIA report information against SERC and SPP information is recommended.
 - CDM Smith will verify the validity of data by back checking all gathered information against any available specific data provided by suppliers.
- Is the use of the multi-scenario forecasting (expected, medium, low and high) the best methodology?
 - Yes, this captures the information in a manner that is similar to other water demand calculations performed by other water sectors in the State.
 - In 2014, Entergy will be joining the Midwest ISO (MISO). Need to determine if EIA has accounted for this in their production projections. This change in alignment may cause a change in operation time for some power plants.
- What range of water withdrawal data is being utilized?
 - The current level of data is for 2000 through 2010.
- Are there any anticipated changes in power generation?
 - Arkansas Electric Cooperative Corporation acquired Hot Spring Power Project. They anticipate a future increase in operations.
 - Entergy Services, Inc. acquired KGen Hot Spring Generating Facility. They anticipate a future increase in operations.
- Is the information in the Arkansas Thermoelectric Power Plant Summary (Excel Spreadsheet) accurate?
 - The Group has provided comments and additional information to this list that will be incorporated into the water demand forecast.
 - The method of tracking water demand for once-through cooled power plants should be changed to account for the fact that the water withdrawals do not directly correlate with energy produced. Most once-through cooling systems withdraw water at a steady rate. The exception occurring during cooler weather operation. Basically assume water demand does not change regardless of energy produced.
 - Possibly use 0.35 gallons per kWh as a rate of water consumption.
- What is the timeline for producing the draft forecast?
 - The preliminary numbers will be developed in the next couple of months with input being sought from the Group.
 - The draft forecast will be published in May/June.
 - Sharing the draft forecast with other stakeholders is anticipated to occur after the draft is published.



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- Would visiting power plants be valuable to understand operation and water usage correlation?
 - Both Stephen (Arkansas Electric Cooperative Corporation) and Greg (Southwest Electric Power Company) offered to provide power plant tours if there is interest.
- Are there other valid sources of information available for use? Goal is to obtain the most accurate data available.
 - Water Use
 - The EPA has a database with published wastewater flow rates by month.
 - ADEQ data may be available online from their website. This information can be used to back check EIA information.
 - Arkansas Electric Cooperative Corporation may have river consumption data.
 - It is important to keep in mind that recent reports may not contain accurate representation of data due to the intent of the report or the lack of understanding of individuals who created reports.
 - Future Power Generation
 - Likely, most power plant companies will not be willing to share Energy Planning/Forecasting information.
 - Air quality permits to identify planned facilities
 - New draft State Energy Plan (December 2012).
 - CDM Smith will look at this report for information regarding possible future renewable energy production regulations. Information will be annotated in report.
- Is there any information that could affect the forecasting of water demands?
 - Cost of fuel could affect production levels of natural gas power plants.
 - EPA rules regarding coal may affect the level of production from coal versus natural gas plants.
 - At combined-cycle facilities, natural gas turbines generate twice the amount of power as steam turbines. Steam turbines require more water for cooling than gas turbines.
 - CDM Smith is aware of this and will incorporate it into the water demand forecast.

Assumptions:

- Plants will continue to operate in the future the same as the past (e.g., base-load will continue to operate as base-load, peaking as peaking), unless specific information indicates otherwise.
- All water sources will remain the same into the future unless specific information indicates otherwise.
- If future power generation needs (i.e., projections) exceed capacity of existing and known planned facilities, assumptions must be made with respect to location and type of new/unplanned capacity.
 - In general, the Group favored assuming that unplanned capacity, if needed, be assigned to locations/water sources associated with existing generating capacity. In essence, this assumes that it is most likely/most appropriate to assume that existing facilities will expand capacity and utilize existing



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sources of water supply rather than speculate about new locations and new sources of water supply.

- Regulatory
 - Future CO₂ regulations will impact water demands. No assumptions can be made at this time, as there is inadequate data available regarding what future regulations will be and when they will come into effect. Annotations will be made in report to document this issue.
- Are there any plans for renewable energy development?
 - Not enough to produce any noticeable shift in current power plant production. Small production may occur via biomass. Wind energy production of any significance is not likely in Arkansas.

Additional Questions/Discussion Items

- Can the ANRC Water-Use Registration data be shared with the Thermoelectric Water Demand Technical Working Group members?
 - CDM Smith will check into any proprietary issues. If there are no issues, CDM Smith will share the database information.
- Greg has provided estimates regarding Turk Plant water withdrawals as this plant has not been in operation long enough to establish a baseline from the Water-Use Registration data.

Summary of Action Items:

- CDM Smith will provide the Group with a link to the EIA Energy Outlook 2012 Report. The Group can review this report and, specifically, the assumptions used to develop power production scenarios by fuel type. Overall, the Group supported this report as the basis for projecting future statewide power generation. However, further comments on these scenarios and their applicability for water demand forecasting are encouraged following a review.
- CDM Smith will prepare a data table showing gallons/MWh withdrawal and consumption by fuel type/prime mover/cooling type combination as identified in the literature. Further, CDM Smith will explore empirical data (e.g., WUDBS, EPA, ADEQ, EIA) as a cross check of these sources. This table will be provided to the Group for review and final assumptions will be made.
- CDM Smith will inquire with ANRC if Water-Use Registration data can be shared with the Group. If so, CDM Smith will provide these data to the Group for review.
- CDM Smith will look for indicators of new generating capacity that should be incorporated into the water demand forecast. We will look for air quality permits with ADEQ as well as with the Public Service Commission.
- CDM Smith will review the State Energy Plan to identify if specific benchmarks, milestones, mandates, etc. need to be incorporated into the water demand forecast.

The call concluded at 12:00 pm.