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September 14, 2020

VIA ELECTRONIC SUBMISSION

Kent A. Chandler
Acting Executive Director
Kentucky Public Service Commission
211 Sower Blvd.
Frankfort, KY 40601

RE: ***Electronic 2018 Integrated Resource Plan of Louisville Gas and Electric Company and Kentucky Utilities Company***
Case No. 2018-00348

Dear Mr. Chandler:

On September 10, 2020, Commission Staff filed a memorandum documenting the Informal Conference of September 4, 2020. The memorandum references the PowerPoint presentation used by representatives of Louisville Gas and Electric Company and Kentucky Utilities Company at the Informal Conference, but inadvertently omits the PowerPoint presentation in the filing. A complete and accurate copy of the PowerPoint attachment in enclosed with this letter.

In accordance with 807 KAR 5:001, Section 8, I certify that the electronically filed documents are a true and accurate copy of the same documents that will be filed in paper medium; that the electronic filing has been transmitted to the Commission on September 14, 2020; that there are currently no parties in this proceeding that the Commission has excused from participation by electronic means; and that the original of this filing, in paper medium, will be delivered to the Public Service Commission within 30 days following the end of the state of emergency announced in Executive Order 2020-215.

Should you have any questions, please feel free to contact me at your convenience.

Yours very truly,

Kendrick R. Riggs

KRR:ec
Enclosure as mentioned
cc: Parties of Record

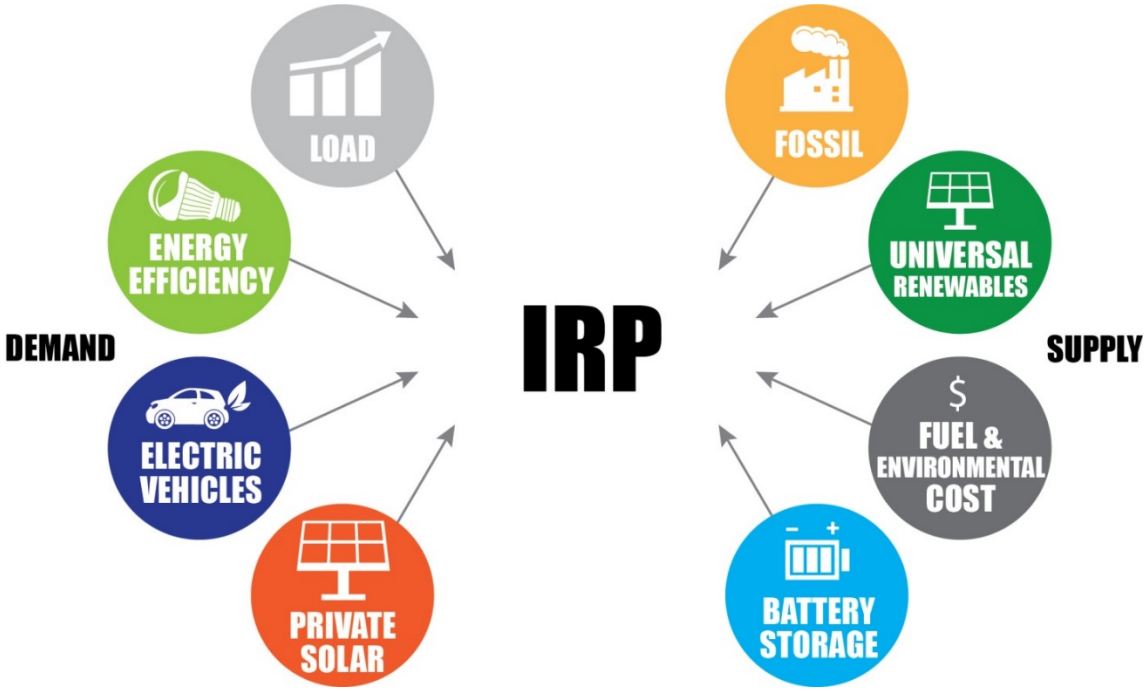
Overview of 2018 IRP

Informal Conference
Kentucky Public Service Commission
September 4, 2020
Case No. 2018-00348

LG&E KU
PPL companies

What is integrated resource planning?

A holistic approach to understanding customers' future electricity needs and identifying the best technologies to reliably and economically meet those needs

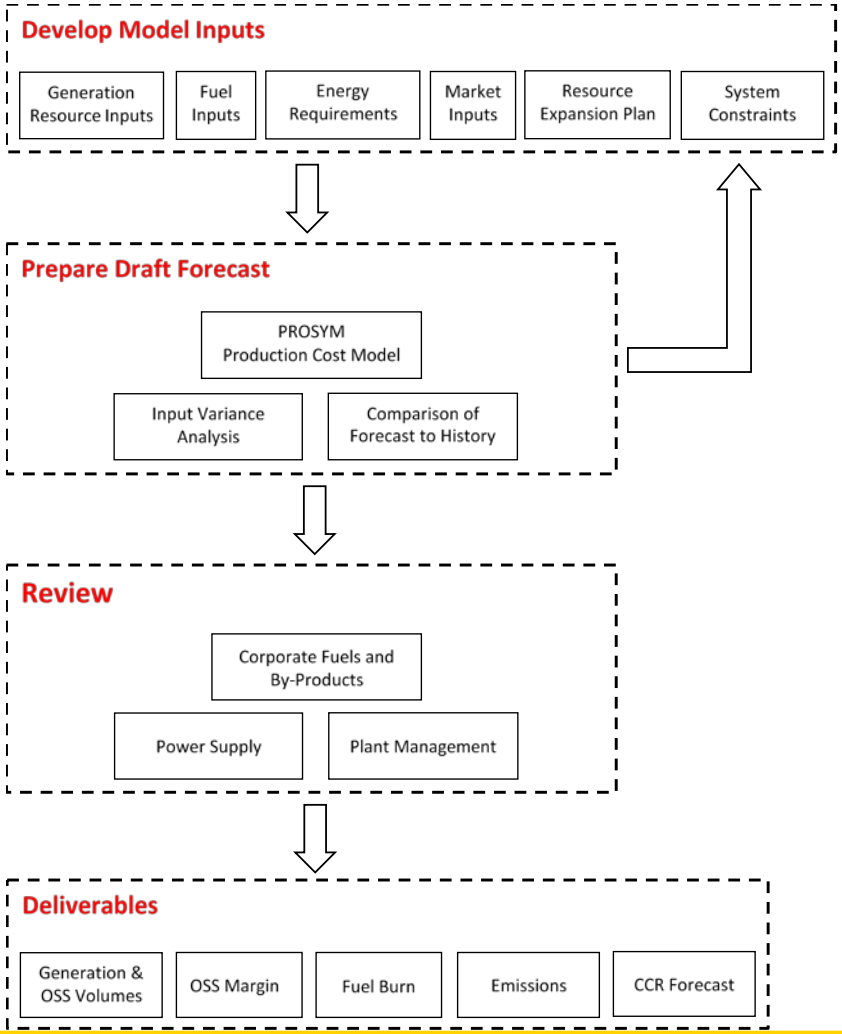


In addition to IRP documents, Company provides generation planning methodology documents in other proceedings

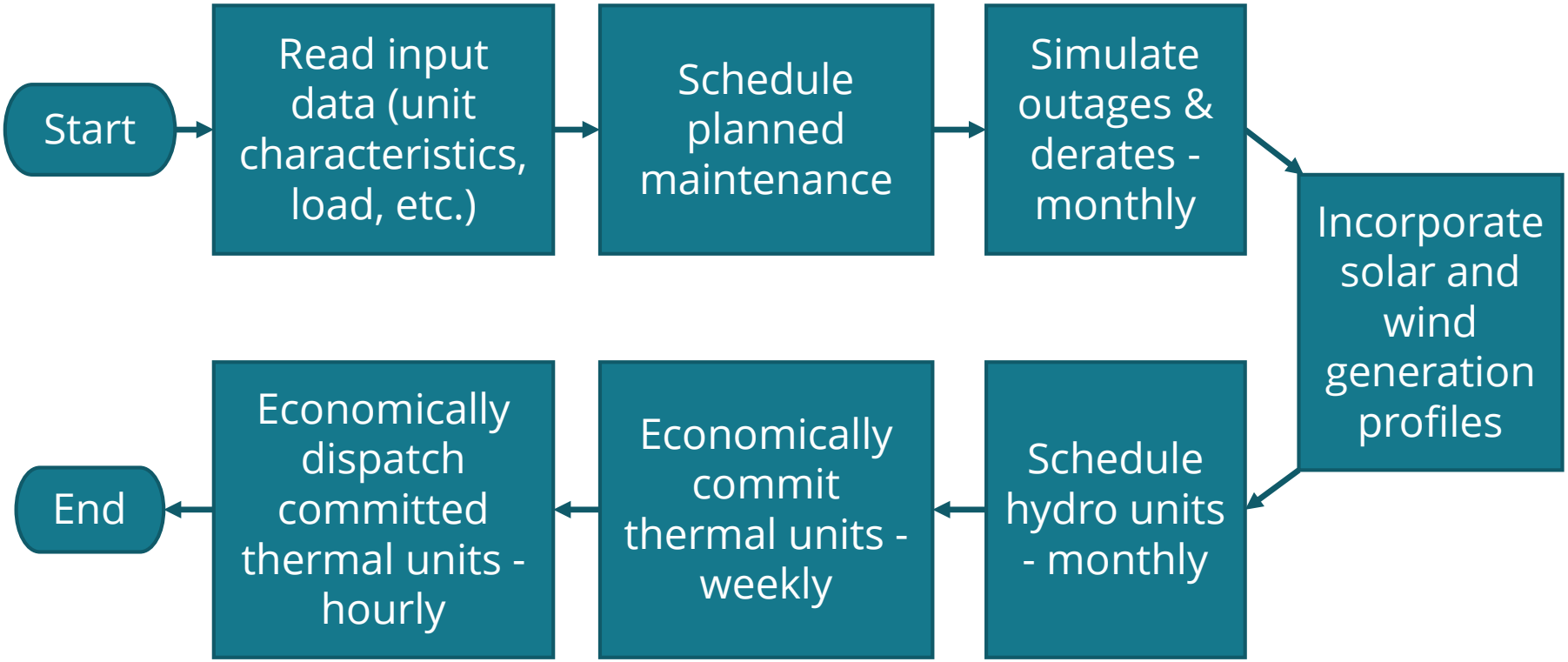
Generation
Forecast Process

PPL companies

Generation Planning & Analysis
2020



PROSYM is a chronological simulation model that optimizes unit commitment and dispatch to meet an electric system load



Generation resource inputs to PROSYM

- Minimum and maximum seasonal capacity
- Hourly solar/wind generation profiles – correlated with weather in load forecast
- Heat rates
- Emission rates – SO_2, NO_x, CO_2
- Variable operating and maintenance costs
- Operating limits – minimum up/down times; ramp rates
- Unit availability – planned maintenance; unplanned outages and derates

Fuel inputs to PROSYM

- Delivered variable fuel costs by station
  — Coal, natural gas, oil
- TC2 fuel blend – Illinois Basin vs. Powder River Basin
- Startup fuel quantity
- Coal heat content and SO_2 content

Market inputs to PROSYM

- Hourly wholesale electricity prices represented by PJM interface with LGE/KU system
- Transmission costs and constraints
- RTO transaction expenses
- Market transaction risk premium to represent RTO prices only being known after-the-fact
- Emissions allowances market pricing

System constraints inputs to PROSYM

- Operating reserves
  - Contingency reserve requirements
  - Regulating reserves
- LG&E/KU transmission constraints
- Commitment order – curtailable customers

Other inputs to PROSYM

- Energy requirements – hourly forecast
  - Native load sales
  - Transmission & distribution losses

- Resource expansion plan

PROSYM model calculates the variable cost of serving load given a set of resources

- Allows for developing scenarios on:
  - Fuel costs
  - Emission costs
  - Load risk
  - Alternative generation fleets

- PROSYM results must be combined with revenue requirements of resource's fixed costs to obtain the total cost of a particular generation portfolio and scenario
  - This step ignores sunk costs

Modeling improvement is always a focus

Resource planning process is constantly being updated to reflect the latest information and better evaluation models and tools.

- Load forecasting
- Heat rates modeling
- Solar forecasting
- NREL Annual Technology Baseline
- Coal and natural gas price scenarios
- Monthly variance analysis
- Turndown model

Key issues analyzed in 2018 IRP

- Future load uncertainty
  - Economic growth
  - Customer adoption of energy efficiency such as LED lighting
  - Electric vehicle potential to impact energy and load shape
  - Distributed solar installation
- Optimal reserve margin in light of:
  - Stay-open costs of coal units
  - Aging secondary CTs
  - Uncertainty associated with direct load control and curtailable load
  - Summer and winter peak demand volatility
- Future CO_2 risks/uncertainties
- Economics of renewables and storage

Resource planning includes evaluating future environmental regulation uncertainties

- Specific uncertainties modeled vary with each IRP
  - 2018 IRP modeled impact on future resource plans of a CO_2 cost per ton beginning in 2026 *(Volume III, Long-Term Resource Planning Analysis, Section 3.5.2)*
  - Other risks associated with future NAAQS or ACE rule were discussed but not explicitly modeled *(Volume I, page 5-20)*
- All resource plan evaluations look at the revenue requirements of the portfolio over the planning horizon, not the levelized cost of energy (LCOE) of a particular generation technology

Alternative generation technologies focused on natural gas, solar, wind, and storage

- None of the future resource alternatives are burdened with the cost of decommissioning existing generation assets since those costs are the same regardless of new generation source
- The 2018 ATB from NREL served as the basis for most of the generation resource inputs *(Volume III, Resource Screening Analysis, Section 2)*
  - Future generation technology costs are updated as part of any major resource analysis project
- Any tax incentives are reflected based on existing law *(Volume III, Resource Screening Analysis – Section 2.3.1 and Long-Term Resource Planning Analysis – Section 4.3)*

Because the future is unknown, resource decisions must be robust under a broad range of possible futures

- 2018 IRP evaluated uncertainties on:
  - Coal prices
  - Natural gas prices
  - CO_2 costs
  - Load forecasts
  - Generation asset life
  - Alternative combinations of technologies
- Ideally, decisions will be made that reflect an option that is "deep in the money" and which has a low cost of being wrong
- Resource planning process is constantly being updated to reflect the latest information and better evaluation models and tools