

# MLGW Integrated Resource Plan Community Engagement Meeting

November 21, 2019

# Agenda



- MLGW Opening Remarks / Safety brief
- IRP Schedule
- Recap of Past PSAT Meetings
- IRP Analysis Update
- Comments and Q&A

## IRP Schedule

### *Where we are today*

- Finalizing all input assumptions Underway
- Finalized all Strategies and Scenarios Will discuss today
- Generation Expansion Plan (MISO and Self Supply) Underway
- Modeling of other Strategies and Scenarios Underway
- TVA is still responding to data requests Still incomplete
- Transmission Analyses Underway

### *What we plan to present in the next Community Engagement meeting on March 25 2020*

- Completed Generation Expansion Results of all Strategies and all Scenarios
- Risk Analysis & Transmission Analysis results
- Recommendations, selected supply option (portfolio), Gap Analysis

# Recap of past PSAT meetings

## Recap of 10/17 PSAT Meeting

### *PSAT members responded to questions on Demand Forecast, Gas / Supply, and LTCE Topics*

1. Demand Forecast feedback (*Siemens updated its load forecast with latest 2019 data*):
  - Load growth is expected to be generally flat, EE and small DG will offset population or EV growth.
  - Rooftop PV or EV adoption should be considered without incentives (adoption should be based on economics)
2. Gas and Supply Options feedback:
  - Combined Cycle plants should be considered as a viable option.
  - Small Modular Nuclear does not appear to be viable today due to the cost, but could become more attractive in the future if technology advanced significantly.
  - Bellefonte Nuclear should not be considered as a viable option in this study.
3. Generation Capacity Expansion Plan (LTCE) feedback
  - The Renewable Portfolio Standard (RPS) goal for Strategy 3 should be relatively low in the Reference Scenario (5%-15% considered).
  - An annual capital expenditure limit should be considered (i.e. 3 times annual payment to TVA, ~\$3B).
  - Net market **exports** should be limited to minimize excess generation.
  - Purchase from MISO capacity market is an option to meet reserve margin

## Recap of 11/7 PSAT Meeting

- This meeting was mainly to allow ICF and Friends of Earth/Brattle to present their studies.
- Both groups recommended to drop TVA. TVA will respond to various studies and claims in a subsequent meeting.

### ICF- Mr. Judah Rose

- Cases studied:
  - Case 1: Business As Usual case (Stay with TVA)
  - Case 2: Joining MISO with Bellefonte PPA and supplemented by MISO power providers
  - Case 3: Joining MISO with power from MISO
- Claimed cost savings:
  - Case 1 BAU cost: \$1,154 M in 2024, and \$46,776 M for 30 years starting 2024
  - Case 2: Cost **savings** \$416 M in 2024, and \$15,347 M for 30 years
  - Case 3: Cost **savings** \$416 M in 2024, and \$5,074 M for 30 years

## Recap of 11/7 PSAT Meeting

- ICF recommended changes MLGW to make:
  - Apply for MISO membership and have MISO to serve as Balancing Authority
  - Have MISO engineers study the transmission requirements - now
  - Send out RFP to solicit power supplies, RFP organized by 3<sup>rd</sup> party
  - Transmission studies and RFP process can be completed within a few months
  - Claimed no obligation for MLGW after transmission studies and/or power supply side RFPs

### ***Several questions were raised in the PSAT breakout session for ICF/Bellefonte developer:***

- PSAT Committee decided not to consider the Bellefonte option further (considered too risky)
- Concern over current disputes over ownership, the age of the mothballed unit, completing project on cost and time

## Recap of 11/7 PSAT Meeting

### Friends of Earth/Brattle Group – Mr. David Freeman (ex TVA CEO)

- Claimed cost savings of \$240-333 M in 2024, or one third lower than costs incurred under current TVA contract
- Claimed difference will increase as costs for renewable technologies keep decreasing
- By going to market, Memphis is “virtually guaranteed” lower prices, and leaves behind massive economic and environmental liabilities by TVA with “virtually guaranteed” rate increases
- Energy Efficiency program and renewable energy projects will generate hundreds of jobs
- Rich in renewable energy will help to keep and capture major companies committed to sustainability
- Will Meet Climate Action Plan goals
- **Final recommendations:**
  - Strongly supports city and utility in conducting independent IRP
  - On the basis of IRP recommendations, encourage city leaders to provide TVA with five year notification
  - Immediately seek alternative supply options in the market - prioritizing renewable energy, storage and efficiency
  - Assure that alternate supply drives economic development in the city
  - Initiate ambitious energy efficiency program to cut load and save ratepayers money

# IRP Analysis Update

## Strategy\*

- Strategy 1 : TVA (Full requirement contract)
- Strategy 2 : Full MISO (Full market purchase from MISO)
- Strategy 3 : MISO + Self Supply

\*Self Supply dropped

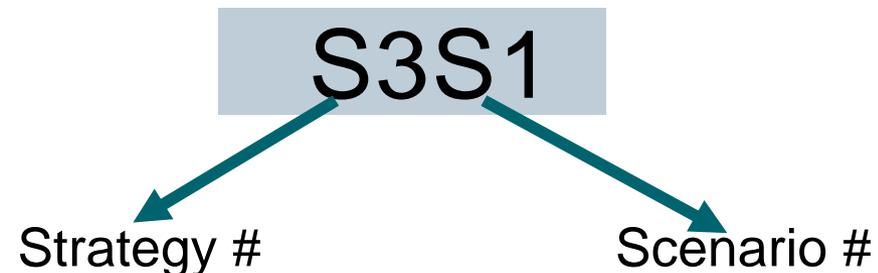
## Scenario\*\*

- Scenario 1 : Reference Scenario
- Scenario 2 : High Regulation
- Scenario 3 : High Technology
- Scenario 4 : Climate Crisis
- Scenario 5 : No Inflation

\*\*Future state of the world

\*\*Details on Scenario assumptions included in Appendix

## LTCE Case Nomenclature



## Total Planned LTCE Cases

	Strategy 1*	Strategy 2*	Strategy 3
Scenario 1	S1S1	S2S1	S3S1
Scenario 2	S1S2	S2S2	S3S2
Scenario 3	S1S3	S2S3	S3S3
Scenario 4	S1S4	S2S4	S3S4
Scenario 5	S1S5	S2S5	S3S5

\*Only one resource portfolio under full MISO or TVA Strategy, costs will vary among scenarios; Five resource portfolios under Strategy 3 due to variations from self-build

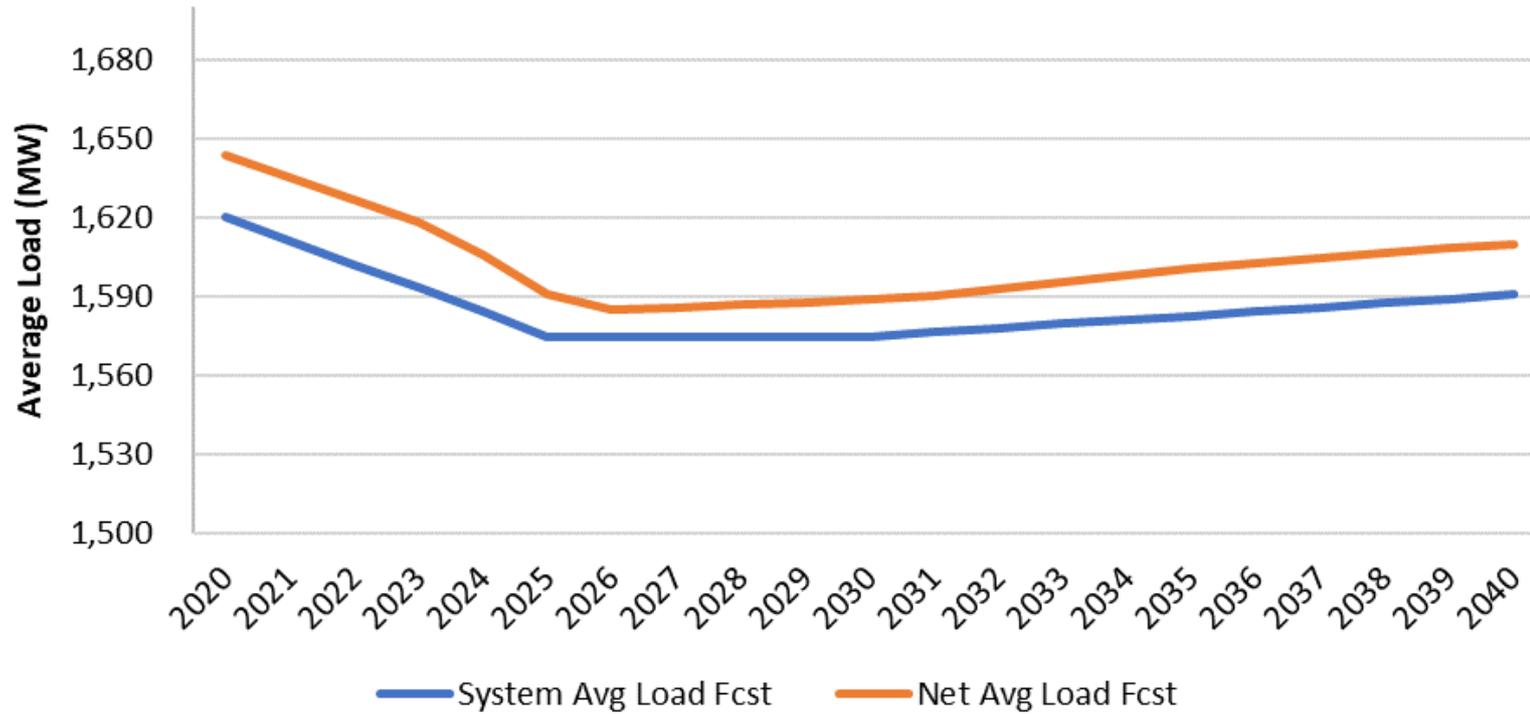
## Transmission Analysis (on-going)

- **Strategy 1** : TVA, BAU for transmission
- **Strategy 2** : MISO Market only: 2 options: Negotiate deal with TVA for full or partial access
- **Strategy 3** : MISO+Self Supply: 3 options: Deal, Middle-Ground, and No-Deal are all possible

	Wheeling Fee	Exit Fee	New Transmission	Reliability	Self-Supply	Total Transmission Cost*
<b>Deal</b>	Full, high fee	High, one-time	Minimal connection required to join MISO, some new facilities required for interconnection of new resources	As is	Flexible, moderate	Depending on exit and wheeling fee, subject to negotiation.
<b>Middle-Ground</b>	Partial, low fee	Medium, one-time	Strong connection, capacity to cover peak load less self supply. Duplicated facilities. Some interconnection.	Stronger, for both	Flexible, moderate	Above, plus \$100~\$150 M
<b>No-Deal</b>	No fee	No	Strong connection, Strategy 2 likely infeasible, Strategy 3 likely feasible. Duplicate facilities raise costs. Some interconnection.	Compliant but reduced for both	Strong self-supply required	\$150~\$300 M

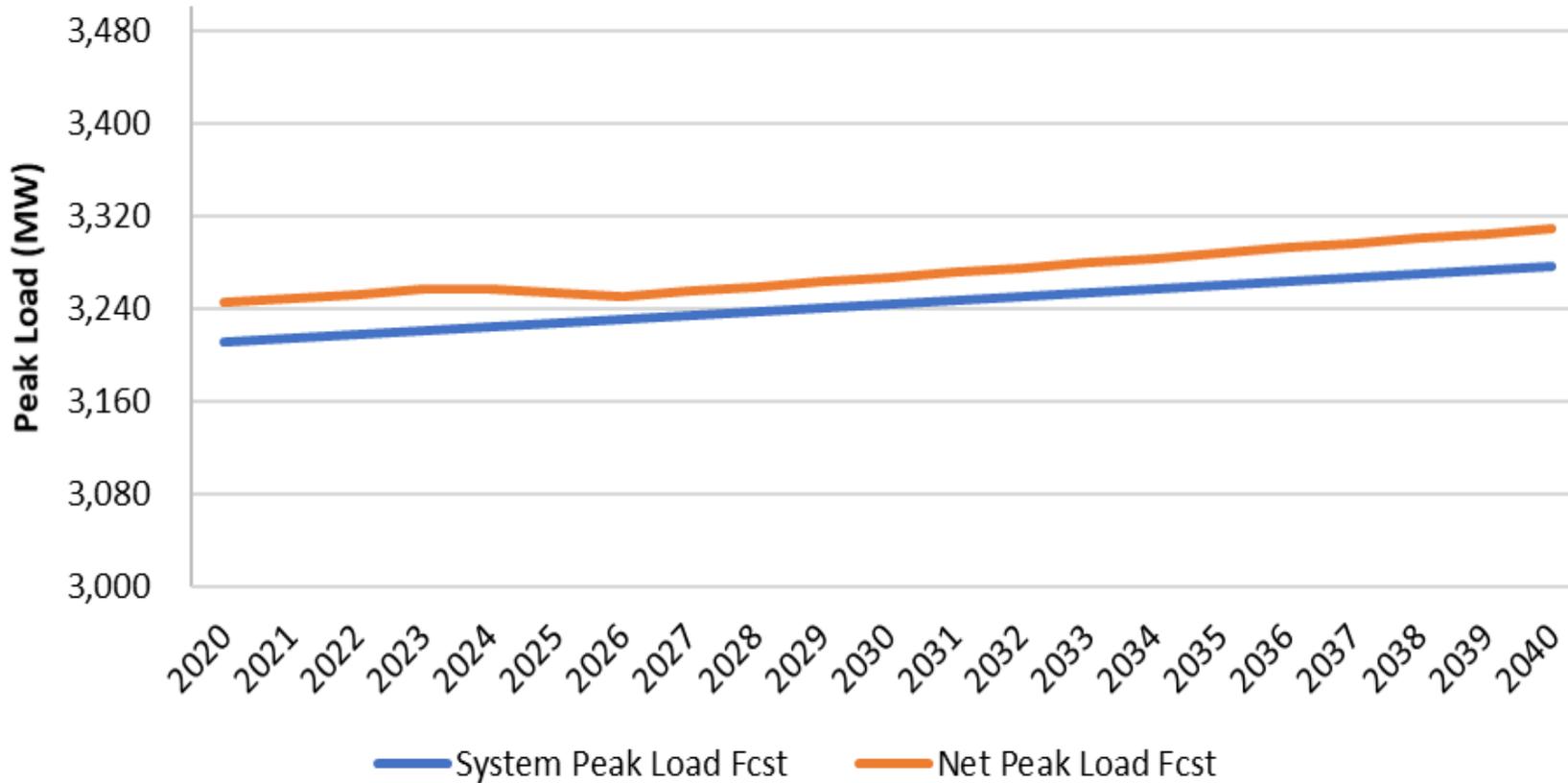
\*Transmission costs are preliminary and subject to refinement

## Net Average Load Forecast



- Regression modeling suggests a reduction in average load in the near term (5 years).
- Net adjustments from EE and Distributed solar offset the EV growth
- Updated the load forecast to reflect known development loads in downtown.

# Net Peak Load Forecast



- Peak forecast reflects new development in downtown Memphis. Amazon and FedEx add significantly to the peak.
- New development and EV growth more than offset DS and EE reductions.

# Questions

SIEMENS



# Glossary

# Glossary

- All-in Capital Cost = The capital costs for building a facility within the plant boundary, which includes equipment, installation labor, owners costs, allowance for funds used during construction, and interest during construction.
- Appalachia Basin = Marcellus Shale Play and Utica Shale Play.
- Average Demand = Average of the monthly demand in megawatts.
- Average Heat Rate = The amount of energy used by an electrical generator to generate one kilowatt hour (kWh) of electricity.
- Baseload Heat Rate = The amount of energy used by an electrical generator to generate one kilowatt hour (kWh) of electricity at baseload production. Baseload production is the production of a plant at an agreed level of standard environmental conditions.
- Breakeven Cost = Average price of gas required to cover capital spending (ideally adjusted to regional prices).
- BAU = Business As Usual
- BTU = British Thermal Unit = unit of energy used typically for fuels.
- CF = Capacity Factor. The output of a power generating asset divided by the maximum capacity of that asset over a period of time.
- CC = Combined Cycle
- EE = Energy Efficiency
- CCS = Carbon Capture and Sequestration
- CT = Combustion Turbine
- DER = Distributed Energy Resources, distributed generation, small scale decentralized power generation or storage technologies
- DS = Distributed Solar
- Dth = Dekatherm (equal to one million British Thermal Units or 1 MMBtu)
- EFT = Enhanced Firm Transportation (varies by pipeline but can include short- or no-notice changes to day-ahead nominations of fuel delivery)
- FID = Final Investment Decision
- FOM = Fixed operations and maintenance costs
- FT = Firm Transportation. FT capacity on a natural gas pipeline is available 24/7 and is more expensive than interruptible transportation (IT) capacity but unused FT capacity can be sold on secondary market.
- Futures = Highly standardized contract. Natural gas futures here are traded on the New York Mercantile Exchange (NYMEX) or Chicago Mercantile Exchange (CME).
- GT = Gas Turbine

# Glossary

- PPA = Power Purchase Agreement; contract to purchase the power from a generating asset
- IPP = Independent Power Producer
- IRP = Integrated Resource Plan
- LNG = Liquefied natural gas
- LCOE = Levelized cost of energy
- LOLE = Loss of load expectation
- LOLH = Loss of load hours
- LTCE = Long Term Capacity Expansion Plan; optimization process to select generation
- MMBTu = million British Thermal Units, unit of energy usually used for fuels
- MWh = unit of energy usually electric power = 1 million watts x hour
- MW = unit of power = 1 million watts
- Peak Demand = The maximum demand in megawatts (MW) in a year.
- PV = Photovoltaic
- Reserve Margin = The amount of electric generating capacity divided by the peak demand.
- RPS = Renewable Portfolio Standard: a regulation that requires the increased production of energy from renewable energy sources
- SMR = Small Modular Reactor
- “Sweet Spot” Core Acreage = Areas within a natural gas play that offer the highest production at least cost.
- Utility Scale = large grid-connected power generation, could be solar, gas, diesel, etc.
- VOM = Variable operations and maintenance costs
- Wheeling = a transaction by which a generator injects power onto a third party transmission system for delivery to a client (load).