
2024 IRP Working Group

Virtual Meeting 4: January 19, 2024

Agenda – January 19, 2024

Welcome

TVA System Update – Aaron Melda; Senior Vice President, Transmission and Power Supply

TVA IRP Modeling

EnCompass Model Overview – Norm Richardson; President, Anchor Power Solutions

External Relations Updates

Upcoming IRP-WG Topics Preview

TVA System Update

Aaron Melda; Senior Vice President, Transmission and Power Supply

TVA IRP Modeling

Preeth Srinivasaraghavan; Specialist III, Resource Strategy

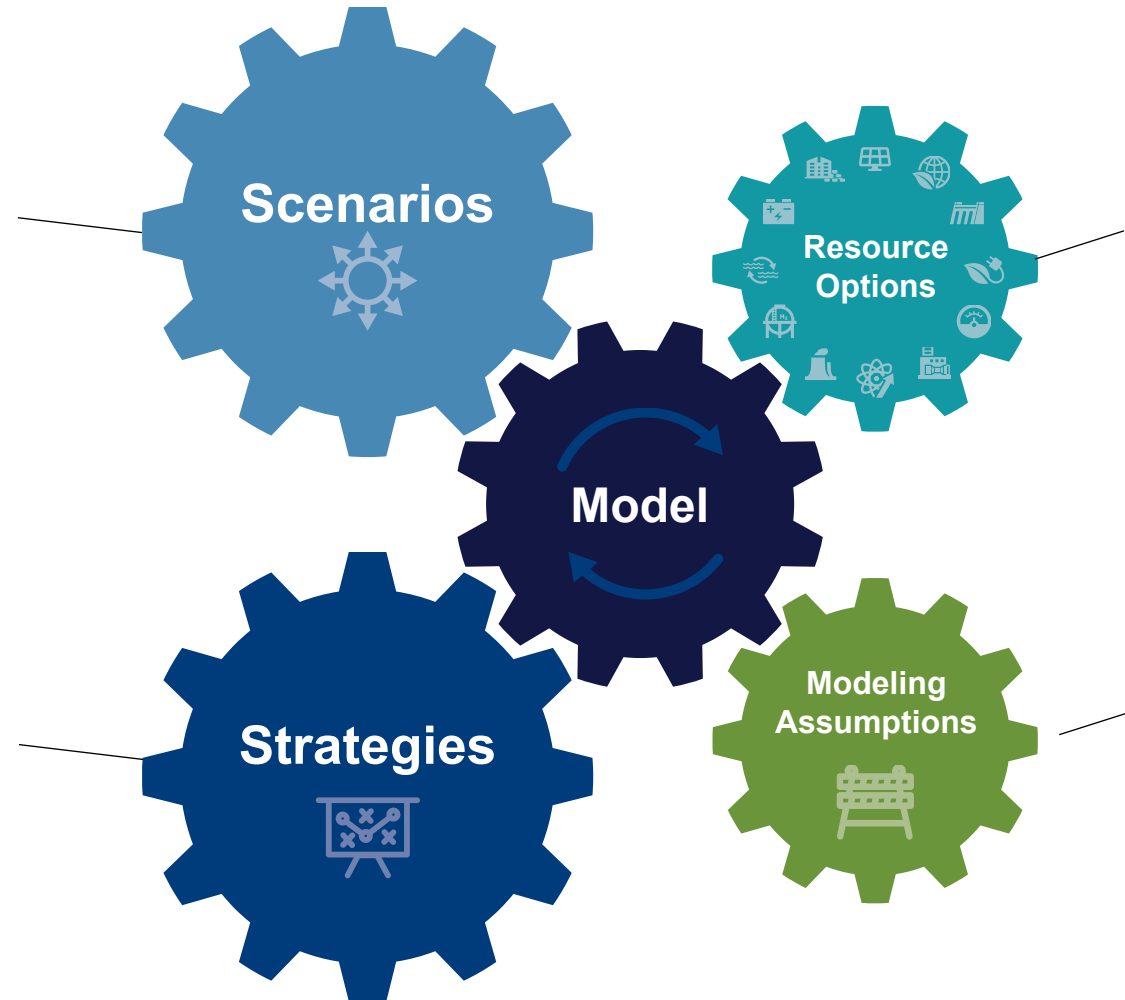
How the Integrated Resource Planning Process Works

Includes forecasts of:

- Economics/inflation
- Peak Demand/Energy
- Coal/Gas/Market Power
- Potential Regulations

Sets business emphasis for resource types; achieved through:

- Lower cost signals, or
- Defined minimum additions



Supply-side and Demand-side

- Physical characteristics
- Economic (cost) characteristics
- Energy patterns (solar, wind, EE)

Key Constraints

- Planning reserve margin
- ELCC (solar, wind, storage)
- Annual/cumulative build limits
- First year available

TVA Adoption of the EnCompass Model

TVA's 2011, 2015, and 2019 IRPs utilized the System Optimizer model, developed by ABB

After extensive review and testing, TVA upgraded to the EnCompass model in 2022

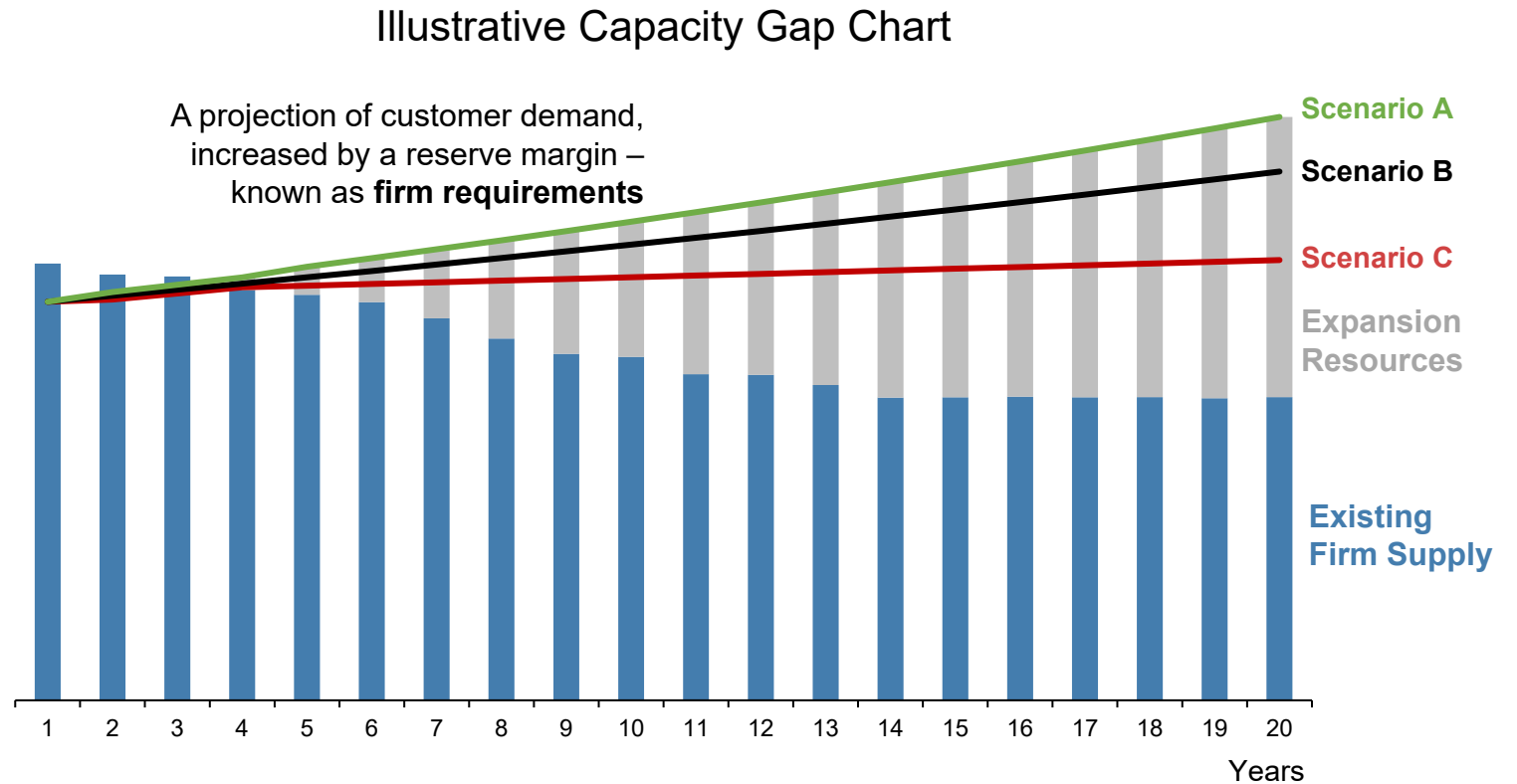
TVA's internal model transition included two bi-annual plans which were simulated in both models for validation testing

Resource Planning for Future Capacity Needs

Resource planning is about optimizing the mix of future capacity.

Projections of capacity needed are filled by the most cost-effective resources.

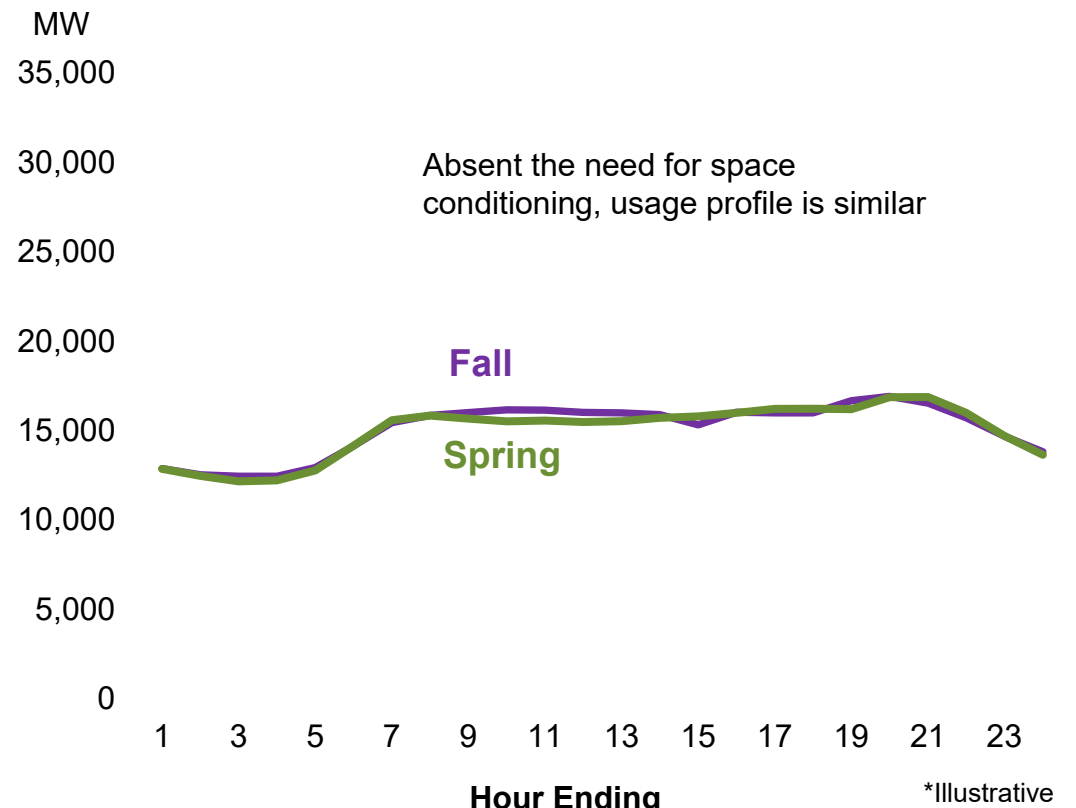
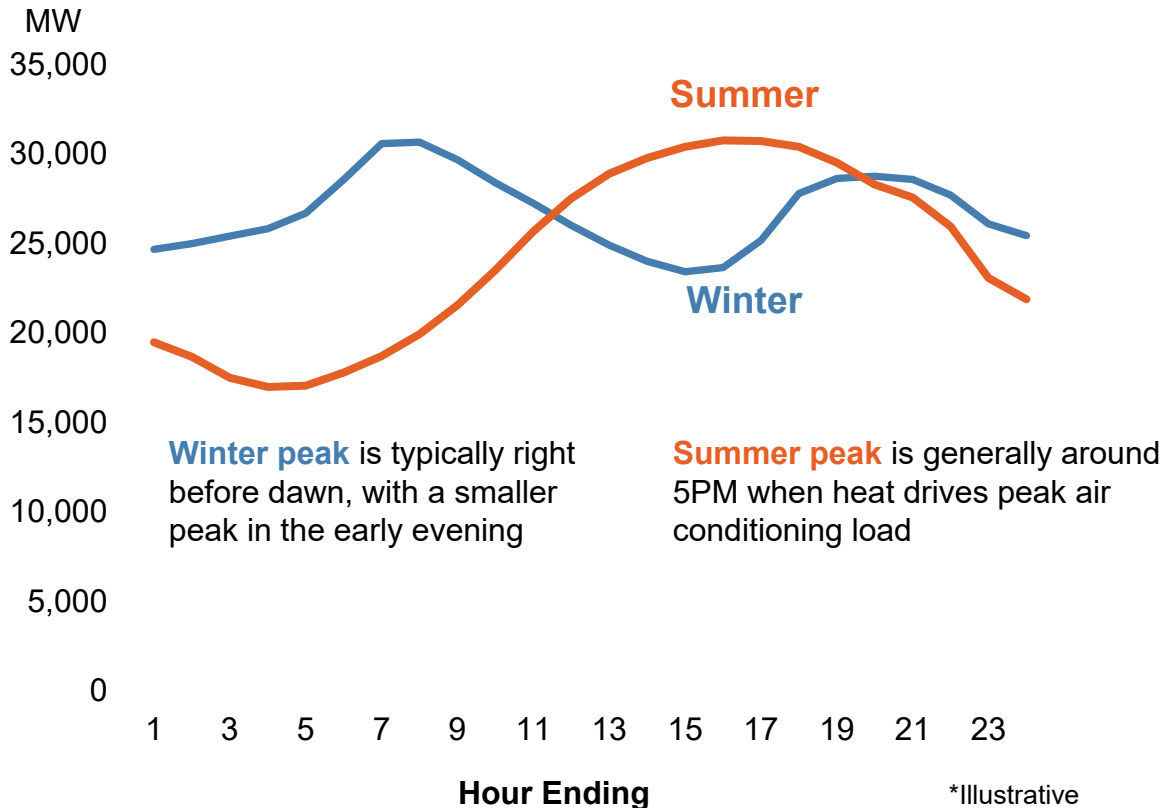
Multiple scenarios will be explored, reflecting different levels of forecasted demand.



Recommended path provides low cost, reliability, diversity and flexibility

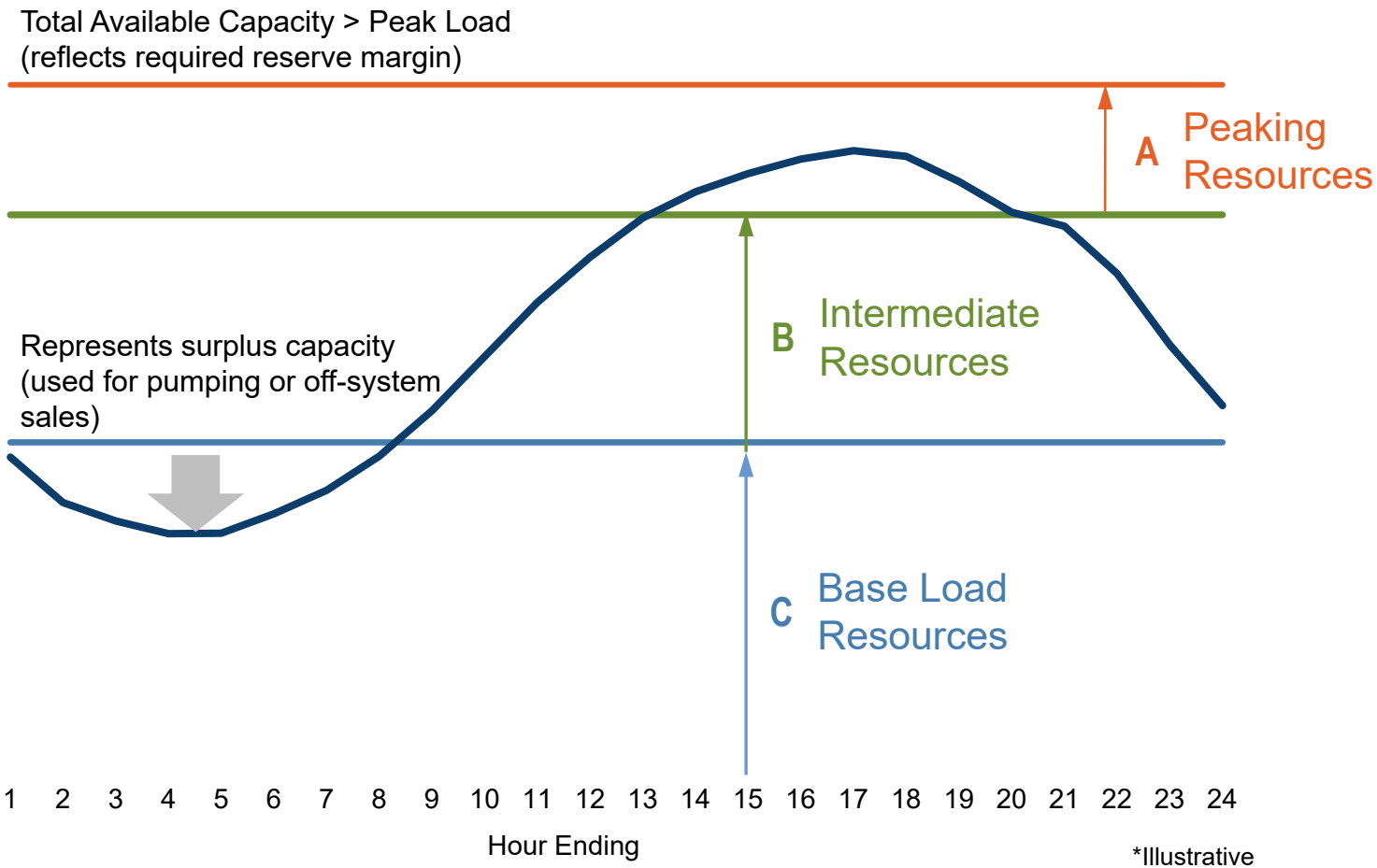
Appendix

Winter and Summer Have Distinct Profiles



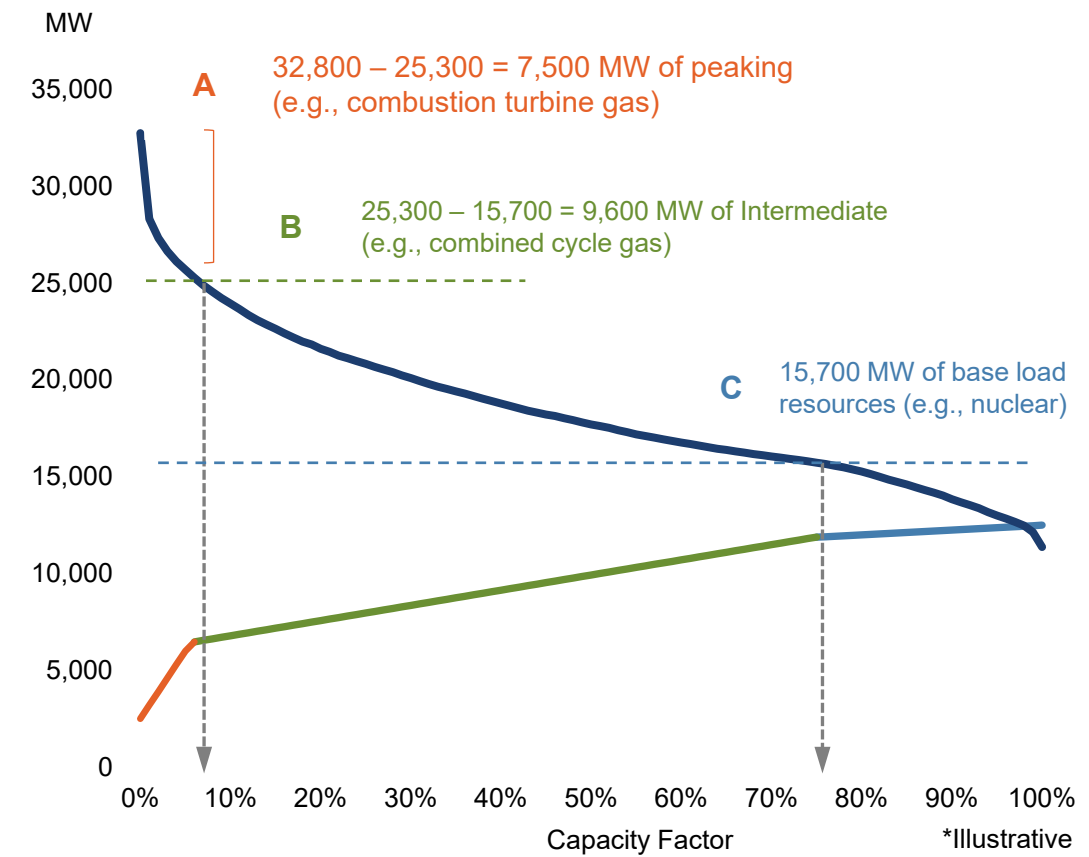
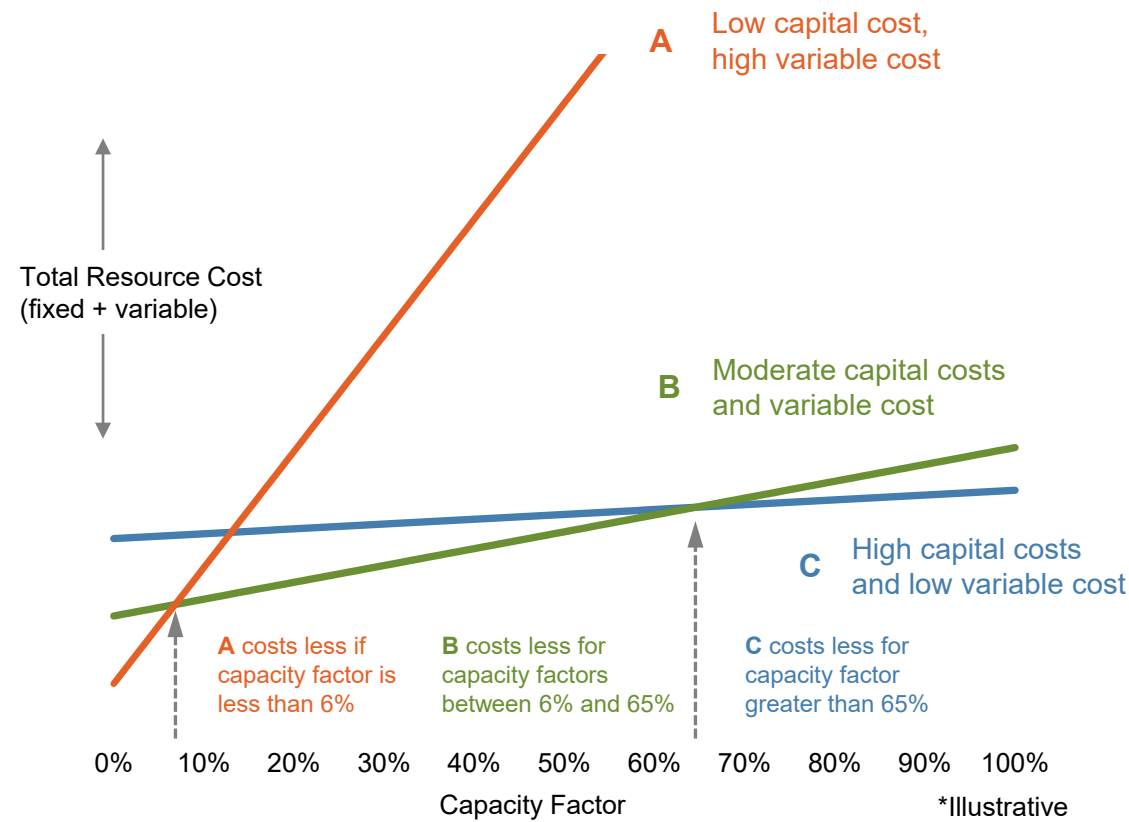
Daily Load Shape and Resource Dispatch

Summer Day Load Shape



Selecting Appropriate Resource Type

Resource selection is complex and considers physical and cost characteristics and portfolio fit



Example Resource Characteristics

Physical and economic characteristics matter for resource evaluation and portfolio fit

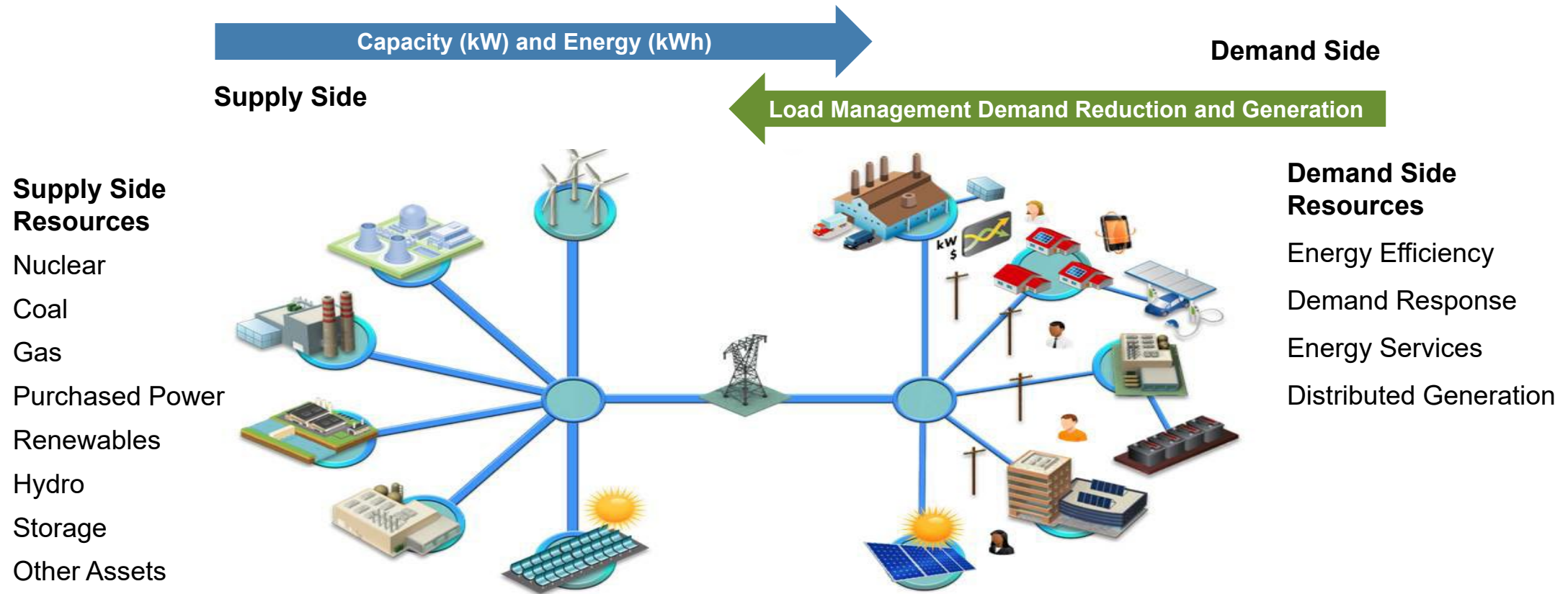
Physical

Item	Measure
Output (capacity)	MW (max dependable) MW (minimum)
Availability	Outage rates
Flexibility	Ramp rate
Duty Cycle	Base, intermediate, peaking
Dispatchability	Dispatchable, intermittent
Fuel	Types of fuel, limits
Emissions	Lbs./kWh
Other	Regulations, constraints

Economic

Item	Measure
Capital Cost	Installed cost (\$), including transmission
Efficiency	Heat rate (Btu/kWh)
Operating Cost	Fixed (\$) Variable (\$/kWh)
Fuel Cost	\$/Btu
Emissions Cost	\$/lb. (as applicable)
Build Schedule	Years
Book life	Years

TVA Operates in Multidirectional Environment



EnCompass Model Overview

Norm Richardson; President, Anchor Power Solutions

External Relations Updates

Althea Jones; Sr. Manager, Public and Community Engagement

Upcoming IRP-WG Topics Preview

Candy Kelly; Sr. Manager, Resource Strategy