



Tennessee Valley Authority

TVA Overview, FCA, & Interruptible Products

MLGW Key Customer Meeting

John Malone

Customer Service Manager, Customer Relations

December 6, 2012



FY 2012 In Review

Hard Spots

- Mild weather significantly impacted demand in winter
- Continued slower economic recovery
- Managing spending pressure for aging assets and regulation

Highlights

- Lower commodity prices (natural gas and purchased power)
- Conserved cash and adjusted capital spending
- Wholesale effective rate \approx 10% lower than plan; 5% lower than 2011



Our Vision

One of the Nation's Leading Providers of Low-Cost and Cleaner Energy by 2020



Low Rates



Cleaner Air



High Reliability



More Nuclear
Generation



Responsibility



Greater Energy
Efficiency



Electricity Essentials

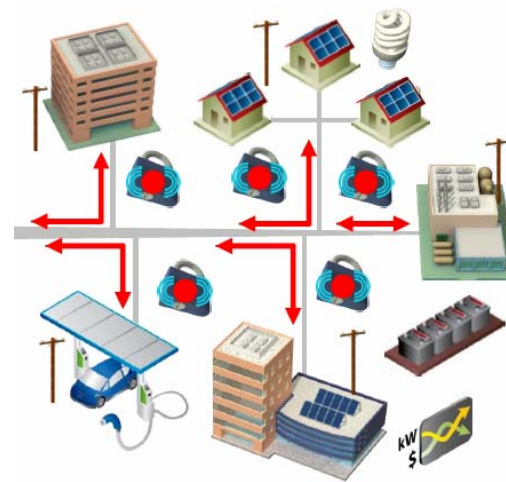
Supply Power



Safely Transmit



Serve Load



Sound Financials

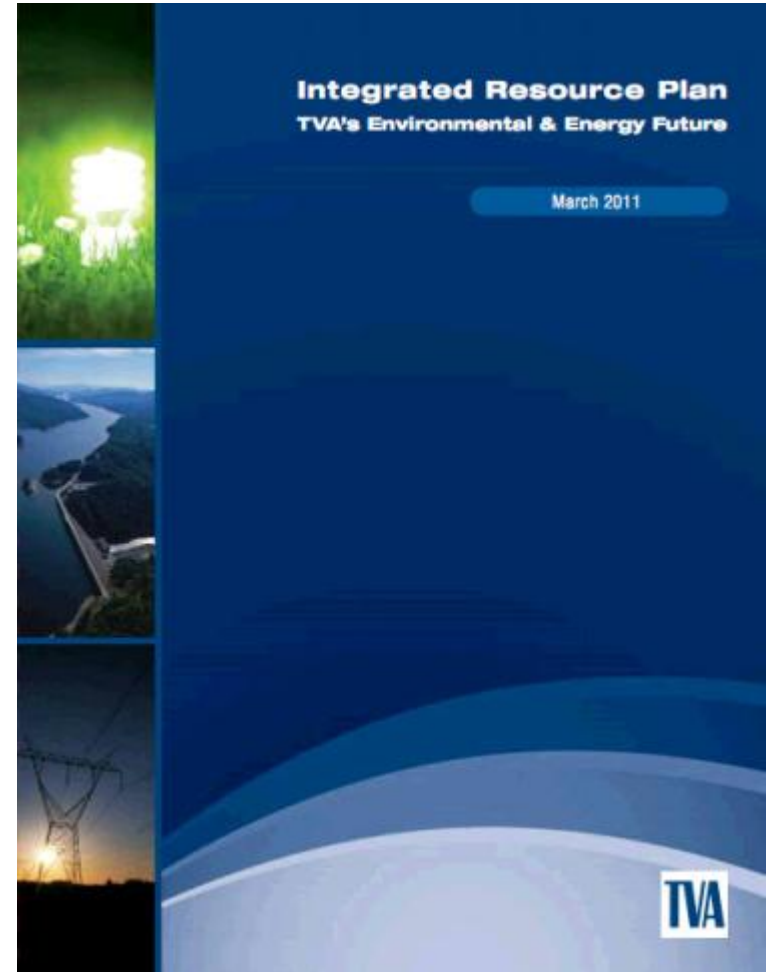


Supply Power

TVA's Integrated Resource Plan Paves the Way

TVA's Integrated Resource Plan

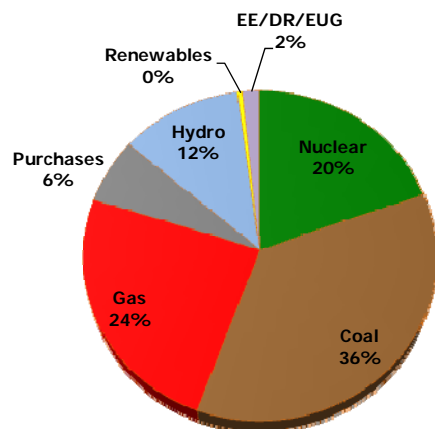
- Guides power system planning
- Balances costs and risks to benefit all stakeholders
- Allows flexible responses to change
- Reduces environmental impacts



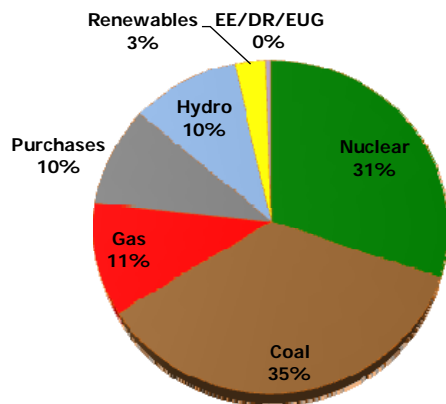


Supply Power – Balanced Portfolio

2013



Total Capacity = 34,144 MW

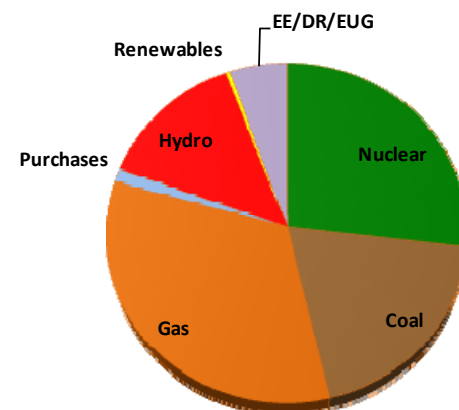


Total Energy = 169,167 GWh

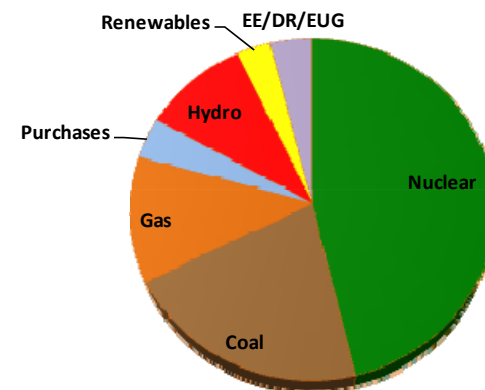
By 2023, TVA's portfolio mix becomes –

- More balanced
- Dependent on coal – but not as much
- Greater exposure to cleaner gas and nuclear capacity
- Combination of hydro, renewables and EEDR combine to provide the remainder

2023



Total Capacity = 40,013 MW



Total Energy = 182,271 GWh



Supply Power *Nuclear*

- **Watts Bar, Unit 2**
 - Under construction
 - Adds 1,180 MW
 - December 2015
- **Bellefonte**
 - In engineering phase
 - Adds 1,260 MW
 - 2020-2023
- **Small Modular Reactors**
 - Studying technical and economical feasibility



Watts Bar Nuclear Plant

**TVA currently operates 3 units at Browns Ferry,
2 units at Sequoyah, and 1 unit at Watts Bar**



Supply Power *Coal*

- **Continue to Operate**

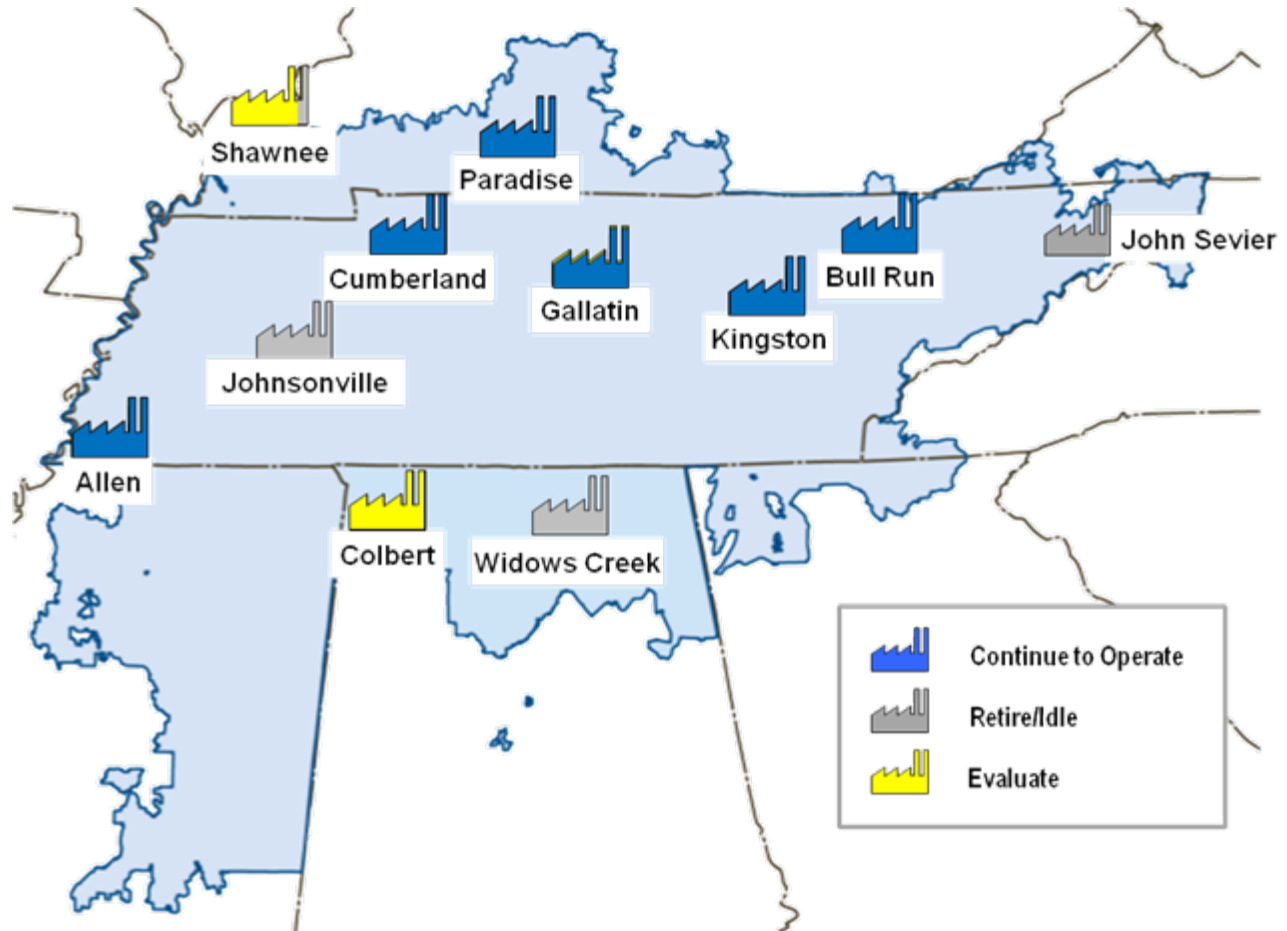
- Allen
- Paradise
- Cumberland
- Gallatin
- Kingston
- Bull Run

- **Evaluate**

- Shawnee
- Colbert

- **Retire / Idle**

- Widows Creek
- John Sevier
- Johnsonville



TVA currently has 14,000 MW of coal-fired generation



Supply Power

Natural Gas

- **Current System**
 - 100 generators
 - 87 simple cycle
 - 13 combined cycle
- **Magnolia**
 - Acquired in August 2011
 - 968 MW; Largest combined-cycle in TVA system
- **John Sevier**
 - Began commercial operation on April 30
 - One month ahead of schedule and under budget



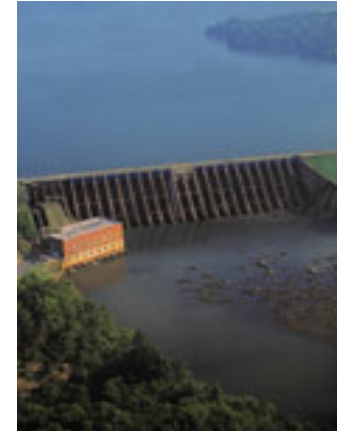
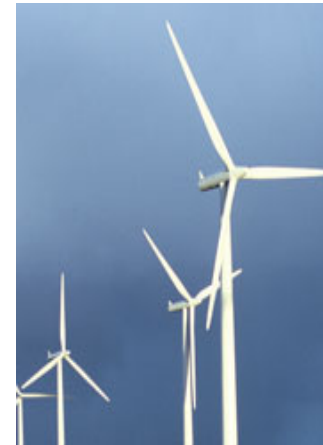
John Sevier Combined-Cycle Plant

John Sevier adds 880 MWs to current 3,000 MWs combined cycle portfolio in addition to 5,200 MWs of combustion turbine capacity



Supply Power *Renewables*

Resource	Capacity (MW)
Hydroelectric	4,600
Wind	1,000
Solar	50
Biomass	25
Total Operating	5,675
Total additional committed	650
Total	6,325



Hydro remains backbone of renewable supply



Electricity Essentials

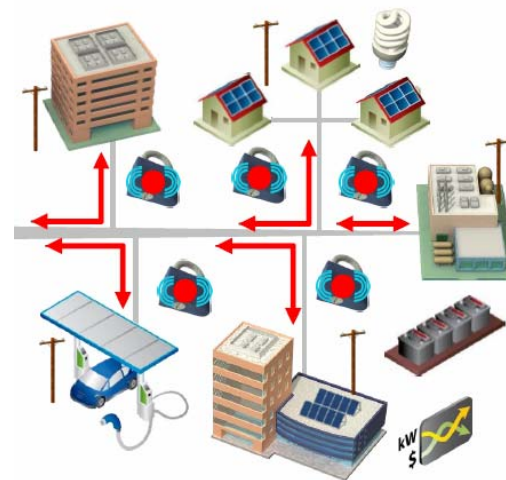
Supply Power



Safely Transmit



Serve Load



Sound Financials



Safely Transmit

Major Investment in Physical Assets



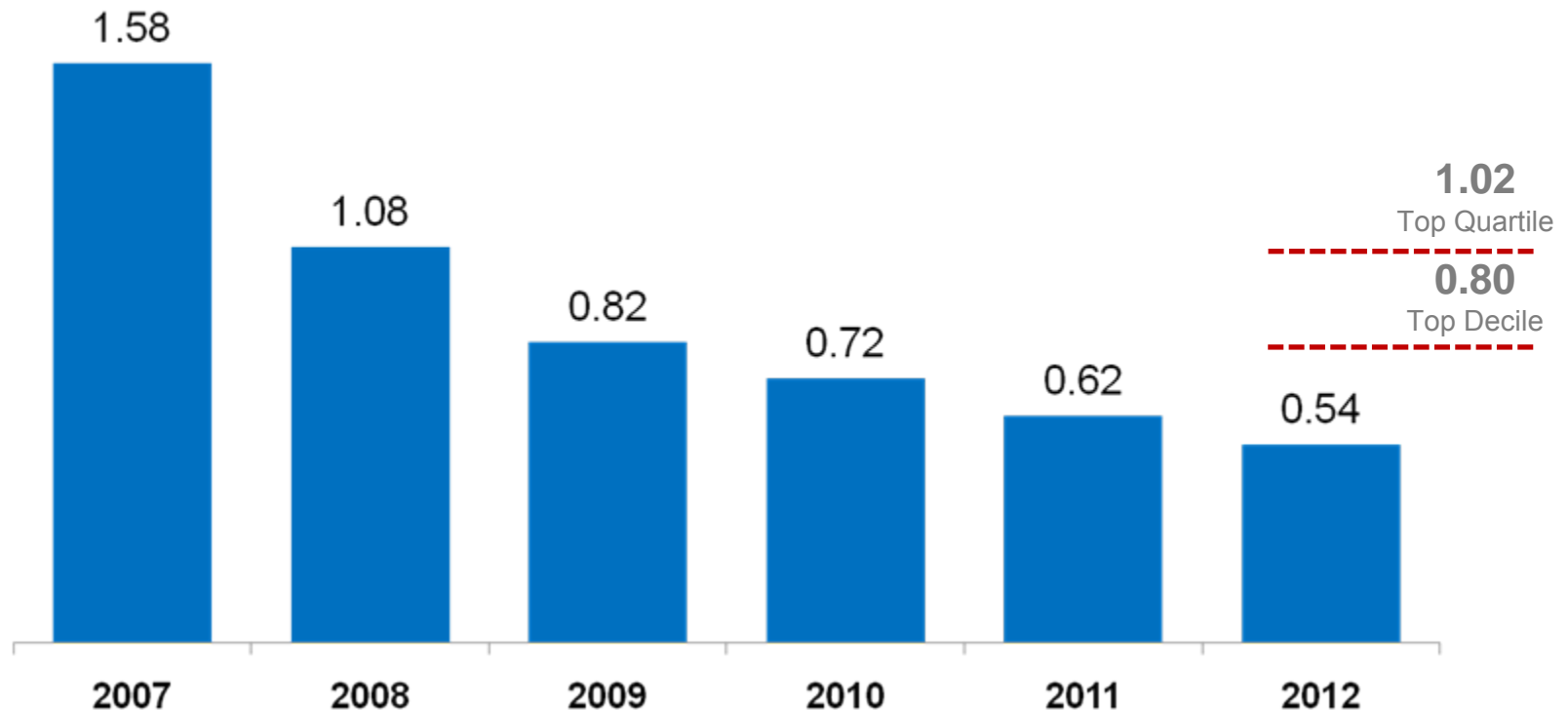
- 16,000 miles of transmission lines
- 495 substations / switchyards
- 102,000 transmission structures on 260,000 ROW acres
- 1,050 individual interconnection and customer connection points
- 63 interconnections with neighboring systems
- 2,700-mile fiber network

Safety • Reliability • Compliance



Safely Transmit

Strong Safety Record

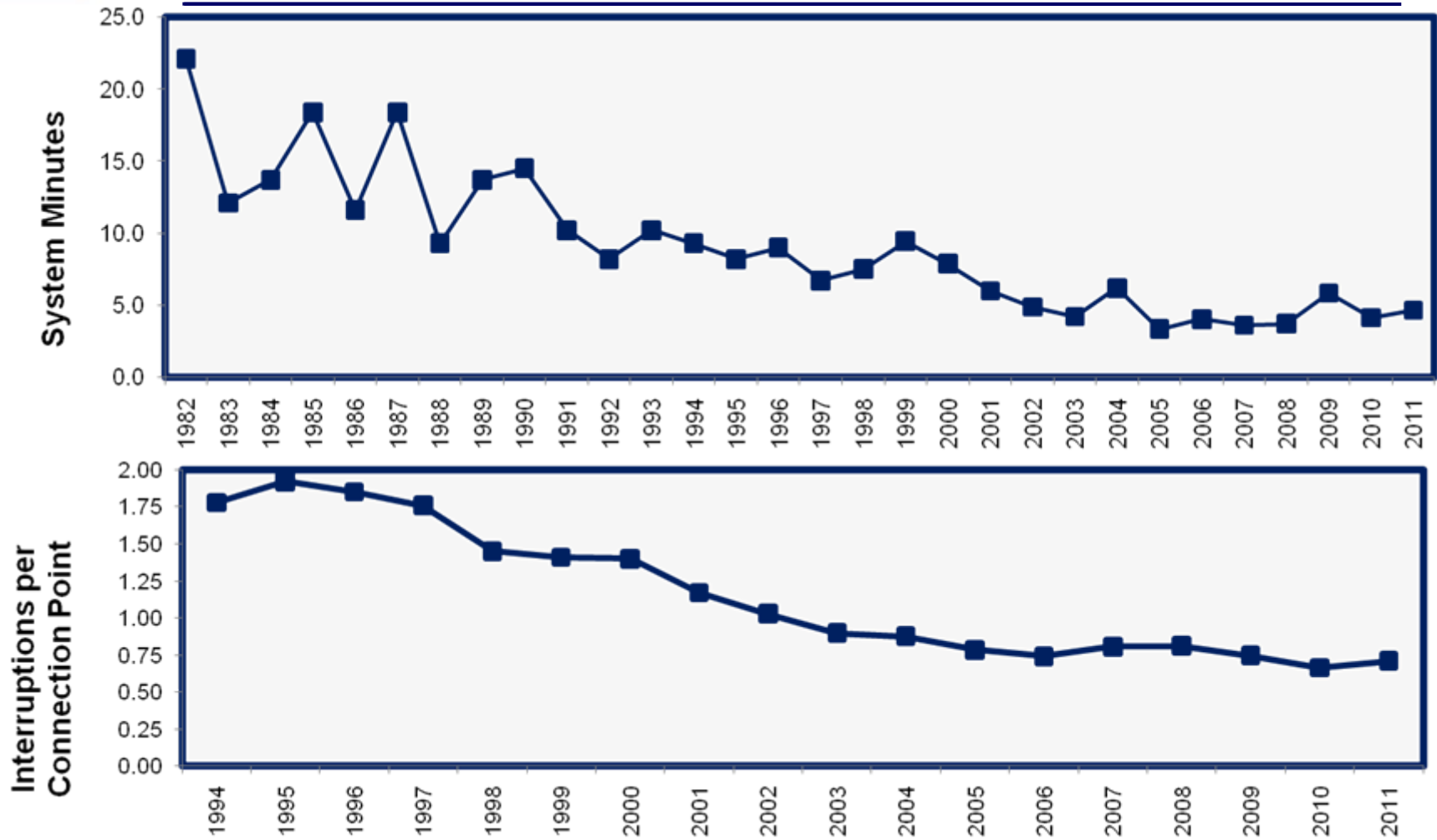


Top Decile in National Industry Benchmark



Safely Transmit

Unparalleled Reliability Record



99.999% Reliable for 13 Consecutive Years



Safely Transmit *Fully Compliant*

- 2012 SERC Audit was completed on May 18
- TVA received a **perfect score** on Operations, Planning, Generation and Reliability Coordinator Audit
- Cleared 91 out of 91 requirements across 35 reliability standards





Electricity Essentials

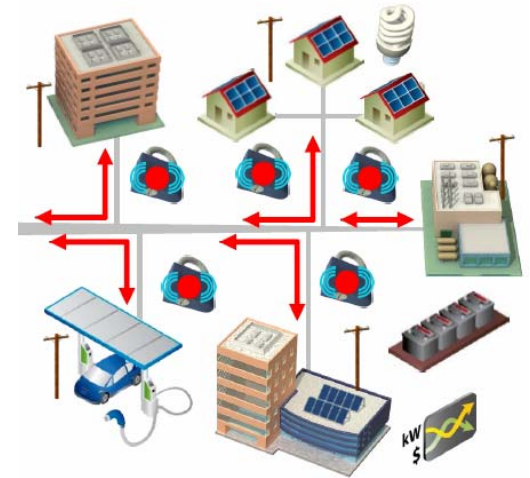
Supply Power



Safely Transmit



Serve Load

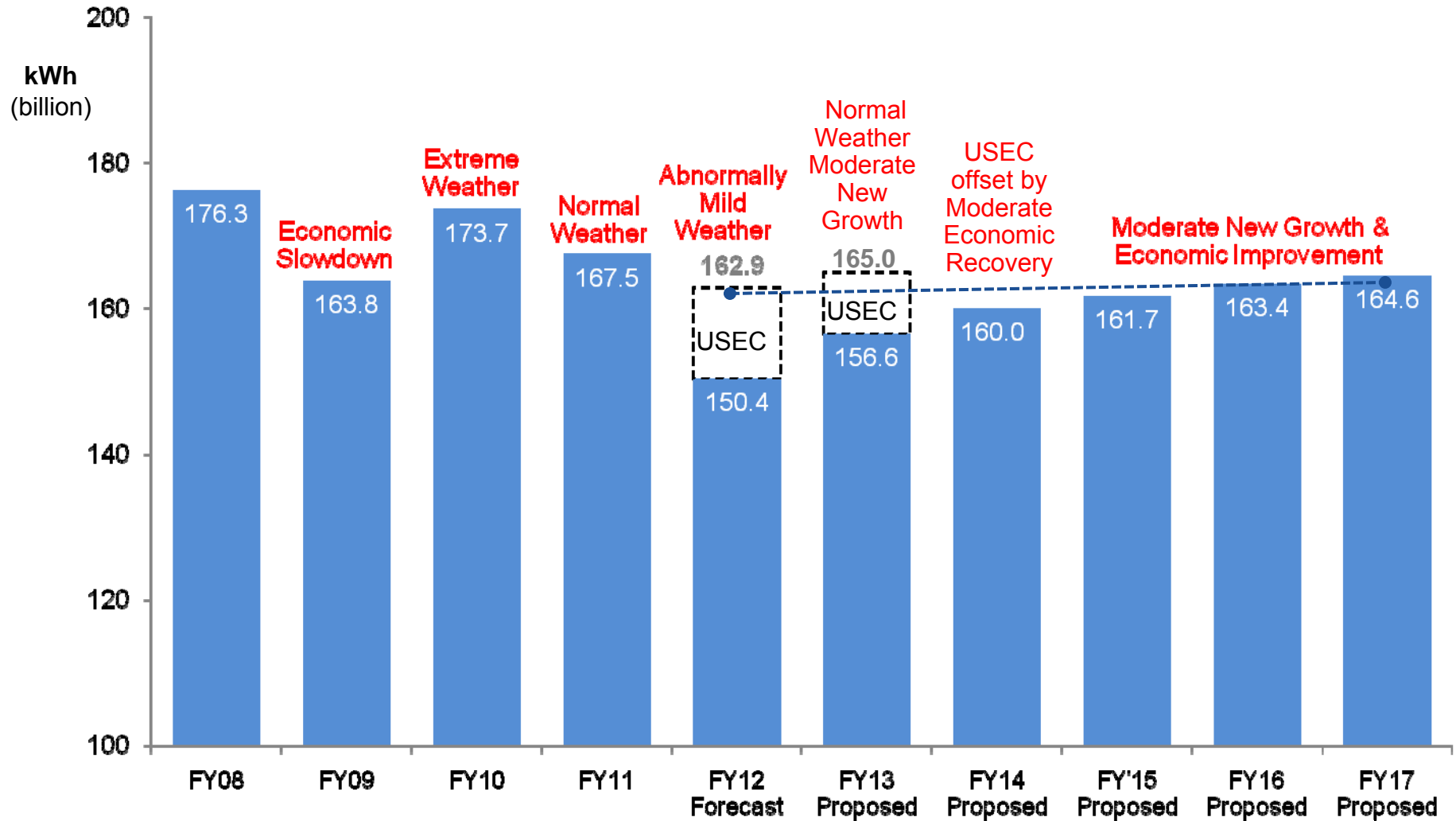


Sound Financials



Serve Load

Projected Sales



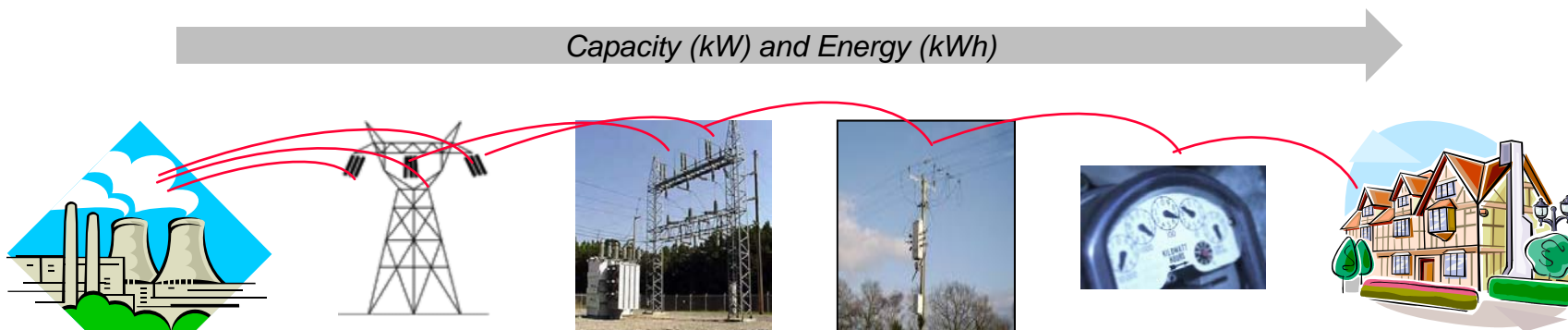
Projected TVA Sales (kWh) = System Energy less Transmission Losses



Serve Load

Historically, Serving Load Was a Uni-Directional Task

Traditionally, resources flowed in one direction – from the generator, through the grid, to the end-use meter...

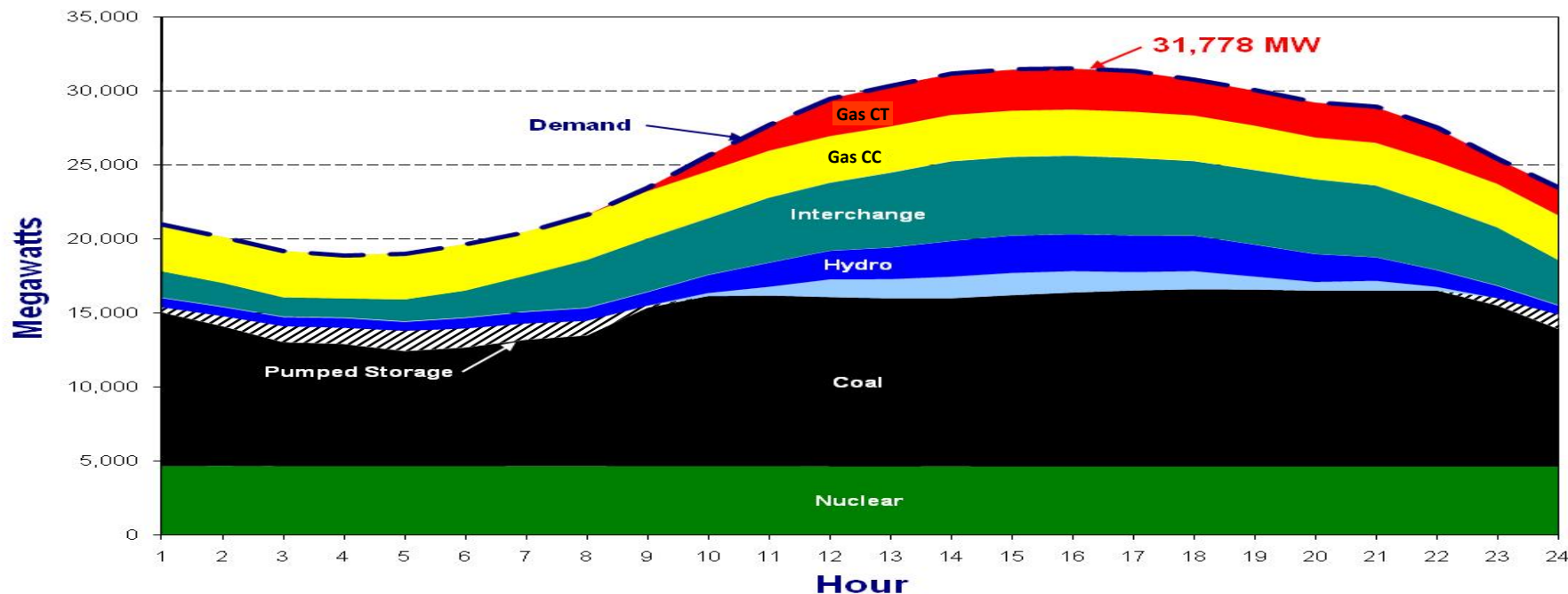


System operations start with a load forecast; only supply adjustments are made to keep the system in balance.



Serve Load

Supply Side Focused . . . Follow the Load



Load Duration Curve

Resource Options

Nuclear

Gas

Pumped Storage

Coal

Hydro

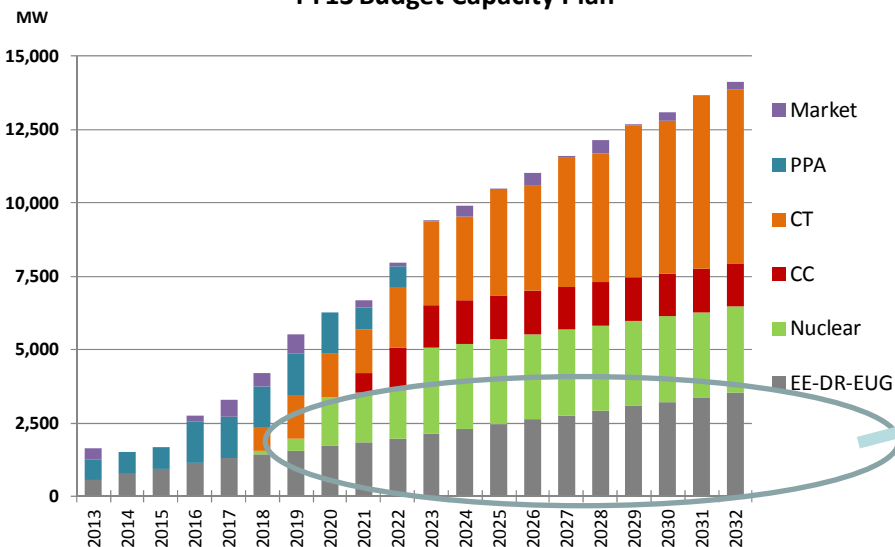
Market Supply



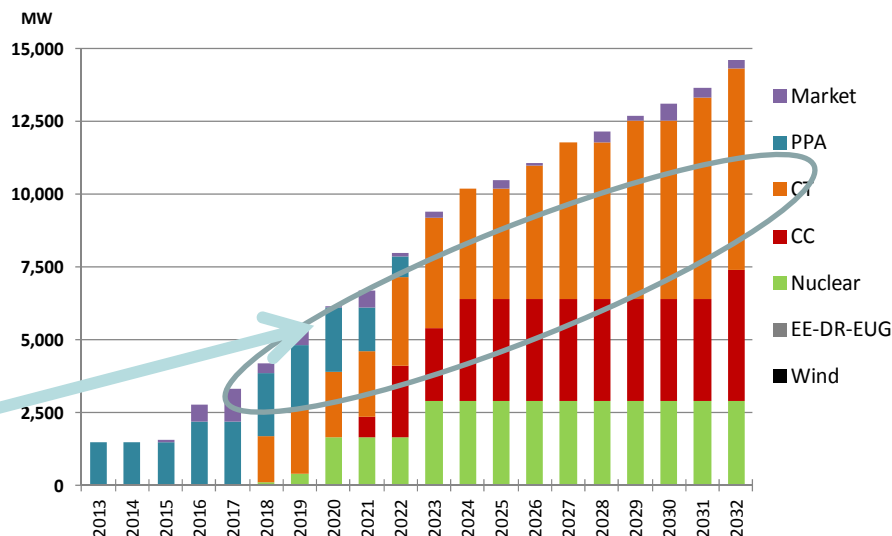
Serve Load

Value of System Efficiency: Avoiding New Capacity Costs

FY13 Budget Capacity Plan



FY 13 Budget Capacity Plan/No EEDR



Maximizing system efficiency reduces the need for additional intermediate and peaking capacity (CC/CTs)



Electricity Essentials

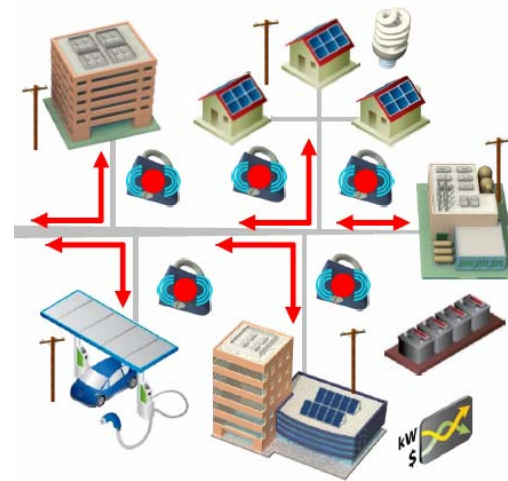
Supply Power



Safely Transmit



Serve Load

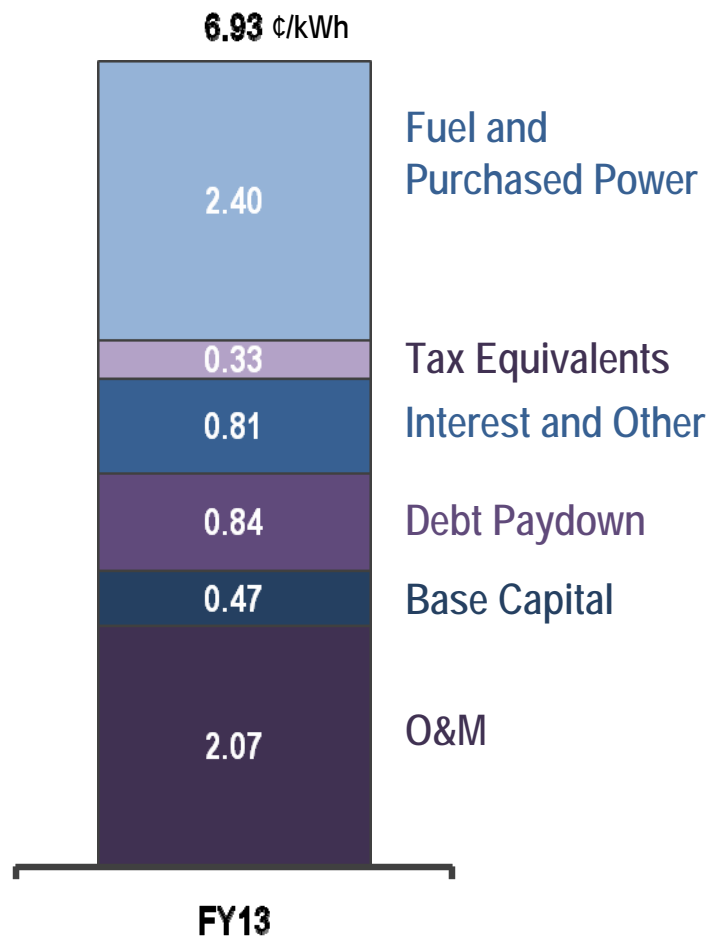


Sound Financials



Sound Financials

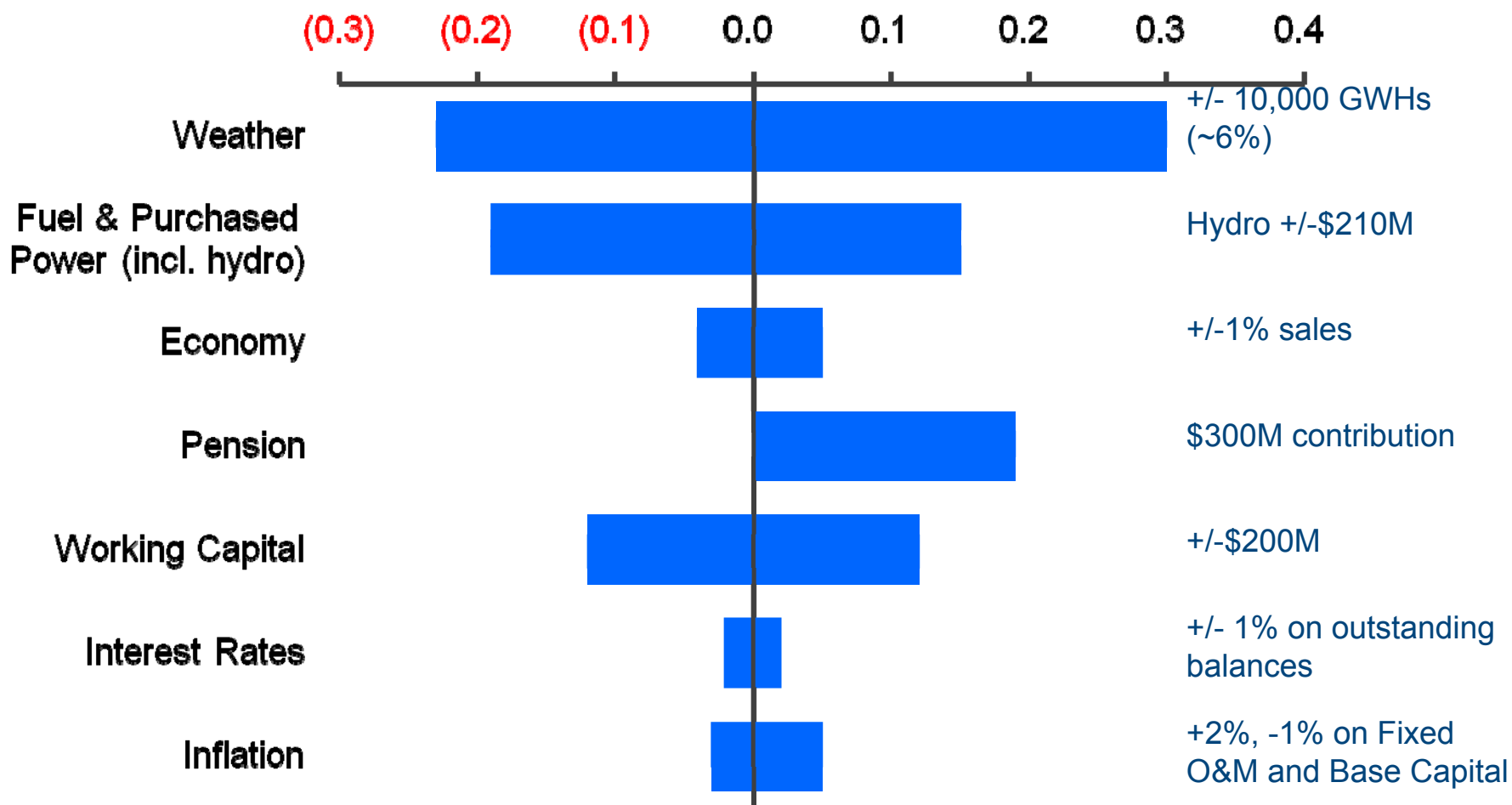
TVA Average Wholesale Rate by Revenue Requirements





Sound Financials

FY13 Retail Rate Potential Pressure

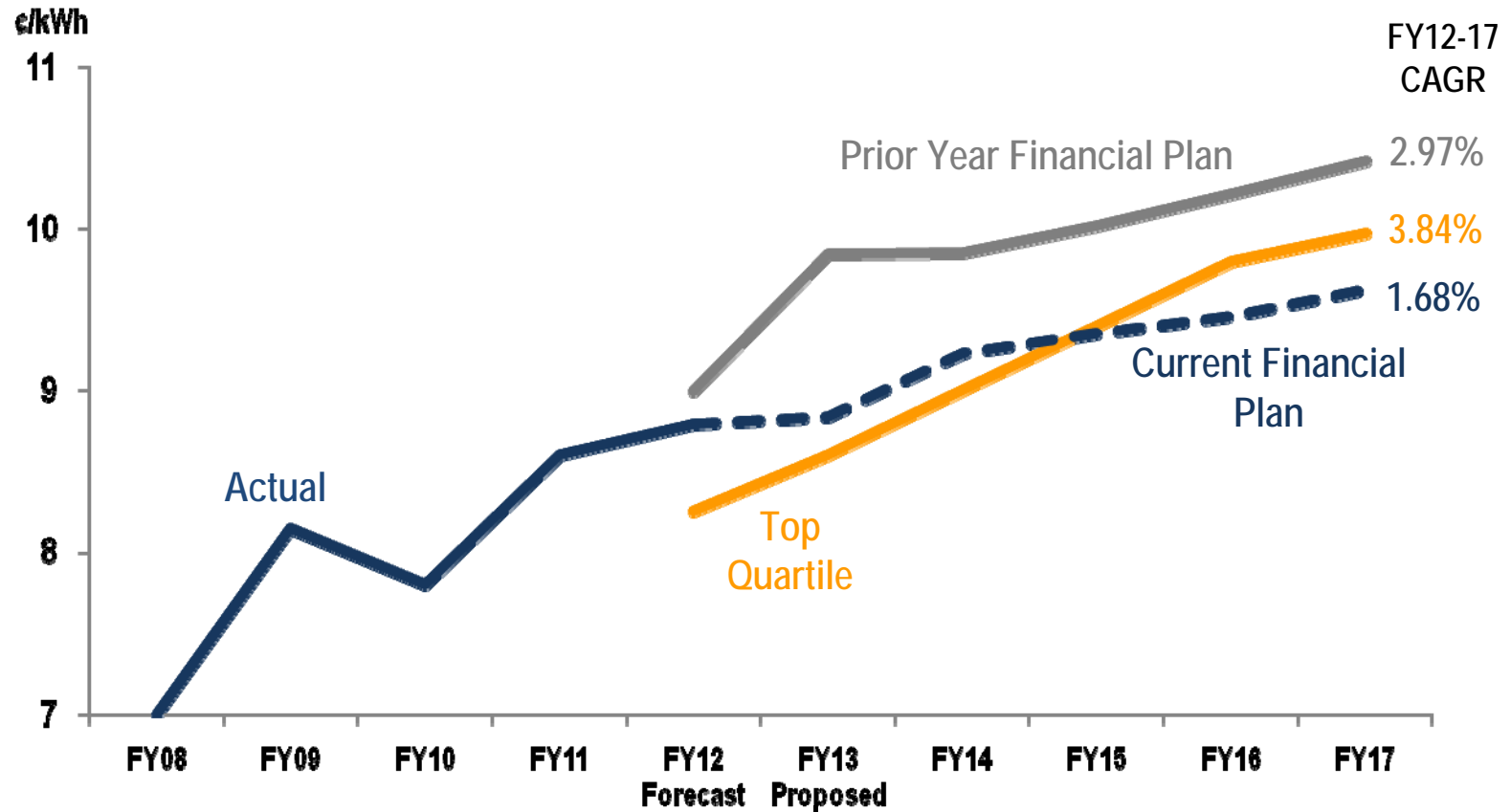


Weather remains largest variable



Sound Financials

TVA Service Area Retail Rates



Current trajectory achieves top quartile by FY16



Path to the Vision

Progress on the path has been made, but challenges remain

RESPONSIBILITY

To our customers, employees, and the Valley

RATES

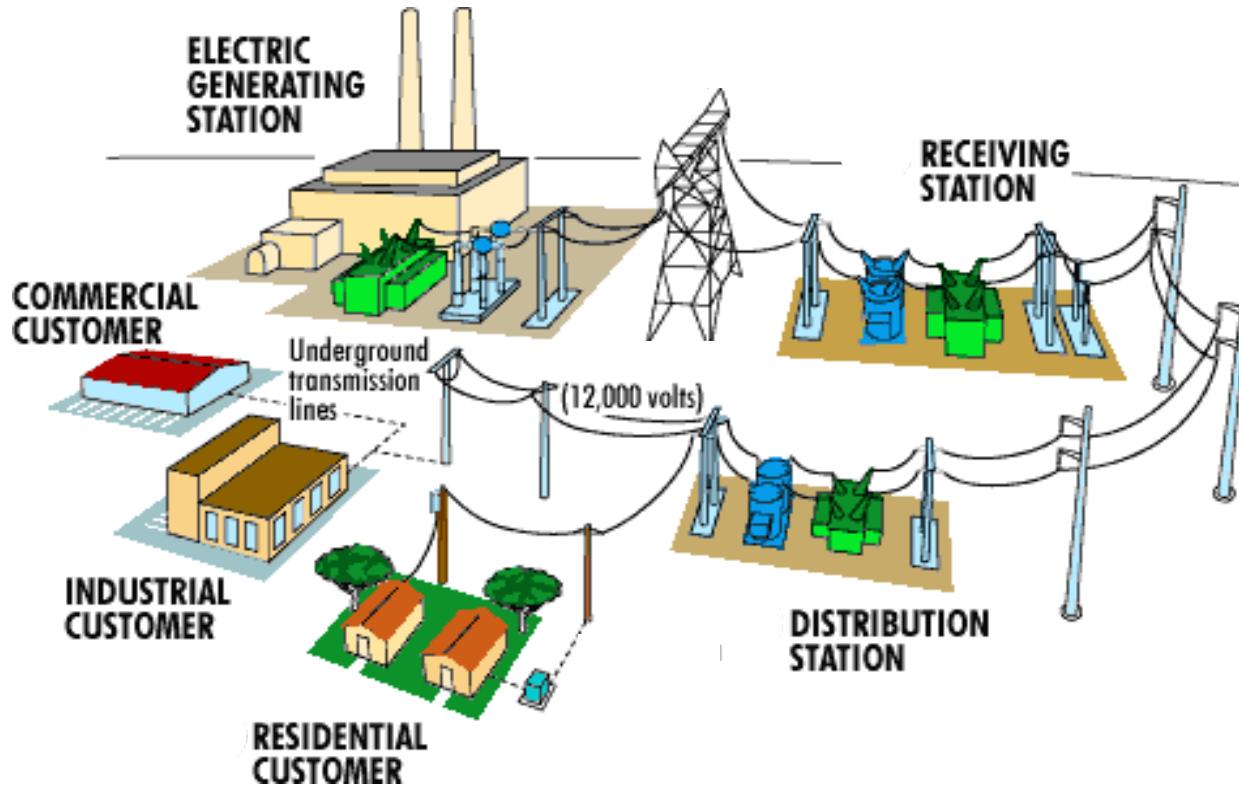
Meeting region's needs through low rates

RELIABILITY

Balanced portfolio and well-operated system

The Value of Customers

The system only works if we all work together . . .



TVA Fuel Cost Adjustment



How TVA Recovers Fuel Costs

- **The Total Monthly Fuel Cost**, also known as the Fuel Cost Adjustment or FCA), is what TVA uses to recover the costs of the fuel it utilizes to generate electricity—such as coal and natural gas. Since the prices of these fuels are determined by market forces, TVA cannot control the prices it pays for these fuels, but it manages costs, where possible, through contracting and financial management.
- **Ensures TVA recovers costs close to when they occur**, helping to better match TVA's revenues to its fuel expenses, which reduces its borrowing costs
- **Recovered through monthly consumer power bills**, depending on energy use as a per kilowatt-hour adjustment.
- **Many utilities across United States** use similar mechanisms, including most utilities bordering TVA's service territory.



TVA Total Monthly Fuel Cost Overview

- The total monthly fuel cost is reset every month.
- It is a variable energy (¢/kWh) rate that fluctuates depending on the costs of fuels like coal and natural gas, as well as electricity purchased from other producers.
- The formula has two main components: the first is a forecast of anticipated fuel and purchased power costs; the second is a reconciliation of any fuel costs TVA under or over collected.
- The total monthly fuel cost includes only the direct cost of fuel used in TVA's generating plants and other fuel related costs directly dependent upon the level of electricity generation and the energy cost of purchased power.
- The difference between the forecast and actual fuel costs is included in future amounts for the total monthly fuel cost, so the end result is that TVA customers pay only the actual fuel costs that TVA incurs.
- The same wholesale charge applies to all customers for the total monthly fuel cost.



Composition of Total FCA

- ❑ The **Core** FCA is the forecasted fuel rate for the upcoming month
 - ❑ *The Core FCA is based on a forecast so that TVA can cover fuels costs as they are incurred.*
- ❑ The **Deferred Account Rate** reconciles prior month's FCA amounts to actual collections.
 - ❑ *After the close of each month, TVA compares the amount collected through the FCA based on forecasted values to the amount that should have been collected based on actual values.*
 - ❑ *The difference between these two amounts, referred to as a "true-up," is added to a deferred account and collected/returned over subsequent months.*
 - ❑ *Because of the information lag and notice periods, with 50% per month liquidation, true-up amounts start to be liquidated on average about 2 months after costs.*



Past Amendments to the FCA

- **Periodicity:**
 - ✓ In the past the FCA was based on quarterly periods.
 - ✓ The transition to a monthly FCA was effective October 1, 2009.
- **Liquidation Credit:**
 - ✓ After the transition to a monthly FCA, a large deferred account balance remained (approximately \$800M).
 - ✓ Beginning October 1, 2009, the credit was gradually disbursed in a declining fashion.
 - ✓ The last liquidation credit that applied was June 2010.
- **Baseline:**
 - ✓ The baseline was formerly shaped to partially mute seasonal effects to the FCA.
 - ✓ Effective October 1, 2010, the baseline was flattened in order to send more proper price signals.
 - ✓ The structure of the baseline changed along with the wholesale rate design in April 2011.
 - ✓ At that time, the baseline was eliminated so that the FCA represents total fuel.
- **General Ledger Reconciliation**
 - ✓ Formerly, the General Ledger calculation for deferred account balance was slightly different from the official calculation.
 - ✓ The major difference was timing due to calendar versus billing month differences.
 - ✓ With the rate change in April, the official calculation will be changed to be based on the general ledger's deferred account.



Detail of Current FCA Eligible Costs

The FCA includes only the direct cost of fuel, fuel-related costs (such as emissions credits), and purchased power, that vary with TVA generation and sales. It does not capture any changes in TVA's fixed costs.

- ☐ **Fossil Fuel Expense - Account 501** - Direct cost of fuel burned in TVA coal plants, including transportation and fuel treatments. Costs to be excluded are lease payments for rail cars, maintenance on rail cars, sampling and fuel analysis, and fuel handling expenses in unloading fuel from shipping media and the handling of fuel up to the point where fuel enters the bunker or other boiler-house structure.
- ☐ **Purchased Power Expense - Account 555** - Energy cost of purchased power to serve native load demand or to displace higher cost generation. Costs to be excluded are fixed demand or capacity payments in tolling agreements and purchased power agreements that do not vary with volume and costs of purchased power linked to off-system sales transactions.
- ☐ **Nuclear Fuel Expense - Account 518** - Cost of nuclear fuel amortization expense dependent upon burn, including DOE spent fuel disposal charges.
- ☐ **Gas Turbine Fuel Expense - Account 547** - Direct cost of gas and oil burned in TVA plants, including transportation. Costs to be excluded are costs of gas storage facilities and sampling and fuel analysis that do not vary with changes in generation volume.
- ☐ **Reagents Expense - Account 501.L** - Cost of emission reagents such as limestone and ammonia that are directly related to the level of generation output.
- ☐ **Allowances Expense - Account 509** - Cost of emission allowance expense such as SO₂ and NO_x that are directly related to the level of generation output.



Current FCA Line-Item Ineligible Costs

FA 501 - Fossil Fuel Expenses

Coal Sampling at Plants
Fuel Sampling & Analysis - Oil
Internal Freight on Oil Transfers
Leased Rail Cars/Rail Upgrades
Maintain Haul Road
Maintenance on Coal Cars
Fuel Prior Period Adjustments (prior to Oct 2006)
Contract Settlements

FA 547 Gas Turbine Fuel

Demand Storage
Fuel Sampling & Analysis

FA 501.L - Reagent Expense

Labor & Limestone Sampling

FA518 Nuclear Fuel Expense

Fuel Assembly Inspection Expense
Contract Settlements

FA555 Purchased Power

Demand Charge Expense
Long Term Transmission Expense

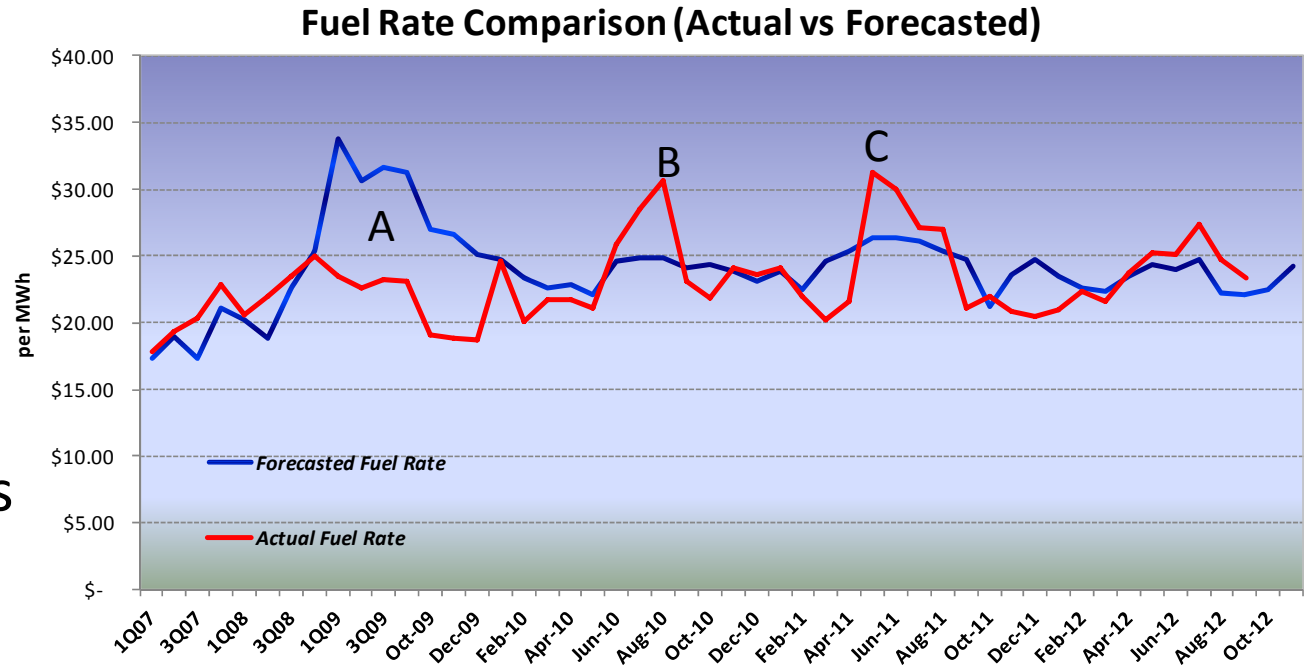
Note: All TVA labor expenses are excluded from the FCA



Fuel Cost and Variance

Key Volatility Drivers

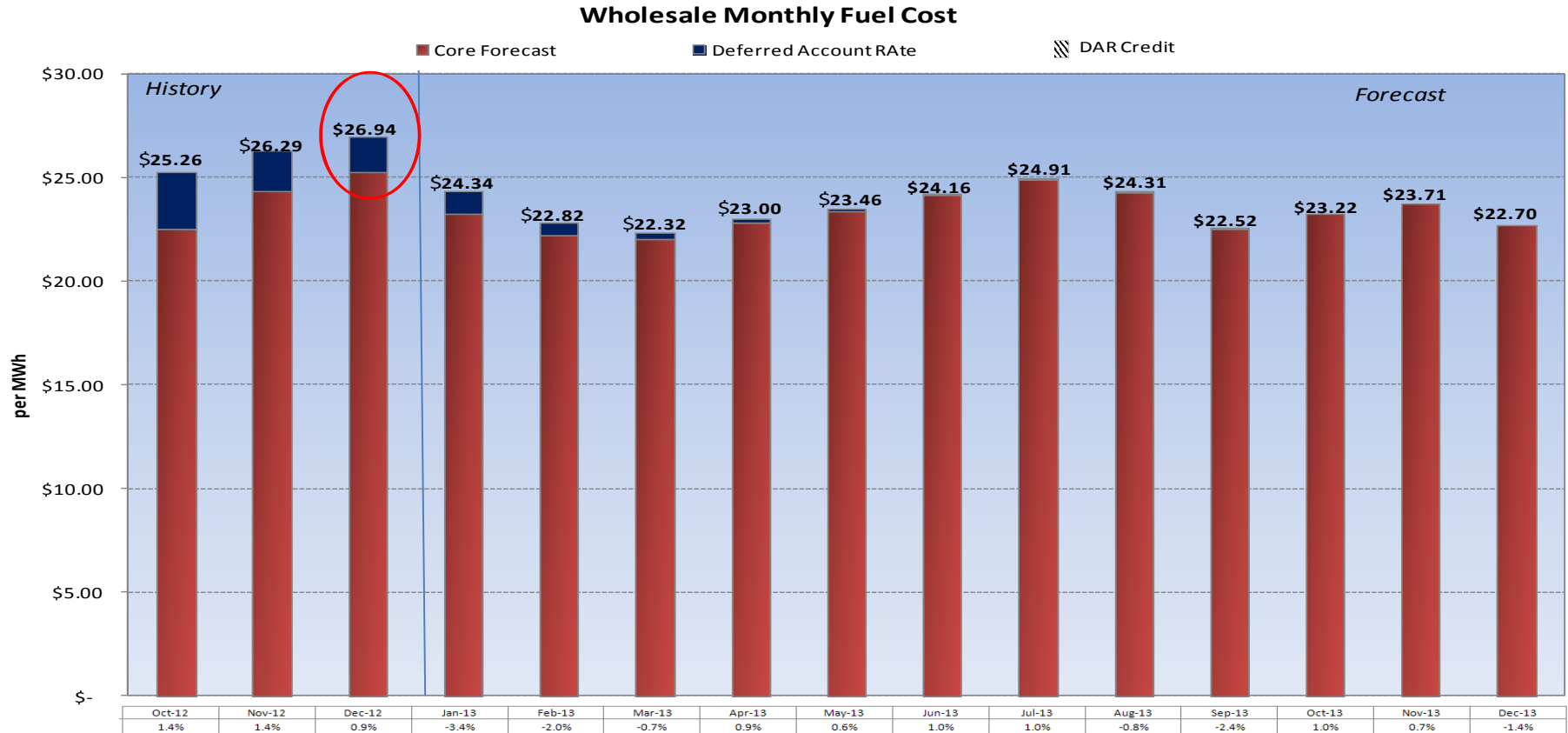
- ☐ Weather
- ☐ Hydro
- ☐ Sales
- ☐ Outages
- ☐ Commodity Prices



- A. Very high expected commodity prices and drought (that both moderated)
- B. Extreme temperatures
- C. Tornado damage with replacement power



Current Total Monthly Fuel Cost and Forecast



Interruptible Product Transition Plan and Reserve Preservation Product

Interruptible Products Update

- TVA conducted a pilot of a new interruptible product, Reserve Preservation (RP), from June 2011 – September 2012
- Due to the success of the pilot, RP was implemented as a full scale product on October 1, 2012
- TVA has announced that the 5 Minute Response (MR) and 60 Minute Response (MR) products will be limited to existing customers and load as of December 31, 2012 and that all contracts will expire by September 30, 2017

Why is TVA Transitioning to RP?

Benefits of RP over 5 and 60 MR:

- RP provides economic calls for demand response in high cost periods providing avoided market cost savings
- The RP pilot has increased TRO's confidence in the curtailment performance of participants as a result of successful economic calls
- RP encourages customers to set realistic protected load levels that they are able to curtail down to during RP events
- Thirty minute notice provides customers sufficient time to shut down their operations in a safe and efficient manner
- The customer outage reporting process required under RP provides TVA with better information about customer operations

TVA's Goal is to end the 5 MR and 60 MR products by the end of FY 2017

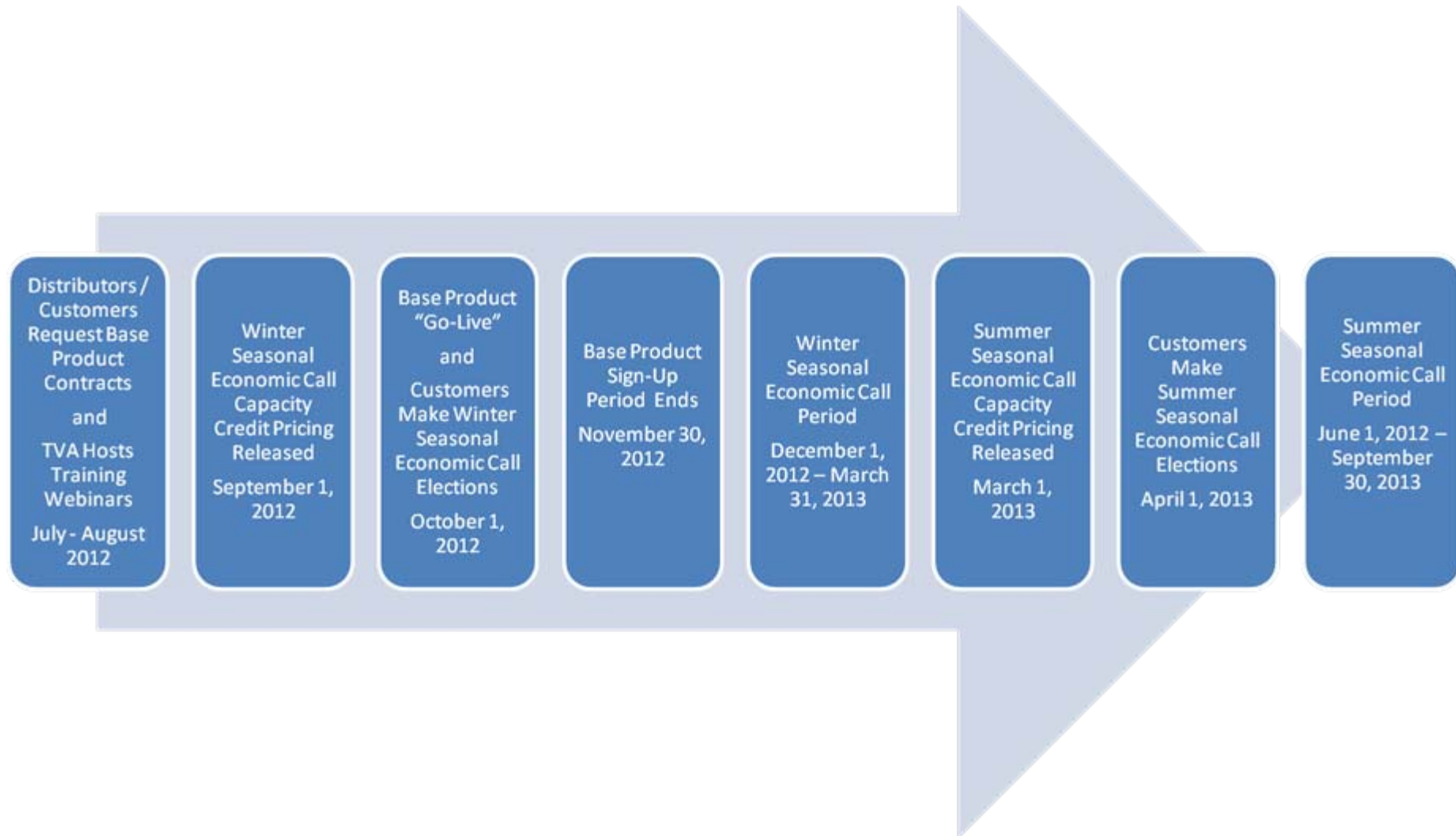
5 MR & 60 MR Transition Proposal

- Freeze participation in 5 MR and 60 MR to existing customers and load with an exception for one customer class as of December 31, 2012
- Existing 5 MR and 60 MR customers may renew contracts; all contracts will expire by September 30, 2017
- Existing 5 MR and 60 MR customers may convert to RP by December 1, 2012 or by October 1st each year thereafter
- Continue the MR products as designed through the end of FY 2017, which includes an annual review of the credit values
- Work with local power company and TVPPA to develop transition plans for the 1 to 5 MW MR customers

RP Key Contract Provisions

- Base Reserve Preservation Product:
 - 10 hours of economic calls per year
 - Unlimited reliability calls (would count against the 10 base product economic call hours if not all hours have been used)
- Base Reserve Preservation contract will last 5 years unless contract termination notice provided three years in advance
- 30 minute minimum event notification
- Option of 2-4 or 4-8 hour economic event durations
- April – October Economic Event Hours - 13:00–22:00 Central Prevailing Time (CPT)
- November – March Economic Event Hours - 4:00-10:00 and 15:00–22:00 (CPT)
- No Event Hour windows for reliability calls (may be called upon any time of day)
- Event Frequency – 1 call a day, unlimited for reliability
- Base-line method – Protected (down to)

Reserve Preservation Timeline



Product Attributes

Product Attribute / Design Parameter	Reserve Preservation		
	Base Product	Seasonal Options (Summer and/or Winter)	
		10 hrs - Winter or Summer	30 hrs - Summer Only
Operating Parameters			
Eligibility	Contract Demand >5MW		
Product type	Capacity & associated energy		
Baseline type	Protected (down-to)		
Performance adjustment	None		
Customer action	Curtail		
Min notification	30 minutes		
Max event frequency	1 / day ¹ (except for emergencies)		
Min-max economic event duration	2 – 4 hrs or 4 – 8 hrs; customer election ²		
Max. aggregate duration	10 hrs/year + emerg. ³	10 hrs/season + emerg. ³ (in addition to base product)	30 hrs/summer + emerg. ³ (in addition to base product)
Min. gap between events	n/a		
Event windows	November-March: 04:00-10:00 & 15:00-22:00 CPT		December-March: 04:00-10:00 & 15:00-22:00 CPT
	April-October: 13:00 -22:00 CPT		June-September: 13:00 -22:00 CPT
	Emergency – all hours		Emergency – all hours
Subscription period	5 year contract	4 month seasonal amendments to base contract at customer's election before start of each season	
Program offering limit	No more than 1,700 MWs on RP, 5 MR and 60 MR		
Dispatch type	Economic		
Customer outages and expected operating information	Notification of outages required		

Notes:

1. Not all customers need to be called during the same event; could be selected based on geographic need or on a rotating basis
2. Customers electing shorter duration events will be exposed to greater event frequency inside maximum aggregate hours limit
3. Unlimited "Emergency" outages

Product Attributes Continued

Product Attribute / Design Parameter	Reserve Preservation		
	Base Product	Seasonal Options (Summer and/or Winter)	
		10 hrs - Winter or Summer	30 hrs - Summer Only
Monthly per-kW Credits			
Payment determinant	> of Monthly Average kW during RP Peak hours - Protected Load ¹ or highest 30 minute billing demand two hours before event notification - Protected Load		
Valuation basis	Attribute-adjusted LT CT cost		
Lost net revenue accounting	Embedded in kW credit valuation		
Pricing (\$/kW-mo) - Indicative Values Subject to Change	\$5.50 ²	Indicative Pricing - \$0.3 ²	Indicative Pricing - \$0.8 ²
Monthly per-kWh Credits			
Performance credits			
Payment determinant	Positive baseline - actual ³		
Valuation basis	Indexed strike (HHNG * 10HR) ⁴		
Under-performance pmts			
Payment determinant	Any amount over protected load		
Valuation	>\$100/MWh or Hour Ahead Top Cost (clock hour before the curtailment begins)		
Other Product Features			
Customer generation	Not currently allowed		
Min bill suspension	Yes		
Nomination variation	May lower protected load from contract in summer	May lower protected load from contract	
Buy-through	n/a	n/a	
Notes:			
1. On-Peak hours = STOU On-Peak hours for both STOU and SD&E customers			
2. Indicative Credit Values, subject to change; Seasonally Shaped Credits for STOU customers only; SD&E customers will receive flat credits; base product credit value subject to change during Annual Product Review			
3. Positive baseline = customer's highest 30 minute billing demand two hours before event notification			
4. Prior month Henry Hub Settlement price (last day of month prior to prompt month)			