Tennessee Valley Authority

Regional Energy Resource Council

Webinar

Oct 15, 2014

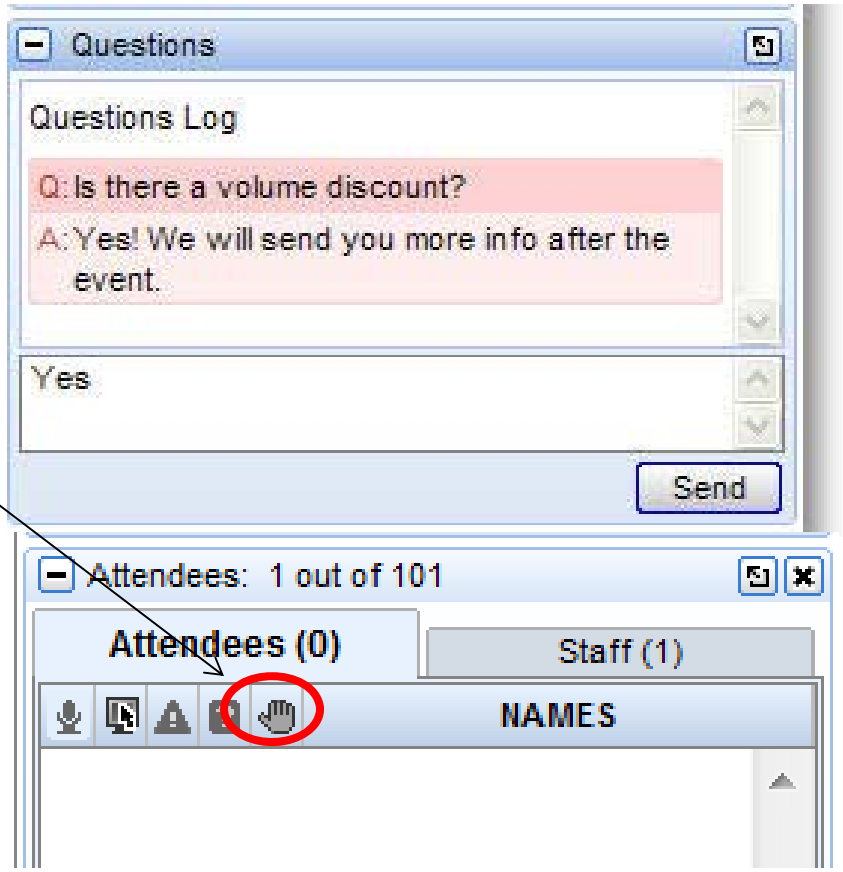
Agenda

9:00	**Welcome**	**Dus Rogers, Council Chair**
	Meeting Purpose / Updates	**Joe Hoagland, Designated Federal Officer**
9:20	**IRP Update**	**Gary Brinkworth**
9:45	**RERC Member Discussion and Q&A**	**RERC Members**
10:00	***Break***	
10:15	**Overview of Renewables and Energy Efficiency in the IRP Model**	**Gary Brinkworth**
11:00	**RERC Member Discussion and Q&A**	**RERC Members**
11:30	**Wrap up & Adjourn**	**Hoagland/Rogers**

Welcoming Comments

About Today's Meeting

- Webinar attendees attending by phone are muted.
- **RERC Members** can submit questions using the Question tool on the Webinar toolbar, or using the Raise Hand function
- Questions or comments from the general public will not be accepted during the webinar; however, written comments are welcomed.
  - Send comments to: bakeel@tva.gov



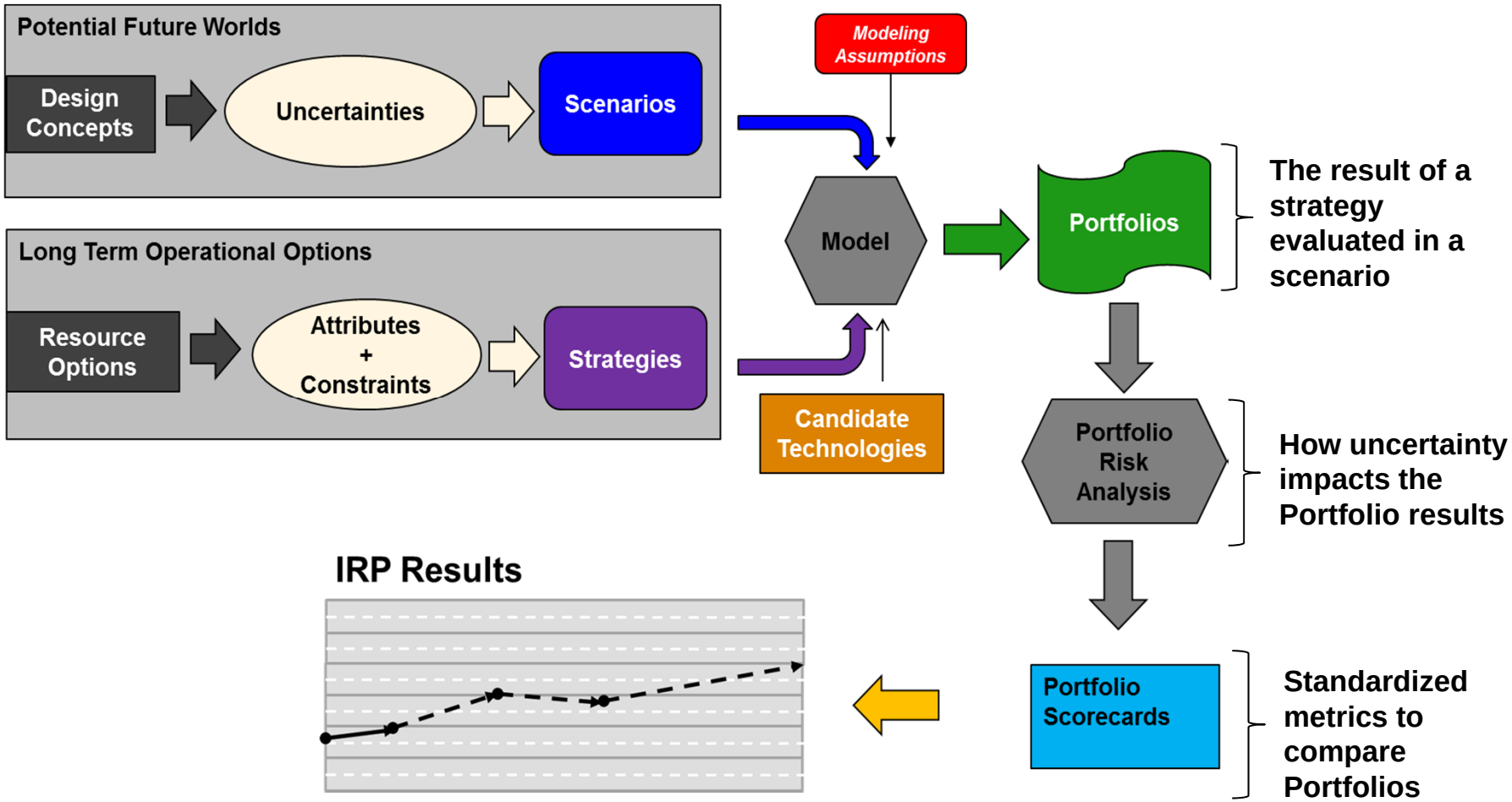
Safety First – Fall Driving Tips

2015 Integrated Resource Plan

Update for RERC Webinar

October 15, 2014

How the Resource Planning Process Works



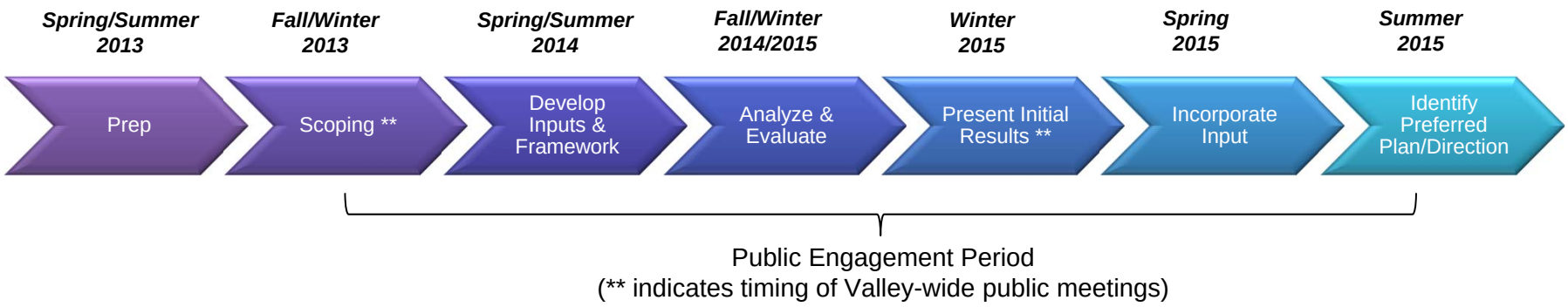
Scenarios and Strategies Selected

Scenarios	
1. Current Outlook	• Current outlook for the future TVA is using for resource planning studies
2. Stagnant Economy	• Stagnant economy results in flat to negative growth, delaying the need for new generation
3. Growth Economy	• Rapid economic growth translates into higher than forecasted energy sales and resource expansion
4. De-Carbonized Future	• Increasing climate-driven effects create strong federal push to curb GHG emissions: new legislation caps and penalizes CO2 emissions from the utility industry and incentivizes non-emitting technologies
5. Distributed Marketplace	• Customers' awareness of growing competitive energy markets and the rapid advance in energy technologies produce unexpected high penetration rates in distributed generation and energy efficiency

Strategies	
A – The Reference Plan	• Traditional utility "least cost optimization" case
B – Meet an Emission Target	• Resources selected to create lower emitting portfolio based on an emission rate target or level using CO2 as the emissions metric
C – Lean on the Market	• Most new capacity needs met using PPA or other bilateral arrangements • TVA makes a minimal investment in owned assets
D – Doing More EE	• Majority of capacity needs are met by setting an annual energy target for EE (e.g., minimum contribution of 1% of sales)
E – Focusing on Renewables	• Majority of new capacity needs are met by setting immediate and long-term renewable energy; includes hydro • Utility-scale approach is targeted initially with growing transition to distributed generation as the dominant renewable resource type by 2024

2015 IRP/SEIS Revised Schedule: Major Phases/Milestones

***The 2015 IRP is intended to ensure transparency and enable stakeholder involvement*.**

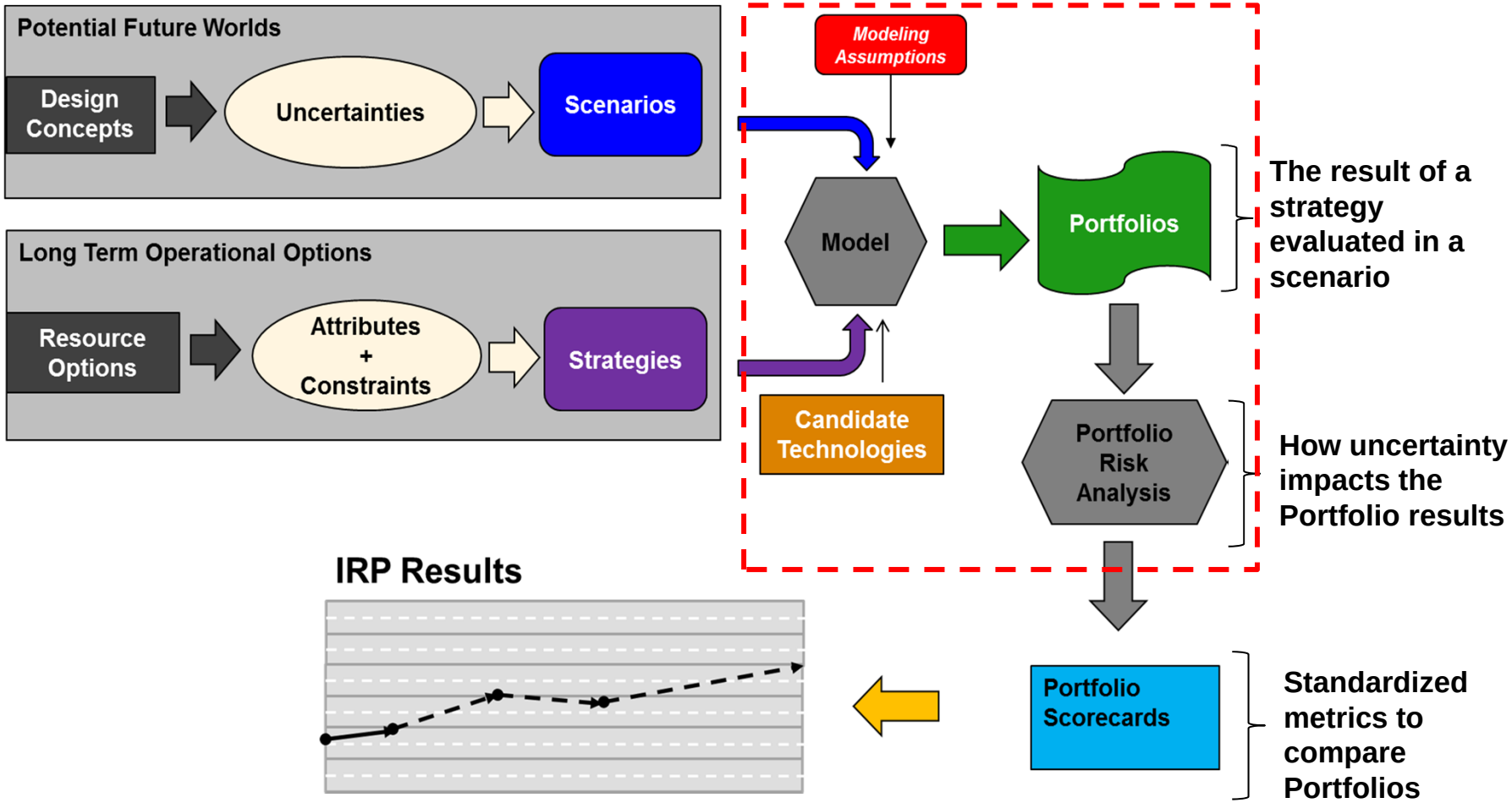


Key tasks/milestones in this revised study timeline include:

- Complete modeling runs – December 2014
- Detailed review of case results & prelim findings – January 2015
- Publish draft Supplemental Environmental Impact Statement (SEIS) and IRP – February 2015
- Complete public meetings on draft results – April 2015
- Final publication of SEIS and IRP and Board approval – Summer 2015

In the original schedule, completion was targeted for Spring 2015

Where Are We in the Process?



Detailed Modeling & Review

- The resource planning team is currently working through all the scenario/strategy combinations
  - Each entry in the matrix below represents a 20-year optimized resource plan
  - Each of these plans is also being subjected to uncertainty analysis (stochastic iterations)
- Preliminary results for the 5 optimized plans in the Current Outlook scenario were recently reviewed with the IRP stakeholders
- Modeling should be complete by late November; the IRP stakeholders will get another results update in early December
  - Review of the final set of case output is scheduled for late January

	Scenarios				
Planning Strategy	**1 Current Outlook**	**2 Stagnant Economy**	**3 Growth Economy**	**4 De-Carbonized Future**	**5 Distributed Marketplace**
A. The Reference Plan	1A	2A	3A	4A	5A
B. Meet an Emission Target	1B	2B	3B	4B	5B
C. Lean on the Market	1C	2C	3C	4C	5C
D. Doing More EE	1D	2D	3D	4D	5D
E. Focusing on Renewables	1E	2E	3E	4E	5E
X. Scenario 1 Baseline	1X				

25 standard cases; 72 stochastic iterations; additional sensitivity runs: over 1800 model runs

Goals For An Optimal Resource Plan

Low Cost

- Minimizing cost critical to economic efficiency, and mandated by the TVA Act
- Does not imply purely least-cost due to risk considerations
- Lowest cost option should be chosen between competing plans of roughly equal risk; the lowest cost wins

Risk Informed

- TVA must manage many risks on behalf of customers, including construction costs, fuel costs, and availability
- Risks should be clearly understood and consciously accepted or mitigated

Environmentally Responsible

- TVA must have a clear understanding of the environmental impacts of its decisions and seek alternatives that best support our Vision and Mission
- Option with better environmental impact should be chosen in situations where economics are inconclusive and risks are generally balanced.

Reliable

- TVA has built a reputation of reliability
- Certain assets are inherently more reliable than others. Others, like wind and solar, are more intermittent requiring backup generation
- Other types of assets, particularly some of TVA's oldest coal assets, are less reliable than others

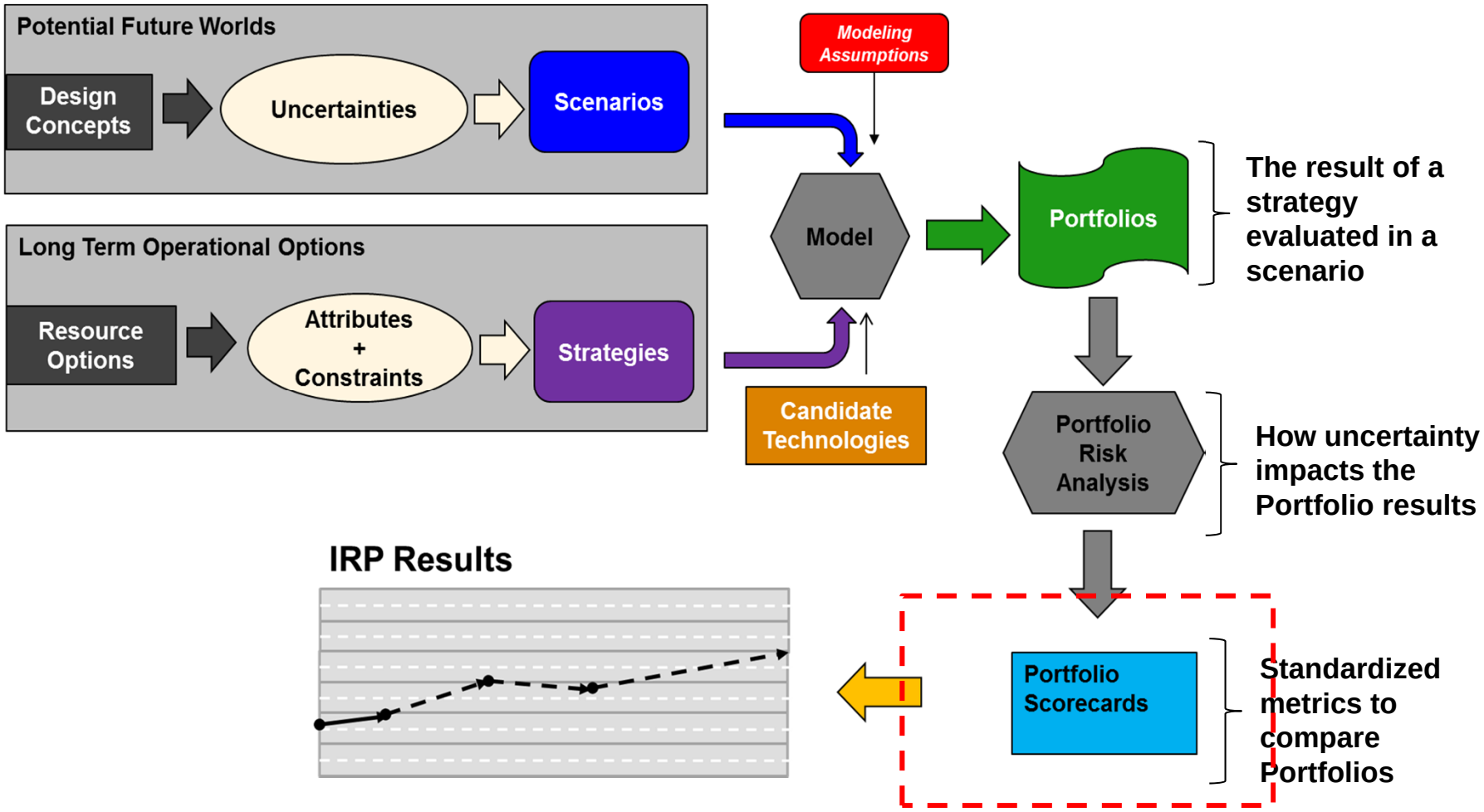
Diverse

- TVA should strive to insulate customers from extreme market fluctuations
- Diversity can be measured by the degree to which a portfolio is robust in a wide variety of futures
- TVA's IRP captures the value of diversity by scoring how well various portfolios perform under subjected shocks
- The most diverse portfolios succeed in a large number of worlds, even if it is not clearly superior in any single world

Flexible

- A sound generation plan will allow decision-makers the flexibility to learn more about future environments before making decisions that would be costly to reverse
- For example, installing scrubbers on marginal coal assets may have positive returns under current conditions, but what happens if new EPA regulation results in significant compliance costs?

How Will We Summarize The Results?



Overview of 2015 Scorecard and Dashboard

TVA is Proposing Five Categories of Metrics

Metric Category	Description
Cost	■ The objective of the cost metrics is to measure the impact of a strategy in terms of total cost to TVA in terms of both capital and operating expenses ■ The aim is to measure the financial effort to implement the strategy both in the long and the medium term ■ Cost metrics are not intended to measure the impact on rates
Risk	■ Risk metrics only focus on financial risks ■ They intend to measure the "certainty" of the calculated total cost and the risk exposure for a particular strategy
Environmental Stewardship	■ The objective of these metrics is to evaluate the environmental impact of a particular strategy
Flexibility	■ These metrics aim to evaluate two critical aspects of meeting quality of power requirements: — Energy supply is available when needed — Under fast changes in demand, the system is agile enough to respond ■ All possible portfolios are required to meet the minimum Capacity Reserve Margin of 15%
Valley Economics	■ The intention of these metrics is to measure the economic impact that the capital and operational expenditures associated with the implementation of a plan will have on TVA's service territory

Types of Metrics

Metrics serve two different purposes in the IRP Process depending upon:

- Definition
- Calculation
- Insights provided

Scorecard

- Well understood characteristics
- Industry standard measures
- Supports numerical comparison

Scorecard metrics will be directly used in the scorecard portions of the IRP results to provide clear and measurable comparisons amongst the resource portfolios created in each scenario

Reporting

- Optional/advanced measures
- Developmental
- Informative/Supplemental

Reporting metrics will be tabulated in the appendix and used in the narrative portions of the IRP & SEIS to capture other aspects of the resource portfolios that are not included in the scorecard

Proposed Scorecard Metrics – Definitions/Formulas

Scorecard Metric	Definition/Formula
System Average Cost ($/MWh) Year 1-10	Average system cost for the first 10 years of the study, computed as the levelized annual system average cost (revenue requirements in each year divided by sales in that year)
Expected Value PVRR 20y	The total plan cost (capital & operating) expressed as the present value of revenue requirements over the study period (20 years). This value is generated from the stochastic analysis (the expected value of the probability distribution of plan costs)
Risk/Benefit Ratio	Area under the plan cost distribution curve between P(95)and Expected Value divided by the area between Expected Value and P(5)
Risk Exposure	The point on the plan cost distribution below which the likely plan costs will fall 95% of the time based on stochastic analysis
CO2 Avg Tons	The annual average tons of CO2 emitted over the study period
Water Consumption	The annual average gallons of water consumed over the study period
Waste	The annual average quantity of coal ash, sludge & slag projected based on energy production in each portfolio
Flexibility	*Note: TVA is still considering a number of Flexibility metrics*
% Change in Per Capita Income	The change in per capita personal income expressed as a change from a reference portfolio in each scenario

Cost
Risk
Environmental Stewardship
Flexibility
Valley Economics

Scorecard Design - Prototype

Example: 2011 Planning Strategy C - Diversity Focused Resource Portfolio

Raw Values	Cost		Risk		Environmental Stewardship			Flexibility	Valley Economics
Scenarios	PVRR	Sys Avg Cost (Yr 1-10)	Risk/Benefit Ratio	Risk Exposure	CO2	Water	Waste	N/A	% Change in Per Capita Income
1. Economy Recovers Dramatically	169.13	78.76	1.38	208.65	1,673	4,663	438	N/A	0.60
2. Environmental Focus is a National Priority	132.04	75.36	1.29	158.90	1,418	4,214	427	N/A	N/A
3. Prolonged Economic Malaise	114.02	77.40	0.89	123.48	1,210	3,749	382	N/A	N/A
4. Game-Changing Technology	134.93	76.00	1.14	155.66	1,408	4,256	397	N/A	N/A
5. Energy Independence	131.23	75.64	1.16	152.91	1,422	4,200	424	N/A	N/A
6. Carbon Regulation Creates Economic Downturn	104.81	75.55	0.91	117.48	1,035	3,503	315	N/A	0.10
7. Spring 2010 Baseline	130.06	75.94	1.14	149.58	1,427	4,305	414	N/A	N/A

N/A: 2011 data not available

DESIGN

- A scorecard will be created for each strategy showing how it performs in the different scenarios. As an example, the graphic above shows the proposed 2015 IRP Detail Scorecard using the results of Strategy C from the 2011 IRP
- Scorecard metrics will be presented in tables showing the results in the original raw values

USE

- Using this type of scorecard allows stakeholders and decision-makers with some technical background to discuss and evaluate options having access to aggregated and detailed information

Flexibility Metrics Still Under Development

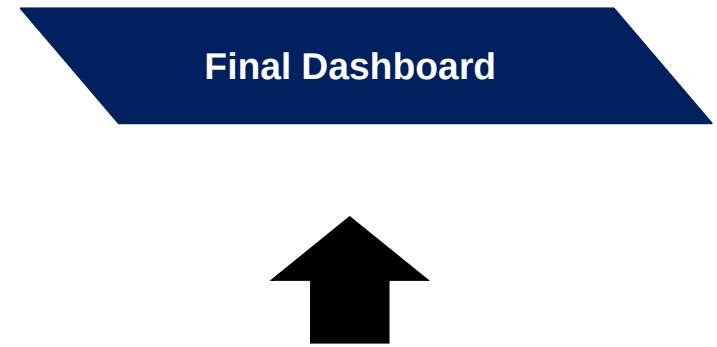
- The flexibility category include metrics that evaluate two critical operational aspects of meeting quality of power requirements:

  1. Energy supply is available when needed
  2. Under fast changes in demand, the system is agile enough to respond
     - Ramps
     - Turn-downs
     - Shorter peaks

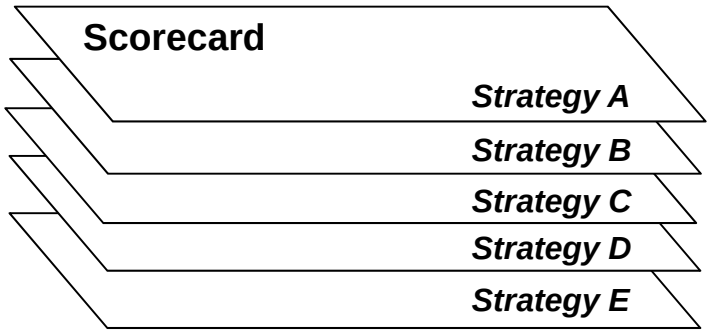
- In addition, these metrics will also help in evaluating the risk exposure of a portfolio to limitations on how variable resources are being modeled (this is a model architecture issue)
  - The fixed energy patterns used to model intermittent or non-dispatchable resources do not adequately reflect the variation in performance over time (and therefore the risk assessment) of those resource types

2015 IRP Results – A Dashboard to Summarize

- The presentation of results will be based on a two tier reporting scheme:



- The dashboard is intended as a one-page representation of the performance of all strategies across the five metric categories
- Results will be presented in a numerical and graphical manner to facilitate the communication of the results to a general audience



- The scorecard will provide analysts and stakeholders with detailed information about the performance of each strategy
- Scorecard metrics will be presented numerically to easily illustrate relative values
- Scorecards are not intended for use in reporting information to the general public

Dashboard Design Concepts

- A dashboard is a visualization mechanism that facilitates decision making
- It should not be treated as an algorithm with a mechanical calculation
- It should strike a balance between summarizing and segregating information that facilitates the understanding & interpretation of the underlying analysis without requiring decision-makers to be familiar with all the details

- The dashboard design should make communication of the key information clear and understandable to stakeholders and the general public
- The structure of the dashboard can take several forms
  - Numerical
  - Visual/relational
  - A combination that can be weighted or un-weighted

Dashboard Prototypes Are Under (Re)Development

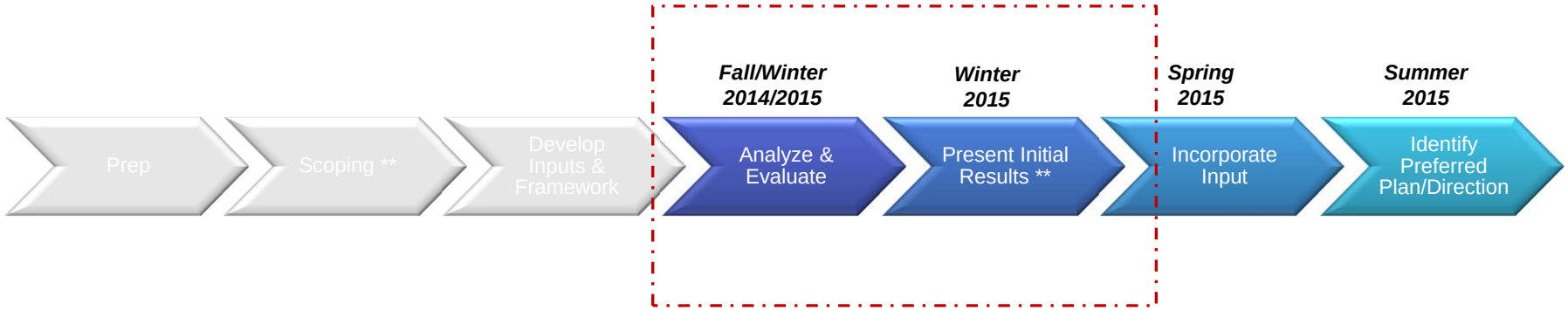
- A prototype dashboard was shared with the IRP stakeholders at their October 7th meeting
  - Generally the design did not achieve the overall goal of making the case results more understandable
  - Stakeholders recommended a number of fundamental changes

- TVA is developing some new prototypes using design goals based on recent feedback
  - Looking for graphical methods that communicate the key metrics
  - Target different formats for different audiences
  - Highest level dashboard should answer the “so what” question
  - General public format should be the most simplified (presume the least technical understanding)

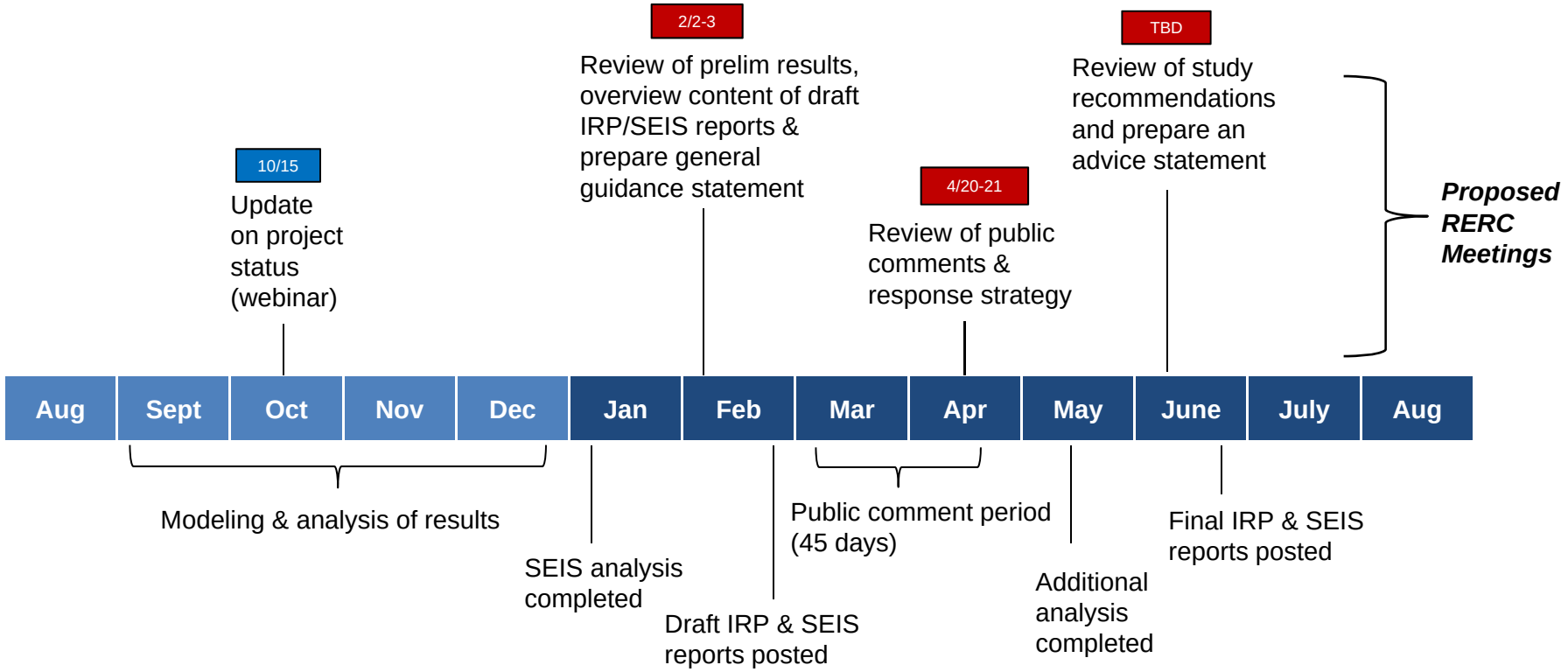
- A revised dashboard will be discussed with IRP stakeholders at their December working session

IRP Project Next Steps

- Complete modeling runs – December 2014
  - Review of additional preliminary results with the IRP stakeholders
  - Finalize the metrics and dashboard
- Detailed review of case results & findings – January 2015
  - TVA internal review and discussion with IRP stakeholders
- Publish draft Supplemental Environmental Impact Statement (SEIS) and IRP – February 2015
  - Public comment period runs from early March through middle of April 2015



RERC Engagement



RERC Discussion

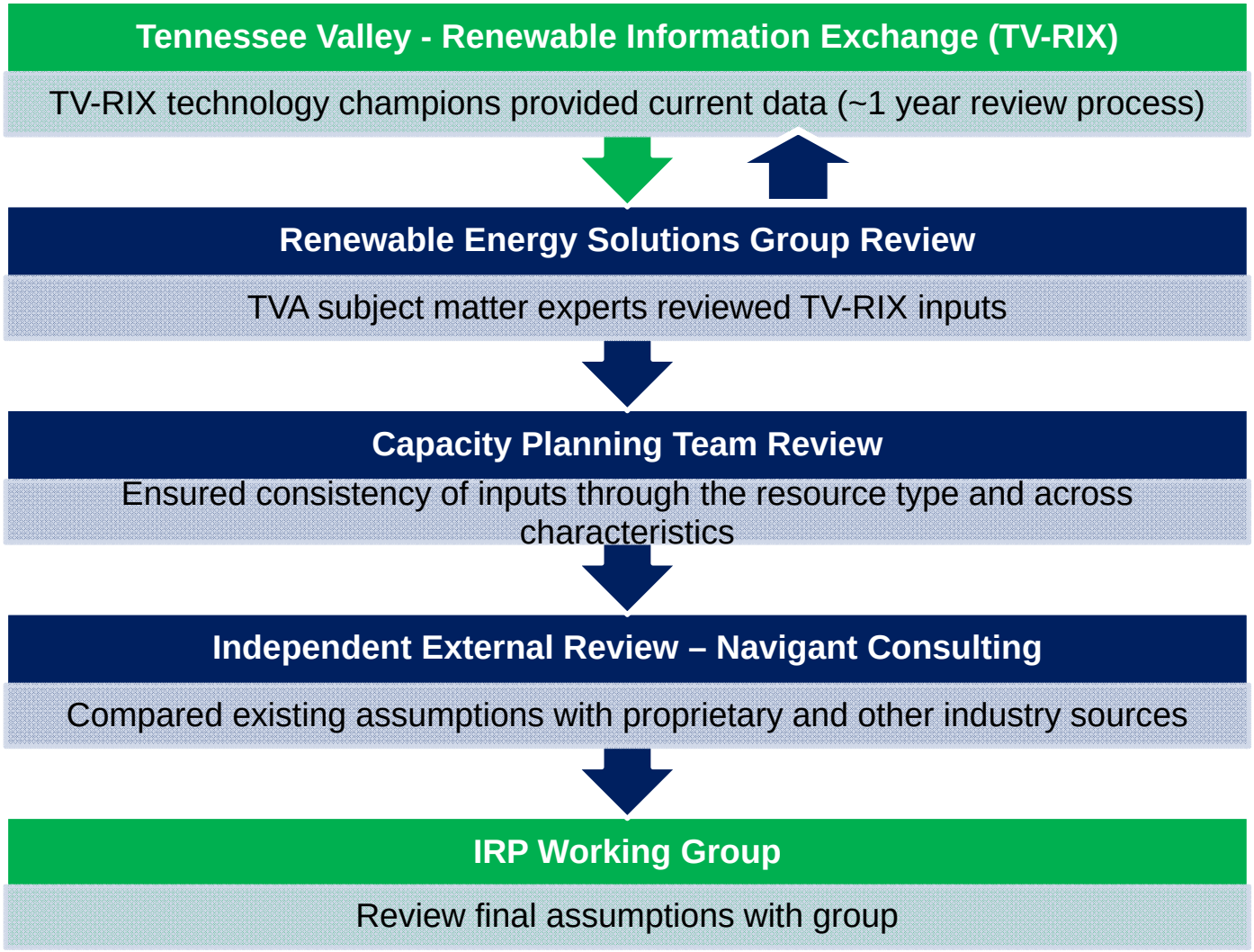
Break

2015 Integrated Resource Plan

Overview of Modeling Concepts:

Solar, Wind and Energy Efficiency

Collaborative Assumption Gathering & Review Process



External Review

Internal Review

Power Resource Options in the IRP

NATURAL GAS FIRED
- Simple cycle combustion turbine (CT3x)
- Simple cycle combustion turbine (CT4x)
- Combined cycle two on one (CC2x1)
- Combined cycle three on one (CC3x1)

COAL FIRED
- Integrated Gas Combined Cycle (IGCC)
- Pulverized Coal 1x8 (PC1x8)
- Pulverized Coal 2x8 (PC2x8)
- Integrated Gas Combined Cycle with Carbon Capture and Sequestration (IGCC CCS)
- Pulverized Coal 1x8 with Carbon Capture and Sequestration (PC1x8 CCS)
- Pulverized Coal 2x8 with Carbon Capture and Sequestration (PC2x8 CCS)

NUCLEAR
- Pressurized water reactor (PWR)
- Advanced pressurized water reactor (APWR)
- Small Modular Reactor (SMR)

HYDRO
- Hydro dam expansion project: Spill addition
- Hydro dam expansion project: Space addition
- Run of river

UTILITY-SCALE STORAGE
- Pumped-hydro storage
- Compressed air energy storage (CAES)

BIOMASS
- New direct combustion
- Repowering

SOLAR
- Utility-scale one-axis tracking photovoltaic
- Utility-scale fixed-axis photovoltaic
- Commercial-scale large photovoltaic
- Commercial-scale small photovoltaic

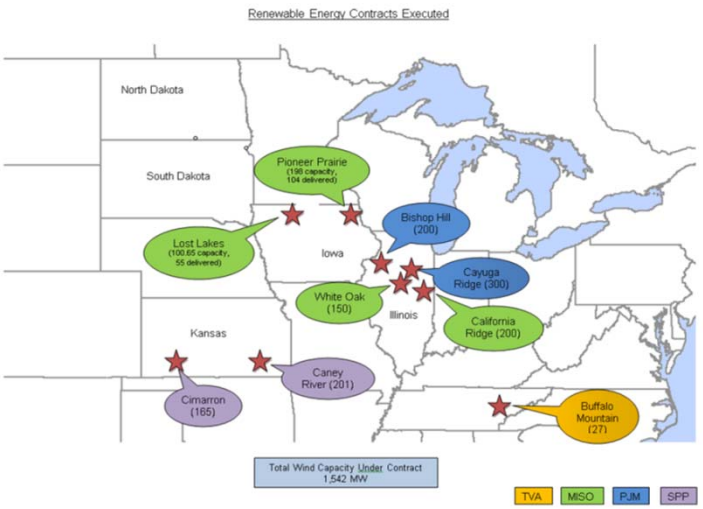
WIND
- Midcontinent Independent System Operator (MISO)
- Southwest Power Pool (SPP)
- In valley
- High Voltage Direct Current (HVDC)

These resource options were developed with input from TVRIX

Wind & Solar Resource Modeling

- Wind and Solar resources have unique operating characteristics that are different from other asset types:
  - Hourly energy profiles are fixed / “scheduled” in to the model and are not dispatchable
  - Heat Rates are not relevant, and a key variable for these resources is capacity factor (how much generation they produce relative to their capacity). This is a proxy for the shape and amount of generation produced
  - Because wind and solar are weather dependent, we must also establish a Net Dependable Capacity (NDC) - how much of each resource can we count on at our peak
  - Transmission costs may be quite significant (HVDC) or routine (in-Valley solar)

- For wind resources, we are modeling
  - in-valley wind
  - out-of-valley wind
  - HVDC wind
- TVA benefits from our significant experience with wind power



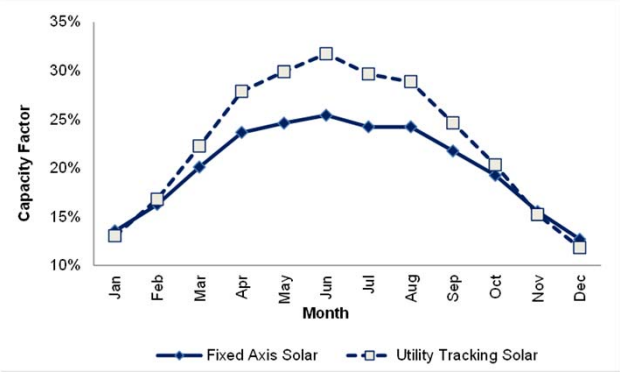
Solar Expansion Options & Performance Assumptions

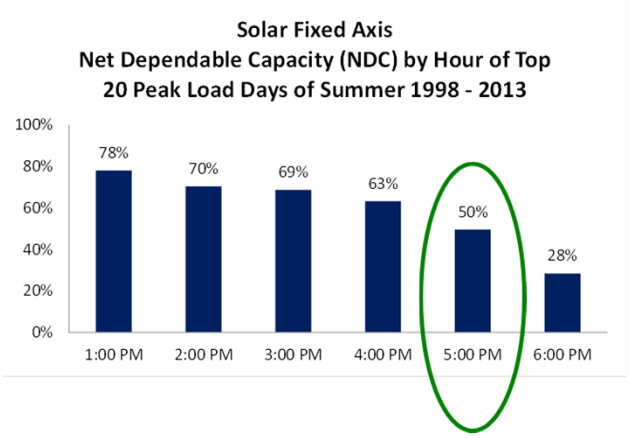
Expansion Options:

- Four different solar options available at minimum capacity block sizes of 25MW
- Utility sized options include:
  - Single-tracking system represents one 25 MW unit
  - Fixed-tilt system represents 2.5 units at 10MW each
- Small commercial option represents 500 installations of 50kW each
- The larger commercial system represents 100 installations of 250 kW systems

In the IRP study, the annual capacity factor for solar is 20% (23% for tracking systems). NDC for solar is 50% (68% for tracking systems). These values align with the recommendations from TVRIX.

	Utility tracking	Utility fixed	Commercial small	Commercial large
Unit Characteristics				
Capacity (MW)	25	25	25	25
Build Schedule (Yrs)	1	1	1	1
Unit Availability (Yr)	2015	2015	2015	2015
Annual Outage Rate	1%	1%	1%	1%
Book Life (Yrs)	25	25	25	25
Cost Characteristics (2013$)				
Overnight Capital Cost ($MM)	**This section of the data table contains confidential information**			
Transmission Upgrades ($MM)				
Total Overnight Capital Cost ($/kW)				
Variable O&M ($/MWh)				
Fixed O&M ($/kW-yr)				





Wind Expansion Options & Performance Assumptions

Expansion Options:

- Four different wind options are available at minimum capacity block sizes of 120MW to 200MW
- Three options originate from different transmission control areas
- The HVDC option incorporates a direct current bulk transmission line that will reduce electrical line losses; transmission costs include build costs and interconnection fees
- SPP wind must pay wheeling charge in MISO ($39/kW-yr) and SPP ($29/kW-yr)

	MISO	SPP	In valley	HVDC
Unit Characteristics				
Capacity (MW)	200	200	120	200
Build Schedule (Yrs)	1	1	1	6
Unit Availability (Yr)	2015	2015	2015	2020
Annual Outage Rate	5%	5%	5%	5%
Book Life (Yrs)	20	20	20	20
Cost Characteristics (2013$)				
Overnight Capital Cost ($MM)	This portion of the data table contains business sensitive information and has been redacted.			
Transmission Upgrades ($MM)				
Total Overnight Capital Cost ($/kW)				
Variable O&M ($/MWh)				
Fixed O&M ($/kW-yr)				

Wind capacity factors based on actual results from TVA's wind contracts, simulated and actual data for the in-valley sites, and proposals for various projects

NDC for wind is based on the capacity factor coincident with TVA's top 20 summer peak hours each year; a 75% confidence factor is applied to this dataset and the results are averaged across each year to yield the net dependable capacity for each wind resource type.

Capacity Factors	In-Valley Wind	Out-of-Valley Wind	HVDC Wind
TVRIX Recommendation**	30-40%	55%	55-61%*
IRP Input	30%	40%	55%

Net Dependable Capacity	In-Valley Wind	Out-of-Valley Wind	HVDC Wind
TVRIX Recommendation**	8%	14%	40-47%*
IRP Input	14%	14%	14%

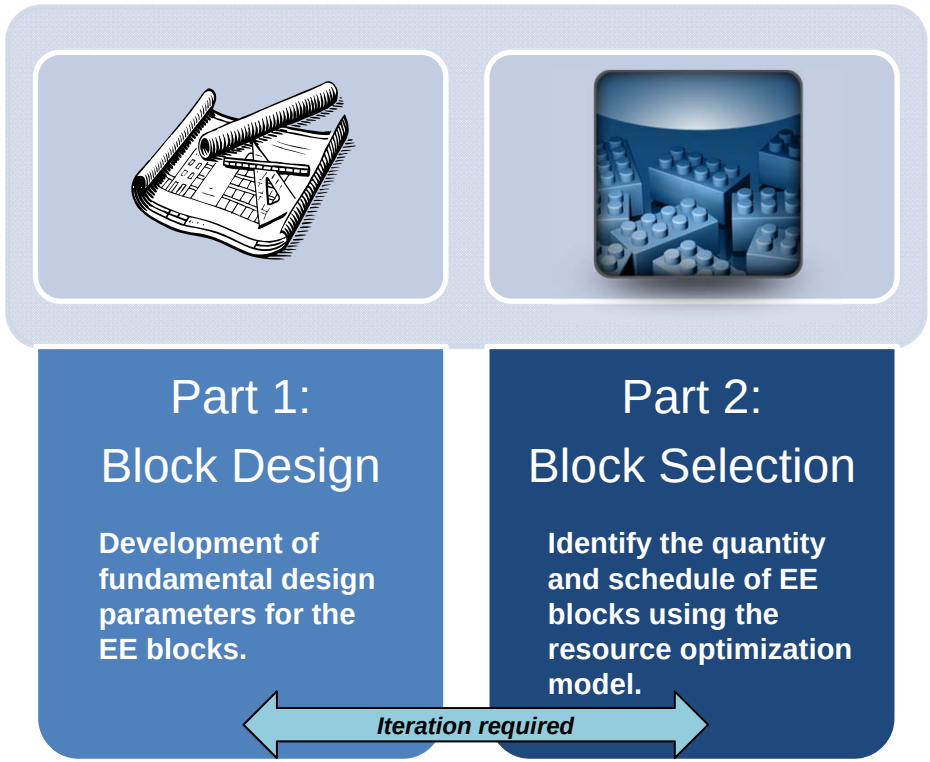
*TVRIX recommendation reflects oversubscription of HVDC line, which is not assumed for the IRP
** Values are computed using TVA methodology with input data taken from TVRIX

Next Steps / Lessons Learned

- Renewable resource modeling is challenging and an exciting opportunity
- First-of-its-kind collaboration with renewable stakeholders was a major investment that resulted in increased learning
- Areas for future study:
  - Impact of increased solar penetration on the timing of our system peak
  - Impact on portfolio flexibility / operating constraints from increased levels of intermittent or variable resources
- As IRP case results become available, TVA will be monitoring renewable resource selection levels and may adjust assumptions or modeling constraints
  - Utility scale renewables are part of the resource options available to the model
  - Small scale (distributed) renewables are not directly evaluated in the IRP but the net effects are captured in the design of one scenario (plausible future)

The EE Modeling Concept

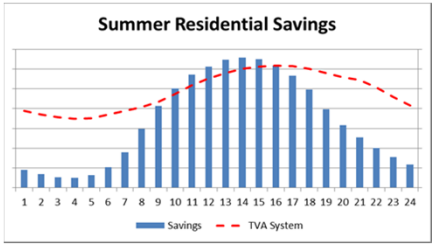
- Enhanced approach to modeling and selection of EE as a resource in the IRP study
- Involves a 2-step process
  - Design of selectable “blocks” of EE that represent program bundles organized by customer sector (residential, commercial, industrial)
  - The optimization of the timing and quantity of EE in the resource plan by treating EE as a resource that competes with other options
- This approach represents an advanced modeling technique not widely used in the industry; as a result, TVA will be closely monitoring the outcome of the IRP cases and may adjust assumptions (this is still and R&D effort)



Energy Efficiency in the Model

Building Block Design

- **Three pricing tiers: 1.16 ¢/kWh to 2.74 ¢/kWh**
- **Maximum of 58 Blocks Annually**
  - **32 Residential**
  - **15 Commercial**
  - **11 Industrial**
- **Service life defined by existing programs and industry standards**
- **Capacity factors:**
  - **57% Residential**
  - **80% Industrial**
  - **68% Commercial**
- **Hourly fixed shape**



Factors for the Model

- **Limited number of total blocks for each tier**
- **No reserve credit**
- **Growth rate maximum of 25% first five years, 20% next ten, 15% for remaining duration**
- **Risk adjusted for LPC delivery risk: 10 % years first five years, then declining 2% per year**
- **Risk adjusted for program uncertainty 0% for first five years, 4% annually after year five, capped at 30%**

Third Party Verification

- Conclusions and recommendations
  - No major 'show-stoppers'
  - Some areas appear to lead to conservative treatment of EE, while others appear to be optimistic
  - ***On balance, TVA appears to be relatively well-positioned to take the innovative step of introducing energy efficiency into the IRP capacity expansion modeling as a model-selectable resource, rather than forcing in pre-set amounts at pre-set times***

- Reviewed:
  - Load shapes
  - Reasonableness of cost changes over time
  - Program energy and cost assumptions
  - Pricing tiers and breakpoints
  - Capacity modeling approach

- ***"Regarding cost treatment and its implications for system modeling, there is substantial uncertainty in both cost and performance for the energy efficiency blocks available for selection by TVA's capacity expansion model."***

NAVIGANT

The TVA estimates for Technical Potential and Economic Potential, though conservative, are within a reasonable range.

An issue is the treatment of the measure impact once initial measure life is achieved. The TVA model appears to assume that measures continue to provide the same amount of energy savings over multiple lifetimes.

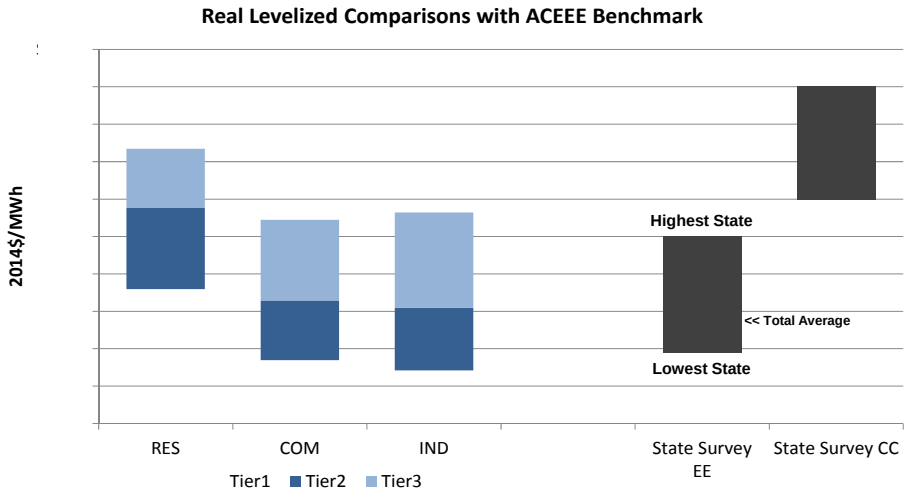
An issue is the possible decline of incentive costs over time (in real terms).

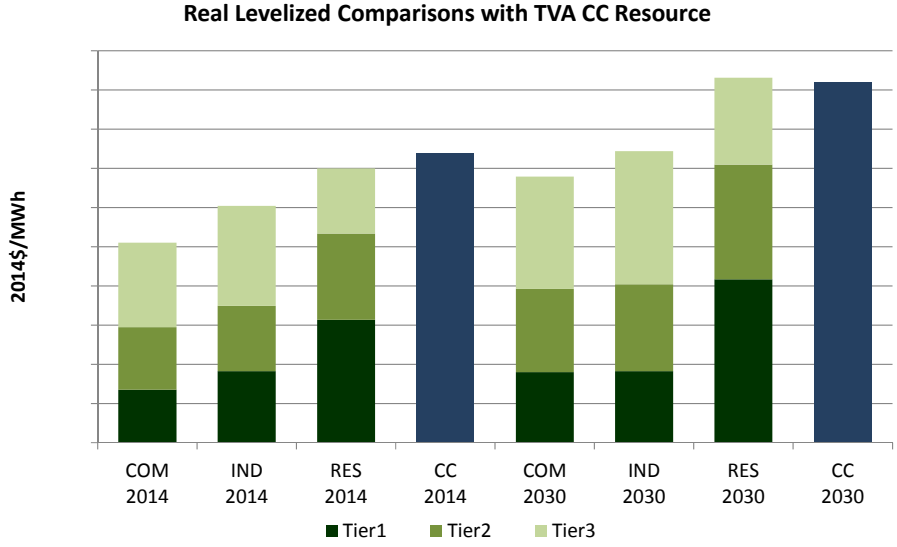
…Navigant is uncertain about the assumptions made for the Tier 2 and Tier 3 blocks. The increasing cost structure between the block levels appears to assume a nearly one-to-one relationship between increased program costs and increased savings.

The method of creating blocks of energy efficiency that apply the EE load shapes to the annual estimates of EE potential at the measure/end-use level (to form a weighted 8760 hourly load file) appears reasonable.

EE Block Costs Benchmarking & Comparison

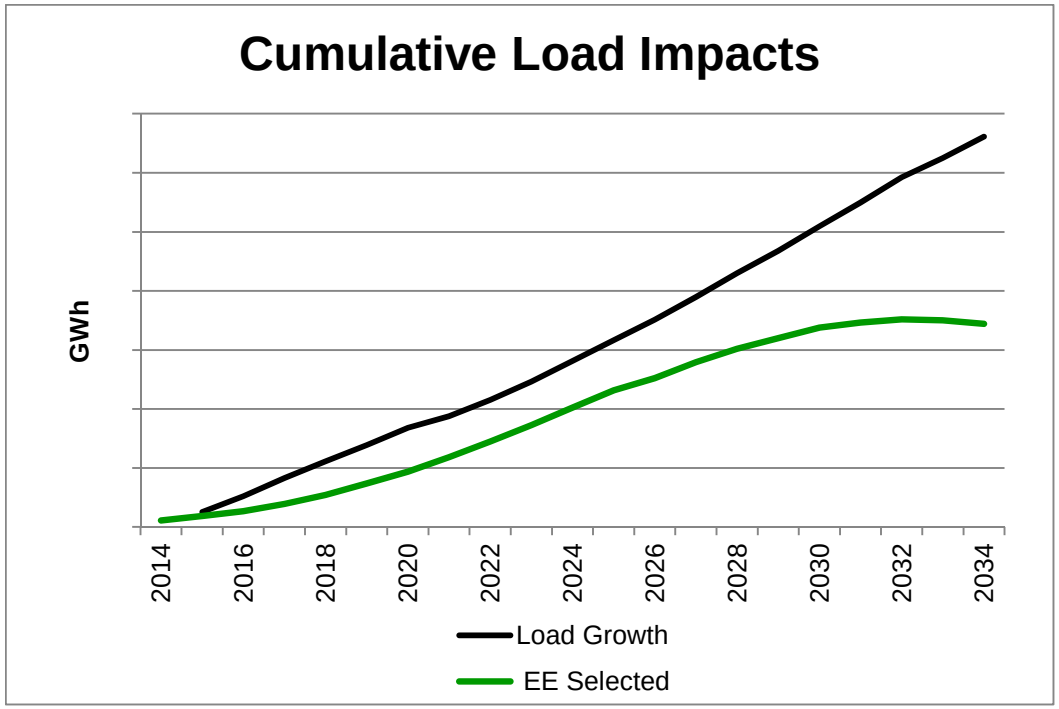
- The American Council for an Energy-Efficient Economy (ACEEE) released a report in March 2014. This study was used as a benchmark for the costs of the TVA EE blocks
- Benchmark range was developed from real levelized costs across 9 states using averaged data from 2009-2012
  - Levelized costs were discounted at inflation
  - Capacity factors for EE Tiers are 57% for residential, 68% for commercial, and 80% for industrial
- The EE block costs shown in the charts are adjusted to reflect a 10% delivery risk factor arising because TVA is not the end use supplier as well as an up to 20% (increasing annually) risk adjustment to reflect increasing uncertainty over time (combined adjustment capped at 30%)
- ***Most of the EE blocks remain cheaper than a natural gas combined cycle (CC) unit***





Methodology Validation

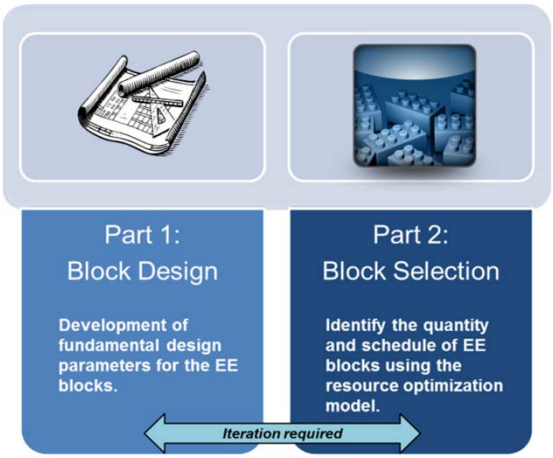
This chart compares the load grow to the cumulative impact of EE resource selection from the latest validation runs. This result is intended to be illustrative, and has not been evaluated using the financial models.



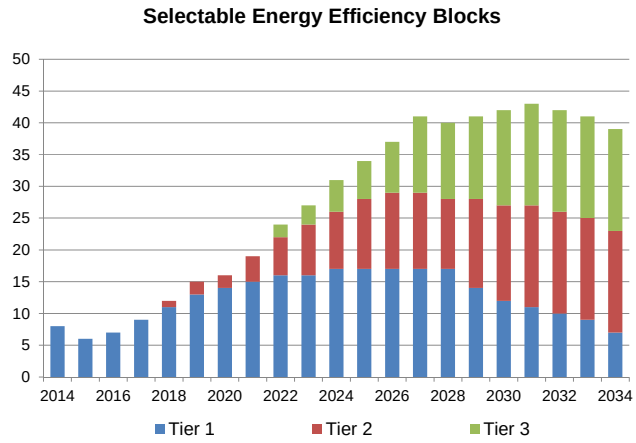
In validation runs, by the end of the study period EE resources serve about 50% of forecasted load growth

Summary

Process



Block Design



Block Selection

- Significant efforts have resulted in the ability to model energy efficiency as a selectable expansion option
- Preliminary results indicate the energy efficiency could meet nearly 50% of load growth by 2034

Lessons Learned

- The block design is acceptable for high-level strategic reviews
- **Revenue erosion is not factored into the capacity expansion model and will need to be analyzed in financial model**
- We may need to adjust/increase the 'Doing More EE' strategy

Renewables and EE Resources in the IRP

- In the 2015 IRP study, solar, wind and energy efficiency resources are selectable
  - In the prior IRP, these resources were fixed inputs into the study process

- Now that the optimization model can select these resources, the timing and amount will depend on the need for new resources, the cost of resource alternatives (capital and operating expenses), and the availability/performance of each resource option

- Some of the metrics being considered for the IRP scorecard will allow TVA to assess the risk associated with portfolios that contain a significant penetration of solar, wind, or EE
  - Current modeling architecture requires these 3 resource types to be represented as “fixed energy patterns” to capture the hourly shape of the energy production (or savings)
  - This modeling approach reduces the ability to fully explore the uncertainty around the performance of these resources
  - TVA is continuing to consider other approaches to better include aspects of this uncertainty in the study process

RERC Discussion

Wrap Up & Next Steps

Reminder on Where to Submit Comments

Email: bakeel@tva.gov

U.S. Mail:

Beth Keel, RERC Records Officer
Tennessee Valley Authority
400 West Summit Hill Drive, WT–9 D,
Knoxville, Tennessee 37902

On-line:
http://www.tva.com/rerc/rerc_members.htm

Next Steps: Upcoming RERC Meetings

- **Winter Meeting:** February 2 & 3, 2015 (New Dates)

  Location: Chattanooga, TN

  Topic: IRP Update: preliminary results, content for draft IRP/SEIS reports; provide guidance

- **Spring Meeting:** April 20 & 21, 2015 (Tentative New Dates)

  Location: Nashville, TN

  Topic: Review of public comments & response strategy

- **Summer Meeting**: TBD

  Location: TBD

  Topic: Final IRP Review and Statement to TVA Board

Thank you for your participation!