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April 20, 2009

Docket Control
Arizona Corporation Commission
1200 W. Washington Street
Phoenix, Arizona 85007

RE: Arizona Public Service Renewable Transmission Workshop Presentations
Docket No. E-00000D-07-0376

Attached please find copies of the presentations presented by Arizona Public Service Company (APS) at the Renewable Transmission Workshop held on April 20th, 2009:

Overview of ACC BTA Order and Planned Utility Response Process
Overall Utility Planning Process And Associated Transmission Issues
APS General Comments Concerning Policy Issues

If you have any questions pertaining to these presentations please contact Jeff Johnson at 602-250-2661.

Sincerely,

Leland R. Snook

Attachments

LRS/dst

Arizona Corporation Commission

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Arizona Corporation Commission

Fifth Biennial Transmission Assessment Commission Decision 70635

**Workshop on Transmission to Support
Renewable Energy Development**

**Overview of ACC BTA Order and
Planned Utility Response Process**

Brian W. Cole

**Manager, Resource Planning
Arizona Public Service Co.**

April 20, 2009

Docket E-00000D-07-0376



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BTA Order 70635

First Part:

“Commission-regulated electric utilities shall, by April 30th, 2009 conduct a joint workshop or series of planning meetings to develop ways in which new transmission projects can be:

- Identified*
- Approved for construction*
- Financed*

in a manner that will support the growth of renewables in Arizona”

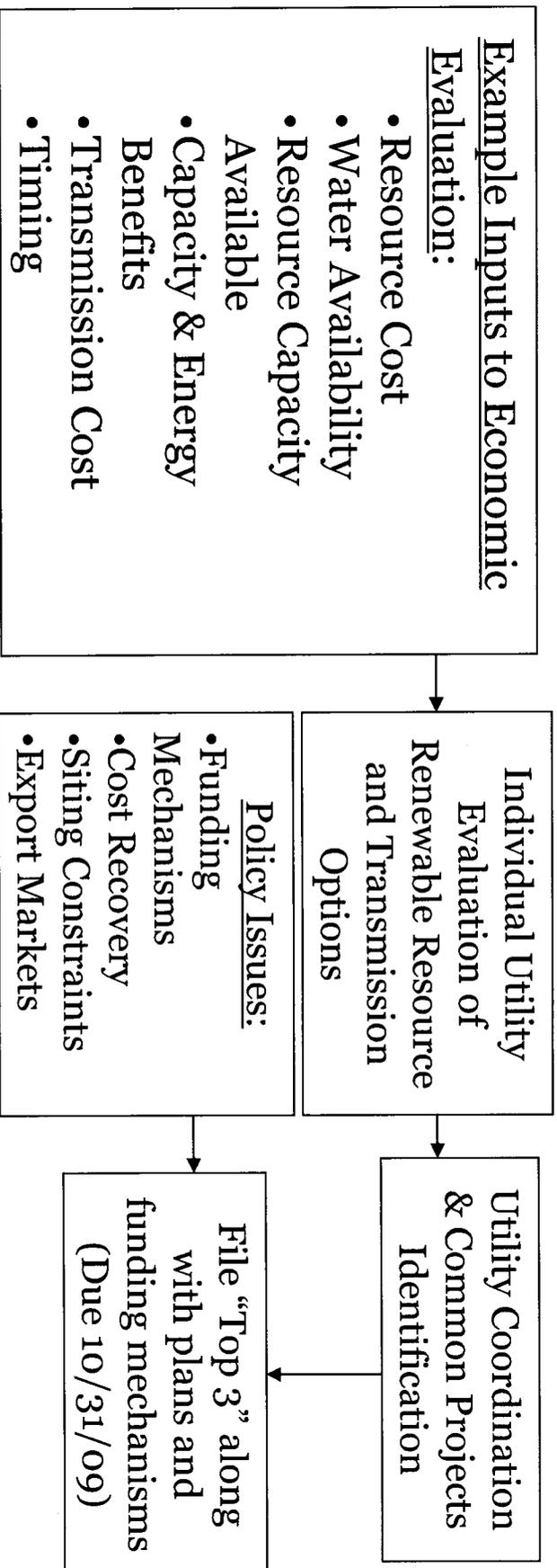
BTA Order 70635

Second and Third Parts:

Each Commission-regulated utility, either alone or in cooperation with other utilities, and by 10/31/09:

- Use the results of the RTTF and identify the top three potential transmission projects
- Develop plans to identify future renewable transmission projects
- Develop plans and propose funding mechanisms to construct the top three renewable transmission projects

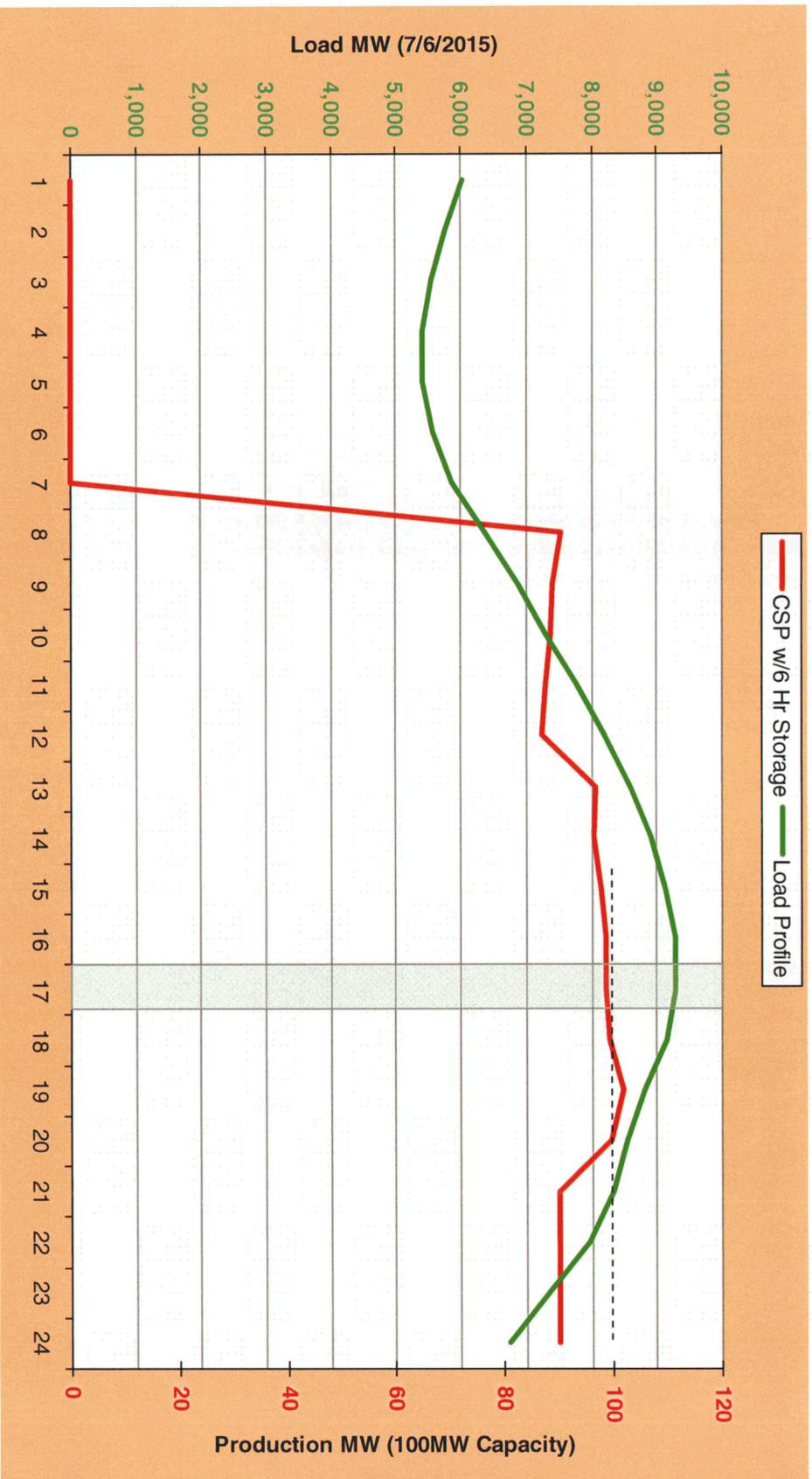
Utilities Evaluation Process



Economic Analysis of Resource & Transmission Project Options

- Overall value will be assessed comparatively to determine highest priority transmission projects
 - Resource and Transmission Combinations will be evaluated
 - Goal: To develop transmission lines and resources that we expect will bring the best value proposition for our customers
- Includes:
 - Financing
 - Capital Cost of transmission
 - Capital Cost of resource
 - Timing of resource in-service dates
- Takes into account expected delivery of energy for resource
 - Quantity
 - Timing
- Assesses value to customers due to:
 - Capacity value of resource
 - Energy value of resource

CSP Production and APS Load Profile



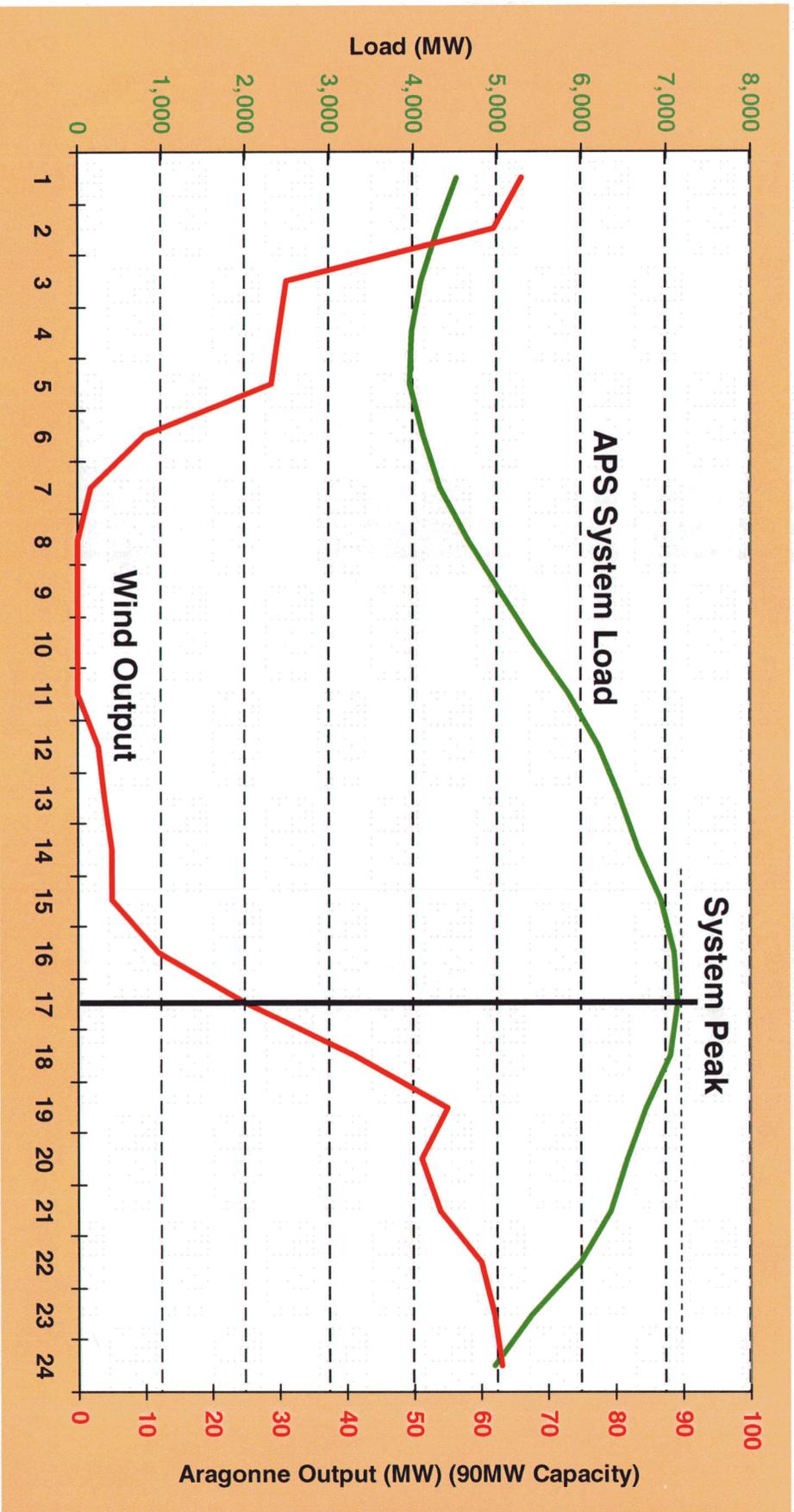
- Solar Production Data from Forecast for July 6, 2015
- Figure 49 from APS Resource Plan Filing (Page 121),

Docket No. E01345A-09-0037



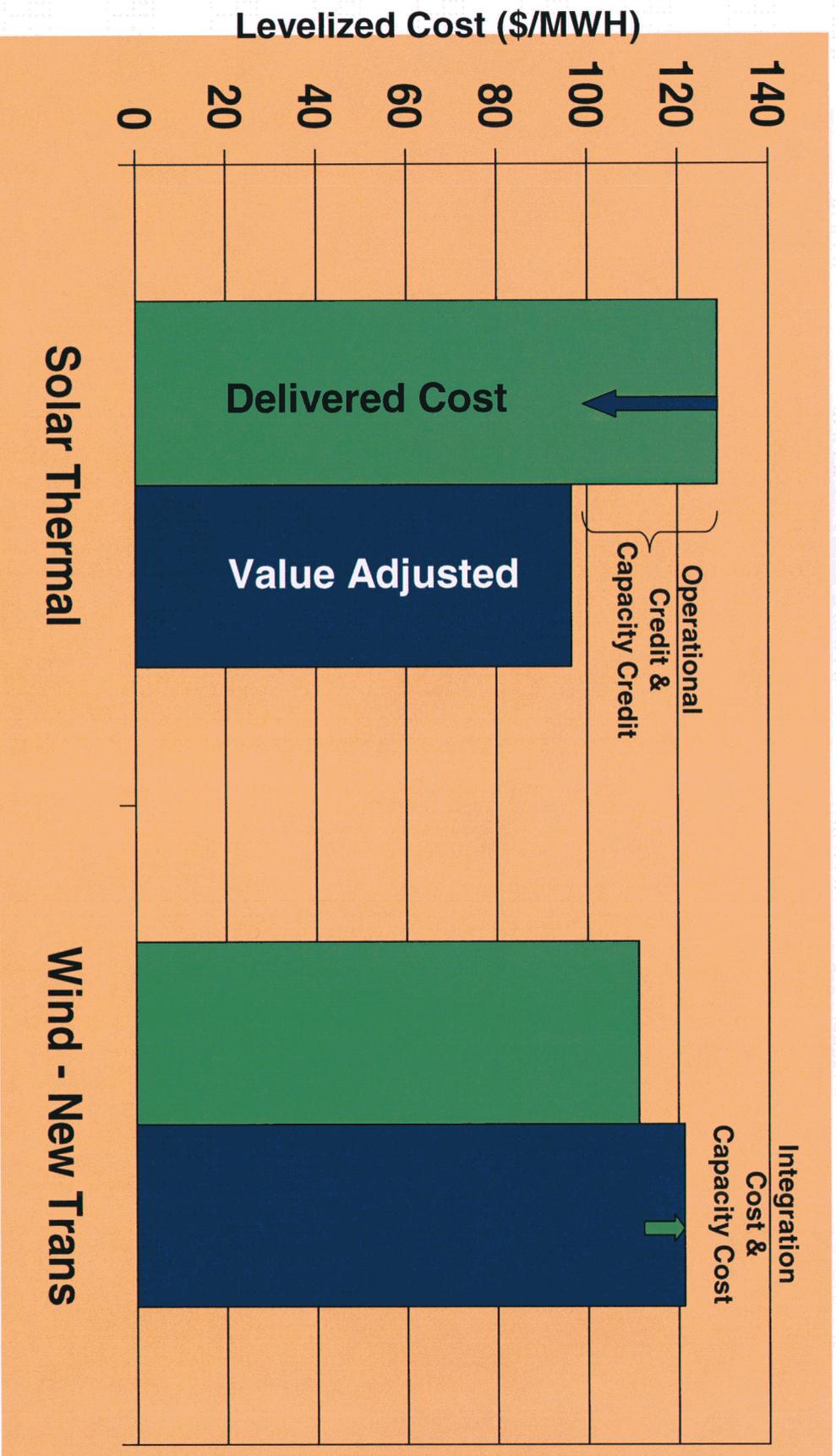
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Wind Production and APS Load Profile

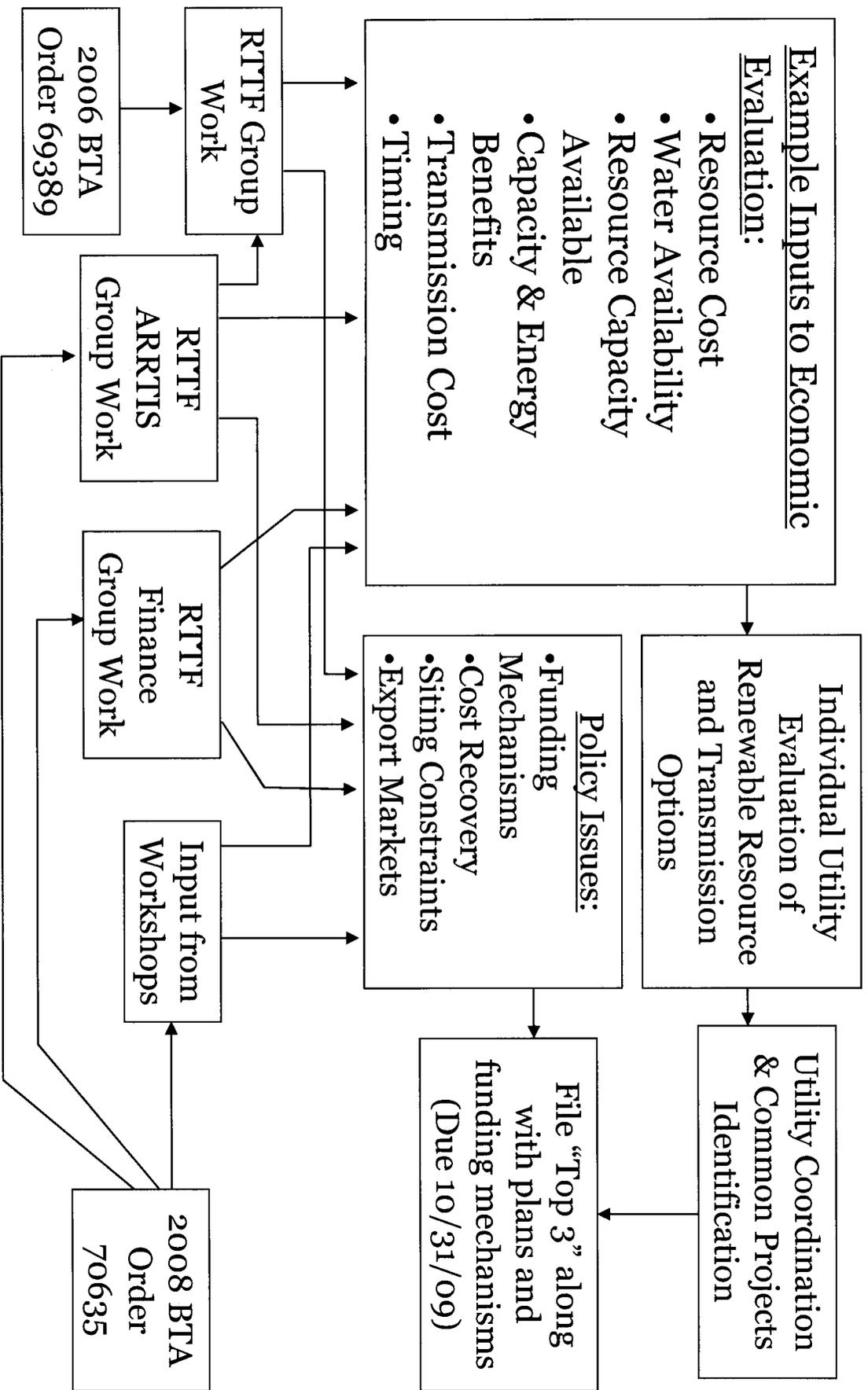


• Figure 50 from APS Resource Plan Filing (Page 122),
Docket No. E01345A-09-0037

APS Value Example



Utility Evaluation Process



Arizona Corporation Commission

Fifth Biennial Transmission Assessment Commission Decision 70635

**Workshop on Transmission to Support
Renewable Energy Development**

**Overall Utility Planning Process
And
Associated Transmission Issues**

Brad Albert

**Director – Resource Planning
Arizona Public Service Co.**

April 20, 2009

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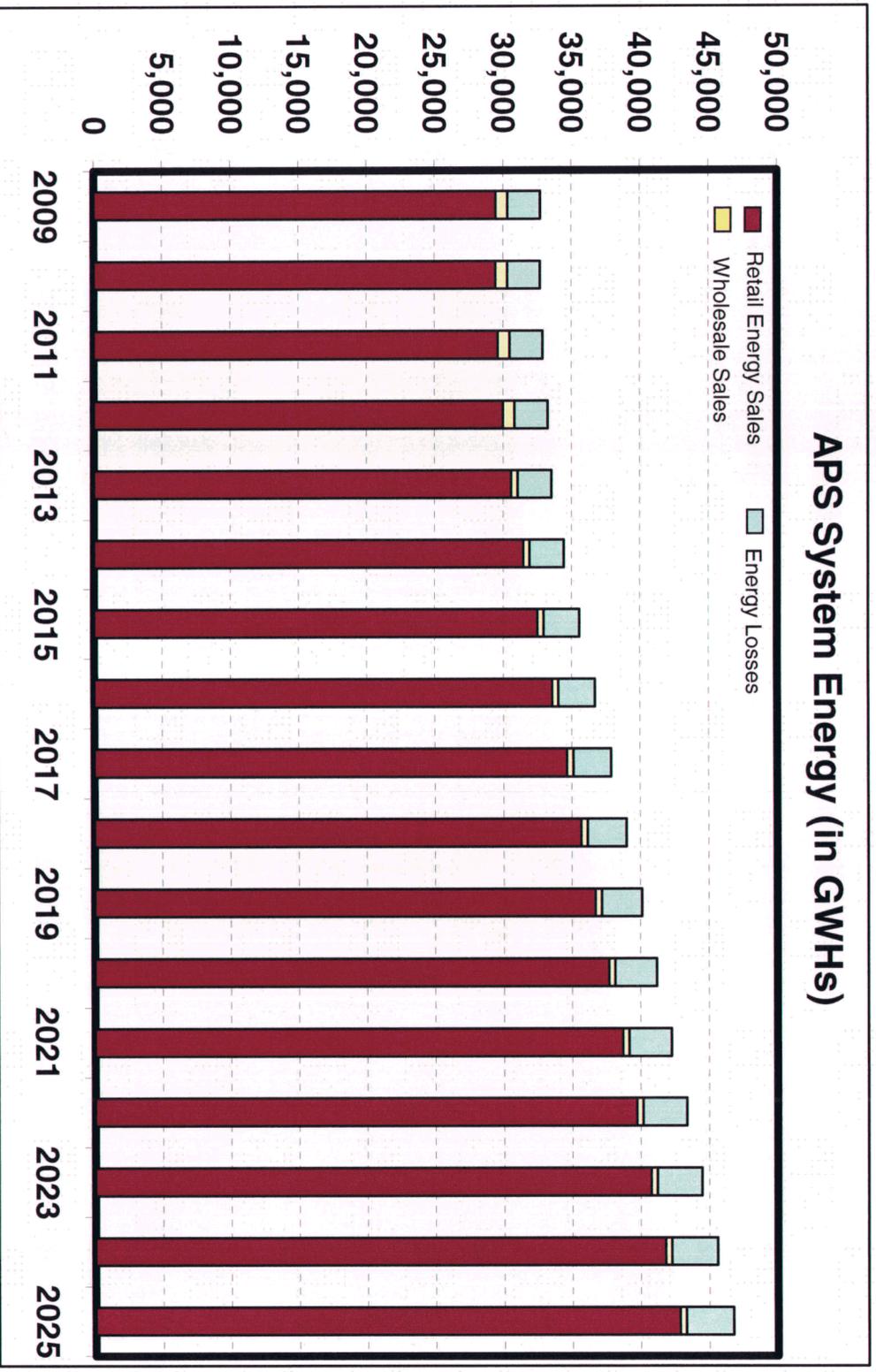
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Determining Renewable Energy Need For a Vertically-Integrated Utility

- **Two Components:**
 - Satisfying Mandates:
 - For Arizona jurisdictional utilities, the RES rules specify the minimum amount of renewable energy:
 - 15% of retail energy sales by 2025
 - 30% of the total comes from distributed energy sources
 - Additional Amounts Determined Through Resource Planning Process:
 - Reasons why a utility may elect to include additional renewable energy sources beyond the mandated amount:
 - Energy source diversity
 - Mitigation of key risk factors (climate change, natural gas volatility, etc.)
 - Strategic (advance technologies for long-term benefit)

Amounts Needed to Meet the RES

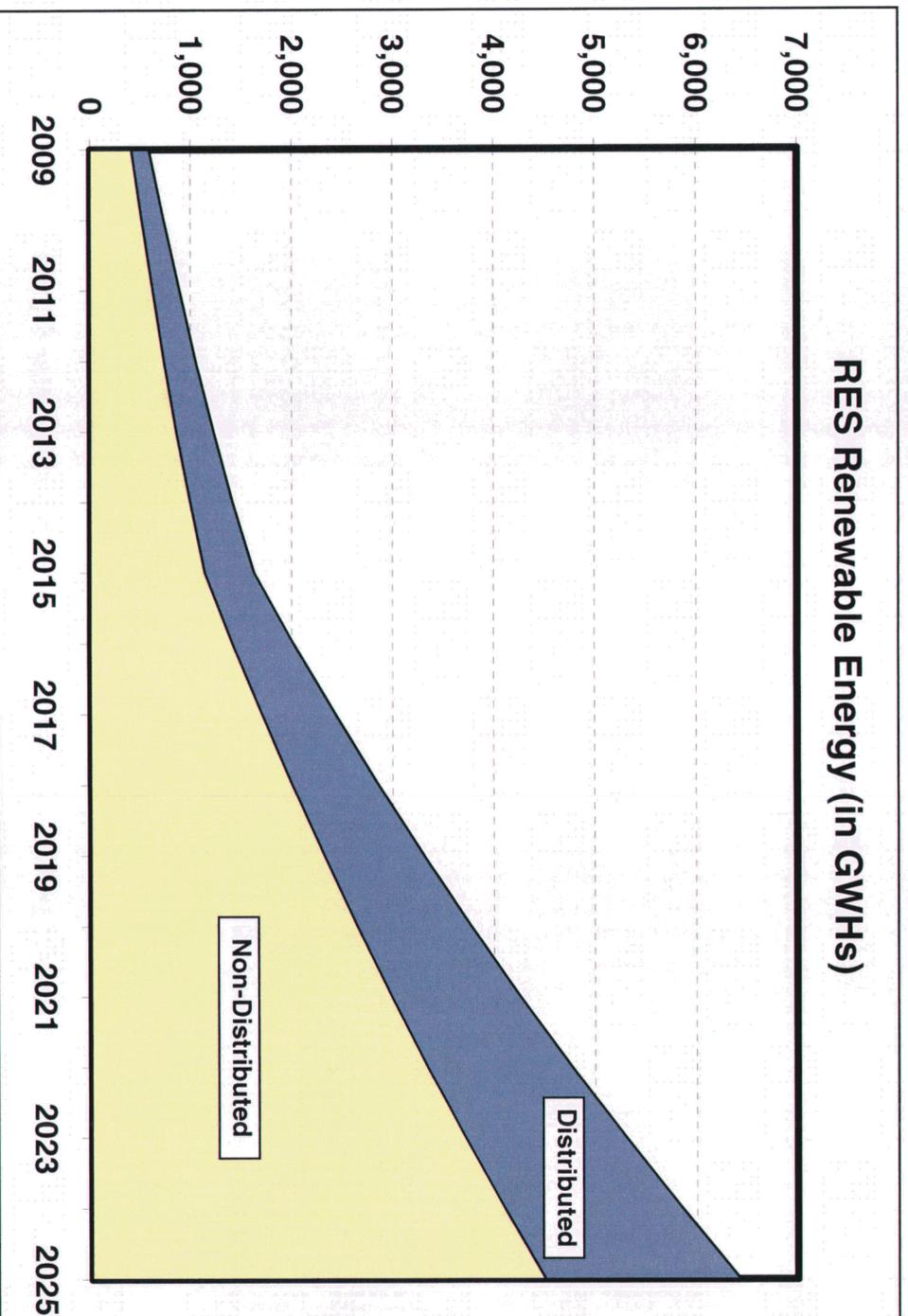
Step #1 – Load Forecast



- Load forecast develops estimate of retail energy sales
- Approx. 43,000 GWhs in 2025 (after considering FE impacts)

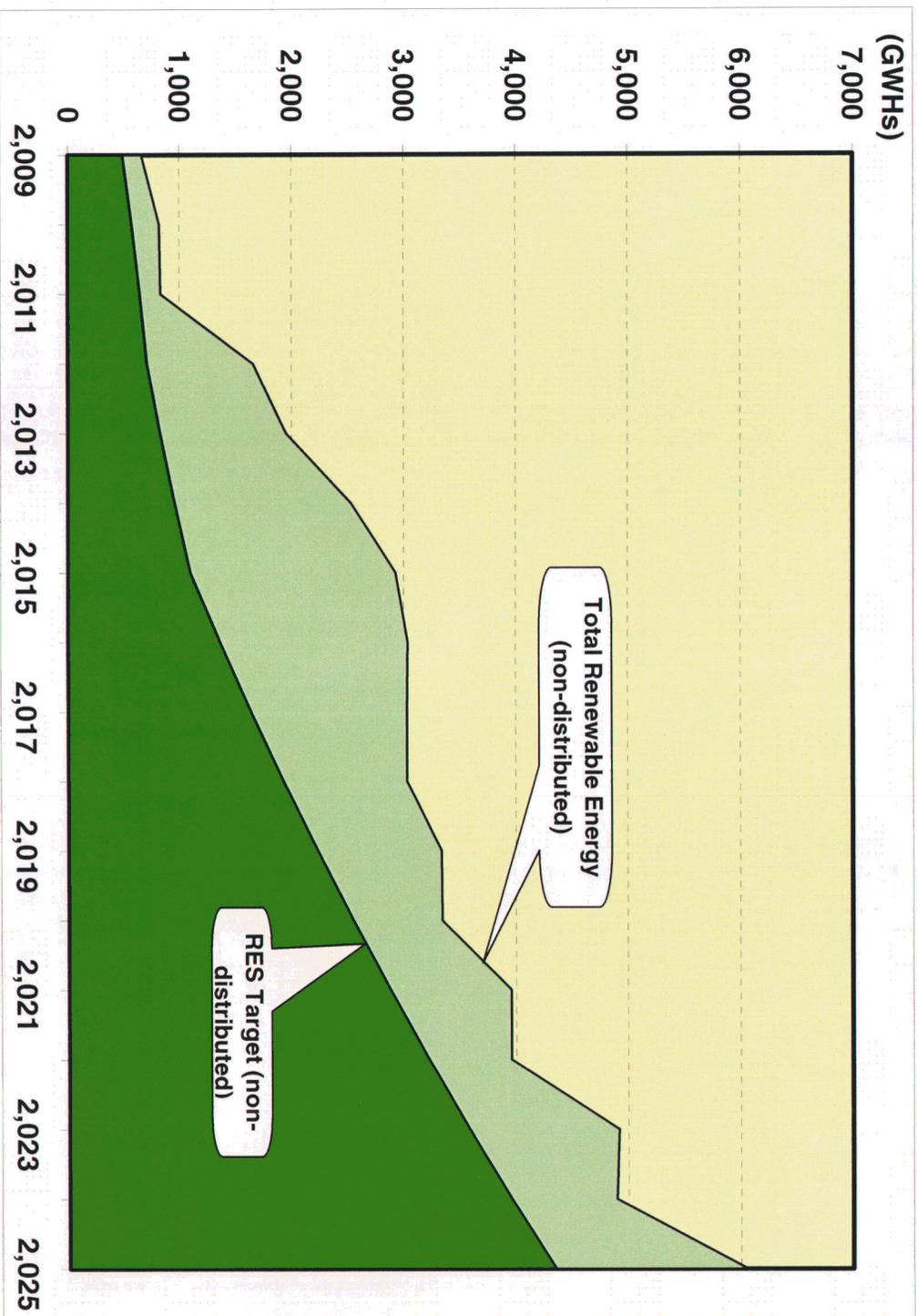
Amounts Needed to Meet the RES

Step #2 – RES Energy Requirements



- Distributed renewables are at the load center (no transmission needed)
- Non-Distributed is about 4,500 GWHs in 2025

Additional Renewables Per APS Resource Plan



- Approximately 6,000 GWhs specified by plan in 2025
- Graph only includes non-distributed renewable resources
- Figure 5 from APS Resource Plan Filing (Docket No. E-01345A-09-0037)

Making Sense of the Numbers

- **APS Resource Plan Specifies 6,000 GWHs of Non-Distributed Renewable Energy in 2025:**
 - APS Currently Has Approximately 1,650 GWHs of non-distributed renewable energy Either Operating or Under Contract:
 - Solana is approximately 900 GWHs per year
 - Remaining Amount (4,350 GWHs) Could be Met By:
 - Approximately 5 more Solana-type CSP solar plants (1,400 MWs), or
 - Approximately 1,650 MWs of wind energy (assuming 30% annual capacity factor), or
 - Approximately 585 MWs of geothermal energy (assuming 85% annual capacity factor, or
 - Some combination of the above

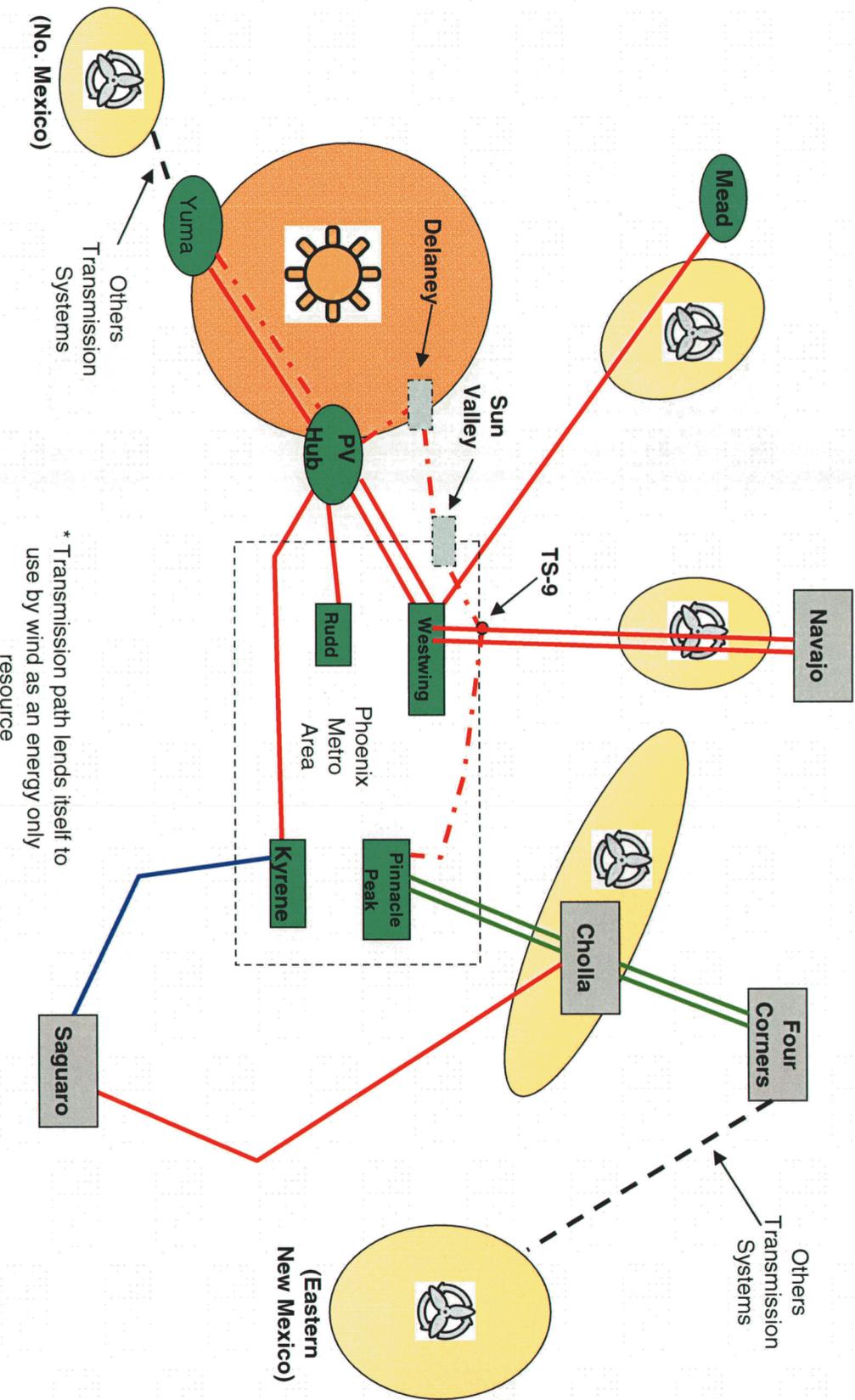
Transmission Need (In-State Utility Perspective)

- **Steps to Defining Transmission Need:**
 - Resource Needs Identified in Resource Plan
 - Amounts, Types, Timing
 - Location of Resources is Assumed (probable locations)
 - Assess Capability of Transmission System to Support Needed Resources:
 - Current Transmission System Plus Planned Projects (10 Year Plan)
 - Identify Transmission Additions to Support Resource Plan
 - Specific Transmission Additions and Required Timing
 - Identify areas in which multiple resources can utilize the same transmission path:
 - PV-East upgrades can potentially be used for solar, new and existing gas, and market purchases
- Regional Transmission Planning Process
 - Planning coordination and analysis thru SWAT

APS Resource Types and Related Transmission Need

Resource Type	Probable Location(s)	Transmission Solution(s)	Comments
Energy Efficiency, Distributed Renewable, Demand Response	Internal to Load Pockets	None	Reduces overall transmission need
Solar CSP, Solar PV	<ol style="list-style-type: none"> 1. Palo Verde hub 2. W of PV 3. Gila Bend 4. Yuma 	<ol style="list-style-type: none"> 1. Generator interconnections, plus 2. Additional PV-East 	<p>Additions already in 10-Year plan will help to meet resource expansion needs</p>
Wind	<ol style="list-style-type: none"> 1. Northern Arizona 2. New Mexico 	<ol style="list-style-type: none"> 1. Use existing, or 2. New transmission 	<p>APS Resource Plan Report identified capability to use existing transmission system to import wind</p>
Gas Combustion Turbines	<ol style="list-style-type: none"> 1. Internal or Adjacent to Valley Network 2. Palo Verde hub 	<ol style="list-style-type: none"> 1. Generator interconnections, or 2. Additional PV-East 	
Market Purchases	<ol style="list-style-type: none"> 1. PV hub 2. Mead 	<ol style="list-style-type: none"> 1. Additional PV-East 	

APS Transmission System Schematic



Planning vs. Procurement

- **Resource Planning Provides the “General” Direction:**

- Includes assumptions regarding the amounts, types, timing, and general location of future renewable resources
- Assumptions define the high-level path to fulfill future renewable resource and related transmission needs

- **Actual Renewable Resource Projects are Determined in the Procurement Process:**

- Specific amounts, timing, types and location of renewable resources determined through future procurement processes
- May lead to results that are different from the resource plan assumptions:
 - Economies of scale can impact project size
 - Technology developments can influence future renewable resource types
 - Location based upon specific project development
- Future resource plans will be adjusted based upon actual procurement results

Other Drivers for Transmission Need

• **Out-of-State Utility Demand for Arizona Renewable Resources:**

- These utilities will go through a similar process of defining renewable resource need
- Will they find Arizona to be a favorable source of renewable energy?
 - Economics?
 - State policies (siting, permitting, land use, water)?
 - In-state preference?

• **Merchant Generation:**

- Renewable projects are not currently being built without long-term utility commitments:
 - Renewable resources currently higher cost than market
 - Renewable resource projects solely driven by utility commitments
- Challenges of sorting out merchant activity:
 - Extensive amount of interconnection requests and development activity
 - Difficult to determine the ultimate destination of the power
 - i.e., Arizona or California

Traditional Transmission Cost Recovery

- **Utility Transmission Line:**
 - Line included in 10-year plan (BTA review process)
 - Line that provides benefits to the system
 - Included in FERC rate base for all transmission customers
 - TCA mechanism for recovery from retail customers (APS case)
- **Generator Interconnection Process (LGIP):**
 - Generator pays for line(s) that connect project to transmission system
 - These lines would benefit generator only
 - Additional system upgrades are initially paid by generator and then “credit” given back to generator over time
 - Benefit system but the need is created by interconnection
 - Credit in the form of transmission service or cash payment
 - This process is established by FERC guidelines

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Renewable Transmission - Policy Issues

- **Timing:**
 - Objective should be to eliminate the “chicken-and-egg” problem
 - Transmission project timing should not delay desired renewable resource projects
 - What may be needed to accomplish this?
 - Permitting prior to anticipated need
 - Changes to CEC requirements:
 - Modify “clear need” requirement
 - Provide longer timeframes before construction must be started
 - Right-of-Way acquisition
 - Assurance of cost recovery for up-front development costs
 - Avoid installing new transmission in advance of first need
 - Risk of allowing transmission development to get too far ahead of need

Renewable Transmission - Policy Issues

- **Who Pays?**
 - What are the options?
 - Captive transmission customers of provider (including native load retail)
 - Renewable resource project developers
 - Merchant transmission project developers
 - State funds
 - Interconnection-wide cost allocation (as per Reid or Bingaman bills)
 - Some of the policy implications:
 - Cost of transmission should be recovered from those that will realize the benefits from the line(s)
 - Observation that merchant transmission is not likely to move forward on a speculative basis
 - Who bears the risk that the transmission project does not get fully utilized?

Renewable Transmission - Policy Issues

- **Other Issues:**
 - Export market could have additional challenges:
 - Some export alternatives may be dependent upon incremental transmission projects outside Arizona
 - Policies in other states favoring in-state versus out-of-state procurement of renewable energy
 - Changes to renewable targets in other states
 - Alignment with other policies impacting competitiveness of Arizona renewable resources (land use, water, etc.)
 - Defining a renewable transmission project:
 - Original intent of line may not match ultimate use
 - FERC policies do not currently allow for discrimination of use
 - The most “robust” transmission projects may have multiple potential benefits
 - Prioritization of transmission projects:
 - Which projects are likely to bring the best economic value to APS customers?