



## TVA Perspectives on Renewable Energy

10<sup>th</sup> Annual Southern BioProducts and Renewable Energy Conference  
May 10-11, 2011  
Beau Rivage Conference Center  
Biloxi, Mississippi

Steve Lomax



## TVA Act: 1933 Congressionally-Mandated Mission



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**TVA Board-Approved Vision:  
Strategic Focus Areas for Achieving TVA's Mission**

**Our VISION**  
ONE OF THE NATION'S LEADING PROVIDERS OF LOW-COST AND CLEANER ENERGY BY 2020

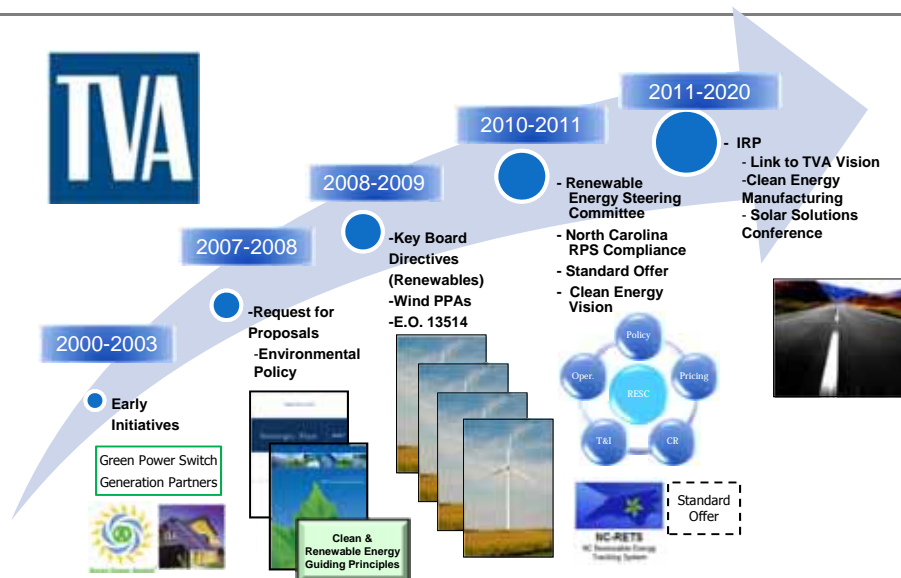
- Low Rates
- High Reliability
- Responsibility
- Cleaner Air
- More Nuclear Generation
- Greater Energy Efficiency

Acting to meet the region's needs for the future, while improving our core business today.

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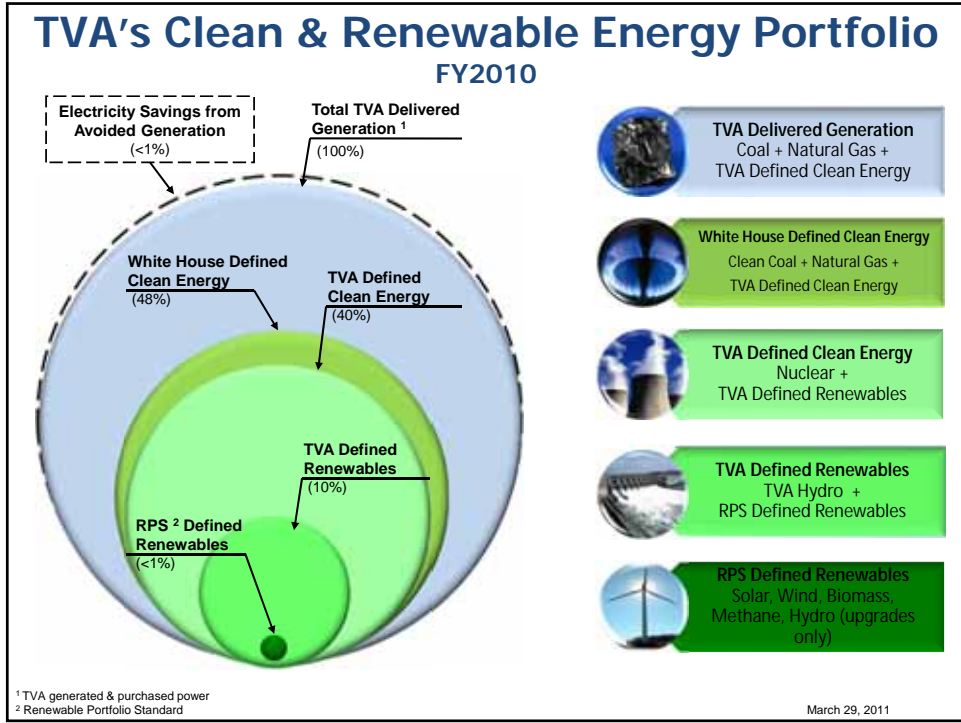
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**TVA's Developing Renewable Energy "Story"**



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## TVA Current Renewable Energy Portfolio

	Renewable Resource Type	Capacity, MW *
	TVA-owned Renewable Resource	Hydro (Conventional) **
		Wind ***
		Solar ***
		Wastewater Treatment Gas Co-firing at Allen Fossil Plant ***
		<b>Total TVA-owned Renewables</b>
	Purchased Renewable Resources (currently operating)	Hydro (Conventional)
		Landfill Methane Gas
		Wind In-valley ***
		Wind Out-of-valley
		Wind: Generation Partners ***
		Solar: Generation Partners ***
		Biomass: Generation Partners ***
	<b>Total Purchased Renewables</b>	
<b>Total TVA-owned &amp; Purchased Renewables</b>		<b>4,460</b>
	Commitments to Purchase Renewable Resources (not yet on-line)	Landfill Gas
		Wind Out-of-valley
		Solar In-valley
		Biomass: Generation Partners
<b>Estimated Future Total TVA-owned &amp; Purchased Renewables</b>		<b>5,739</b>

\* Nameplate capacity (Net Dependable Capacity could be significantly less); values may not sum exactly to totals due to rounding.  
 \*\* Includes 565 MW of incremental hydro (capacity expansions and efficiency upgrades).  
 \*\*\* Renewable credits currently are retired for Green Power Switch sales.

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## Generation Partners and Green Power Switch ®

### Generation Partners:

- Launched in 2003 to encourage Valley homeowners and businesses to install renewable energy systems (up to 200 kW)
- Participants sell 100% of renewable energy generated back to TVA for 10 years
- TVA retains RECs
- Premiums of 12 cents per kWh for solar and 3 cents for other renewables
- TVA currently has 121 participating distributors and 496 GP installations with a capacity of 12,283kW
- In Mississippi, currently there are 18 participating distributors, and 17 installations with a capacity of 205 kW.

### Green Power Switch®

- Launched in 2000 to give Valley residents the opportunity to support renewable energy in the Valley for \$4 extra per month per 150kWh block.
- Limited to only solar, wind and methane gas with at least 50% solar and wind
- 100% in-Valley generation
- First green power pricing program in Southeast.
- Currently 116 participating power distributors and 11,092 participants
- In Mississippi, currently 15 participating distributors and 165 participants.



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## TVA Renewable Standard Offer

- Launched in late 2010 for mid-sized projects (200kW to 20 MW)
- Targets mature renewable technologies in the Valley
  - Solar
  - Wind
  - Qualified biomass combustion (including co-firing more than 50%) and biomass gasification
  - Methane recovery
- Limited to 100 MW total
- Three executed contracts, to date, for 7 MW of capacity

Month	Base Price Range (¢/kWh)
July and August	4.078-15.966
June and September	3.963-8.139
January and February	4.278-5.937
December and March	4.151-5.596
April, May, October and November	3.793-5.616

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**TVA** TVA's Integrated Resource Plan (IRP)

- Board approved in April 2011.
- Comprehensive study of alternatives for meeting the future electricity needs in the Tennessee Valley over the next 20 years.
- Enables TVA to respond needs and respond to a dynamic regulatory and economic environment.
- Meets the objectives of TVA's Strategic Plan, Environmental Policy, and the goals of Valley stakeholders obtained during the public comment period.



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**TVA** A Wide Variety of Resource Options are Considered

A wide variety of resource options (*supply- and demand-side*) are considered to meet customer demand



Conventional power plants



Renewable sources



Conservation & demand-side management

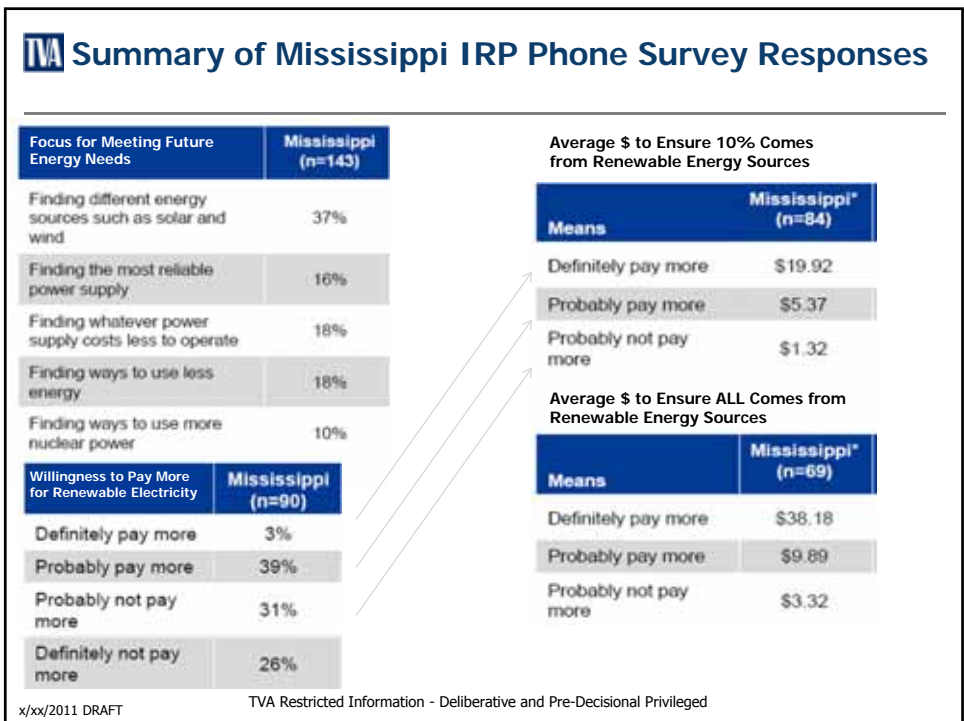
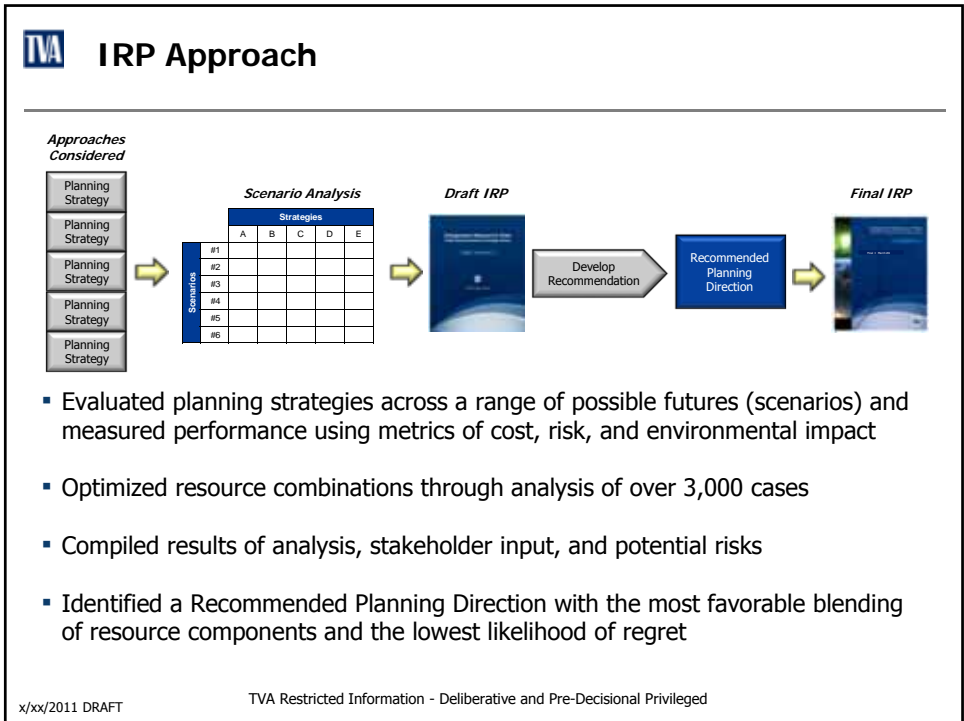


Power imports



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## TVA IRP Recommended Planning Direction

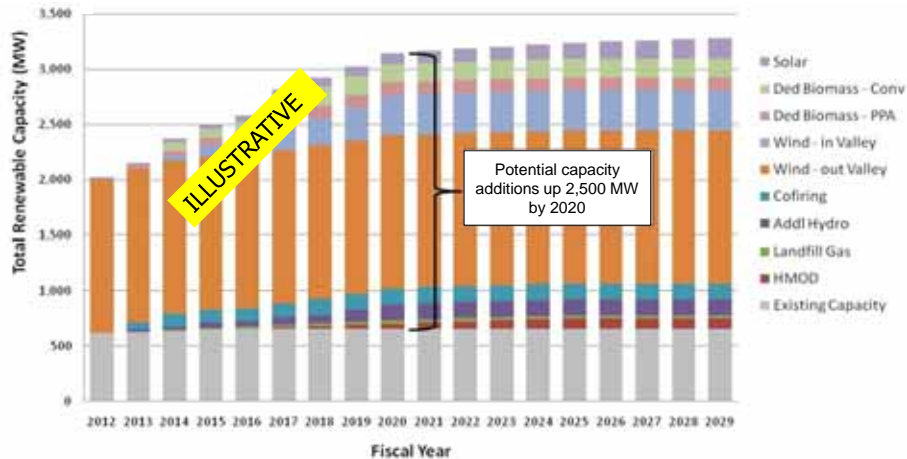
Component	Guideline MW Range	Window of Time	Recommendations
Energy Efficiency / Demand Response	3,600-5,100 (11,400-14,400 GWh)	By 2020	◆ Expand contribution of energy efficiency / demand response in the portfolio
Renewable additions	1,500-2,500	By 2020	◆ Pursue cost effective renewable energy
Coal capacity idled	2,400-4,700	By 2017	◆ Consider Increasing amount of coal capacity idled
Energy storage	850	2020-2024	◆ Add pumped storage hydro capacity
Nuclear additions	1,150-5,900	2013-2029	◆ Increase contribution of nuclear generation
Coal additions	0-900	2025-2029	◆ Preserve option of generation with carbon capture
Natural gas additions	900-9,300	2012-2029	◆ Utilize natural gas as an intermediate supply source
Market purchases	1,300-4,700	2013-2029	◆ Utilize cost effective market purchases to supplement TVA owned supply

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## TVA Role of Renewable Energy

Component	Guideline MW Range	Window of Time	Recommendations
Renewable additions	1,500-2,500	By 2020	◆ Pursue cost effective renewable energy



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**TVA Low Cost Power vs. Economic Development**

	Technology	Low-Cost Power	Resource Potential	Economic Development		
		LCOE in 2015	2015	Capital Investment in 2015	Construction Jobs	Operation Jobs
Biomass	Co-firing	Green	Yellow	Red	Yellow	Green
	LFG	Green	Red	Red	Red	Yellow
	Direct Combustion	Yellow	Yellow	Yellow	Yellow	Green
	Livestock/Poultry Waste	Yellow	Red	Green	Red	Yellow
	WTE	Green	Red	Green	Green	Green
Hydro	Conventional Hydro	Yellow	Red	Yellow	Yellow	Red
	Small Hydro	Red	Red	Green	Yellow	Yellow
Solar	Utility-scale PV	Yellow	Green	Yellow	Green	Red
	Distributed PV	Red	Green	Yellow	Green	Red
Wind	Utility-scale Wind	Yellow	Green	Red	Red	Red
	Small-scale Wind	Red	Red	Yellow	Red	Red

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**TVA Economic Development & Clean Energy Manufacturing**

- TVA has been recruiting clean energy and solar component manufacturers.
- TVA and external partners recruited Hemlock Semiconductor Corporation and Wacker Chemie polysilicon, the world's largest polysilicon producers.
- The polysilicon produced by the two plants will support the rapid growth of solar generation through PV products.
- Over \$1 billion will be invested at each site, and over 500 employees will be hired for each site.
- Manufacturers attracted to TVA's reliable, low-cost power.



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# SOLAR SOLUTIONS

## 2011 conference

**August 9-10, 2011**  
**Gaylord Opryland Resort and Convention Center**  
**Nashville, Tennessee**

For two days in August, the spotlight on solar energy development will shine on the Tennessee Valley, as national, regional and state leaders gather to share technology innovations and development solutions for the deployment of clean energy generation.

**For More Information Contact - Jennifer Brogdon, TVA, 423/751-8397**

The 2011 Tennessee Valley Solar Solutions Conference will facilitate discussions and idea exchanges between:

- Solar Researchers
- Technology Experts
- Solar Manufacturers
- Power Generators
- Electric Distributors
- Commercial and Industrial Users
- Energy Policy Makers



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