



Welcome

2008 Regional Public Briefing

**Draft Energy Efficiency and
Renewable Energy Proposals**



Draft Energy Efficiency/ Demand Response Plan Presentation

TVA 2007 Strategic Plan

ENVIRONMENTAL STRATEGY OBJECTIVE SUMMARY

Support TVA's long-term success by managing environmental risk and impacts, increasing business and public value of environmental management and enhancing TVA's reputation.

Environmental Policy and Framework

ENVIRONMENTAL DIMENSIONS

Climate Change Mitigation

Air Quality Improvement

Water Resources Improvement

Waste Minimization

Sustainable Land Use

Natural Resource Management

Energy Efficiency and Demand Response Strategy

IMPLEMENTATION PLANS

Energy Efficiency and Demand Response Strategy

Renewable Energy Strategy

Land and Shoreline Strategy

Natural Resource Strategy

Recreation Strategy

Clean Air Strategy

Carbon Strategy

Water Resource Strategy

Waste Management Strategy

Hazardous Materials Strategy

TVA Facilities and Fleet Operations

Others

Energy Efficiency Improvement and Peak Demand Reduction

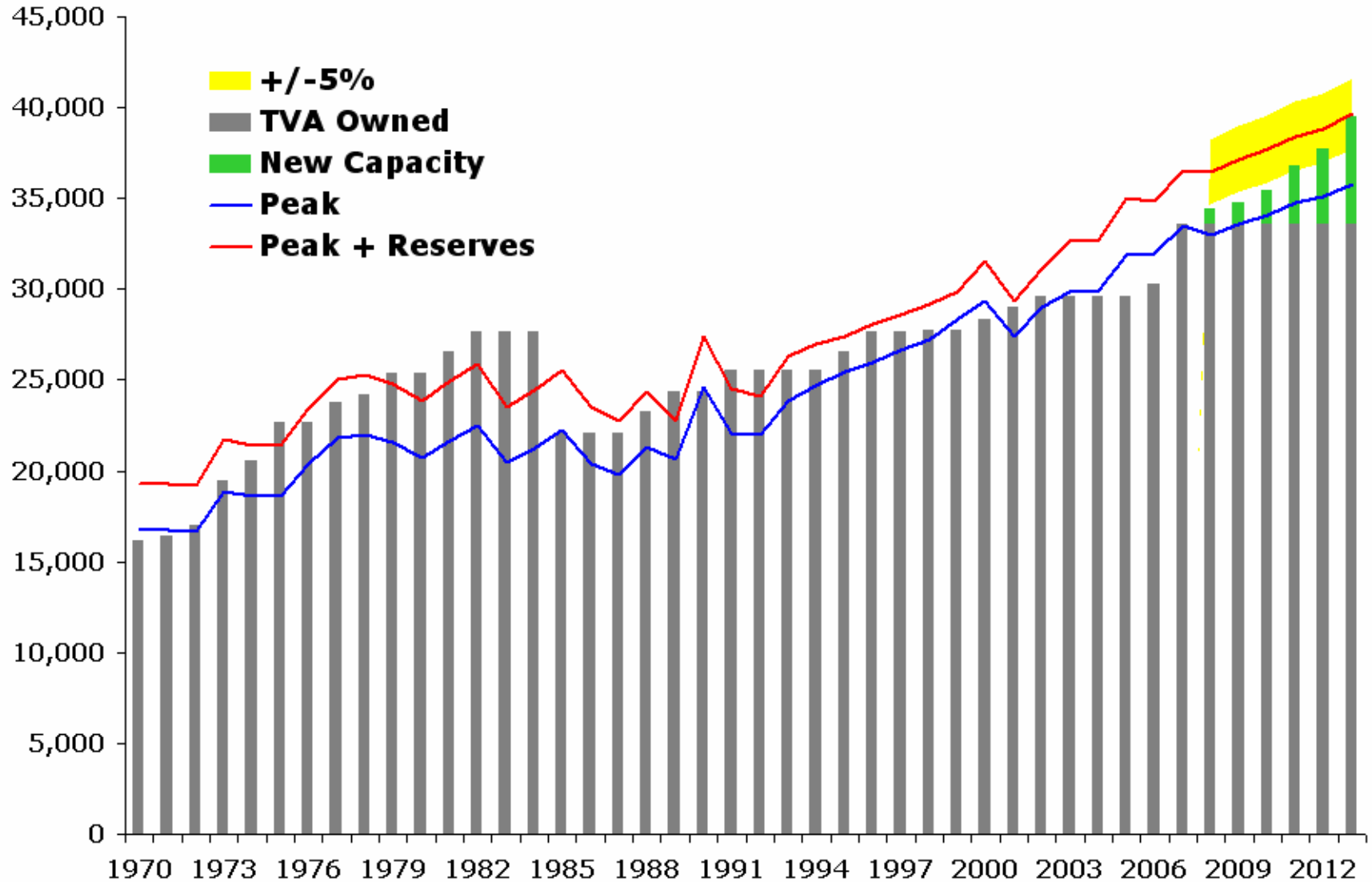
“In partnership with others, TVA will strive to be a leader in energy-efficiency improvements and peak demand reduction over the next five years.”



“Improving energy efficiency and reducing peak demand are significant actions that help slow demand growth in a cost-effective manner while addressing air pollution and global climate change.”

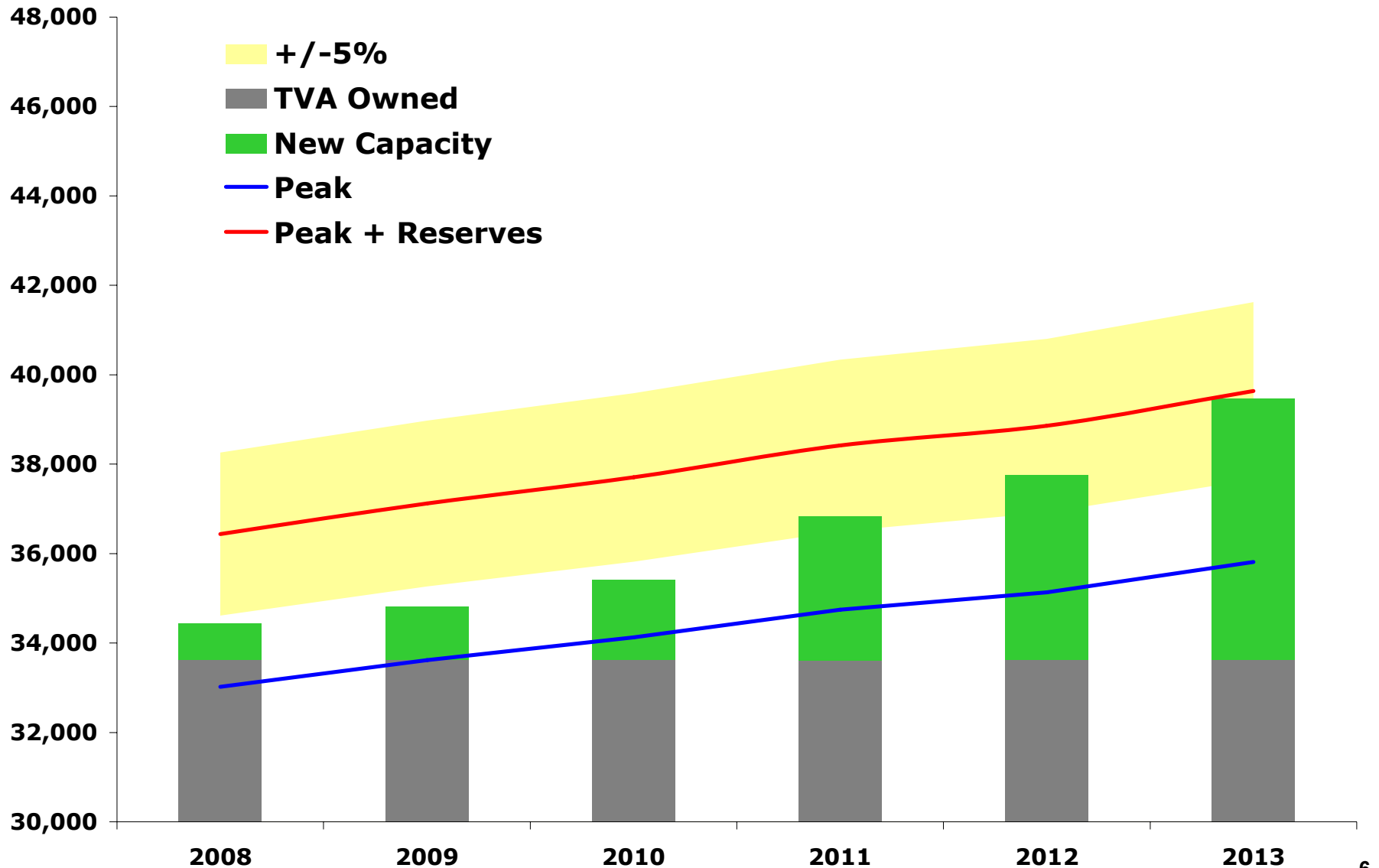
TVA Projected Peak Demand Growth

Megawatts

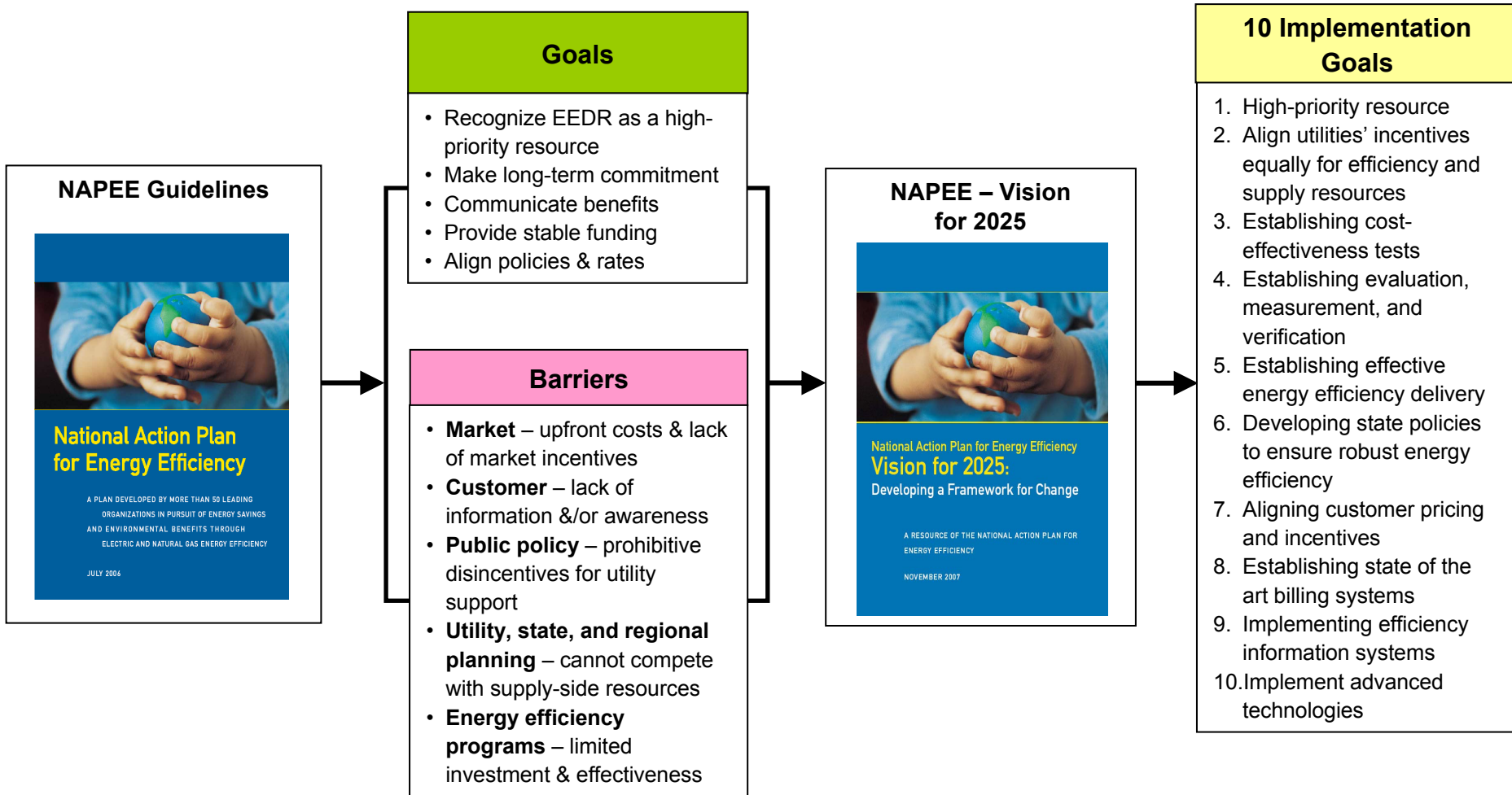


TVA Projected Peak Demand Growth

Megawatts



TVA National Action Plan for Energy Efficiency



TVA Strategic Plan

Environmental

- Lower environmental footprint
- Regulatory requirements
- Clean energy

Financial

- Debt to asset ratios
- Sound financial health
- \$/MW \$/MWh

Operational

- +/-5% TVA owned generation
- Diverse portfolio
- Energy security

Customer

- Lower cost bills
- Social responsibility
- Reliability
- Rapid deployment

- ▶ Recognize as high-priority resource
- ▶ Communicate benefits
- ▶ Policy & rate alignment

- ▶ Long-term commitment
- ▶ Provide stable funding

EE/DR PLAN

Energy Efficiency Programs

Demand Response

End-Use Generation

Internal Reductions

Policy and Framework

Guiding Principles

Goals

EE/DR Action Plans

EE/DR Plan Goals

Inform and educate all stakeholders

Stimulate and transform marketplace

Support development of standards and regulations

Provide proper pricing signals

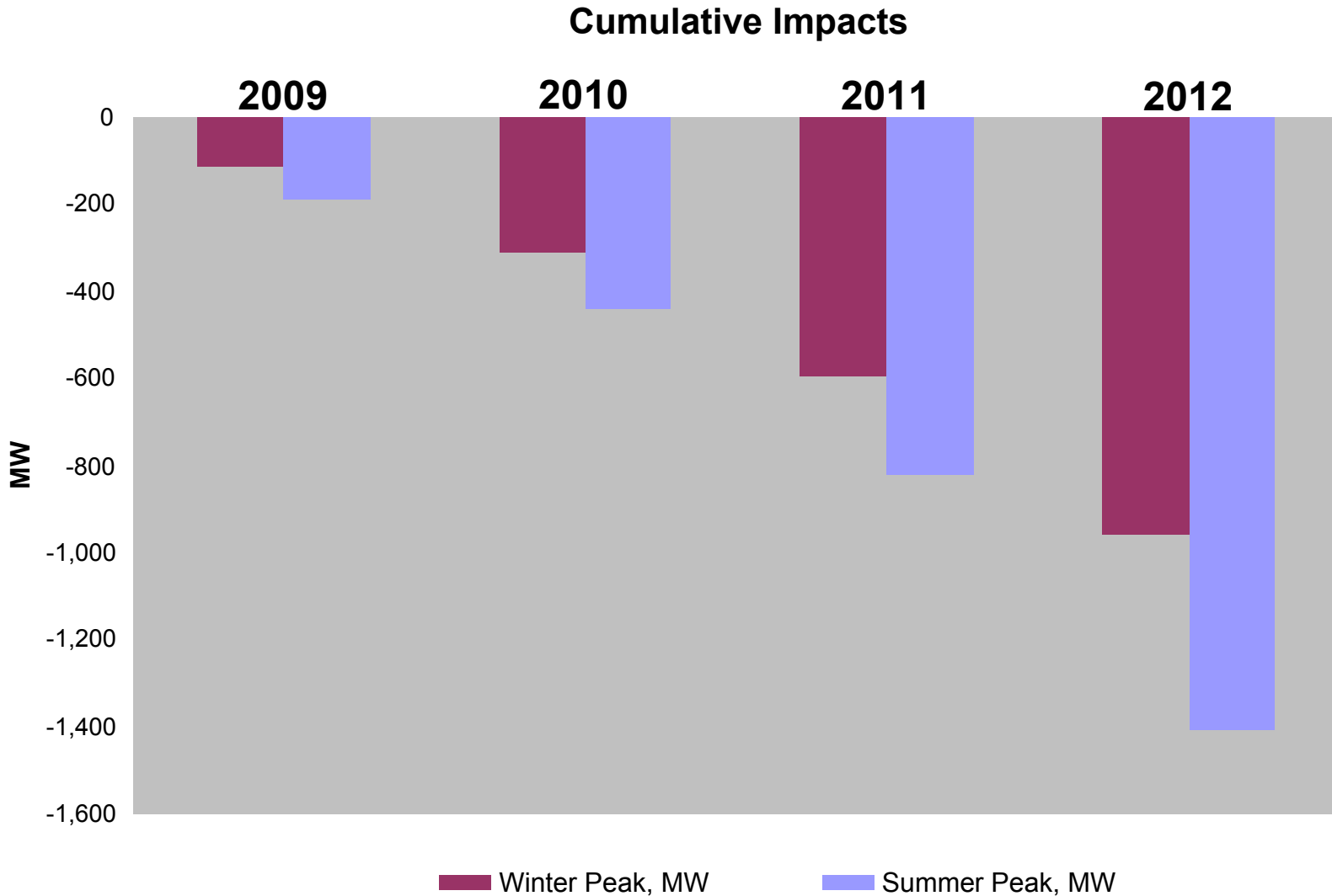
Enable automatic metering and direct load control

Expand and support clean end-use generation

Continue premium Green Power Switch Program

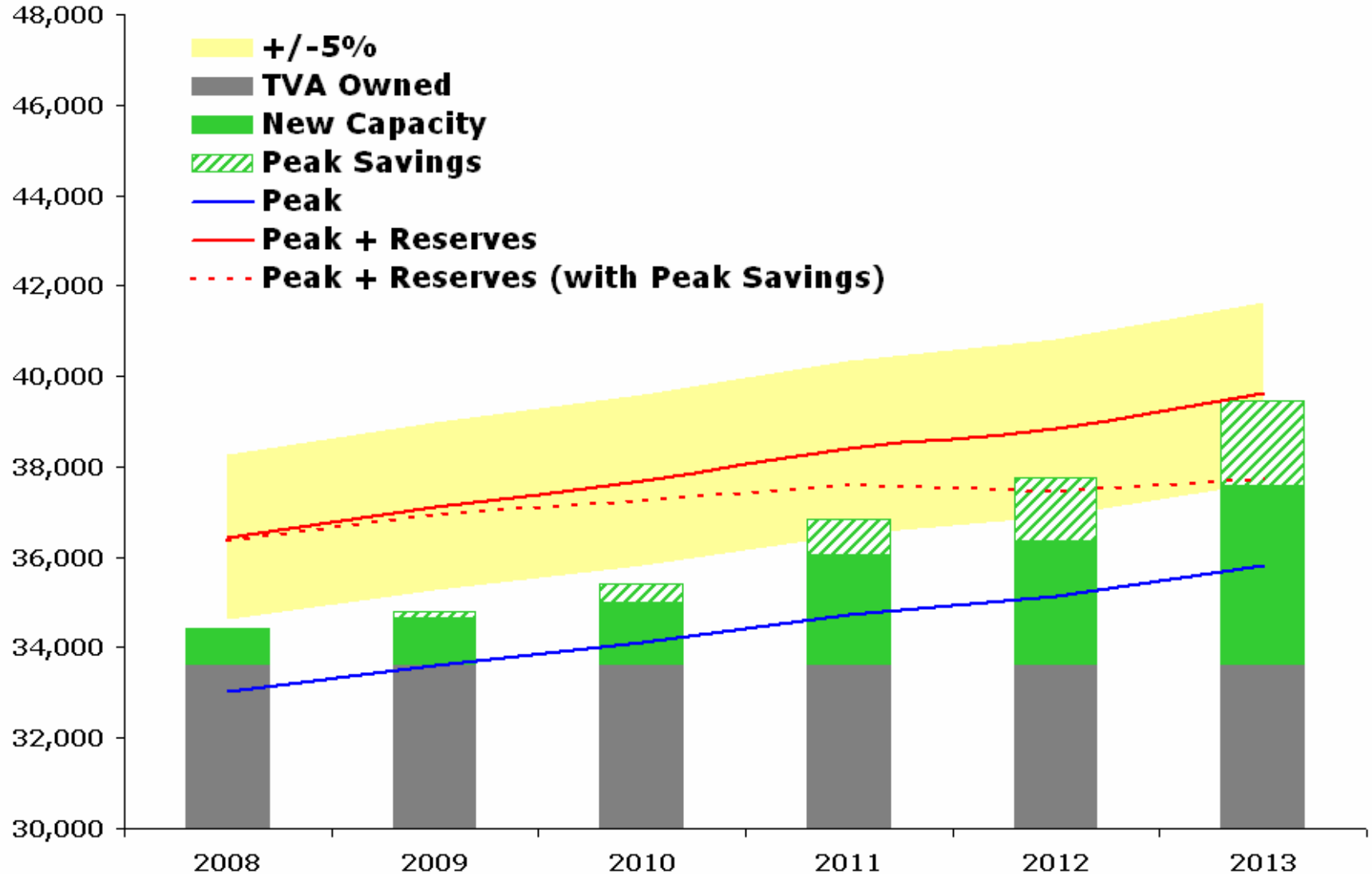
Define quantity and cost goals

TVA Potential Program Impacts Through 2012



TVA Projected Peak Demand Growth

Megawatts



Energy Efficiency

Residential

- New homes
- Online audits
- Existing homes
- Manufactured homes
- HVAC
- Appliances

Commercial

- New construction
- Efficient equipment
- Building performance

Demand Response

Residential

- Direct load control

Commercial

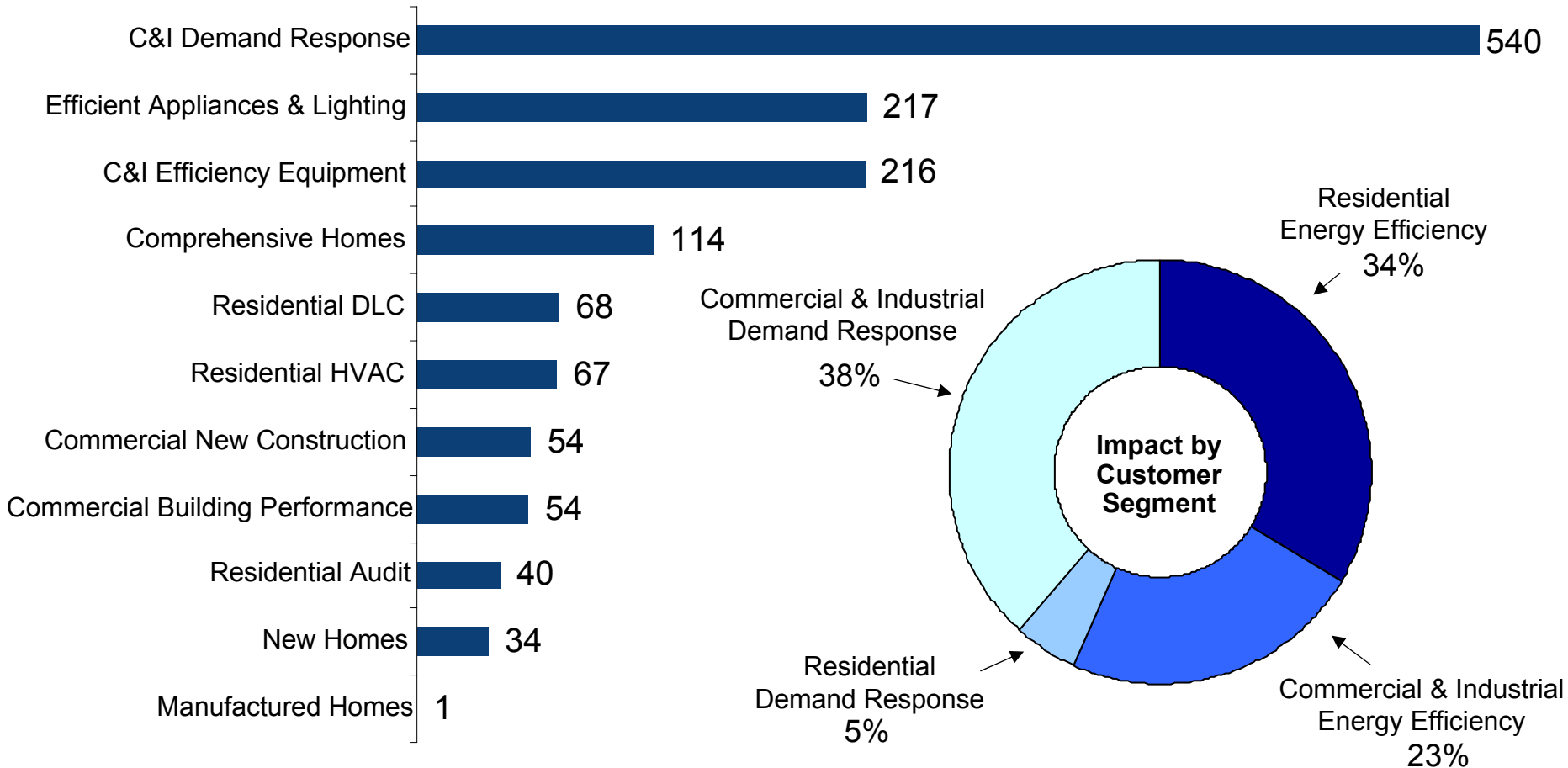
- 3rd party aggregator



Programs & Impacts

Summer Peak Demand (Megawatts)

Summer Peak MW Reduction, Impact at 2012 1,400 MW

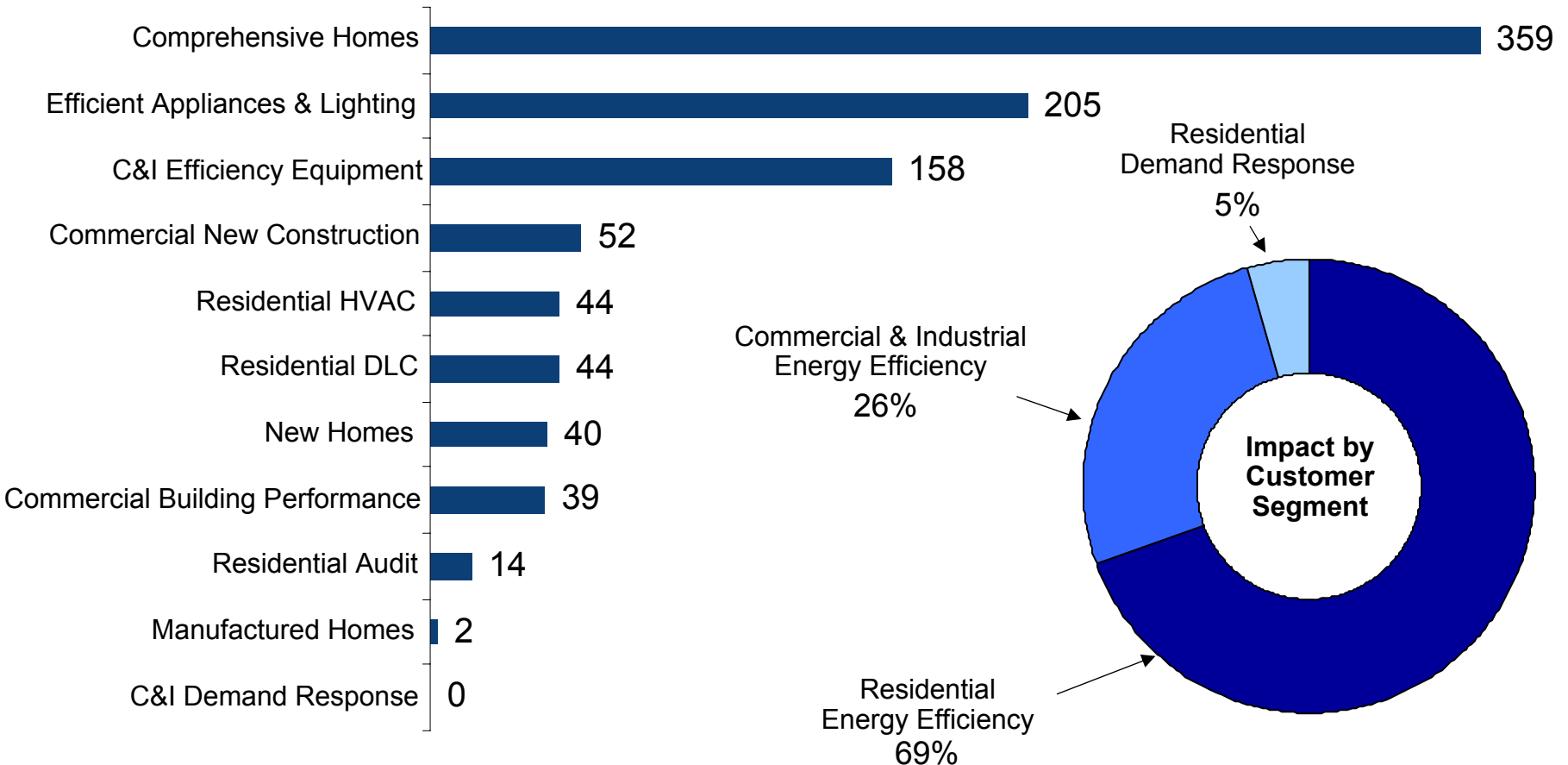




Programs & Impacts

Winter Peak Demand (Megawatts)

Winter Peak MW Reduction, Impact at 2012 950 MW



Next Steps

Public input

Power distributor input

Guiding principles considered by Board at May meeting

Finalize plan (subject to environmental review)

Product development and education campaign

Begin implementation



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Draft Renewable and Clean Energy Assessment Presentation

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Strategic Plan Commitments

“TVA will strive to reduce the carbon intensity of its generation by increasing renewable generating capacity”

“The TVA Strategic Plan promotes reduction of TVA’s environmental footprint, including a reduction in carbon intensity and an increase in renewables generation”

“Moving forward, TVA will make decisions that give strong consideration to fuel mix and generation assets that are low- or zero-carbon emitting resources”



- **One-on-one interviews with key constituencies**
- **Board listening sessions on renewables and energy efficiency**
- **Nine regional town hall meetings (*Continuing to be conducted through April*)**



Preliminary Input Comments:

- Limited regional supply
- Renewable & clean
- Partnerships needed
- Proactive education & outreach
- Premium programs above RPS
- Be a leader in some aspect of renewables

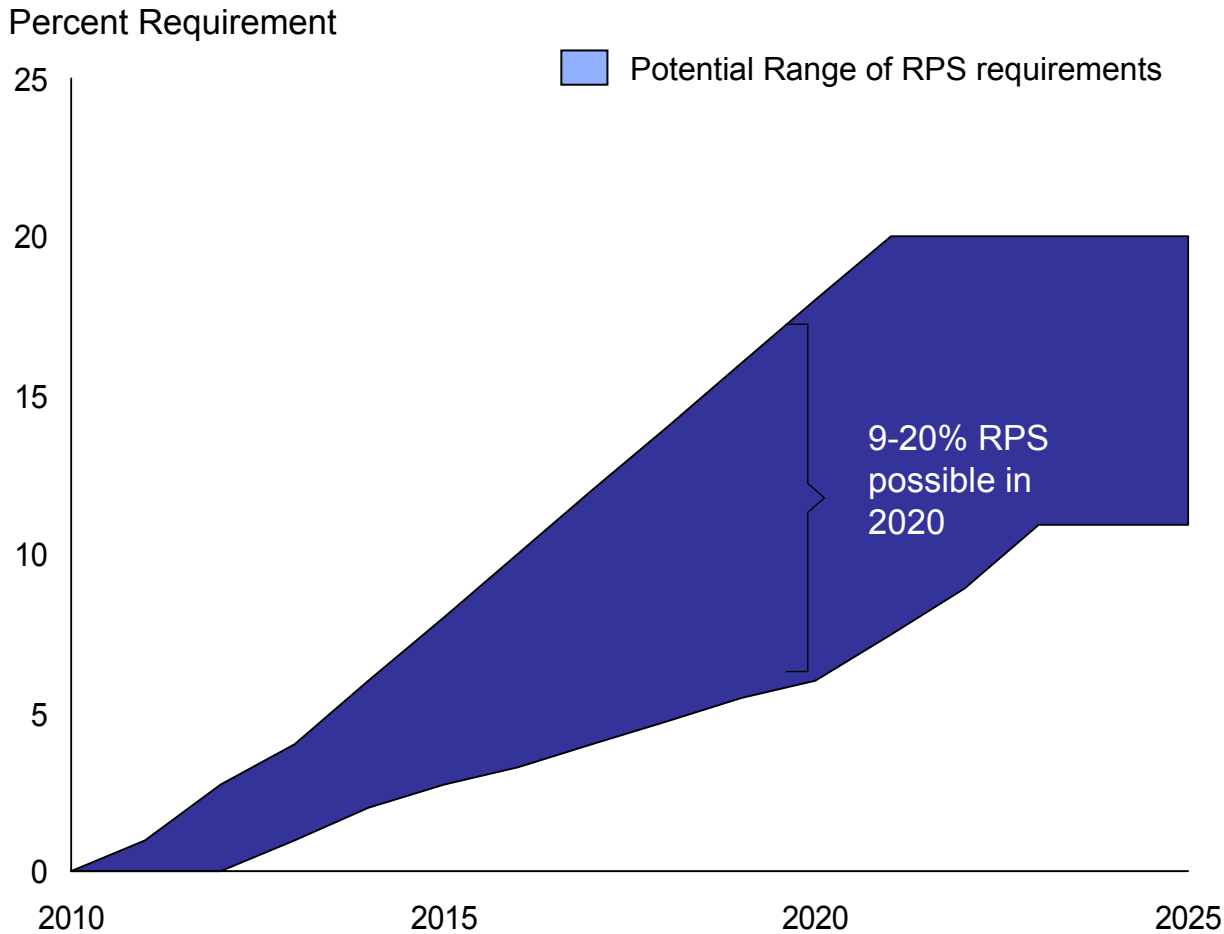


Current Renewables Supply

	Capacity (MW)	Energy (MWh)
Generation Partners	0.24	281
TVA Solar	0.35	460
TVA Wind	2.00	3,854
Middlepoint Landfill Gas PPA	2.20	13,490
Allen Fossil digester gas cofiring	8.00	35,040
Colbert Fossil wood waste cofiring	7.00	45,990
Wind PPA with Invenergy	27.00	54,400
HMOD (hydro modernization)	412.00	398,499
Total	458.79	552,014

*as of 1/1/08

Range of Federal RPS Proposals



Compliance Methods

“Traditional” renewable resources


- Incremental hydropower
- Biomass
- Wind
- Landfill gas
- Solar (*distributed and central*)
- Geothermal energy
- Hydrokinetic energy
- Ocean
- Tidal


Renewable Energy Certificates

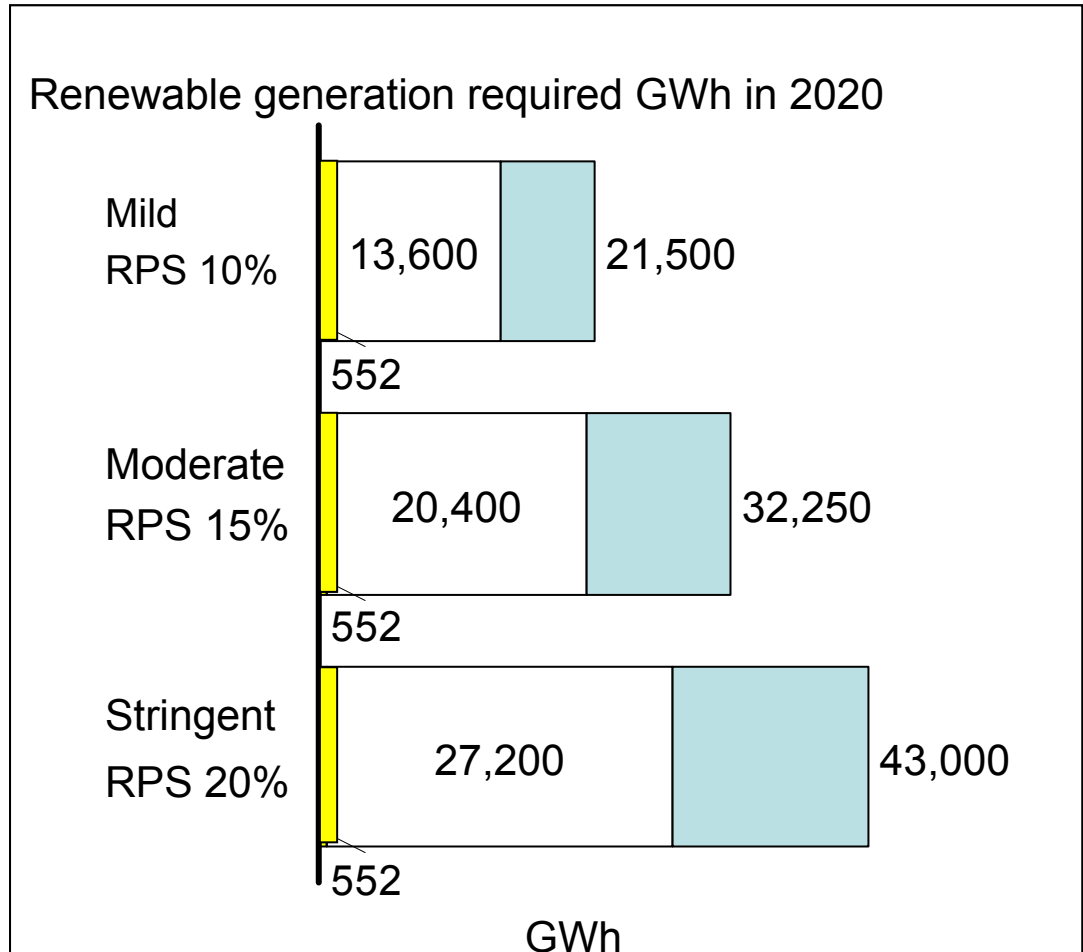
Alternative Compliance Penalty

Energy efficiency

RPS Scenarios - "Traditional" Sources

Existing TVA renewable generation 

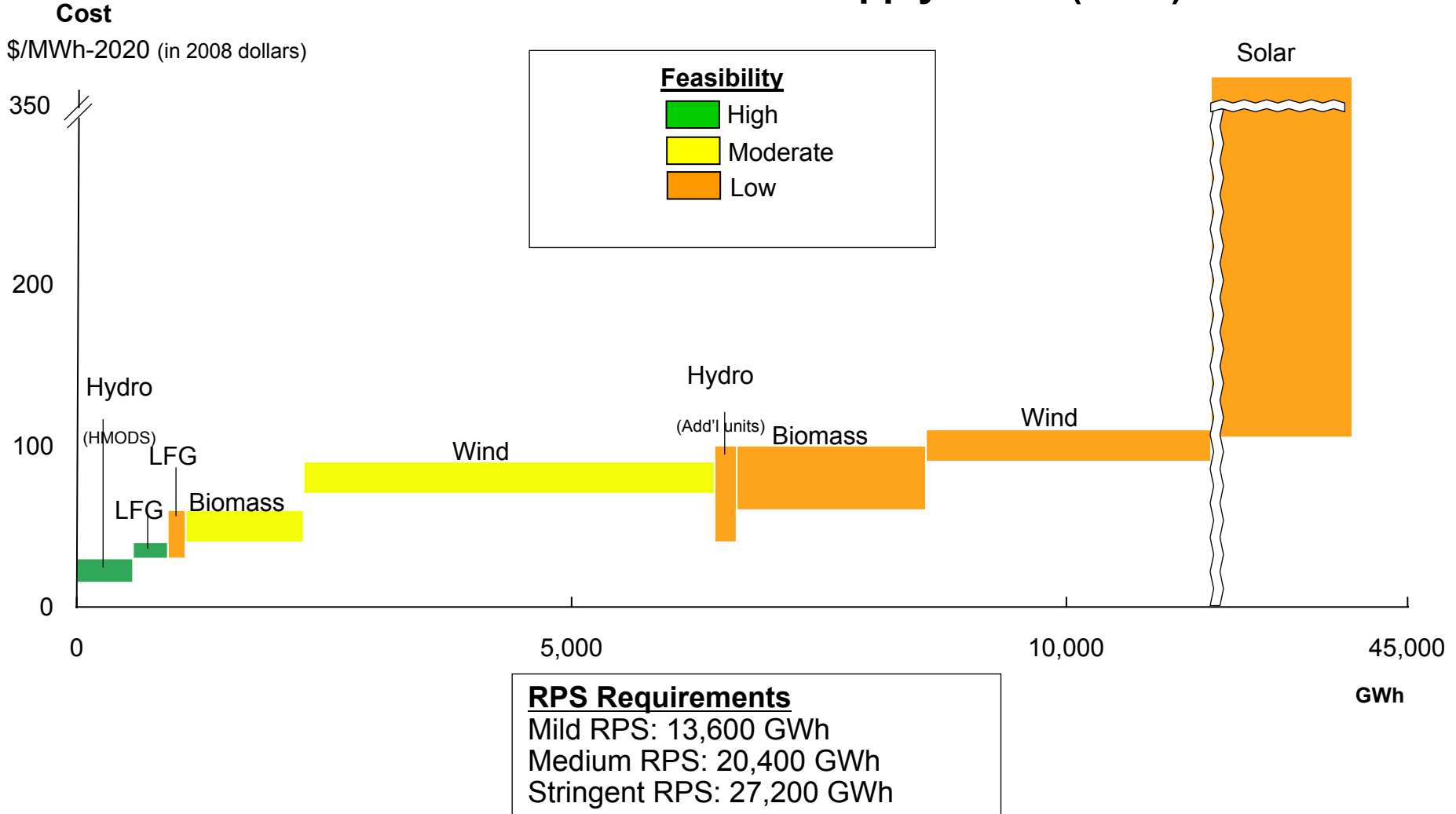
Likely exclusions based on size of retail sales and existing hydro 





Potential “Traditional” Renewables Supply In Valley

TVA service area renewables supply curve (2020)



Benefits:

Can respond to large and rapidly varying loads in minutes

Can store energy until it is needed

Significant nonpower benefits including flood control, navigation, and recreation

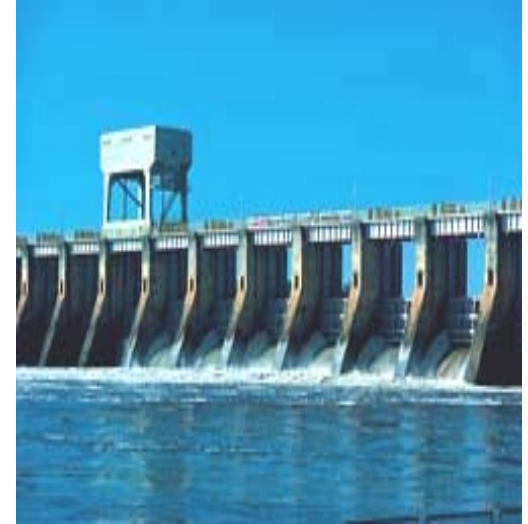
Challenges:

Generation can be impacted by drought

May threaten ecosystems

May impact the quantity and quality of water downstream of the dam

Cost Range: \$40 to \$120/MWh



Benefits:

Carbon neutral

Regional use of timber waste

Regional potential for a cash-crop

Less waste sent to landfills

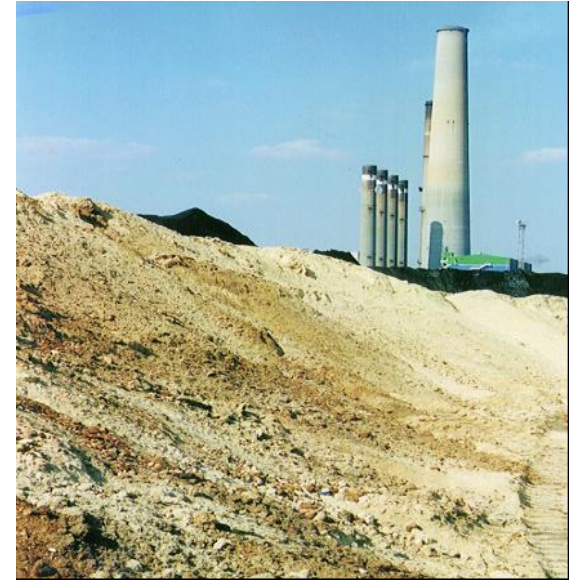
Challenges:

Potential impact of cofiring on SCR catalyst and ash disposal, nitrates, particulates

Significant capital required to upgrade units to achieve high levels

Uncertain cost, availability, and competition with others for biomass resource

Cost Range: \$50 to \$100/MWh



Benefits:

Does not require fuel source other than wind

Offsets greenhouse gases

Relatively simple design, short lead time construction

Challenges:

Limited regional sites, class 3

Wide range of potential future costs

Siting resistance due to aesthetic and visual impact of wind turbines

Competition for “choice” sites with regional competitors

Cost Range: \$70 to \$110/MWh



Benefits:

Practical for a large range of sized landfills

Converts waste material into useable energy

Methane gas is captured and used productively

Challenges:

Uncertainty of production life of landfill gas

Transmission line availability

Cost Range: \$30 to \$60/MWh



Benefits:

Does not require fuel source other than sunshine

Offsets greenhouse gases

Can reduce household or facility electric bill

Challenges:

Current high costs

Incentives necessary to accelerate adoption

Large scale solar (e.g. concentrated solar power) less efficient compared to PV

Cost Range: \$325 to \$390/MWh



Potential Roadmap For Clean Energy

Feasibility
■ High
■ Moderate
■ Low

**“Traditional”
Renewable
Options**

Tier I

\$

- HMOD
- Low level biomass co-firing
- Additional hydro units at existing dams
- Lower cost renewables
- RECs

Tier II (Tier I plus:)

\$\$

- High level co-firing
- Higher class wind sites
- Small scale biomass
- Mid-priced renewables
- Technology investment to lower costs:
 - Expansion of cofiring
 - Biomass gasification
 - Suitability of microturbines

Tier III (Tier I & II plus:)

\$\$\$

- Viable wind sites
- Additional hydro units
- Dedicated biomass
- Repower fossil unit with biomass
- Solar photovoltaics
- Update metering and interconnection rules to facilitate solar development

**Range of Available
Renewables**

800 –1,600 GWh

3 X

1,600 – 8,000 GWh

15 X

8,000 – 12,000 GWh

22 X

current
supply

**“Clean”
Energy
Solutions**

- Create awareness for clean energy options
- Identify energy efficiency opportunities in Valley
- Uprates/conversions
- Combined heat & power
- Nuclear power

- Support carbon capture and sequestration development

- Advanced generation technologies

TVA Strategic Plan

Policy and Framework

Customer

- Social responsibility
- Renewable supply for GPS subscribers
- End-use renewables offsets

Operational

- Renewables; increasingly more important role
- Diverse portfolio
- Energy security

Environmental

- Lower environmental footprint
- Reduce carbon intensity

Financial

- Sound financial health
- Manage risk and economic exposure

Guiding Principles

1. Identify immediate actions
2. Meet compliance obligations for TVA customers
3. Develop pricing structure
4. Implement public education initiatives
5. Explore clean regional generation options
6. Plan for long-term commitment to clean energy sources
7. Take leadership position in a targeted area

Renewable and Clean Energy Plan

Compliance Focus

Renewable Enablers

Clean Energy Supply

Operational Plans

Continue public input

Board consideration of the Renewable and Clean Energy Guiding Principles at the May board meeting

Finalize plan (subject to environmental review)



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