



## MEMORANDUM

**TO:** Mayor and Council Members

**CC:** Marc Ott, City Manager

**FROM:** Roger Duncan, General Manager

**DATE:** August 17, 2009

**SUBJECT:** Recommendation for the Resource and Climate Protection Plan

I am pleased to present you with the Austin Energy Recommendation for the Resource and Climate Protection Plan to 2020. The Plan presents a bold and achievable enhancement to the Austin City Council's strategic guidance to the utility over the last several years, while directly meeting new challenges and seizing new opportunities. The economic, financial, technological, regulatory, and social characteristics of the environment in which we continue to provide world-class electric services to the people of our community are constantly evolving. From this context of change, we now discern the emergence of clear patterns that will shape our future, hence, the need for this update to our Plan. More detail is provided below, but several key themes characterize this Plan:

- **Responsible:** Climate change legislation is coming to the United States, with the assured result of major changes in our economy and the electric services industry. This Plan addresses that reality head on, reducing direct emissions to 20% below 2005 emissions—a level safely lower than our best current estimates for what regulation will require.
- **Smart:** Energy efficiency is our least cost, most robust resource for meeting demand for electric service. The Plan starts with a strengthened commitment to making Austin's home buildings and businesses more energy efficient—800 MW of demand reduction by 2020. In essence, all forecasted growth in residential and commercial demand is met with energy efficiency resource investments over the planning horizon.
- **Renewable:** Austin Energy has long been a leader in putting clean, secure renewable energy to work for the benefit of our community. Over the planning horizon, expected technological and cost improvements in solar, wind, and other renewable energy technologies will enable Austin Energy to set a new, more aggressive goal of obtaining 35% of our energy from these resources, including 1,000 MW of wind generation and a doubling of our commitment to solar energy.
- **Water Conscious:** Water availability for power plant cooling is an increasingly important concern facing the electric industry. The Plan's increasing reliance on energy efficiency

and renewable energy generation technologies like wind and solar means improvements in Austin Energy's total water use and the intensity of its water use. Total water use will decrease by 1 billion gallons by 2020. Water intensity (water used per unit of energy produced) will improve by 20% over the same period.

- **Reliable:** Electric service is a basic need for life in modern society. The Plan builds on an Austin Energy tradition of providing safe and reliable electric service from a diverse mix of coal, natural gas, nuclear, and other generation resources over a well-maintained, efficient grid network. We will continue to operate these plants and systems in a safe, efficient manner and deliver outstanding service over the Austin Energy grid. As we introduce more renewable energy into the system, we will reduce our dependence on carbon-intensive sources of generation, including the Fayette Power Plant and older gas-fired generation units. The Plan calls for essential expansion of our natural gas generation capacity with new, more efficient units, and the system will be enhanced through deployment of cutting edge smart grid technologies.
- **Affordable:** Regardless of the course of action, our analysis shows that the price customers must pay for reliable electric service will rise over the coming years. The Plan will enable us to deliver cleaner, more efficient, more advanced and more reliable electric service at an average increase of some 2% per year. Under the Austin Energy recommendation, the average residential bill will be about \$21 higher each month in the year 2020.

The Austin Energy Recommendation for the Resource and Climate Protection Plan to 2020 benefits from an unprecedented level of public and stakeholder engagement. Over the course of the last year, we have held dozens of meetings, answered hundreds of questions, shared reams of data and analysis, reviewed hundreds of survey submissions, shared information with thousands of web site visitors, and reviewed a dozen alternative plan scenarios recommended by energy experts and stakeholders. We have used detailed and expensive production cost modeling to enable "apples to apples" comparisons of scenario alternatives across a wide range of metrics. The Austin Energy Recommendation, while it most assuredly will not please every point of view, has certainly benefited from the committed engagement of hundreds of Austin residents and stakeholders.

My staff and I are justifiably proud of the results of our work over the past year. Still, there is more work to be done. We have identified the need for the development of subsidiary and associated plans to address a few issues. We believe the time has come to develop a comprehensive plan to harvest all the rooftop solar energy potential in our city, and the associated manufacturing, installation, and operations economic development and jobs benefits that come along with such a commitment. We need to update our detailed understanding of the energy efficiency potential in our city, including that within the transmission and distribution system itself, and to move aggressively to implement buildings codes and innovative rate designs. And we need to develop a comprehensive strategy around energy storage, especially in a system more heavily dependent on variable renewable energy resources.

We are confident that prompt and efficient execution of this Plan will deliver broad and lasting benefits to the people of Austin. The Plan establishes the electric services foundation for achieving Austin's vision of being the most livable city in the nation while meeting best management goals. It builds for the future while maintaining a solid and continuously improving

record of safe, reliable, and affordable delivery of electric services to support communities, government, and commerce. Increasing reliance on efficiency and renewables will make Austin's energy mix substantially greener, and can only be accomplished by all city departments and citizens pulling together. The Plan and the business model changes it addresses keep Austin Energy on a healthy financial footing, minimizing the risk associated with regulatory change while optimizing the utilization of advanced and emerging technologies. The Plan was developed by engaging the entire community and will be updated in coming years in the same open and transparent fashion. We ask for your approval and guidance on our movement forward.

An Executive Summary and a detailed presentation are attached. If you have any questions, please do not hesitate to contact me at 322-6157.

A handwritten signature in black ink, appearing to be 'RD', with a long horizontal flourish extending to the right.

Roger Duncan  
General Manager



## **Executive Summary**

### **Austin Energy Resource and Climate Protection Plan to 2020**

The City Council established strategic energy policy for Austin Energy through its adoption of a strategic plan in 2003, and adoption of the Austin Climate Protection Plan (ACPP) in 2007. A key element of this policy framework is to reduce Austin Energy greenhouse gas emissions by offsetting the need for a 700 MW power plant by 2020 through energy efficiency, acquiring renewable resources (including 100 MW of solar) to deliver at least 30% of energy provided by 2020, and taking steps that allow the utility to become carbon neutral over time. These Council goals, while ambitious, are typical of those now being established by cities across the country. More importantly, they underscore the desire of our community to be a leader in these areas.

This past year, in planning future generation needs, Austin Energy developed a preliminary resource plan designed to ensure an adequate power supply through 2020 and meet the climate protection goals set by Council at a reasonable cost. A Public Participation Process was launched in October 2008 to seek feedback on the proposed generation plan as well as various options to that plan. This continuing process has included eight Town Hall meetings and 12 meetings with stakeholder groups, most notably large commercial and industrial customers and the environmental community. The plan options are also under review by a Council-appointed task force. In addition, Austin Energy has employed outside consultants to provide a cost and risk assessment of the various plan scenarios.

The Public Participation Process continues through September with additional Town Hall and stakeholder meetings as well as deliberations by the Austin Generation Resource Planning Task Force, Electric Utility Commission (EUC) and the Resource Management Commission (RMC). Austin Energy has developed a staff recommendation for review during this final phase of the Public Participation Process. We believe this recommendation will maximize the potential of energy efficiency gains and renewable resources, while balancing cost with a long-term reduction in carbon emissions.

The components of the staff recommendation are as follows:

#### **Energy Efficiency**

**Increase peak demand reductions through energy efficiency and load shifting from 700 MW to 800 MW by 2020.** Energy efficiency and load shifting are the least expensive way to address growth in peak energy use. On average, Austin Energy spends about \$350 per kilowatt (kW) of peak energy demand saved, a level far below the construction and operating cost of any type of new generation. Austin Energy's experience as well as the experience of numerous states shows that efficiency improvements on average costs about 3 cents per lifecycle (LCC) kilowatt-hour saved compared to about 7 cents to over 13 cents per kilowatt-hour for conventional electricity generation.

Between 1982 and 2003, Austin Energy customers offset the need for about 600 MW of peak demand through energy efficiency programs. Since 2005, our programs have offset

an additional 236 MW of peak demand, an average of 59 MW per year. Over the next decade Austin Energy's efficiency programs will increasingly be targeted to reducing climate impacts while increasing market penetration and reach. Austin Energy predicts that 800 MW by 2020 is achievable due to the following:

- City of Austin building code enhancements
- Energy Conservation and Audit Disclosure Ordinance
- Enhanced federal tax credits, Austin Energy/Texas Gas Service residential rebates
- Stimulus/other funding for home weatherization and municipal building efficiency improvements
- Enhanced efficiency/load shifting targeting of small businesses and commercial customers and increasing participation
- Thermostat cycling program (largest of its type in nation)
- Voluntary curtailment programs
- Ongoing development of Austin Energy's smart meter / smart grid infrastructure

### **Renewables**

**Increase from 30% to 35%, the percentage of power provided through renewable resources by 2020.** Currently about 12% of the energy provided by Austin Energy is delivered from renewable resources. This figure is projected to increase to 13% when the 30 MW solar facility at Webberville goes on line at the end of 2010 and to 17% when the 100 MW biomass plant in east Texas goes on line in 2012. Austin Energy recommends the 35% goal based on the following actions:

- Increase wind capacity from the current 439 MW to 1,001 MW by 2020 through a combination of purchase power agreements and ownership, facilitated by transmission build out in West Texas.
- Increase solar capacity from 100 MW goal to 200 MW through the following:
  - Develop a portfolio of approaches for siting and financing solar.
  - A recent study funded by Department of Energy shows that rooftops within the Austin Energy service area are capable of accommodating 2,300 MW of solar capacity equivalent to 27% of current load; ground-mounted solar potential adds 1,700 MW.
  - Create a plan to develop all of Austin's solar energy generation potential, including incentives and strategies to attract local solar manufacturing with the associated economic development and jobs benefits.
  - The Pecan Street Project provides a vehicle for expanded use of distributed energy resources, smart grid technology, advanced vehicle concepts and other opportunities.
  - Develop joint solar/wind projects for transmission optimization
- Develop an energy storage capability for wind and energy storage capability for solar-generated power.
- Add 50 MW of biomass reflecting the limited nature of this resource in Texas.

### **Natural Gas**

**Expand the Sand Hill Energy Center (SHEC) by 200 MW of combined-cycle gas generation and maintain existing natural gas generation resources.** New natural gas

discoveries and extraction technology have increased natural gas supplies.

Considerations:

- Infrastructure for SHEC expansion already in place
- Expansion of plant provides balancing services for intermittent renewables
- More efficient unit will generate fuel savings of approximately \$130 million by 2020
- More efficient unit will provide CO<sub>2</sub> savings of approximately 1 million tonnes by 2020
- Will utilize reclaimed water for cooling

## **Nuclear**

**Continue current participation in South Texas Project (STP), Units 1 and 2.**

- As previously approved by City Council, no participation in Units 3 and 4
- Evaluate nuclear purchase power agreements offered

## **Coal**

**Goals related to renewables, energy efficiency and efficient natural gas should reduce capacity factor of Austin Energy-owned share of the Fayette Power Plant (FPP) to 60% by 2020, setting the stage for eventual sale or other disposition of Austin's share of the plant.**

- Investigating with LCRA, the feasibility of co-firing the FPP with biomass or natural gas.
- Will complete installation of scrubbers on Units 1 and 2 to reduce SO<sub>2</sub> and investigate feasibility of additional NO<sub>x</sub> reductions as well as carbon capture.

Considerations:

- LCRA has options to utilize Austin Energy-owned FPP capacity if unused by Austin Energy
- ERCOT can dispatch all power plants for grid reliability
- New nodal market design may impact plant operations
- ERCOT and LCRA must sign off on any plant closure
- Austin Energy may forgo off-system sales revenues under this course of action
- Purchase of CO<sub>2</sub> allowances or offsets may be less expensive alternative depending on expected federal legislation

## **CO<sub>2</sub> Plan**

**Reduce CO<sub>2</sub> emissions associated with generation to 20% below 2005 levels by 2020.**

Can be achieved through proposed resource plan of additional renewables, energy efficiency and new more efficient gas generation:

## **Water Use**

The Austin Energy recommended plan would reduce water use intensity by 20% from 724 gallons/kilowatt-hour (kWh) to 574 gallons/kWh. Water use by Austin Energy generation is currently 7 billion gallons annually. With implementation of this recommended plan, water use in 2020 is estimated at 6 billion gallons:

- Energy efficiency, solar PV, wind require no water
- Biomass, geothermal, solar thermal require water

- Natural gas units use reclaimed water
- Reduced capacity factor at FPP reduces water use

### **Cost**

Pace Consulting Group analyzed 10 generation plan scenarios suggested through the Public Participation Process in addition to the original Austin Energy “strawman” proposal. The added cost of generation under these scenarios ranged from zero to as much as a 35% increase in average monthly residential electric bills under the most costly proposal by 2020.

The Austin Energy staff recommendation would increase residential electric bills by about 22% (\$21 on a monthly bill by 2020), placing this recommendation at about the halfway point of cost estimates – while achieving all goals and positioning the utility favorably for upcoming federal requirements related to carbon emissions.

### **Business Model**

Changes in the business environment, increases in overall costs, and Austin’s energy supply transformation, as well as other factors, will require an updated business model. A new business model is necessary to ensure that Austin Energy collects sufficient revenues to maintain and operate its infrastructure, as well as the ability to implement technological advancement in areas such as smart grid development. Establishing the new business model will involve:

- Unbundling the rate structure to give Austin Energy the flexibility to design competitive tariffs and service offerings to meet the demands of a rapidly evolving electric services marketplace.
- Reviewing and resetting rates to address revenue erosion, new operational costs, and the demand for increased capital investment, through a rate case in 2012, resulting in new electric rates in FY2013.
- Addressing the fuel-related contribution to the General Fund transfer.

### **Vetting of these Recommendations**

Austin Energy’s recommendations will be presented and feedback sought from the EUC, the RMC, and the Council-appointed Austin Generation Resource Planning Task Force, from Austin Energy customers during a Town Hall meeting on September 1 and large companies and environmentalists at a stakeholder meeting in September. Finally, a public hearing at the October 15 City Council meeting is being scheduled. Attached is a comprehensive presentation. Please let me know if you have any questions as we move through this process.



Roger Duncan  
General Manager  
(512) 322-6157

# Resource & Climate Protection Plan to 2020

*Recommendations & Plan*

Austin Energy

Roger Duncan, General Manager



Resource & Climate Protection Plan to 2020

# AGENDA & BACKGROUND

August 17, 2009



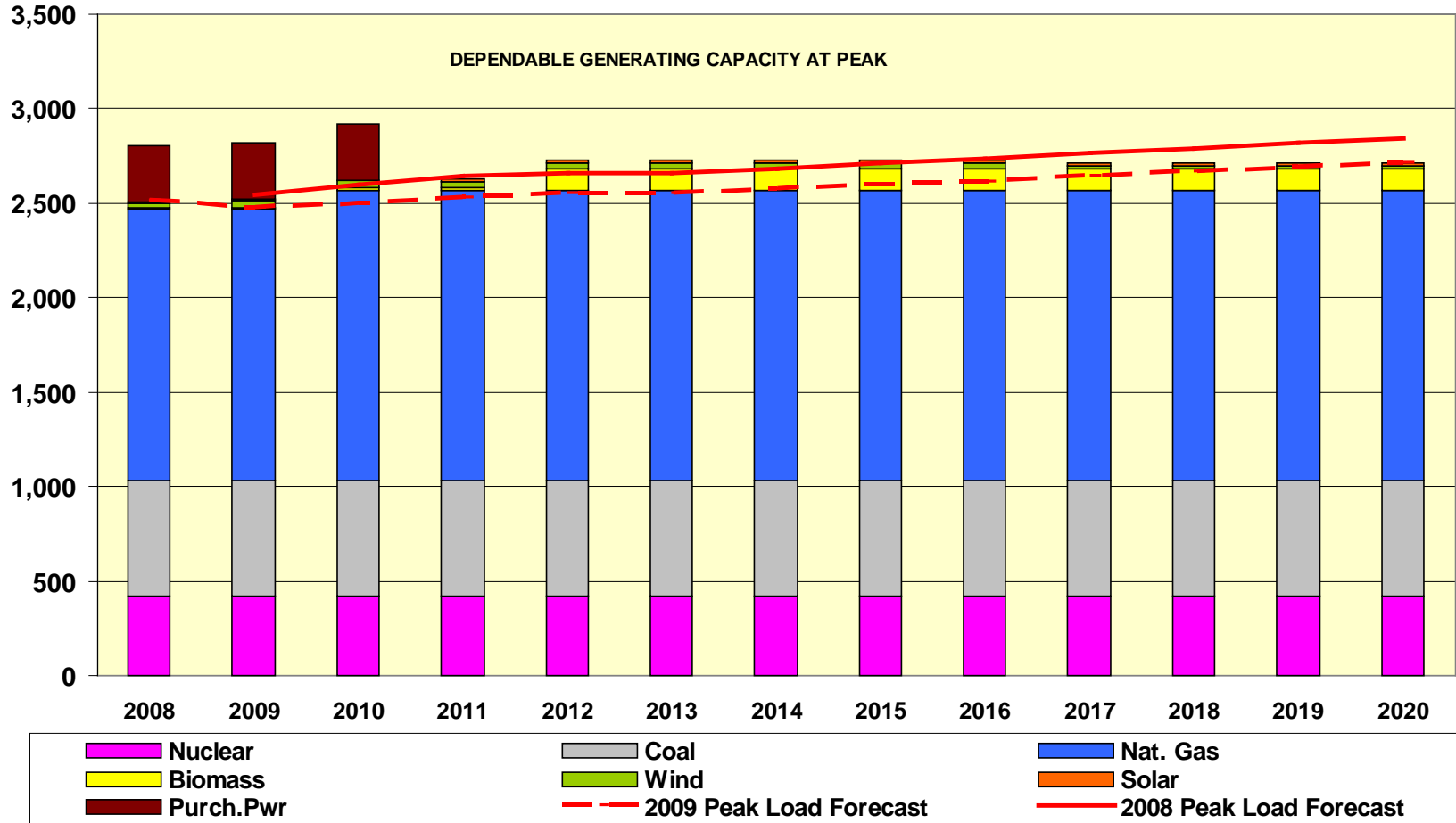
# Agenda

- Background
- Public Process
- Austin Energy's Recommendation
- Next Steps

# Key Planning Requirements

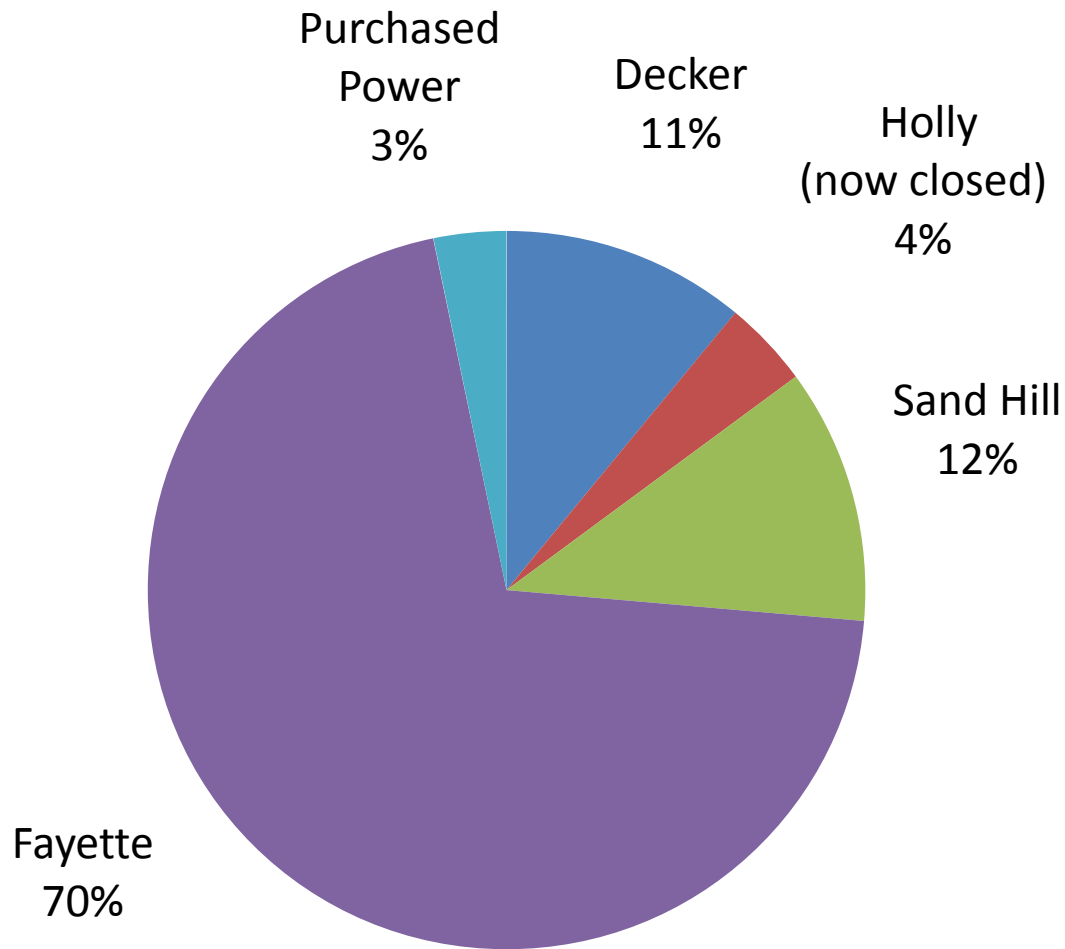
- Reliably meet demand and energy requirements
- Meet Council goals
  - 30% renewables by 2020
  - 100 MW solar by 2020
  - 700 MW efficiency by 2020
- Execute existing generation contracts (solar & biomass)
- No retirement of existing power plants before 2020

# Current Resources vs. Load Forecasts



# Austin Energy CO<sub>2</sub> Emissions Profile, 2007

Fayette Power Plant = Nearly  $\frac{3}{4}$  of Power Plant CO<sub>2</sub> Emissions



August 17, 2009



Resource & Climate Protection Plan to 2020

# **PUBLIC PARTICIPATION PROCESS**

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# Public Participation Process

- 8 Town Hall Meetings held from Oct 2008 through Feb 2009
- Town Hall Meeting attendance: 239
- Stakeholder meetings with the environmental community and our large commercial, industrial customers beginning in December 2008 (ongoing)
- **Austinsmartenergy.com** web site hits: 208,906
- Surveys submitted: 384
- 4 Employee Town Hall Meetings held with 282 attending
- 12 Stakeholder Meetings have reached approximately 500 members
- Launched “Change Your Generation” online energy game
- Two combined stakeholder meetings with over 100 attendees at each

# Results of Public Participation Process

- More energy efficiency
- More solar
- More wind
- Less coal
- Split on nuclear
- Somewhat ambivalent on gas
- Information on cost of fuels and new technology



# What's Important to Citizens

- Costs, especially for large customers
- Environmental groups say this is the time to stop using coal
- Across-the-board support for energy efficiency
- Transparency is strongly desired, and sometimes hard to satisfy
- Continuing opportunities to participate in the process

# Strong Debate

- Around fuels and technologies, especially future prices and availability
- About impacts of regulatory changes
- About economics of power production

# Scenarios Analyzed

	Meets 30% Renewable Energy Goal	Meets 100 MW Solar Goal	Includes 700 MW DSM	Includes Existing Generation Units & Contracts	No Replacement of Existing Units before 2020	Meets AE Peak Demand and Energy Requirements	Allows any combination of supply and demand side options	Phased Replacement of FPP, 300 MW 2014, 300 MW 2020	Adds 200 MW Nuclear PPA in 2017	Eliminates Sand Hill CC addition planned for 2015	Assumes 400,000 plug-in vehicles by 2025	Assumes solar technology breakthrough (60% reduction in capital costs by 2020)
<b>Draft Energy Resource Plan "Strawman"</b>	✓	✓	✓	✓	✓	✓						
<i>No Additional Generation</i>			✓	✓	✓	✓				✓		
<i>Lowest Bill Impact</i>			✓	✓	✓	✓	✓					
<i>Lowest Bill Impact Meeting Council Goals</i>	✓	✓	✓	✓	✓	✓	✓					
<i>Replace FPP : Renewables</i>	✓	✓	✓	✓		✓		✓				
<i>Replace FPP : Low Cost, Low Carbon</i>			✓	✓		✓	✓	✓				
<i>Waxman-Markey Draft CO2 Bill</i>	✓	✓	✓	✓	✓	✓						
<i>Strawman with Impact of the Electrification of the Transportation Sector</i>	✓	✓	✓	✓	✓	✓					✓	
<i>Strawman with Solar Technology Breakthrough</i>	✓	✓	✓	✓	✓	✓						✓
<i>Strawman with Nuclear Addition</i>	✓	✓	✓	✓	✓	✓		✓	✓			
<i>300 MW Solar DG</i>	✓	✓	✓	✓		✓	✓			✓		

# Class Rate Impacts in 2020

	Current Rates	No New Builds	No New Builds w/o Prod Base Rate Decrease	Least Cost Results	Strawman	Replace FPP	Least Cost Council Goals	W-M Emissions Reductions	Electric Vehicles	Nuclear PPA	Pecan Street	Solar Breakthrough
	2009	2020										
<b>Residential (1,000 kWh)</b>												
Base	\$ 58.35	\$ 46.51	\$ 58.36	\$ 74.34	\$ 76.09	\$ 99.34	\$ 76.75	\$ 84.15	\$ 82.38	\$ 68.43	\$ 91.75	\$ 80.08
Fuel	36.53	44.08	44.08	30.30	34.64	28.32	29.61	31.72	32.18	40.07	29.10	32.91
Total	\$ 94.88	\$ 90.59	\$ 102.44	\$ 104.64	\$ 110.73	\$ 127.66	\$ 106.37	\$ 115.88	\$ 114.56	\$ 108.50	\$ 120.85	\$ 112.99
Percent Increase (decrease)		-4.5%	8.0%	10.3%	16.7%	34.5%	12.1%	22.1%	20.7%	14.4%	27.4%	19.1%
Monthly \$ Amt Increase (decrease)		(4.29)	7.56	9.76	15.85	32.78	11.49	21.00	19.68	13.62	25.97	18.11
<b>General Service Demand (100 kW, 43,800 kWh)</b>												
Base	\$ 2,122.40	\$ 1,691.77	\$ 2,122.61	\$ 2,704.15	\$ 2,767.61	\$ 3,613.39	\$ 2,791.80	\$ 3,060.93	\$ 2,996.62	\$ 2,488.94	\$ 3,337.26	\$ 2,912.78
Fuel	1,600.01	1,930.83	1,930.83	1,326.98	1,517.11	1,240.28	1,297.05	1,389.48	1,409.28	1,755.22	1,274.61	1,441.41
Total	\$ 3,722.41	\$ 3,622.60	\$ 4,053.45	\$ 4,031.13	\$ 4,284.72	\$ 4,853.66	\$ 4,088.86	\$ 4,450.40	\$ 4,405.90	\$ 4,244.16	\$ 4,611.87	\$ 4,354.19
Percent Increase (decrease)		-2.7%	8.9%	8.3%	15.1%	30.4%	9.8%	19.6%	18.4%	14.0%	23.9%	17.0%
Monthly \$ Amt Increase (decrease)		(99.82)	331.03	308.72	562.31	1,131.25	366.44	727.99	683.49	521.75	889.45	631.78
<b>Industrial (5,000 kW, 3,300,000 kWh)</b>												
Base	\$ 94,015.00	\$ 74,939.36	\$ 94,024.40	\$ 119,784.51	\$ 122,595.56	\$ 160,060.54	\$ 123,667.33	\$ 135,588.43	\$ 132,739.78	\$ 110,251.39	\$ 147,829.19	\$ 129,026.19
Fuel	116,952.00	141,142.89	141,142.89	97,001.56	110,900.29	90,663.48	94,813.79	101,570.12	103,017.90	128,305.87	93,172.97	105,366.53
Total	\$ 210,967.00	\$ 216,082.25	\$ 235,167.30	\$ 216,786.07	\$ 233,495.85	\$ 250,724.01	\$ 218,481.12	\$ 237,158.55	\$ 235,757.68	\$ 238,557.26	\$ 241,002.16	\$ 234,392.72
Percent Increase (decrease)		2.4%	11.5%	2.8%	10.7%	18.8%	3.6%	12.4%	11.8%	13.1%	14.2%	11.1%



Resource & Climate Protection Plan to 2020

# **AE RECOMMENDATION**

August 17, 2009



# AE Recommendation

## Generation Resources in MW

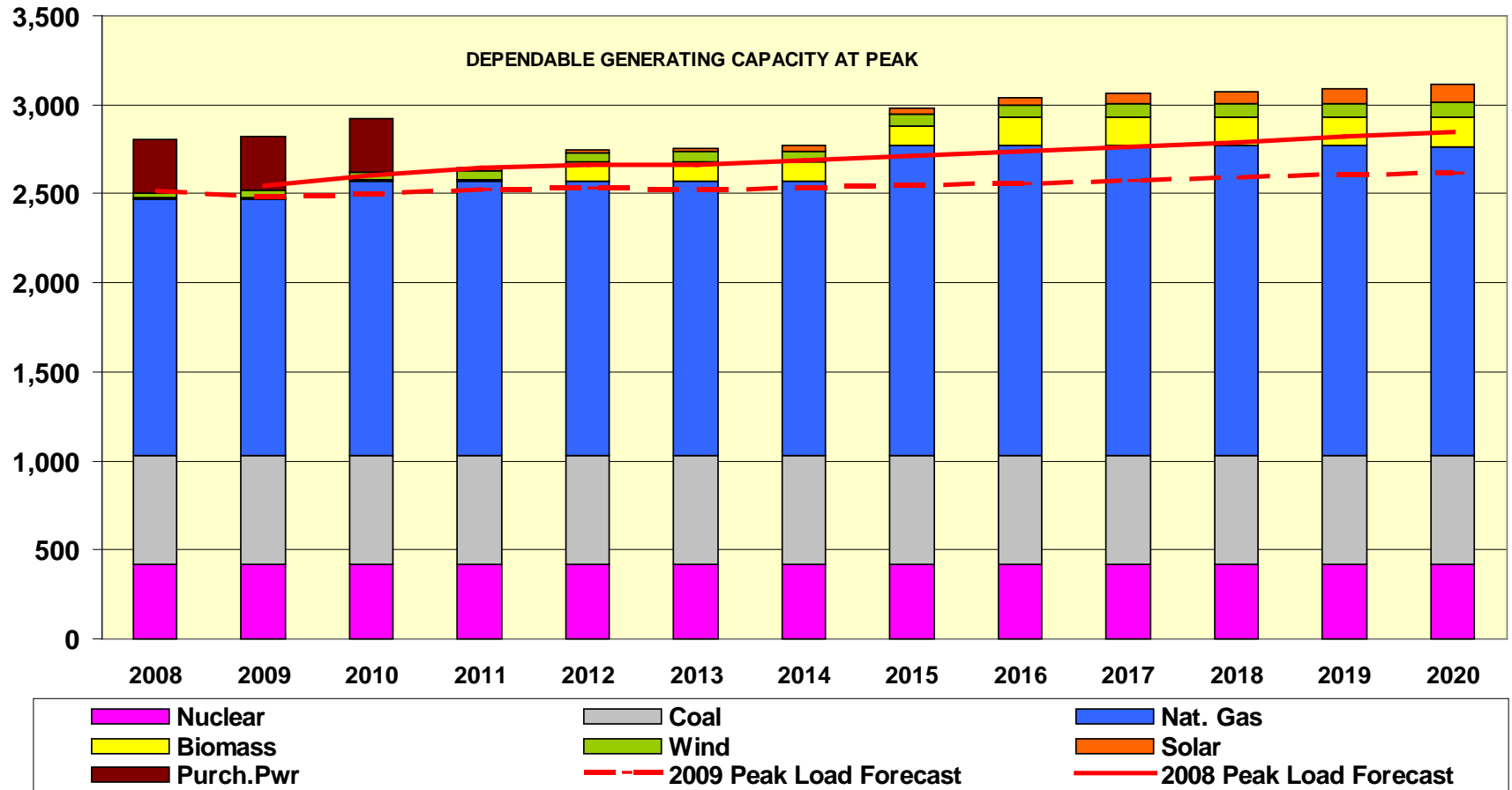
Year	Coal/Nuclear	Gas	Biomass	Wind	Solar	Renewable Portfolio
2009	1,029	1,444	12	439	1	12.6%
2010		100			30	12.5%
2011				(77)* / 200		17.7%
2012			100			22.2%
2013				150		26.2%
2014					30	26.4%
2015		200		100		28.7%
2016			50		20	31.6%
2017				(126)* / 200	30	35.0%
2018					20	33.6%
2019					30	33.7%
2020				115	40	36.7%
<b>Total</b>	<b>1,029</b>	<b>1,744</b>	<b>162</b>	<b>1001</b>	<b>201</b>	

\* Wind contracts expire.



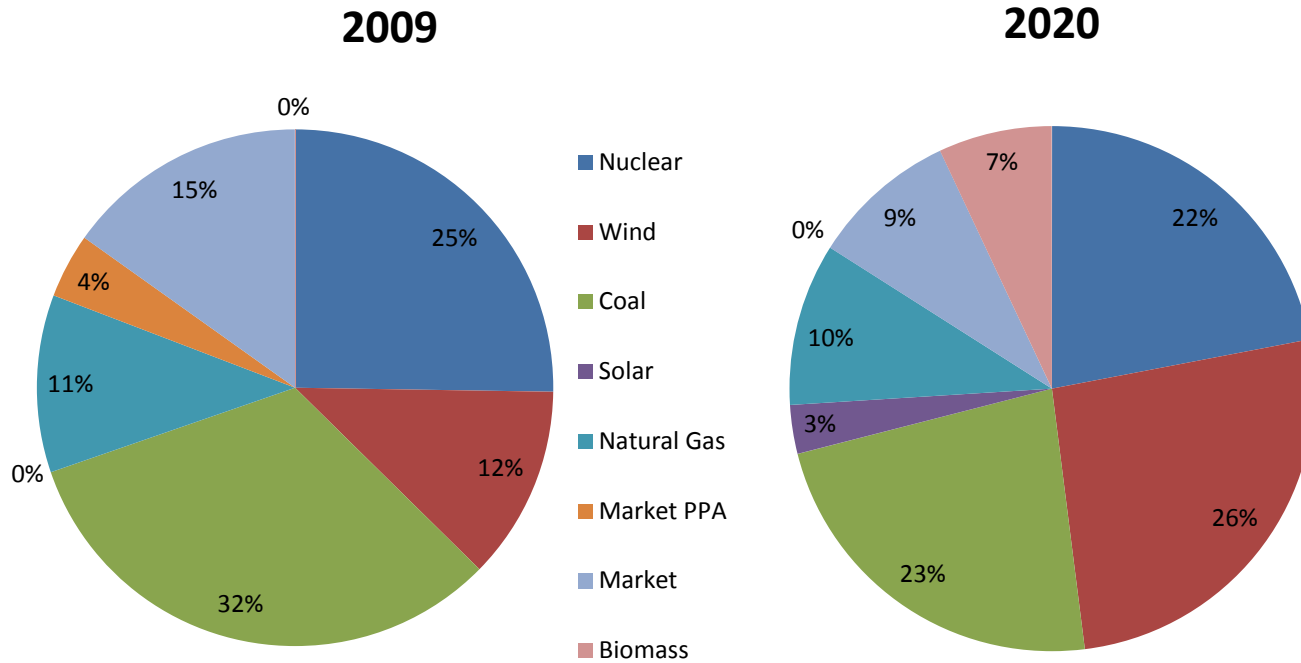
# AE Recommendation

## Generation Resources & Load Forecast



# AE Recommendation

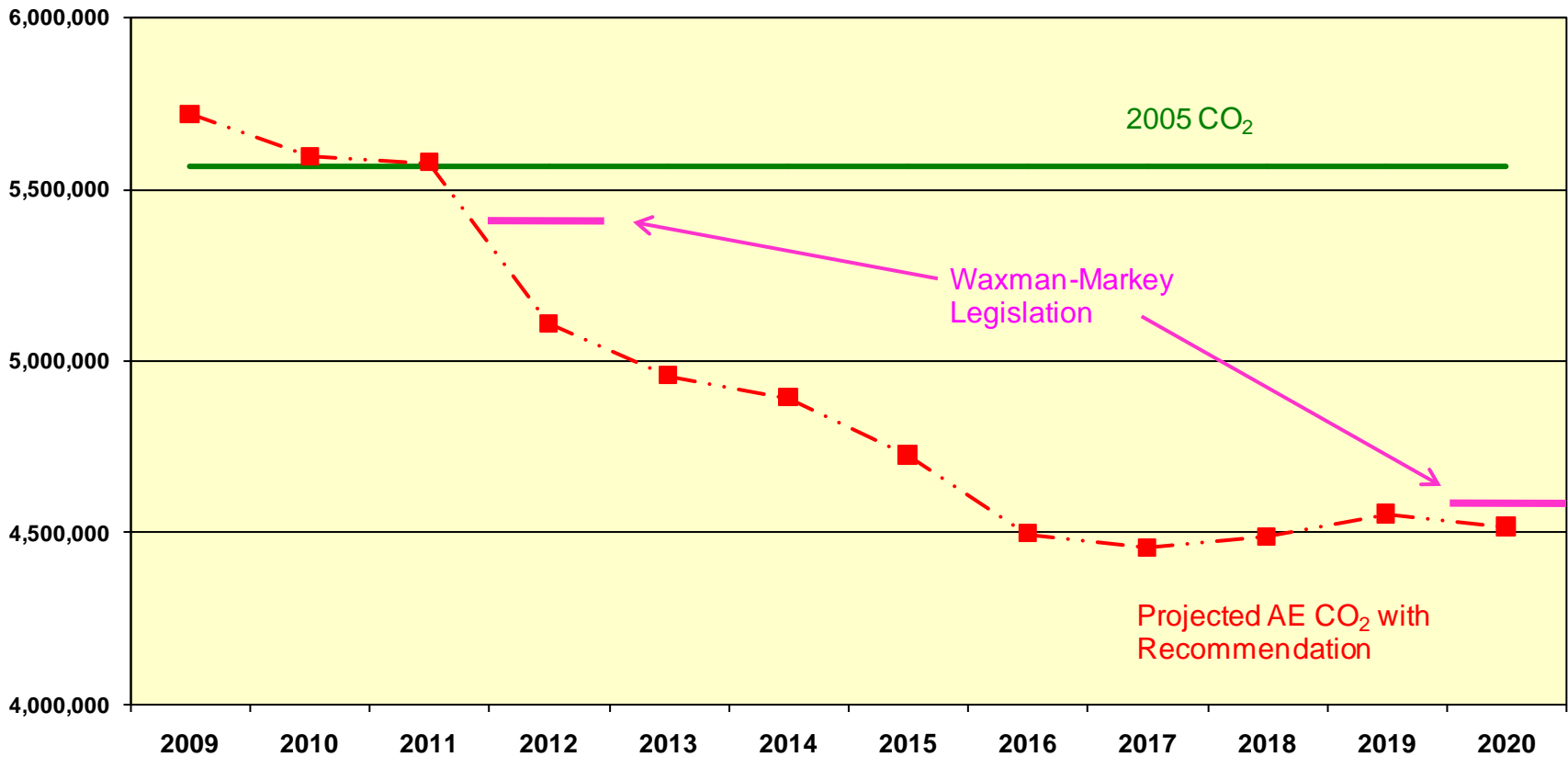
## Energy Mix – 2009 vs. 2020



# AE Recommendation

## CO<sub>2</sub> Emissions

Tonnes



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# *AE Recommendation*

## Goals Summary

### Proposed 2020 Goals

- Increase renewable energy goal to 35%
- Increase energy efficiency goal by 100MW to 800MW
- CO<sub>2</sub> reduction target of 20% below 2005 level

# *AE Recommendation*

## Estimated Rate Impacts

Estimated impacts associated with increased generation requirements, in 2020.

	Residential	General Service	Industrial
Demand/Energy Used	1,000 kWh	100 kW/ 43,800 kWh	5,000 kW/3,300,000 kWh
Increase over 2009	22.0%	19.2%	11.7%
Bill Impact	\$21	\$717	\$24,684

- Total capital expenditures to 2020 of \$2.67 billion
- No near term base rate impacts

Resource & Climate Protection Plan to 2020

# PLAN COMPONENTS

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# Energy Efficiency

## 1<sup>st</sup> priority for meeting new load growth

- Increase 700 MW Goal by 2020 established in 2007 to 800 MW by 2020
- Continue building code changes for Zero Energy Capable Homes (ZECH) homes by 2015
- Conduct combined heat and power potential study
- Develop plan for distribution system efficiency improvements
- Implement innovative rate design changes for energy efficiency, including dynamic pricing
- Refocus on base load efficiency programs that reduce carbon
- Conduct new energy efficiency potential study
- Develop plan for local contractor, M/WBE contractor, and veterans opportunities

# Wind

Increase wind capacity to 1,000 MW by 2020

- Seek ownership of wind resources
- Pursue compressed air energy storage
- Support increased transmission capacity in ERCOT
- Investigate other wind energy deployment and storage strategies

# Solar

Double Solar goal to 200 MW by 2020

- Develop a portfolio approach to siting, financing and ownership
- Promote solar thermal hot water use
- Develop incentives and strategies for local manufacturing capacity
- Develop solar energy storage strategy
- Plan for development of full on-site solar energy potential in Austin

# Biomass

Add 50 MW biomass capacity by 2020

- Study small facility options
- Continue to investigate biomass co-firing at Fayette Power Plant

# Natural Gas

- Maintain current gas units of 1,544 MW
- Add 200 MW combined cycle gas turbine (CCGT) at Sand Hill
  - Use reclaimed water for cooling new CCGT
  - Utilizes existing expansion option
- More efficient plant offers:
  - Fuel savings of approximately \$130M by 2020
  - CO<sub>2</sub> reductions of approximately 1 million tonnes by 2020
- Dispatchability balances variable renewable and energy efficiency resources

# Coal

Generation plan should reduce Fayette Power Plant capacity factor to 60% by 2020

- Sets stage for eventual modification, closure, or sale
- Continue to investigate co-firing at Fayette Power Plant
- Investigate further NO<sub>x</sub> reductions and carbon capture and storage retrofits

# Nuclear

- Continue participation in STP Units 1 and 2
- No participation in STP Units 3 and 4
- Evaluate nuclear power purchase agreements if offered

# Geothermal & Other

- Investigate geothermal resource acquisition
- Assess non-solar renewable resources in service area

# Complementary Strategies

- Energy Storage - Develop a comprehensive energy storage strategy
- Smart Grid & Pecan Street - Accelerate development and deployment of smart grid
- Electric Transportation - Continue development of electric vehicle incentives and utility integration for storage and other opportunities
- Economic Development - Develop and implement green collar job initiatives to grow and strengthen the local workforce

Resource & Climate Protection Plan to 2020

# CLIMATE PROTECTION PLAN

August 17, 2009



# Climate Protection Plan – “CO<sub>2</sub> Plan”

Reduce CO<sub>2</sub> emissions to 20% below 2005 level by 2020

- *AE Recommendation* is a plan that will reduce stack emissions under Austin Energy’s control
- Austin Energy may be limited in its ability to reduce emissions at the power plants
- *AE Recommendation* may not be the lowest cost way to reduce CO<sub>2</sub> footprint

# Direct Emissions Reductions

*AE Recommendation* is a plan that will reduce stack emissions under Austin Energy's control

- Energy efficiency and renewable resources reduce load of fossil fuel plants
- CCGT, 200 MW – Will displace less efficient generation resources (e.g., Decker) and provide balancing resources for renewable energy generation
- Expected to reduce Fayette Power Plant capacity factor to 60% by 2020—this is the intended result, setting the stage for closure, sale or modification
- Designed to accomplish a direct-emissions approach to compliance with likely federal regulatory requirements



# Operational Considerations

Austin Energy may be limited in its ability to reduce emissions at the power plants

- LCRA options regarding FPP operations
- Both LCRA & ERCOT have a say in FPP closure
- ERCOT can dispatch any generator for grid reliability purposes

# Financial Considerations of CO<sub>2</sub>

*AE Recommendation* may not be the lowest cost way to reduce CO<sub>2</sub> footprint

- Ability to buy / sell CO<sub>2</sub> allowances or offsets
- Environmental dispatch vs. economic dispatch
- May forgo off-system sale revenues, with uncertain environmental benefits
- New technologies (e.g., carbon capture and sequestration “CCS”)

# Water Consumption

*AE Recommendation* expected to reduce water use intensity from 724 gal/kWh in 2007 to 574 gal/kWh in 2020 (total consumption in 2020 of about 6 billion gal)

- Energy efficiency, solar PV, and wind require no water
- Biomass, geothermal, and solar thermal will require water
- Natural gas units are more efficient and use reclaimed water
- Reduced capacity factor at FPP reduces water consumption

# Business Model

Address deployment of distributed energy resources, especially self-generation

- Investigate “unbundled rate structure”
- Move from volumetric pricing to more fixed-cost pricing
- Address fuel portion of General Fund Transfer
- Develop plan for future Green Choice offerings
- Prepare for rate case in 2012



Resource & Climate Protection Plan to 2020

# NEXT STEPS

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# Next Steps

- EUC, RMC, Task Force meetings
- Risk analysis
- Town Hall & Stakeholder Meetings
- No urgent requirement