INVESTING IN A CLEAN FUTURE

Austin Energy's Resource, Generation and Climate Protection Plan to 2020 Update

April 16, 2014

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Framework for Developing Effective Goals for the Generation Plan

Austin Resource Generation Planning Task Force

April 16, 2014

Building Effective Environmental Goals in the Resource Plan

- Good policy helps companies work better for both society and the economy

- How can companies collaborate with stakeholders, government and industry to create efficient and effective environmental policy?
  - Policy makers working on environmental issues have a range of policy instruments available to them which are effective at certain times
  - Policy framework based on good data and research builds effective and efficient environmental policy

Why is this Important?

- Environmental Policies have sweeping implications for business, citizens and the environment – there are opportunities for things to go well, or poorly
  - German experience: 80 GW of load, 64 GW of behind the meter renewable backed by 120 GW of fossil much of it coal. Carbon intensity is higher than US and retail rate is 40 cents
  - Even policies viewed as successes may involve trade offs

- Task Force members will face a critical question of how effective are different instruments in achieving their objectives? How efficient are these instruments?

- Ideally, the Task Force will have to recommend policy that:
  - Is flexible and achieves environmental goals
  - Is cost effective & supports affordability goals
  - Is relevant to those affected by these policies
  - Demonstrates accountability to the public

Best Practices in Environmental Policy

- Flexibility is more effective than rigidity
  - Utilities have different avenues to achieve the same goal (eg: energy efficiency vs Carbon offsets)
  - Terms of the policy can change as circumstances evolve (eg: cost of storage)
- Markets can work as well as regulation
  - Leverage established markets – Renewable Energy Credits and Carbon Offsets
  - Goals based on expenditures rather that firm MWs
- Policy effectiveness can vary depending on its target
  - Consider targeting government or citizens as well as companies – depending on the circumstance

Sustainability Issues

Sustainability Pillar	Issues
Environmental	1. Greenhouse gas emissions 2. Reductions in other emissions 3. Water quality 4. Water availability 5. Waste management & minimization
Social	1. Public safety and health 2. Engagement and Collaboration
Economic	1. Energy reliability 2. Energy affordability 3. Economic viability of utility

Maturity Level of Issues

Maturity Level	GHG Emissions	Other Emissions	Water Quality	Water Availability	Waste Management	Public Health	Engagement	Reliability	Affordability	Utility Viability
5										
4										
3										
2										
1										

Thread Maturity	Strategy	Implentation	Measuring Results	Shared Value

Choosing the Best Suited Policy Instrument

Has the policy been analyzed

- Who do we need to perform the Analysis?
- Have key constituents been communicated to?
- Is the issue at hand, an end, or a means to an end?
- What is the uncertainty around the issue?

How should the policy be analyzed & Designed?

- What are we measuring and how will we measure it?
- How will AE perform Carbon accounting?
- What are the performance measures? $/CO2 reduced?
- Is the policy consistent with other policies and regulations and ERCOT market rules
- What are the effects of this policy on other issues
- Questions about the administrative burden, support from critical stakeholders and use of funds
- Affordability is critical when translating policy design into action

Selection, Implementation, Measurement & Evaluation

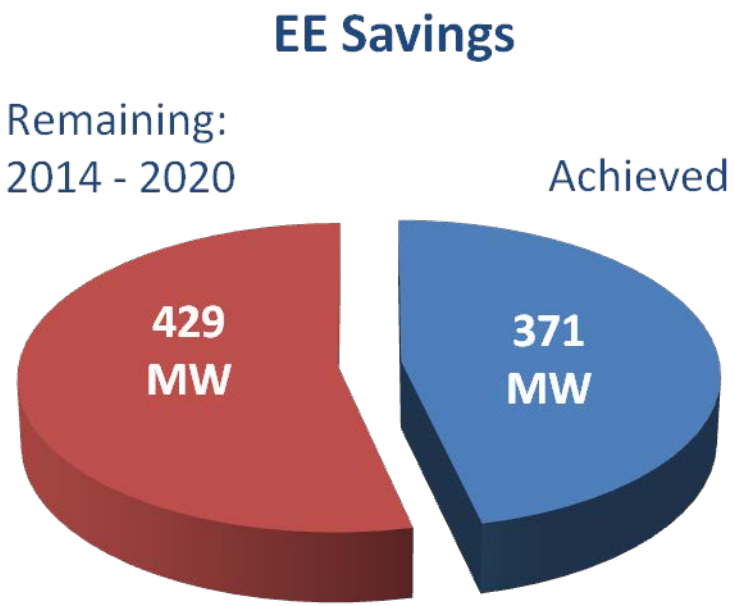
- Have the outputs of the preceding steps been considered in implementation?

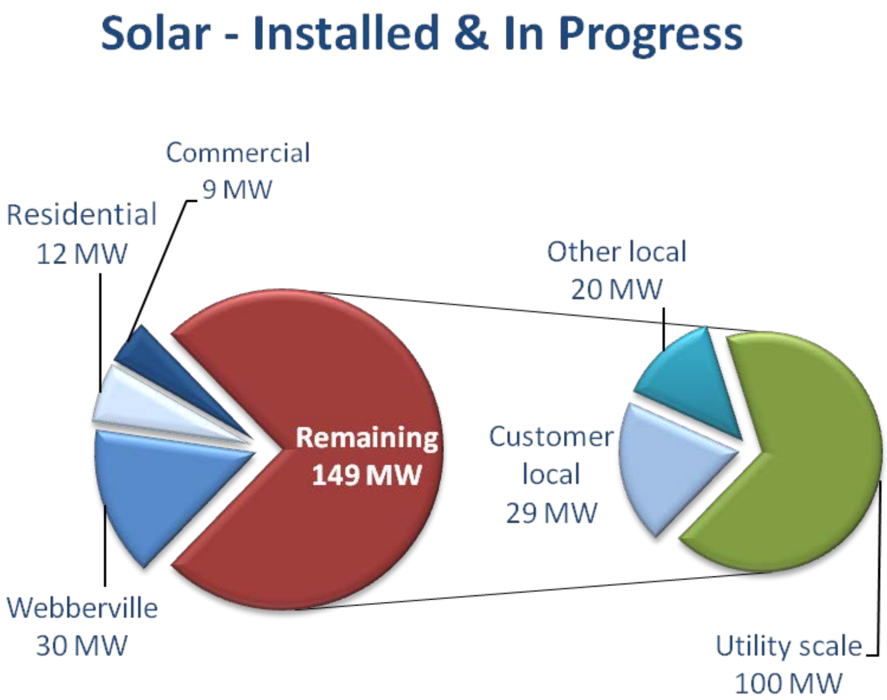
Policy Instrument Examples and Their Trade-Offs

Policy	Examples	Pros & Conditions for Success
Energy Efficiency & Demand Response	Household weatherization programs Peak Shifting	Effective monitoring & verification Tying incentives to effectiveness can contain costs
Renewable Technology	Wind contracts Utility solar contracts Distributed solar	Economics of long term purchase obligations Total effect on market Operational issues Rate equity design Cycling Costs
Storage	Battery Storage Compressed Air Storage	Total cost Technological maturity
Emission Trading	Renewable Energy Credits Carbon Credits	Verification and validation Cost effectiveness Look and feel to community
Voluntary Agreements	Environmental dispatch	Cost to PSA Market Rules
Marketing & Advertising Campaigns	Green Choice Electric Vehicles	Bundling with financial incentives

Progress on Goals and Other Achievements

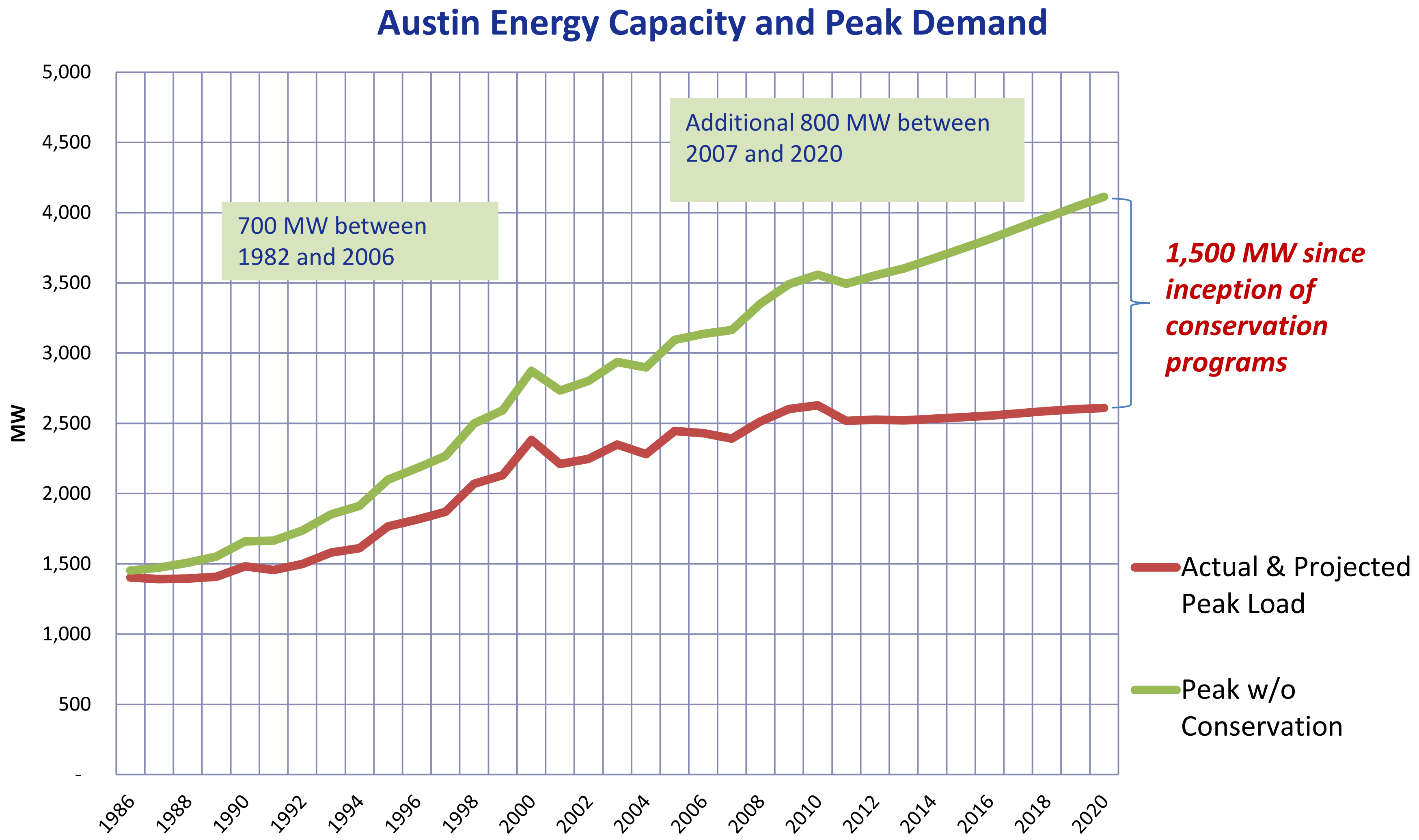
Energy Efficiency (EE) & Solar Goal Status 2007- 2013





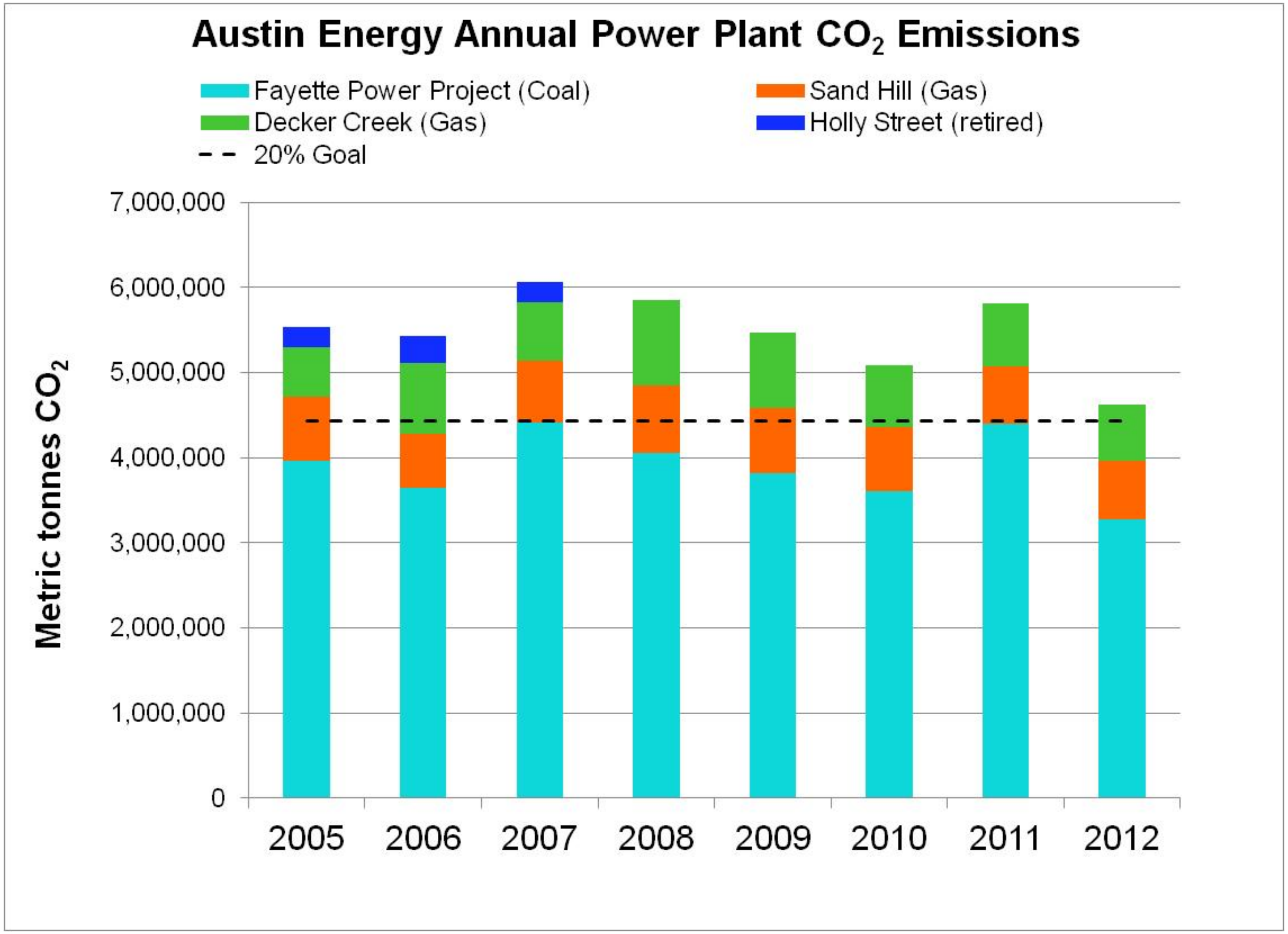
Does not reflect recent 150 MW RFP

Austin Energy: Past, Present and Future



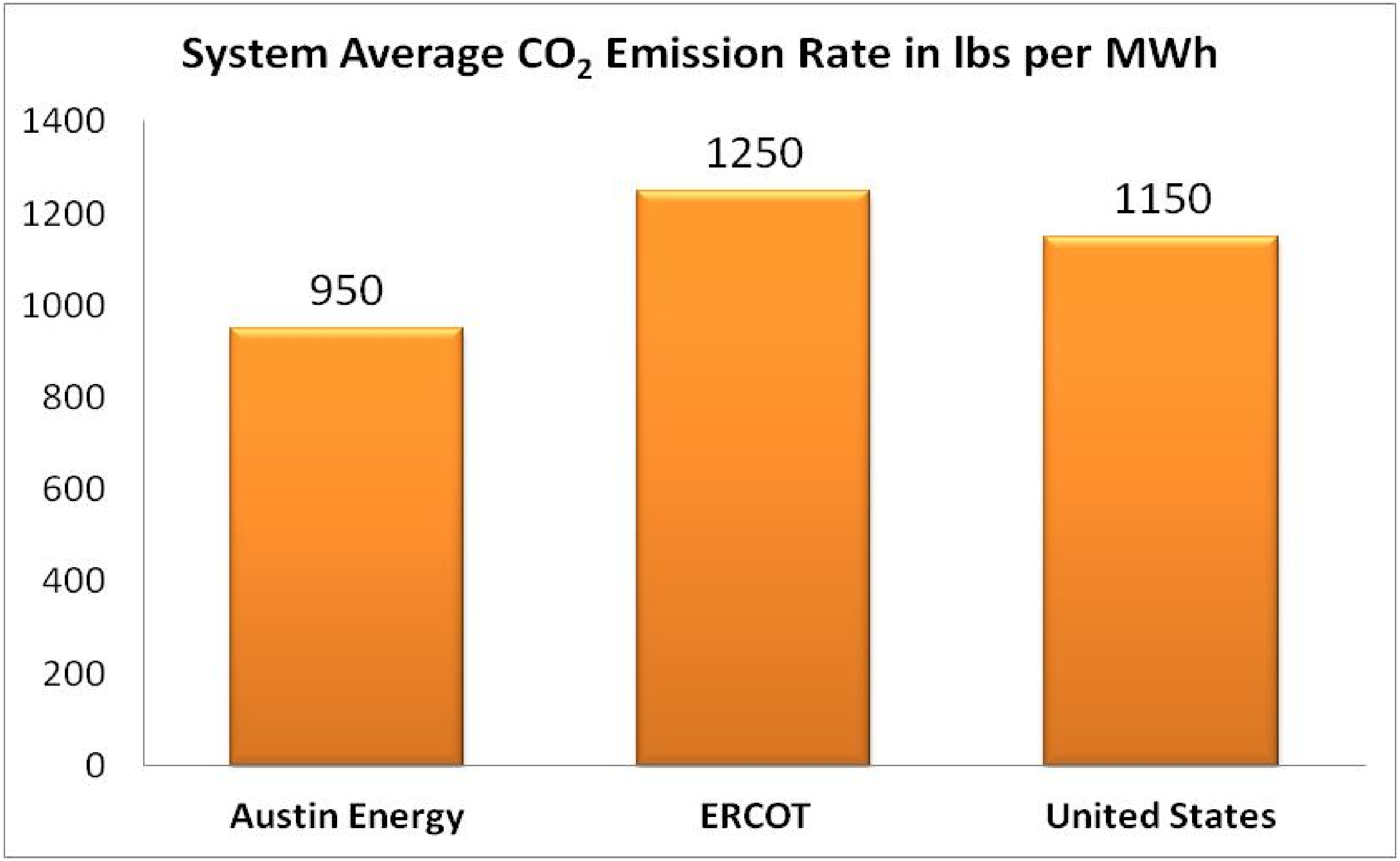
Key Performance Indicators: Total CO_2 Emissions

Austin Energy today has almost the same total generating capacity (MW) that emits CO_2 as in 1990, despite Austin's growth – compared to Texas up 42%.



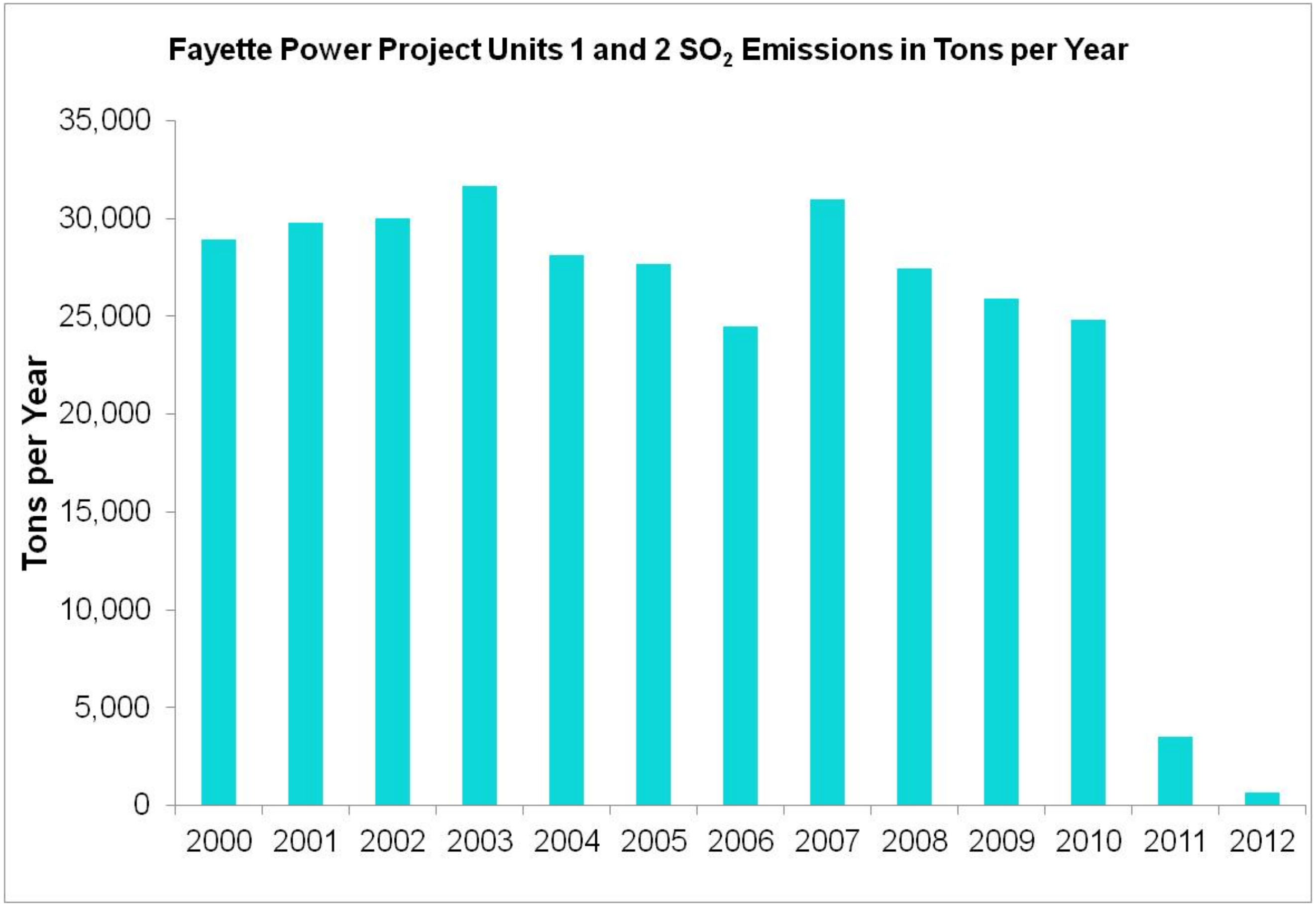
Key Performance Indicators: Average CO_2 per MWh Generation

Austin Energy's system average CO_2 emissions rate has decreased 14% since 2005 due to renewable additions. It will continue to decrease as new wind resources come online.



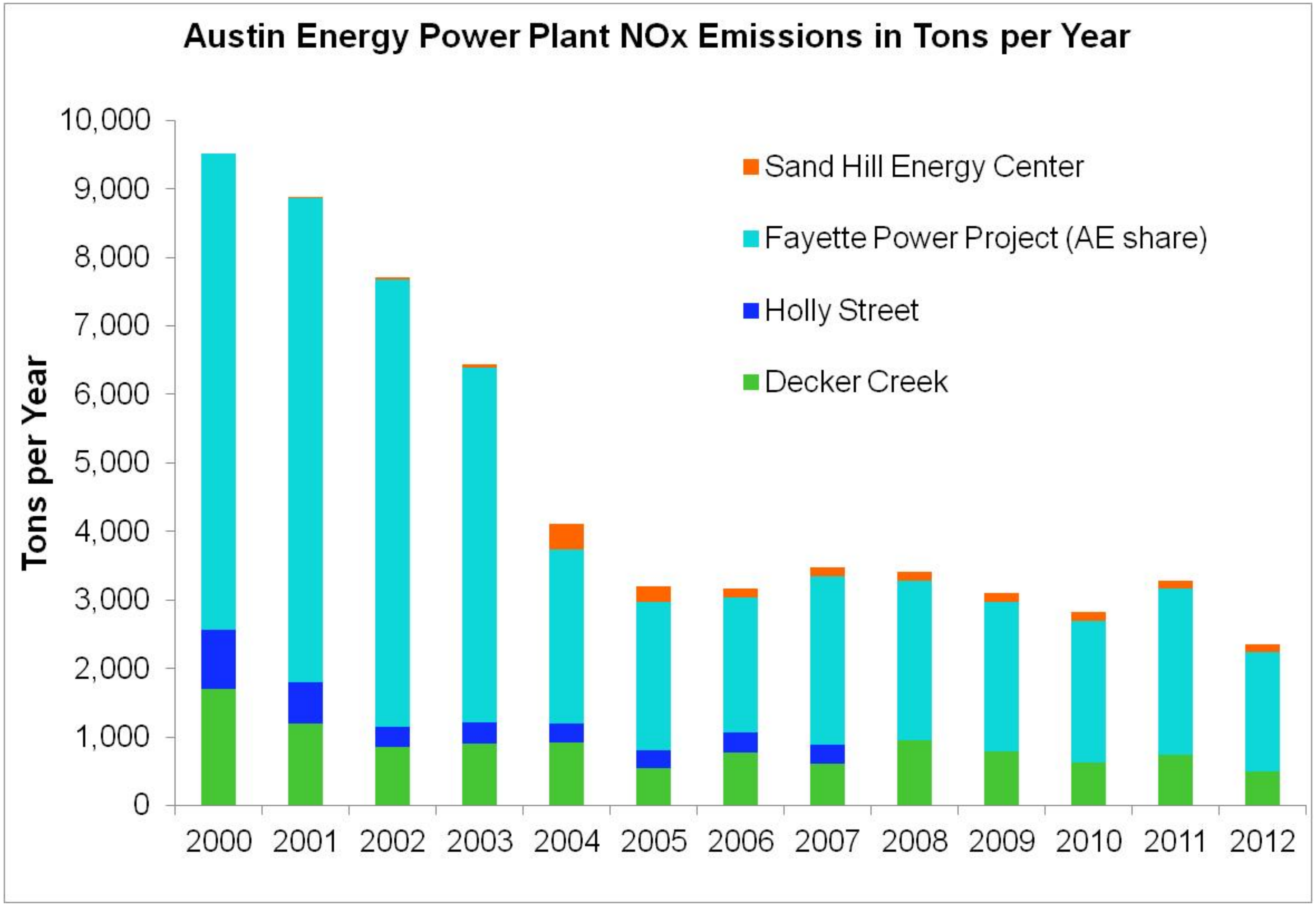
Key Performance Indicators: SO_2 Emissions

Austin Energy SO_2 emissions, almost exclusively from the Fayette Power Project, decreased more than 95% beginning in 2011 when the scrubbers went online. SO_2 also can contribute to acid rain and particulate matter pollution.



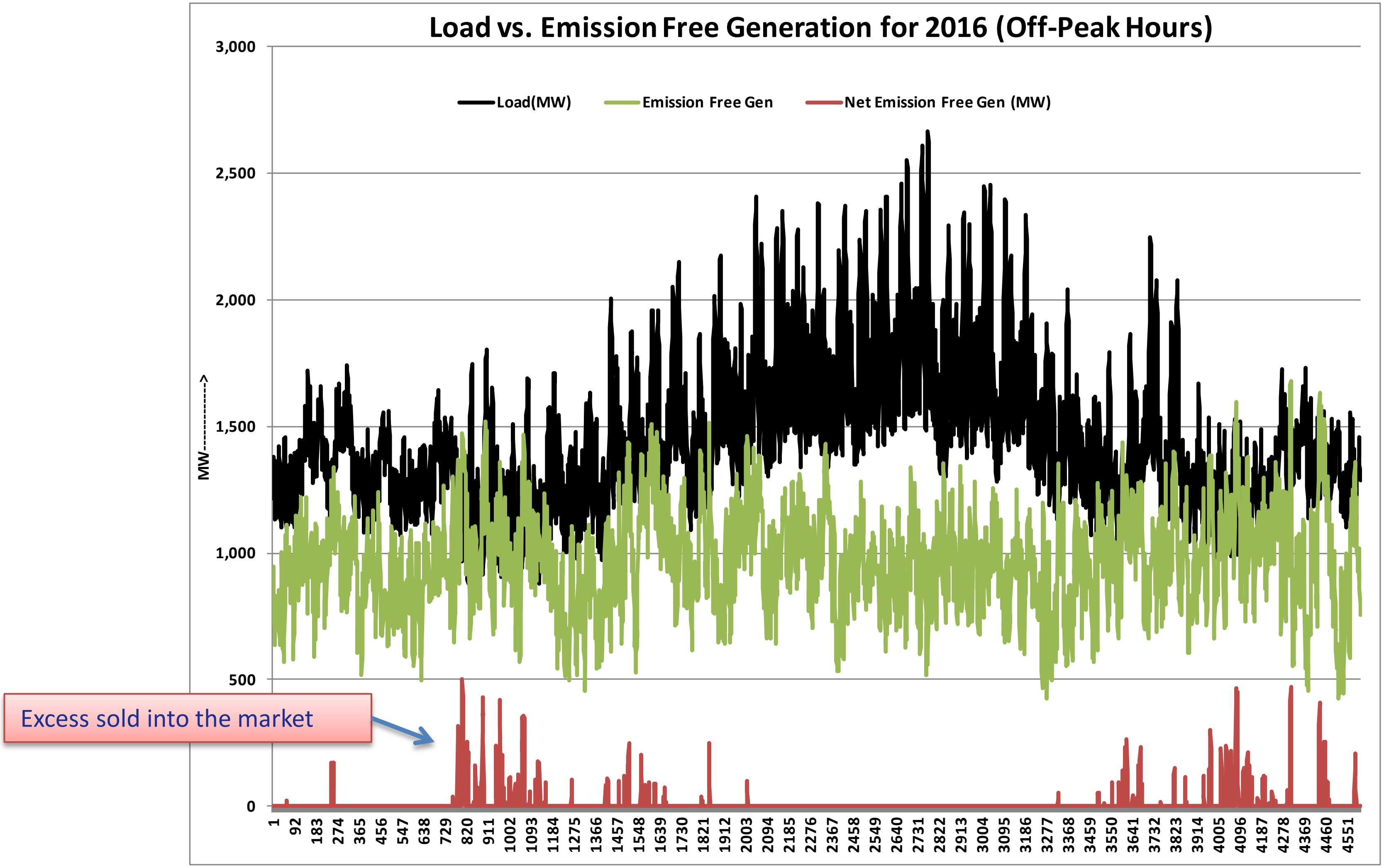
Key Performance Indicators: NOx Emissions

Austin Energy's power plant NOx emissions decreased 75% between 2000 and 2012, lowering contribution to ozone-forming pollution.

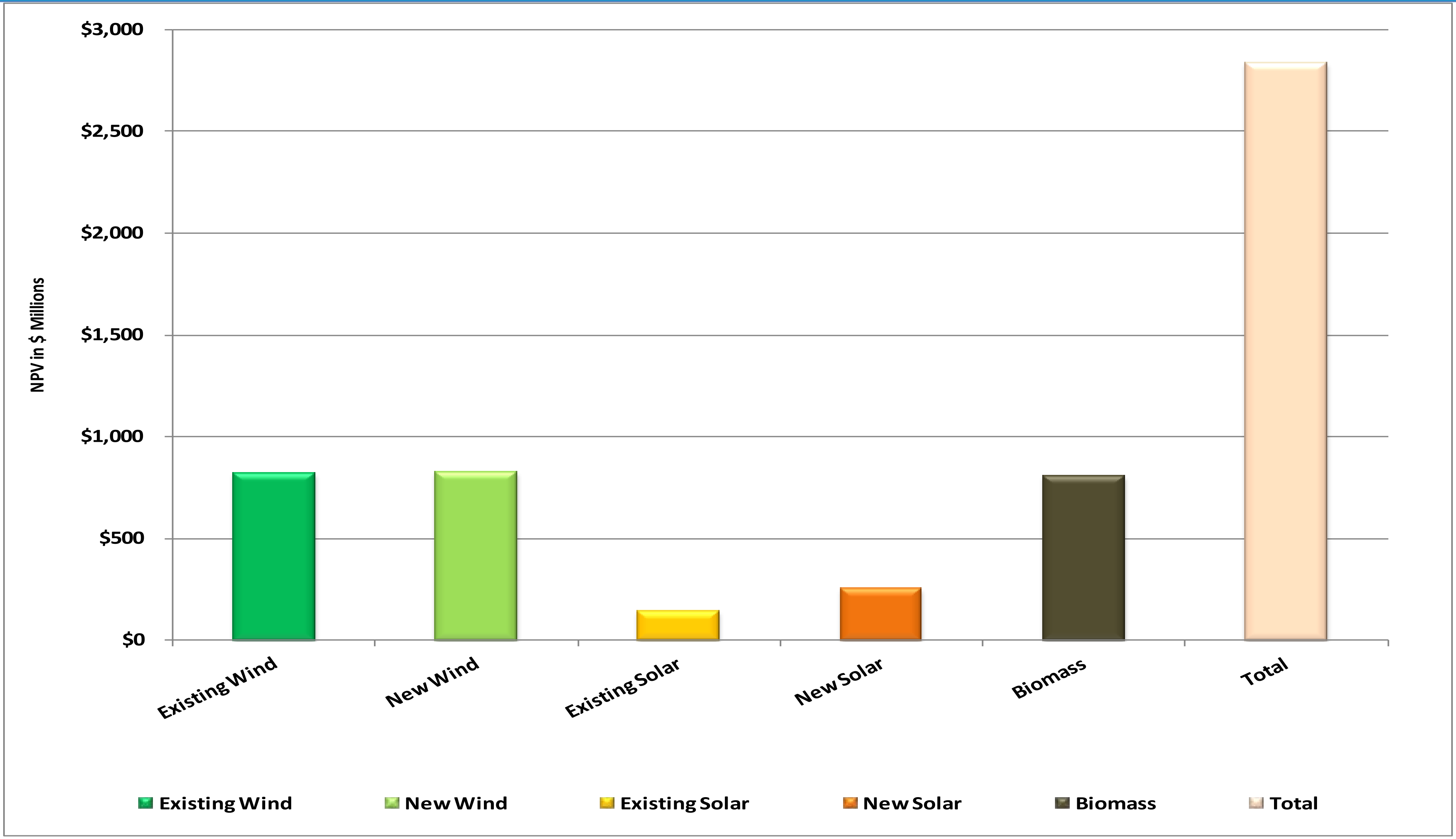


Emerging Issues of Achieving Existing Goals

A Net Seller of Wind in the Off-Peak Hours



Growing PPA Obligations

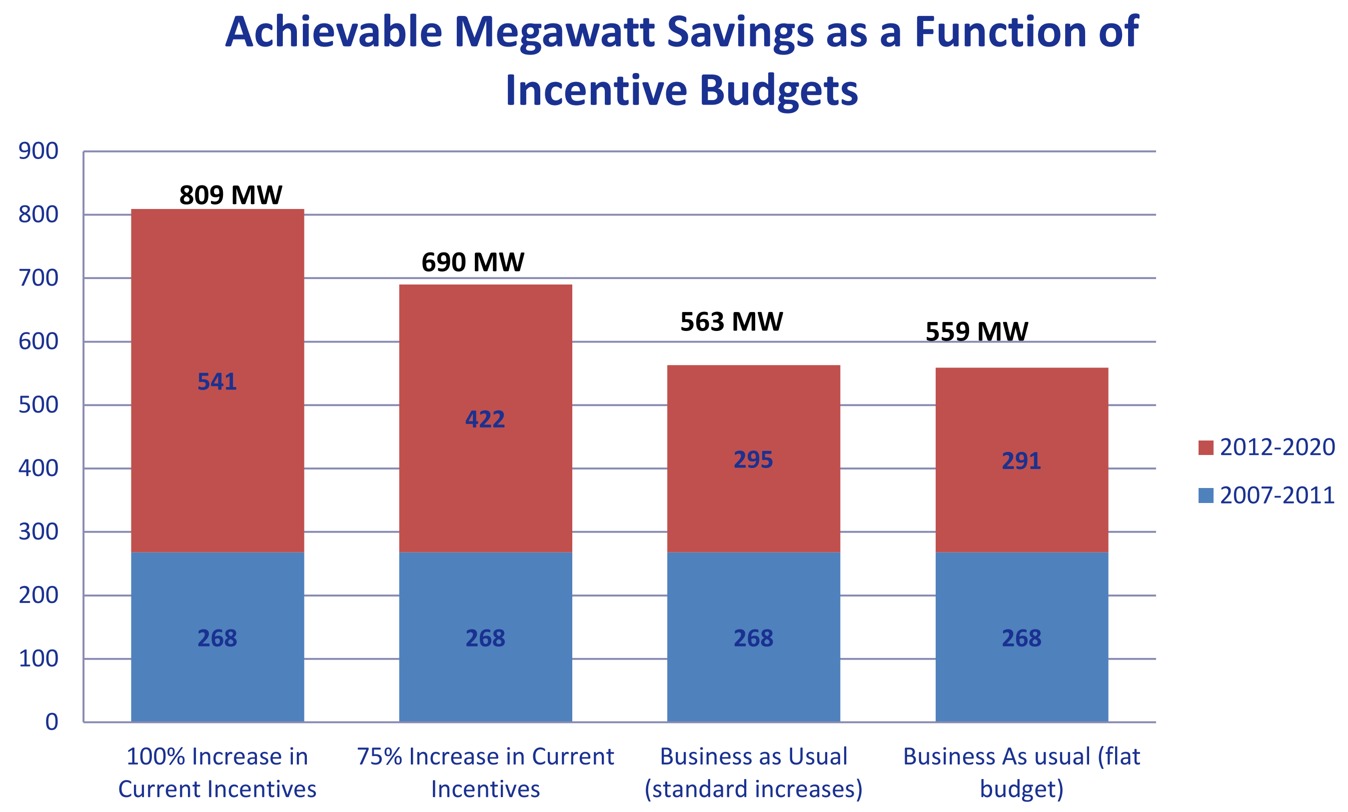


- NPV @ 5% discount rate
- Covers the life of the contracts
- New Wind and New Solar include the projects that AE recently signed or yet to sign.

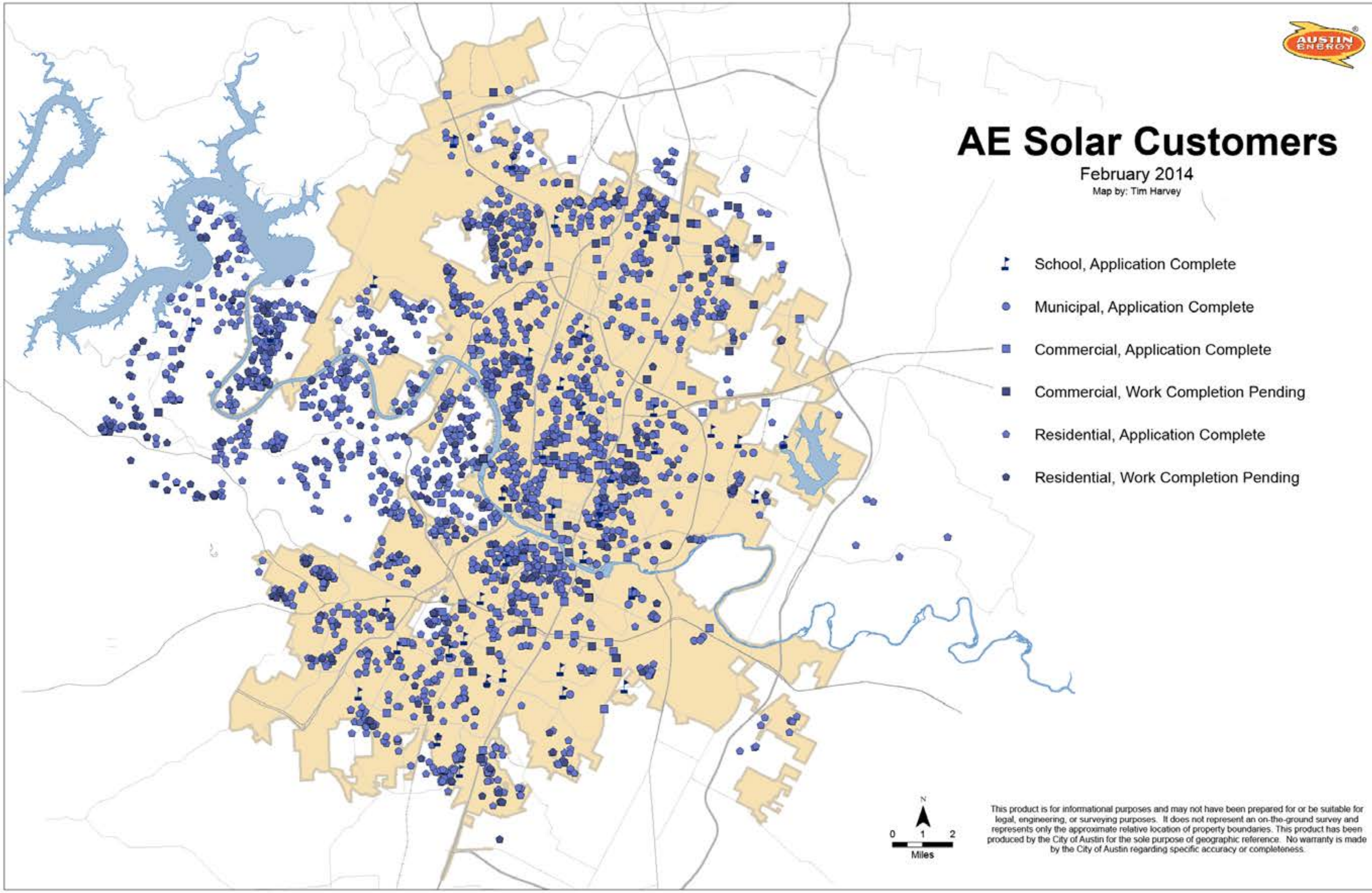
Incremental DSM Costs

- Energy savings is a function of incentive budgets, with greater savings requiring higher levels of incentives

(Source: KEMA Market Potential Assessment, 2012)



Distributed Solar Penetration



Appendix

Has the policy been analyzed?

- Can we point to an analysis that has been done to provide a basis for policy function?
  - Are the right people available to perform the analysis
  - Have key constituents been communicated to?
  - What kind of governance mechanisms are required to facilitate the analysis

Key Success Factors:

1. Is the issue at hand an end or a means to an end?
   - Example: low carbon technology can be a tool for Green House Gas (GHG) mitigation
2. What is the degree of uncertainty around the issue?
   - How accurate are our forecasts?
   - What the is the future behavior of market actors? Federal GHG policy, EPA regulations, technology advancement

The Diagnosis should:

- Understand timelines of upcoming policy developments
- Guide where we should invest in relationships of upcoming policy discussions
- Understand the research around upcoming technology developments
- Identify critical questions of concerns on behalf of all our stakeholders
- Consider the uncertainty in the forecast
- Identify potential independent research to close the gap

How should the policy be analyzed & Designed

- Performance measures are critical for assessing the effectiveness of a policy
- Should policy actions be measured on whether they are effective at addressing the problem at hand or their effects on competitiveness and affordability? How will AE perform Carbon accounting? What are the performance measures? $/CO2 reduced?
  - Non-tangible value of actions taken by AE

Key Success Factors:

1. Tailor the goal setting process to the circumstances at hand
2. Take a long term vision
   - Current environmental challenges demands continued and sustained attention by all parties. Ensure the measures are appropriate given the time horizon of the problem at hand

In constructing measures we should:

- Identify unintended consequences of the proposed measures
- Work with stakeholders to provide constructive feedback on proposed measures

How should the policy be analyzed & Designed (cont.)

- Coherence among different policies and programs is a key considerations. Is the policy decision at hand in-line with Federal, State and local decision making?
- Are there other programs or policies in place that interact with the issue under consideration?
- Are goals consistent with ERCOT market rules?

Success Factors:

1. Fit policy within its context. Ex: Policy seeking to support technology development will be designed differently depending on the maturity of the market for which it will be used
2. Understand the target audience. One size does not fit all. The choice of specific instruments depends on the nature of the issue and the parties involved.

The design should:

- Identify possible impacts, conflicts or redundancies
- Identify potential trade-offs or alternative solutions that will maximize policy impact and minimize costs
- Highlight the incremental costs of compliance and reporting under different options so policy-makers understand the trade-offs