The Austin Climate Protection Plan 2014 – intent and implications

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Co-Founder Climate Buddies, Austin resident

WHEREAS, the 2007 ACPP and the current AE Resource, Generation, and Climate Protection Plan to 2020 are now reaching a point where an update is needed to ensure the City of Austin and Austin Energy continue as leaders in climate protection efforts; **NOW, THEREFORE,**

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF AUSTIN:

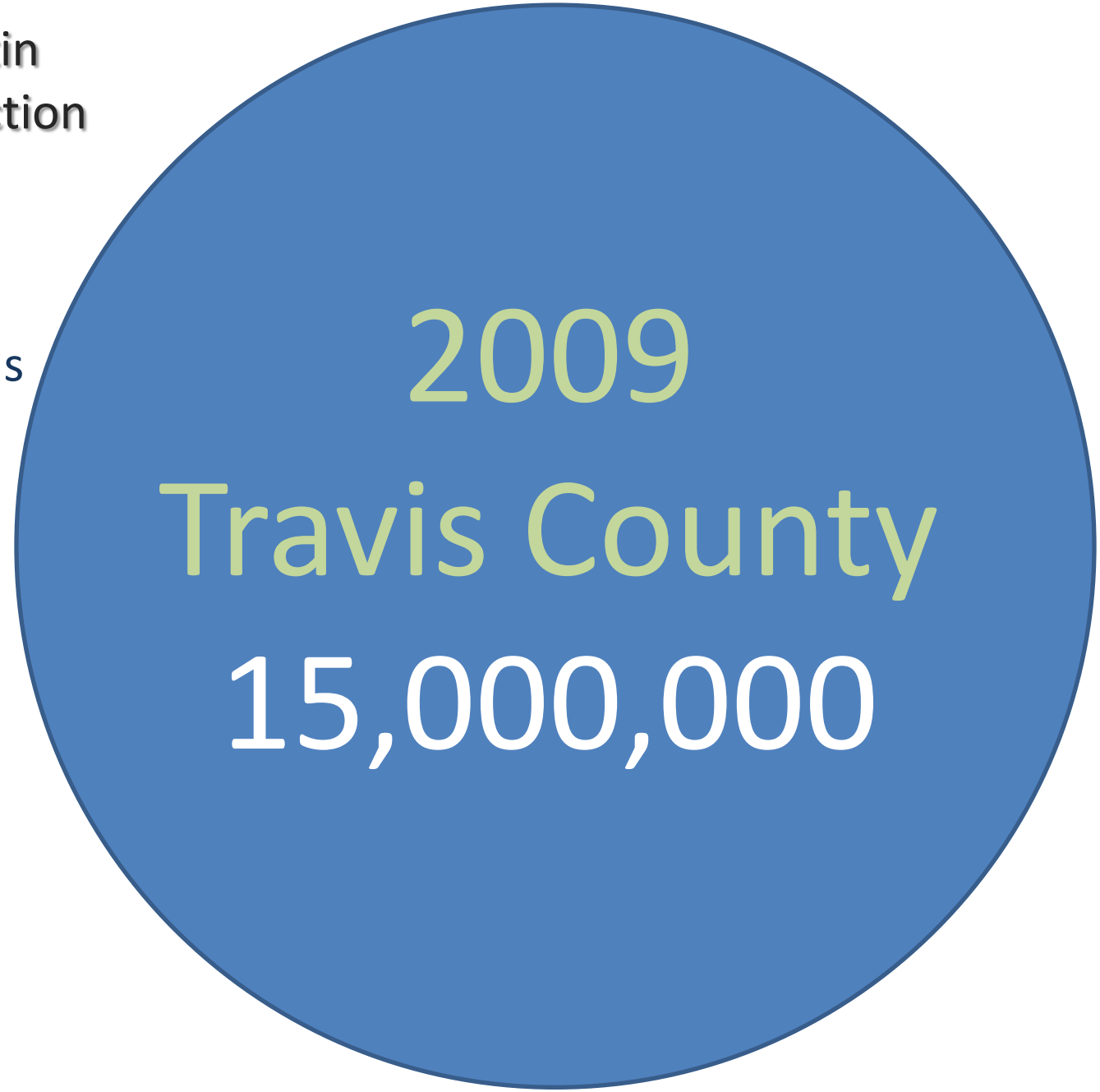
The City Council establishes a goal of reaching net zero community-wide greenhouse gas emissions by 2050 and prefers to achieve this goal as soon as it is feasible. The City Council also recognizes that emissions reductions accomplished sooner are more important and valuable for our city's climate protection efforts.

About this presentation

- This presentation is about intent, interpretation, potential implications
- None of the data presented is vetted by Austin Energy
- It is a framing document
- It includes recommendations tocreate clarity about the relation of the ACCP2014 and the Taskforce recommendations

Proposed Austin Climate Protection Plan 2014

Direct greenhouse gas emissions
Expressed in metric tons CO_2eq



You

10

Proposed Austin Climate Protection Plan 2014

Direct greenhouse gas emissions Expressed in metric tons CO_2eq

Me + wife

-300

Improving the Climate

Generation

Home Solar PV

7 Community solar projects

2 Utility scale wind projects

5 Community wind projects

Solar for 500 African families and farmers

Use

NET Positive home – 8 solar panels, < 2,000 kWh

Electric car – 12 solar panels , 12,000 miles

Sequestration

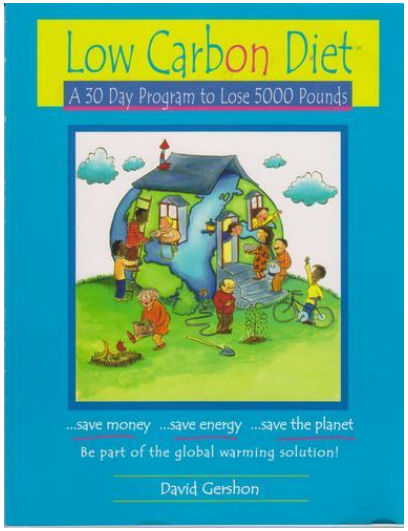
2000 Trees planted in Mala Atlanta

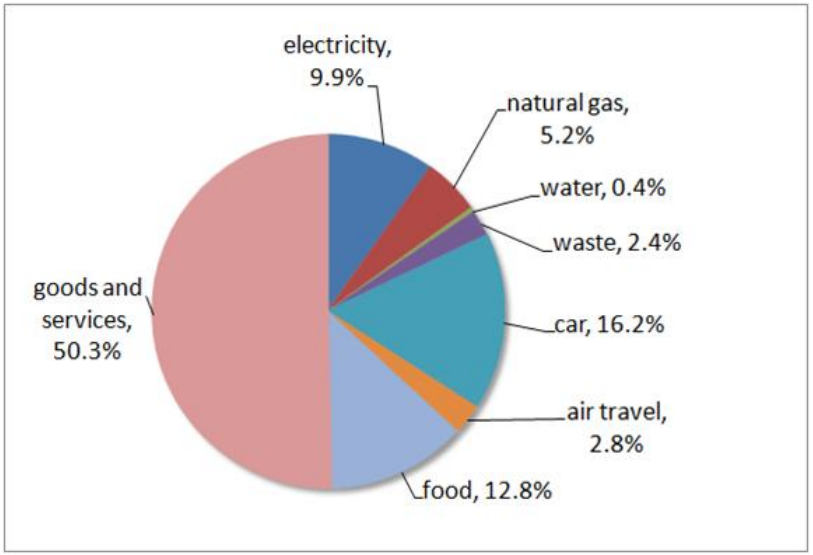
1000 Trees planting in Amazonas

10 hectares Forest preservation in Costa Rica

Carbon Diet Program

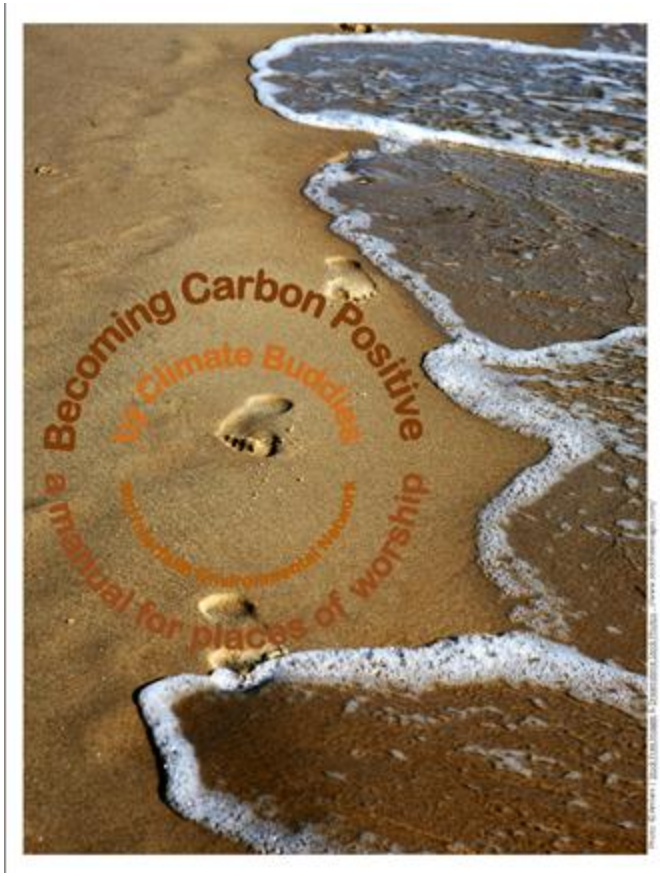
Lose 5,000 lbs of your carbon footprint in 6 weeks!





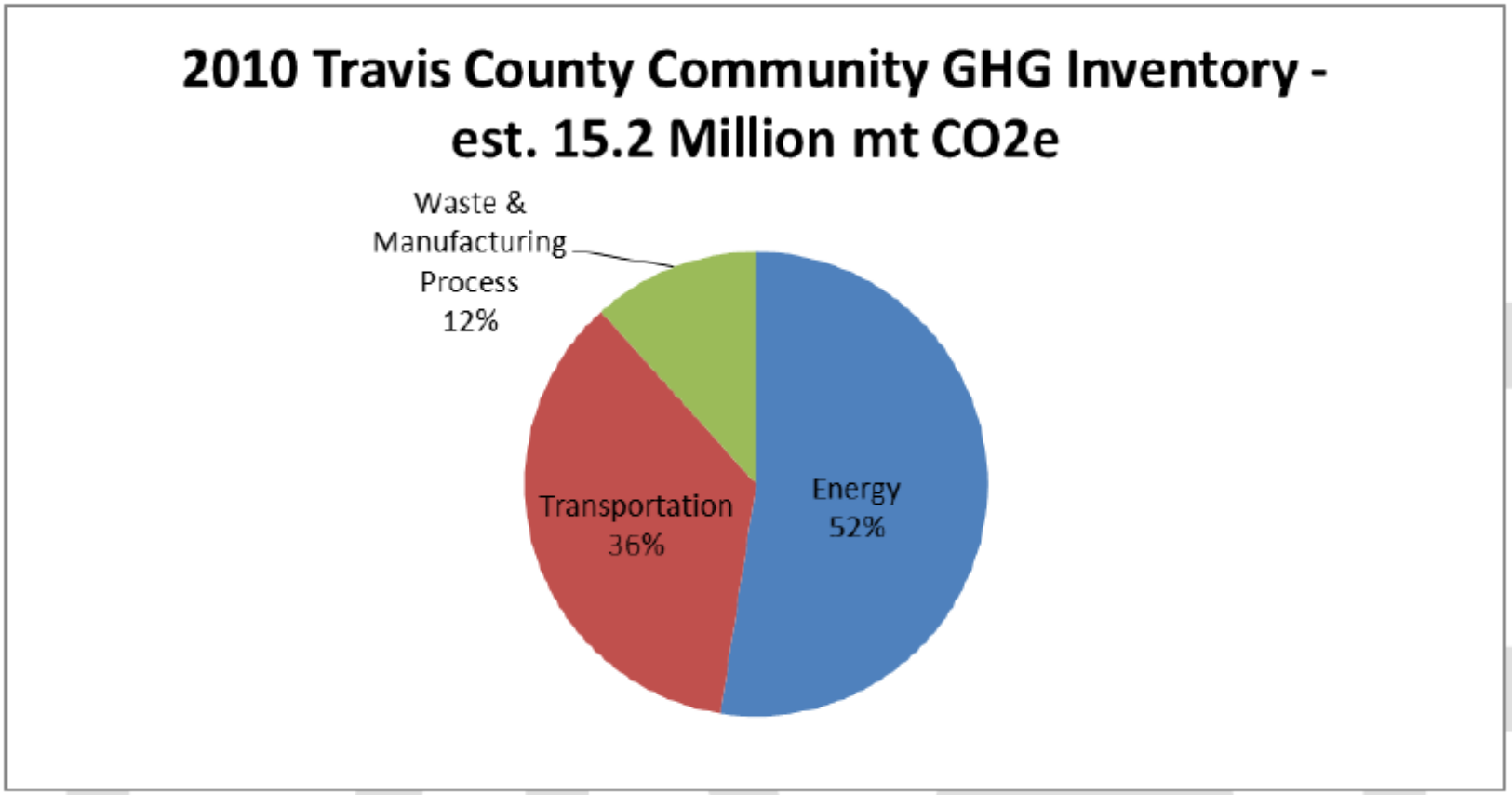
Participants speak up! Susan Adams - *When my family started the carbon diet program, we felt like we were doing pretty well and had little to learn about improving our carbon footprint. Were we wrong! We lost more than 20,000 pounds on the carbon diet and see the world through different eyes. The program outlined all kinds of simple ways to reduce our carbon footprint, while reducing our bills at the same time. The meetings were a great way to hear what actions other people were taking and to get their ideas and support.*

Interfaith Energy Action Team
Becoming Carbon Positive – a manual for houses of worship

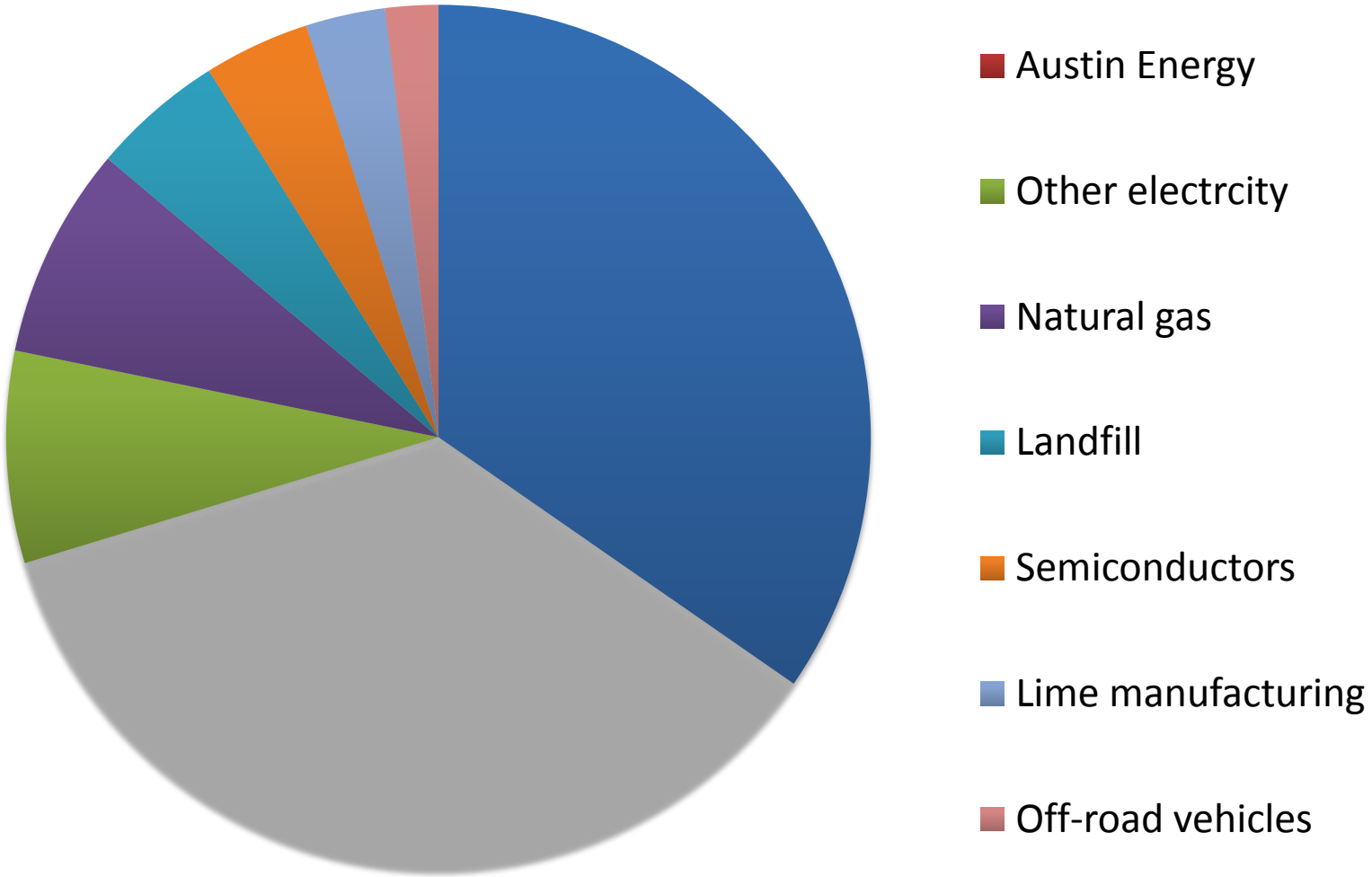


Faith-based members speak up during the first annual climate change preach off in 2014. Becoming Carbon Positive represents the values and actions of Austin's faith community in tackling the challenges of climate change. Clergy and church communities have joined across central Texas, forming the Interfaith Environmental Network to spur awareness and action in reducing their congregational carbon footprint in forming Green Shepherds programs. You can find out more at www.interfaithenvironment.org.

2009 GHG impact

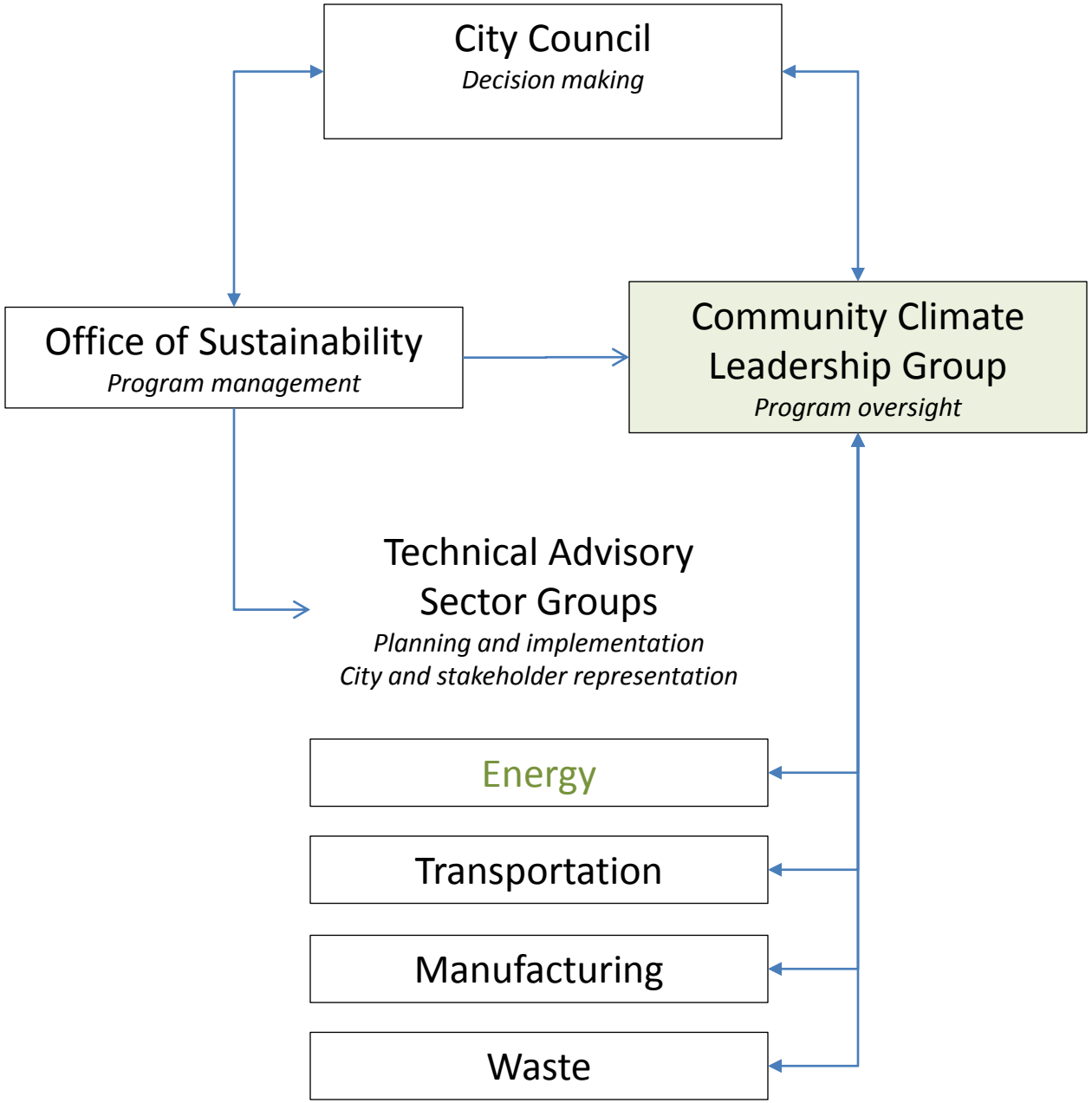


Travis County 2009 greenhouse gas emissions per sector



Stakeholders

- Energy (52%)
  - Austin Energy (36%)
  - Third party owned CHP (8%)
  - Natural gas (8%)
- Transportation (36%)
  - Cars and trucks (98%)
  - Off-road vehicles (2%)
- Waste and manufacturing (12%)
  - Landfill (5%)
  - Semiconductor (4%)
  - Lime manufacturing (3%)


City Council
Decision making
Office of Sustainability
Program management
Community Climate Leadership Group
Program oversight
Technical Advisory Sector Groups
Planning and implementation
City and stakeholder representation
Energy
Transportation
Manufacturing
Waste

Community Climate Leadership Group

Program oversight

Draft Role and Responsibilities

Decision making

- Community Liaison and communication vehicle between technical advisory groups and the community
- Collect public input through web / in person interaction
- Overall leadership for how the sector plans fit together
- Setting interim targets
- Determining a schedule for progress reports and updates
- Reviewing work and progress of technical advisory groups

Timeline

- Adoption by city council – April 10th 2014
- Installation of Stakeholder groups
- Progress report to council, September 2014
- Plan approval by city council, March 2015

Proposed Austin Climate Protection Plan 2014

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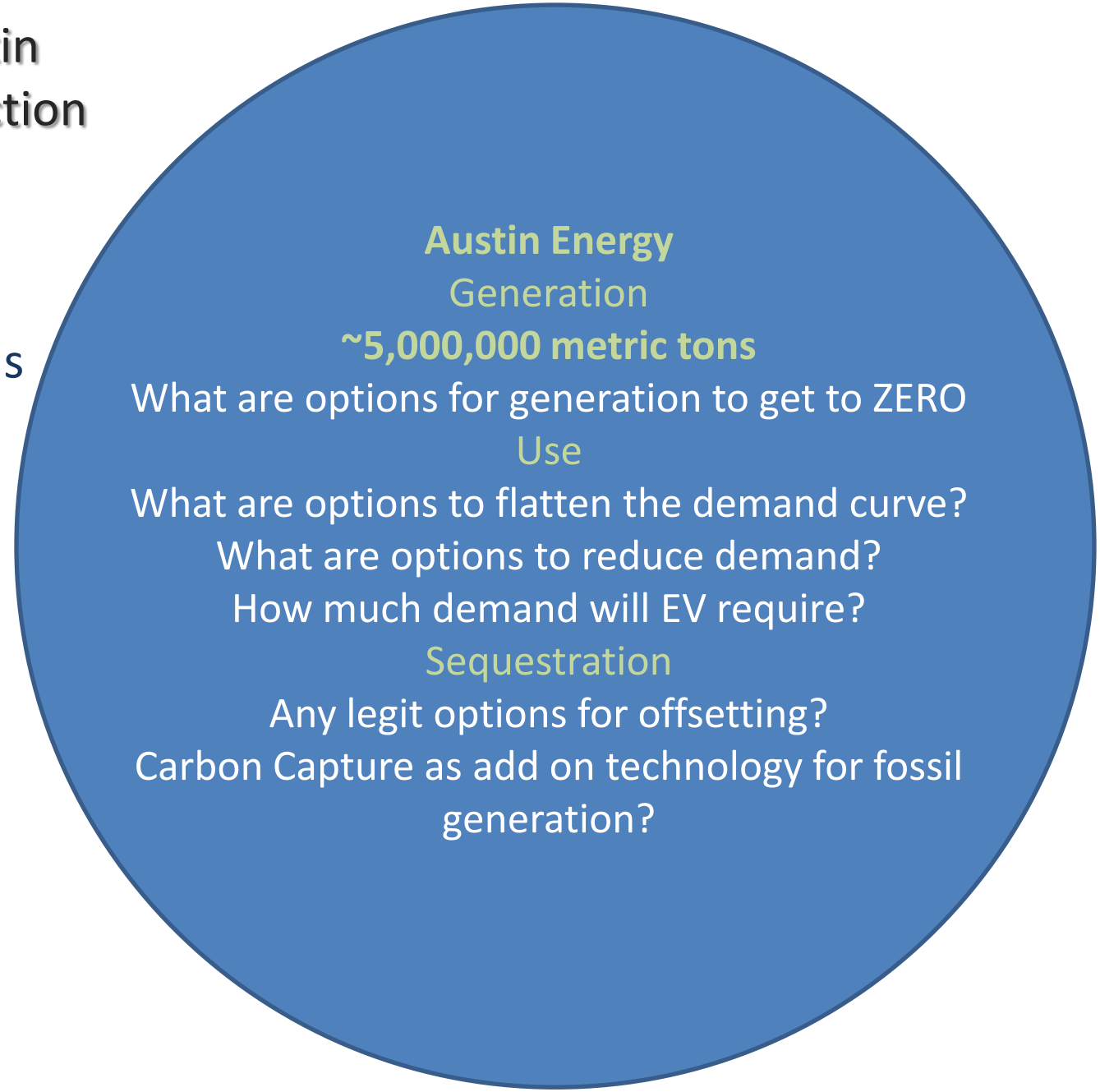
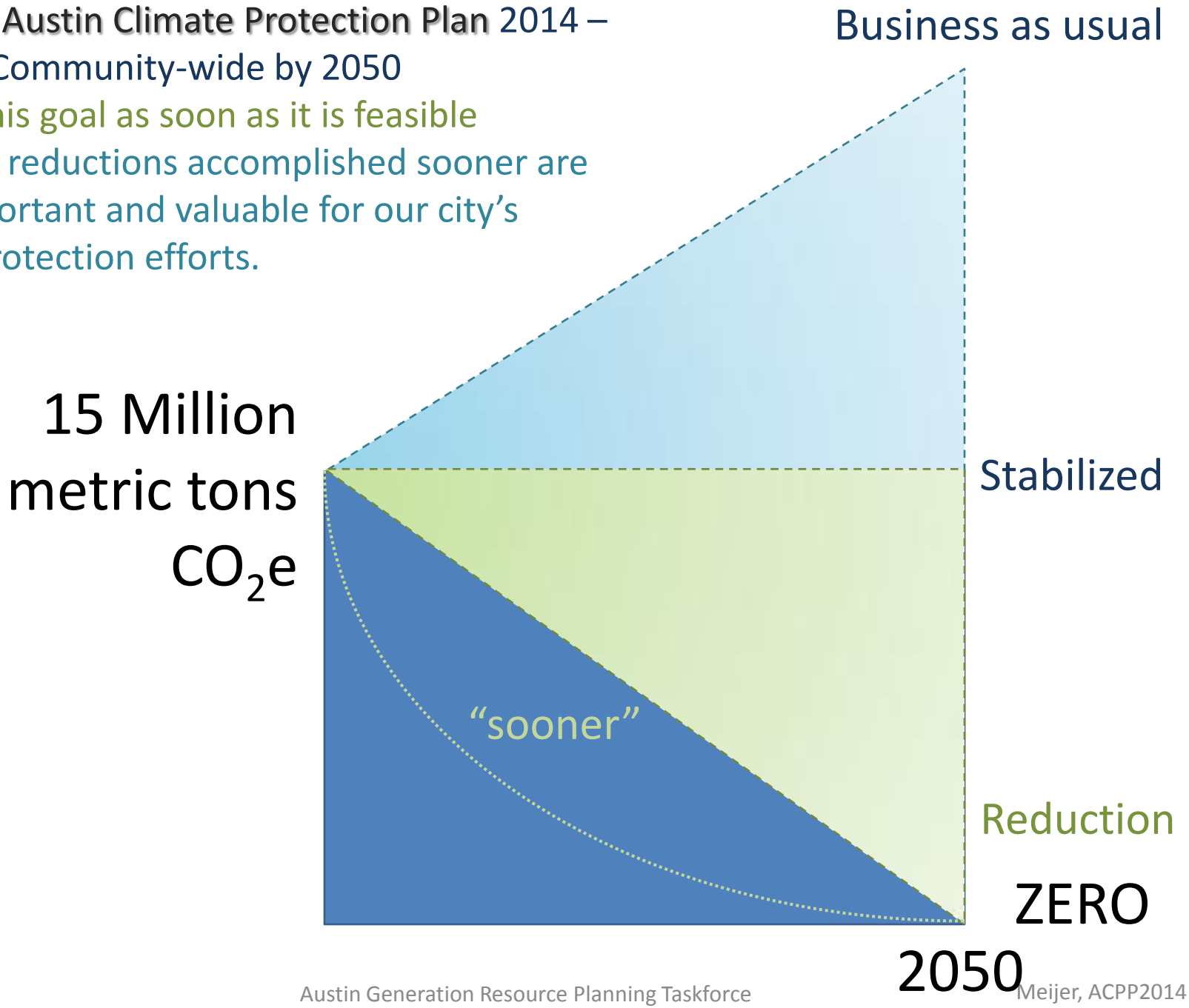


Proposed Austin Climate Protection Plan 2014 –
Net Zero Community-wide by 2050
achieve this goal as soon as it is feasible
emissions reductions accomplished sooner are more important and valuable for our city's climate protection efforts.



Steady glide path to NET ZERO

Year	CO2e performance index	Δ (%)	AE Carbon intensity (CO2e/kWh) following glide path	Existing reduction goal (%)	
2005	100		1.17		
2010	88.9	11.1	1.04		
2015	77.8	22.2	0.91		
2020	66.7	33.3	0.78	20	ACPP2007
2025	55.6	44.4	0.65		
2030	44.4	55.6	0.52		
2035	33.3	66.7	0.39		
2040	22.2	77.8	0.26		
2045	11.1	88.9	0.13		
2050	0.0	100.0	0.00	100	ACPP2014

ACPP2007 fall short of meeting ACPP2014 goals

Should we do more with Energy?

- Think about what 2050 would look like
  - All people: 1,000,000 now; 2.8% growth (today) would add 265% more people
  - 400,000+ existing buildings retrofitted
  - All new homes / neighborhoods only use renewable electricity and make most or all themselves
  - All transportation electric: 1,000,000 cars (2013)
  - All manufacturing is carbon neutral
  - No more emission from waste treatment
  - Optimized Energy Productivity

Which sector is more difficult to implement?

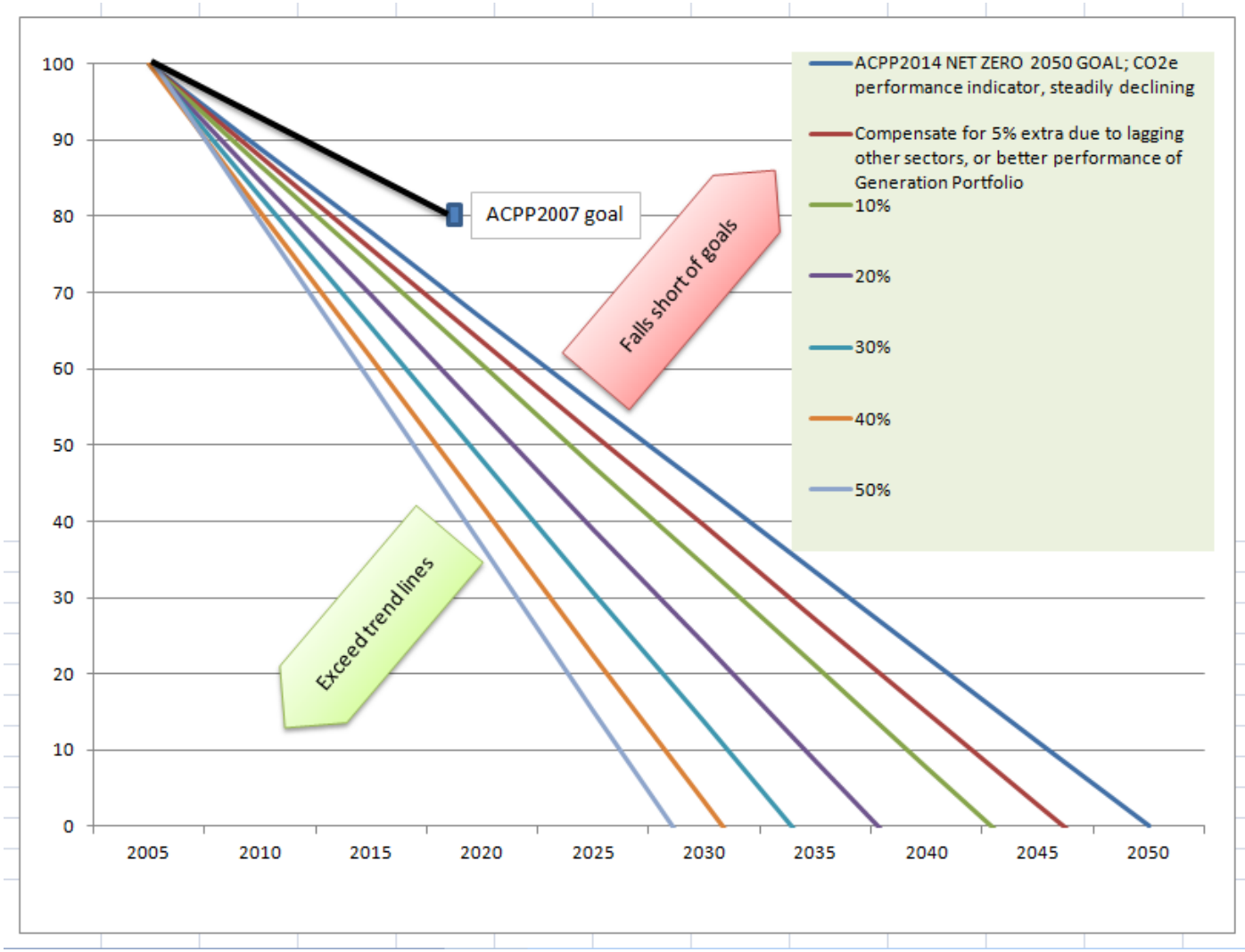
- Energy
- Transportation
- Manufacturing
- Waste

Which sector is easier to implement?

- Energy
  - Austin Energy:
    - One owner
    - Full decision making power
    - Control both expenses and income
    - Relevance: 35% of all GHG emissions

This is a unique opportunity compared to the other 3 sectors

Others slower, Austin Energy faster



Goals in case other sectors go slower

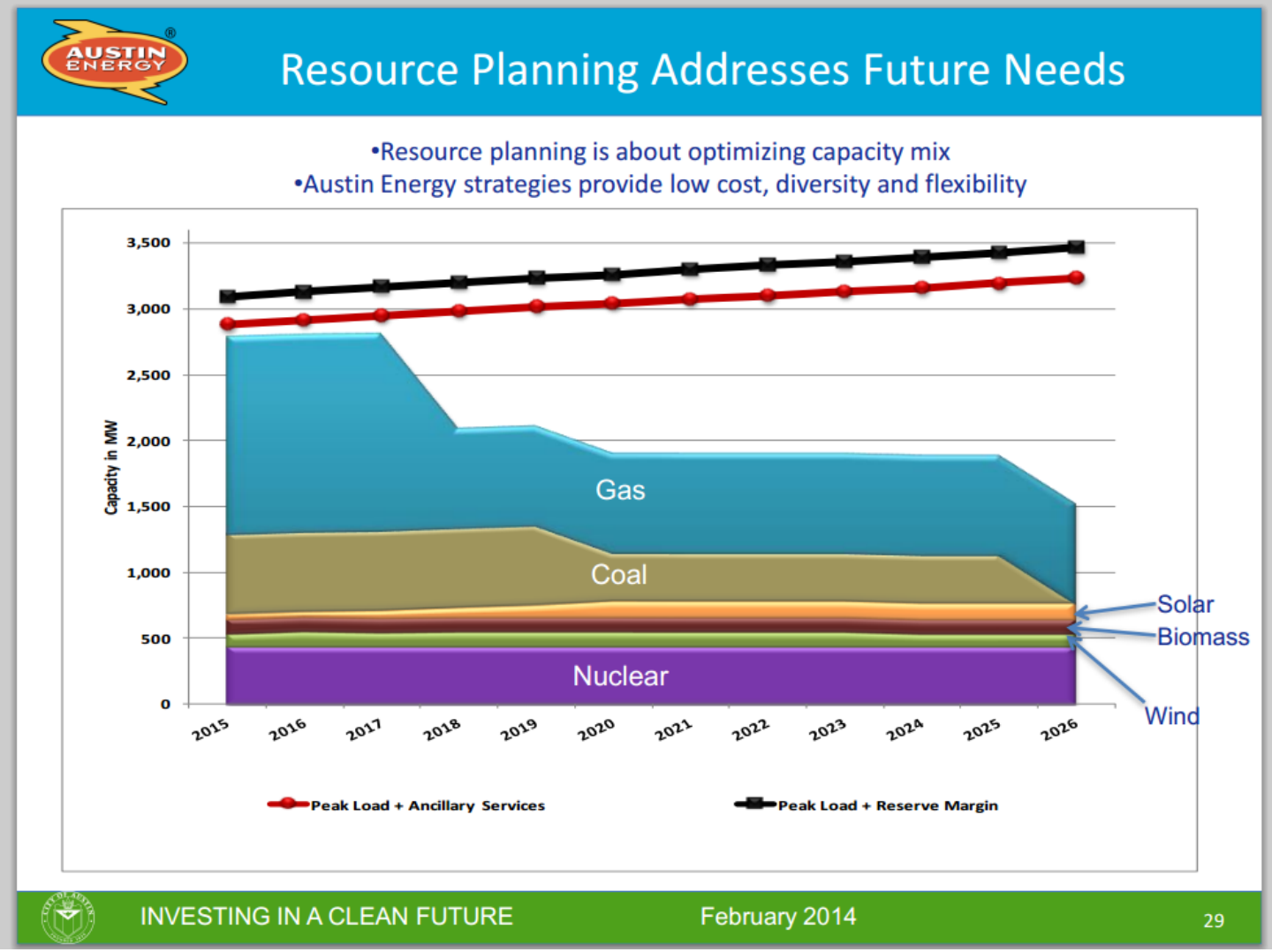
CO2e performance index, steadily declining		Compensate for lagging other sectors, or Better performance of AE Generation Portfolio					
Year		5%	10%	20%	30%	40%	50%
2005	100	100	100	100	100	100	101
2010	88.9	87.9	86.8	84.8	82.7	80.6	79.6
2015	77.8	75.7	73.7	69.5	65.4	61.3	58.1
2020	66.7	63.6	60.5	54.3	48.1	41.9	36.7
2025	55.6	51.4	47.3	39.0	30.8	22.5	15.3
2030	44.4	39.3	34.1	23.8	13.5	3.2	-6.1
2035	33.3	27.1	21.0	8.6	-3.8	-16.2	-27.6
2040	22.2	15.0	7.8	-6.7	-21.1	-35.6	-49.0
2045	11.1	2.9	-5.4	-21.9	-38.4	-54.9	-70.4
2050	0.0	-9.3	-18.6	-37.1	-55.7	-74.3	-91.9

Disclaimer: estimates! not AE data!

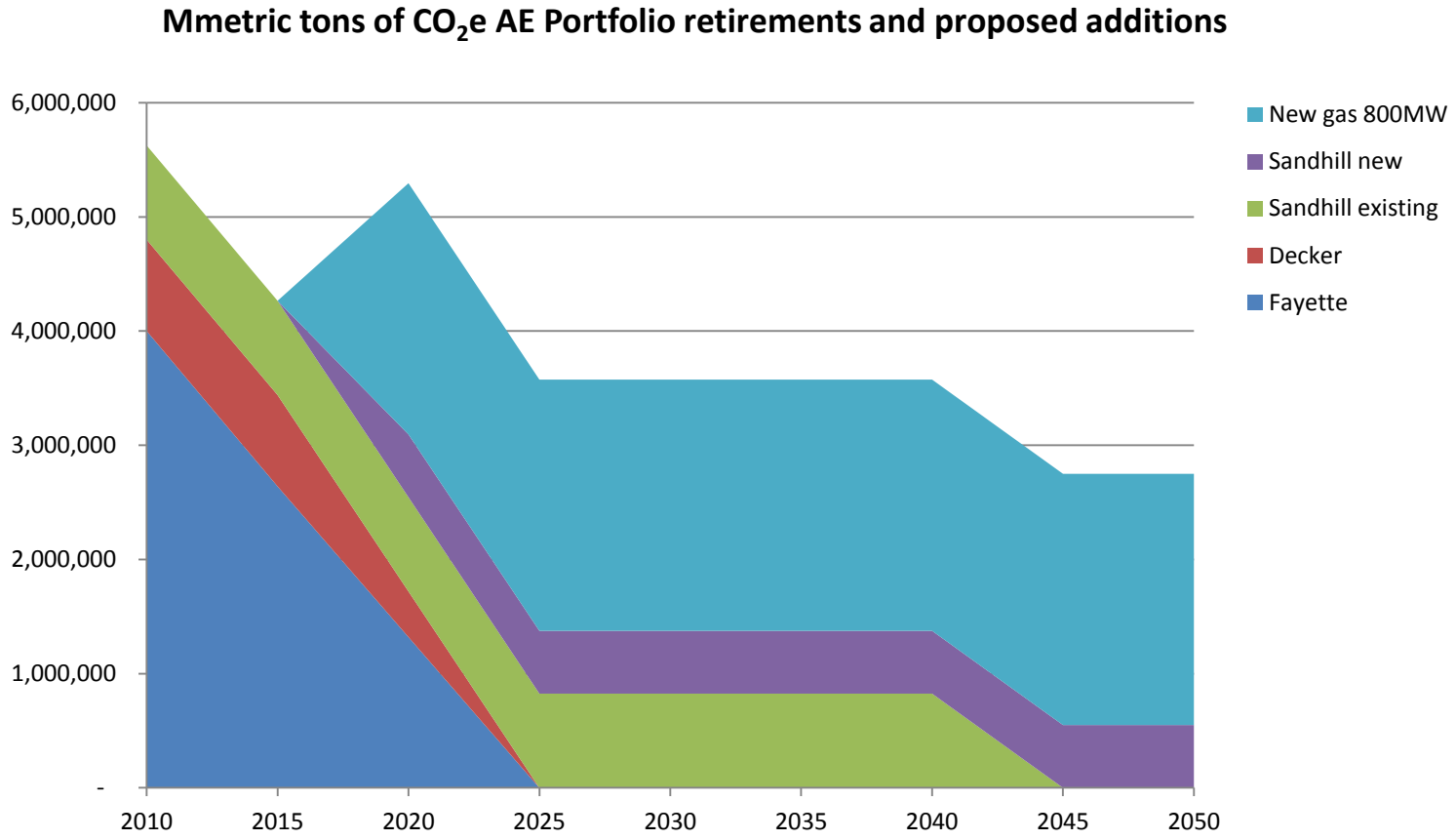
Goals

- Use for target setting: where @ what year
- Choose ambition
  - For your horizon, 2025, index range 55-15, or reduction of 45-85% GHG emissions
  - Example : NET ZERO, 2035 25-30% faster than steady

Create GHG Map existing portfolio commitments



First draft attempt



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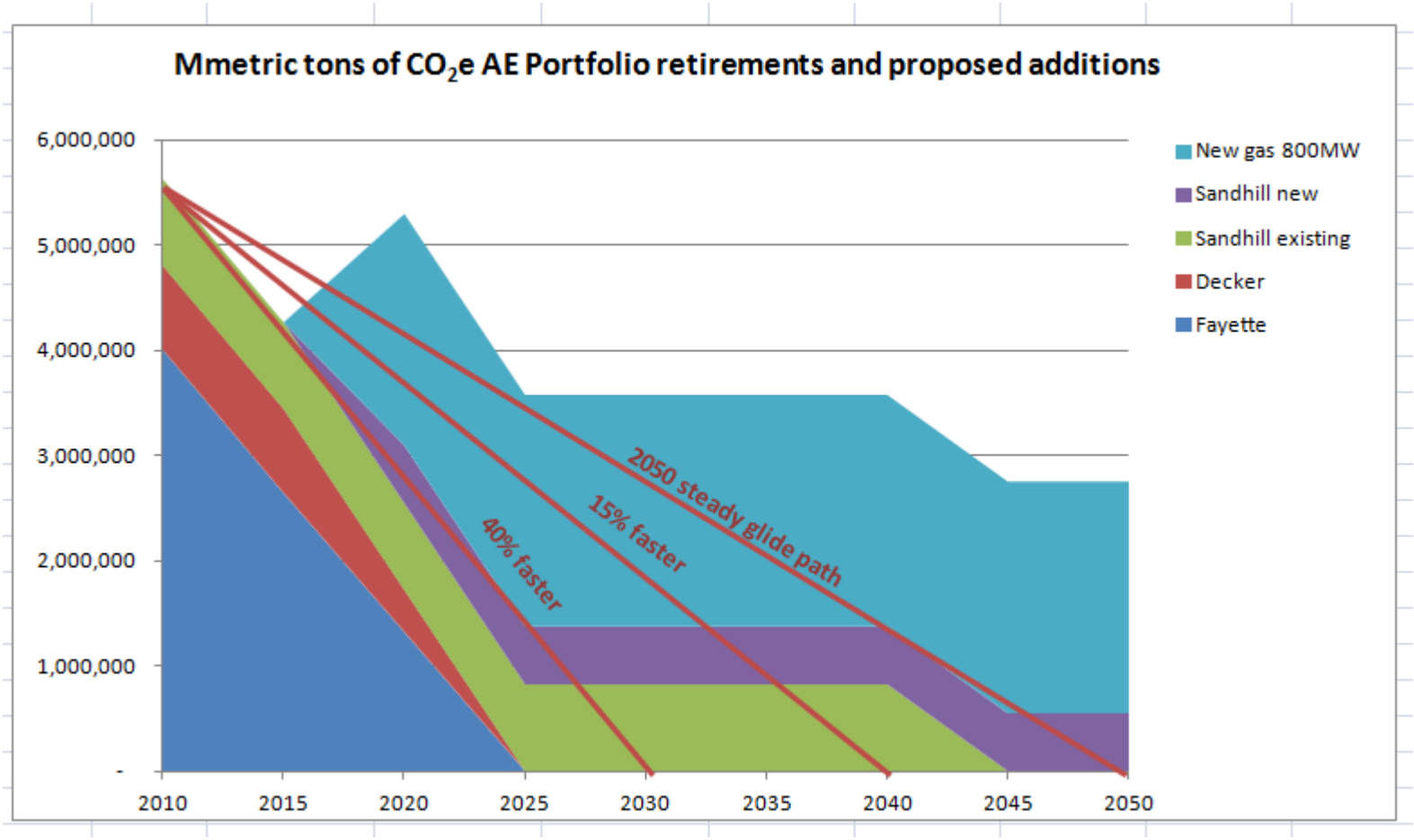

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ACPP2014 Implications

- Any plant that emits GHG today can not be in operations by 2050
- Any new GHG emitting plant has to fit within the chosen ambition pathway
- Possible escape: capture GHG (cost and performance) or offset (reliability)
  ACPP2007 says: carbon neutrality for any new carbon based generation.

Is there room for new fossil fuel based generation ?

Year	CO2e performance index; steady glide path to 2050	No new fossil fuel plant scenario, planned closures proceed as planned	Planned retirements + new gas
2005	100	100	100
2010	88.9	..	..
2015	77.8	..	..
2020	66.7	**90.0**	130
2025	55.6	**24.0**	**64.0**
2030	44.4	24.0	64.0
2035	33.3	24.0	64.0
2040	22.2	24.0	64.0
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Decker Fayette New gas 800MW

Disclaimer: estimates! not AE data!

Retiring Decker and Fayette meets goals till 2040 with all new generation zero GHG

Year	CO2e performance index	No new fossil fuel plant scenario, planned closures proceed as planned	Planned retirements + new gas
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Adding 800 MW new gas makes puts us behind the steady decline path from ~2022 and on

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Decker Fayette New gas 800MW

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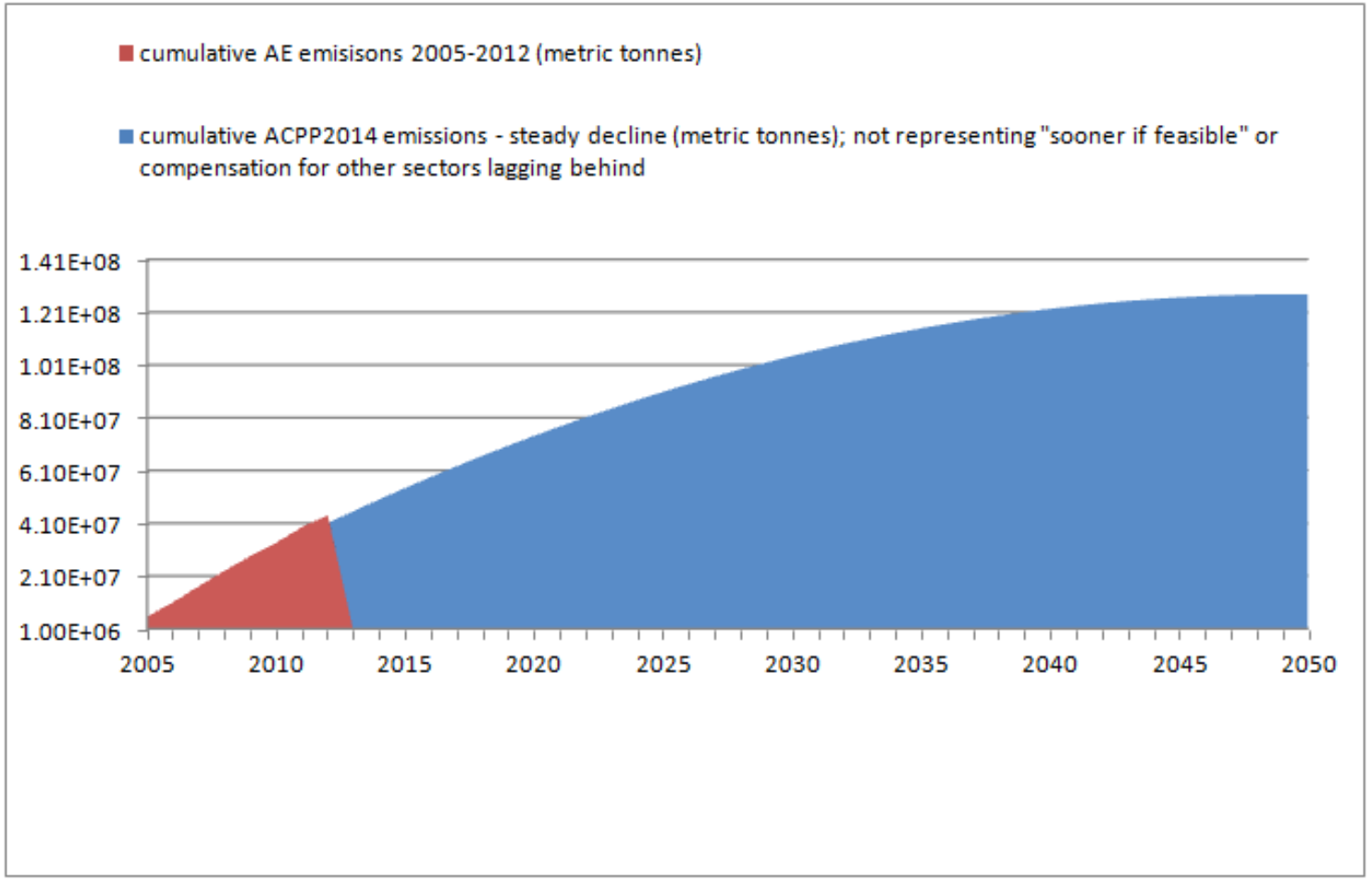
Are we on track today?



We need to catch up: 7.5% behind 2005-2012

Direct GHG are the norm, but…

- Current GHG accounting typically includes direct emissions (burning fuel, process related)
- No indirect emissions for exploration and mining (fracking)
- No capital goods
- No infrastructure (generation, distribution)

Example: Sandhill expansion EPA permit request dec 2013

- Table 3-4 Annual GHG Emissions - Total Project shows transparency. The GHG emissions include "Natural Gas **PIPELINE** Fugitives" shows it is almost entirely methane.
- A good start, but the reporting requirement should have added "Natural Gas **Hydraulic Fracturing and Recovery** Fugitives".
- Science is not settled; range expected between ~2% (current EPA estimate) and up to 17%.
- Difference coal and natural gas emissions (EPA) (100 year): 95.52 vs 53.06 kg CO_2e/mmBtu (Δ -44%)
- 2% emission = 25 kg CO_2e : total 78, also leackage from coal mining, same order of magnitude
- 17% emissions =216 kg CO_2e total 269 (Δ +182%)

GHG emissions life time

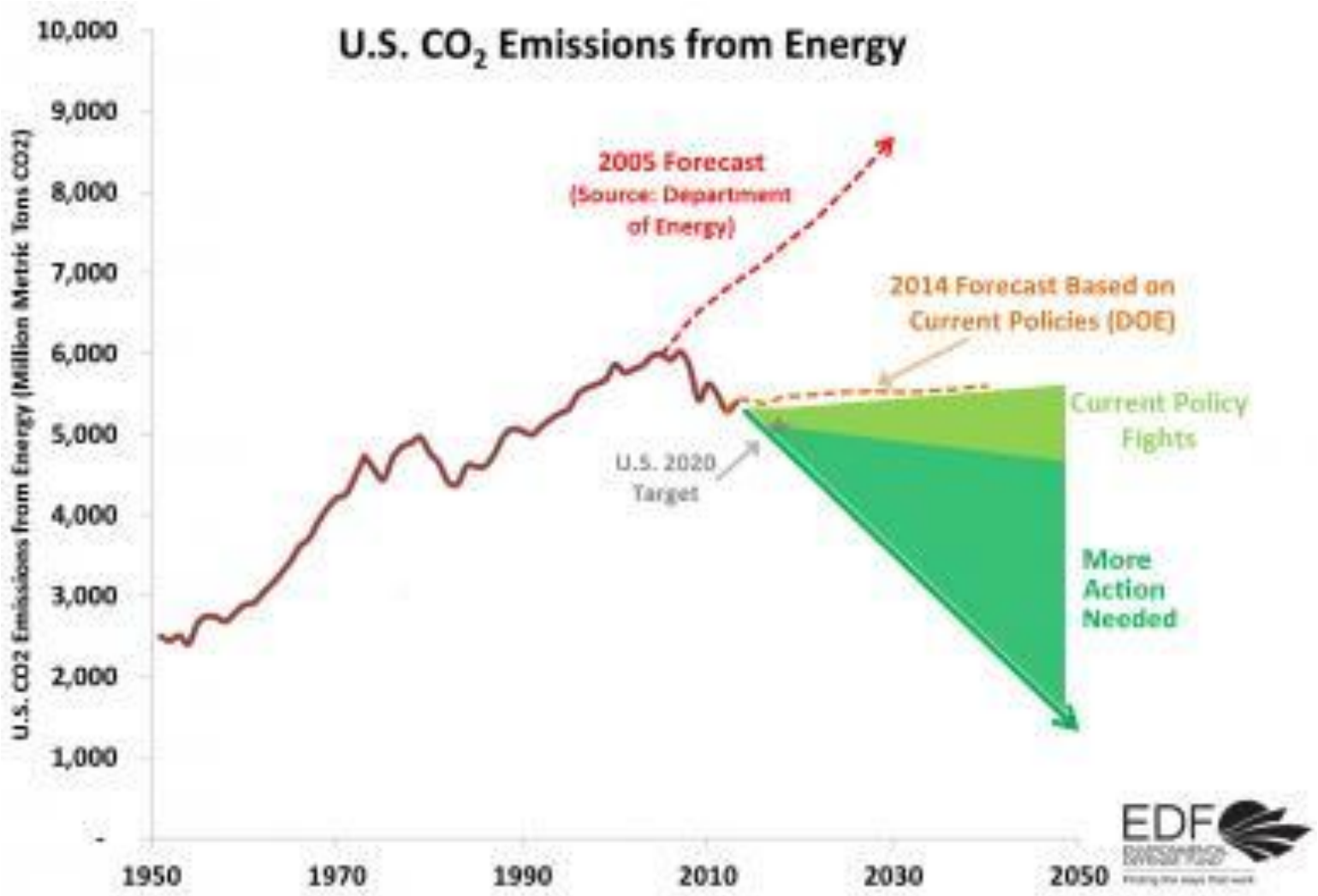
- GHG stay in the atmosphere for hundreds of years
- We are still breathing the CO_2 emitted by our founding fathers
- Emission reductions today are better than reductions tomorrow

ACPP2014 Intent going forward

- Always consider climate impact when making decisions about energy resource and usage planning (CO_2e performance index)

- Take actions that move us closer to the net zero target, not away

Indentify the downward options

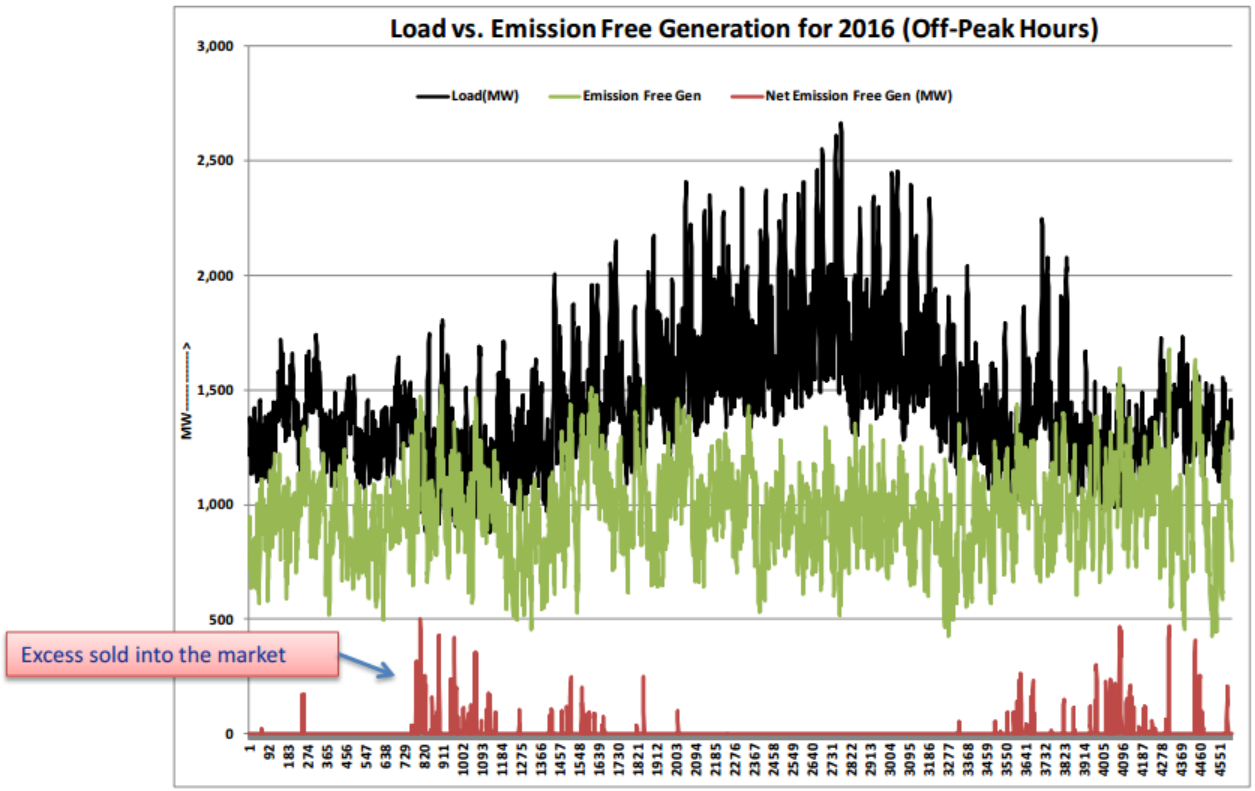


You know all this!

- Stimulate voluntary action by businesses and residents so that they invest and do their part
- Provide income based incentives
- Work with end users to control load and load curve to control cost and GHG emissions
- Make Greenchoice pricing attractive and not expensive knowing it is cheaper today and has less risk and compliance cost associated with it
- Exhaust EE: how much is there, how fast can we get it, how cheap is it, how needs to be involved in getting it done
- On the cheap menu: insulate all residential attics in the next 5 years, solar screens, caulking and stripping; replace washers and dryers
- Develop a program to retrofit all existing homes and business in Austin (without having to pay for it) (ecofys aggressive retrofit are cheaper than CCS, low retrofit scenario etc., bond program)
- Make all new homes energy producers (Net Zero is planning in the Austin building code) (**monthly bills** for residents will be lower.
- Make all transportation electric (introduce two-way charging, build more charging infrastructure around town, time of use pricing)
- …..

One example

A Net Seller of Wind in the Off-Peak Hours



INVESTING IN A CLEAN FUTURE 18

One example: EV battery

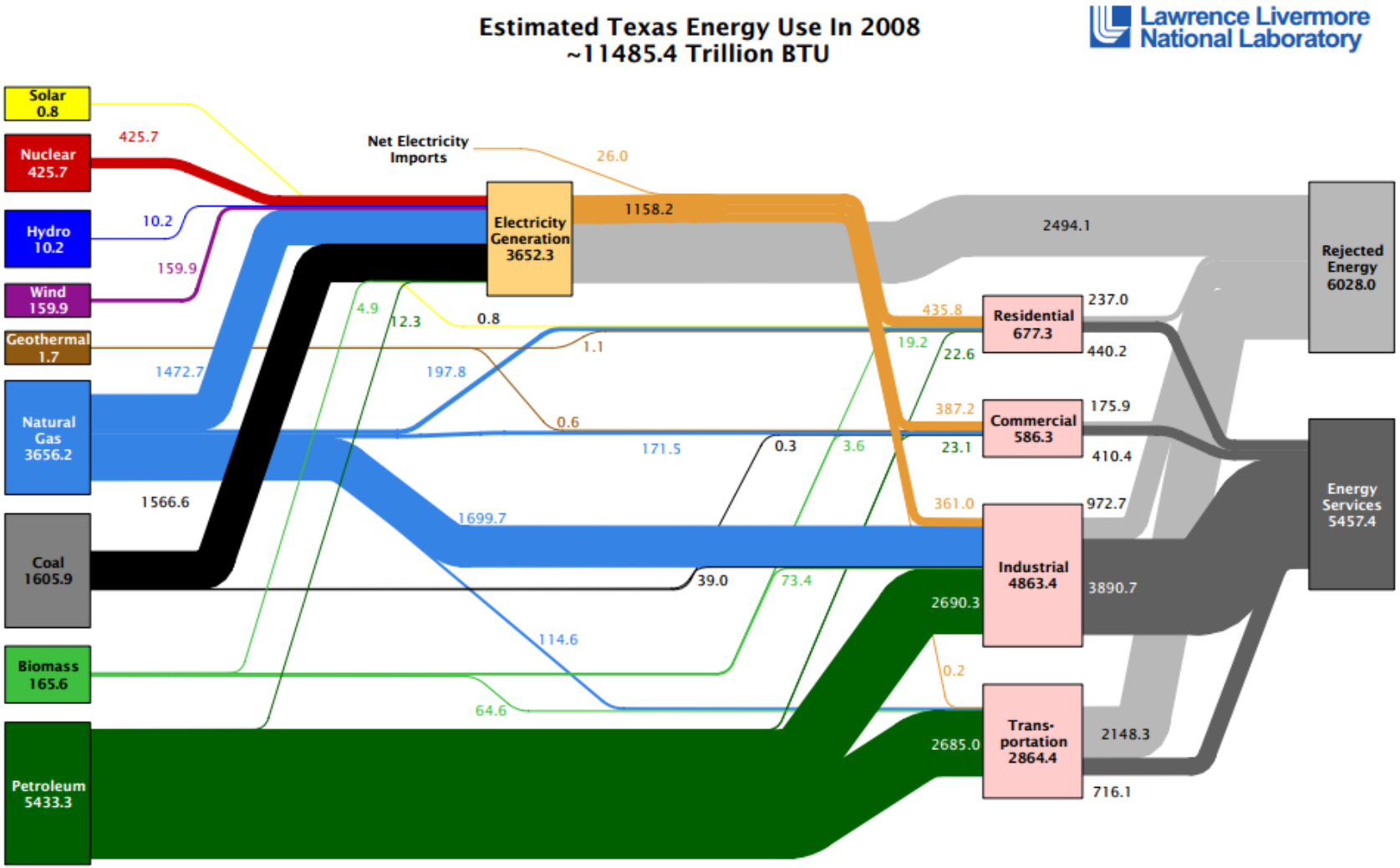
- Peak shaving during the day
- More demand at night
- Perfect match to add more wind

1,000,000 registered cars (TRAVIS 2013)
24kWH battery (LEAF); 80% available; 19,200,000 kWh per day storage;

equals 55% of one average day of use in AE territory in 2012

10% of cars EV = 5.5% storage capacity paid for by the market

Know DER sources, use Energy Productivity and GHG Productivity as KPI's.



Unlock the potential of Distributed Energy Resources (DER)

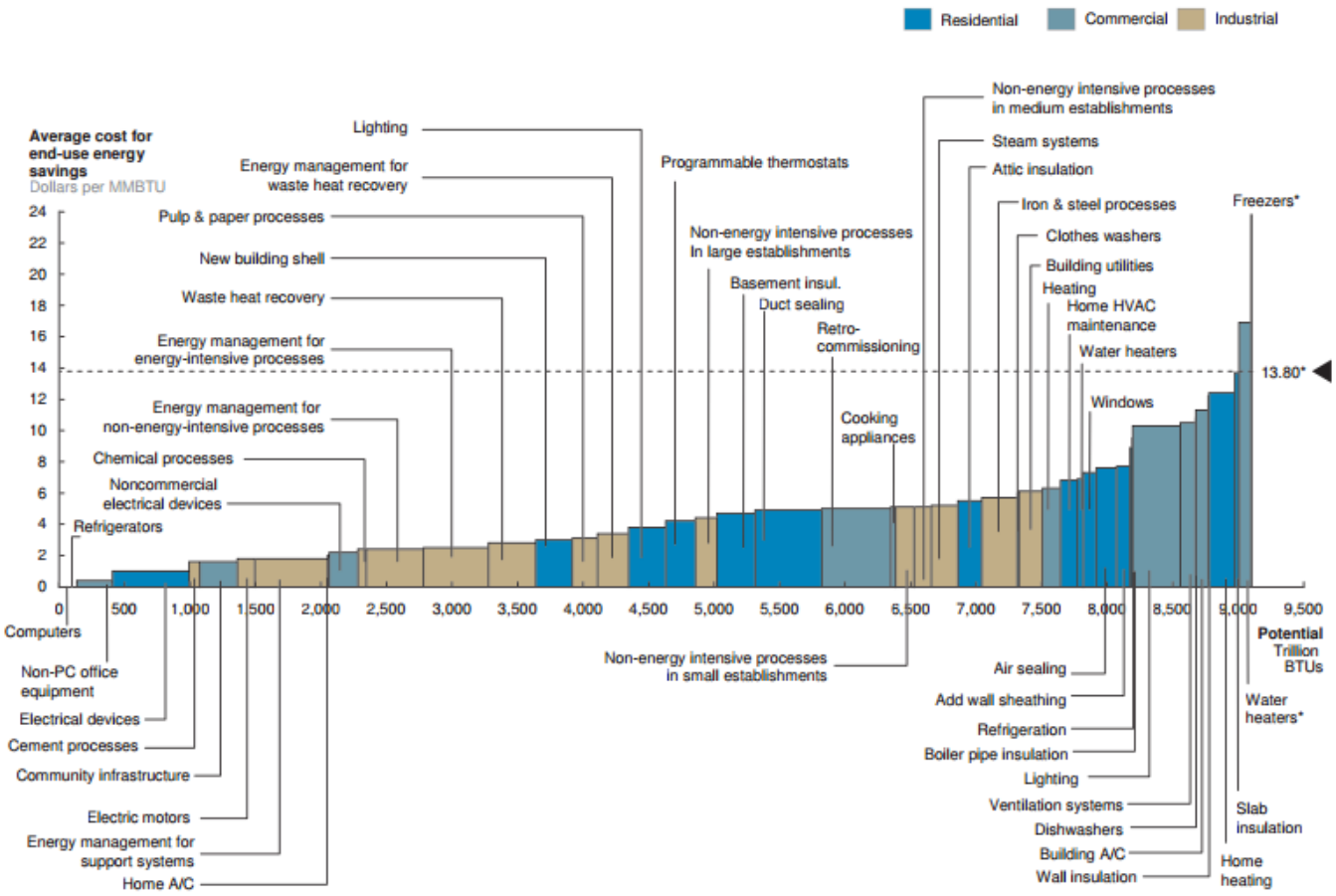
Examples of DER:

EE, DR, DS, EV, storage, Microgrid, …

Question to be answered:

- How much is out there?
- How fast can we get it?
- Who is responsible for getting it?
- What are the costs and savings involved?

US: Up to 30% cheap



* Average price of avoided energy consumption at the industrial price; $35.60/MMBTU represents the highest regional electricity price used; new build cost based on AEO 2008 future construction costs

Source: EIA AEO 2008, McKinsey analysis

- http://www.mckinsey.com/client_service/electric_power_and_natural_gas/latest_thinking/unlocking_energy_efficiency_in_the_us_economy

Unlock the potential of EE, DR, DES, EV

- Exhaust all options first at a price lower than
  - Average generation cost?
  - Cost of operation Fayette?
  - New gas + sequestration?
- Incentives options that are not cost effective to share burden with market, to create market, to drive cost down
- Serve all customer groups (2012 AE data)

Residential	Commercial	Industrial	Public Street & Highway	Government Entities
34%	36%	21%	0.4%	8%

Market is changing - total cost of ownership of users

- Paying a loan for NET ZERO homes is cheaper than paying utility bills for the duration of a mortgage
- Car payment for an electric vehicle + fuel cost is lower than driving a comparable car

We will see more and more customer owned distributed generation

We need to plan for EV integration and optimization

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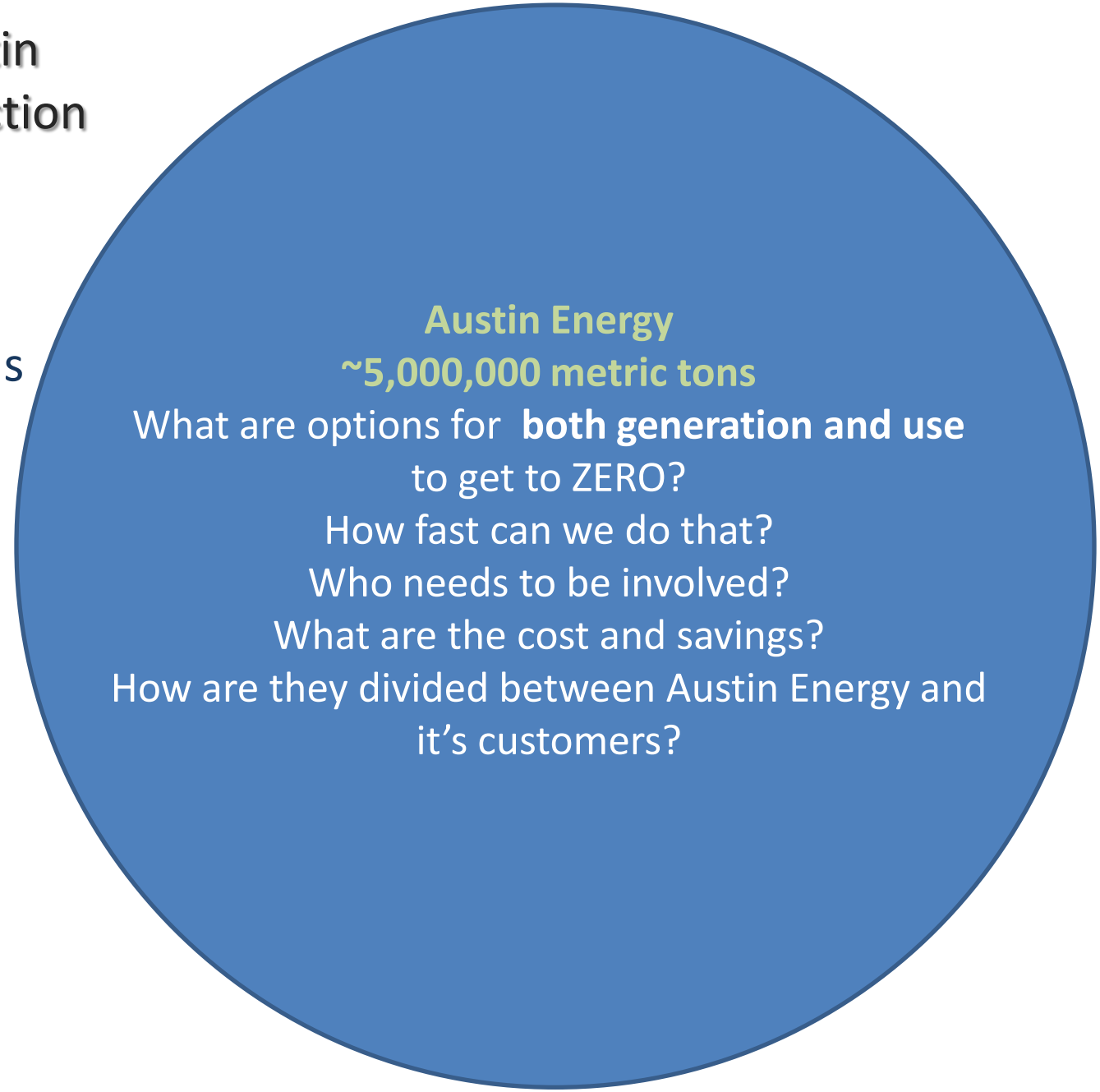

Recommendation to the Taskforce

- Use a carbon performance index going forward
- Develop a resource plan for getting to NET ZERO by:
  - As soon as feasible (ACPP2014)
  - Sooner is preferred (ACPP2014)
    - 2030
    - 2035
    - 2040
    - 2045
  - 2050 Steady glide path to 2050 (but no later then.. ACPP2014)