NASA /CMS Applications Policy Speaker Series

Boundary Processes in the Development of Phoenix's Greenhouse Gas Emissions Inventory

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Boundary processes is identified as the dynamic and often ambiguous system of negotiable and non-negotiable pathways that straddle the academic and political paradigms.

Borrows from the work of Guston et. al (2000, 2001) on "boundary organizations" that are able to transfer useful knowledge between politics and science.

Methodology

- Case study: two examples
- In-depth Interviews
- Experiential knowledge
- State Climatologist
- Collaborative work with stakeholders
- Examples of boundary organizations in ASU: Center for Integrated Solutions to Climate Challenges, Sustainable Cities Network, Walton Sustainability Solutions Services.

Phoenix Metropolitan Area

One of the hottest cities in the United States

Includes 24 cities and 4 Native American tribes

13th most populous in the United States

Credit: ASU/WSSI

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Phoenix and GHG Inventory

- 2008: Phoenix City Council adopted a mandate to reduce greenhouse gas (GHG) emissions from city operations to *5% below the 2005 levels by 2015.*

- 2009: 2005 GHG Inventory for city operations completed
  - 2005 GHG Inventory: GHG emissions projected to rise 14% if the city did not take appropriate action

- 2012: 2005 GHG emissions were revised from 618,682 to 678,150 metric tons of CO_2e

Ref: ASU_2012 Greenhouse Gas Emissions Reduction Report

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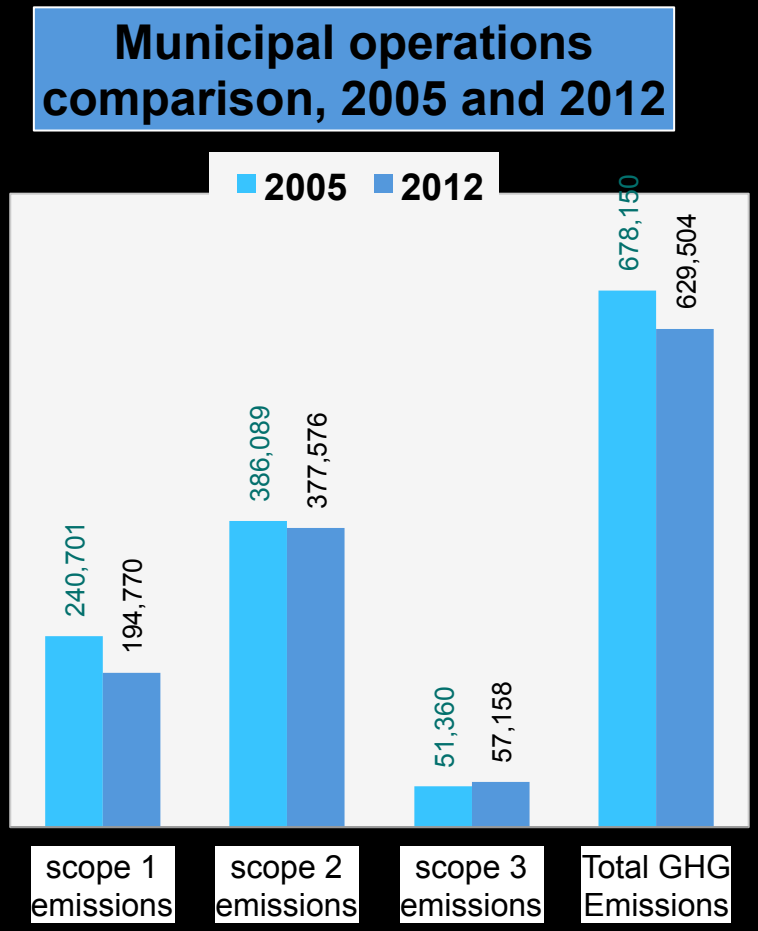
2012 Phoenix's GHG Inventory

Emissions from City of Phoenix municipal operations fell by 7.2%, from 678,150 to 629,504 metric tons of CO_2e between 2005 and 2012.



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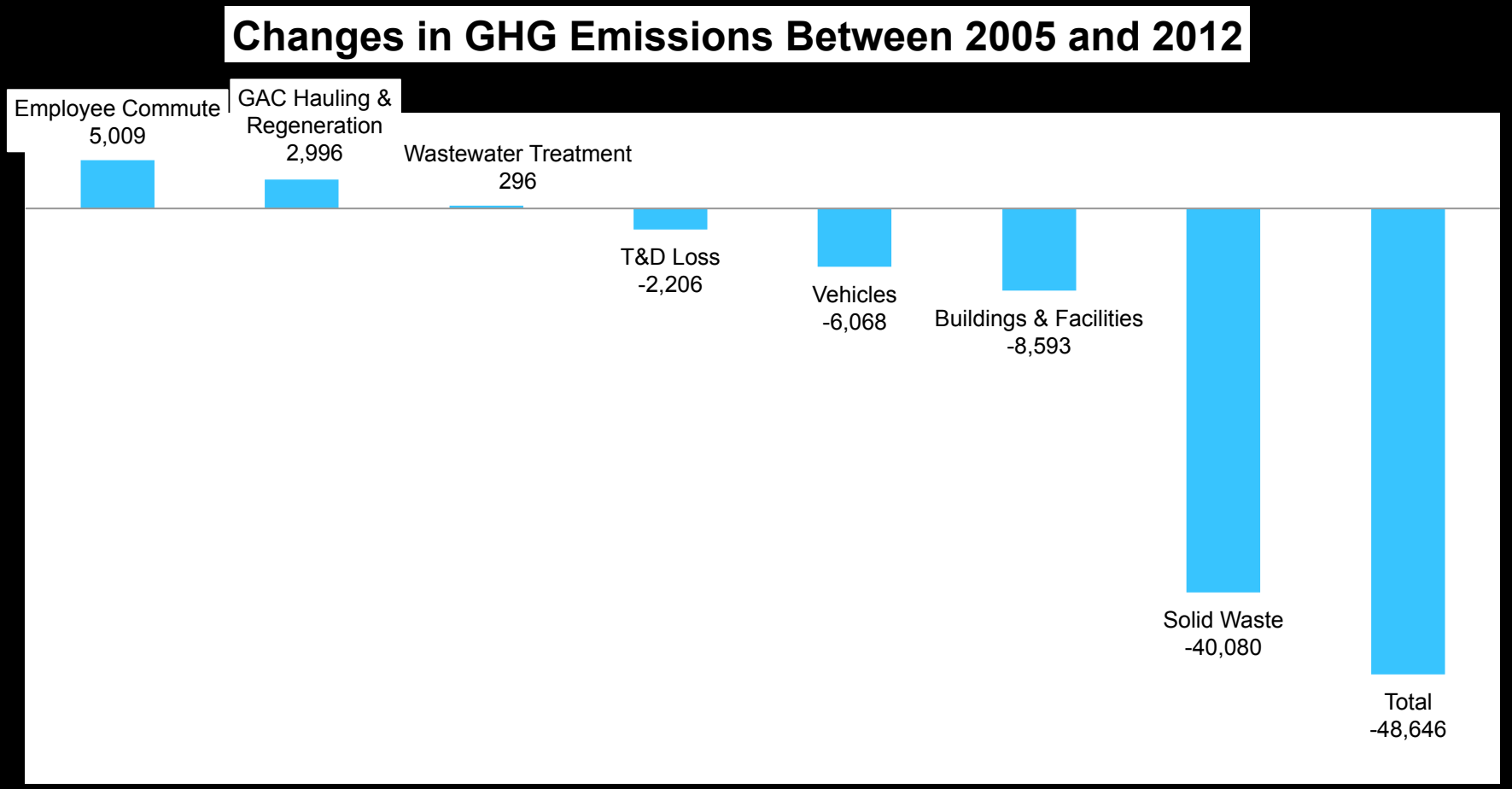
Reductions By Reporting Sector



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Ref: ASU_2012 Greenhouse Gas Emissions Reduction Report

Where does Phoenix stand?

- Decision makers like to be in the middle of the pack of cities - behind Seattle and San Francisco and on par with Salt Lake City (maybe).

- In Phoenix – likely to compare with cities in Salt Lake City in Utah than in Seattle and San Francisco. Who do we most resemble?

- In their work, environmental managers like to make decisions in incremental steps and not by leaps and bounds.

- Feel Phoenix is quite a well managed city.

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- Media attention and government tracking have not always

Governance structure

- Legislative body: City council – approval
- Executive branch: Mayor – leadership
- Departmental staff (e.g. environmental managers) – implementation and needs actual buy-in and support

Current city themes in environment

- Climate and carbon emission themes are not top priorities.
- Focus on energy, air quality, and water resources.
- Carbon related issues tend to be embedded in transportation and air quality.

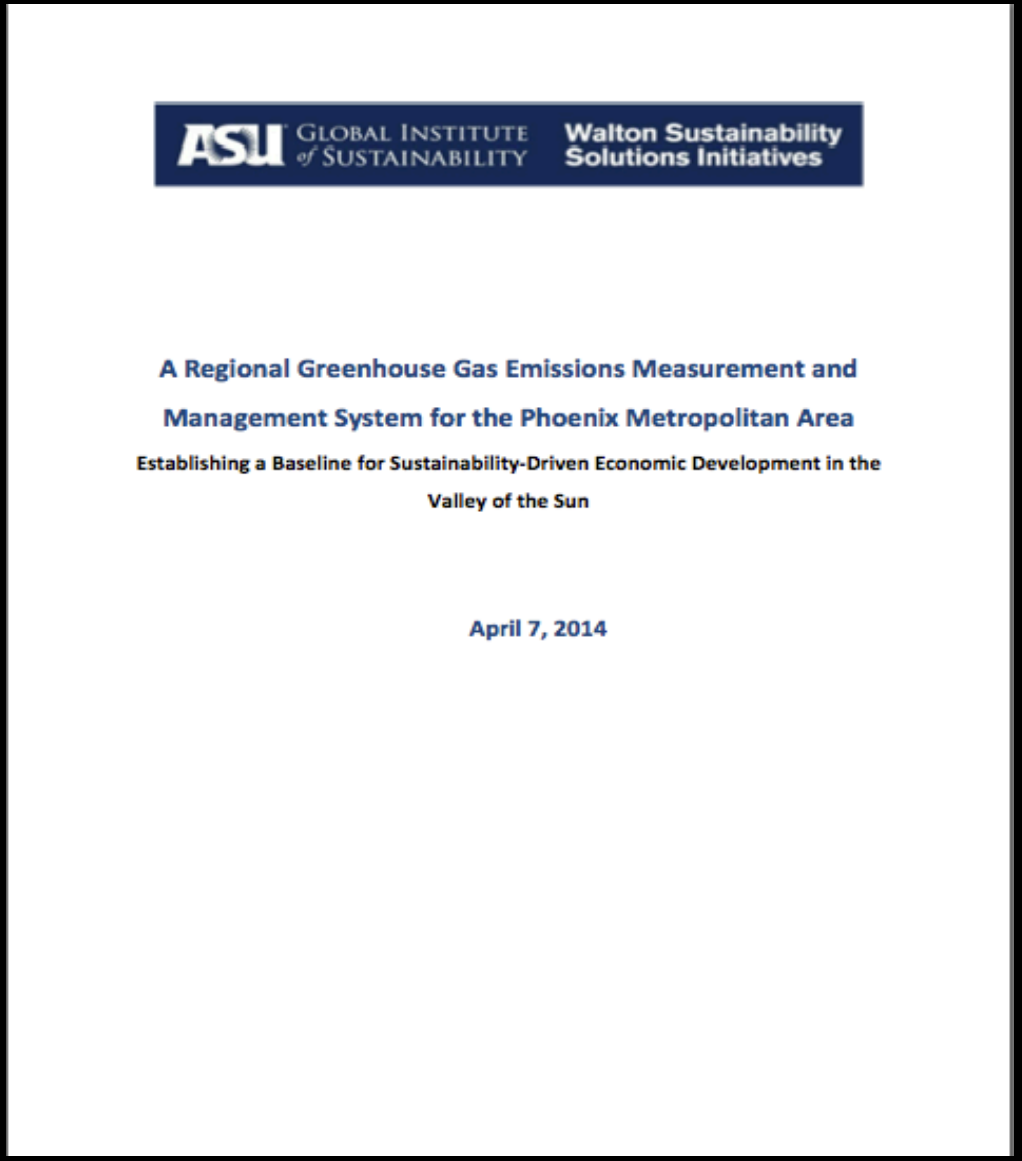
Constraints of cities

- Environmental managers in general:
  - Want to manage carbon emissions
  - Are proactively concerned about carbon emissions
  - Want to mitigate impacts of carbon emissions

Stakeholders' quotes

- "Academics forget the politics that we have to deal with……."
- "Academics have to consider the politics of area before new tools can be implemented…."
- In AZ tools developed related with climate and carbon emissions do not "fly politically."
- Projects related with "climate and carbon emissions does not get funded. Period."

Regional GHG inventory proposal, 2014



ASU Global Institute of Sustainability | Walton Sustainability Solutions Initiatives

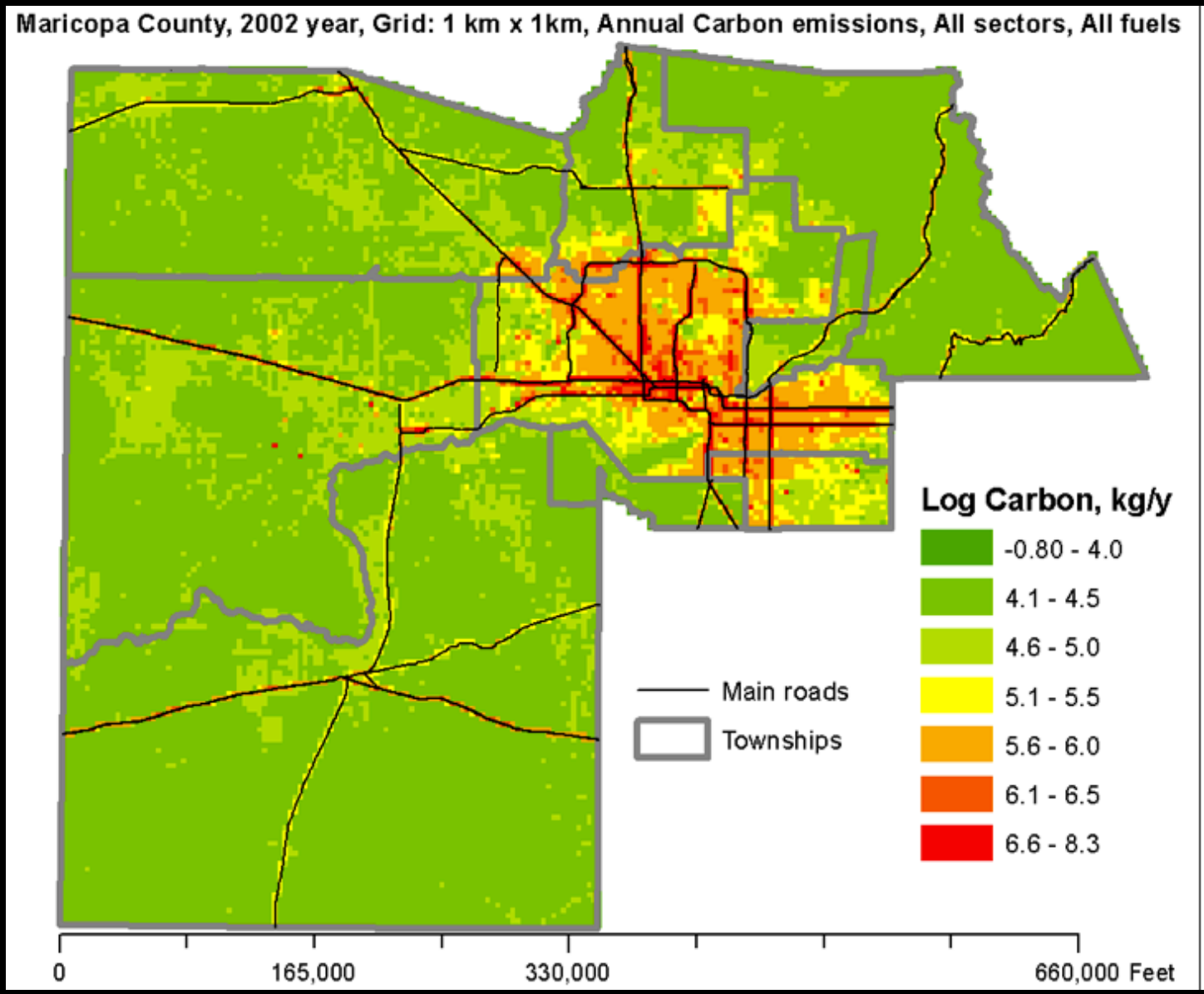
A Regional Greenhouse Gas Emissions Measurement and Management System for the Phoenix Metropolitan Area

Establishing a Baseline for Sustainability-Driven Economic Development in the Valley of the Sun

April 7, 2014

Ref: ASU/WSSI_2014 Regional GHG inventory Proposal

Quantification of fossil fuel CO_2 emissions in Maricopa County.



Credit (ASU's):
S. Yildiz;
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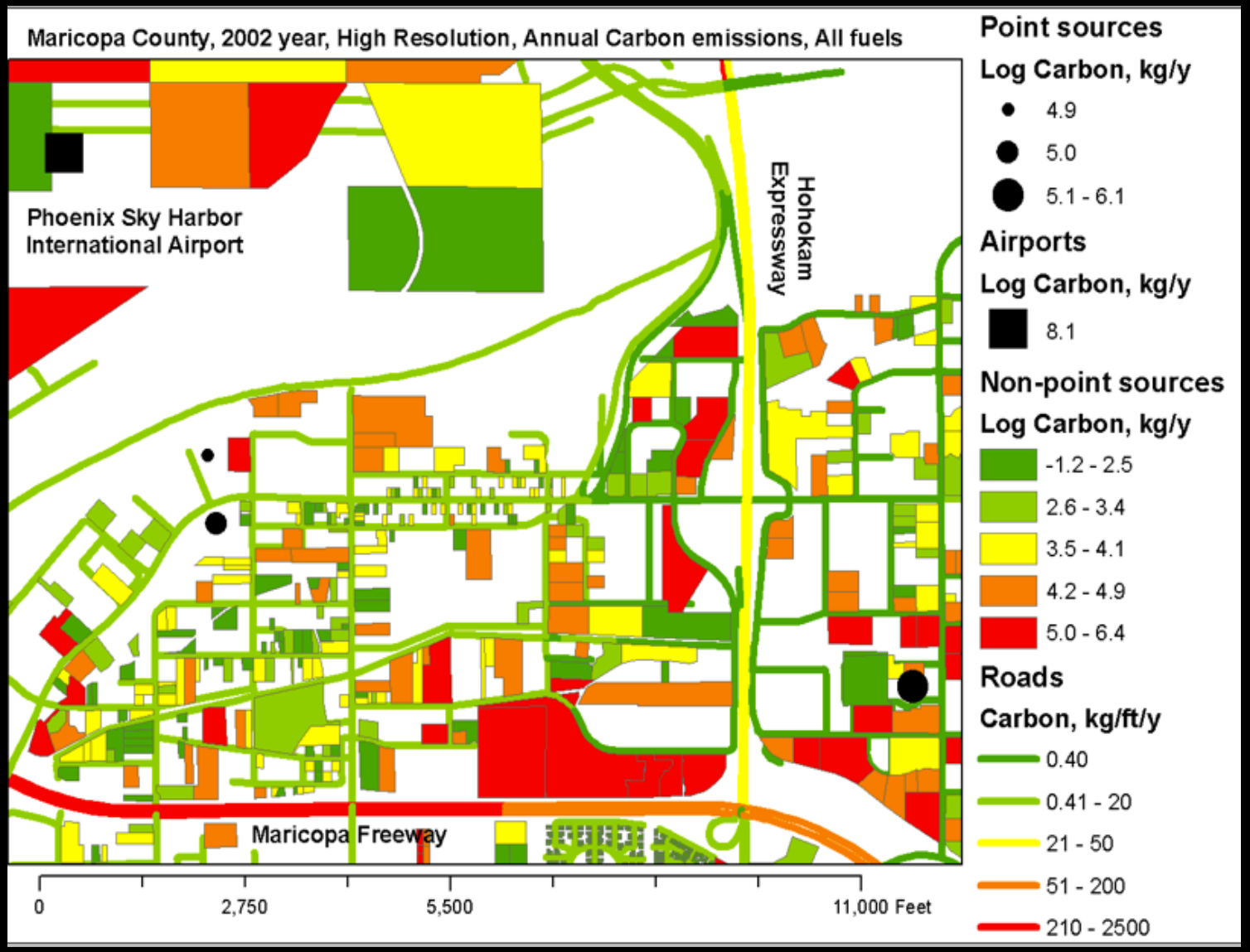

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Constraints of working with carbon emissions visualization

Visualization of spatial and temporal distribution of emissions ensure:

- hotspots are identified (e.g. utility companies with power plants, large companies) ;
- who the largest emitters are;
- have negative PR implications;
- resistance to finer level resolution data on grounds of privacy concerns, property rights, government over-reach;
- perceived fear that large emitters could be put on notice by the public and shift focus from residential emissions to them

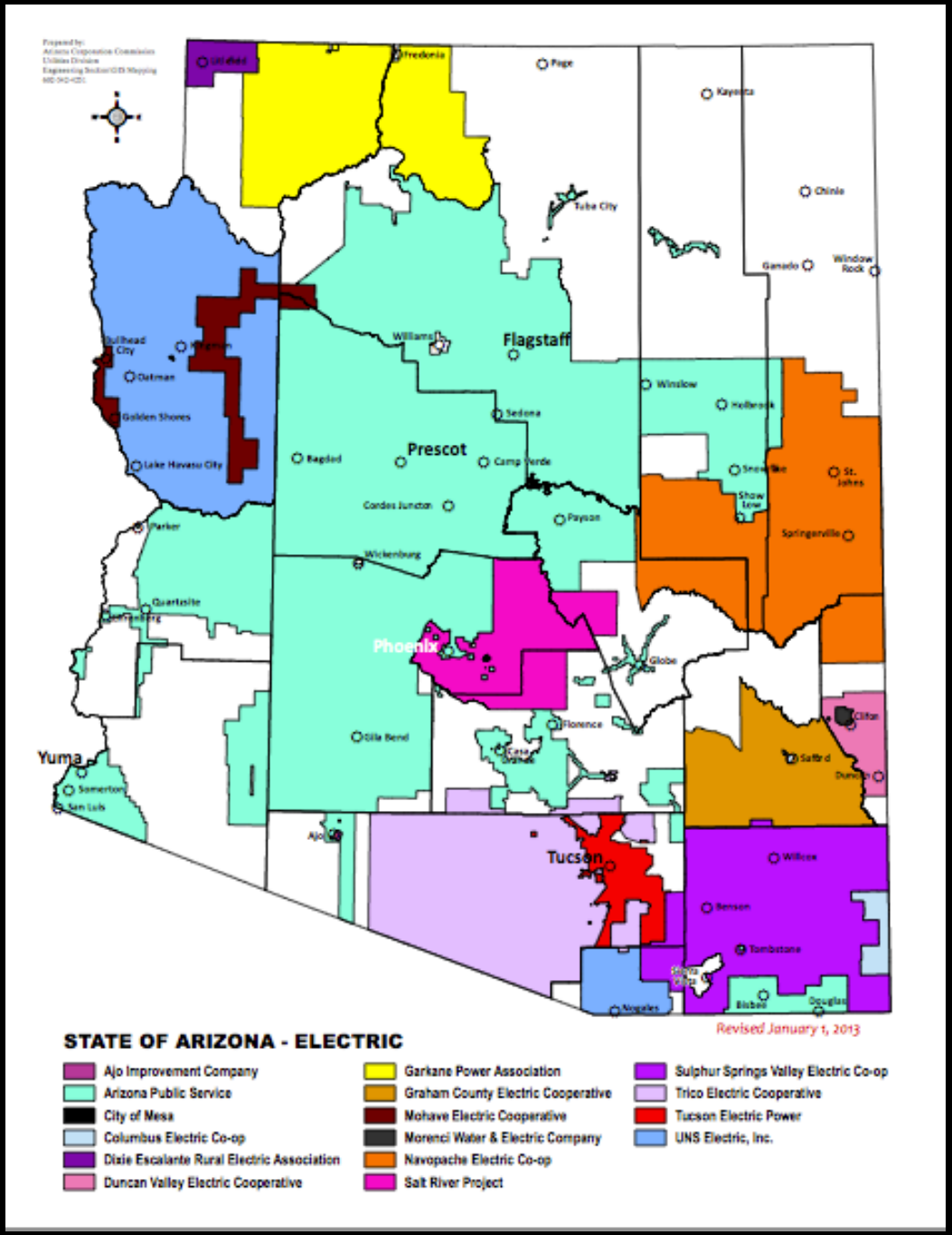
Constraints of working with carbon emission visualization (cont..)

- Technically the concept is still abstract.
- Wariness on use of software that rely heavily on experts.
- Perception of heavy duty work that require complex software with centralized data system with significant technological knowhow required;

Spreadsheet works! (still)

- ICLEI protocol provides spreadsheet with aggregate numbers
- Widely endorsed (e.g WRI)
- Has been around for sometime
- Provided statistics that could be embraced generally
- Open source

Electric companies in AZ in the EPA eGRID region of AZNM



Source: http://www.azcc.gov/Divisions/Utilities/Electric/map-elect.pdf (accessed, 06/17/2014)

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Emitters vs emitters

- EGRID (inventory of environmental attributes of electric power systems) factor for AZNM region has become a point of contention.
- Progressive utility companies' intention to reduce emissions is in contradiction with current eGRID factors in the region (AZNM) (e.g high coal small utility district (e.g. Sulphur Springs) serving only 150 people.
- Companies reluctant to change given that they may open themselves to regulatory burdens.
- Underlying tension between utility companies, academics and city managers.
- Utility companies need to be continually nudged.

Current infrastructural status

- At the municipalities level there is little state-of-the art knowledge generation culture
- Staff and city managers are more used to EXCEL/ spreadsheet information sharing
- Installing new tools and programs is a hassle
- Many still operate outdated(?) Windows XP
- There is both resistance to new tools
- Systems are more than 10 to 12 years old and difficult to get rid of
- Especially for established older staff – not having to reinvent when they retire is important

So what would work in Cities?

- Whatever tools that saves them money;
- Makes most of their resources;
- Enables better planning;
- Provides better customer service;
- Provides opportunities for new jobs;
- Allows them to brand the city positively;
- Allows them to manage cities better;
- Is less regulatory;
- Has low risks of lawsuits.

Case of State climatologists – creating boundary processes to make tools work

Examples of agricultural and water conservation modeling

- Stakeholders have specific focus and science takes that into account,
- Stakeholders tend to know each other,
- Discussions occur not so much in meetings as in workshop environments,
- Exchange of science occurs not as a one-shot or a few discrete events but more as continual “show and tell” with feedback loops,
- Tools are tested before being scaled up,
- State Climatologists are trained to listen to their stakeholders – to really stop and listen.

….creating boundary processes to make tools work……(cont)

- Systematically valuing experiential knowledge.
- Developing infrastructure/system that creates “unified group” of people to use data/ create data.
- Speaking in a common language.
- Providing common training across a range of stakeholders: E.g in water resources - at county, cities, states army corps, private consultancies, at some point people have had same training in understanding and using the data
- (Albeit in the “flooding context” we have 100 years of knowledge).
- Takes time and resources.
- Lack of demonstrable impacts becomes a hindrance.

- Do not have these processes fully in place in carbon emission monitoring.

SouthWest Climate Assessment Townhall at ASU, April 2013

Credit: ASU/Center for Integrated Solutions to Climate Challenges

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