Tucson Carbon Mitigation Project

UA Global Change class: GEOS 478/578

Presentation to Tucson Climate Committee

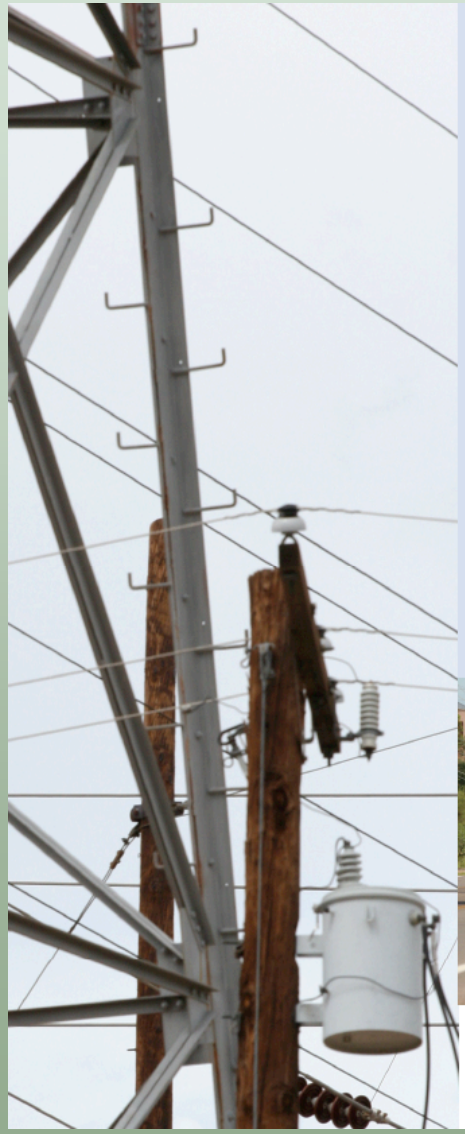
Dec, 8, 2009

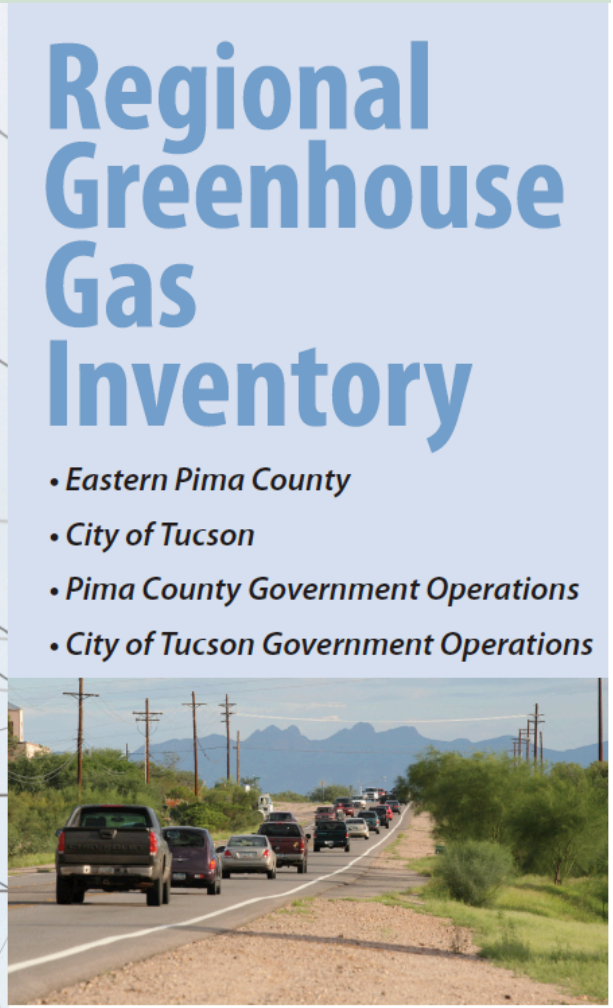
Mitigation measures: General categories

- Commercial
  - Behavior, education
  - Auditing, improvements
  - City codes and policy changes
  - Construction
- Residential
  - Behavior, renting, education
  - Construction
- Transportation
  - Behavior, policy, infrastructure
- Municipal

Big picture

- City goal for reduction is 2,678,000 tons of CO_2 equivalent by 2012
- Our top (good) measure is 10% of this; most measures are <<5%.
- Many "charismatic" measures aren't very useful for carbon
  - Solar heating for city pools, planting trees, hybrid taxis
- Measures that accrue over time hold great promise
  - Residential construction standards





Assessment of top measures

- Carbon impact not the sole factor
  - Ancillary benefits, cost savings,
- Quality of work and calculations
  - Includes a sense of whether the measure itself can really be quantified
- Reasonableness of implementation
  - Can this be reasonably put forward as a policy measure?
- A starting point
  - Next steps to discuss later

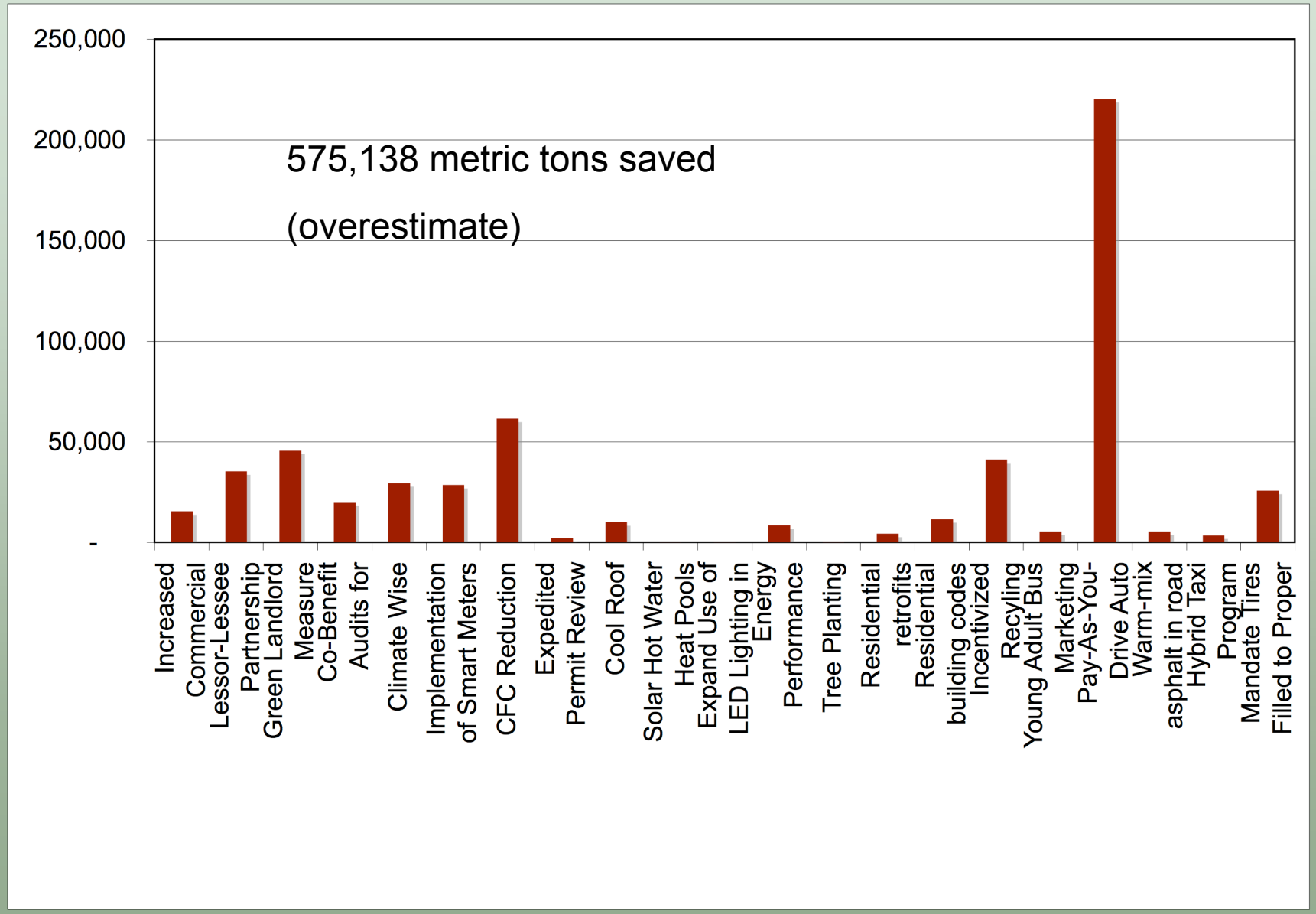
Our top 21

(in increasing order of carbon payoff, based on single year savings)

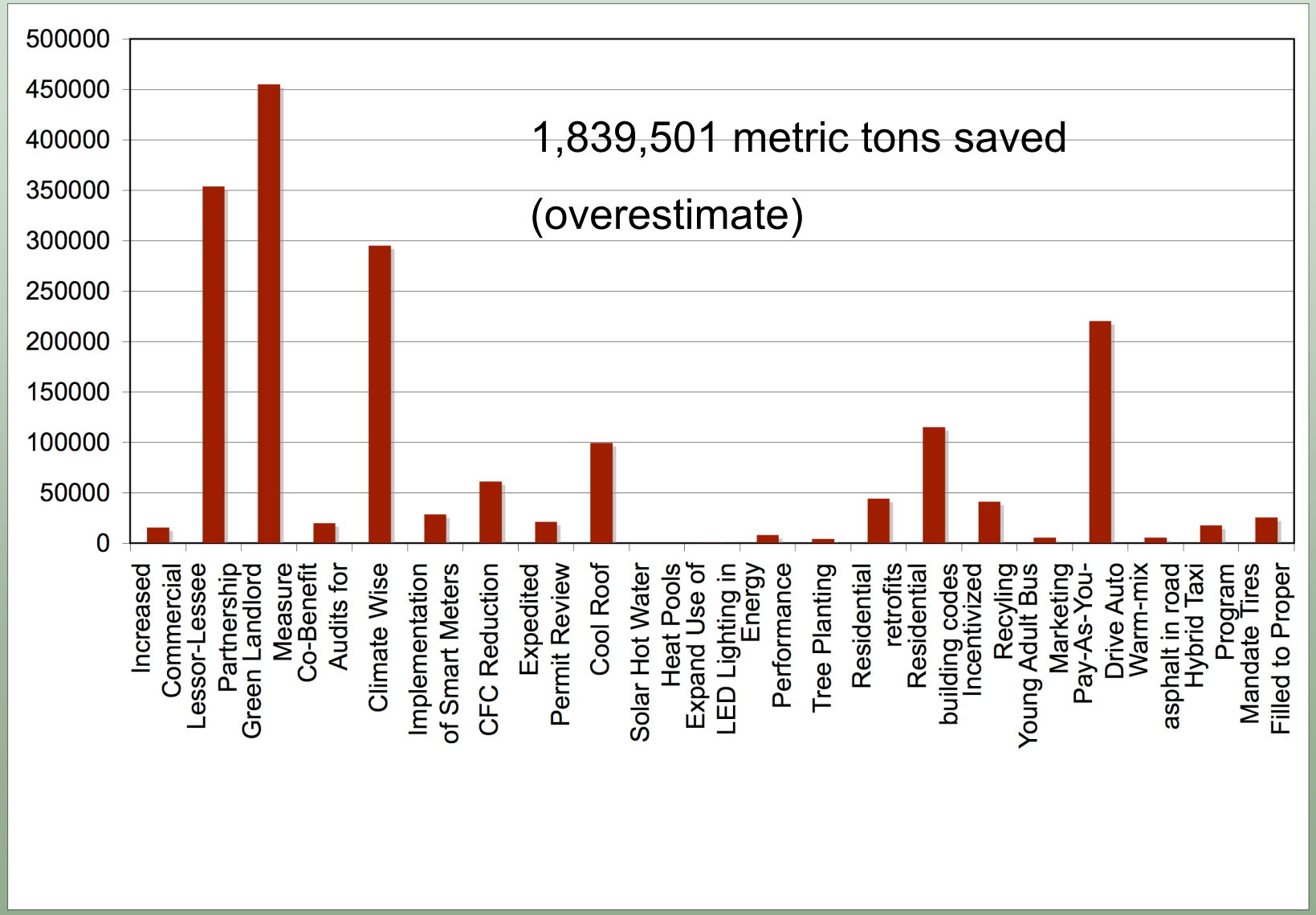
Solar Hot Water Heat Pools
Expand Use of Public LED Lighting
Tree Planting
Expedited Permit Review
Hybrid Taxi Program
Residential retrofits
Young Adult Bus Marketing Campaign
Warm-mix asphalt
Energy Performance Contracting
Cool Roof
Residential building codes, Santa Fe model
Increased Commercial Recycling
Co-Benefit Audits
Mandate Tires Filled to Proper Pressure
Smart Meters in commercial buildings
Climate Wise
Lessor-Lessee Partnership Program
Incentivized Recyling Program (PAYT)
Green Landlord Measure
CFC Reduction
Pay-As-You-Drive Auto Insurance

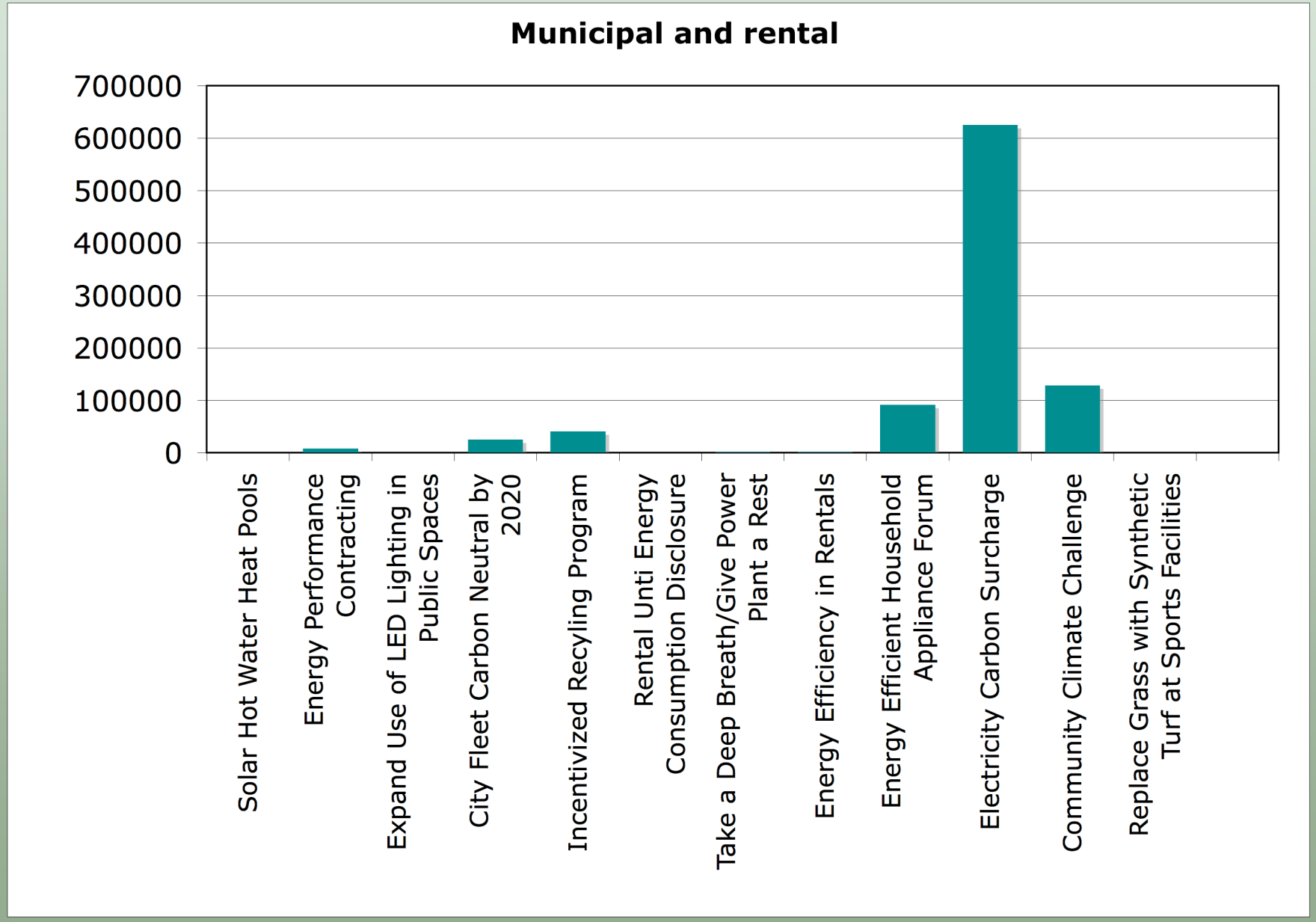
Measure	CO2-equiv. saved (metric tons)	scale by 10
Solar Hot Water Heat Pools	142	
Expand Use of Public LED Lighting	312	
Tree Planting	419	4,190
Expedited Permit Review	2,114	21,140
Hybrid Taxi Program	3,569	17,843
Residential retrofits	4,444	44,440
Young Adult Bus Marketing Campaign	5,500	
Warm-mix asphalt in road resurfacing	5,550	
Energy Performance Contracting	8451	
Cool Roof	9,937	99,370
Residential building codes #2, Sante Fe model (recommended)	11,513	115,130
Increased Commercial Recycling	15,573	
Co-Benefit Audits for Commerical Sectors with highest GHG Likelihood	20,131	
Mandate Tires Filled to Proper Pressure	25,660	
Smart Meters in commercial buildings	28,487	
Climate Wise	29,518	295,180
Lessor-Lessee Partnership Program	35,410	354,100
Incentivized Recyling Program (PAYT)	41,299	
Green Landlord Measure	45,528	455,280
CFC Reduction	61,500	
Pay-As-You-Drive Auto Insurance	220,223	
total saved	**575,138**	**1,406,673**

Our top 21


250,000
200,000
150,000
100,000
50,000
-
575,138 metric tons saved
(overestimate)
Increased
Commercial
Lessor-Lessee
Partnership
Green Landlord
Measure
Co-Benefit
Audits for
Climate Wise
Implementation
of Smart Meters
CFC Reduction
Expedited
Permit Review
Cool Roof
Solar Hot Water
Heat Pools
Expand Use of
LED Lighting in
Energy
Performance
Tree Planting
Residential
retrofits
Residential
building codes
Incentivized
Recyling
Young Adult Bus
Marketing
Pay-As-You-
Drive Auto
Warm-mix
asphalt in road
Hybrid Taxi
Program
Mandate Tires
Filled to Proper

Our top 21 - scaled up 10 yrs




Municipal and rental
700000
600000
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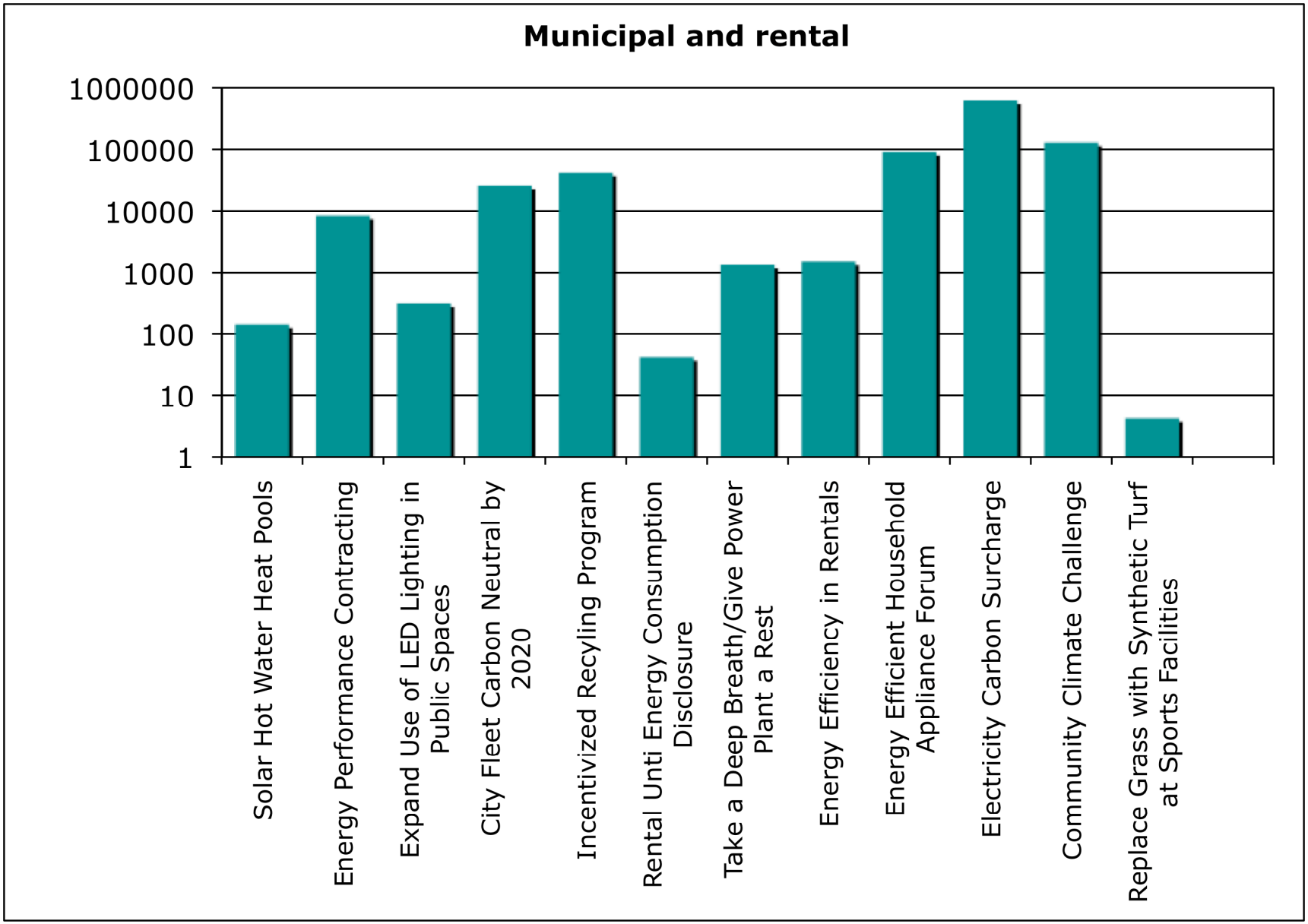
Solar Hot Water Heat Pools
Energy Performance Contracting
Expand Use of LED Lighting in Public Spaces
City Fleet Carbon Neutral by 2020
Incentivized Recyling Program
Rental Unti Energy Consumption Disclosure
Take a Deep Breath/Give Power Plant a Rest
Energy Efficiency in Rentals
Energy Efficient Household Appliance Forum
Electricity Carbon Surcharge
Community Climate Challenge
Replace Grass with Synthetic Turf at Sports Facilities


Municipal and rental
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Solar Hot Water Heat Pools
Energy Performance Contracting
Expand Use of LED Lighting in Public Spaces
City Fleet Carbon Neutral by 2020
Incentivized Recyling Program
Rental Unti Energy Consumption Disclosure
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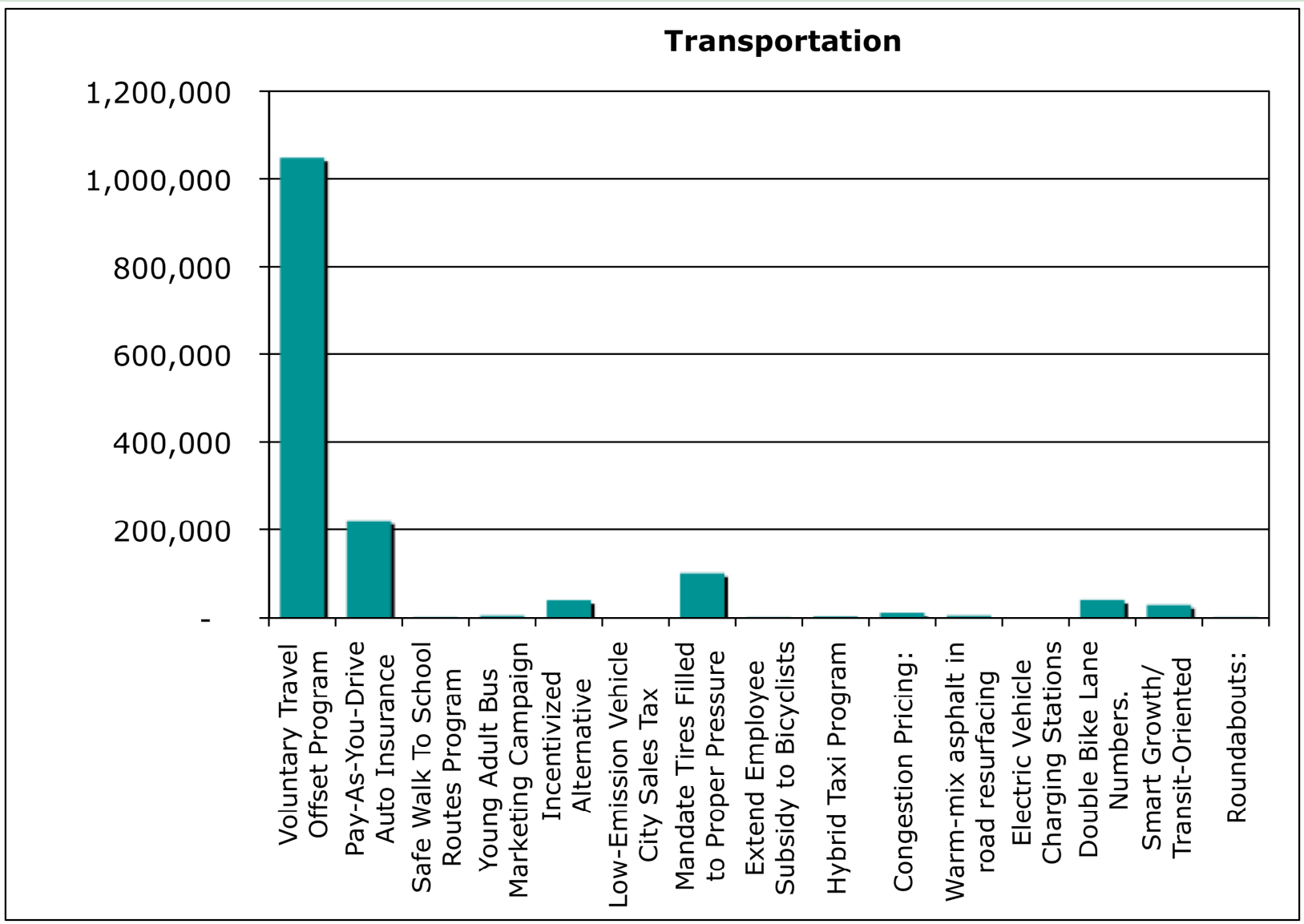
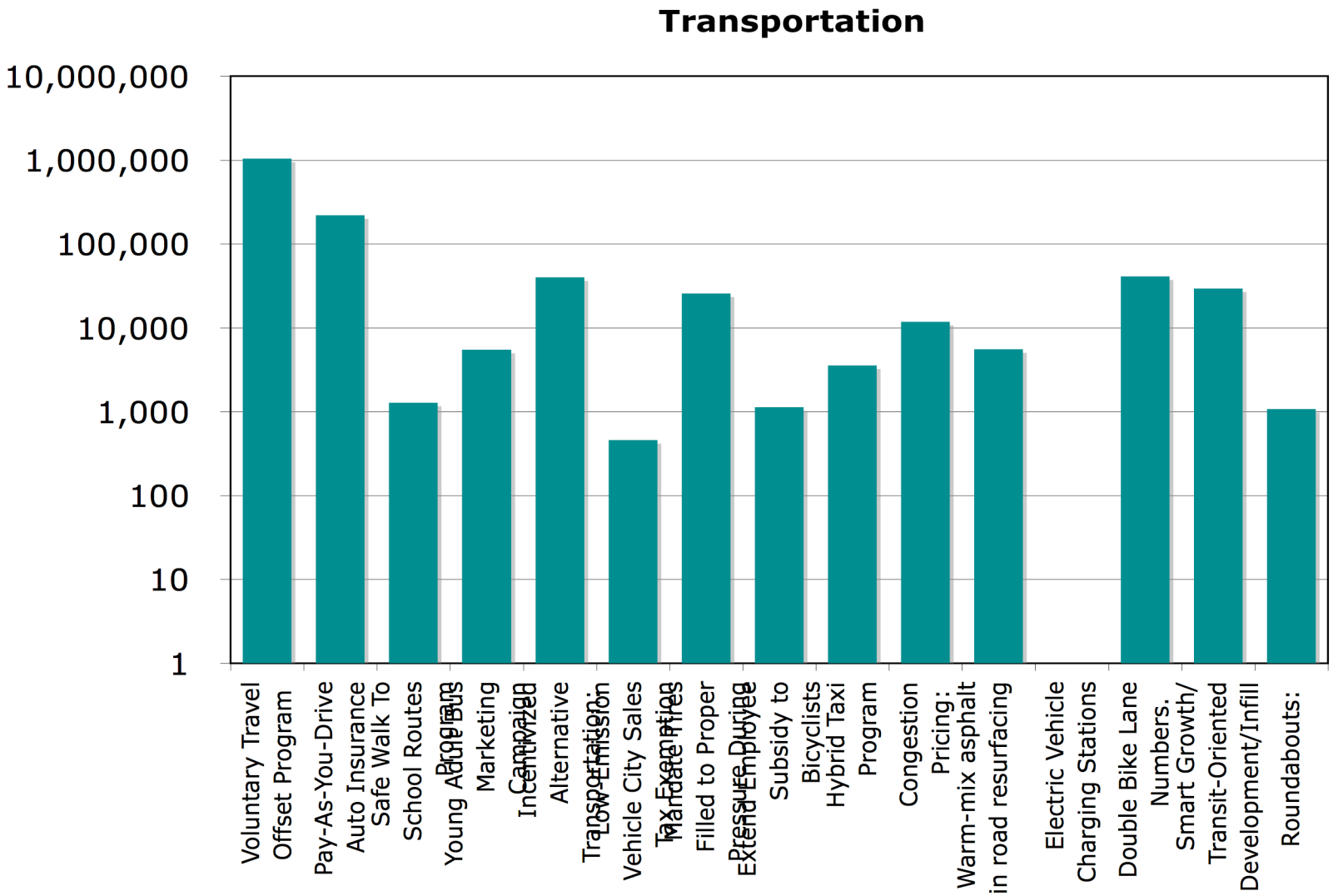

Transportation
1,200,000
1,000,000
800,000
600,000
400,000
200,000
-
Voluntary Travel Offset Program
Pay-As-You-Drive Auto Insurance
Safe Walk To School Routes Program
Young Adult Bus Marketing Campaign
Incentivized Alternative
Low-Emission Vehicle City Sales Tax
Mandate Tires Filled to Proper Pressure
Extend Employee Subsidy to Bicyclists
Hybrid Taxi Program
Congestion Pricing:
Warm-mix asphalt in road resurfacing
Electric Vehicle Charging Stations
Double Bike Lane Numbers.
Smart Growth/ Transit-Oriented
Roundabouts:


Transportation
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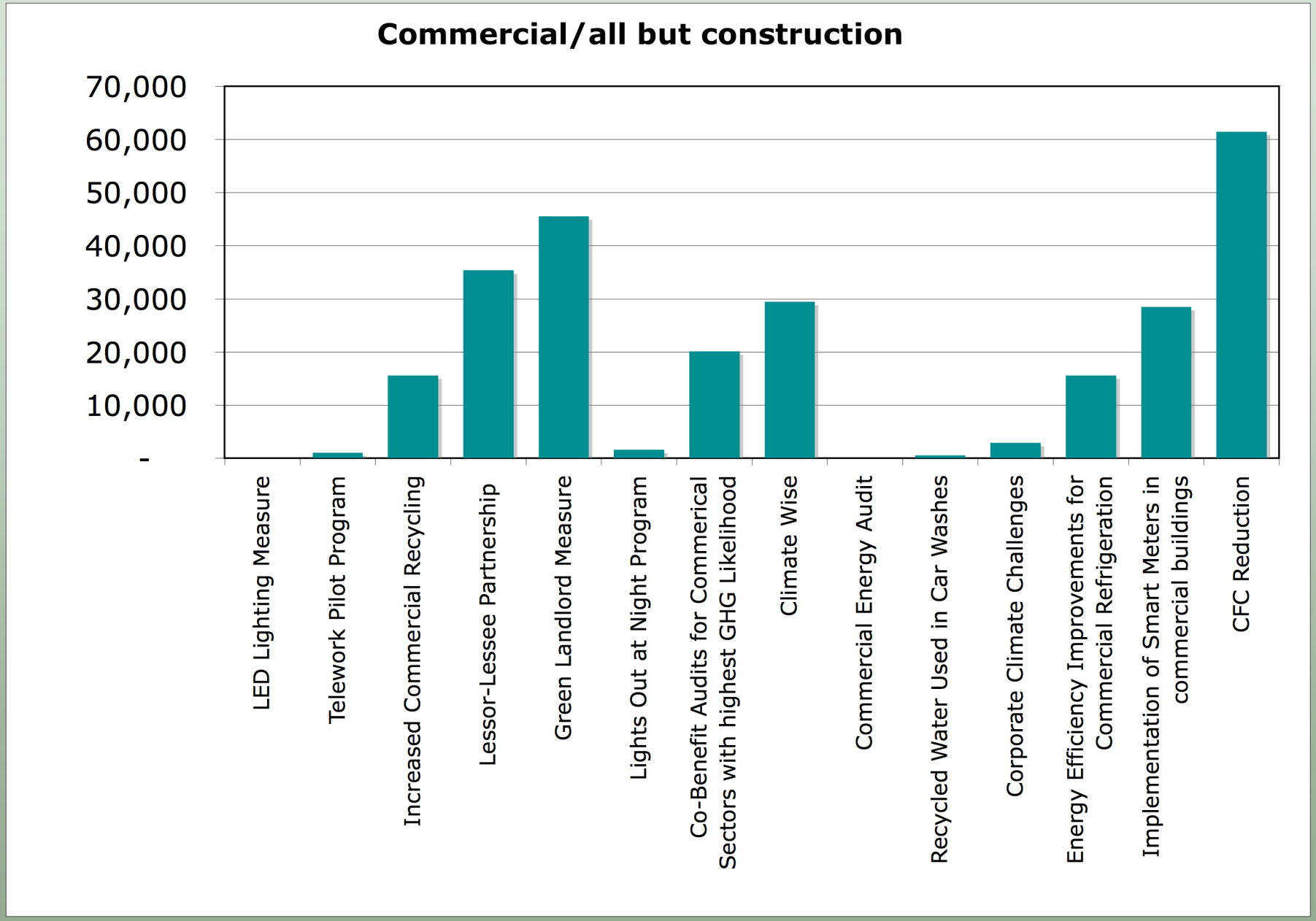
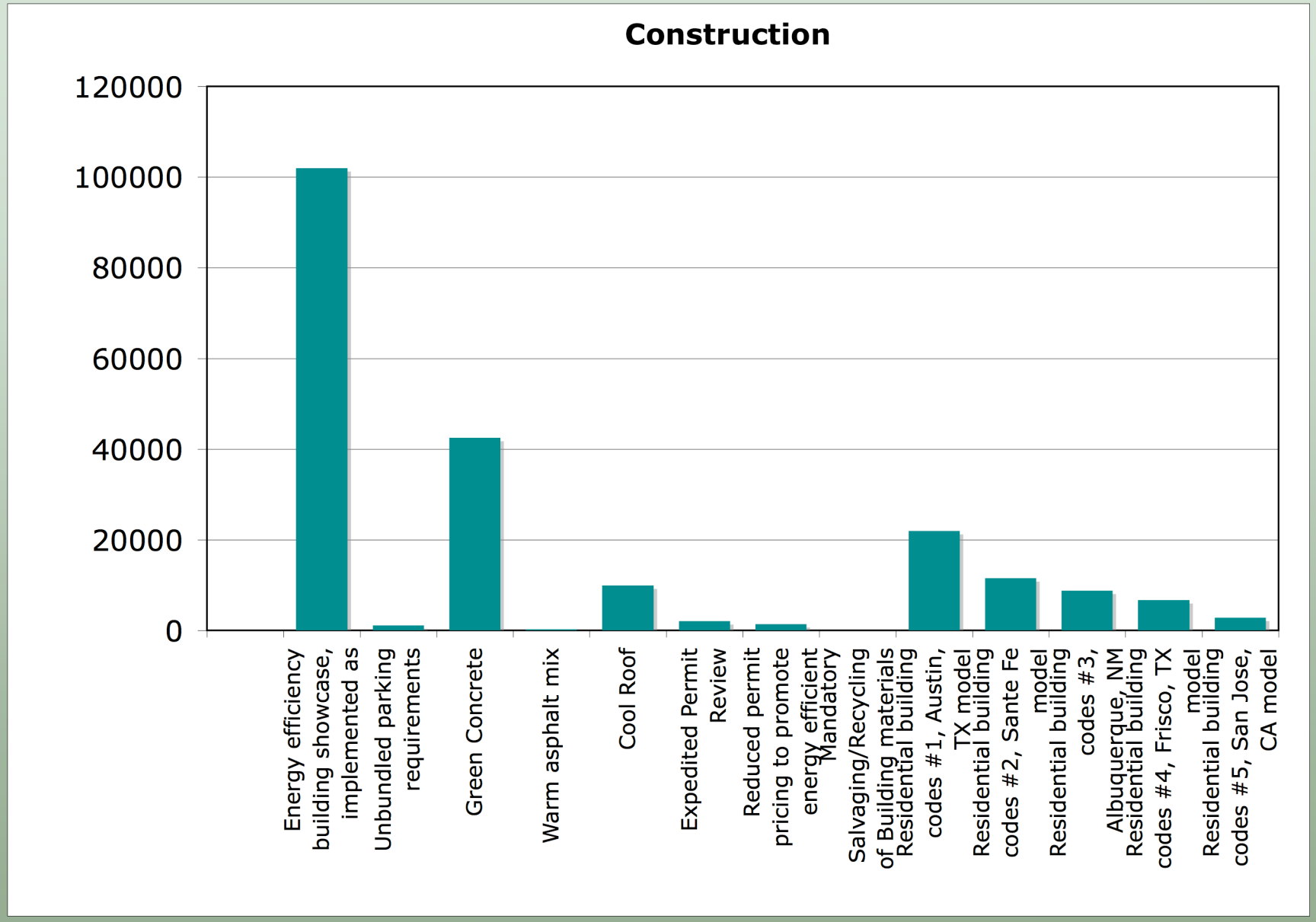
10
1
Voluntary Travel Offset Program
Pay-As-You-Drive Auto Insurance
Safe Walk To School Routes
Young Adult Bus Pass Program
Marketing Campaign
Incentivized Alternative Transportation: Low-Emission Vehicle City Sales Tax Exemption
Mandate Tires Filled to Proper Pressure During Extend Employee Subsidy to Bicyclists
Hybrid Taxi Program
Congestion Pricing:
Warm-mix asphalt in road resurfacing
Electric Vehicle Charging Stations
Double Bike Lane Numbers.
Smart Growth/ Transit-Oriented Development/Infill
Roundabouts:


Commercial/all but construction
70,000
60,000
50,000
40,000
30,000
20,000
10,000
-
LED Lighting Measure
Telework Pilot Program
Increased Commercial Recycling
Lessor-Lessee Partnership
Green Landlord Measure
Lights Out at Night Program
Co-Benefit Audits for Commerical Sectors with highest GHG Likelihood
Climate Wise
Commercial Energy Audit
Recycled Water Used in Car Washes
Corporate Climate Challenges
Energy Efficiency Improvements for Commercial Refrigeration
Implementation of Smart Meters in commercial buildings
CFC Reduction


Construction
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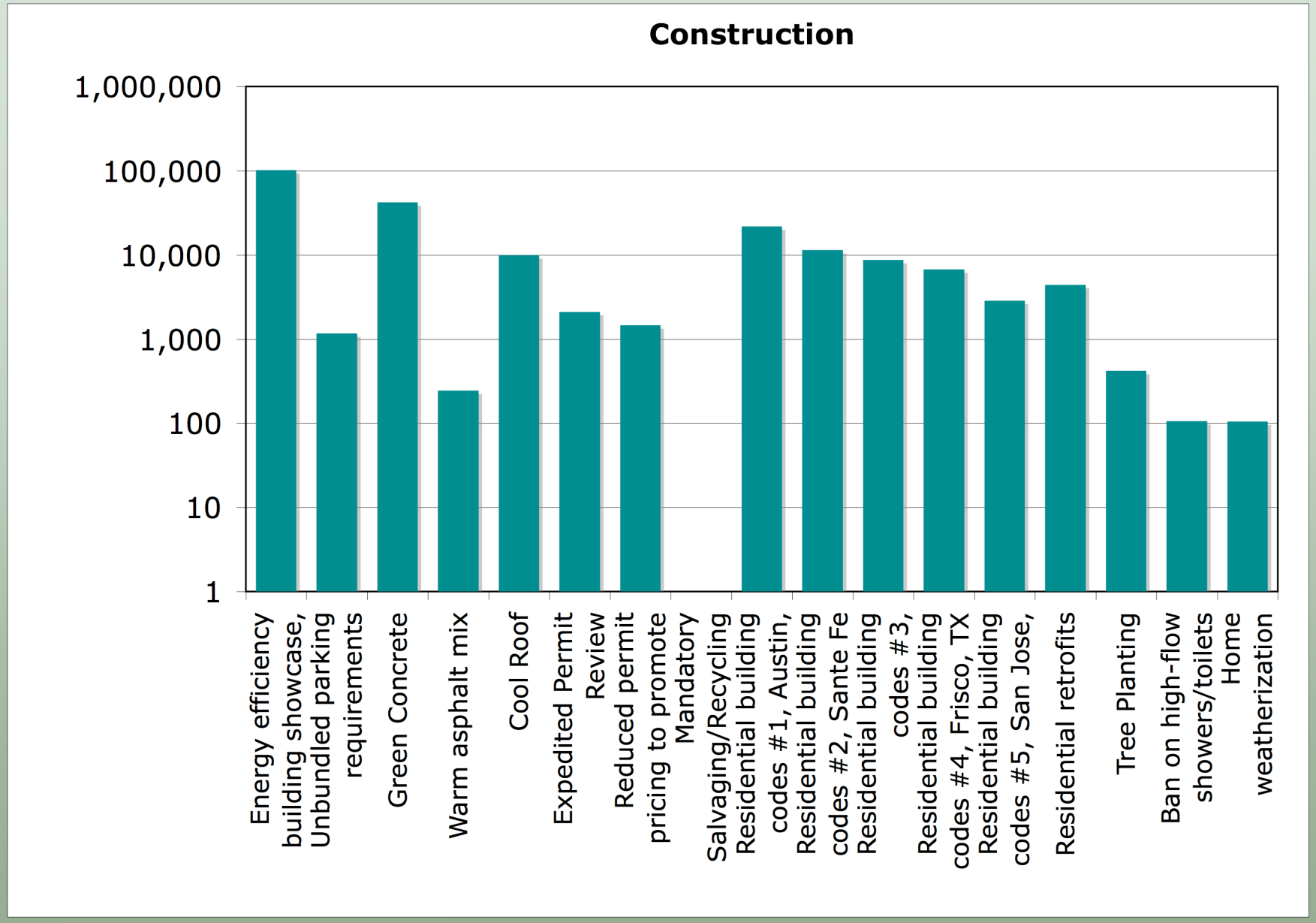
Energy efficiency building showcase, implemented as
Unbundled parking requirements
Green Concrete
Warm asphalt mix
Cool Roof
Expedited Permit Review
Reduced permit pricing to promote energy efficient
Mandatory Salvaging/Recycling of Building materials
Residential building codes #1, Austin, TX model
Residential building codes #2, Sante Fe model
Residential building codes #3, Albuquerque, NM
Residential building codes #4, Frisco, TX model
Residential building codes #5, San Jose, CA model


Construction
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Energy efficiency building showcase,
Unbundled parking requirements
Green Concrete
Warm asphalt mix
Cool Roof
Expedited Permit Review
Reduced permit pricing to promote
Mandatory Salvaging/Recycling
Residential building codes #1, Austin,
Residential building codes #2, Sante Fe
Residential building codes #3,
Residential building codes #4, Frisco, TX
Residential building codes #5, San Jose,
Residential retrofits
Tree Planting
Ban on high-flow showers/toilets
Home weatherization