Climate Action Plan (CAP) 2.0
CAC Meeting December 7, 2017

SAFER, SMARTER, GREENER

Agenda

- **Roll Call Public Comment (5 min)**

- **Welcome**, Introductions- (20 min)

- **Project background** and update- (15 min DNV GL)

- **Business as Usual forecast** and regional emissions per capita; Q and A – (25 min DNV GL)

- **Group activity**: Key Focus Areas, 10 min presentation
- **Brainstorm Focus Areas and Key Strategies** (30 minutes, sharing 10 min, dot voting 5 min)

- **Close** (5 min)
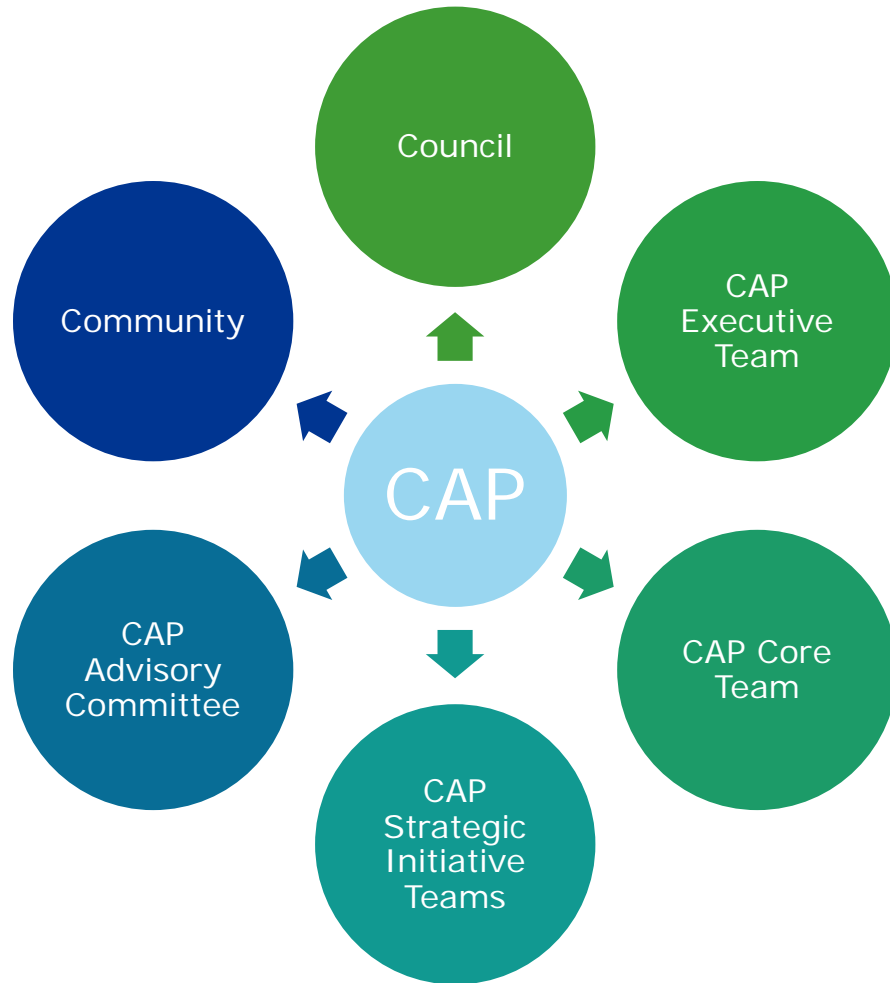
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The Team to Create Sunnyvale's Creative, Realistic, Bold, Achievable CAP 2.0
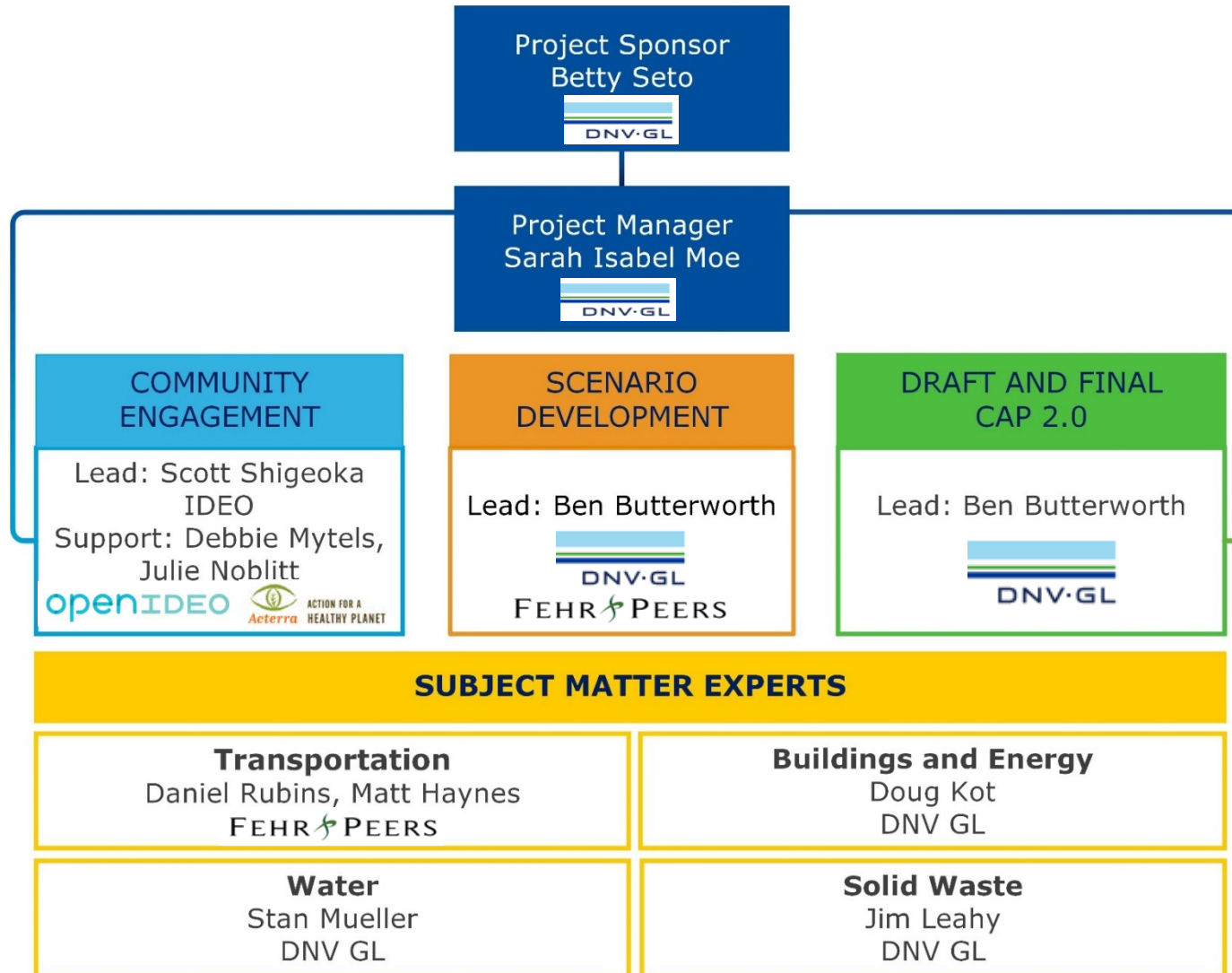
Name, Affiliation

What is your top Climate Action priority? (current or planned future action)

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Sustainability Leadership at Every Level

Council

CAP Executive Team

Community

CAP

CAP Core Team

CAP Advisory Committee

CAP Strategic Initiative Teams

CAP Journey

- **Aspirational** (Goals + Strategies)

- **Operational** (Strategic Internal infrastructure, culture)

- **Implementation** (Marketing/Education, Partnerships/staff, Finance planning)

City Plans Relevant to CAP 2.0

List of Documents	
Biennial Progress Report	Lawrence Station Area Plan
Bicycle Plan	Moffett Park Area Plan
Climate Action Plan 1.0	Parks of the Future Plan
Downtown Specific Plan	Pedestrian Plan
El Camino Real Precise Plan	Peery Park Specific Plan
General Plan Environmental Management Element	Safe Routes to School Plan
General Plan Land Use and Transportation Element (LUTE)	Storm Drain Master Plan
Green Infrastructure Master Plan	Transportation Plan and Completes Streets Plan (Chapter 3 of the City's General Plan)
Hazard Mitigation Plan	Urban Forestry Plan
Lakeside Specific Plan	Vision Zero Plan
Zero Waste Strategic Plan	

- Important to incorporate the goals and priorities of above plans into the CAP 2.0 vision
- What else needs to be incorporated?

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Sunnyvale CAP 2.0 Workplan

TASK 6
COMMUNITY ENGAGEMENT

TASK 2
COMMUNITY IDEATION WORKSHOP

TASK 7
DRAFT & FINALIZE CAP 2.0

TASK 1
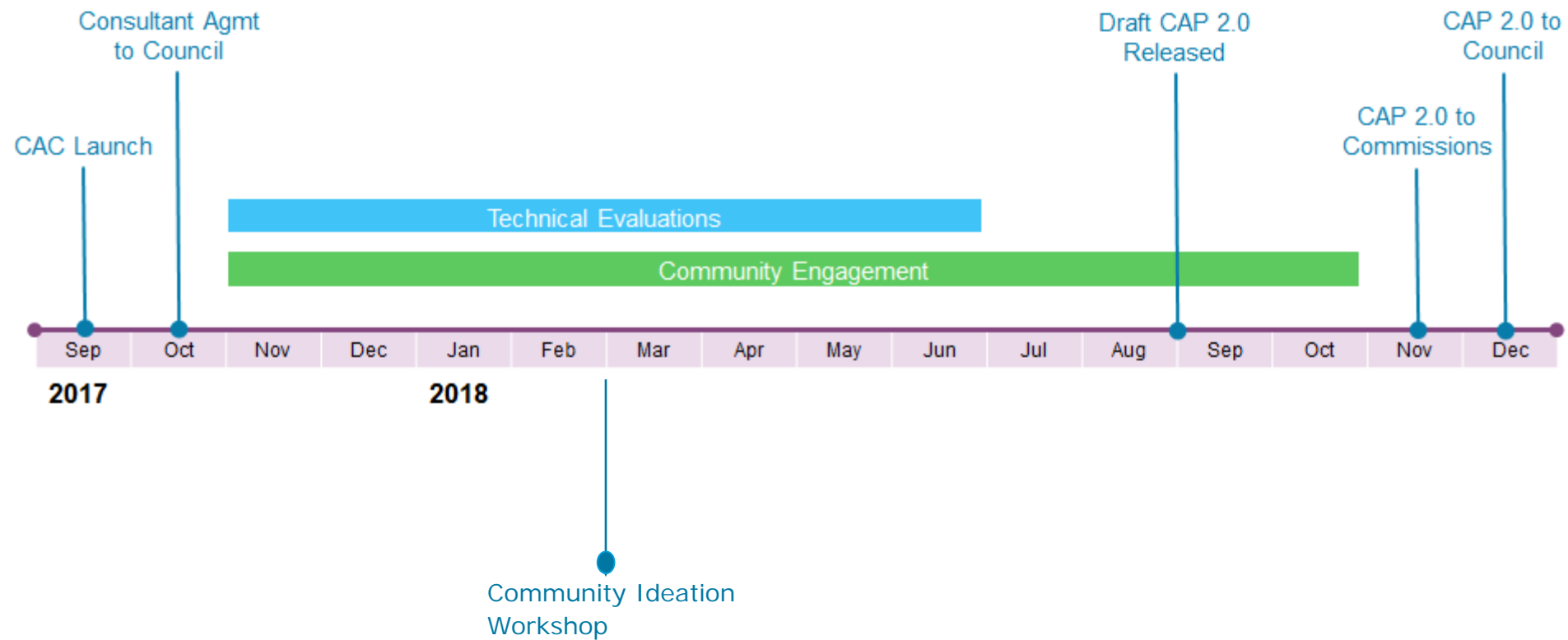**ADVISORY COMMITTEE MEETINGS**

1   2   3   4   5   6

TASK 3
GHG ANALYSIS & KEY FOCUS AREAS

TASK 4
40% AND 80% SCENARIO ANALYSIS

TASK 5
STRATEGIC FRAMEWORK & FUNDING

Sunnyvale CAP 2.0 Timeline

Task 1. Facilitate CAP Advisory Committee

- *Meeting 1:* Project kick-off meeting: GHG Inventory Review, Business as Usual Forecast- & Focus Area Brainstorm

- *Meeting 2:* "Climate Action Charrette" and prototype the Community Ideation and Brainstorm Workshop; Commercial/Industrial focus

- *Meeting 3*: CAP Organizing framework Review -menu of specific actions and focus areas to be included in scenario development; Review Initial Scenarios; Buildings/energy focus - Train Trainers – Vet top idea.

- *Meeting 4:* Update on Scenario Planning 2030 and 2050; Trend Lab/Transportation focus

- **Meeting 5:** Implementation Focus: Strategic Framework and funding opportunities

- *Meeting 6:* Review Administrative Draft CAP

Task 1:
Advisory Committee Meetings

1 2 3 4 5 6

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Tasks 2. and 6. Community Engagement and Ideation

OUTREACH — PROTOTYPE WORKSHOP — OFFICIAL WORKSHOP — IDENTIFY CHAMPIONS — TRAIN-THE-TRAINER — COMMUNITY WORKSHOPS

Key activities and deliverables:

- **Community Engagement Plan**
- **Community Ideation Workshop** in February/March 2018 led by IDEO
- **Identify Community Leaders**
- **Support Leading Community Workshops in Sunnyvale**
- **OpenIDEO web portals** for ongoing ideation
- **Public input to feed into CAP** and public comment on draft
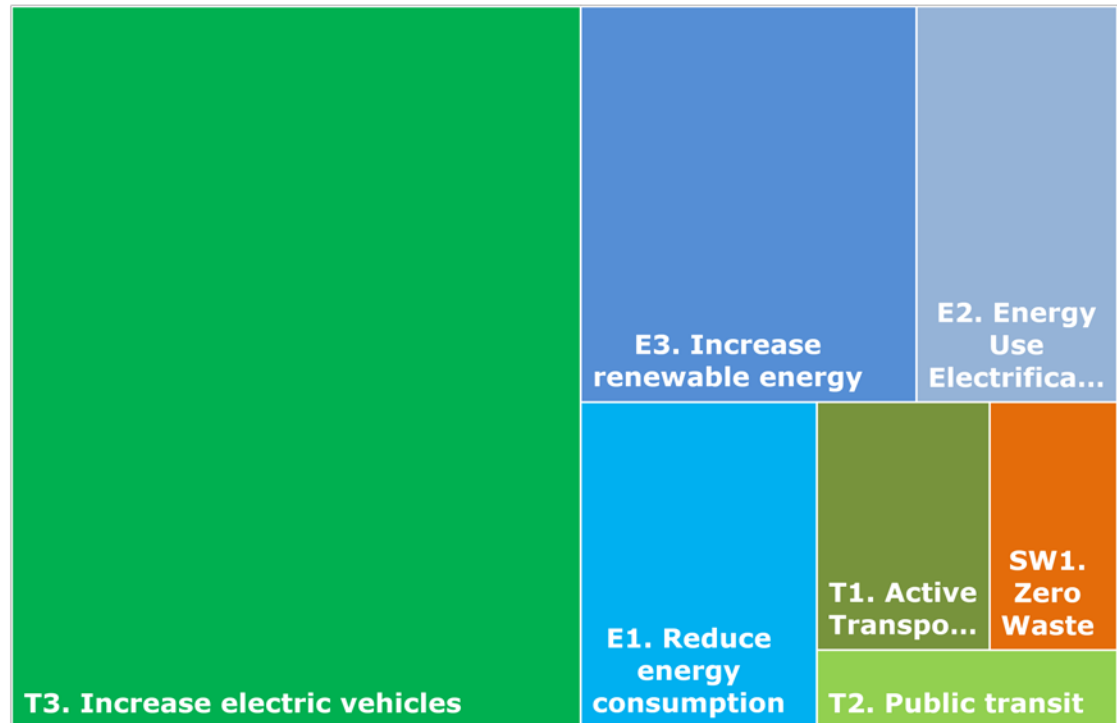- **Presence on the city website**

For discussion:

- Who should we include into the community engagement piece?

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Task 3. Determine Key Focus Areas

- **3.1** Background research on key focus areas, including CAP 1.0, 2014 inventory

- **3.2** Develop proposed CAP 2.0 Focus Areas based on background research and Task 1 Brainstorm/Ideation
  - Vet focus areas with City staff and Advisory Committee

- **3.3** GHG emissions reductions (following Task 4)

- **For discussion:**

Other hot button issues to keep in mind?

SANTA MONICA CARBON NEUTRAL BY 2035 SCENARIO

T3. Increase electric vehicles

E3. Increase renewable energy

E2. Energy Use Electrifica...

E1. Reduce energy consumption

T1. Active Transpo...

SW1. Zero Waste

T2. Public transit

Task 4. 2030 and 2050 Scenario Analysis

- Vet and agree on CAP 2.0 organizing framework
  - Focus Area – Actions
  - Build out the CAP 2.0 Scenario Analysis Tool
  - GHG Projections with state measures
  - Integrate Fehr & Peers TrendLab

- Prioritize implementation actions
  - Scoring methodology versus ranking based on specific metric ($/MTCO2, payback, other financial metric)

- **For discussion:**

Initial questions or comments about prioritization?

Develop proposed focus areas and menu of specific actions

Estimate GHG savings for 2030 and 2050
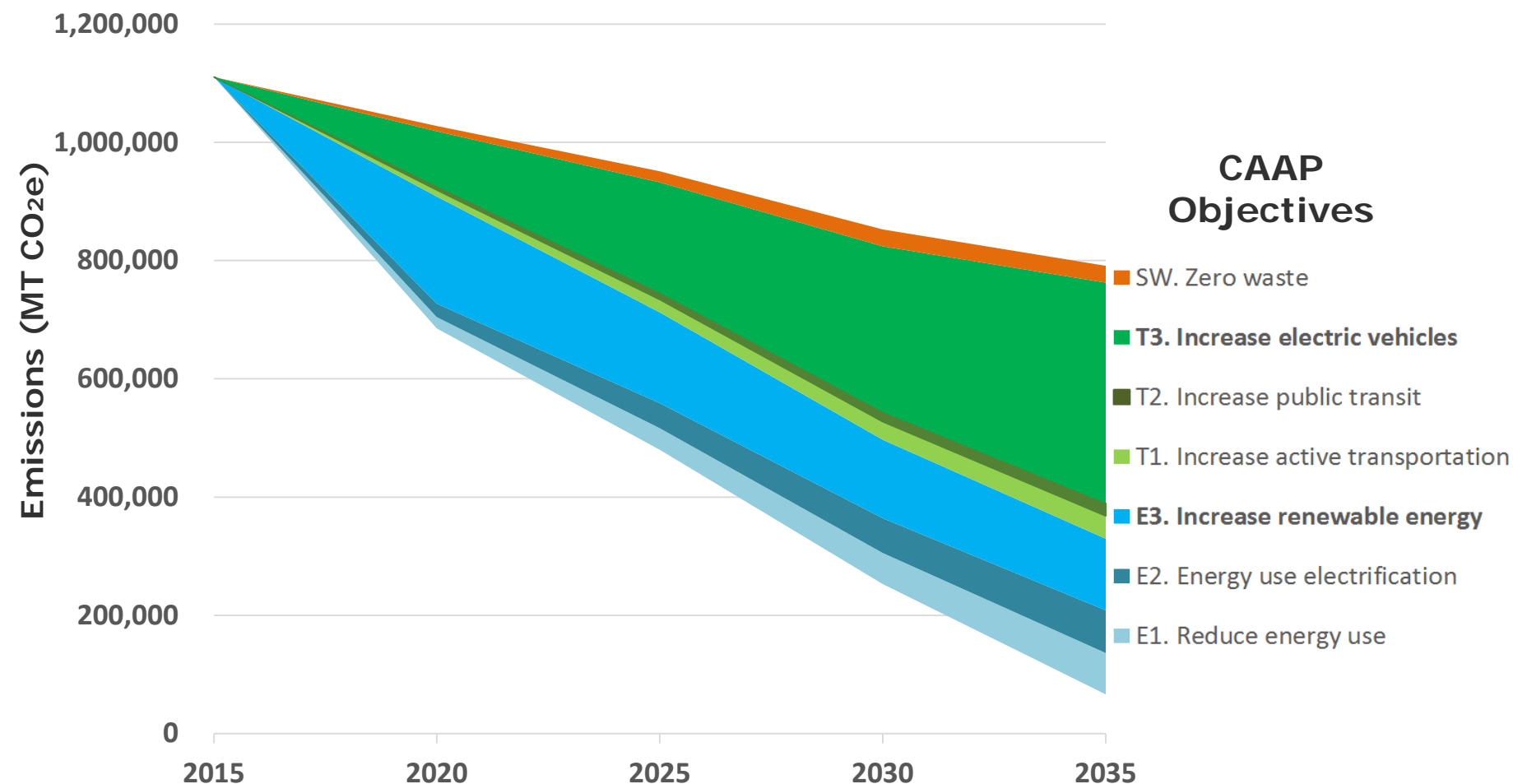- Climate Scenario Analysis Tool

Prioritize based on:
- Impact-feasibility assessment
- Key metrics ($/ton, payback, or scoring)
- Community input

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2035 Carbon Neutrality Roadmap Scenario
Electrification & Renewable Energy as Key Drivers

CAAP Objectives

- SW. Zero waste
- **T3. Increase electric vehicles**
- T2. Increase public transit
- T1. Increase active transportation
- **E3. Increase renewable energy**
- E2. Energy use electrification
- E1. Reduce energy use

Emissions (MT CO_2e)

Task 5. Strategic Framework and Funding

- After stakeholder vetting of 40% and 80% scenarios, specific strategies and priority actions summarized; online OpenIDEO top ideas incorporated

  - Initial near-term implementation steps identified

- Cross-department collaboration, community implementers and partners to the table

  - Identify funding sources and innovative financing strategies

For discussion:

- How to be sure plan sticks?

Task 7. Draft and Finalize CAP 2.0

CAP 2.0	Stakeholder input
Administrative Draft	• City staff • Advisory Committee
Public Review Draft	• Public meeting • Online input (OpenIDEO) • Community-led input via train-the-trainers • Council Study Session • All City Commissions to review
Final Adoption	• Council meeting

For discussion:

▪ Who are community leaders to be trained to lead workshops?

Business as Usual Preliminary Forecast

Ben Butterworth, DNV GL

City of Sunnyvale CAP 2.0: Achieving Bold Climate Goals
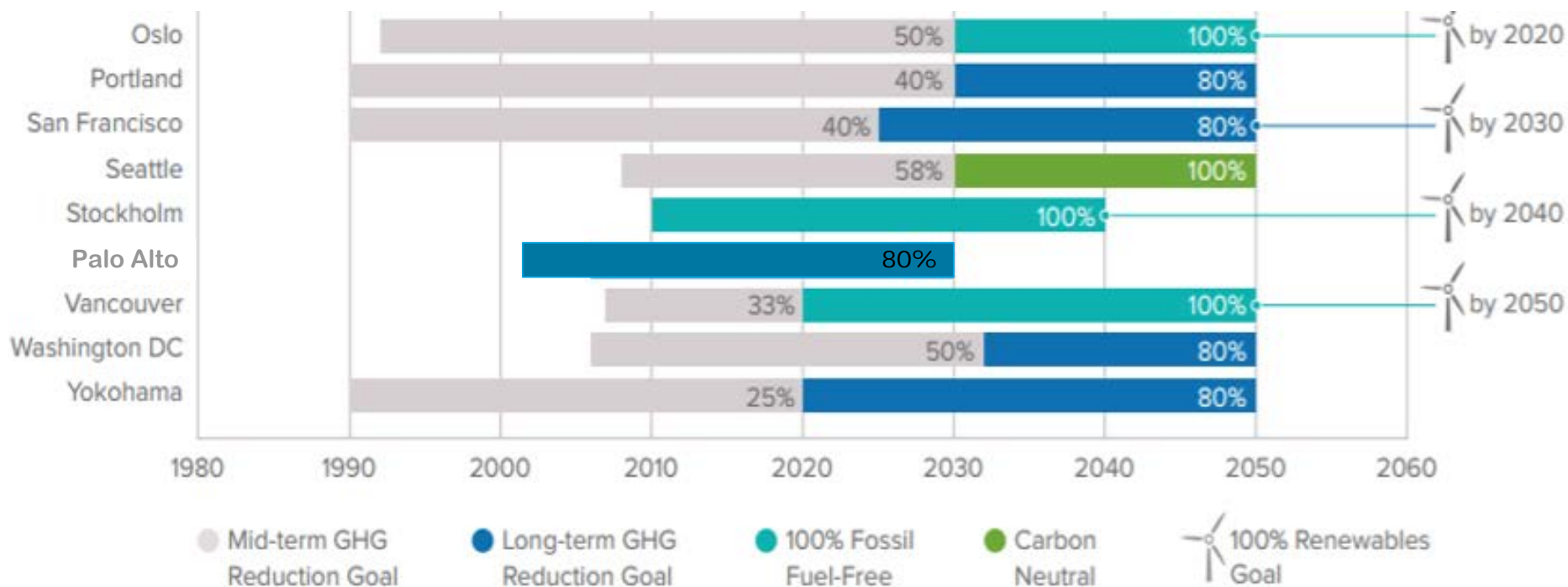
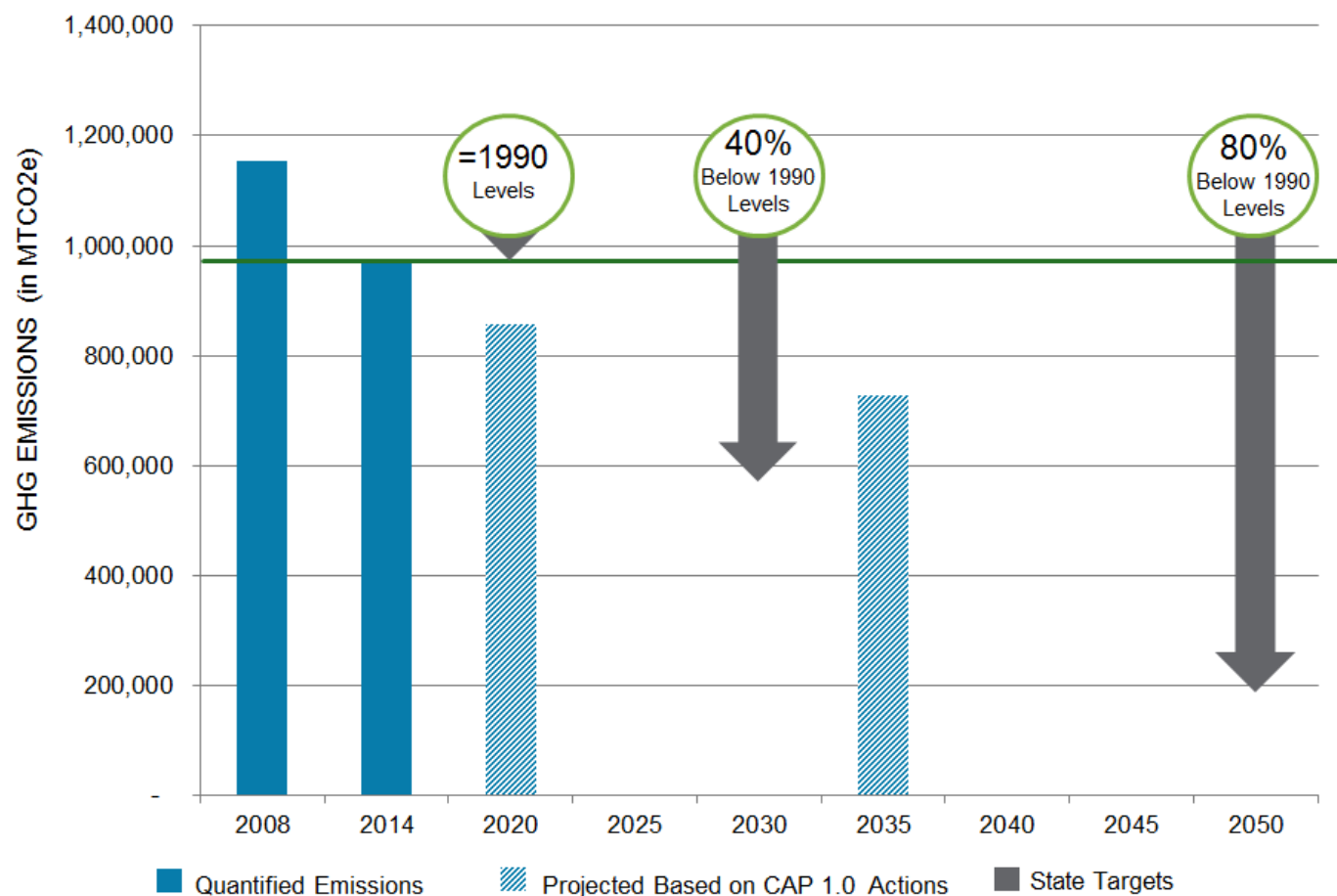## Decarbonization calls for transformation

40 x 2030

80 x 2050

Engaging the enthusiasm of local community and innovation of Silicon Valley

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Climate Action Goals of Leading Cities
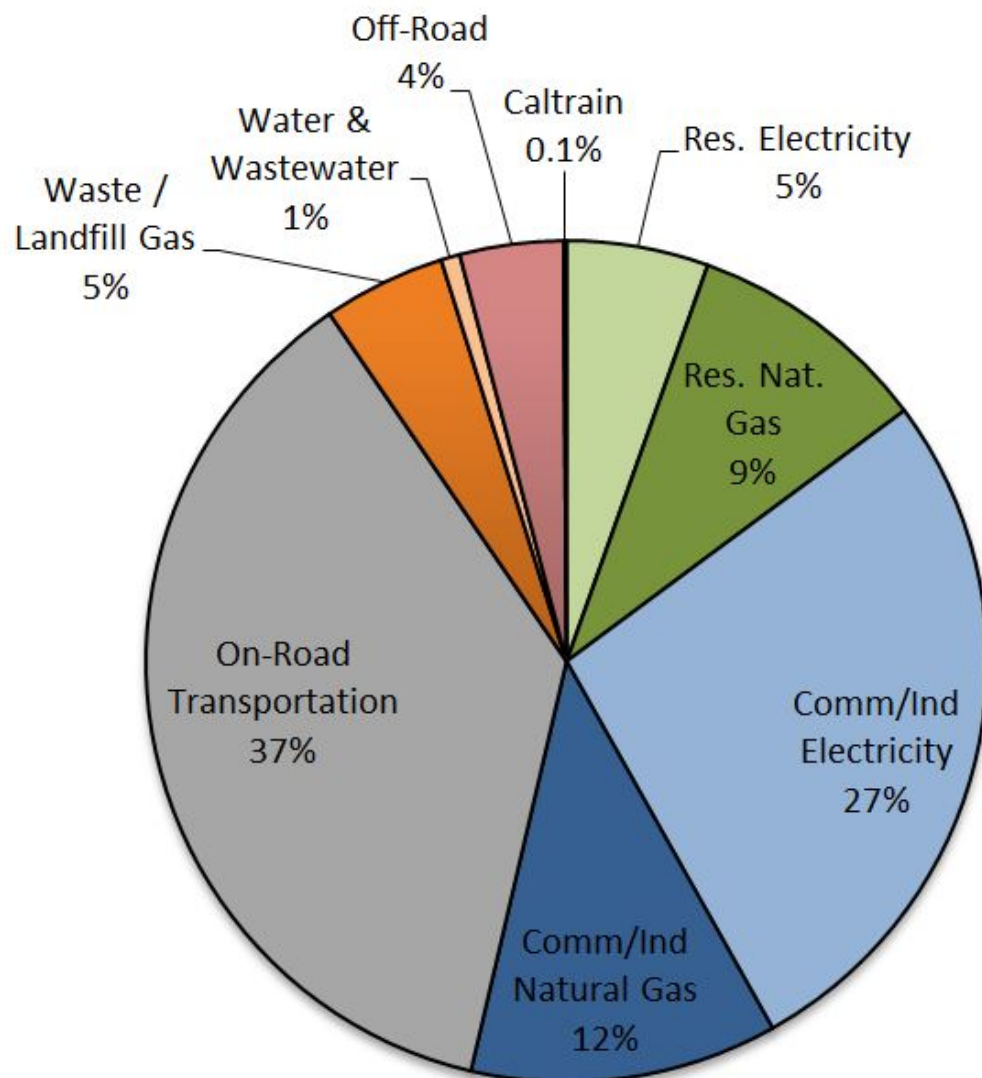
Sunnyvale Emissions Reduction Progress

- CAP 1.O:
  - On target to achieve 2020 State target
  - Not designed to achieve:
    - 2030 target (40% below 1990)
    - 2050 target (80% below 1990)

Sunnyvale 2014 Community-wide GHG Inventory

Energy consumption in buildings (54%) and on-road transportation (37%) account for the vast majority of emissions

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Territorial-Based vs. Consumption-Based GHG Emissions Inventories

Territorial-Based

- Allocate emissions to a city based on activities taking place in that city
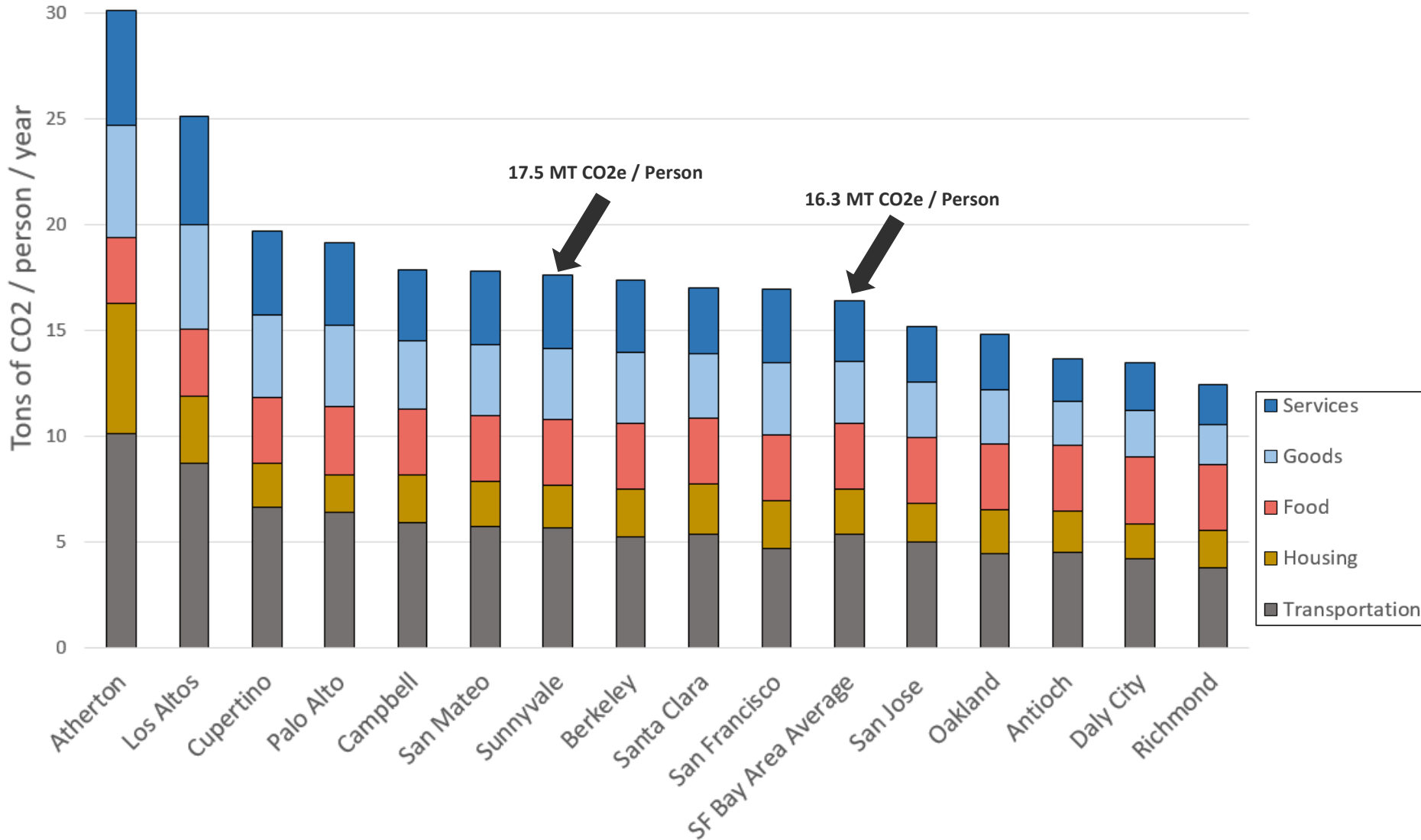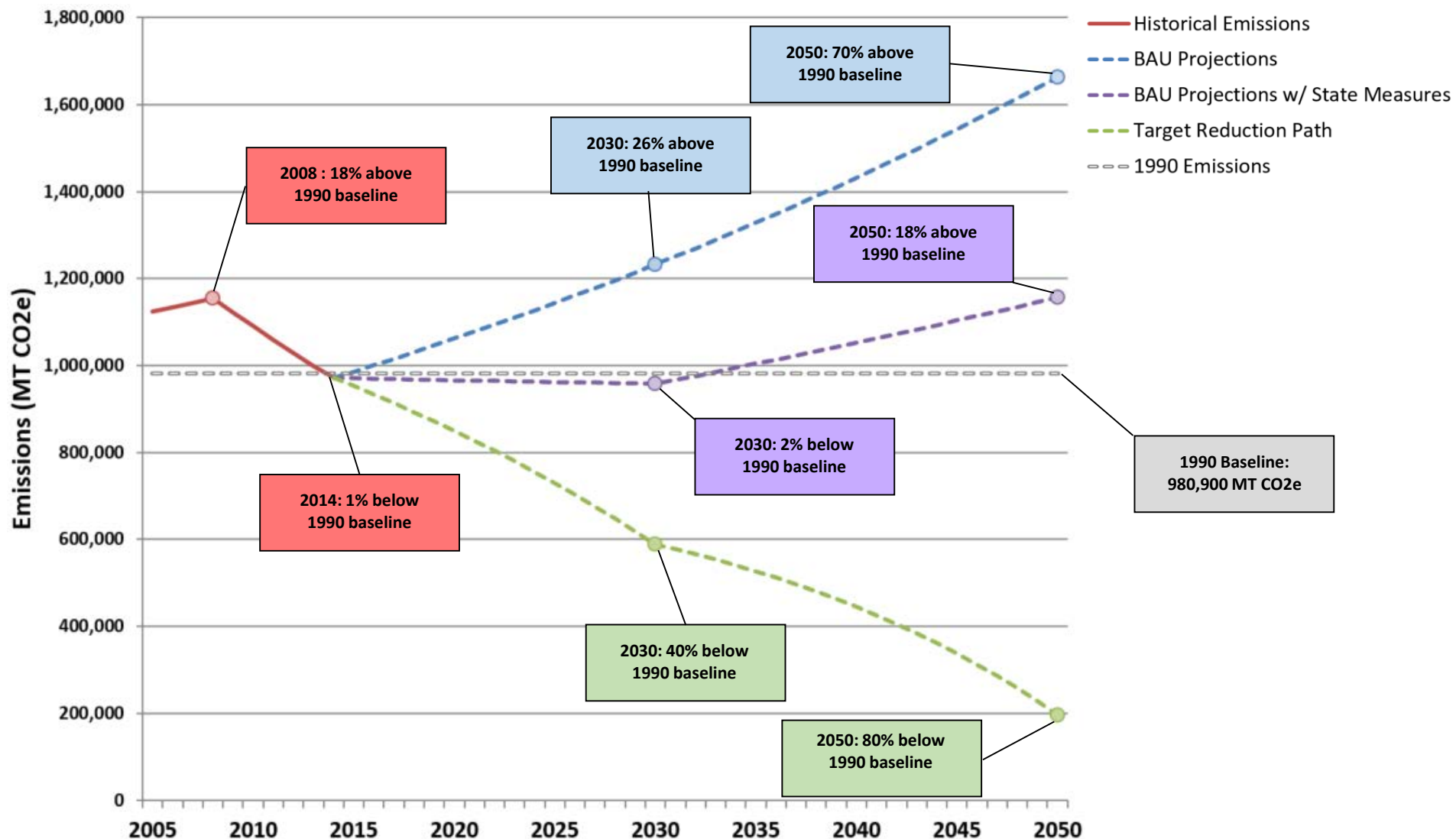   - e.g. iPhone charged in Sunnyvale

Consumption-Based

- Allocates all emissions associated with goods and services to consumers in a city, regardless of where emissions are released to the atmosphere in supply chains
    - e.g. iPhone made in China

Comparing Emissions Per Capita Across Bay Area Cities
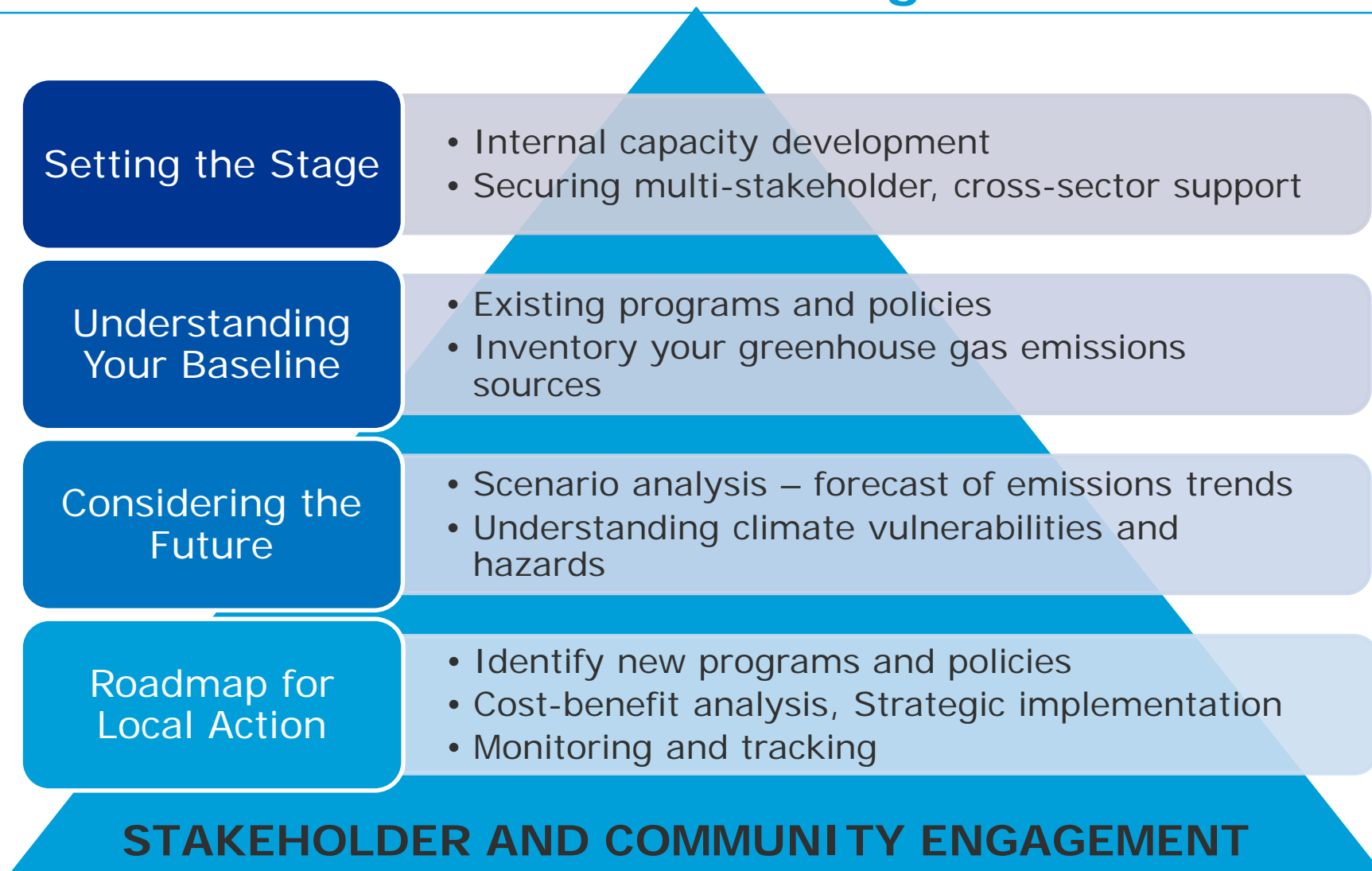
Sunnyvale GHG Emissions Forecast

Sunnyvale GHG Emissions Forecast: Impact of State Measures

Description	2030 Emissions (MT CO2e)	2050 Emissions (MT CO2e)
Business-As-Usual	**1,232,332**	**1,663,545**
Clean Car Standards	-164,080	-281,134
Low Carbon Fuel Standard	-1,357	-1,739
Renewable Portfolio Standard	-93,842	-110,487
Caltrain Electrification	-895	-1,247
Zero Net Energy New Residential	-14,295	-48,514
Zero Net Energy New Non-Residential	0	-63,957
All State Measures	**-274,469**	**-507,078**
Business-As-Usual with State Measures	**957,862**	**1,156,468**
Emissions Target	**588,525**	**196,175**
Remaining Emissions Reduction Required from City Climate Action	**-369,338**	**-960,293**

Questions about Sunnyvale's business as usual forecast?

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Group Activity

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DNV GL Climate Action Planning Framework

Setting the Stage
- Internal capacity development
- Securing multi-stakeholder, cross-sector support

Understanding Your Baseline
- Existing programs and policies
- Inventory your greenhouse gas emissions sources

Considering the Future
- Scenario analysis – forecast of emissions trends
- Understanding climate vulnerabilities and hazards

Roadmap for Local Action
- Identify new programs and policies
- Cost-benefit analysis, Strategic implementation
- Monitoring and tracking

STAKEHOLDER AND COMMUNITY ENGAGEMENT

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Why Are Local Governments Taking Action?

Equity

Quality of Life

Community Building

Resilience

Prosperity
Triple bottom line
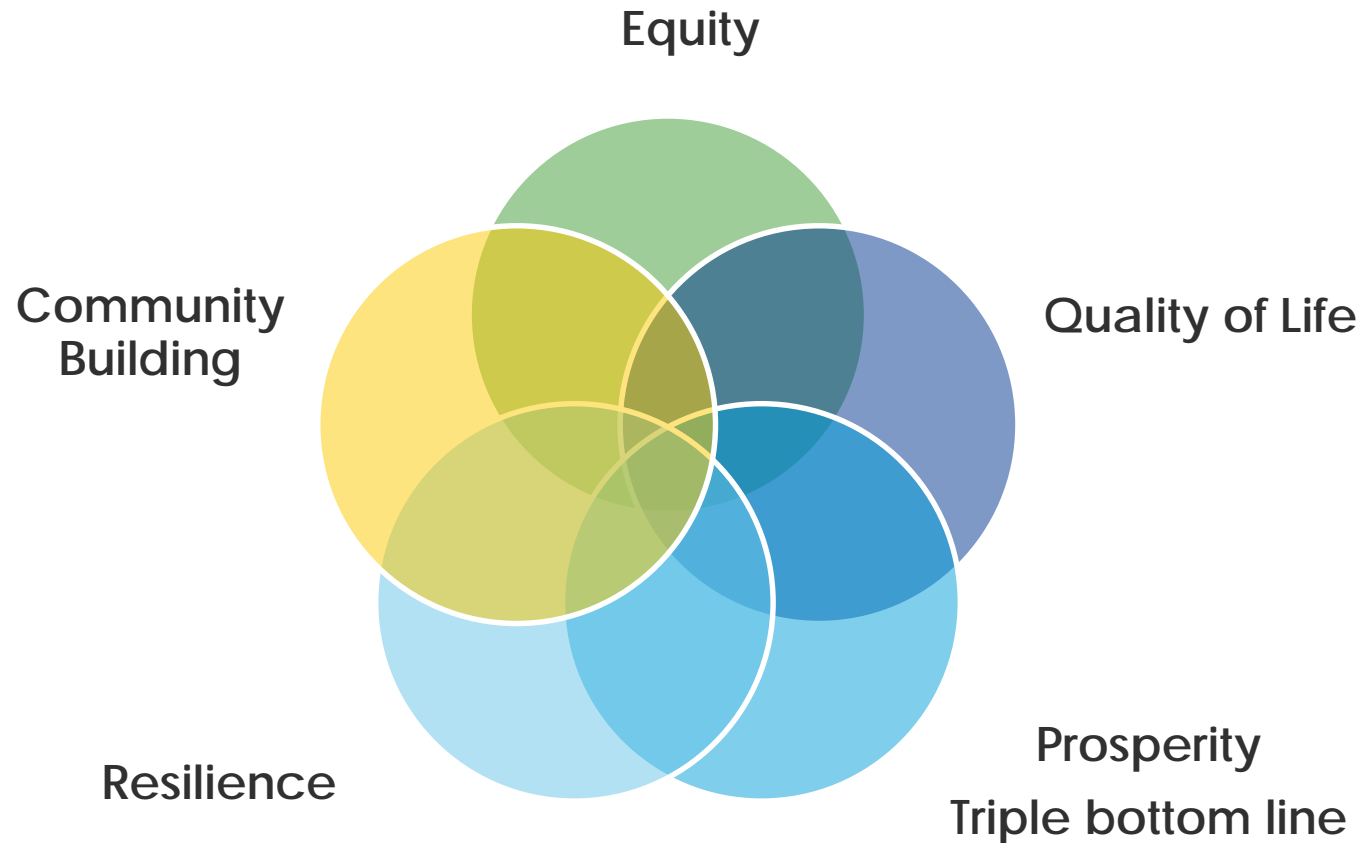
The GHG reduction strategies are separated by goal or topic area to correspond with the sectors and sources of GHG emissions as follows:

OS Open Space and Urban Forestry	EC Decrease Energy Consumption	EP Provide a Sustainable Energy Portfolio	WC Decrease Water Consumption	LW Reduce Landfilled Waste
OR Reduce Off-Road Equipment Emissions	SA Increase and Retain Awareness of Sustainability Issues	LUP Improve Mobility Through Land Use Planning	CTO Expand Sustainable Circulation and Transportation Options	OVT Optimize Vehicular Travel

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Santa Monica: Focus Areas for Climate Action and Adaptation

Rethinking Mobility	**Energy in Buildings: Electrifying our City**	**Adaptation and Climate Change**
Zero Waste and the Circular Economy	**Getting Smart about Water**	**Municipal Operations – Leading the Way**
Utility of the Future	**Community Behavior and Culture Change**	**Regeneration and the Natural Environment**

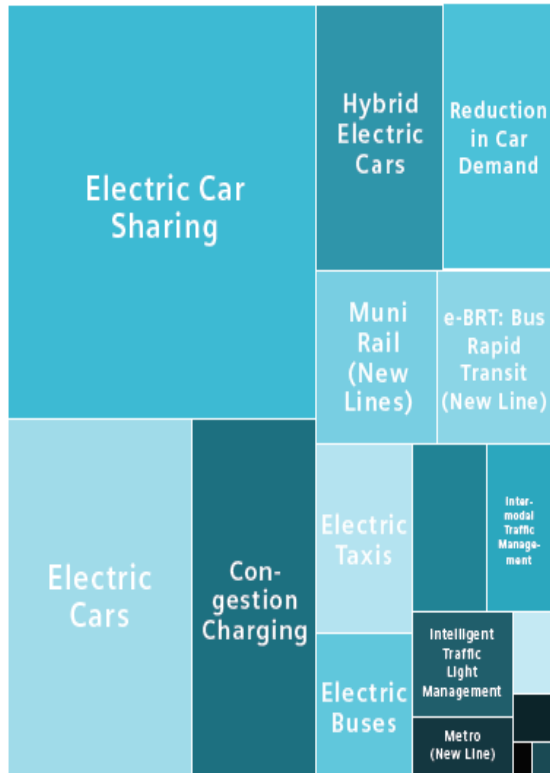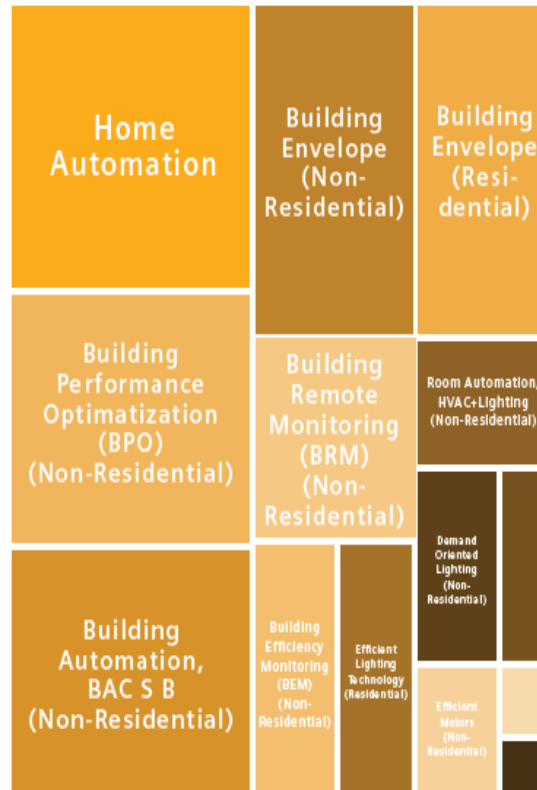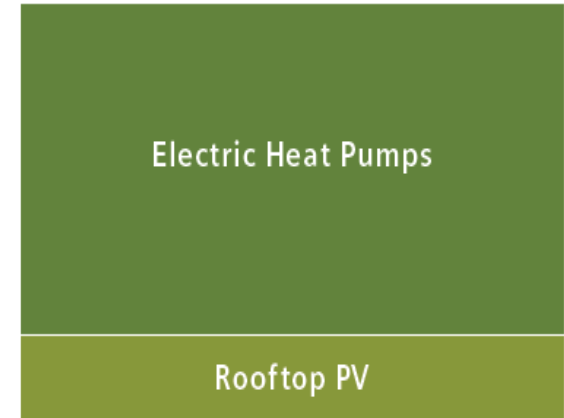| Levers	Goals	City of Palo Alto
Rethinking Mobility	Expand non-auto mobility options	T-FAC-1: Expand bicycle network and infrastructure T-FAC-2: Expand transit facilities and services T-FAC-3: Facilitate shared transport options
	Create right financial incentives for alternatives	T-INC-1: Provide universal transit access T-INC-2: Utilize parking pricing and management
	Implement land-use approaches	T-LU-1: Pursue jobs-housing balance
	Reduce carbon intensity of vehicular travel	T-EV-1: Convert Palo Alto vehicles to electric vehicles T-EV-2: Convert in-bound vehicles to electric vehicles
Electrifying our City	Reduce use in existing homes	NG-RES-1: Electrify residential water heating NG-RES-2: Electrify residential space heating
	Reduce use in existing businesses	NG-COMM-1: Electrify commercial water heating NG-COMM-2: Electrify commercial space heating NG-COOK-1: Electrify commercial cooking
	Reduce use in new buildings	NG-GAS-1: Zero net energy new construction
	Reduce carbon content (offsets or biogas)	NG-OFF-1: Purchase carbon offsets NG-OFF-2: Procure biogas
Smart about Water	Reduce consumption	Expand demand management measures
	Supplement supply	Rainwater and greywater capture
Zero Waste	Enhance programs	Recycling, compost and reuse programs and policies
	Infrastructure investments	New organic waste processing facility

San Francisco 80 x 50

TRANSPORT: -30.8% CO₂eq

Electric Car Sharing
Hybrid Electric Cars
Reduction in Car Demand
Muni Rail (New Lines)
e-BRT: Bus Rapid Transit (New Line)
Electric Cars
Con-gestion Charging
Electric Taxis
Inter-modal Traffic Manage-ment
Intelligent Traffic Light Management
Electric Buses
Metro (New Line)

BUILDINGS: -32.6% CO₂eq

Home Automation
Building Envelope (Non-Residential)
Building Envelope (Resi-dential)
Building Performance Optimatization (BPO) (Non-Residential)
Building Remote Monitoring (BRM) (Non-Residential)
Room Automation, HVAC+Lighting (Non-Residential)
Demand Oriented Lighting (Non-Residential)
Building Automation, BAC S B (Non-Residential)
Building Efficiency Monitoring (BEM) (Non-Residential)
Efficient Lighting Technology (Residential)
Efficient Motors (Non-Residential)

ENERGY: -17.2% CO₂eq

Electric Heat Pumps
Rooftop PV

Source: CyPT Model

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San Francisco Climate Action — 0 50 100

Portland

BUILDINGS AND ENERGY

2030 OBJECTIVES

1 Reduce the total energy use of all buildings built before 2010 by 25 percent.

2 Achieve zero-net carbon emissions in all new buildings and homes.

3 Supply 50 percent of all energy used in buildings from renewable resources, with 10 percent produced within Multnomah County from on-site renewable sources, such as solar.

URBAN FORM AND TRANSPORTATION

2030 OBJECTIVES

4 Create vibrant neighborhoods where 80 percent of residents can easily walk or bicycle to meet all basic daily, non-work needs and have safe pedestrian or bicycle access to transit. Reduce daily per capita vehicle miles traveled by 30 percent from 2008 levels.

5 Improve the efficiency of freight movement within and through the Portland metropolitan area.

6 Increase the fuel efficiency of passenger vehicles to 40 miles per gallon and manage the road system to minimize emissions.

7 Reduce lifecycle carbon emissions of transportation fuels by 20 percent.

CONSUMPTION AND SOLID WASTE

2030 OBJECTIVES

8 Reduce consumption-related emissions by encouraging sustainable consumption and supporting Portland businesses in minimizing the carbon intensity of their supply chains.

9 Reduce food scraps sent to landfills by 90 percent.

10 Reduce per capita solid waste by 33 percent.

11 Recover 90 percent of all waste generated.

FOOD AND AGRICULTURE

2030 OBJECTIVES

12 Reduce consumption of carbon-intensive foods and support a community-based food system.

URBAN FOREST, NATURAL SYSTEMS AND CARBON SEQUESTRATION

2030 OBJECTIVES

13 Sequester carbon through increased green infrastructure (trees, plants, soil) and natural areas. Reduce effective impervious areas by 600 acres. Expand the urban forest canopy to cover at least one-third of the city with a minimum canopy cover of 25 percent of each residential neighborhood and 15 percent of the central city, commercial and industrial areas.

CLIMATE CHANGE PREPARATION

2030 OBJECTIVES

14 Reduce risks and impacts from heat, drought and wildfire by preparing for hotter, drier summers with increased incidence of extreme heat days.

15 Reduce risks and impacts from flooding and landslides by preparing for warmer winters with the potential for more intense rain events.

16 Build City and County staff and community capacity to prepare for and respond to the impacts of climate change.

What Can Community Members Do?

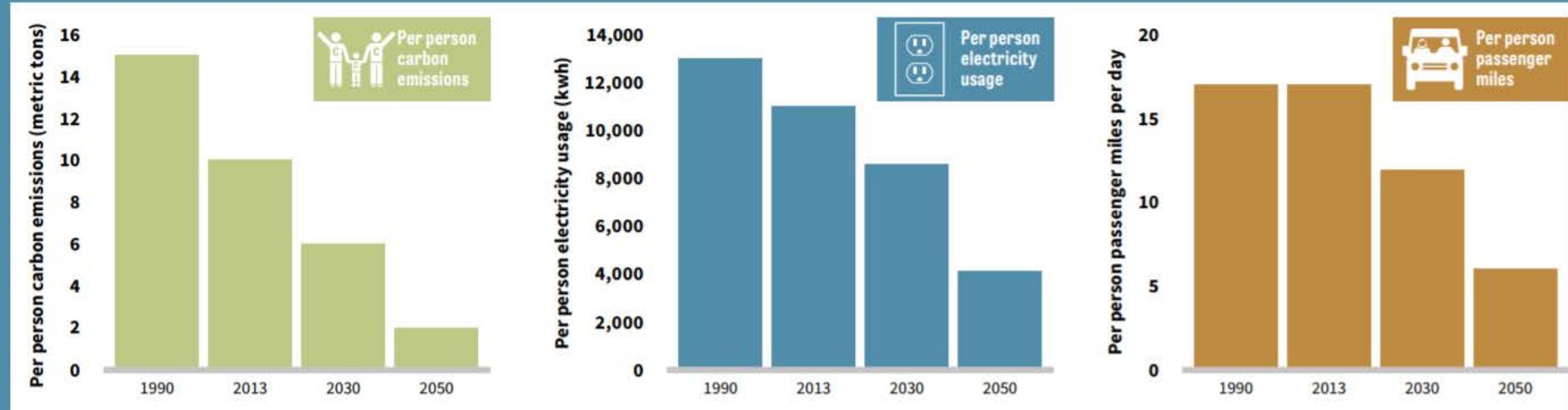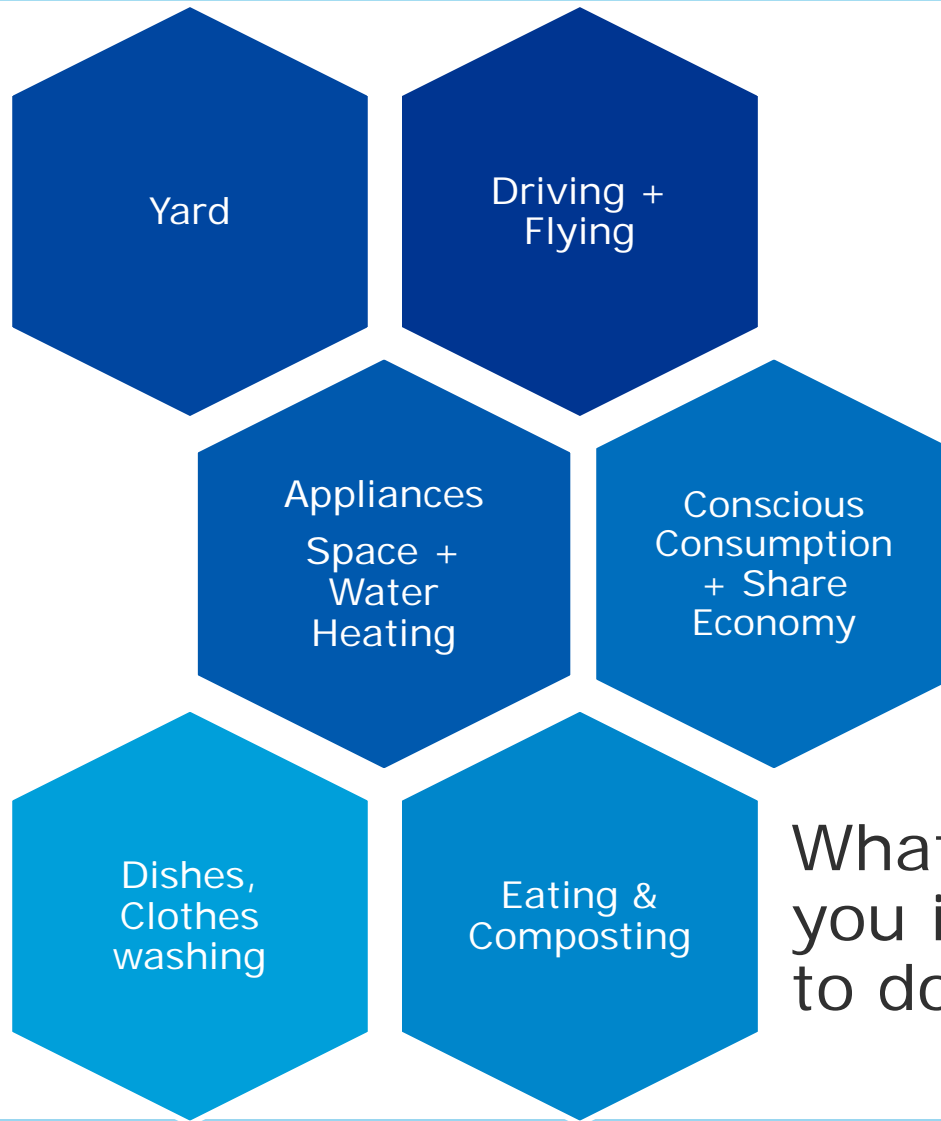**Drive less and use less electricity to help meet Portland's goal**

Figure 4. Per person carbon emissions, electricity use and passenger miles in 2030 and 2050. *Source: Portland Bureau of Planning and Sustainability*

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Top Personal Sustainability Actions

Yard

Driving + Flying

Appliances Space + Water Heating

Conscious Consumption + Share Economy

Dishes, Clothes washing

Eating & Composting

What are you inspired to do?

Clean Energy & Low Carbon Neighborhoods

- ▪ E1. Reduce energy use
- ▪ E2. Energy use electrification
- ▪ E3. Increase renewable energy

Mobility & Clean Transport

- ▪ T1. Increase active transportation
- ▪ T2. Increase public transit
- ▪ T3. Increase electric vehicles

Materials & Consumption

- ▪ SW. Zero waste

2035 CARBON NEUTRAL SCENARIO

Mobility & Clean Transport

Clean Energy, Low Carbon Neighborhoods

Waste

CARBON NEUTRAL BY 2035 SCENARIO

T3. Increase electric vehicles

E3. Increase renewable energy

E2. Energy Use Electrification

E1. Reduce energy consumption

T1. Active Transportati...

SW1. Zero Waste

T2. Public transit
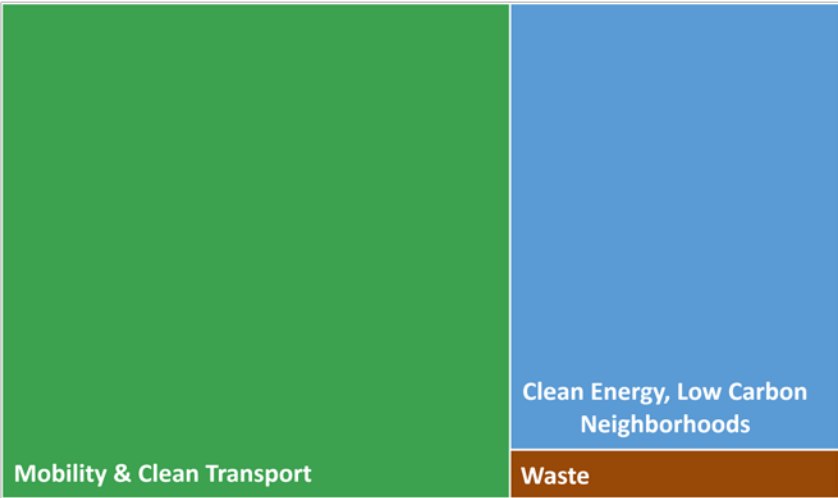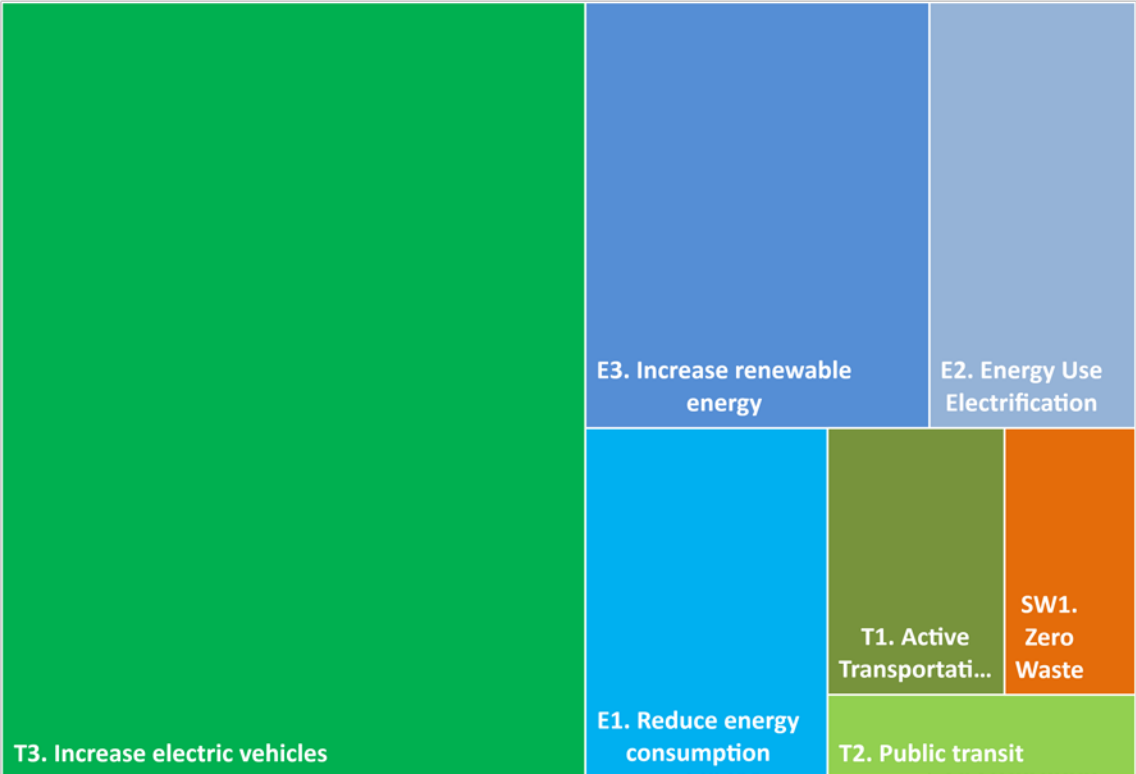
Other Components

- Climate Change Vulnerability Assessment
- Adaptation Strategies
- Resilient City Strategies
- Water Security
- Local Food
- Carbon Sequestration
- City Operations
- Implementation & Finance
- Community Engagement

Clean Energy & Low Carbon Neighborhoods

- E1. Reduce energy use

- E2. Energy use electrification

- E3. Increase renewable energy

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E-1. Reduce Energy Consumption

IMPACT: 69,947 mtCO2e
- Community Cost Savings
- Equity (energy costs)
- Job Creation
- Public Health
- Resource Conservation
- Resilience

Reduce energy use in existing buildings by 50% or more by 2030

Action E-1.1: Adopt Energy Benchmarking & Retrofit Policy for Existing Buildings

Action E-1.2: Energy Audit and Upgrade Incentive Program

Action E-1.3: Carbon Free Homes & Businesses Recognition Program

Action E-1.4: Zero Net Energy New Construction Ordinance – Multifamily & Commercial

Action E-1.5: Community Energy Challenge Program

Action E-1.6: Develop Green Leasing Incentive Program

Action E-1.7: Smart Building & Clean Technologies Challenge

Action E-1.8: Community Carbon Fund

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E-2. Decarbonize/ Electrify Energy Use

IMPACT: 72,267 mtCO2e
- Job Creation
- Public Health
- Resource Conservation
- Resilience
- Renewable Energy

Electrify or reduce use of fossil fuels by 80% in existing buildings and 100% in new buildings by 2035

Action E-2.1: Heat Pump Program Phased launch

Action E-2.2: Develop Carbon Free Home Program for Existing Homes

Action E-2.3: Carbon Free Homes & Businesses Incentive & Recognition Program

Action E-2.4: Workforce Training & Education

Action E-2.5: Electric Cooking Education Campaign

Action E-2.6: Commercial Heat Pump Replacement Incentive

Action E-2.7: Adopt a Carbon Neutral Ordinance for Residential New Construction

Action E-2.8: Adopt an Electrify Upon Sale Ordinance

Action E-2.9: Explore Renewable Sources of Natural Gas

E-3. Achieve 100% Renewable Energy

IMPACT: 120,600 mtCO2e
- Community Cost Savings
- Equity
- Job Creation
- Public Health
- Resource Conservation
- Resilience

Achieve 100% renewable energy by 2025, with 20% local generation by 2030

Action E-3.1: Implement a Community Choice Aggregation (CCA) program
Action E-3.2: Establish community solar purchase program
Action E-3.3: Promote and Offer Solar PV Incentives
Action E-3.4: Expand Solar Santa Monica Offerings
Action E-3.5: Expand Streamlined Solar Permitting
Action E-3.6: Expand Promotion of PACE Financing for Solar
Action E-3.7: Pilot and Expand Microgrids
Action E-3.8: Establish Clean Energy Entrepreneurs Program

T-1. Increase Active Transportation

IMPACT: 38,921 mtCO2e
- Community Cost Savings
- Equity
- Job Creation
- Public Health
- Resource Conservation
- Resilience

Increase walking and biking to 50% of all local trips by 2030

Action T-1.1: Expand Protected Bike Lane Network
Action T-1.2: Increase Bicycle Parking
Action T-1.3: Pedestrian Network Improvements/Expansions
Action T-1.4: Diversify Breeze Fleet
Action T-1.5: Expand Bike-Share System Network Coverage
Action T-1.6: Expand Safe Routes to Schools (SRTS)
Action T-1.7: Implement Safe Routes for Seniors
Action T-1.8: Adult Bicycle Education Programs

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T-2. Increase Transit & Mobility Services

IMPACT: 21,229 mtCO2e
- Community Cost Savings
- Equity
- Job Creation
- Public Health
- Resource Conservation
- Resilience

Increase use of public transit and emission-reducing mobility services to 15% by 2030

Action T-2.1: Prioritize Mixed-Use and Transit Oriented Development (TOD) Projects

Action T-2.2: Augment First/Last Mile Networks

Action T-2.3: Subsidize Transit Fares

Action T-2.4: Prioritize Public and Employer Car/Van Pool

Action T-2.5: Expand Car-Sharing Opportunities, Including Electric Vehicles

Action T-2.6: Implement Road Congestion & Parking Pricing

Action T-2.7: Pilot Autonomous Vehicle Technologies and Policies

Action T-2.8: Decarbonize Big Blue Bus (BBB) Fleet

Action T-2.9: Decarbonize School Bus Fleet

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T-3. Increase Electric Vehicles

IMPACT: 373,184 mtCO2e
- Community Cost Savings
- Equity (energy costs)
- Job Creation
- Public Health
- Resource Conservation
- Resilience

Increase zero emission & electric vehicles to 90% by 2035

Action T-3.1: Increase off-street and on-street locations for public charging infrastructure
Action T-3.2: Provide incentives for EV charging in multi-unit dwellings (MUDs) and workplaces, with additional incentives for low-income
Action T-3.3: Streamline permitting for installation of EV charging equipment
Action T-3.4: Pilot EV charging through streetlights
Action T-3.5: Develop educational resources and outreach programs
Action T-3.6: Add charging stations for city fleet-owned vehicles
Action T-3.7: Increase minimum EV charging requirements for new construction
Action T-3.8: Partner with local car dealerships to provide discounted pricing
Action T-3.9: Explore new and emerging technologies and ways to integrate into Santa Monica's EV charging network

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Materials & Consumption

■ SW. Zero waste

SW. Achieve zero waste

IMPACT: 28,779 mtCO2e
- Community Cost Savings
- Equity
- Job Creation
- Public Health
- Resource Conservation
- Resilience

Divert annual waste generated from the landfill by 95% by 2030

Action SW-1.1: Implement mandatory organics recycling citywide

Action SW-1.2: Continue to promote and expand the reuse and repair economy

Action SW-1.3: Provide waste audits for businesses and residents

Action SW-1.4: Explore and incentivize reusable packaging for businesses and reusable containers for food services

Action SW-1.5: Develop extended producer responsibility programs

Action SW-1.6: Implement landfill bans for materials that should be composted or recycled

Action SW-1.7: Adopt a recycling requirement for construction and demolition debris of 90% by 2030

Action SW-1.8: Institute wet-dry system for businesses

Action SW-1.9: Reduce trash collection services and re-evaluate program fees

Action SW-1.10: Explore technologies to convert waste to energy locally

Design Key Focus Areas & Strategies for Sunnyvale

- 3 min (on own) – diversity of ideas

- 10 minutes with table / discussion (choose as many as you like)

- Aggregate all Key Focus Areas (share) 10 min

- Dot vote (all CAC) (5 min)

- Each group choose 1 or 2 Focus Areas:

- Draft Key strategies under each Focus Area (10 min)

- Share back and close

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Thanks!

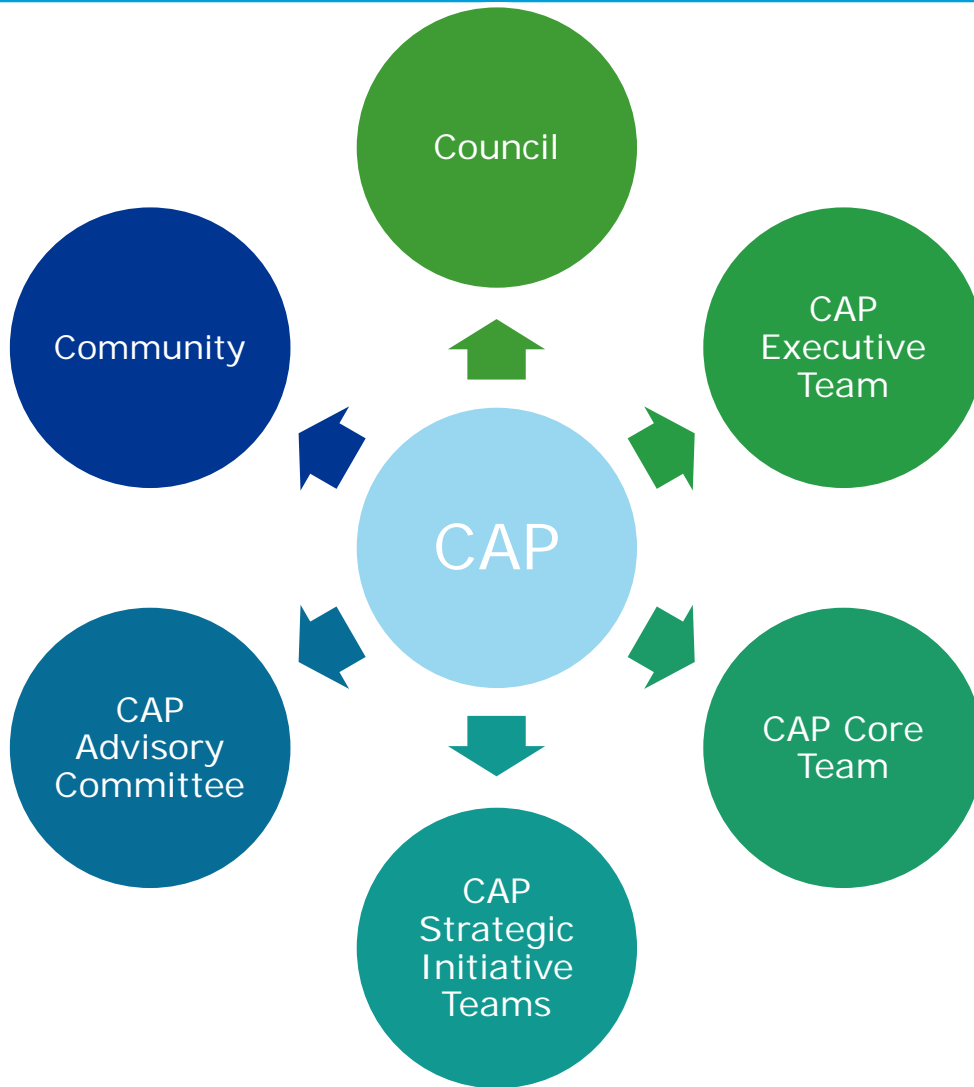**Sarah Isabel Moe**
Sarah.moe@dnvgl.com
510-414-7064

www.dnvgl.com

SAFER, SMARTER, GREENER

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Executive Team Interview slides

Leadership

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Sustainability Leadership at every level

CAP Journey

- **Aspirational**

  (Goals + Strategies)

- **Operational**

  (Strategic Internal infrastructure, culture)

- **Implementation**

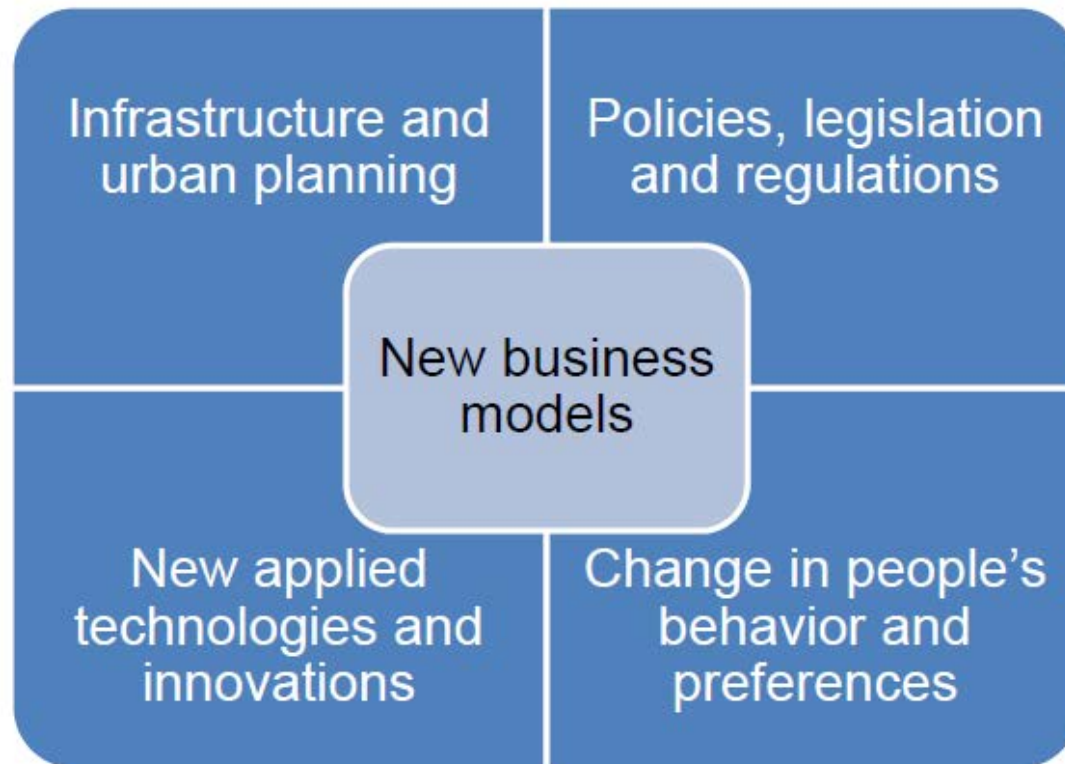 (Marketing/Education, Partnerships/staff, Finance planning)
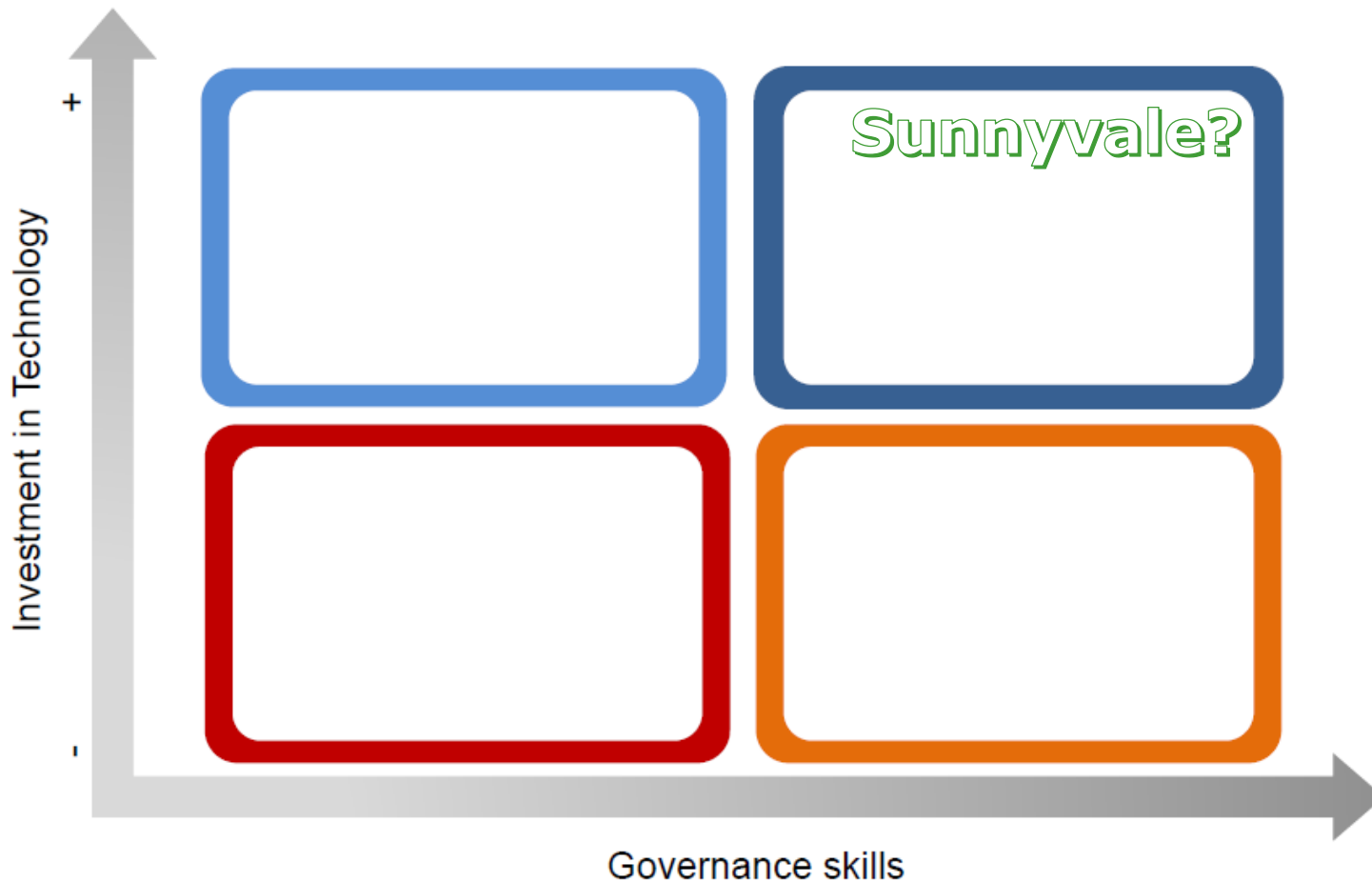
Zones of Control and Influence

City operations

City codes, mandates and ordinances

Incentives, rebates, education and outreach

Regional and statewide policy
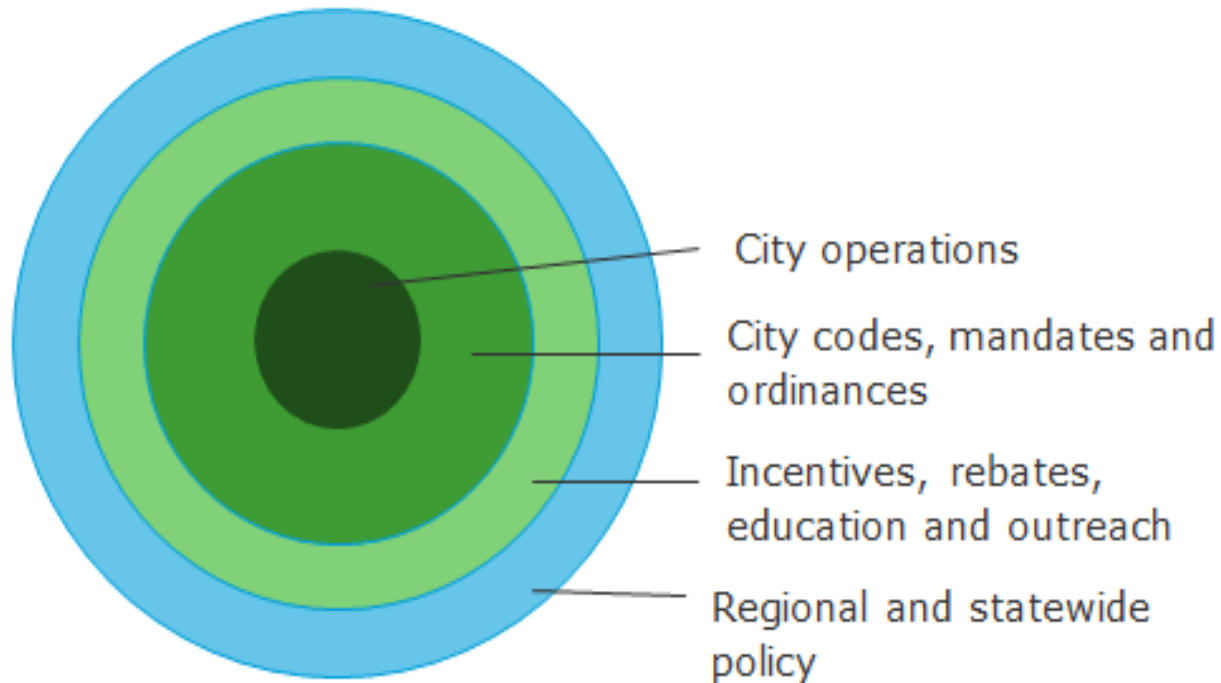
Source: DNV GL (produced for City of Palo Alto)

Opportunities in Clean Transportation, Buildings and Energy

Smart Governance, Clean Technology and Collaboration

City Leadership Check List

- Systemic view
- Strategic CAP plan
- Open and transparent
- Innovative business models
- Modern management practices
- Public private partnerships
- Cohesive society

Types of Policies and Programs for Driving Market Transformations are Well-documented

Planning & Targets
- Create targets to guide policy-making
- Provide signals to investors

Cost Reductions
- Reduce soft and hard costs of RH&C technologies
- Improve competitiveness against conventional tech

Mandates
- Create obligations to drive adoption of RH&C in buildings or for utilities

Workforce Development
- Support local workforce development and strengthen industry supply chain

Marketing & Outreach
- Raise local awareness among vendors, installers, and consumers

Incentives
- Offer upfront or performance-based incentives to improve economics

Innovative Financing
- Develop low-cost loan and 3rd party ownership products
- Enable standardization and aggregation of assets

QA/QC
- Ensure high performance via regulations and inspections
- Harmonize standards and best practices

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8 Step Change Management Process (Kotter, 1995)

- **1. Establish a sense of urgency**- Examine market, identify and discuss crises, potential crises or opportunities. Create the catalyst for change.

- **2. Form a powerful coalition-** Assemble a group with enough power to lead the change effort. WHO ELSE?

- **3. Create a Vision**- Create a vision to help direct the change effort. Develop strategies for achieving that vision – CAP 2.0

- **4. Communicating the Vision -** Using every channel and vehicle of communication possible to communicate the new vision and strategies. The guiding coalition teaching new behaviors and leading by example.

- **5. Empowering others to act on the vision** - Removing obstacles to change. Changing systems or structures that seriously undermine the vision. Encouraging risk taking and non-traditional ideas, activities and actions.

- **6. Creating short term wins**– Planning for visible performance improvement. Recognizing and rewarding employees/community members involved in these improvements.

- **7. Consolidating improvements and producing still more change**- Promoting, and developing employees who can implement the vision: eliminating structures/policies that don't fit the vision.

- **8. Institutionalizing new approaches**

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We've got this.

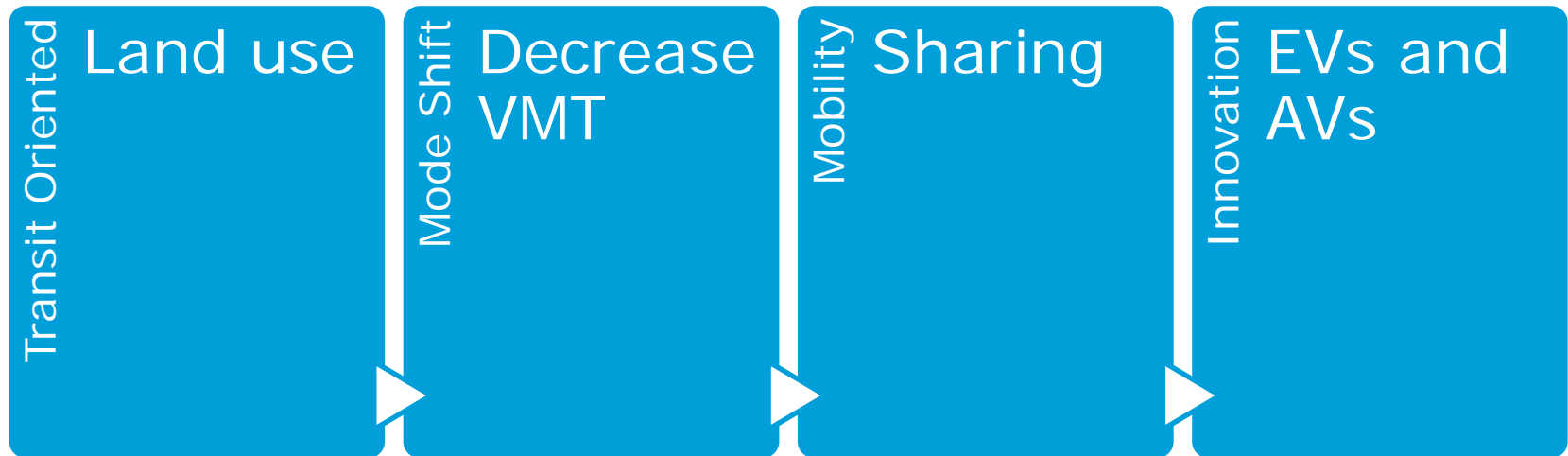Source: Institute For Sustainable Communities; Urban Leadership Academy

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MOBILITY and TRANSPORTATION

▪What is Possible???

– National policies (DOT and HUD), new zoning laws, and changes in lending and commercial investment created and built the suburban model in ~30 YEARS – **a radical departure from the past.**

– A similar coordinated public policy & changing market could DECARBONIZE SOCIETY in next 3 decades... road to 2050.
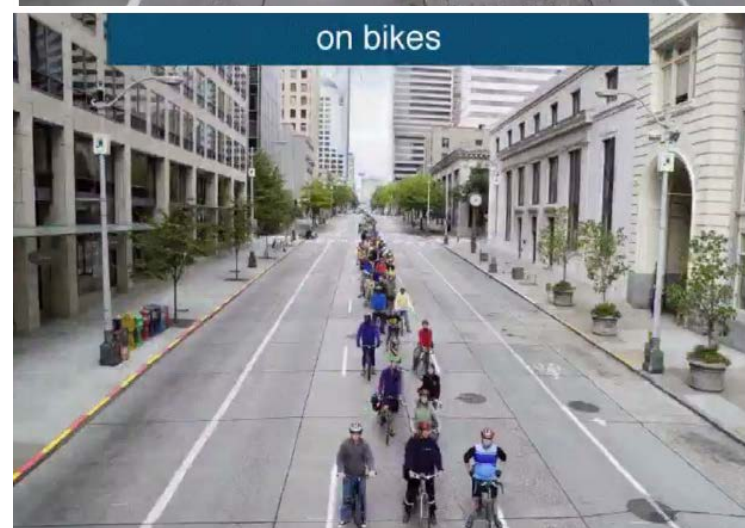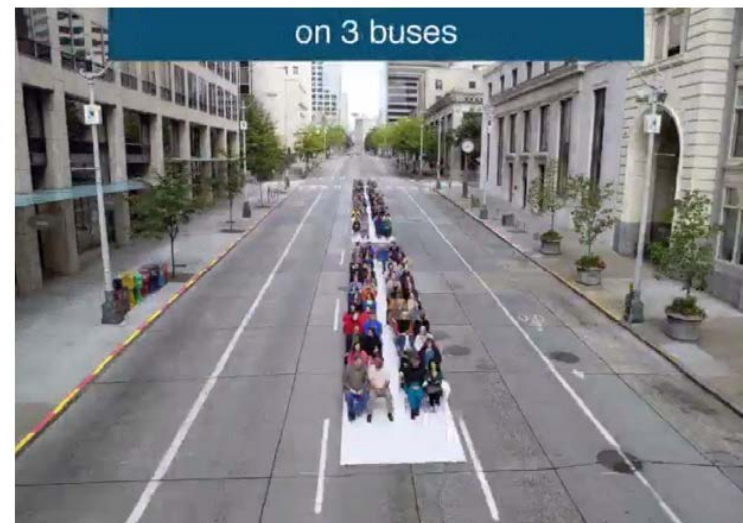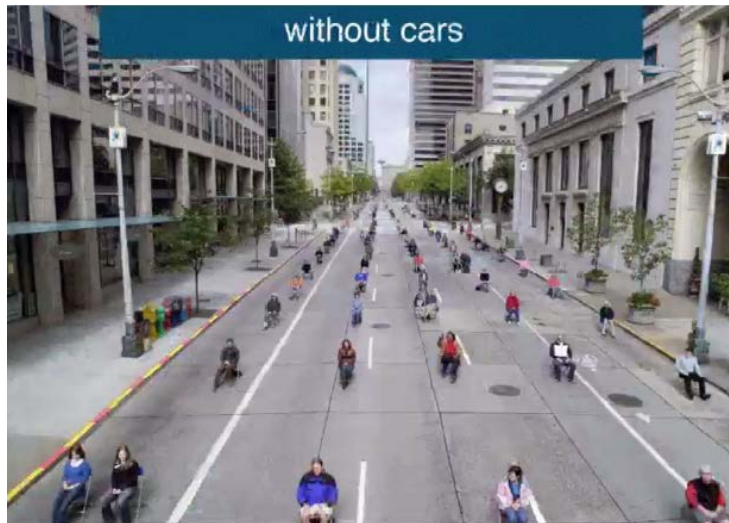
Cultural

Technical

Financial

Political
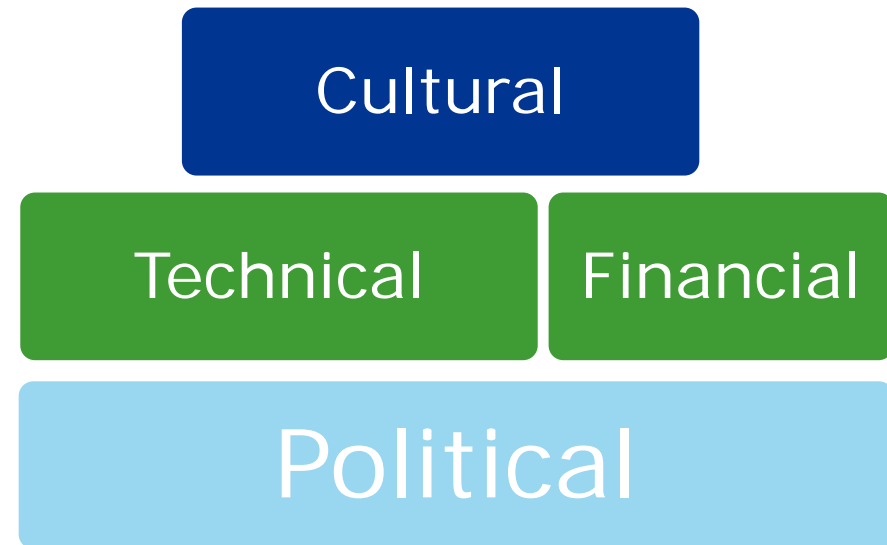
Loading Order of Transportation

without cars

on 3 buses

on 1 light rail train

on bikes

Potential of Mode Shift from SOVs
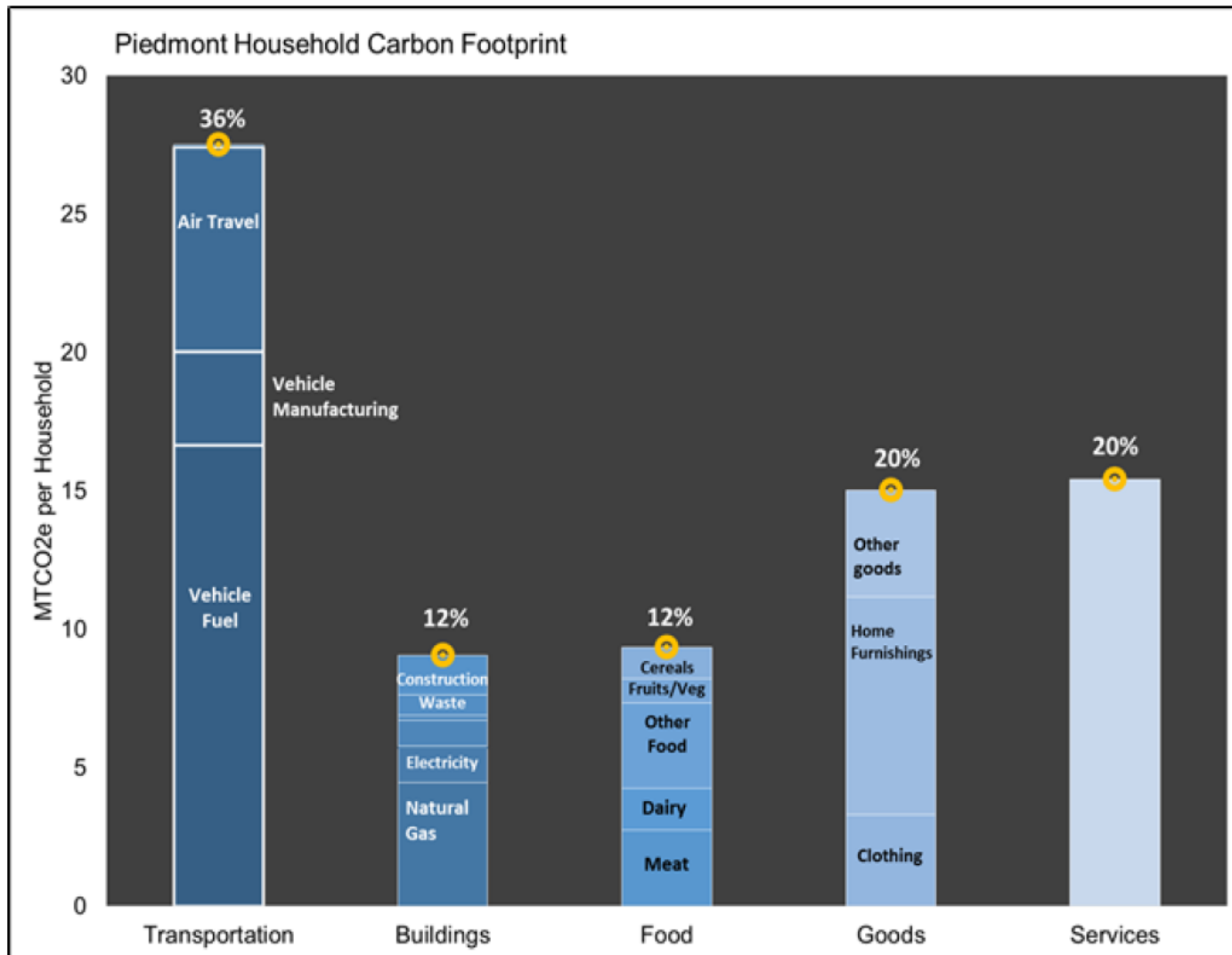
DNV GL Projected Electric Vehicle Adoption

Market share of electric vehicles in new light vehicle sales

Units: **Percentages**

Regions
- Europe
- China / North America / OECD Pacific
- Indian Subcontinent
- North East Eurasia / Latin America / South East Asia / Middle East & N.Afr.
- Sub-Saharan Africa
- World
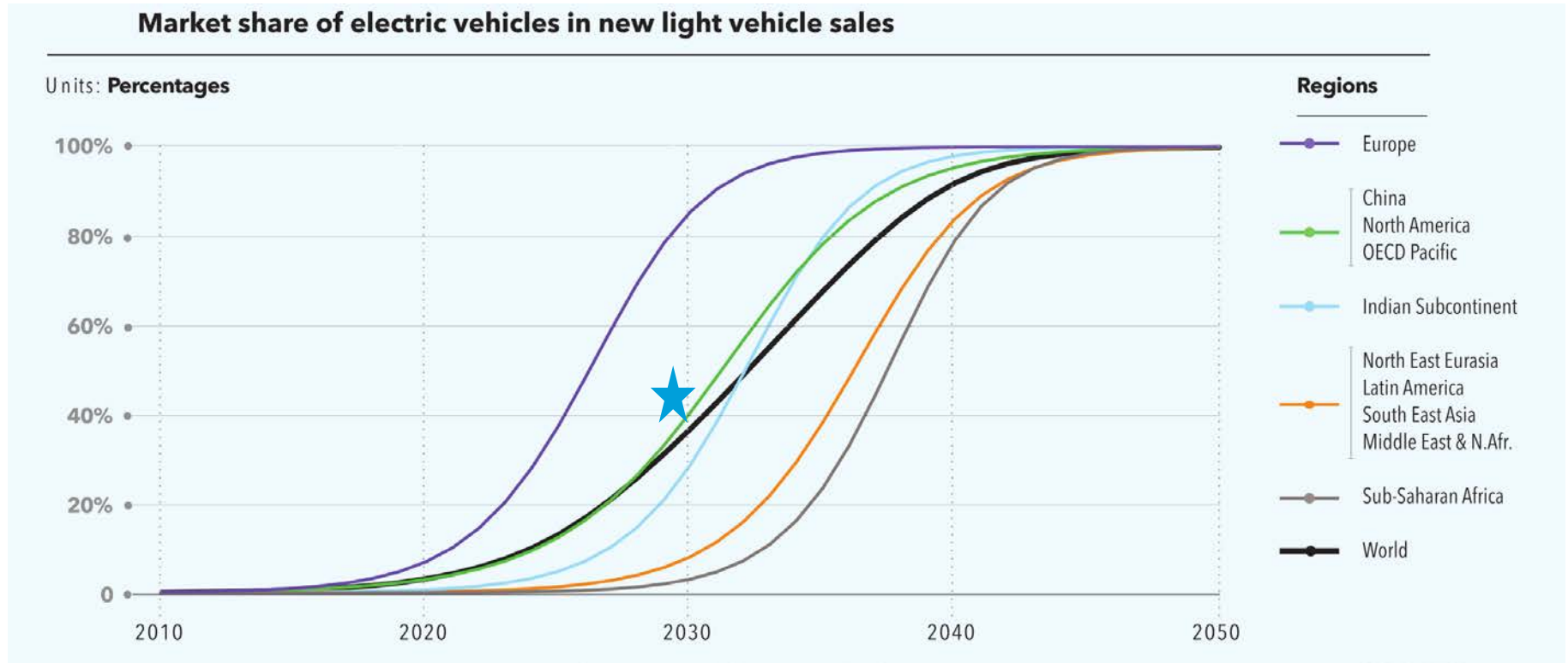
100% EV Goals:

2025 Norway

2030 India

EV Action Plan: Increase Electric Vehicles

Innovation

EVs and AVs

Increase zero emission, electric vehicles

- Public charging infrastructure
- Parking pricing
- Incentives in MUD, low income and employers
- Pilot new tech (streetlight charging)
- City fleets
- Car dealership partnership for discounts (Sunshares)
- AV Pilots: Buses for loops in business districts

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TNCs. growth

Unintended Consequences

Figure 4. Annual vehicle mileage, 2013 and 2016
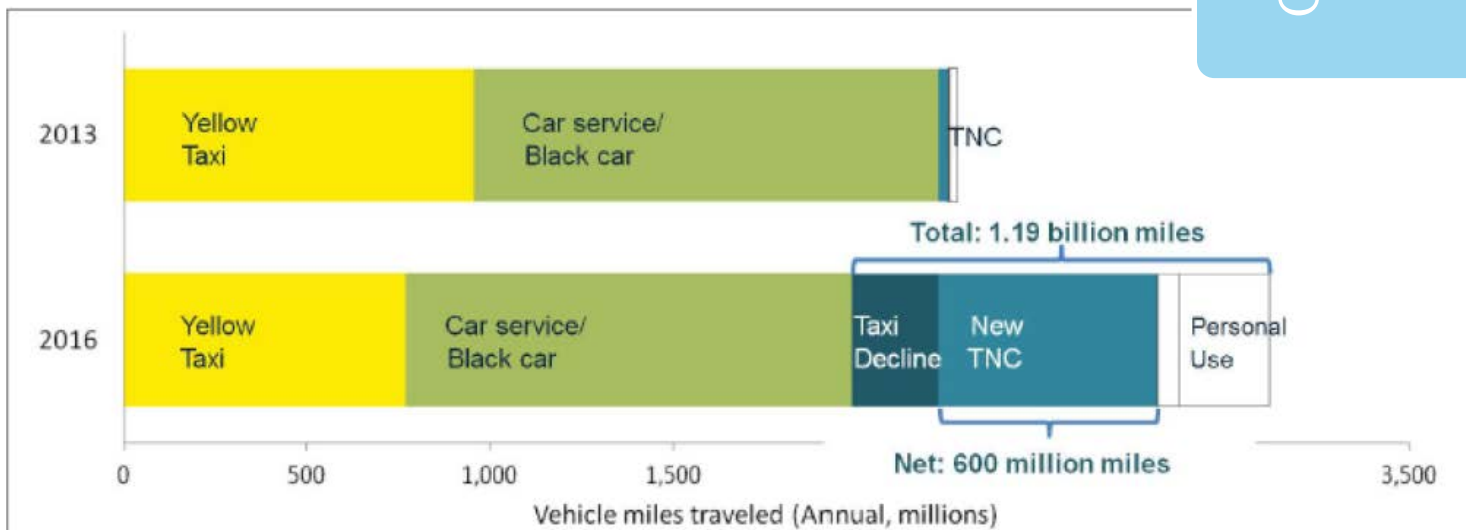
Source: TLC odometer and trip files.

Source: Schaller, 2017

Figure 11. Changes in ridership by mode, 2014 to 2015
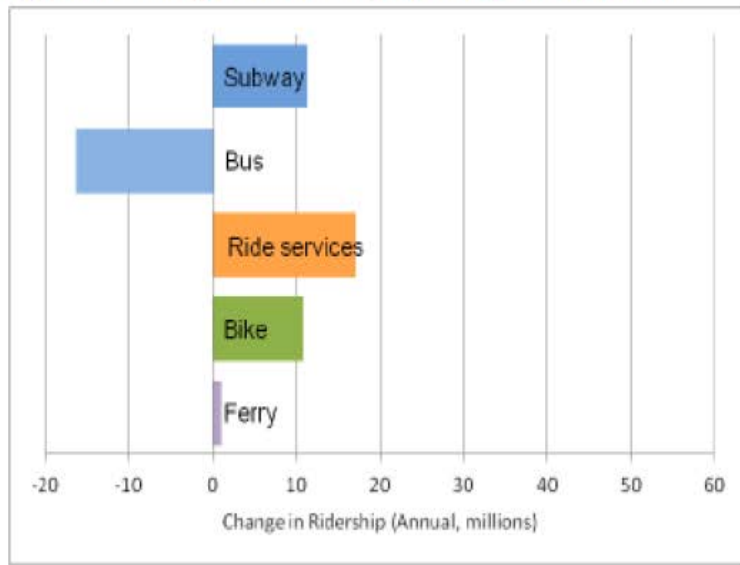
Figure 12. Changes in ridership by mode, 2015 to 2016
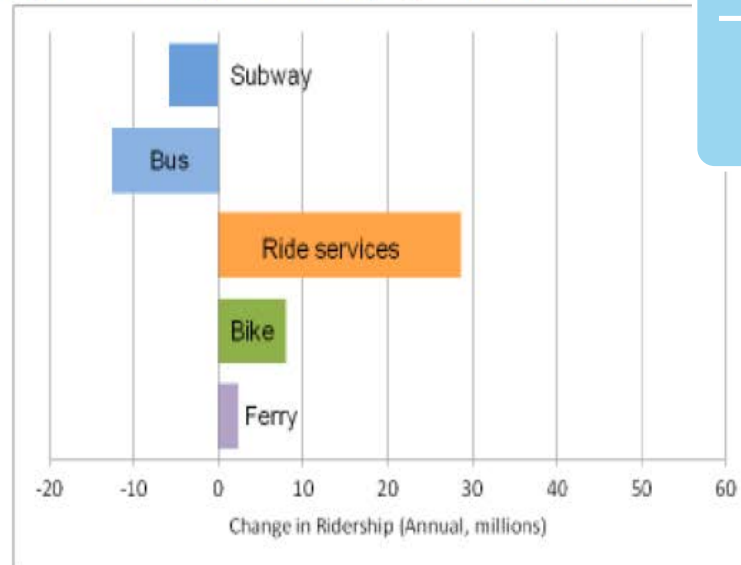
Source: Schaller, 2017

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Opportunities in Clean Transportation, Buildings and Energy

Infrastructure and urban planning

Policies, legislation and regulations

New business models

New applied technologies and innovations

Change in people's behavior and preferences

All of us

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Triple Bottom Line Economic Development

DNV·GL

Fort Collins

DNV·GL

Specify Location | Answer Questions: | Investment | Industry, Jobs and Wages | Construction & Operations | Placemaking and Accessibility | Governance | **Generate TBL or Access TBL Report**

TRIPLE BOTTOM LINE REPORT FOR: The Anchor

Print/Save Report PDF

Legend	Definition
76-100	Project appears to be strongly aligned with TBL goals.
51-75	Project appears to be moderately aligned with TBL goals.
26-50	Project appears to be weakly aligned with TBL goals.
0-25	Project appears to be poorly aligned with TBL goals.

©2009 NAVTEQ™

TBL SCORES AND PROJECT INFORMATION: The Anchor

Click on "+" to reveal the impacts used to calculate each performance score or to drill down further and see each measure.

- The Anchor: TBL Profile

	Project Information	Project Score

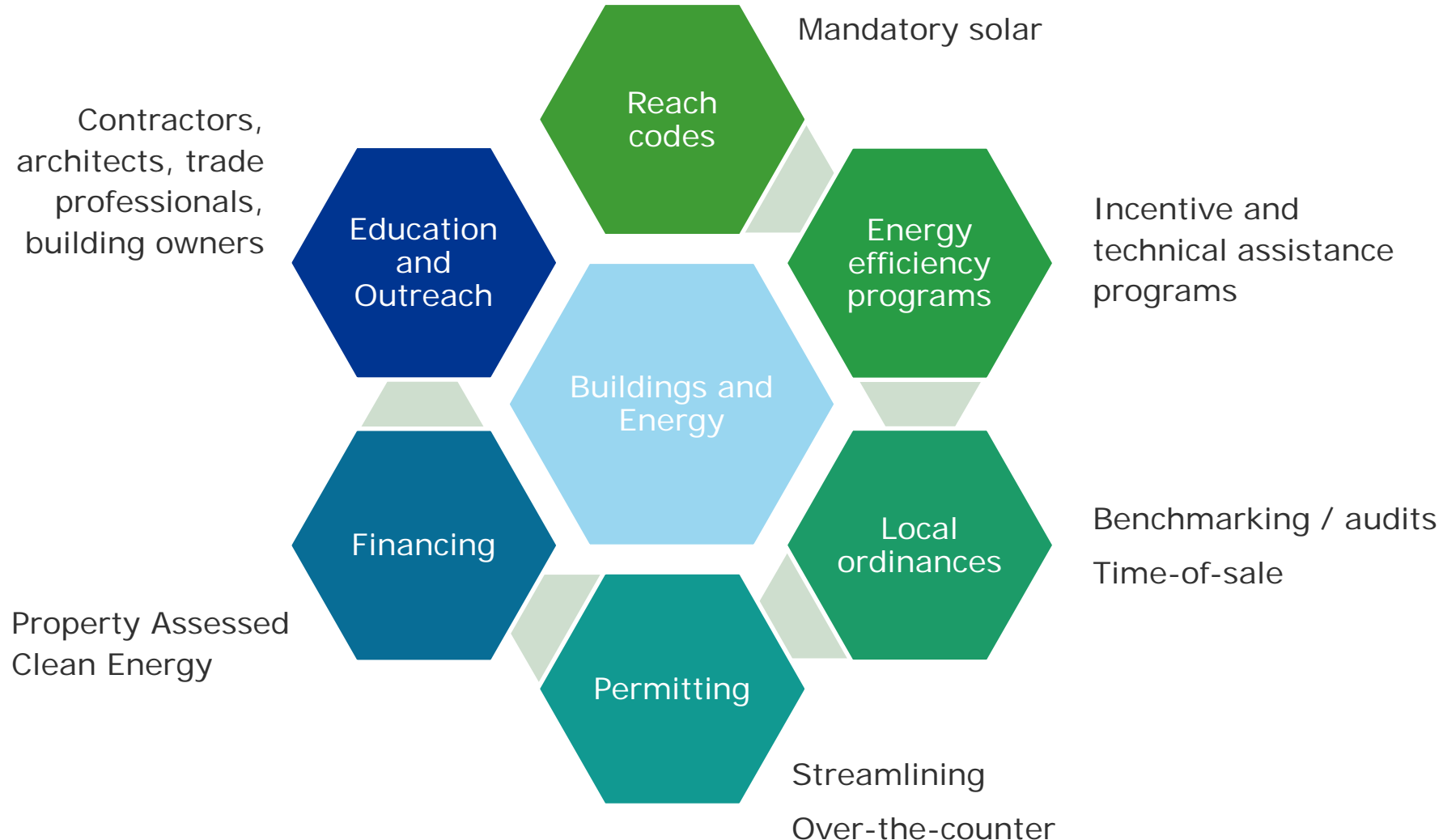**ECONOMIC VITALITY** ⓘ
Investments promote regional economic strength and resilience, are fiscally sound, and provide access to good quality jobs.   **83**

+	Quality Jobs ⓘ		66
+	Sound Investment ⓘ		100

NATURAL RESOURCE STEWARDSHIP ⓘ
Investments make efficient use of natural capital and ecosystem health is maintained or restored.   **90**

+	Industry Eco-efficiency ⓘ		78
+	Green Design and Construction ⓘ		94
+	Green Operations ⓘ		97

COMMUNITY WELL-BEING ⓘ
Investments promote health and opportunity, preserve or enhance unique culture, and cultivate distinctive and well-functioning communities in which to work and live.   **93**

+	Placemaking and Accessibility ⓘ		91
+	Environmental Health ⓘ		87
+	Governance ⓘ		100

Buildings and Energy

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Loading Order of Energy in Buildings

Reduce energy use
Energy efficiency

Shift to clean
100% RE

Transform
Microgrids
Zero net energy
Resilience
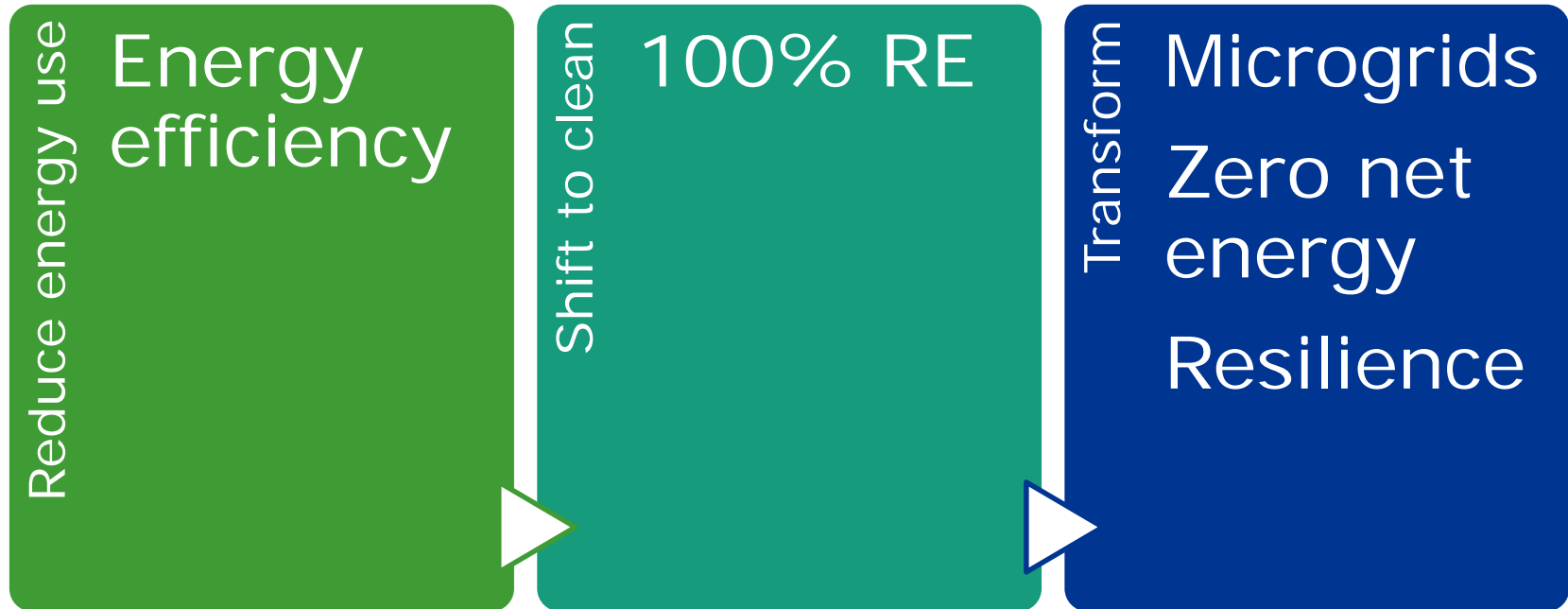
Leading Practices for Local Action

Mandatory solar

Contractors, architects, trade professionals, building owners

Reach codes

Energy efficiency programs

Incentive and technical assistance programs

Education and Outreach

Buildings and Energy

Financing

Local ordinances

Benchmarking / audits

Time-of-sale

Property Assessed Clean Energy

Permitting

Streamlining

Over-the-counter

Opportunities in Clean Transportation, Buildings and Energy

DNV·GL
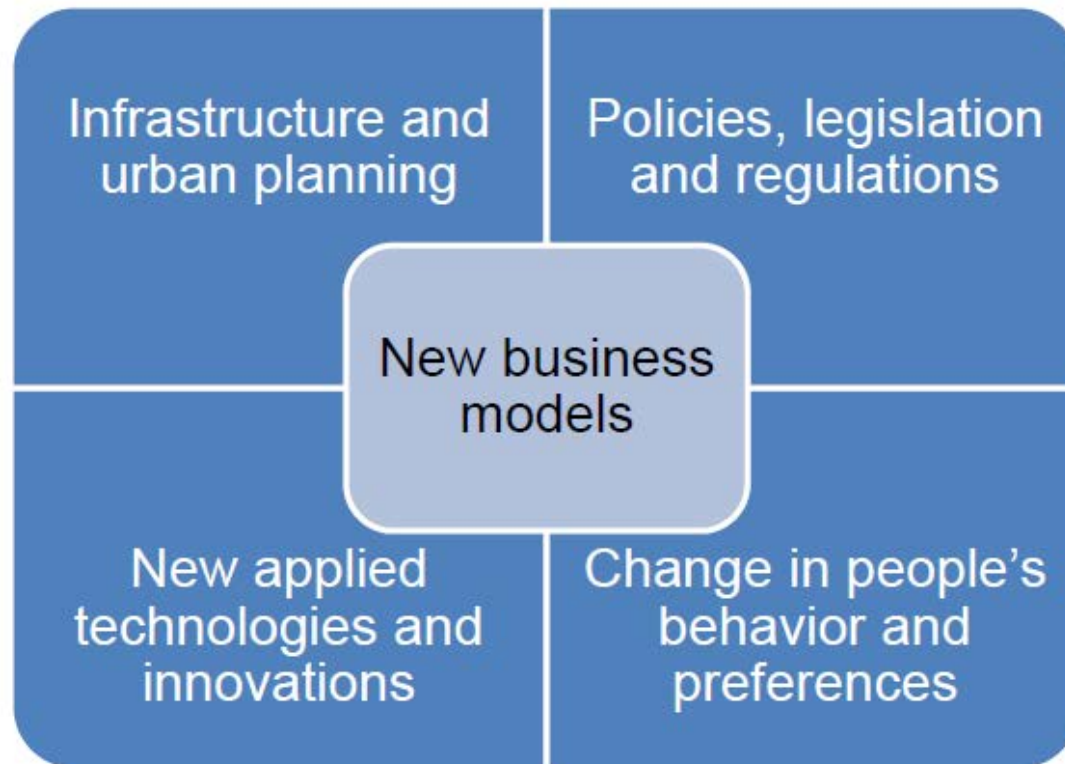
Financing Climate Action

Low Carbon Economy

A circular cycle diagram with five stages connected by arrows:

- Low Carbon technology
- Attracts City Policy & $$$
- Volume / Costs Improve
- Tech goes mainstream (LED)
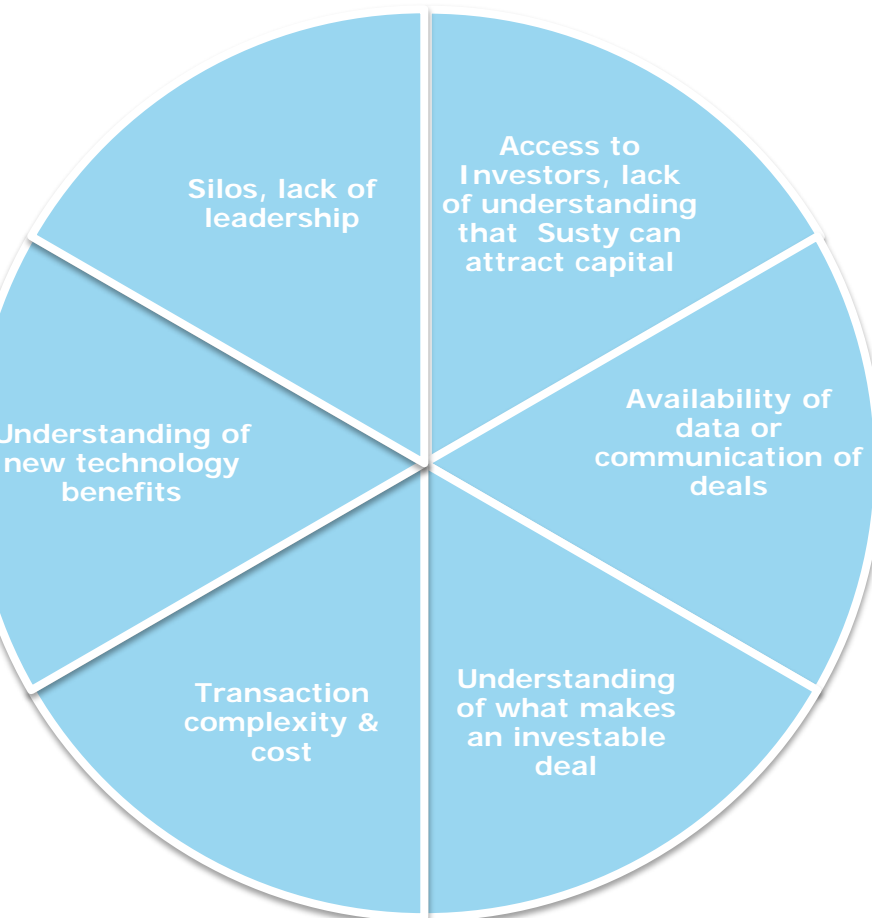- Reinforces Policies, Drives Economies of Scale
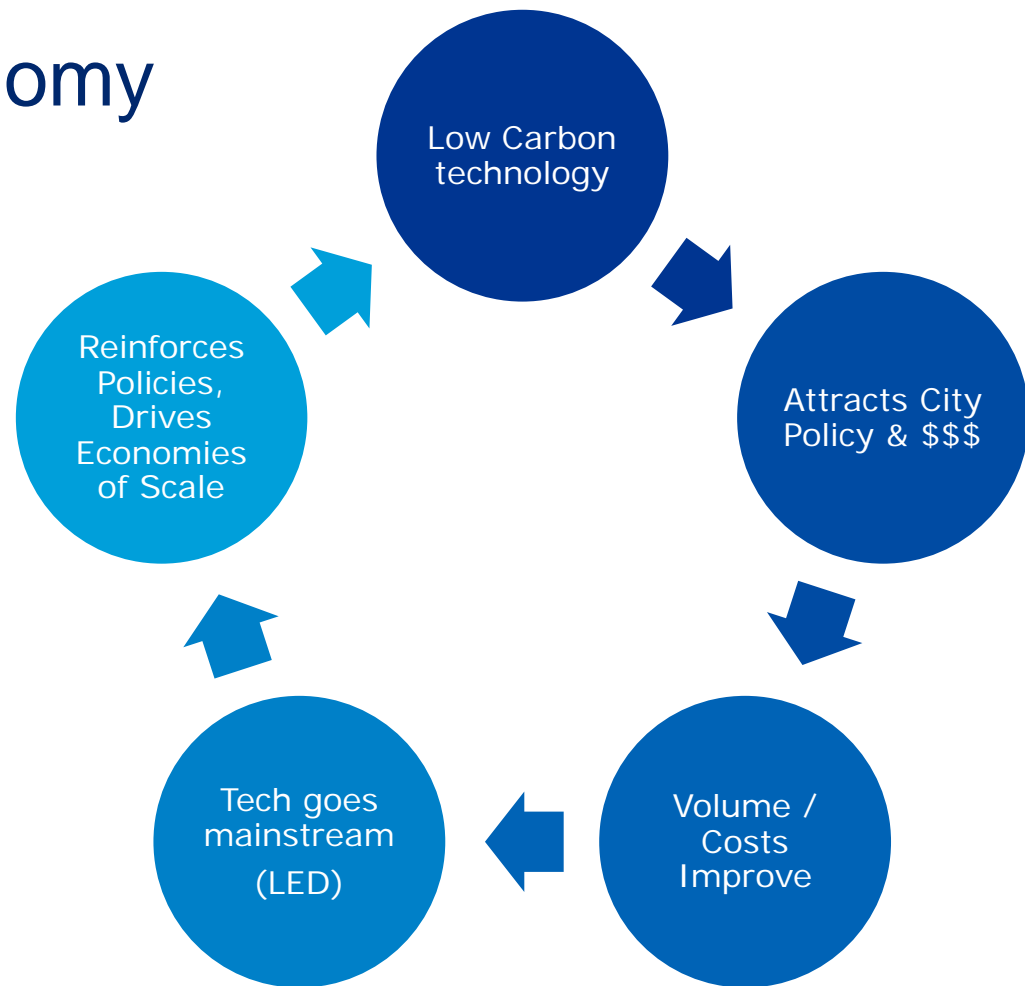
Opportunities & Barriers

$93 Trillion needed to reach Paris Climate Goals
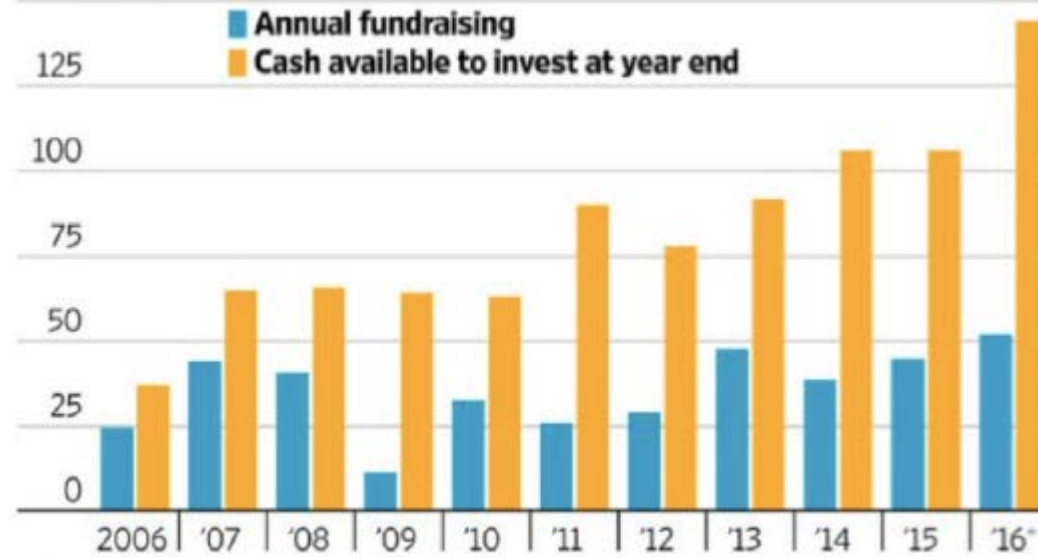**$57 Trillion for Global Infrastructure**
$510 Billion needed for USA Infrastructure
$72 billion in energy efficiency (850trillion BTU, 175mmt, 300,000 jobs)

in Infrastructure Funds

$150 billion

- Annual fundraising
- Cash available to invest at year end

125

100

75

50

25

0

2006 | '07 | '08 | '09 | '10 | '11 | '12 | '13 | '14 | '15 | '16*

*Through Dec. 12
Source: Preqin

THE WALL STREET JOURNAL

Pie chart segments:
- Silos, lack of leadership
- Access to Investors, lack of understanding that Susty can attract capital
- Understanding of new technology benefits
- Availability of data or communication of deals
- Transaction complexity & cost
- Understanding of what makes an investable deal

Mission Carbon Neutrality

- Test as you fly & collaboration
- Take known mitigated risk
- Learn from Failures
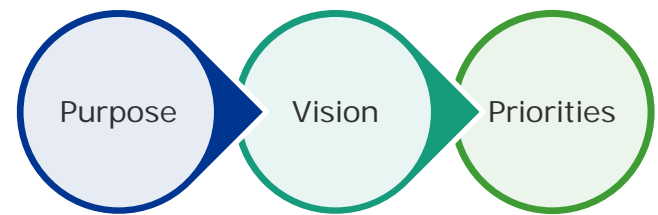- Elevator Pitch

High contact sport

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Strategic Priorities

Shared vision, priorities
specific enough to shape
investments

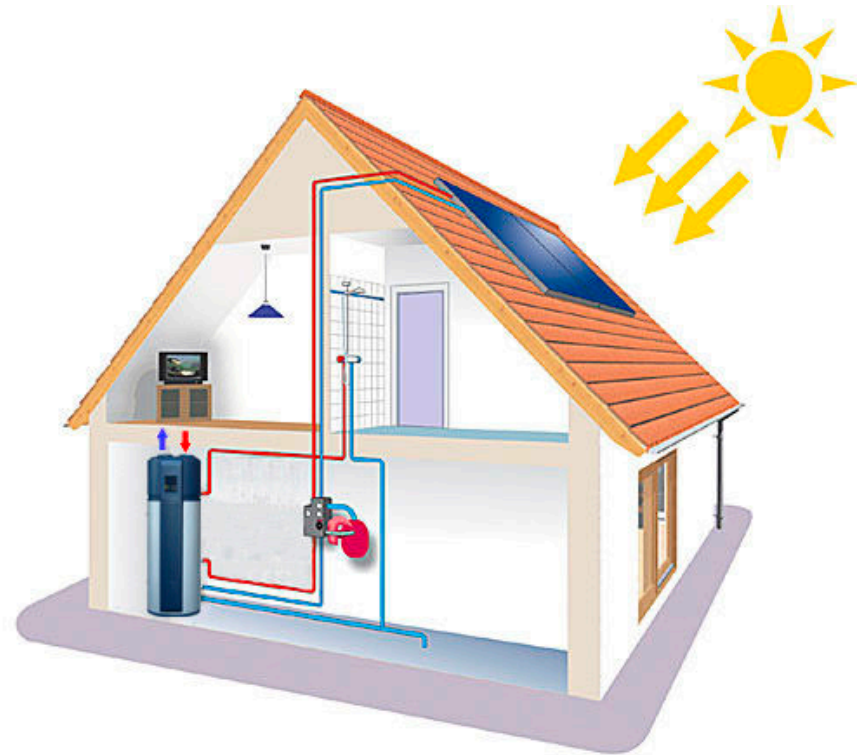- Convene
- Define Needs
- Assess Resources
- Set Priorities

Purpose → Vision → Priorities

Considerations in Setting Priorities:

- **Environmental impact**
- **Drivers of urgency (e.g. consent decrees)**
- **Equity and social co-benefits**
- **Ease of financing**
  - **Repayment source?**
  - **Risk/return parameters**
  - **Payback period**
- **Politics**
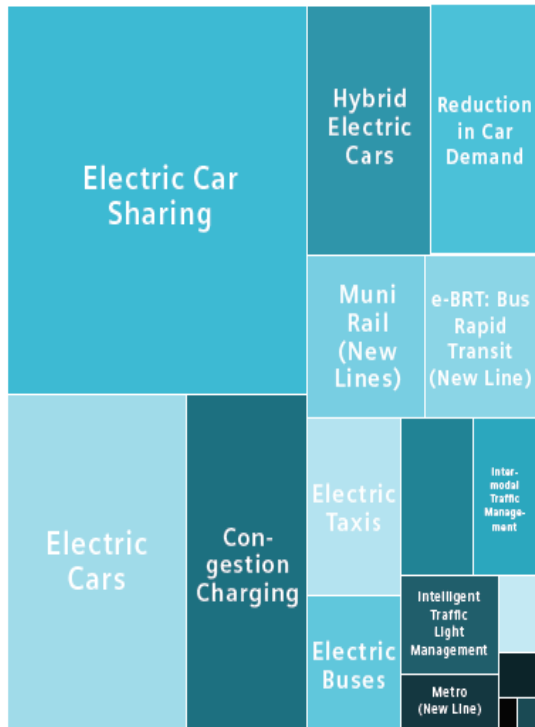
Define whole Pipeline: Mitigation and Adaptation

Identify and develop potential investments that together add up to the realization of the community's strategic priorities.

- – Map whole pipeline
- – Leverage public funds (assemble capital)
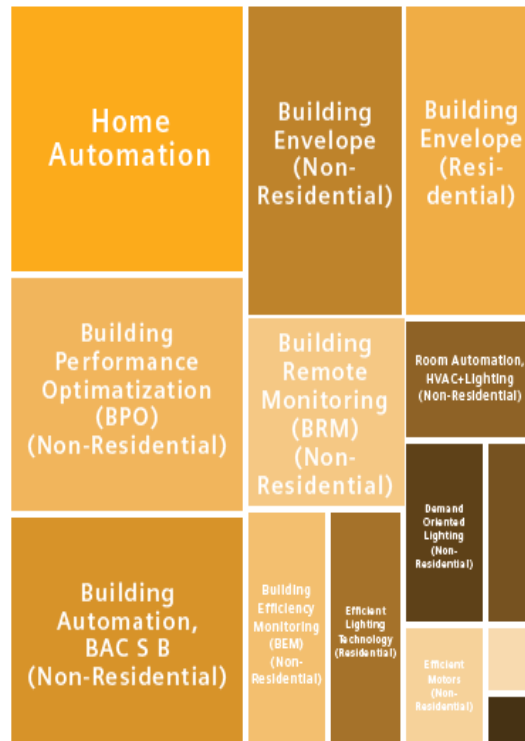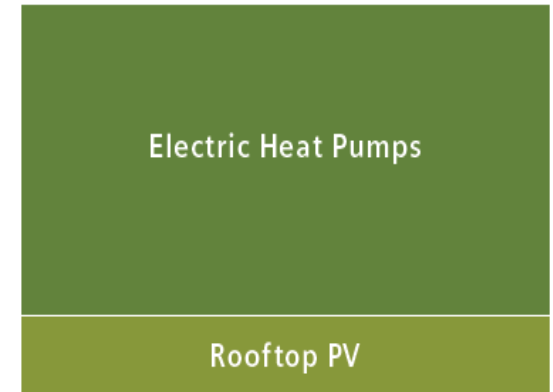- – Structure/underwrite deals

SF 80x50 Pipeline

TRANSPORT: -30.8% CO_2eq

- Electric Car Sharing
- Hybrid Electric Cars
- Reduction in Car Demand
- Muni Rail (New Lines)
- e-BRT: Bus Rapid Transit (New Line)
- Electric Cars
- Congestion Charging
- Electric Taxis
- Inter-modal Traffic Management
- Intelligent Traffic Light Management
- Electric Buses
- Metro (New Line)

BUILDINGS: -32.6% CO_2eq

- Home Automation
- Building Envelope (Non-Residential)
- Building Envelope (Residential)
- Building Performance Optimatization (BPO) (Non-Residential)
- Building Remote Monitoring (BRM) (Non-Residential)
- Room Automation, HVAC+Lighting (Non-Residential)
- Building Automation, BAC S B (Non-Residential)
- Building Efficiency Monitoring (BEM) (Non-Residential)
- Efficient Lighting Technology (Residential)
- Demand Oriented Lighting (Non-Residential)
- Efficient Motors (Non-Residential)

ENERGY: -17.2% CO_2eq

- Electric Heat Pumps
- Rooftop PV

Source: CyPT Model

Direct Government Investments
Public Financial Mechanisms #1 Policy

Direct Cash Incentives

Up-front
- Rebates
- Buy-downs
- Grants
- Subsidies

Performance-based
- Renewable Energy Credits
- Feed-in Tariffs

Tax-based Credits & Rebates
- Property Taxes
- Sales Taxes
- Producer & Investor Taxes
- Green Taxes
- Income Taxes

Debt Financing

Municipal Bonds
- General Obligation Bonds
- Revenue Bonds

Variations
- Green Bonds

- Tax Credit Bonds
  - *Qualified Energy Conservation Bonds*
  - *Clean Renewably Energy Bonds*

Direct Financing
- Loan Agreements
- Lease Agreements

Credit Enhancement

Guarantees

Loan Loss Reserve Funds

Interest Rate Buy-downs

Insurance

Debt Service Reserve

Senior/Subordinate Capital Structure

SEMI-PUBLIC: P3s

- Developer chosen, Source of capital (risk reduced by muni incentives/contract)
- Muni provides incentives
- Developer bound to performance

Investor assumes Risk → **Gov. provides security**

P3sHigh transaction cost
*big deals, long contracts
Clear Revenue, expectations

Most Common Funding:
- PPA
- ESPC

Alternative Mechanisms

- PACE
- Revolving Loan Funds
- Carbon Markets
- Green Banks
- Crowd funding

Sustainable Finance is HOT

Public/Private Capital • Technology • Crowdfunding

PARTNERS FOR PLACES

CDP — DRIVING SUSTAINABLE ECONOMIES

DSIRE®

SIDE WALK LABS

Neighborly

Foundations are
Funding Climate
Action

International Climate
Financing

Matchmaker

Grants (USA)

Database of State
Incentives for
Renewables &
Efficiency

Innovation

Entrepreneurs
and Innovators
Solve Urban
Problems

Crowdfunding
Carbon Funds

Behavior + Culture
Change

Funding OOS | Internal Revenue Sources

Taxes – **to raise revenues for general local services**

User Fees – **To regulate activities and services**

Development Charges – **New Construction/new areas**

Tax Increment Financing – **Blighted Areas keep property revenues in district for 15 – 35 years.**

Intracting (Energy Savings Agreements) - **upfront Retrofit costs paid back through energy savings.**

Palo Alto

Fees

Fees regulate activities and services.

Storm Water Fees & Watershed Protection property relat
fee, linked to storm drain; will fund Green Infrastructure
Projects
- Blue Ribbon Commission Identified Projects
- Community Group campaign (tax called a fee);
- Mail ballot
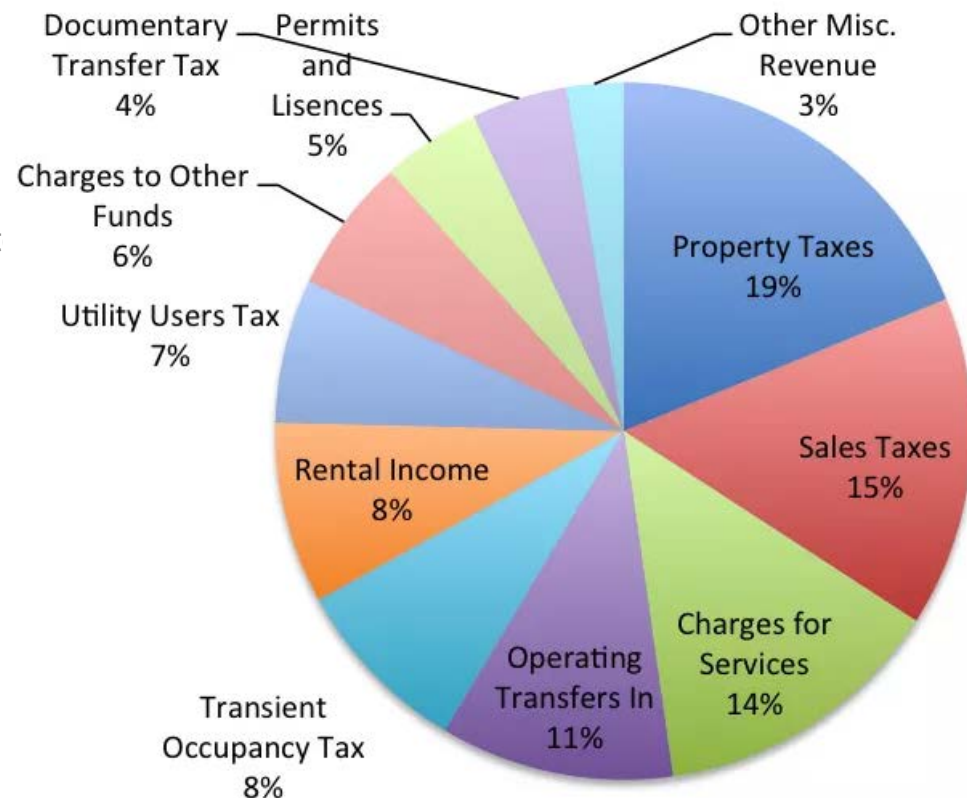
Transportation Impact Fee (RFP in process)

Paid Parking Study (happening now)

New Development Impact Fee: IT Fee for Smart City

Development Impact Fees being restructured

Existing Buildings -will have to Tax

Existing Businesses – Considering head count employee tax
to fund transportation programs

Pie chart labels:
- Documentary Transfer Tax 4%
- Permits and Lisences 5%
- Other Misc. Revenue 3%
- Charges to Other Funds 6%
- Utility Users Tax 7%
- Property Taxes 19%
- Sales Taxes 15%
- Rental Income 8%
- Charges for Services 14%
- Transient Occupancy Tax 8%
- Operating Transfers In 11%

Taxes

Tax to raise revenue.

Carbon Taxes.
Transfer Taxes.
Berkeley and the Utility Users Tax.

Fees | San Francisco

Re-Structure Fees to fund a staff member (Utah). Break it out.

"You're already paying for this; we are just re-calculating the way we are collecting it".

ENERGY FEE & TRASH FEE
Donnie Oliveira, San Francisco Department of the Environment

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Financing Sustainable Cities Toolkit (USDN)

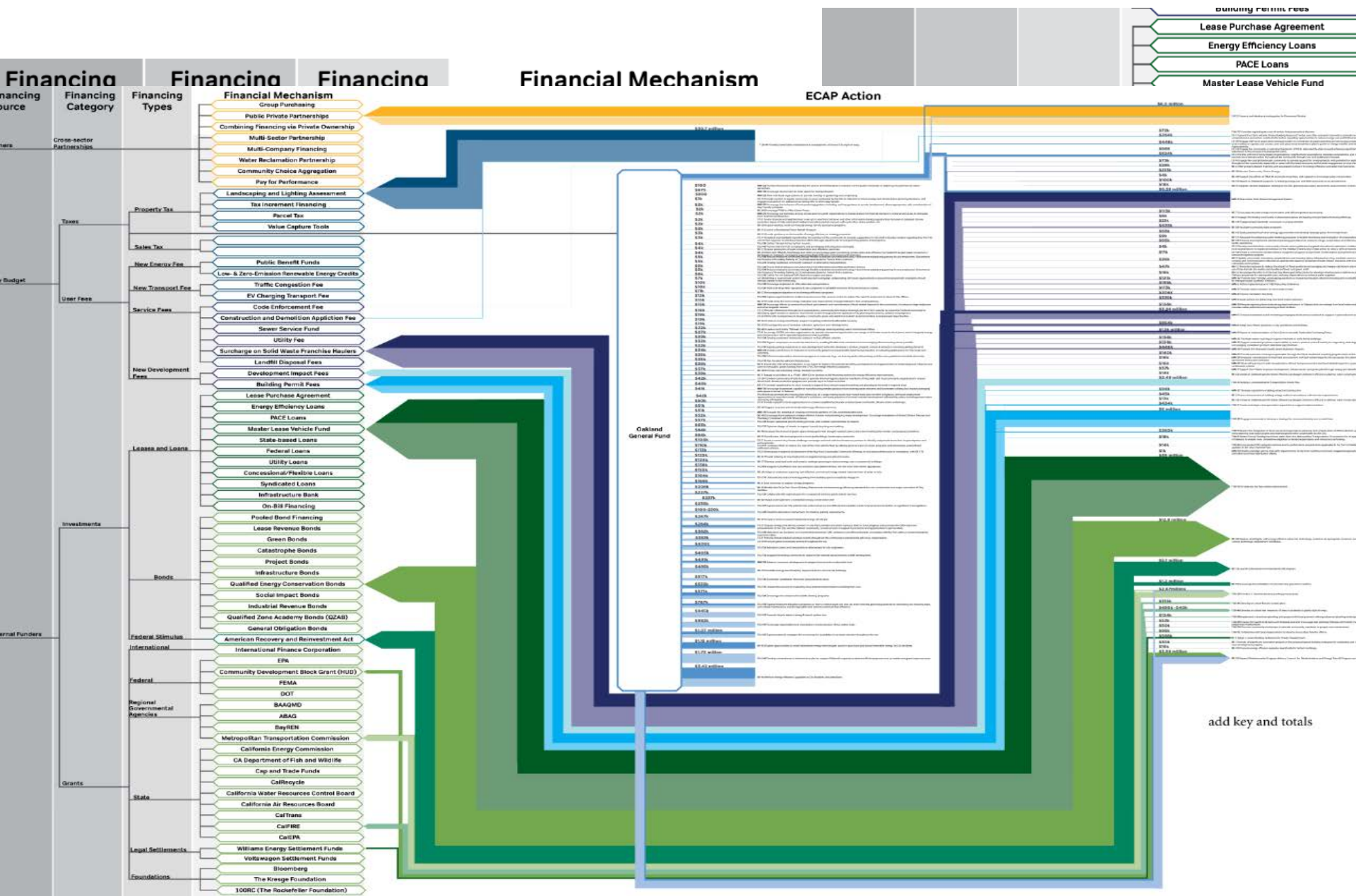**Key Questions:** What are most useful financing vehicles for your CAP projects?

Can we Calculate (Term Sheets):
- Cost/Savings
- Payback, ROI, NPV
- Return Profile
- Size/Scalability
- Co-Benefits

Knowledge and Practice Gap
- Quantification of Projects, Pipeline
- Seeking and Finding Funding

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Mahalo Nui!

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SAFER, SMARTER, GREENER

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