George V. Leyva Middle School, San Jose (Credit: KaraGeorge Studios)

nbi new buildings institute

Reach Code for Non-Residential New Construction

June 4, 2019

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

CLIMATE SMART SAN JOSE
LIVING BETTER TODAY FOR TOMORROW

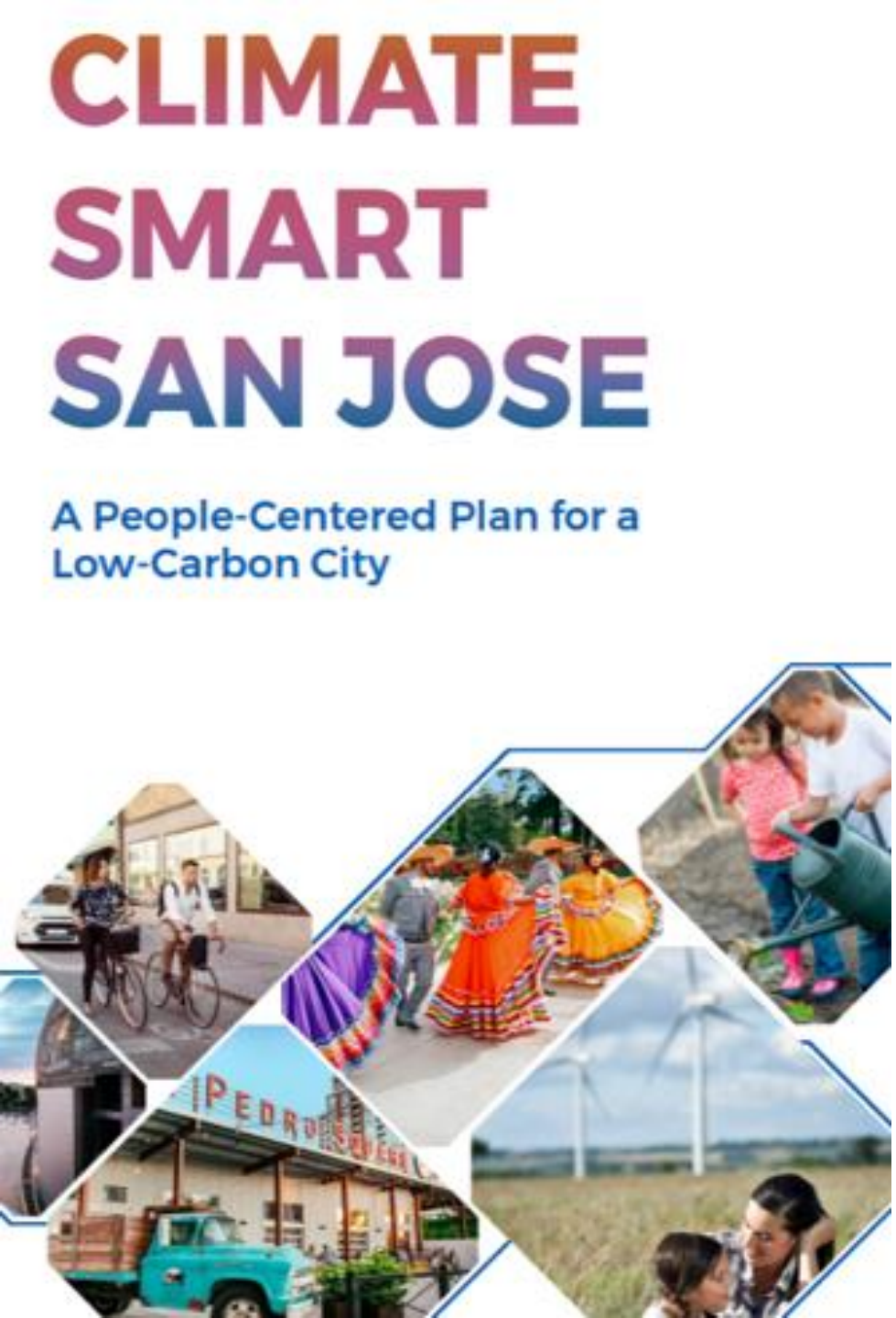
Agenda

- Introductions
- Why San José is Pursuing a Reach Code
- Reach Code Development Process
- Stakeholder Feedback for Reach Code Options
  - Electrification
  - Electric Vehicle Charging Infrastructure
  - Solar

nbi new buildings institute

nbi new buildings institute

CITY OF
SAN JOSE
CAPITAL OF SILICON VALLEY



Why is San José Pursuing a Reach Code?

- Aligns with Climate Smart 2030 goals:
  - 47% of homes are all-electric
  - 37,975 zero net carbon (ZNC) homes
  - 70M sq. ft. of ZNC commercial buildings
  - 61% of all passenger vehicles are electric
  - 668 MW of solar installed

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

Avoided GHG emissions are significant

Benefits to community

nbi new buildings institute

CITY OF SAN JOSE CAPITAL OF SILICON VALLEY

San José Context – Carbon Impact of Growth

Building Type	Sq. Ft.	CO2/ Yr.		Units/ Yr.		Years in Service		Years in Code Cycle		Total CO2
Single- Family	2,700	2 tons	X	350	X	50	X	3	=	**105,000 tons**
Multi-Family	1,000	1 ton	X	2400	X	50	X	3	=	**360,000 tons**
Commercial/ Industrial	100,000	120 tons	X	24	X	50	X	3	=	**432,000 tons**
										1.7 trillion car miles

Courtesy TRC, PSE & SVCE

nbi new buildings institute

CITY OF SAN JOSE CAPITAL OF SILICON VALLEY

San José Context

All-Electric Buildings

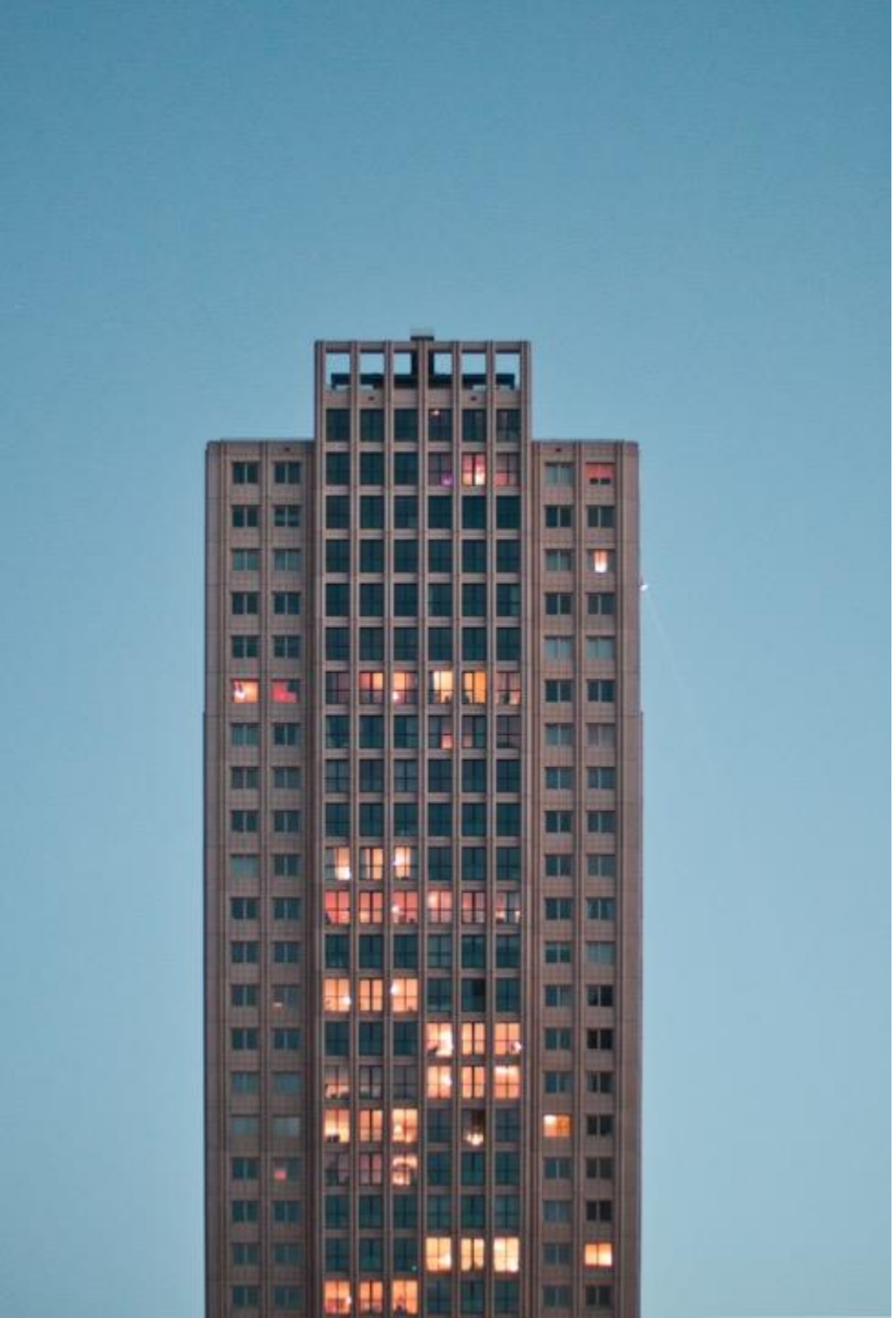


Solar

EVs and Charging Infrastructure

nbi new buildings institute

CITY OF SAN JOSE CAPITAL OF SILICON VALLEY



San José
Reach Code Development

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

Minimum Base Codes

Set minimum levels of efficiency for building design and construction

nbi new buildings institute

2019 – Minimum Base Code

- Requires solar-readiness for low-rise, non-healthcare buildings

nbi new buildings institute

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

2019 – Minimum Base Code

- Requires solar-readiness for low-rise, non-healthcare buildings

San José CALGreen Requirement

- Requires that a portion of parking spaces be “EV Ready”

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

What is a Reach Code?

- Overlays the base code
- Includes additional requirements, such as:
  - Energy efficiency
  - Water efficiency
  - Renewable energy
  - EV charging infrastructure
  - Electrification

nbi new buildings institute

What is a Reach Code?

- Overlays the base code
- Includes additional requirements, such as:
  - Building Electrification
  - Electric Vehicle Charing Infrastructure
  - Solar PV

nbi new buildings institute

City		Measures
Alameda County	2018	Solar PV
City of Brisbane	2017	Cool Roof, Solar PV
City of Chula Vista	2018	Outdoor Lighting
City of Del Mar	2018	Energy Efficiency
City of Davis	2017	Energy Efficiency, Solar PV
City of Fremont	2017	Lighting, Solar PV
City of Healdsburg	2017	Energy Efficiency
City of Lancaster	2018	Solar PV
Marin County	2017/8	Energy Efficiency
Mill Valley	2017	Energy Efficiency
City of Novato	2017	Energy Efficiency
City of Palo Alto	2016	Energy Efficiency, Solar PV, EV
Town of Portola Valley	2017	Energy Efficiency
City of San Francisco	2016	Solar PV or Solar Thermal
City of San Mateo	2016	Cool Roofs, Solar

Courtesy TRC, PSE & SVCE

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

Reach Code Regional Effort

NRDC
NATURAL RESOURCES DEFENSE COUNCIL

PENINSULA CLEAN ENERGY

DNV·GL

BUILDING DECARBONIZATION COALITION

EAST BAY COMMUNITY ENERGY

TRC
Results you can rely on

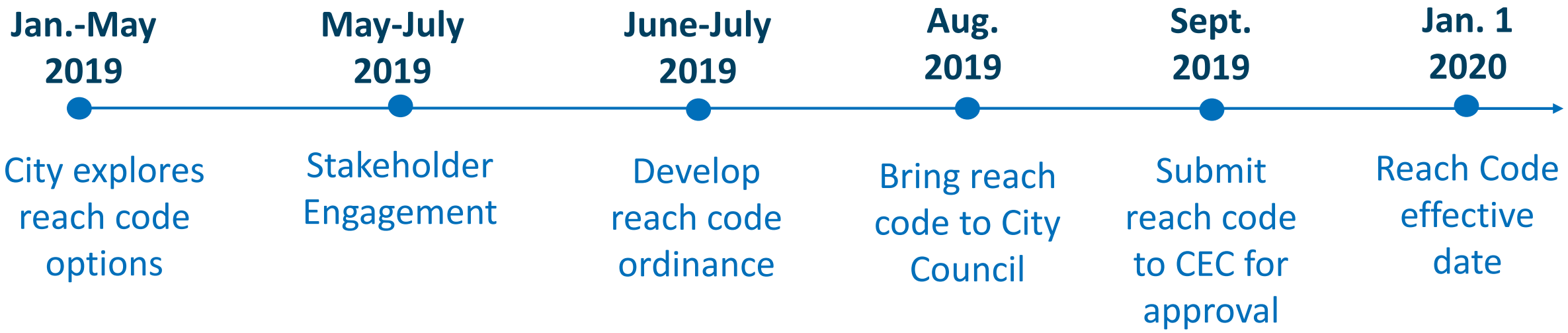
BAYREN

nbi new buildings institute

SILICON VALLEY CLEAN ENERGY

nbi new buildings institute
CAPITAL OF SILICON VALLEY

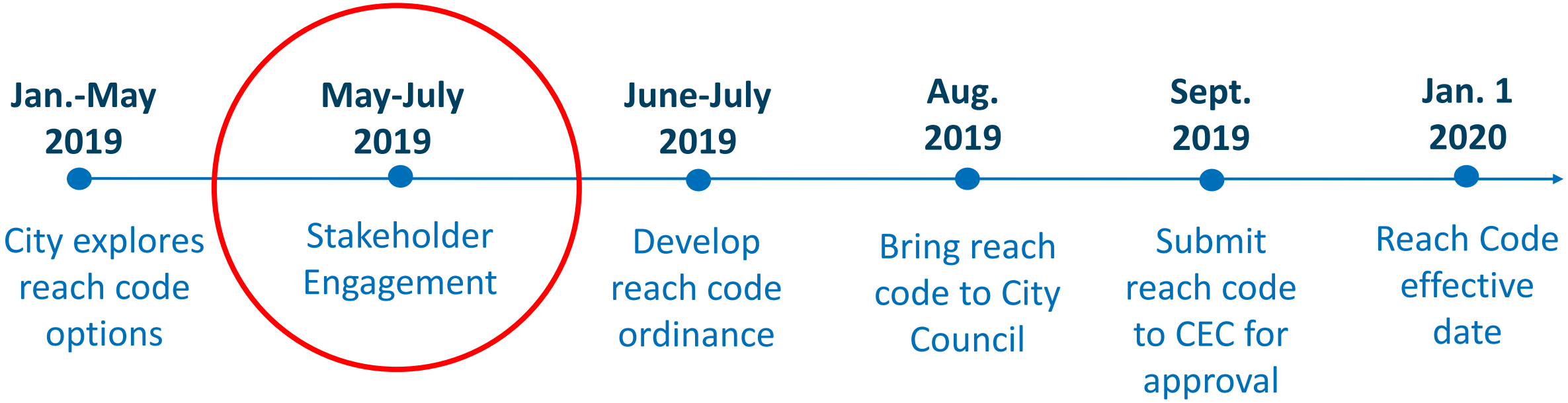
San José Reach Code Development Process & Timeline



nbi new buildings institute

CITY OF SAN JOSE CAPITAL OF SILICON VALLEY

San José Reach Code Development Process & Timeline



nbi new buildings institute

CITY OF SAN JOSE CAPITAL OF SILICON VALLEY

San José Reach Code Stakeholder Meetings

Initial Feedback

Non-Residential

Residential

Final Input

nbi new buildings institute

CITY OF SAN JOSE CAPITAL OF SILICON VALLEY

Discussion and Feedback

Objective: Further building electrification, EVCI and Solar PV installation for new commercial construction in San José

nbi new buildings institute

CITY OF SAN JOSE CAPITAL OF SILICON VALLEY

CLIMATE SMART SAN JOSE

A People-Centered Plan for a Low-Carbon City

- Building Electrification
- Electric Vehicle Charging Infrastructure
- Solar PV

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

CLIMATE SMART SAN JOSE

A People-Centered Plan for a Low-Carbon City

- **Building Electrification**
- Electric Vehicle Charging Infrastructure
- Solar PV

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

Building Electrification Strategies

- Require “electrification-readiness”
- Require only base code for all-electric buildings
- Require greater efficiency from mixed-fuel buildings

CALIFORNIA ENERGY CODES & STANDARDS

A STATEWIDE UTILITY PROGRAM

Title 24, Parts 6 and 11
Local Energy Efficiency Ordinances

2019 Nonresidential New Construction Reach Code Cost Effectiveness Study

DRAFT

nbi new buildings institute

CALIFORNIA ENERGY CODES & STANDARDS
A STATEWIDE UTILITY PROGRAM

Title 24, Parts 6 and 11
Local Energy Efficiency Ordinances

2019 Nonresidential New Construction Reach Code Cost Effectiveness Study
DRAFT

Prepared for:
Christopher Kuch
Codes and Standards Program
Southern California Edison Company

Prepared by:
TRC Advanced Energy
EnergySoft

Last Modified: March 18, 2019

SDGE A Sempra Energy utility | SoCalGas A Sempra Energy utility | Southern California Edison An EDISON INTERNATIONAL Company | PG&E Pacific Gas and Electric Company

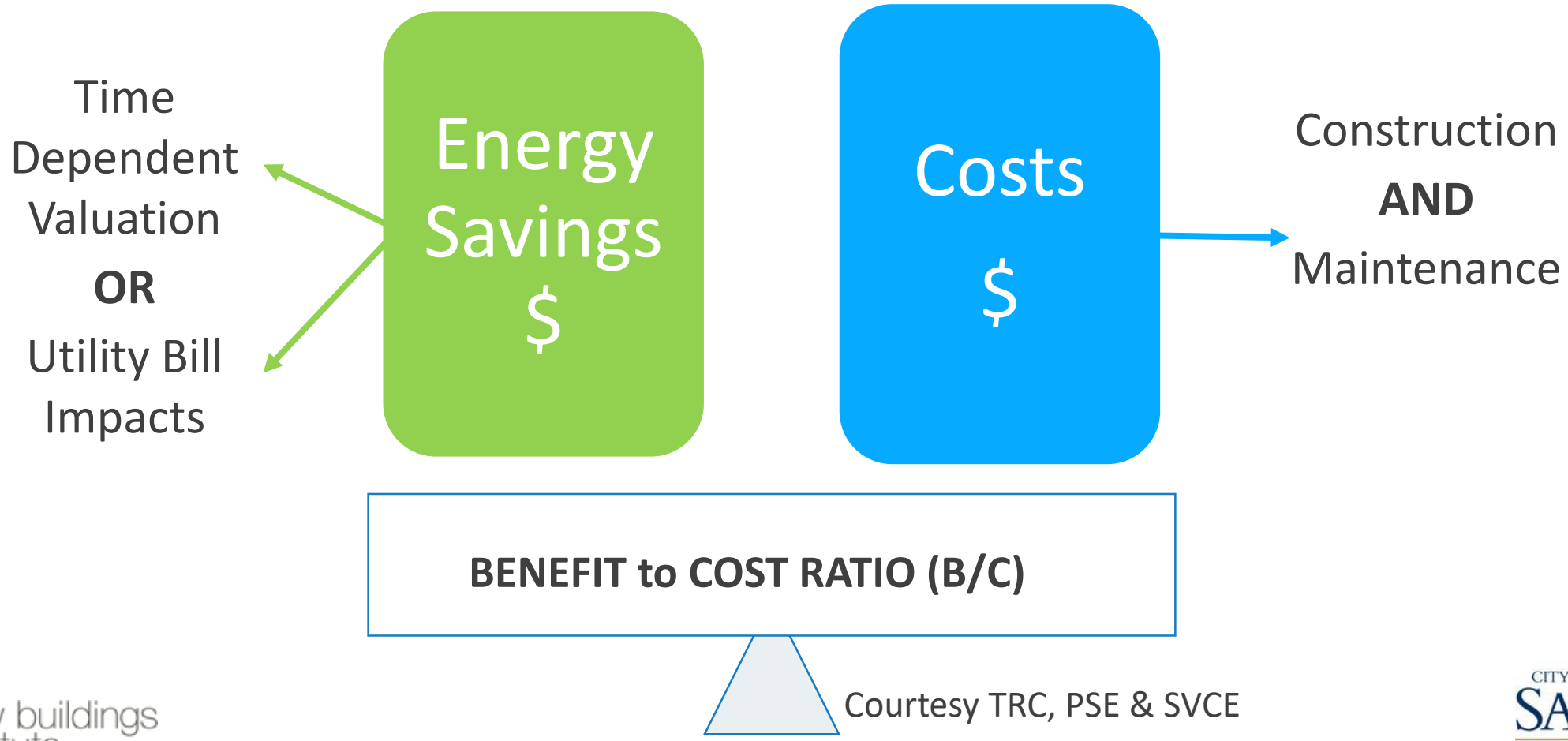
Package	Measure	Office	Retail	Hotel
EE	**ENVELOPE**			
	Lower SHGC Fenestration	X	X	
	Fenestration as a Function of Orientation	X		
	DHW/HVAC			
	Drain Water Heat Recovery			X
	VAV Box Minimum Flow	X		X
	Economizers on Small Capacity Systems		X	
	Preemptive efficiencies	X	X	X
	LIGHTING			
	Interior Lighting Reduced LPD	X	X	X
	Institutional Tuning	X	X	X
	Daylight Dimming Plus Off	X		
	Occupant Sensing in Open Plan Offices	X		
PV	Solar PV	135 kW	80 kW	90 kW
	50 kWh Battery	X	X	X

Courtesy TRC, PSE & SVCE

nbi new buildings institute

CITY OF SAN JOSE CAPITAL OF SILICON VALLEY

Determining Cost Effectiveness



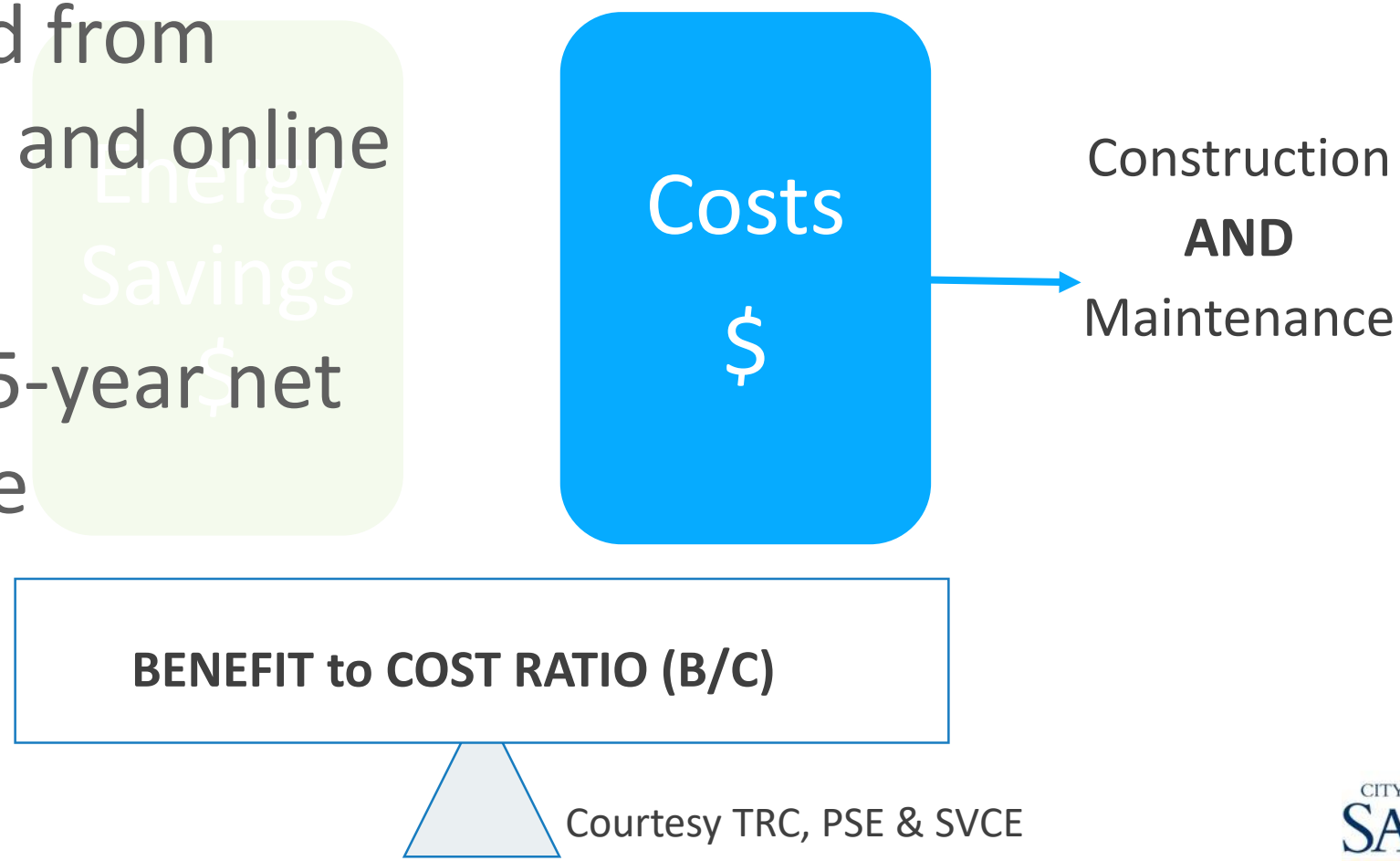
Courtesy TRC, PSE & SVCE

nbi new buildings institute

CITY OF SAN JOSE CAPITAL OF SILICON VALLEY

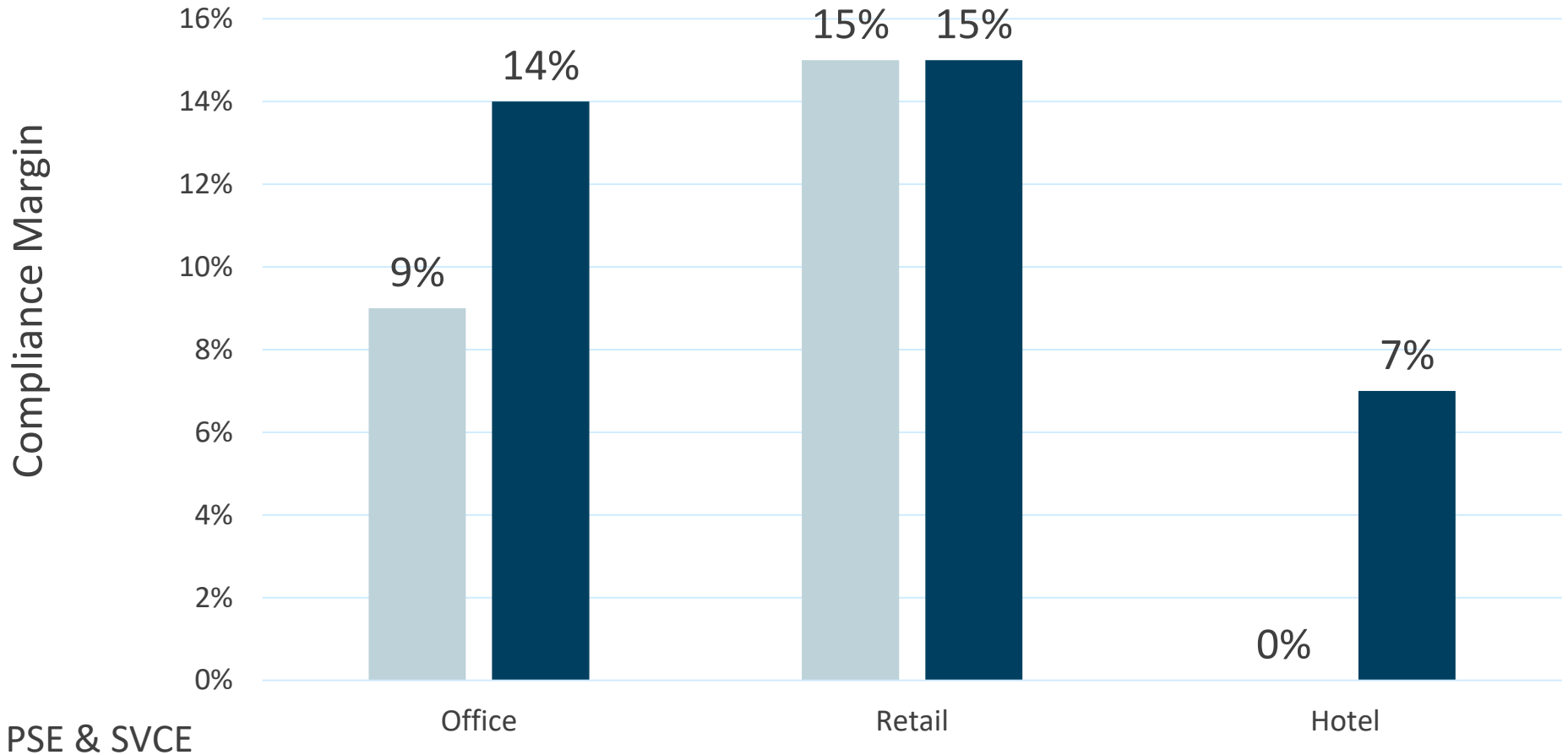
Determining Cost Effectiveness

- Costs derived from local experts and online resources
- 30-year or 15-year net present value



Courtesy TRC, PSE & SVCE

Cost Effective Savings



Courtesy TRC, PSE & SVCE

nbi new buildings institute

CITY OF SAN JOSE CAPITAL OF SILICON VALLEY

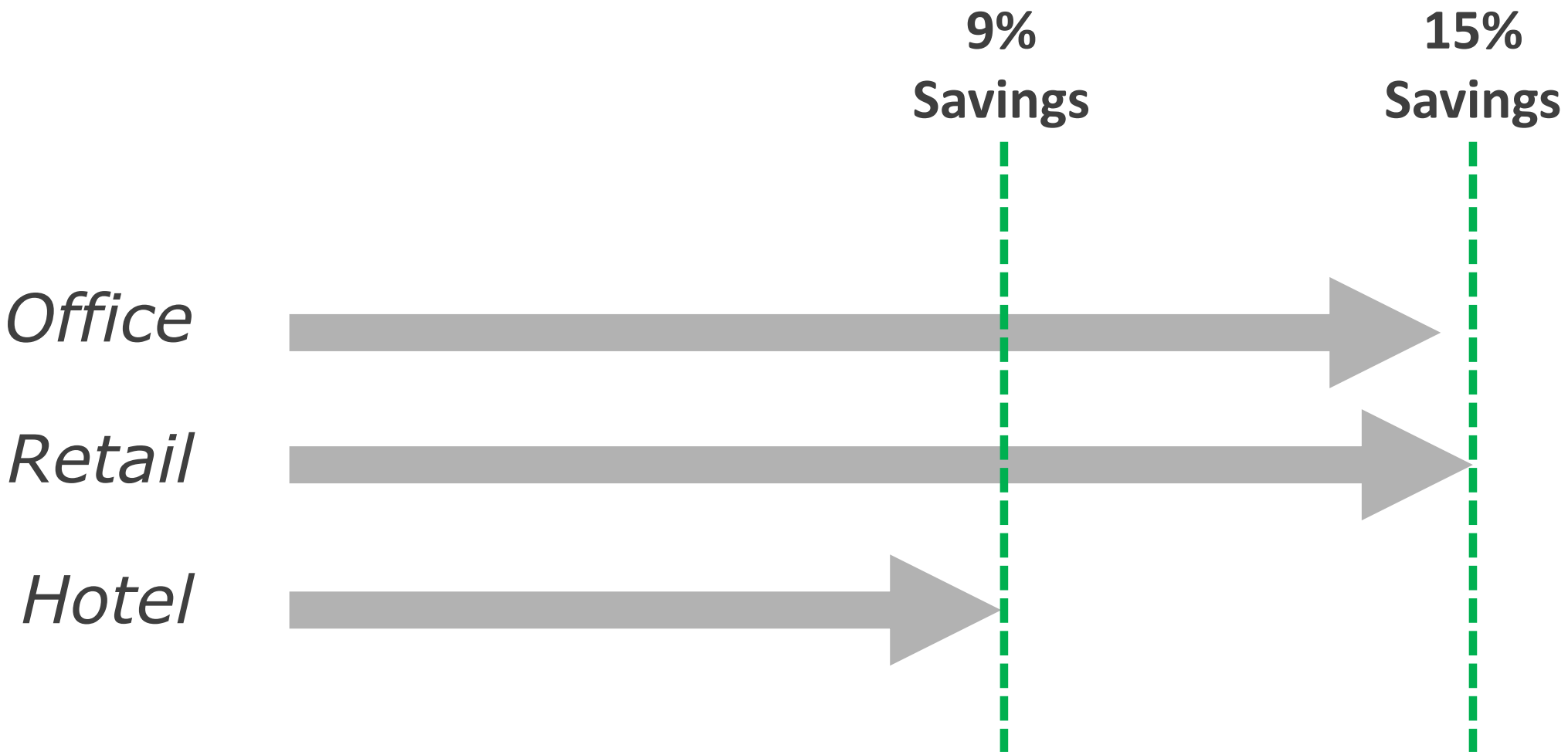
Non-Residential:
Building Electrification Reach Code Options

All Electric Building:

- 0% more efficient than Title 24

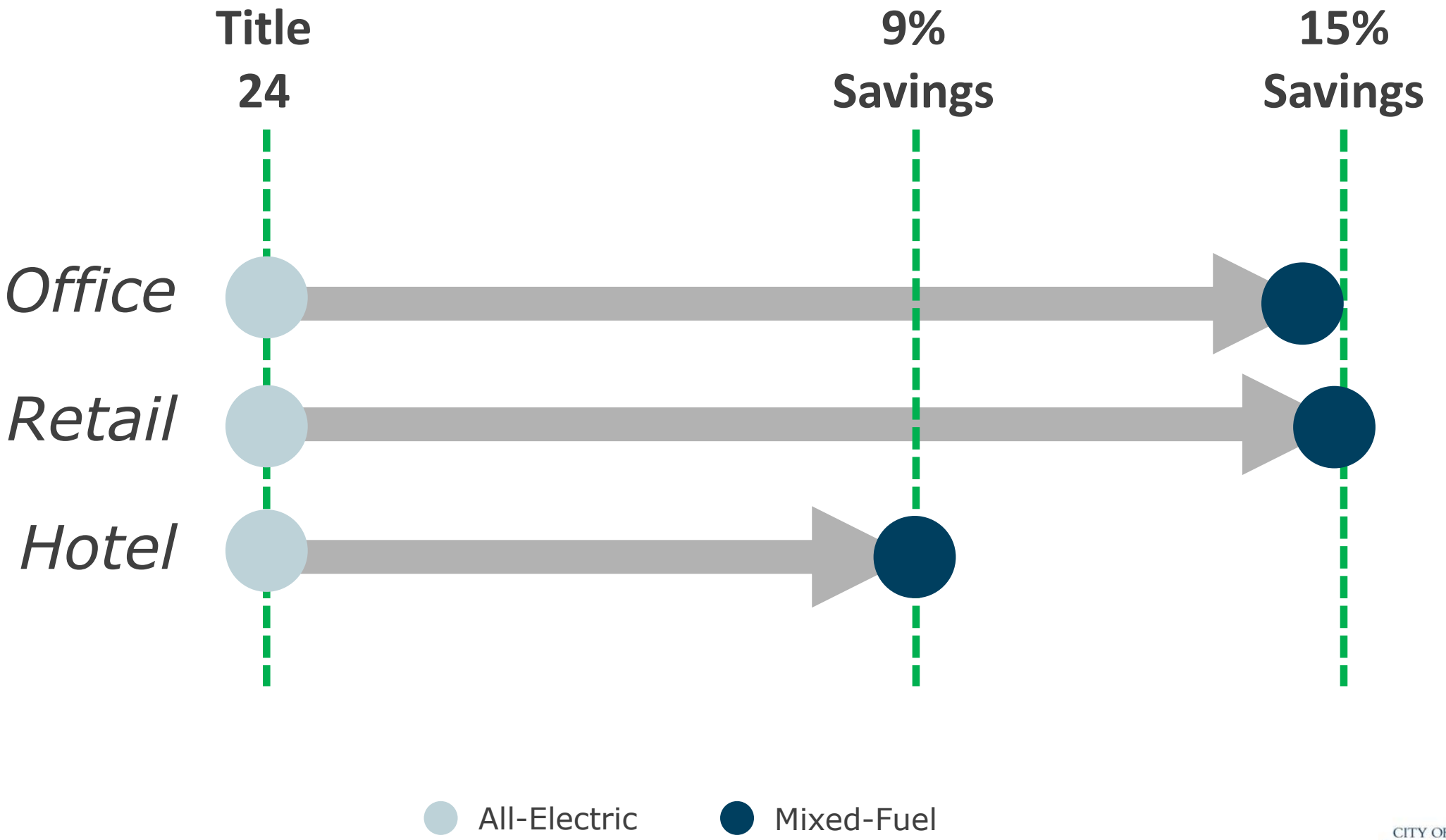
Mixed Fuel Building:

- Office: Up to 14% more efficient than Title 24
- Retail: Up to 15% more efficient than Title 24
- All other: Up to 9% more efficient than Title 24



nbi new buildings institute

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY



nbi new buildings institute

CITY OF SAN JOSE CAPITAL OF SILICON VALLEY

CLIMATE SMART SAN JOSE

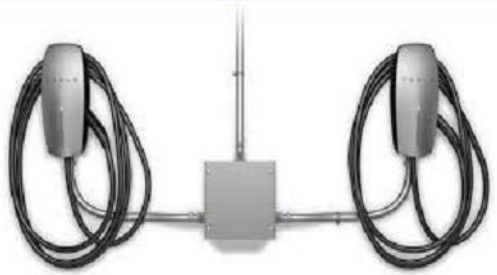
A People-Centered Plan for a Low-Carbon City

- Building Electrification
- **Electric Vehicle Charging Infrastructure**
- Solar PV

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

EVCI Definitions

Electric Vehicle Charging Infrastructure

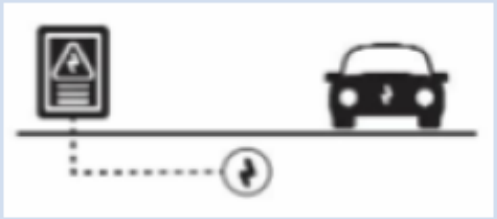
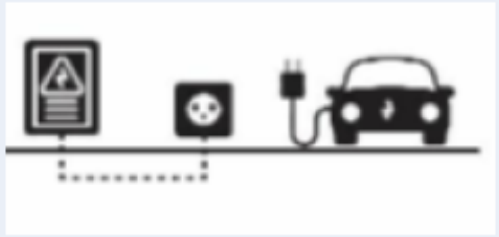
Level 1		15-20 Amp, 120v AC (standard household outlet) Driving Distance provided: 3-4 miles/hour
Level 2		40+ Amp, 208/240v AC Driving Distance provided: 25-30 miles/hour
DC Fast Charge		80-400 Amp, 200-600v DC Driving Distance provided: 125-1000 miles/hour

nbi new buildings institute

CITY OF SAN JOSE CAPITAL OF SILICON VALLEY

EVCI Definitions

Electric Vehicle Charging Infrastructure

EV Capable *(Some assembly required)*		Raceway (conduit), electrical capacity (breaker space)
EV Ready *(Plug & Play)*		Raceway (conduit), electrical service capacity, overcurrent protection devices, wire and outlet (i.e. full circuit)
EV Supply Equipment (EVSE) Installed *(Level 2 Charge!)*		All the equipment needed to deliver electrical energy from an electricity source to the EV

Courtesy TRC, PCE & SVCE

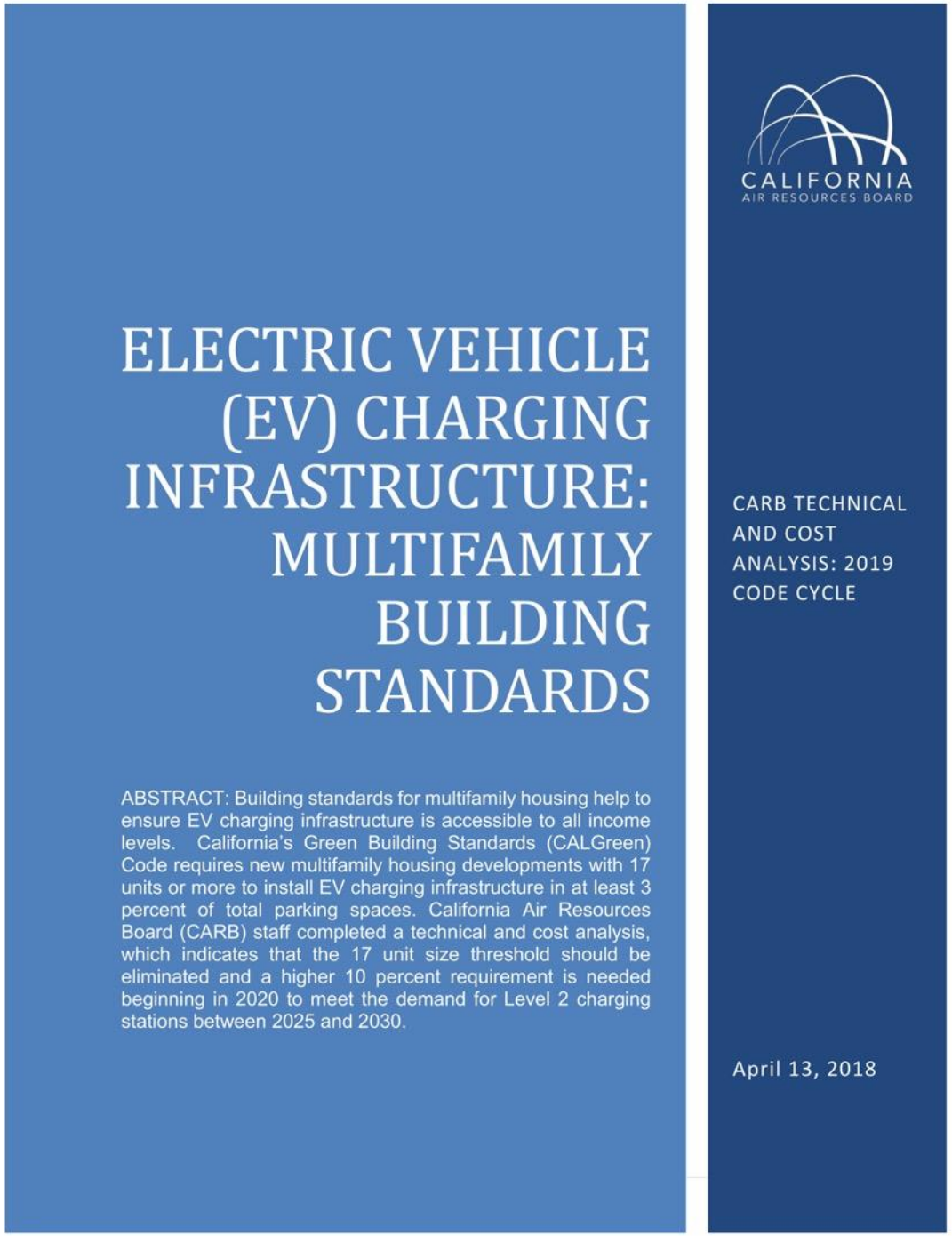
nbi new buildings institute

CITY OF SAN JOSE CAPITAL OF SILICON VALLEY

Electric Vehicle Projections

Multifamily Parking

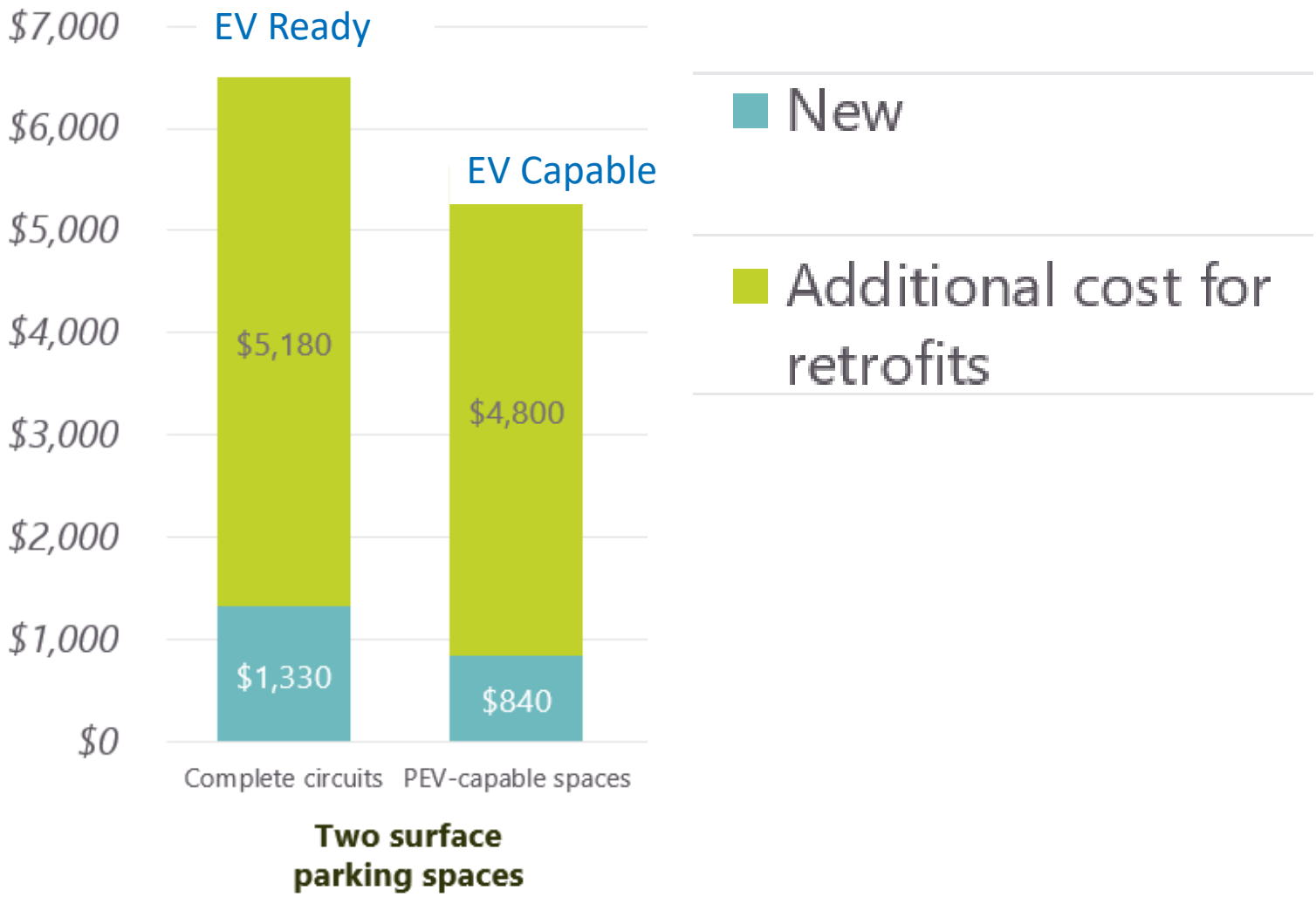
- 10% EV parking by 2025
- 43% EV parking by 2050



nbi new buildings institute

EVCI – Cost of New vs. Retrofit

Electric Vehicle Charging Infrastructure



Avoided Retrofit $
EV Ready: $5,180
EV Capable: $4,800

"Driving Plug-In Electric Vehicle Adoption with Green Building Codes" by Energy Solutions, PG&E, ARB.
(Graphic courtesy TRC, PSE & SVCE)

Electric Vehicle Charging Infrastructure

Non-Residential: EVCI Reach Code Options

- Increase EV Capable Requirements
- Include EV Ready Requirements
- Include EVCI Installation Requirements

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

CLIMATE SMART SAN JOSE

A People-Centered Plan for a Low-Carbon City

- Building Electrification
- Electric Vehicle Charging Infrastructure
- **Solar PV**

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

Non-Residential: Solar Reach Code Options

- Solar readiness for all buildings
- Promote PV with increased efficiency
- Require PV
  - To meet code
  - In addition to code

Next Steps

Upcoming Stakeholder Meetings:

- June 25 – Residential New Construction Focus
- July 10 – Final Reach Code Input

Contact Information:

- energy@sanjoseca.gov
- City Reach Code Webpage: http://www.sanjoseca.gov/index.aspx?NID=6357

nbi new buildings institute

CITY OF SAN JOSE CAPITAL OF SILICON VALLEY