# FlexPath

Scope, Opportunities and Requirements

# Purpose

Understand the steps and decisions you need to make to develop a single family FlexPath ordinance

# Scope

**Single Family Homes, Duplexes and Townhomes**

**During remodels of a certain size and scope**, install energy improvements from among a menu of options to achieve an established target score.

Electric appliances are **NOT** required, only encouraged.

Typically, does not include small projects, unpermitted work and repairs.

# Ordinance Objectives

- **Capture GHG reductions during certain projects through:**
  - Electrification
  - Energy efficiency
  - Solar PV
- Provide flexibility for applicants
- Use a simple application process
- Meet Federal and State requirements

# Single Family FlexPath Example Project

- Remodels 1,000 $ft^2$ kitchen and living room
- No existing air conditioning
- Construction cost ~$500,000 ($500/$ft^2$)
- Flex Path Target Score: 19 for alterations that are 1,000 square feet or larger

**How will this comply with a FlexPath Ordinance?**

# FlexPath Example Project Measures

## Compliance Path 1

- Project chooses a heat pump hot water heater (12 points) + heat pump space heater (7 points) to comply
- Total compliance cost = $25,000

5% cost increase

*Rebates available to homeowner, not included in FlexPath calculations*

## Compliance Path 2

- Project chooses attic insulation (5) + windows (5) + wall insulation (3) + new ducts + duct sealing (6) Keeps existing gas furnace
- Total compliance cost = $28,200

5.6% cost increase

| Measure | Point Value |
|---|---|
| Heat Pump Water Heater | 12 |
| Heat Pump Space Heater | 7 |
| Water Heating Package | 1 |
| Induction Cooktop | 1 |
| Heat Pump Clothes Dryer | 1 |
| Air Sealing | 1 |
| Duct Sealing | 3 |
| R-49 Attic Insulation | 5 |
| Windows | 5 |
| R-13 Wall Insulation | 3 |
| New Ducts + Duct Sealing | 6 |
| R-19 Floor Insulation | 1 |
| R-30 Floor Insulation | 2 |
| Solar PV + Electric Readiness | 17 |

# Identifying Opportunities

Review Building Stock and Permit Data

# Permit and building stock data demonstrate reach code opportunities

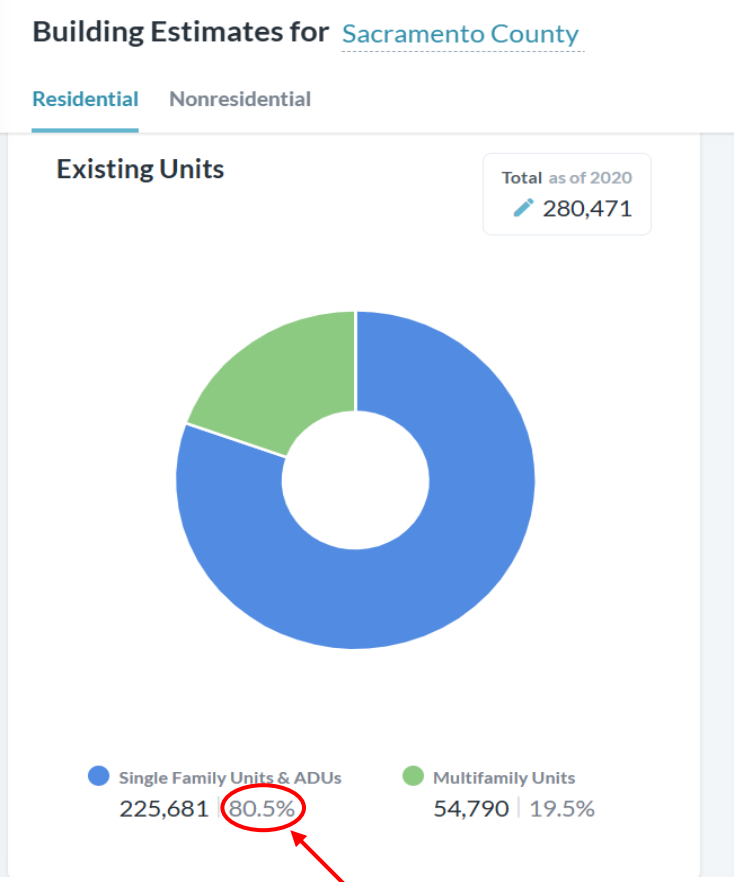
**Building stock data identifies:**

- Building types & proportion of the building stock
- Building vintages
- Average home size

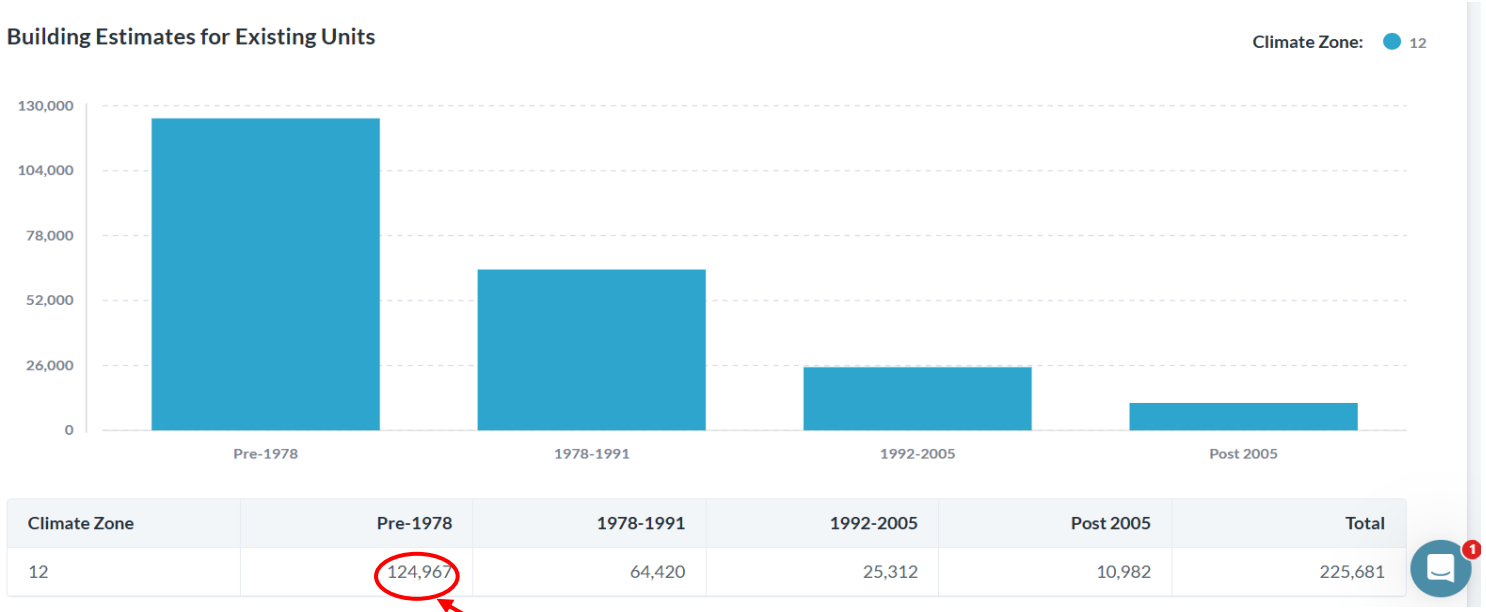
**Permit data identifies:**

- Covered project definition
- Project valuation/retrofit cost
- Count of applicable projects
- Proof of concept/market readiness for covered projects and measures

# Building Stock Data Example




81% of residential building stock is single-family

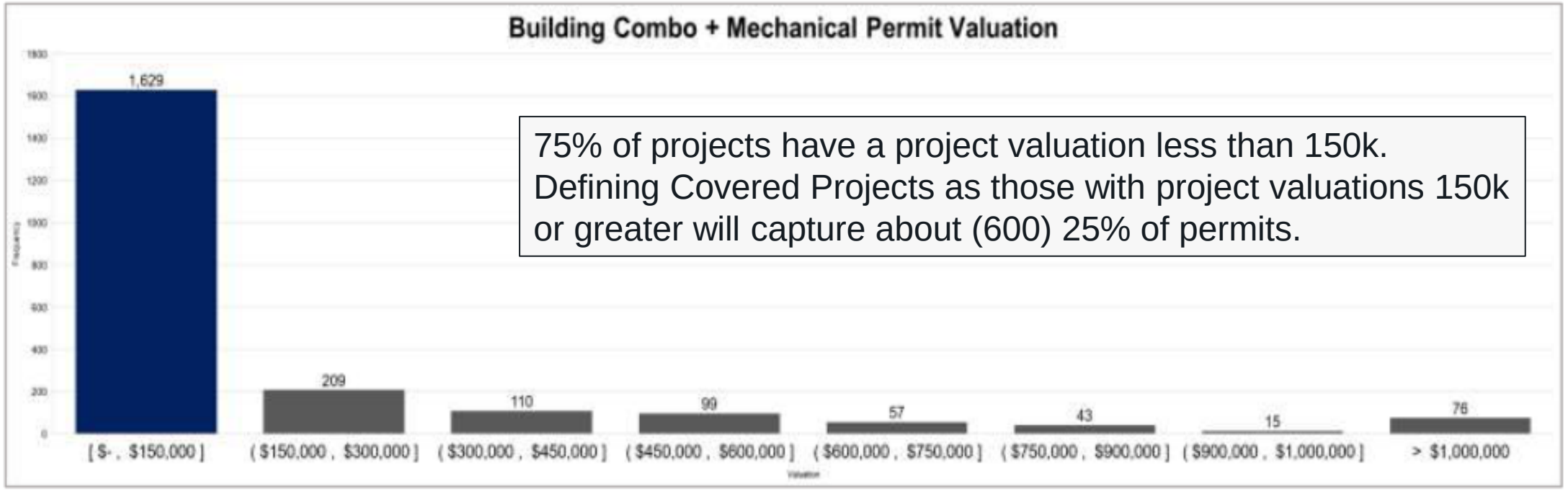



| Climate Zone | Pre-1978 | 1978-1991 | 1992-2005 | Post 2005 | Total |
|---|---|---|---|---|---|
| 12 | 124,967 | 64,420 | 25,312 | 10,982 | 225,681 |

55% of existing building stock was built before 1978

Source: Cost Effectiveness Explorer

# Permit Data Example – Project Valuation



# Flexpath Requirements

Target Score, Measures and Exceptions

# Covered Projects Definition Options

**Additions and Alterations**

**Valuation**

**Specific Permit Type**

**Equipment Replacements and Modifications**

# How to Determine Target Score

**Requirement: There must be at least one cost-effective compliance pathway that does not require electrification**

| |
|---|
| Identify vintage (Pre-1978, 1978 – 1991, 1991-2005) |
| Identify maximum score |
| Determine target score based on flexibility and compliance cost |
| Determine if you want to set a tiered approach |
| Develop compliance packages to understand how many compliance options there are and their associated cost |

# Cost-effectiveness explorer example

POLICY REQUIREMENTS

Require specific measures

Require a minimum flexible score

Required flexible score: 49

Maximum cost-effective score: 70

Calculation method: LSC

The cost-effectiveness explorer tool selects the maximum score for you

Long-term systemwide cost is the CEC's cost-effectiveness metric

| MEASURE LIST | | | BENEFIT/COST RATIOS | | | PER HOME RESULTS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Available Measures | Flexible Score annual energy savings | Mandatory | On-Bill (2022 Esc) ≥ 1.0 is cost effective | On-Bill (2025 Esc) ≥ 1.0 is cost effective | LSC ≥ 1.0 is cost effective | Incremental Cost | Annual Bill Savings (on-bill) | Emissions Reductions ($MTCO_2e$/year) | Lifecycle Savings (on-bill) | Electricity Savings (kWh/year) |
| R-38 Attic insulation | 7 | | 1.0 | 1.4 | 1.6 | $6,762 | $305 | 0.300 (7.5%) | $9,159 | 800 |
| R-19 Raised Floor Insulation | 7 | | 1.3 | 2.4 | 2.3 | $3,633 | $284 | 0.500 (10.9%) | $8,520 | -372 |
| Water Heating Package | 1 | | 1.9 | -- | -- | $229 | $0 | 0.072 (0.0%) | $0 | 0 |
| Windows | 8 | | 0.7 | 0.9 | 1.0 | $11,463 | $328 | 0.200 (5.9%) | $9,850 | 1,294 |
| R-13 Wall Insulation | 6 | | 1.8 | 2.7 | 3.0 | $2,950 | $268 | 0.300 (8.6%) | $8,046 | 252 |
| Duct sealing | 6 | | 2.3 | 3.1 | 3.5 | $2,590 | $271 | 0.300 (7.1%) | $8,132 | 589 |
| R-49 Attic insulation | 8 | | 1.0 | 1.4 | 1.6 | $7,446 | $336 | 0.300 (8.2%) | $10,077 | 888 |
| Air sealing | 2 | | 0.3 | 0.5 | 0.5 | $4,684 | $78 | 0.100 (2.6%) | $2,331 | 58 |
| Lighting Measures | -- | | -- | -- | -- | $48 | $0 | 0.004 (0.0%) | $0 | 34 |
| R-30 Raised Floor Insulation | 8 | | 1.3 | 2.4 | 2.3 | $4,113 | $323 | 0.500 (12.5%) | $9,704 | -438 |
| PV | | | | | | | | | | |
| Electrification | | | | | | | | | | |
| Heat Pump Water Heater | 12 | | 0.8 | 1.9 | 1.6 | $4,332 | $407 | 0.800 (20.7%) | $12,220 | -1,371 |

Explorer tool training

Source: Cost Effectiveness Explorer

# Available Measures

## Heat Pump Appliances

- Water Heater
- Space Conditioning
- Clothes Dryer

## Roof Improvements

- Cool Roof
- Radiant Barrier

## Other Electrification

- Induction Cooktop
- All-electric Home

## Envelope Improvements

- Air Sealing
- Attic Insulation
- Wall Insulation
- Windows
- Raised Floor Insulation

## Duct Improvements

- Duct Sealing
- New Ducts + Insulation + sealing

## Other Efficiency

- Solar PV
- Electric Readiness
- Lighting
- Water Heating Package

# Considerations when Selecting Measures

**Which measures should be mandatory?**

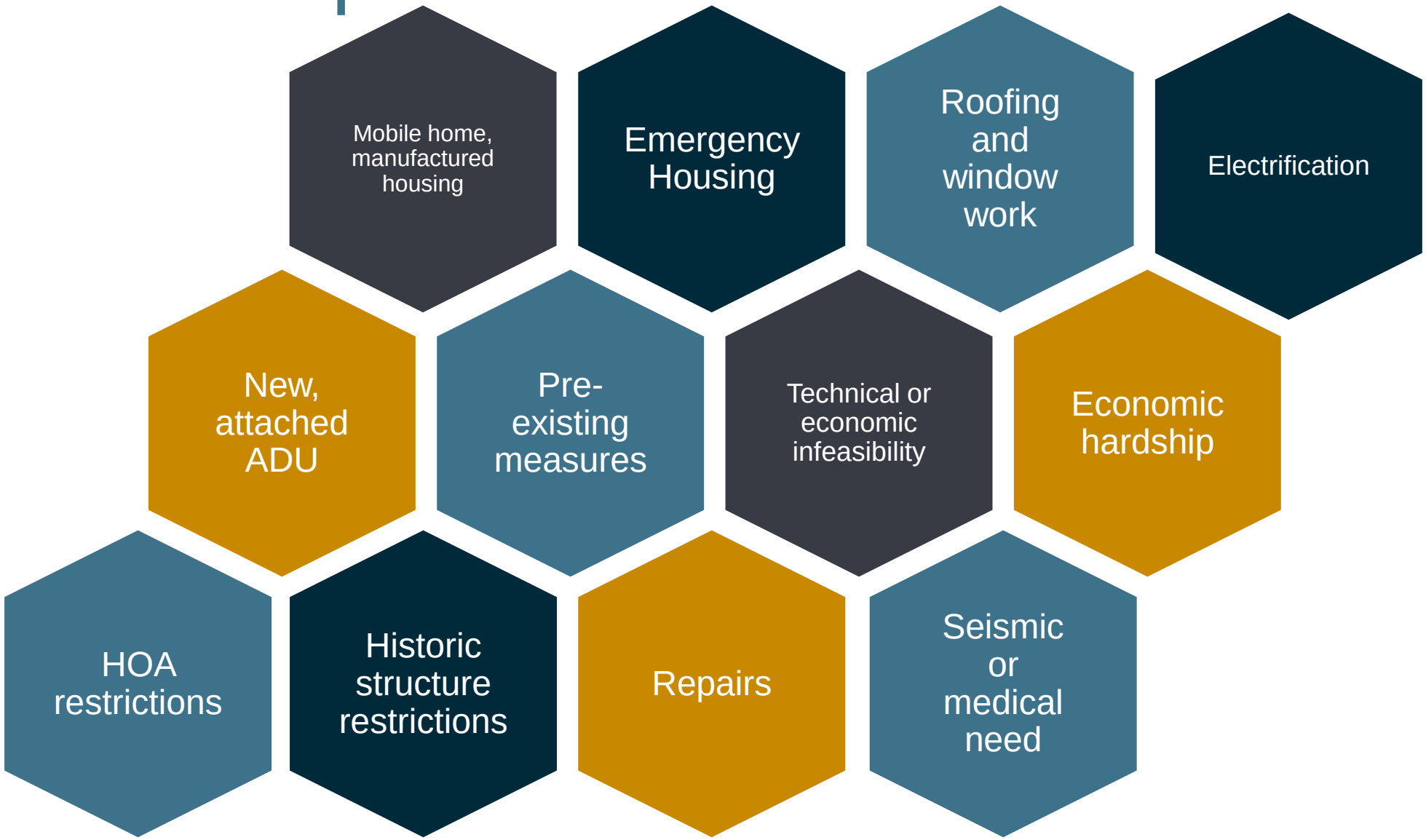
Cost Effectiveness explorer sets mandatory measures for you

**Should solar pair with electric readiness?**

**Should high efficiency measures have higher values?**

**Should electrification measures be included?**

# Potential Exceptions



# Suggested next steps

- Circulate the policy concept with key decision makers
- Analyze building stock and permit data to
  - identify reach code opportunities
  - covered project definition
  - appropriate measures