

# Reaching Carbon Neutrality at UCLA

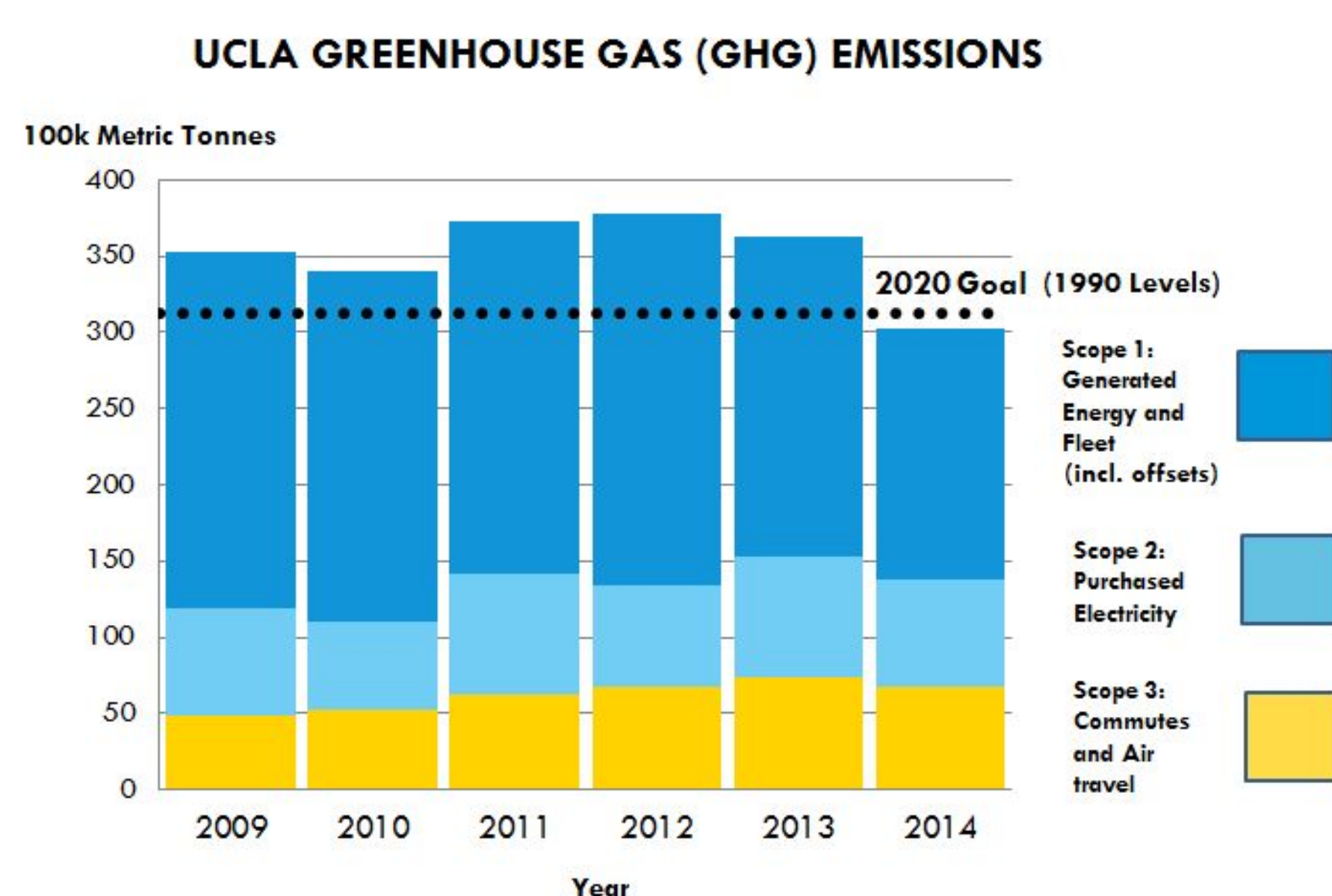
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## Introduction and Background

The University of California has pledged to become carbon neutral by 2025, becoming the first major research university to accomplish this achievement. This project focuses on the technical analysis for UCLA's carbon neutrality strategy.

Through a combination of energy conservation and efficiency, landfill gas, on-site renewables and offsets, UCLA achieved the 2020 target of below 1990 emissions in 2014. However, significant challenges remain to reach carbon neutrality.



Moving forward, key strategies for carbon neutrality at UCLA include:

1. Energy conservation and energy efficiency
2. On-site renewable energy
3. Off-site renewables or utility green power purchase
4. Biogas procurement
5. Management of environmental attributes

## Challenges

- Regulatory framework with public utility
- Limited land/space
- Plans for increased growth and projects
- High-energy medical and research facilities (e.g. Ronald Reagan UCLA Medical Center, David Geffen School of Medicine expansion)

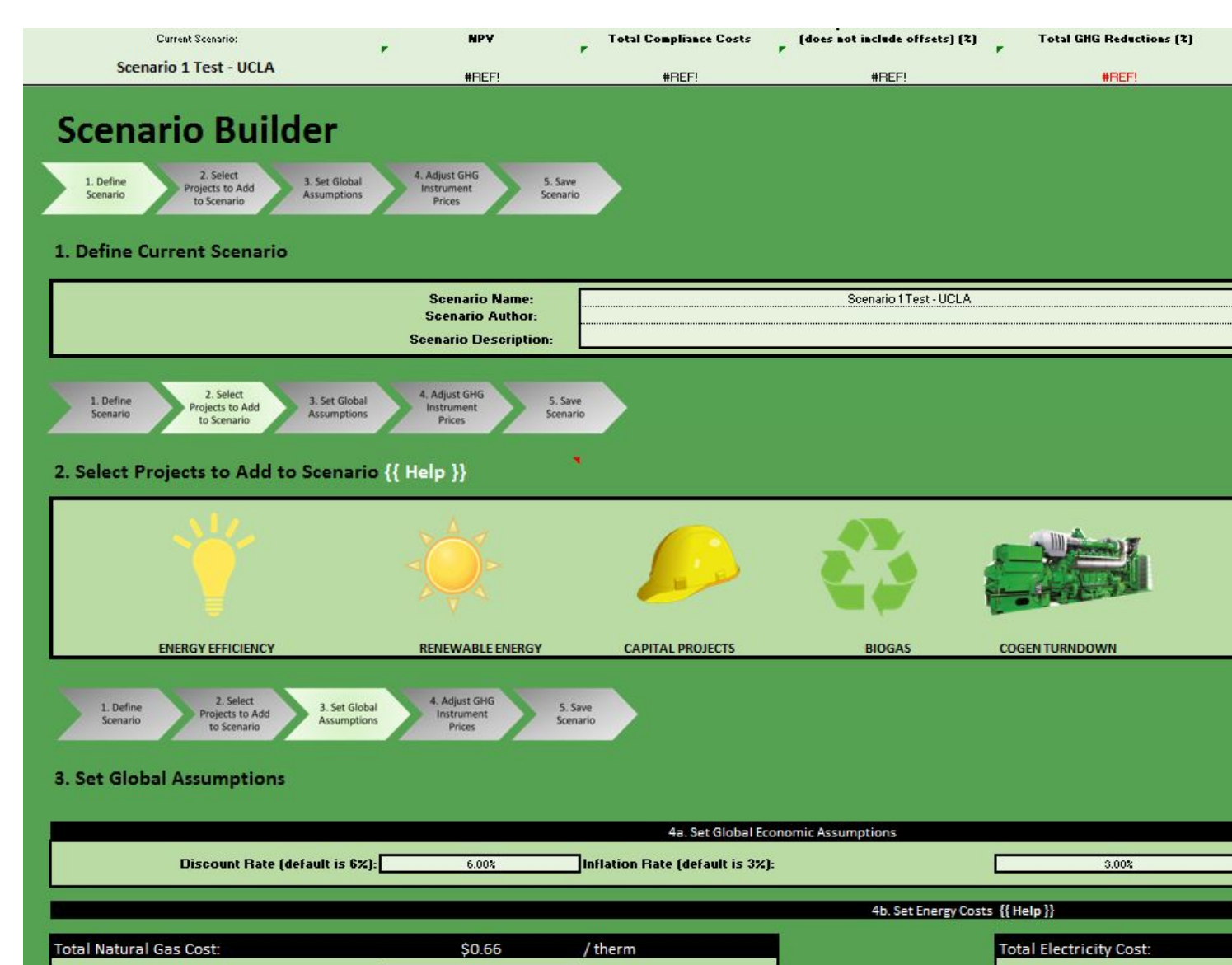
## Project Goals

- Review best practices used in other universities and municipalities to achieve carbon neutrality.
- Working with consultants, customize UCSC scenario planner for UCLA
- Collect data needed to run scenario analysis for UCLA carbon neutrality planning
- Identify gaps in data needed for financial analysis

## Methods and Determining Baselines

To conduct our analyses, we used the Climate and Energy Study Scenario Analysis Tool ("the Tool") developed by University of California Santa Cruz (UCSC) in collaboration with Ecoshift Consulting. We adapted the Tool for campus-specific projects using the data. We identified the key data required for UCLA to conduct scenario analysis for Carbon Neutrality and began data collection.

We evaluated best practices in carbon neutrality planning from cities, counties, and other universities committed to carbon neutrality. We also reviewed strategies in the Carbon Neutral Cities Alliance (CNCA) Framework for Long-Term Deep Carbon Reduction Planning in addition to UC sustainability initiatives.



## Best Practices for Consideration

### 1. Wholesale Electricity

- Investigate whether UCLA could do large scale utility solar procurement through UCOP similar to the UC solar power agreement for 80 MW of solar power beginning in 2017.
- Because UCLA is not eligible for direct access, this would require a different agreement structure

### 2. Campus Energy Efficiency and Renewable Energy

- UCI Smart Labs Initiative - 50-60% energy savings
- UCI Solar Project - 11,700 solar panels to generate up to 3.2 megawatts of power
- UC Berkeley Energy Management Initiative - 10% energy reduction; \$2.4M savings
- UC San Diego Microgrid - generates 92% of campus electricity, saving \$8M/yr. Energy produced from solar, fuel cell, and cogen

### 3. Biogas and Biomass Procurement

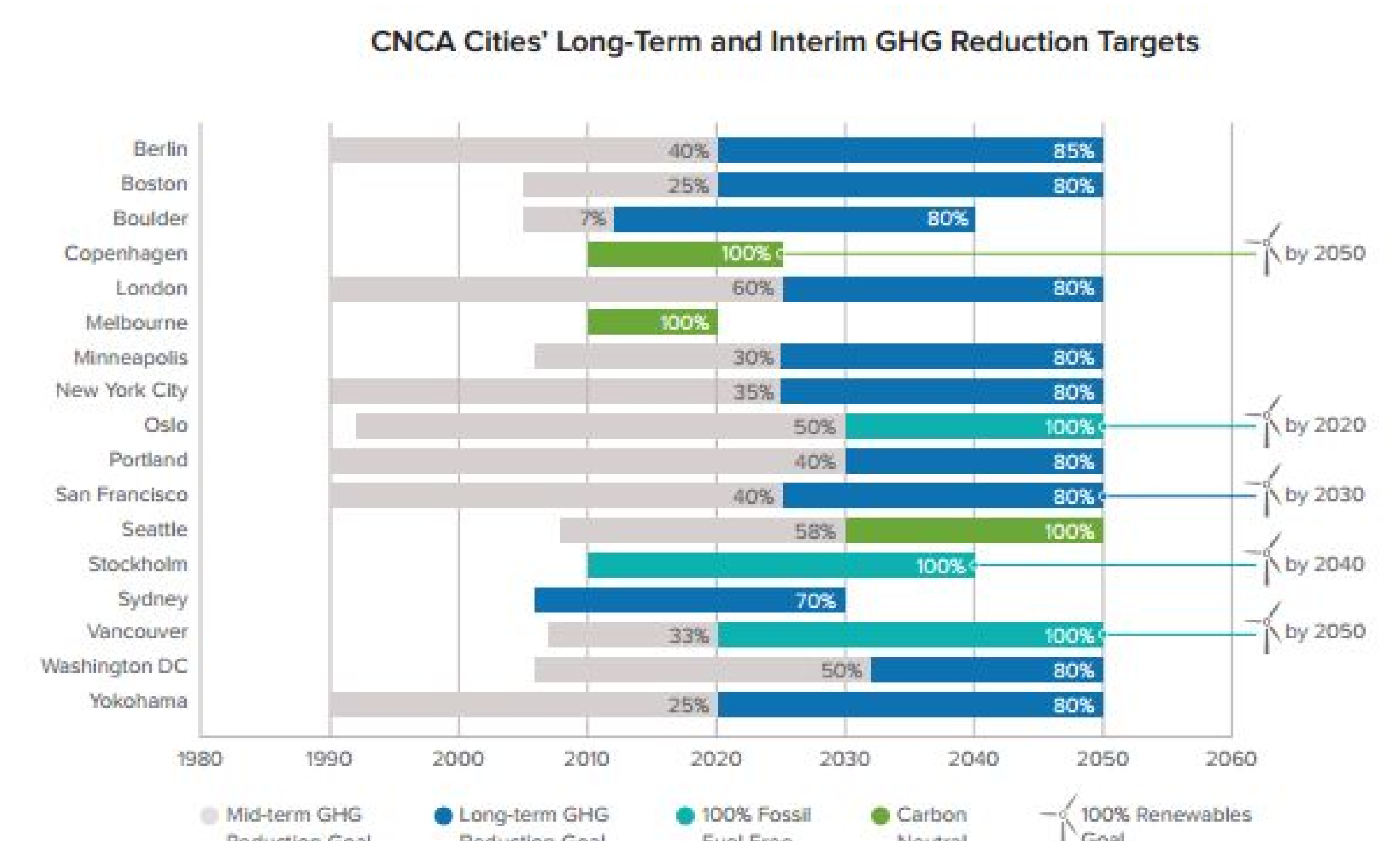
- UC San Diego Biogas - a 2.8 MW fuel cell provides 8% of campus energy needs (methane gas → electricity)
- UC Davis Biodigester - converts 50 tons of organic waste to 12,000 kWh of renewable electricity each day
- In Copenhagen, biomass is planned to replace coal and provide 100% renewable energy from the combined heat and power (CHP) plant. One plant has already been converted to 100% biomass.

### 4. Management of environmental attributes

- Funded through an undergraduate and graduate compulsory fee, UCSC's Carbon Fund, which was originally created to purchase renewable energy credits (RECs), has ~\$150,000 dedicated for campus carbon neutrality projects

## Results and Outcomes

- Data collection and aggregation is key to the functioning of the tool. Further coordination in gathering baseline data and producing sufficient scenarios is needed.
- Identifying the minimum data requirements to run the tool is still needed.
- Review of municipalities' and related jurisdictions' carbon neutrality plans have revealed strategies worthwhile for further investigation.



Source: Carbon Neutral Cities Alliance (CNCA) Framework for Long-Term Deep Carbon Reduction Planning (2015)

## Going Forward

- Continue to apply campus energy and cost data towards developing scenarios
- Continue to collect best practices relevant to UCLA's focus areas

## References

- UC Santa Cruz Climate and Energy Study Scenario Analysis Tool
- Carbon Neutral Cities Alliance Framework for Long-Term Deep Carbon Reduction Planning
- Copenhagen Solutions for Sustainable Cities
- UC campus sustainability plans/initiatives

## Acknowledgements

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