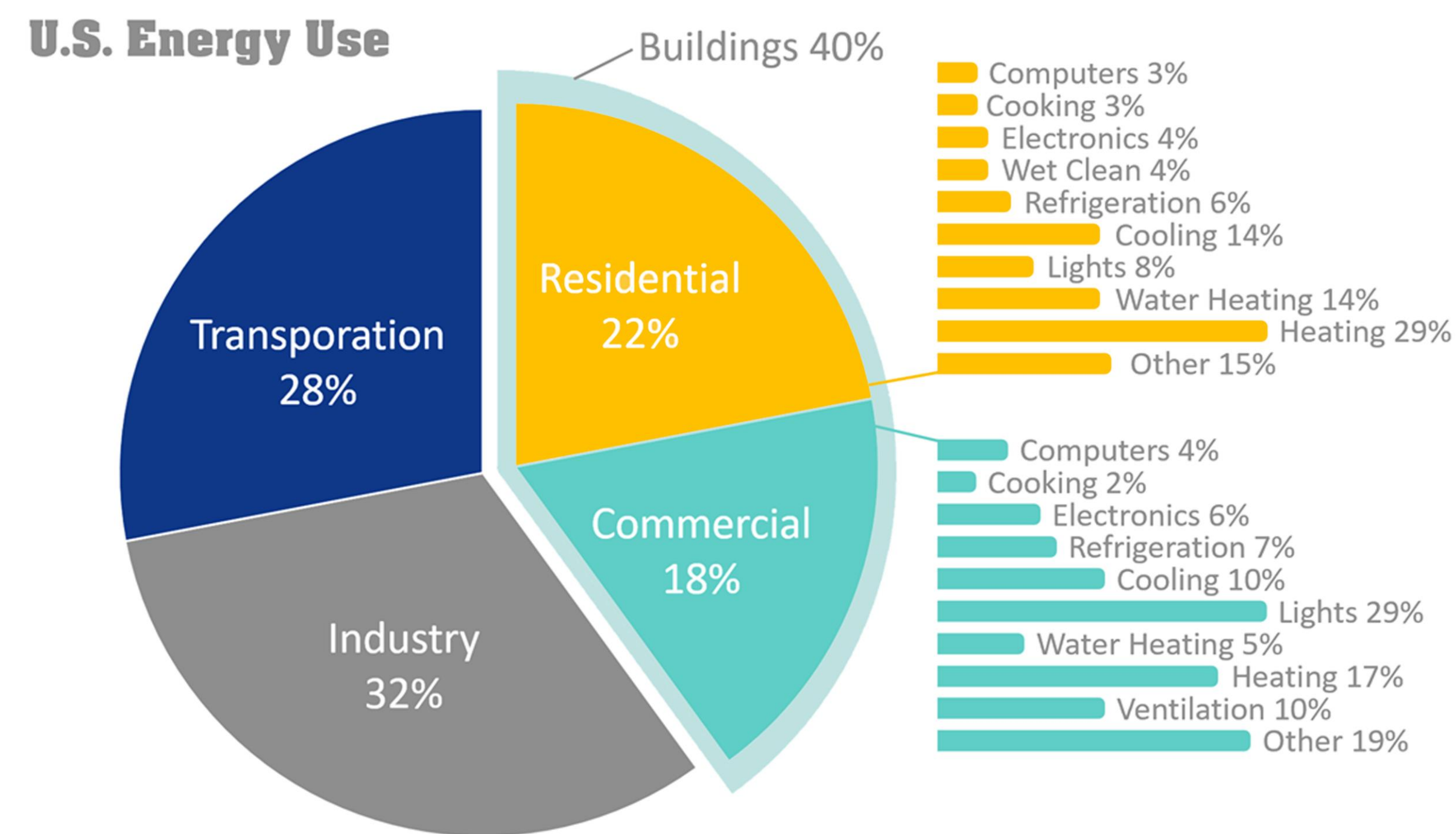
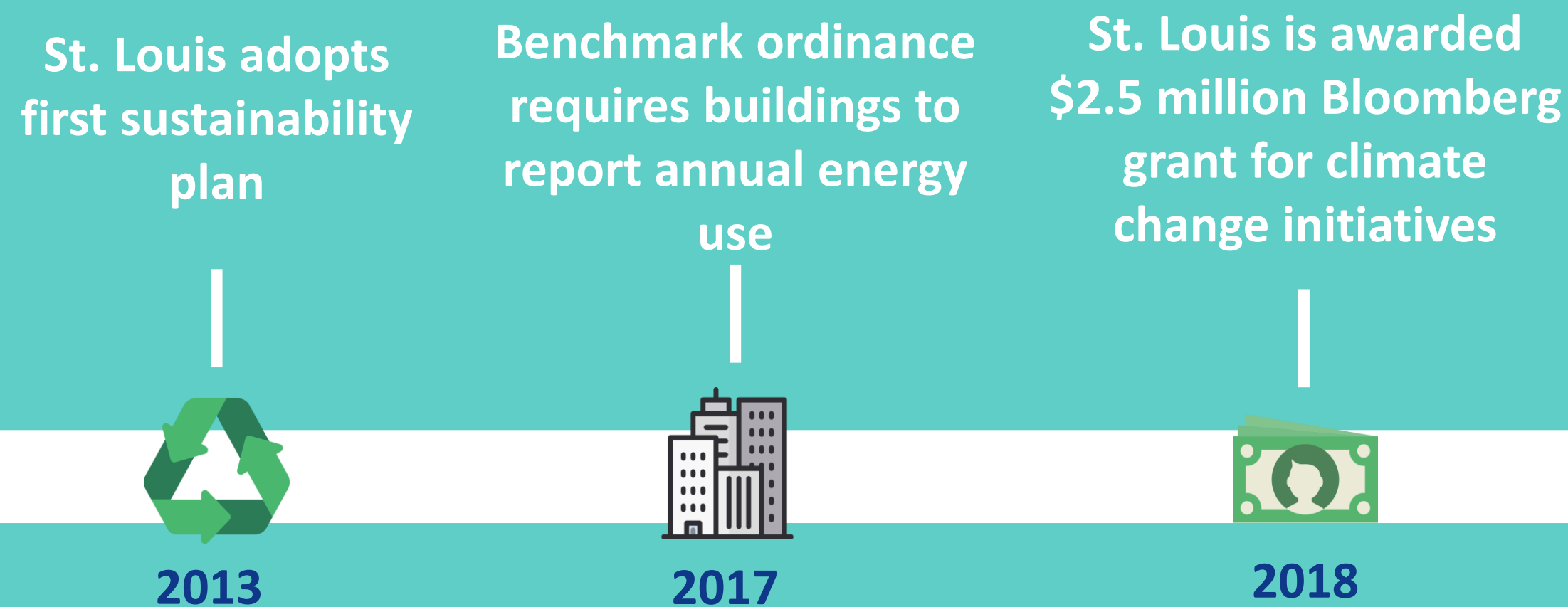


Why Building Efficiency?



What is Benchmarking?

- The tracking and reporting of annual energy and water use
- Mandatory for buildings greater than 50,000 sq. ft
- Self-reporting and self-submitting
- Buildings are scored based on their energy performance and efficiency
- Measured in Energy Use Intensity (EUI)
- An index of comparison and a driver of future improvement



Why Benchmark?

- Benchmarking is crucial for learning the current state of a building's energy use and the efficiency of its operating systems.
- For building owners, benchmarking enables them to make informed decisions about managing and improving their building's energy usage.
- Benchmarking can not only be used internally, but can also help building owners compare their energy usage to other buildings of similar size, industry, etc.
- "Benchmarking is the first, best tool an owner has to challenge themselves and say, what am I leaving on the table?" - Tim Michaels
- "The city benchmarking ordinance is a great opportunity to help foster knowledge and a response to that knowledge." - Tim Michaels

St. Louis City Building Energy Project

Washington University in St. Louis Sustainability Exchange

KK Cyrus, Lulu Feldman, Samantha Wiebe, Daniel Lee, Sam Movius, Lianghao Tang

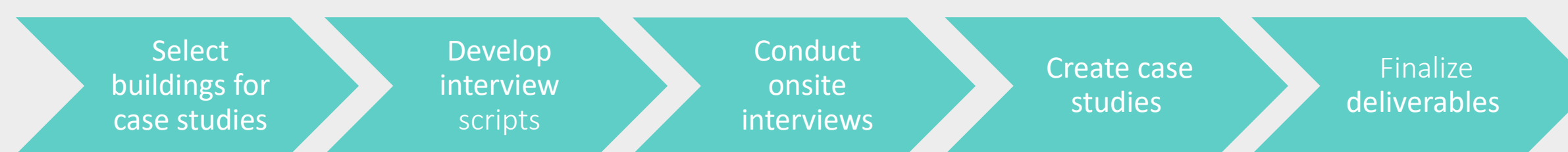
Objectives

1. Understand the motivations of benchmarking
2. Create video case studies featuring energy efficient buildings to improve the public's understanding of benchmarking
3. Promote engagement in benchmarking to assist St. Louis's energy reduction targets

Stakeholders



Our Process



Incentive Programs

Utility companies provide rebates and incentives that encourage customers to switch to more energy efficient systems, such as:



- Changing Fluorescent T-8s to LEDs: \$2-4/lamp
- HVAC Systems: \$13-20/ton
- Variable Frequency Drives: \$80-100/horsepower



- Boiler Heating Systems: \$525-15,000/unit
- Gas Furnaces: \$200-500/unit
- Energy Audit Rebates: 50% of cost up to \$500

Case Studies

Embassy Suites in Downtown St. Louis

Actions Taken:



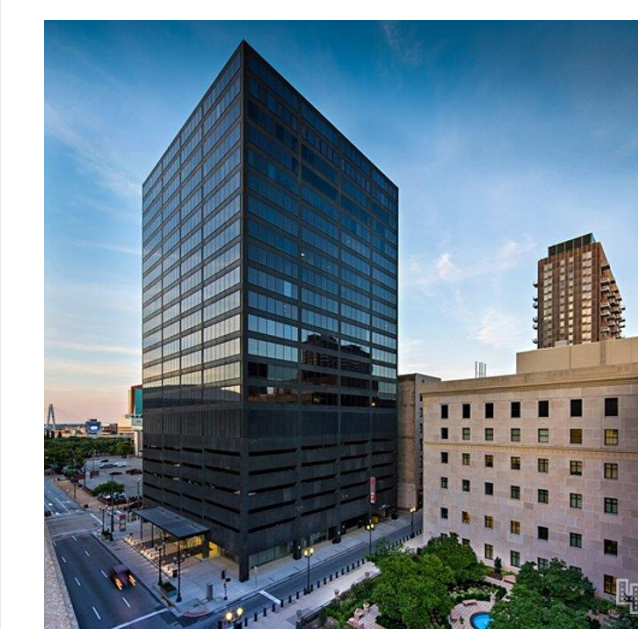
- Installed automation system and occupancy sensing thermostats
- Used BizSavers Lighting Program from Ameren to transition to LED lights

Motivations:

- Corporate commitment to sustainability (Light Stay Program, LEED Silver certification)
- Customer comfort and satisfaction
- Cost cutting initiatives

500 N Broadway

Actions Taken:



- Installed new reliable control automation system to monitor the building's energy use
- Transition to LED lighting
- Installed new frequency drive on a 500-ton chiller

Motivations:

- Tenant comfort, satisfaction, and retention
- Revitalization of the downtown area
- Utility cost reduction

Old Post Office

Actions Taken:



- Retro-commissioning study of Direct Digital Control system
- Calculated the utility usage and cost of the building

Motivations:

- Better intake air control and Tenant retention
- Sustainability for future generations and preserving the building's historic nature

Next Steps

- Energy cohort – small coalition of building owners
- 100% clean energy by 2035
- Pursue 100% Benchmarking Compliance