



Indianapolis Benchmarking and Market Transparency Policy Opportunities

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Executive Summary

As of 2019, commercial and residential buildings represent about 28% of the energy consumed in the United States.¹ Energy consumption within cities and large metropolitan areas are especially high; cities themselves contribute to roughly 70% of global energy consumption.² These values are expected to increase as human populations and the infrastructure associated with them follow suit. High levels of energy consumption can pose negative anthropogenic consequences such as environmental degradation, more expensive electricity bills and increased respiratory issues. These negative consequences can pose economic, social and environmental threats to the citizens of Indianapolis and the world at large.

As of 2016, the Community Greenhouse Gas inventory for Indianapolis showed that 65.9% of emissions came from buildings.³ Since then, Indianapolis has undergone major accomplishments toward sustainability and climate leadership. In 2018, Indianapolis set an ambitious goal to reduce citywide GHG emissions 26% by 2025 and joined the American Cities Climate Challenge by 2019. To continue reducing GHG emissions, Indianapolis will propose a new policy aimed toward increasing benchmarking and transparency efforts to assess building performance and encourage the adoption of energy efficiency.

The purpose of this study is to highlight the potential benefits of a benchmarking and transparency policy within Indianapolis' municipal, commercial, and multifamily buildings. Table ES-1 outlines the projected bill and water savings, air quality benefits and job creation through such policies listed above. The combination of such policies is cost-effective and creates over 1,000 jobs, nearly \$195 million in bill savings and reduces roughly 9 million short tons of CO₂ cumulatively through 2030.

¹Frequently Asked Questions (FAQs) - U.S. Energy Information Administration (EIA). (2020, June 15). Retrieved July 16, 2020, from <https://www.eia.gov/tools/faqs>

² <https://www.energy.gov/eere/understanding-energy-use-cities-infographic>

³ Metropolitan Development Commission. (2019). Thrive Indianapolis. Retrieved From <https://www.thriveindianapolis.com/>



Table ES-1: Scenario Outcomes for Indianapolis through 2030

| Implementing in 2021 | Through 2025 | Through 2030 |
|-----------------------------------------------------------------------|---------------|----------------|
| Bill Savings(\$M-Total) | \$25.1 | \$194.1 |
| Investment (\$M-Total) | \$49.5 | \$142.0 |
| Air Quality Benefits (\$M- Total) * | \$10.4 | \$77.8 |
| NO _x | \$2.7 | \$18.0 |
| SO ₂ | \$1.1 | \$8.6 |
| CO ₂ | \$6.6 | \$51.2 |
| Total Benefits * | \$35.4 | \$271.9 |
| Total Costs* | \$49.5 | \$142.0 |
| Benefit/ Cost Ratio | 0.72 | 1.92 |
| Net Jobs | 442.6 | 1,132 |
| Direct | 208.0 | 630.7 |
| Indirect | 88.9 | 269.4 |
| Induced | 84.6 | 256.5 |
| Total Jobs | 476.3 | 1,441.3 |
| Water Savings (Mg) | 8,565 | 75,541 |
| Withdrawal | 8,195 | 72,277 |
| Consumption | 370 | 3,263 |
| Electricity CO2 Emissions Reductions (thousand short tons) | 686 | 9,035 |



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Background

Nationally, energy consumption from buildings comprise about 28% of all energy use within the U.S. Commercial and residential buildings in Indianapolis represented about 66% of city wide energy consumption. This analysis focuses on the potential energy savings through benchmarking and transparency policies within Indianapolis' building stock. Benchmarking allows building owners to understand their property's energy use, while transparency encourages the adoption of energy reduction techniques among neighbors. Both policies naturally push energy and bill savings and provide cleaner, more breathable air. An energy efficient future also contributes to citywide economic development through job creation in construction, efficiency, and administrative sectors.

What follows in this report is a deeper description of benchmarking and transparency and an explanation of the methods used to calculate the projected savings and benefits produced through this analysis. A timeline outlining the proposed ordinance scenarios among commercial, municipal, municipal corporations, and multifamily housing follows. This report concludes with the results and observed benefits of the expected scenario outcomes. Assumptions, caveats, and sources regarding this analysis can be found within the technical appendix.

Policy Descriptions

Improving the energy efficiency of commercial and multifamily residential buildings brings many benefits to the community. These include bill savings, improved air quality, increased local jobs, and decreased water consumption, which can be directly correlated with the reduction of energy use due to increased efficiency. Policies that focus on benchmarking and market transparency incentivize building owners to increase and continue energy efficient practices for an extended number of years.

Benchmarking provides building owners with the appropriate tools to track their energy and water consumption, while market transparency allows building owners to overcome market barriers by providing them with information on building performance.

This report analyzes the outcomes from a benchmarking and transparency proposal following Indianapolis' implementation policy outlined in Table 1. Figure 1a and 1b present the percentage of buildings from various sectors that are included within this analysis as well as the number of buildings from each cohort.

Starting in 2021, all owners of commercial, multifamily, municipal corporations, and municipal buildings are encouraged to begin benchmarking their energy consumption as a voluntary approach to the program. Municipal buildings greater than 50,000 square feet are then required to begin the benchmarking in 2022, followed by large commercial, multifamily, and municipal corporations. Transparency follows two to three years after, depending on the cohort each building belongs to. Industrial/ manufacturing properties and single-family dwellings are exempt.



Table 1: Indianapolis Policy Implementation Timeline

| Proposed Implementation Phased-In Schedule | | | | | | | | | | | | | | | |
|----------------------------------------------------------------------|----|----|----|------------------------------------------------------|----|----|----|---------------------------------------------------|----|----|----|--------------------------------------------------|----|----|----|
| Phase 1 | | | | Phase 2 | | | | Phase 3 | | | | Final Phase | | | |
| 2021 | | | | 2022 | | | | 2023 | | | | 2024 | | | |
| Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 |
| Voluntary benchmarking program (for all sectors and size thresholds) | | | | Municipal Buildings over >50,000 SF must comply | | | | Municipal Buildings over >25,000SF must comply | | | | Municipal Buildings over >10,000 must comply | | | |
| | | | | Commercial buildings: data submission is voluntary | | | | Commercial buildings over >100,000 SF must comply | | | | Commercial buildings over >50,000 SF must comply | | | |
| | | | | Multifamily buildings: data submission is voluntary | | | | Multifamily buildings >100,000 SF must comply | | | | Multifamily buildings >50,000 SF must comply | | | |
| | | | | Municipal corporations: data submission is voluntary | | | | Municipal corporations >100,000 SF must comply | | | | Municipal corporations >50,000 SF must comply | | | |
| Industrial/ Manufacturing Exempt | | | | | | | | | | | | | | | |
| Transparency in 2024 | | | | Transparency in 2024 | | | | Transparency in 2025 | | | | Transparency in 2025 | | | |



■ Municipal ■ Municipal Corp ■ Commercial ■ Multifamily

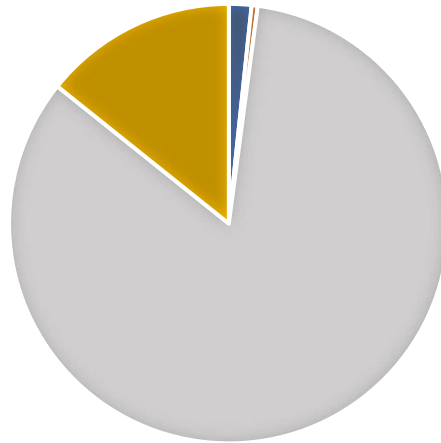


Figure 1a: Breakdown of Buildings included in Ordinance

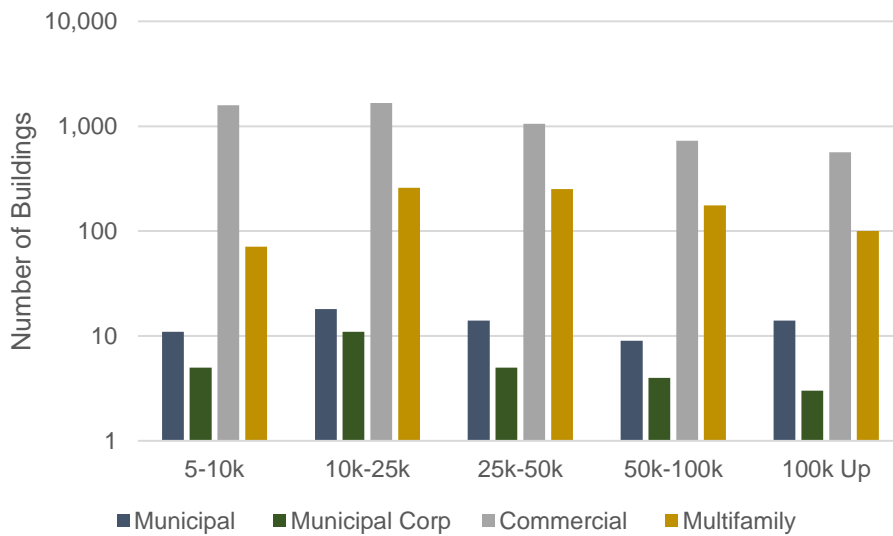


Figure 1b: Number of Buildings Belonging to Each Cohort

Anticipated Impacts

Energy Savings

Benchmarking and transparency have the potential to promote energy efficiency and reduce energy consumption, leading to increased bill savings for building tenants and owners. Figure 2 outlines the bill savings throughout 2030. Electricity and natural gas reductions lead to over \$25 million in bill savings within the first five years of benchmarking policy and implementation.



Savings jump from \$6.7 to \$15.9 million between 2024 and 2025, after all buildings have begun their reporting and transparency has taken effect. By 2030, building owners see roughly \$194 million in bill savings cumulatively.

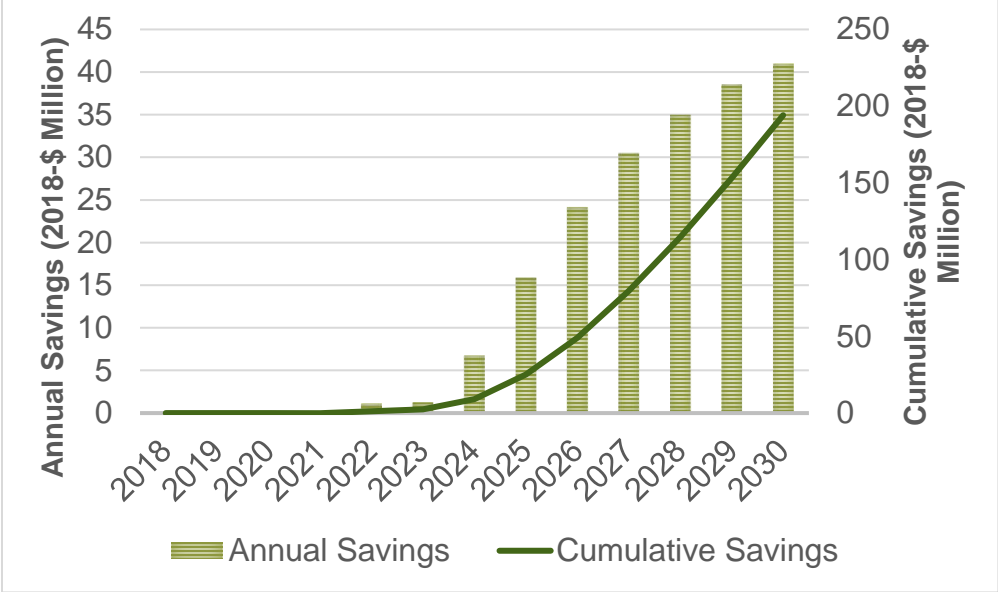


Figure 2: Annual Energy and Bill Savings

Job Creation

Transitioning toward a clean energy economy through benchmarking and transparency policies brings forth jobs involved with installations, existing appliance repairs and other services related to energy efficiency. Benchmarking allows building owners to understand and track their baseline energy consumption while transparency encourages competition to decrease that consumption, therefore encouraging adoption of actions taken toward energy efficiency. Increased energy efficiency declines overall energy use in buildings and therefore decreases utility bill spending, giving buildings owners and multifamily residents more spending flexibility. This induces jobs related to recreation, leisure, retail, dining services, and many other sectors. As jobs related to the clean energy sector increase, jobs supported by traditional energy sales will be replaced. Energy efficiency jobs range anywhere from construction and installation to insurance and program administration. These are generally more labor-intensive than jobs within the traditional energy sector; it is common to see an overall increase in total job years throughout the timeline of these programs.



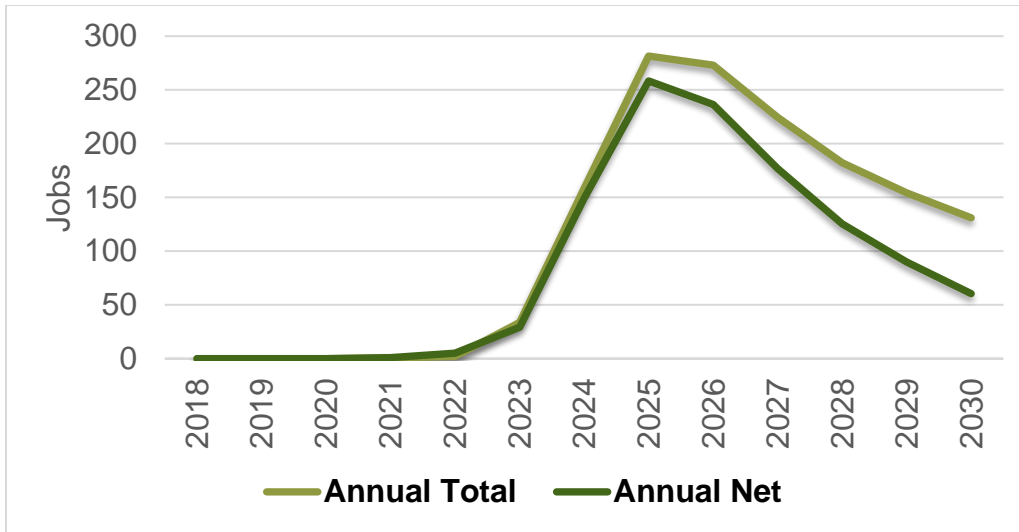


Figure 3a: Annual Job Creation*

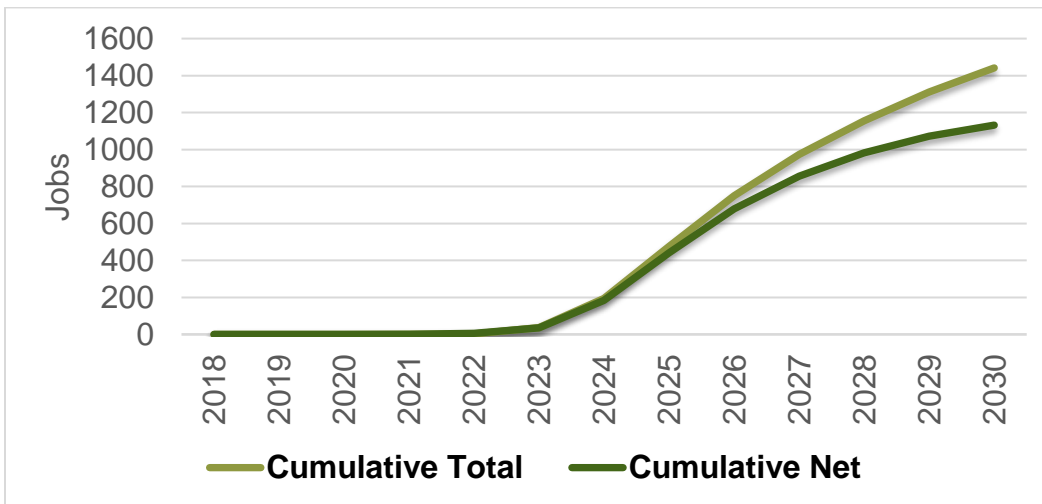


Figure 3b: Cumulative Job Creation*

**Jobs presented are job-years, representing one full-time employee equivalent. Total Jobs represent all job creation; Net Jobs represent job creation minus job losses*

Annual net and total jobs are shown in Figure 3a, above. Job creation is spurred between 2021 and 2022 due to an uptake in the voluntary benchmarking from all buildings. A sharp increase in both total and net jobs begins in 2023 as the policy begins the mandating process. The demand for energy efficiency is spurred from benchmarking and transparency policies, therefore causing an increase in jobs throughout the beginning years. Net job creation begins to taper off around 2025, as job loss in the traditional energy utility sector begins to be offset and the spur of energy efficiency jobs is in less demand. Figure 3b shows that net job creation is roughly 1,400 job years through 2030.

Health and Environmental Impacts



Large quantities of air pollution, such as carbon dioxide (CO₂), nitrogen oxide (NO_x) and sulfur oxide (SO_x) are produced by the combustion of fossil fuels used to provide energy to buildings within the United States. Though somewhat hard to avoid in today's energy climate, inefficient buildings in Indianapolis can emit increased amounts of air pollution than necessary, further contributing to climate change and respiratory issues. Furthermore, to maintain the temperature of coal power plants, massive quantities of water taken from watersheds are used for “once-through” cooling systems.

Figure 4 illustrates the carbon reductions observed through 2030 after implementing the proposed policies in this report. Overall, CO₂ decreases by roughly 8% through 2030, a 27% greater impact than is projected if no policies were implemented at all. The upward spike between 2021 and 2022 is driven by planned utility actions, as tracked by the Energy Information Administration (EIA).

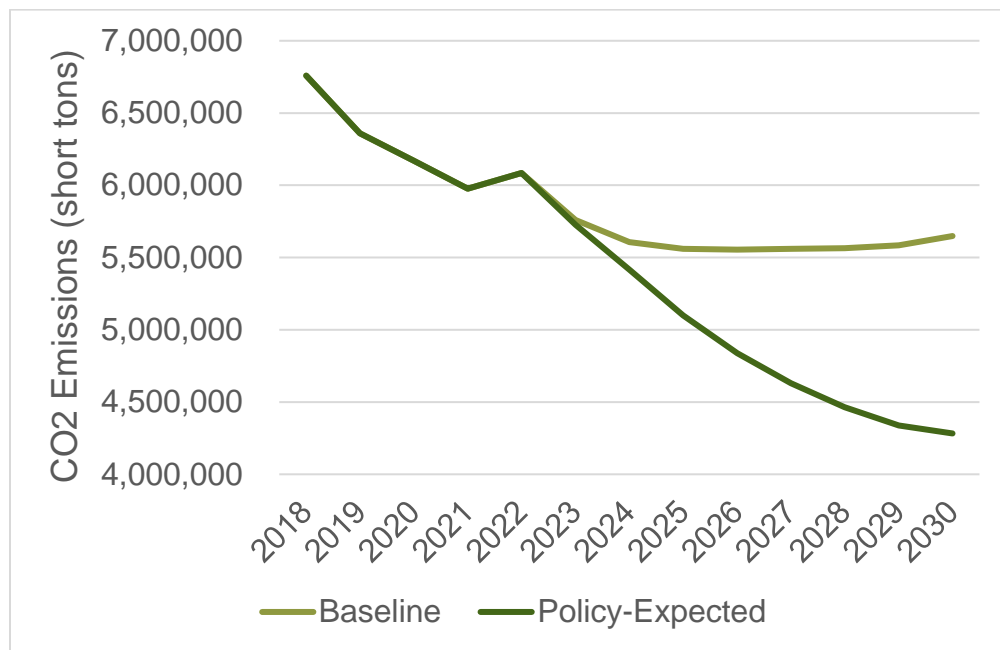


Figure 4: Carbon Emission Reductions through 2030

Healthier, more breathable air, along with saved public healthcare costs are a result of carbon emissions. By 2025 Indianapolis can expect to save over \$10 million in healthcare related benefits and will reach over \$77 million cumulatively by 2030. These benefits can be seen in Figure 5.



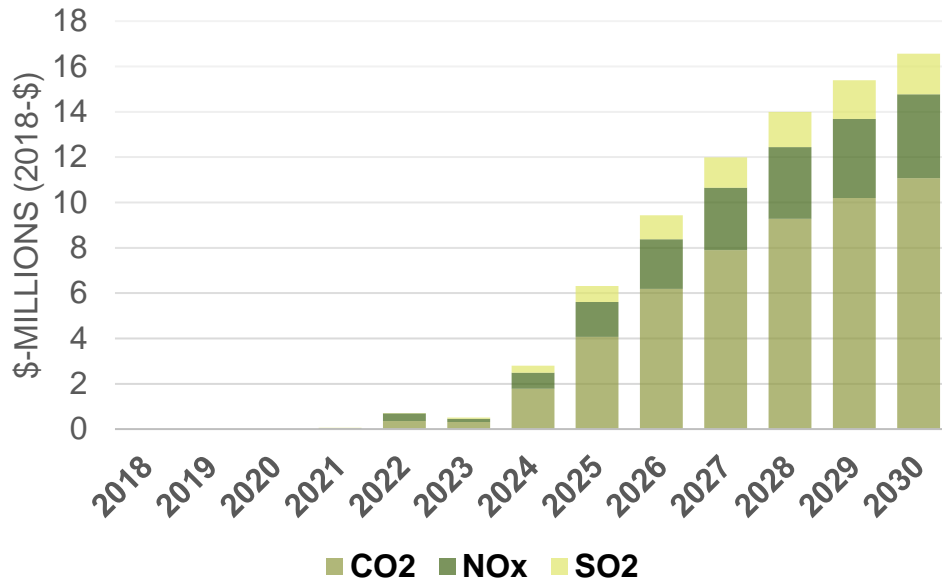


Figure 5: Air Quality and Public Health Benefits

Large amounts of CO₂ are reduced because of implementing the policy mix detailed throughout the report. Although all the assessed emissions within this study have a negative effect on human health, CO₂ is particularly detrimental. CO₂ emits dangerous particulate matter into the air and is heat trapping, accelerating the effects of climate change.

Reduced energy use as a result of benchmarking and transparency not only improves air quality, but watershed improvements are realized as well. Coal fired power plants require massive amounts of water to cool their facilities; reducing energy consumption reduces the reliance on natural waterways and water treatment centers. Figure 6 shows the water withdrawal and consumption savings through 2030. Cumulatively, Indianapolis should expect to save over 75 billion gallons in water withdrawal and over 3 billion gallons in water consumption. Less water consumption puts less stress on natural waterways and water system treatment plants, meaning a more sustainable future for the region.



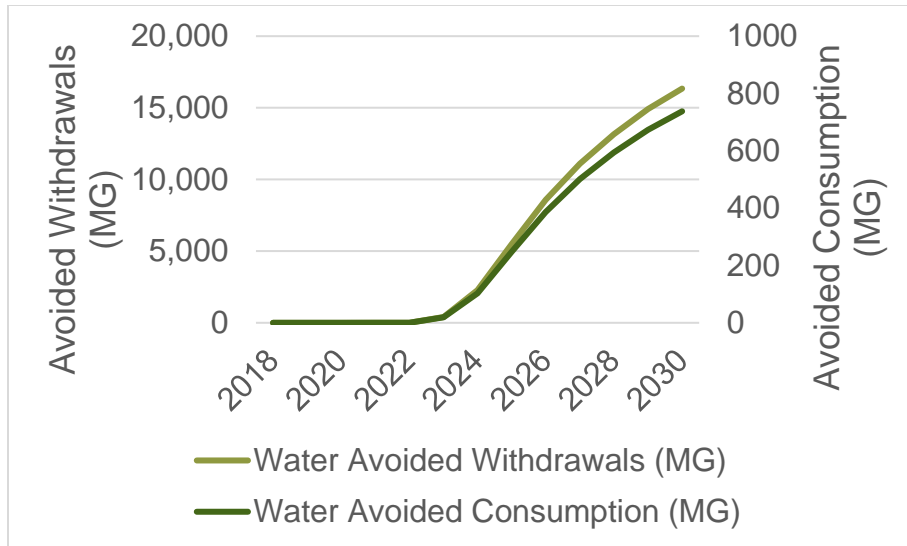


Figure 6: Water Withdrawal and Consumption Savings through 2030

Table 2 outlines the cumulative benefits and costs associated with implementing the policy options discussed throughout this report. Promoting an energy efficiency future can lead to multiple benefits including high bill savings, advances in air quality, job creation, and water savings.

Table 2: Indianapolis Cumulative Costs and Benefits Through 2030

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Conclusion

The policy analysis outlined in this report evaluates the impact of benchmarking and market transparency for Indianapolis. This research shows that Indianapolis could achieve roughly \$194 million in bill savings, \$78 million in public health benefits, and create over 1,100 net jobs. Over 75 billion gallons in water and 9,000 thousand short tons could be saved by 2030 if each policy follows the implementation timeline outlined above. Policy options geared towards reducing energy consumption could significantly benefit Indianapolis by boosting the economy, improving environmental concerns and increasing the health of all its citizens.

