Springfield Township (Montgomery County)
Energy Benchmarking Report

October 2, 2019

Summary

To determine if opportunities exist to improve the energy efficiency of Springfield Township's municipal facilities, Practical Energy Solutions (PES) benchmarked the whole-building energy performance of the Township's Free Library, Police/Administration building, and Public Works facility. Our analysis shows that Springfield Township's Free Library and Police/Administration facilities operate less efficiently than typical, comparable buildings, suggesting substantial opportunities to improve energy efficiency. The Public Works building is more efficient and performs better than comparable local facilities.

Methods

We used the U.S. Department of Energy's Energy Star *Portfolio Manager* tool to calculate the energy use intensity (EUI, or kBtu/sf) for each building based on the most current year of utility data provided to us by the Township (through July 2019). The EUI is a measure of total energy use, or kBtu, per square foot, and it serves as the basis for comparing the whole-building energy performance of buildings.

Typically, this tool uses the EUI as a basis for generating the Energy Star score, which is a number from 0-100 that reflects the energy performance of the buildings relative to similar buildings across the country. A score of 50 represents the national median. For various reasons, the three Township buildings were not eligible for an Energy Star score.

We therefore used the EUIs (rather than the scores) to benchmark the three facilities. We compared Springfield's EUIs with the national median EUIs for similar buildings across the country. We also compared them with the EUIs of similar local facilities from our own PES dataset, as well as publicly available EUI data from other municipalities – including Philadelphia and Boston. We derived the PES internal dataset from energy audits our team has performed for local municipalities throughout the suburban Philadelphia region.

Free Library of Springfield

As Figure 1 shows, the Free Library EUI is 30% higher than the national median for libraries across the country, suggesting this facility uses 30% more energy than the average library in the U.S. Further analysis confirms this, as the library's EUI is approximately 50% higher than the PES dataset of eight local libraries. These local libraries are most similar to the Springfield facility in terms of size and use, and their proximity is also important due to the regional weather conditions and the impact of these weather conditions on air conditioning and heating energy use.

We also compared the Springfield EUI to datasets available for larger libraries in Boston and Philadelphia. The Springfield Library EUI is still 10% higher than the median for Boston's 22 libraries. It is lower than the median for the Philadelphia dataset. However, this is not unexpected. PES is the chief energy advisor to the City of Philadelphia Office of Sustainability, and our team has evaluated several of the City's libraries. We have found them to be largely inefficient due to age, oil and steam heating systems, and old-technology lighting.

Figure 1. Library EUIs

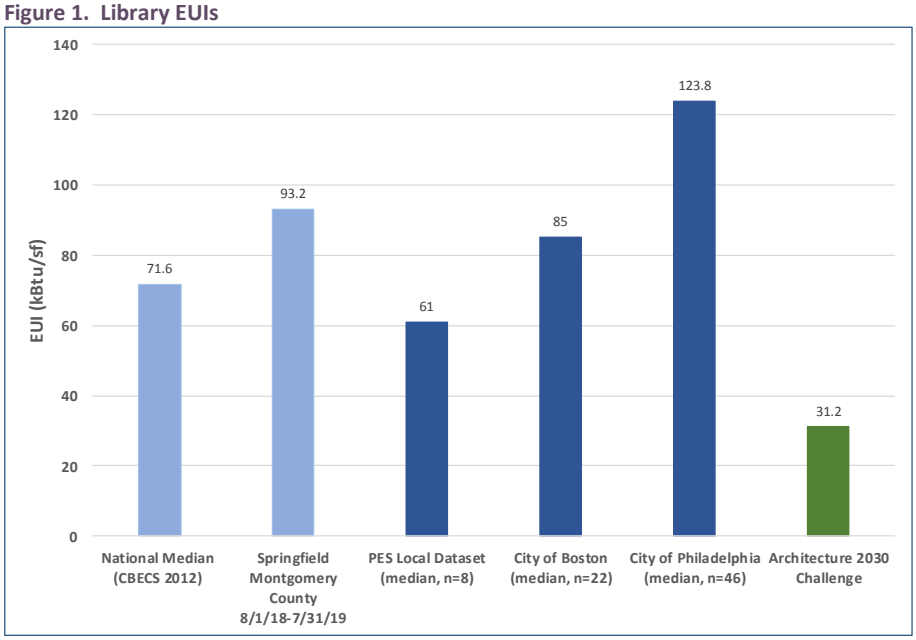


Figure 1 also shows a target EUI for libraries promoted by the *Architecture 2030 Challenge*. This organization's mission is to transform the built environment to net-zero carbon emissions by 2030. The EUI target reflects what this organization believes is a viable – albeit aggressive – average energy baseload for a highly energy-efficient library. Once full efficiency is achieved, this baseload would then be generated using clean alternative energy sources (such as on-site solar) to achieve "net zero" carbon emissions. Architecture 2030, which is supported by the American Institute of Architects, recently released a "zero code" energy standard for commercial buildings.

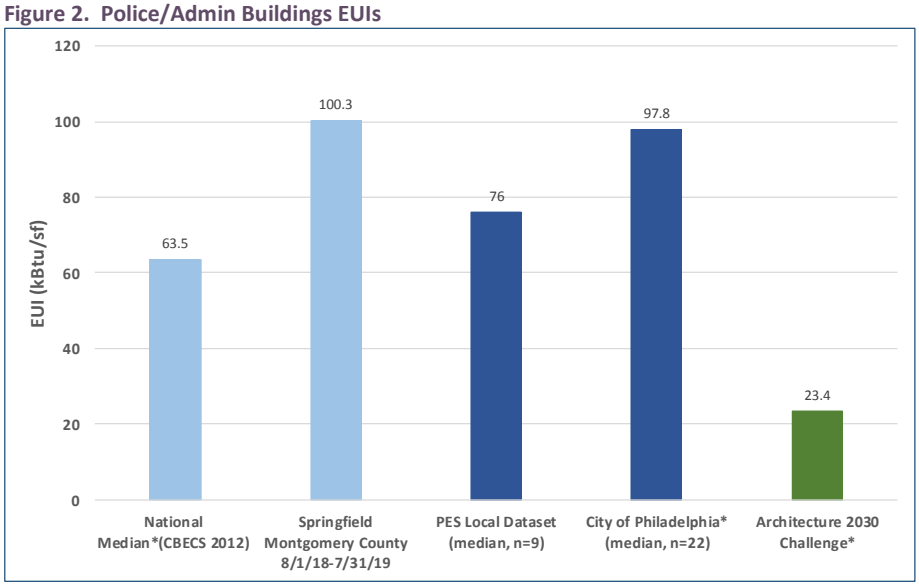
Police/Administration

The Springfield Police/Administration building EUI is 58% higher than the national median for police stations (without a combined administration function) across the country, as Figure 2 shows. When compared with similar, combined Police/Administration facilities in our region based on the PES internal dataset, the Springfield facility EUI is 32% higher. As Figure 2 shows, it is on par with police-only facilities in the City of Philadelphia.

To us, this suggests significant energy-saving opportunities for this building. The national median EUI for a stand-alone office is 52.9, and it is our experience that combined police/administrative facilities should therefore have lower EUIs than stand-alone police departments because the administrative functions do not operate 24/7.

As expected, the *Architecture 2030 Challenge* target EUI is substantially lower.

Figure 2. Police/Admin Buildings EUIs

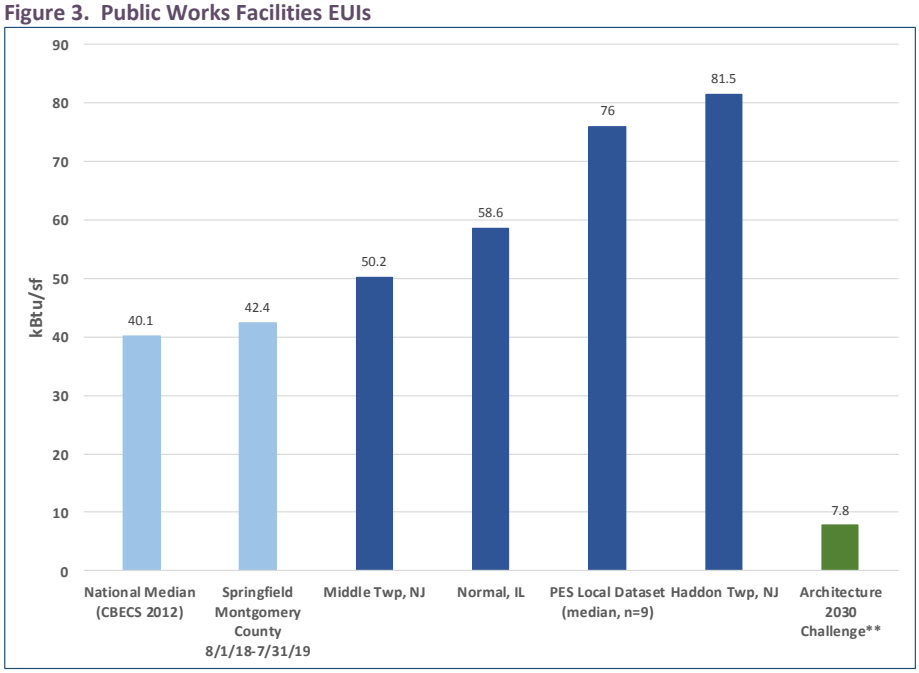


**Police only, no adjoining administration component. The national median EUI for a stand-alone office is 52.9. Combined facilities should have lower EUIs.*

Public Works

The Public Works facility EUI is on par with the national median, and it is better than the PES internal dataset and several other comparable facilities in New Jersey and Illinois (Figure 3). This signifies that the Springfield Public Works building is performing on average, or better than what is typical for our region. It is, however, substantially higher than the *Architecture 2030 Challenge* target.

Figure 3. Public Works Facilities EUIs



Conclusions

Our analysis suggests that Springfield Township's Free Library and Police/Administration facilities operate less efficiently than typical, comparable buildings, with the library using approximately 30% more energy than comparable libraries across the country and the Police/Administration building using approximately using 58% more energy than the typical stand-alone police departments. The Public Works building is at least on par with comparable facilities across the nation and performs better than similar local facilities.

In all cases, especially in the Free Library and Police/Administration buildings, opportunities for improvement exist. The strategy to reduce energy use should depend on the Township's goals and capacity. The Township could bring the buildings in line with what is considered to be average performance, or the Township can set goals for deeper energy savings that will place the Township's energy performance above average and help move these facilities toward a net-zero future.