

# CASE STUDY

## GREEN BUILDINGS ALLIANCE

*2017 - Present*



### Objectives

1. Benchmark Buildings
2. Customize Engaging Report Cards
3. Compare Performance Across Portfolios

### Stakeholder #1

Green Building Alliance:  
Administrators of the  
Pittsburgh2030 District

### Stakeholder #2

Building Owners &  
Managers for over  
730 buildings in  
Pennsylvania

# Summary

Maalka partnered with Green Building Alliance (GBA) to develop the 'Performance Targets' program to manage building benchmarking, analysis, and reporting for the Pittsburgh2030 initiative. Performance Targets helps GBA engage building owners with interactive reports that communicate progress towards energy, water, and carbon reduction commitments set by Pittsburgh2030 administrators. After initial success, GBA leveraged the new program to support regional stakeholders like cities, counties, hospital campuses, corporate parks, and universities by benchmarking their buildings and portfolios. Similarly, Maalka clients across the US and EU have adopted the program to reduce administrative costs, improve building owner engagement, and better manage their data.

## About Maalka

Maalka is a platform that enables organizations to centrally manage all aspects of sustainability across their real estate portfolio. Programs hosted on Maalka simplify and strengthen the management of everything from energy, water, waste, and carbon tracking to asset utilization and employee wellbeing. Optimized to support organizations with ever-expanding sustainability visions, Maalka enables the development of custom programs that integrate unique datasets, enterprise systems, and analytics.



**Maalka has demonstrated its ability to understand the deepest challenges of working with multi-dimensional data to create solutions scalable to global audiences.**

*Isaac Smith,  
Former Director,  
Performance Targets*

# The Maalka Process



## Data Collection

The first step toward unlocking Maalka's powerful features is importing historical data. Maalka makes this easy by supporting data imports from ENERGY STAR® Portfolio Manager® and easy-to-fill Excel templates. Maalka also allows automated data imports directly from local energy and water utilities.

*Immediately after importing your historical data, Maalka's dashboards come to life to reveal actionable performance insights across vast building portfolios.*



## Validation

Maalka lets users apply customizable data quality rules to check energy and water data for jumps, gaps, and inconsistencies in real-time. Maalka's dashboards make it easy to validate data across an entire portfolio, providing confidence that cost and consumption data is accurate and up-to-date.



## Analysis

Maalka's analytical dashboards empower users with customizable filters to explore massive datasets, compare performance across buildings, and identify specific buildings to target for improvements. The real-time analytics engine ensures that as data changes, calculated metrics and statistics are updated to show the state of the portfolio to the latest minute.



# How Performance Targets Works

Performance Targets allows users to set specific time-bound energy, water, and emissions reduction targets for their buildings. Maalka makes tracking progress towards these sustainability goals simple.

## The journey of establishing an actionable building sustainability plan begins with two simple questions:

- 1 How is building performance measured?
- 2 What starting point are you improving from?

The Performance Targets program defines building performance as the amount of energy used, water consumed, and carbon emitted by a building over the course of a year. To enable performance comparisons across buildings, these totals are divided by the building's floor area to yield energy use intensity (EUI), water use intensity (WUI), and Emissions Intensity (EI).

To answer the second question, it's necessary to determine the most appropriate baseline against which building performance can be measured. Progress is then calculated by comparing building performance to that baseline. For example, to reach “net-zero,” the fossil fuel-powered portion of a building’s EUI must reach a 100% reduction from its energy baseline.

$$EUI = \frac{\text{Energy}^*}{\text{Floor Area}}$$

\*Water and Emissions Intensity are calculated similarly.


## Maalka supports multiple methods for setting performance baselines:

- 1 Users can set baselines according to historical performance by specifying a date range over which the maximum EUI, WUI, or EI, is automatically calculated. Once set, all progress is then measured against this historical baseline.
- 2 Baselines can be determined by a building's individual characteristics, taking into account variables such as the type of building, its location, and operating hours. Maalka supports setting such baselines through a custom API connection with the ZeroTool\*, which uses a methodology based on the Portfolio Manager® ENERGY STAR® Score to calculate the EUI for a typical building with similar characteristics.
- 3 Maalka lets users set custom baselines so that performance can be measured against any benchmark, such as a regional or national average or a program-specific goal.

\*Maalka developed the ZeroTool in collaboration with Architecture2030 to help inform the next generation of performance-based energy codes and to support baseline calculations for the Zero Cities Initiative and 2030 Districts.

Check out the Architecture2030 ZeroTool:

<https://zerotool.org/zerotool>



Site Name	Historic Baseline			2030 Target	
	Baseline Period	Historic Baseline	Custom Baseline	Target (50%)	Custom Target
Boston HQ	1/1/2010 - 1/1/2019	75.999	75	37.5	
Cleveland Warehouse	1/1/2010 - 1/1/2019	92.782		46.391	
Houston HQ	1/1/2010 - 1/1/2019	39.647		19.824	
Jefferson Apartments	1/1/2010 - 1/1/2019	211.625		105.812	
Lamas St. Warehouse	1/1/2010 - 1/1/2019	372.586		186.293	

Programs often set intermediate performance targets to help monitor progress towards goals. For example, Pittsburgh2030 has a goal to reduce EUI by 50% from baseline by 2030. To help track this progress, they set intermediate targets of reducing EUI 20% by 2020 and 35% by 2025. Maalka allows users to set multiple performance targets for each building baseline.

# Digital & Print Reports

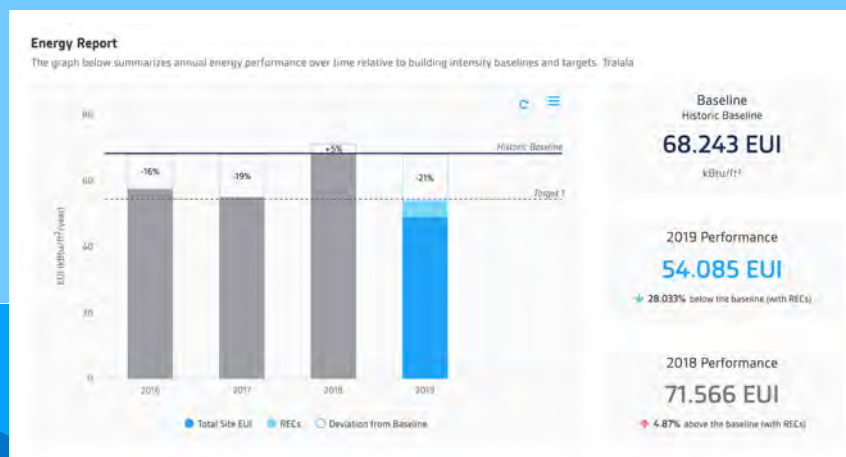
To effectively reach building performance goals, it is essential to engage building stakeholders with actionable, data-driven insights. Maalka lets users create beautifully designed, comprehensive, and up-to-the-minute performance reports at the click of a button. These reports can be created for individual buildings, entire portfolios, or for user-defined groups of buildings. With Maalka, GBA was able to reduce the time it took to generate

building performance reports for Pittsburgh2030 participants from months to a matter of minutes. GBA leverages the time savings to engage far more participants with these beautiful reports, and has been able to quadruple its outreach efforts.

**Let's take a deeper look into what these reports are, and why they've been so effective.**

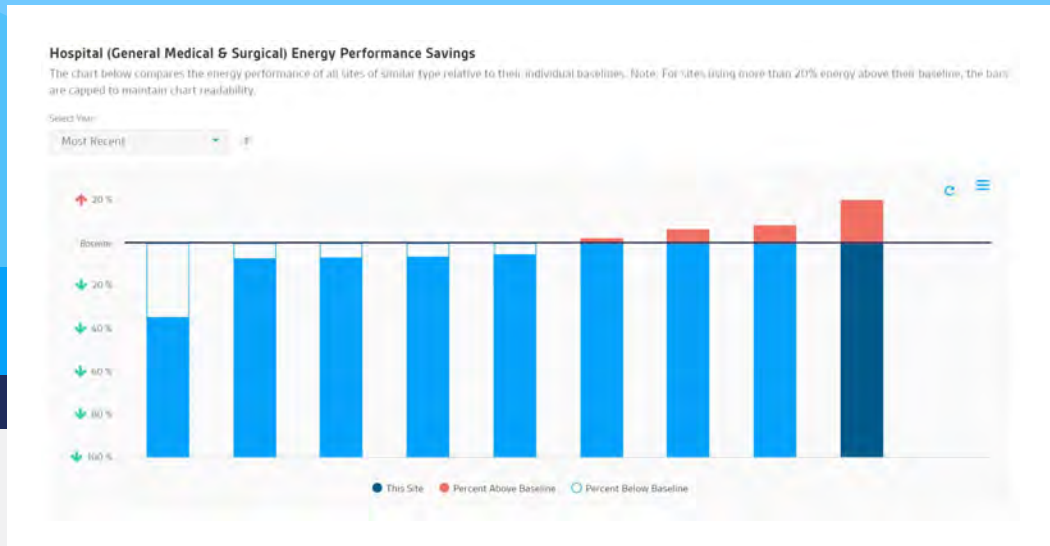
## Site-Level Performance Reports

The following describes a Building Performance Report created within Maalka's Performance Targets program. Maalka allows users to easily view, print, and share these dynamically updated reports with other users. Starting at the top, a central graphic displays how a building is performing by plotting its annual EUI values against baseline and reduction targets. Maalka automatically calculates and displays the percentage difference between the EUI and baseline so that users can easily see how a building is performing against its goals over time.

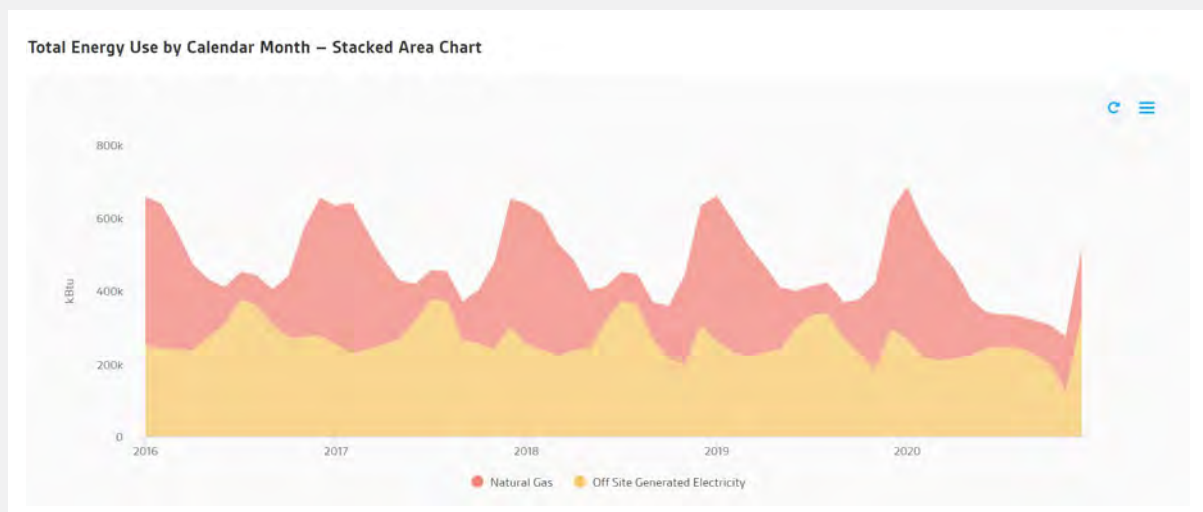


In addition to tracking building performance over time, users can compare how different buildings are performing relative to their respective baselines. The chart below highlights a user's building in dark blue

while other similar buildings - in this case, hospitals - are presented in light blue. Buildings that are performing poorly can easily be identified by the bars with red tops, which indicate EUIs that are higher than baseline.

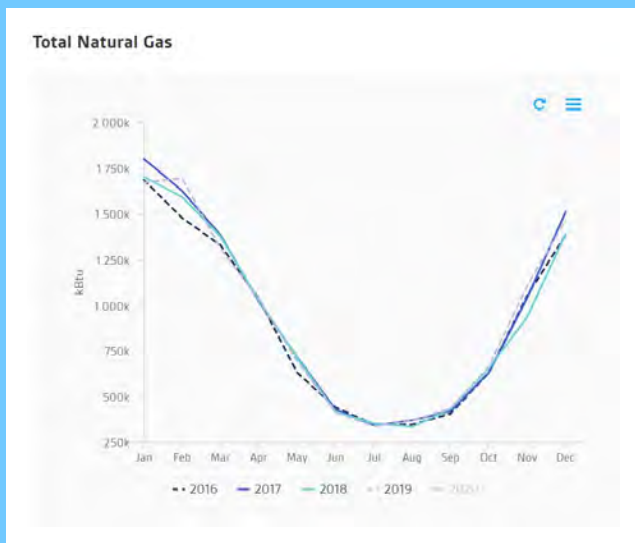
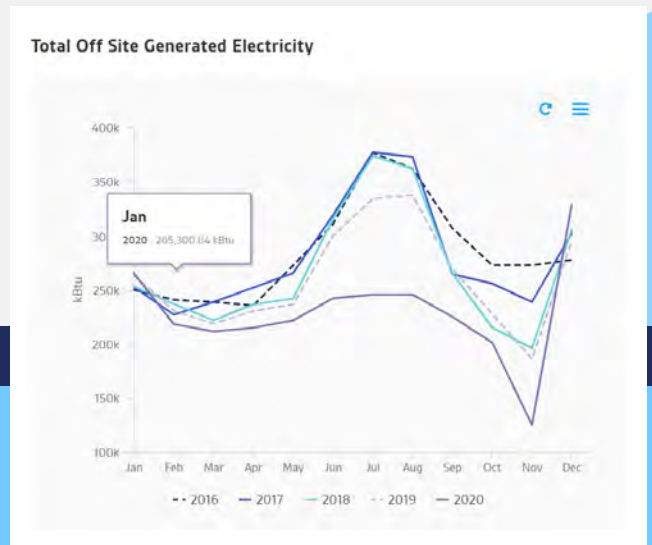


Below the baseline performance plots, the report includes a series of interactive charts that let users understand a building's consumption of different fuel and water types at monthly and annual resolutions.





These charts help users understand seasonal consumption patterns and can be used to identify anomalies.



Complementary tables provide users with an easy way to see the the numbers and trends behind the charts.

	Total Off Site Generated Electricity (kBTU)	Total Natural Gas (kBTU)	Total Other (kBTU)	Total Energy (kBTU)
2016	3,419,358	2,730,253	34,121	6,183,732
2017	3,367,927	2,629,680	68,242	6,065,849
2018	3,226,176	2,565,498	136,485	5,928,160
2019	3,132,008	2,559,502	255,910	5,947,420
2020	2,745,985	2,310,874	426,517	5,483,377
Changes ?	↓ 12.3%	↓ 9.7%	↑ 66.7%	↓ 7.8%



Similar to the energy performance section introduced above, the Building Performance Report contains sections for water and emissions-based performance. Users have the option of exposing or hiding any section when they print the report. Below, a baseline chart for Emissions Intensity is observed in the same format as the energy baseline chart.



Finally, Performance Targets lets users add personalized comments to the Building Performance Report to engage building owners with insightful interpretations of their data. These comments can be updated any time and are included in the printed versions of the reports.

## Portfolio-Level Performance Reports

Performance reports can also be generated on-demand to assess aggregate performance for user-defined groups of buildings. Buildings can belong to multiple groups based on a range of characteristics, such as building type (e.g. fire stations), size (e.g. over 50,000 sq.ft.), or location (e.g. postal code). Groups can also be

composed of buildings owned by a single entity, like a school or hospital campus. Program managers can engage portfolio managers with Portfolio Performance Reports that provide insights about all of their buildings. Furthermore, Maalka enables easy comparisons of performance metrics between any of these different groups.



At the top of the Portfolio Performance Report (seen in the screenshot above) is a summary section that displays portfolio-level energy, water, and carbon statistics for a selected calendar year. Maalka dynamically filters the group to include only buildings with valid energy and water data and gross floor areas. This ensures that the report accurately represents group statistics that aren't skewed by incomplete data. Users can use Maalka's Data Quality tools to easily identify and remedy issues for buildings that are excluded.

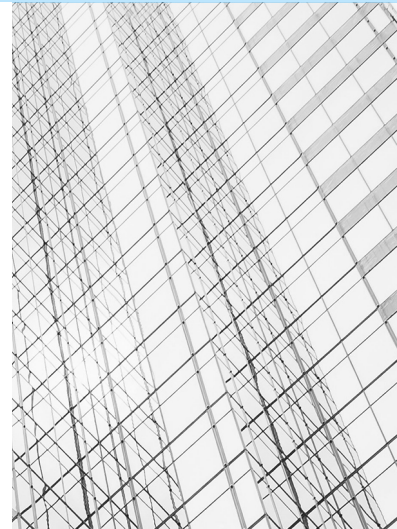
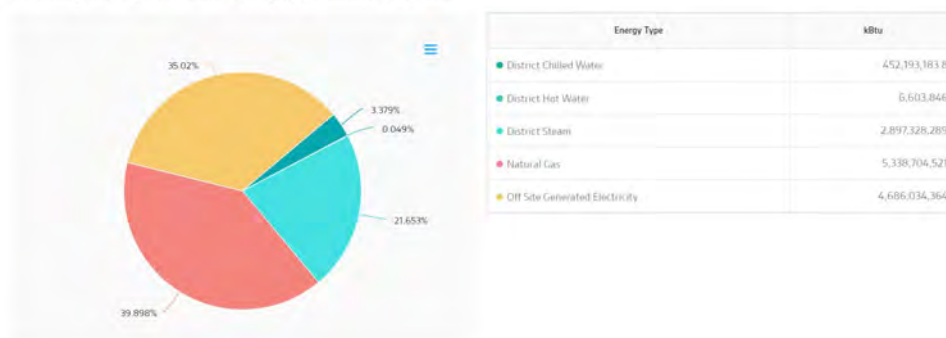


Portfolio Performance Reports display the breakdown of total energy and water consumption by fuel or end-use type for a group of buildings. Additional charts provide information about the distribution of consumption metrics within building subgroups. For example, users can easily observe the variance of EUI, WUI, and EI to compare identified, allowing users to target specific buildings for improvements, such as an office building that is skewing the portfolio's EUI.



#### Energy Breakdown by Type – 2019

The following section displays a breakdown of energy by type consumed in the portfolio:



Similar to Building Performance Reports, baselines and targets can also be set for groups. Below we see how a group's EUI and total energy changes from year to year, as well as how the group is performing relative to its baseline. This is one of about twenty charts and graphs that users can choose to include in their Portfolio Performance Report, empowering them to engage portfolio managers with the information they find most valuable.

#### Year to Year Trends – Last 10 Years

The follow plot shows the annual EUI and Total Energy consumed for the portfolio over time. Only buildings for which energy data exist in the specified year are included.



# Program Impact

Pittsburgh2030 regularly engages participants with site Building and Portfolio Performance Reports that are dynamically generated on Maalka. Before Maalka, the process of analyzing data and generating progress reports was fragile, error-prone, and could not scale across the district. Now, setting, analyzing, and reporting progress relative to program goals is so streamlined that GBA is helping other 2030 Districts like Erie2030 to follow in its footsteps. This means the program can be scaled across more buildings, owners and managers can be engaged more often and, ultimately, more carbon emissions can be avoided.



**“Maalka provided a fantastic solution for our sustainability data and reporting needs, with lots of flexibility in design and a powerful back-end infrastructure—all on the same platform.”**

*Rob Watson,  
Chairman of Green Schools Alliance  
Founder of LEED Certification*



In its latest annual progress report, the Green Building Alliance reports that Pittsburgh2030 building owners collectively achieved an EUI reduction 23.1% below their baseline level, which was calculated using Maalka's API connection to the Architecture2030 ZeroTool. This achievement means that the average EUI decreased by **35 kBtu/ft<sup>2</sup>** across **85.2 million** square feet, representing annual energy savings of **3 billion kBtus**. For a grid powered largely by coal, this equates to burning 600,000 fewer US tons of coal, representing **1.7m tons of CO2e emissions avoided**. Moreover, building owners realized more than \$135 million in annual cost savings from reduced energy consumption.

*In 2019, Pittsburgh building owners reported energy savings of **3 billion kBtus**, resulting in **600,000** fewer tons of coal burned.*

With Maalka, GBA has been able to achieve unprecedented levels of engagement with members, while reducing the cost of this effort. This, in turn, has enabled GBA to more than quadruple the number of community members actively participating in its program, benchmarking their buildings and targeting a 50% reduction in their energy, water, and carbon emissions.



# Program Expansion

After its successful deployment with GBA, the Performance Targets program is now available to all cities, corporations, and commercial building portfolio owners and managers. Each month, more and more users are leveraging Performance Targets to better engage their stakeholders with data-driven insights that drive progress towards their sustainability goals. As Erica Taylor, a Building Innovation Analyst at The PNC Financial Services Group puts it in the 2030 District Annual Report, “No two buildings are the same, and continuous collaboration and innovation is paramount for everyone to achieve greater efficiency and sustainability.”

Performance Targets has allowed GBA to scale its stakeholder engagement efforts and deliver a more impactful building sustainability program. To learn more about how Maalka can help your organization achieve its sustainability goals, please contact us at [info@maalka.com](mailto:info@maalka.com).



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