

RECHARGE YOUR BUILDINGS

# ENERGY MANAGEMENT PLAYBOOK

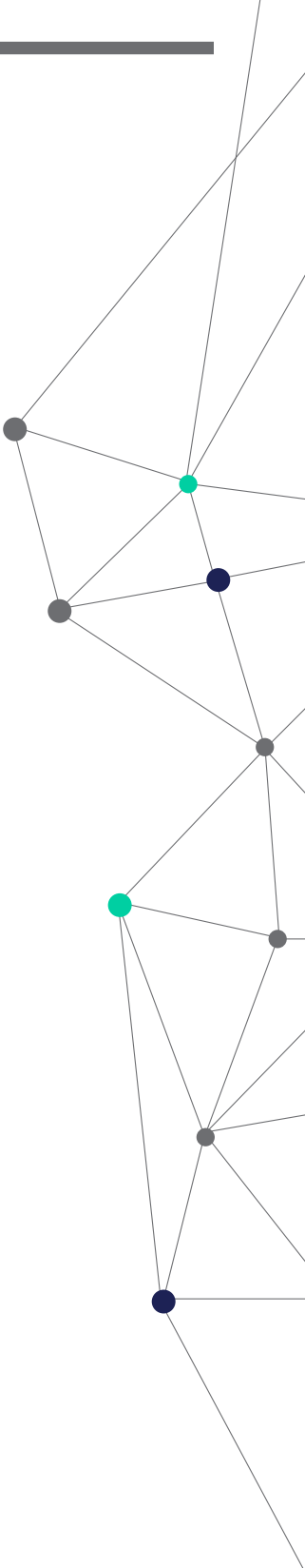
REDUCE YOUR FACILITY COSTS  
AND OPERATE MORE SUSTAINABLY

 **JadeTrack**

 **HEAPY**

# TABLE OF CONTENTS

- Introduction** ..... 4
- Energy Management Fundamentals** ..... 8
  - Energy Markets 101 ..... 10
  - Energy Supply ..... 13
  - Regulated vs. Deregulated Markets ..... 14
  - How You Use Energy ..... 18
  - Ad Hoc vs. Strategic Energy Management ..... 20
- Make a Commitment: Where You Want to Go** ..... 24
- Initial Assessment: Where You are Now**
  - Understanding Your Utility Bills ..... 26
  - Understanding Your Energy Usage ..... 28
  - Identifying Key Metrics ..... 30
- Action Plan & Implementation: Where You Are Going**
  - Setting Energy Management Goals ..... 32
  - Create a Culture of Energy Conservation ..... 35
  - Overcoming Challenges and Barriers ..... 36
- What's Next?**
  - Continuous Improvement ..... 38
  - Advanced Energy Efficiency Approaches ..... 40
- A Final Word** ..... 42





---

# INTRODUCTION

Why does energy management deserve your attention?

Energy Usage accounts for **30%**  
of a typical building's annual operating budget.

Like most things, future success starts with solid fundamentals. And if you're looking to learn how to successfully manage your energy usage and reduce your operating costs, then you've come to the right place.

The **Recharge Your Buildings** playbook is packed with keep-it-simple insights, real-world examples, and effective approaches to energy optimization inside all types of facilities.

This isn't a technical book or an instruction manual – it's a collection of ideas and best practices to support you no matter where you are in your journey. Anyone working in energy or sustainability – including facilities, operations, and finance – will find value and inspiration in these pages.

Before we begin, imagine what outcomes are most important to you and your organization. Take a moment to jot them down.

Examples of energy and sustainability goals may include:

- Know what's driving your energy costs and what impact it has on your business.
- Spend less money on building energy usage.
- Reduce your impact on the environment.
- Report on key energy usage metrics to drive change and make smart decisions.
- Build a culture of energy efficiency in your organization and improve employee engagement.

Now that you have a vision of your future state, let's dive right in.



**Katie Williams**

Account Executive

**JadeTrack**

## ABOUT JADETRACK

JadeTrack specializes in delivering simple, effective software solutions to better understand and manage your energy. We believe that sustainability starts with reliable data.

The JadeTrack software platform helps:

- Save time by eliminating manual data entry.
- Automatically translate your data into ENERGY STAR benchmarking scores, as well as carbon emissions data.
- Get real-time alerts on metered demand.
- Easily generate reports.

Our software makes it possible for your team to improve energy efficiency, achieve cost savings, track sustainability and net zero goals, and more.

## OUR SOLUTION INCLUDES:

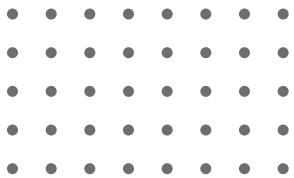
### Utility Bill Management with Automated ENERGY STAR Benchmarking

This function saves time and eliminates errors by giving you access to portfolio-wide utility cost and usage data. Plus, you get digital PDF copies of invoices with line-item details, when available. Sync your utility bill data with ENERGY STAR Portfolio Manager for easy performance comparisons using a 1-100 score or site Energy Use Intensity (EUI) rating.

### Real-time Monitoring

View hourly, daily or weekly real-time energy and water data, with a temperature overlay to help you identify and solve issues before they impact your bill. See your peak demand in any given period, and set automated usage alerts to manage your energy more proactively than ever before.

Learn more on our website at [JadeTrack.com](https://www.jadetrack.com)





**Patty Spangler**

PE, CEM, LEED AP  
Sr Energy Engineer

**HEAPY**

**ABOUT HEAPY**

HEAPY is a nationally recognized leader in sustainable and resilient engineering design, serving clients across the United States.

Our team members serve as coaches and partners to help your team manage facilities and improve building energy usage and efficiency, as well as assist in carbon and net zero roadmapping. We provide commissioning and retro-commissioning to ensure buildings perform at their peak, as well as energy audits and intelligent building management solutions.

Founded in 1945, HEAPY plans, designs, and commissions more than \$1 billion annually in total construction costs. Through HEAPY Solutions, we also offer comprehensive engineer-led design/build construction services.

Learn more on our website at [HEAPY.com](https://HEAPY.com)

**ENDURING RELATIONSHIPS**

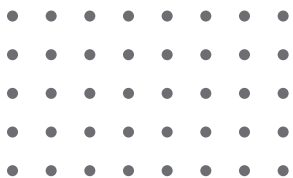
At HEAPY, our clients are friends and partners. The infrastructure we build together will last for 50 years or more: It must be designed to inspire and to last. We take that responsibility very seriously, and we care about the future we will create together.

That’s why more than 80% of our business comes from repeat clients.

**GIVING BACK**

With more than 200 colleagues and five offices throughout the United States, we care deeply about the communities where we live and work. Each year, we organize a massive HEAPY Helps week, where every colleague is given paid hours to donate to a worthy cause in their local community. We have built single-family homes, planted gardens, cleaned up parks, and helped feed children and families, living our values to MAKE A DIFFERENCE and IMPROVE THE WORLD.

We are excited to offer this playbook to our friends and partners as another way to give back. We hope you take away tips and tricks to make your organization more resilient, more sustainable, and better for people and the planet.





---

# ENERGY MANAGEMENT **FUNDAMENTALS**

**Get familiar with the basics** of energy management  
(even if you're a newcomer) to gain confidence moving forward.

COMMERCIAL BUILDINGS CONSUME  
**35%** OF ENERGY IN THE U.S.



**826** MILLION METRIC TONS  
OF CARBON DIOXIDE  
EMISSIONS

**16%** OF ALL U.S. CARBON  
DIOXIDE EMISSIONS

Source: [energy.gov](https://www.energy.gov)



## How Do Your Buildings Measure Up?

# 30% OF ENERGY USED

## In Commercial Buildings Is Wasted

We're not just consuming literally tons of energy: We are wasting it. According to the U.S. Environmental Protection Agency, on average, 30% of the energy used in commercial buildings is squandered.

Source: [www.energy.gov](http://www.energy.gov)

Most employees flip the lights on and carry on with their day without a second thought. Your organization may simply pay the utility bills without doing a deeper dive for cost saving opportunities. It doesn't have to be this way.

We can use energy to run our buildings while also improving our triple bottom line - people, planet, and profit. Reducing your energy consumption is not only good for your ROI, but for the planet and the people who inhabit it. **Strategic energy management** is one of the most powerful ways to achieve your financial and environmental goals.

Many individuals across operational functions play an important role in identifying and implementing the tactics listed throughout this playbook to save on energy costs, champion awareness, and monitor energy consumption. Everyone - from business owners to facility managers or sustainability teams - can appreciate the concepts covered in this section on the fundamentals of energy management:

- Energy Markets 101
- Energy Supply
- Regulated vs. Deregulated Markets
- How You Use Energy
- Ad Hoc vs Strategic Energy Management
- Glossary on Energy Speak

# "DON'T DO LESS & ACCEPT LESS"

Jeanette Epps, Aerospace Engineer and Astronaut



Sources of Energy:  
Fossil Fuels  
vs Renewables

# ENERGY MARKETS

## 101

Having a basic understanding of the forces that drive energy markets can help make sense of today's ever-evolving energy market. What's true today may not be tomorrow. Is your company ready to adapt to the changing energy landscape?

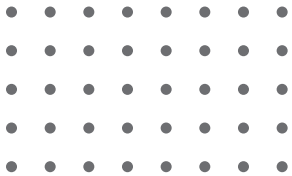
A majority of our energy supply comes from nuclear, coal, and natural gas generation plants, with a smaller portion coming from renewable resources like solar and wind.

Energy is categorized into three major sources:

1. Fossil fuels (coal, natural gas, and petroleum)
2. Nuclear energy
3. Renewable energy also known as "clean energy" (wind, hydropower, solar, biomass, geothermal)

According to the U.S. Energy Information Administration, renewable energy sources account for 20% of the electricity generation in the United States:

- Wind - uses the movement of wind
- Hydropower - uses the movement of water
- Solar - uses radiant light and heat from the sun
- Biomass - uses plant or animal material
- Geothermal - uses the Earth's internal heat





**The transition to clean energy is already underway.**

There are many market factors driving an increased need and interest in renewable energy, such as the changing climate and growing scarcity of fossil fuels.

It remains a top priority for companies to reduce their reliance on fossil fuels, and the race to reach Net Zero is already underway in many sectors. Every day, we see headlines of companies committing to 100% renewable energy targets, mostly from wind and solar.

A record level of 260 gigawatts (GW) of renewables-based energy generation capacity was added globally in 2020, more than four times the capacity added from other sources.

The top reasons why companies are prioritizing clean energy include:

- Reduce costs
- Meet customer expectations
- Improve employee satisfaction and staff retention
- Achieve competitive market advantage
- Protect the environment



---

# HOW ENERGY SUPPLY IMPACTS COST

As you can imagine, energy prices are constantly fluctuating, creating low price opportunities one day and costly spikes the next. This unpredictability has implications for your ability to achieve budget targets for your business—if you know what causes prices to climb and fall, you can capitalize on opportunities to save money and brace for spikes that could drive your costs up.

Most electricity prices are generally based on the costs incurred by utility companies to generate and distribute power to customers.

According to the U.S. EIA, the supply-side forces that most often impact electricity prices include:

- **FUEL PRICES:**  
Determine the costs to generate electricity.
- **POWER PLANT COSTS:**  
Each power plant has financing, construction, maintenance, and operating costs.
- **TRANSMISSION AND DISTRIBUTION:**  
The electricity transmission and distribution systems that connect power plants with consumers have construction, operation, and maintenance costs.
- **REGULATIONS:**  
In some states, public service/utility commissions fully regulate prices, while other states have a combination of unregulated prices (for generators) and regulated prices (for transmission and distribution). See the next section for more information on regulated versus deregulated markets.

*“Factors on the supply-side that affect prices include natural gas production, net imports, and storage inventory levels. Increases in supply tend to pull prices down, while decreases in supply tend to push prices up. Increases in prices tend to encourage natural gas production and imports, and sales from natural gas storage inventories. Declining prices tend to have the opposite effects.” – EIA*

These factors are outside of the control of most businesses, but understanding how different factors influence the cost of your utility bills will help you become a more savvy energy manager.



---

# REGULATED VS DEREGULATED MARKETS

In many states, energy reforms and market competition bring lower, more flexible energy prices. These reforms are the result of energy deregulation, where consumers are empowered to compare rates, services and contract terms, and choose the options that are best for them.

**It's just like choosing your cellphone provider.** You purchase your phone from a manufacturer like Apple or Samsung, and you also select a cell service provider, like AT&T or Verizon. In the same way, deregulated energy markets provide benefits like competitive rates and a variety of purchasing plans.

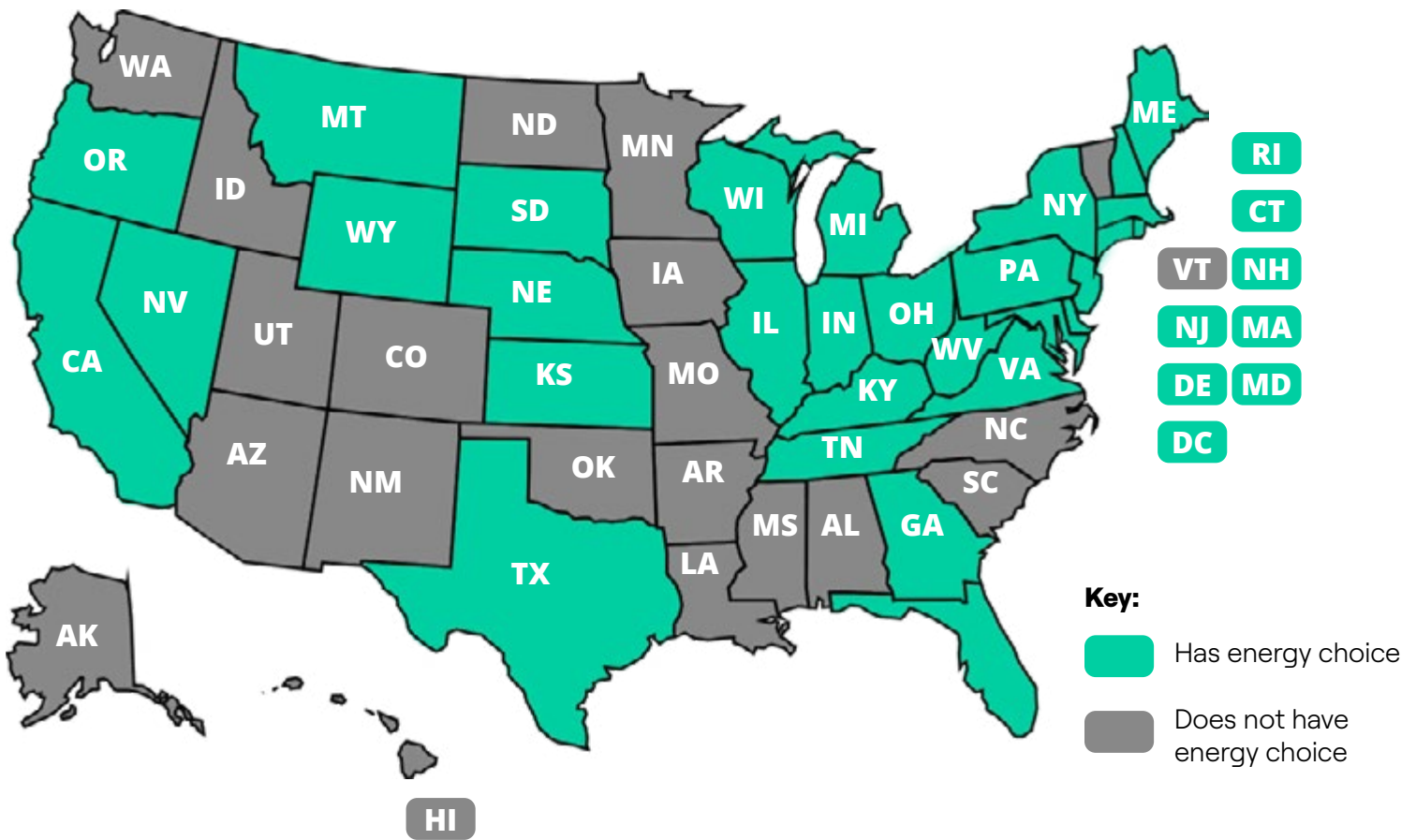
1. In regulated markets, the consumer must purchase electricity and natural gas from the local utility at prices regulated by the state and federal government.
2. In deregulated markets, the government enacts laws that change who can produce and sell energy. This reform encourages multiple suppliers to enter the market where prices are determined by competition.
3. Some states have deregulated both natural gas and electric markets, other states have deregulated only natural gas or electric, and still others remain wholly regulated. Your supply and pricing options depend on your state's conditions.

In deregulated markets, utilities continue to operate the infrastructure for transmission and distribution of energy and are responsible for outages and system reliability. Since deregulation gives consumers the right to choose where their energy comes from, users can always decide to receive their energy directly from the utility.

So how does purchasing from a competitive source work? Electricity and natural gas are still transported to your utility's meter through local power lines and pipelines. You will continue to pay your local utility for delivery of your electricity or natural gas. The change is who you buy power or natural gas from, and how much you pay for it.

In summary, deregulated markets offer many options:

- Competitive pricing for energy
- Flexible terms for your energy purchase contract
- Price reductions aligned with efficient energy practices
- Sustainable or green energy source options, such as solar or wind



Source: [www.competitiveenergy.org](http://www.competitiveenergy.org)

---

# GLOSSARY

A helpful list of words or concepts mentioned in this playbook and what they mean.

**CCF** – ccf is a measure of natural gas equal to 100 cubic feet.

**COMMISSIONING** – a quality-focused process of verifying, inspecting, testing, and documenting building systems to ensure equipment is installed and operating according to design intent, industry standards, and local codes or ordinances.

**CONSUMPTION** – the energy expended to perform an action, manufacture something or run a building.

**DEMAND** – the rate of consumption.

**ENERGY USE INTENSITY (EUI)** – EUI expresses a building's energy use as a function of its size or other characteristics. It's calculated by using the total energy consumed by the building in one year and dividing it by the total gross floor area of the building. Generally, a low EUI signifies better energy performance.

Source: [www.energystar.gov](http://www.energystar.gov)

**KW** – kilowatt (kW) is a measure of power equivalent to 1,000 watts.

**KWH** – kilowatt hour (kWh) is the amount of energy you would use to power 1,000 watts running for one hour.

**RETRO-COMMISSIONING (RCx)** – Retro-commissioning, sometimes called an energy audit, is a systematic investigation and analysis of existing building systems, which is intended to identify opportunities for improved performance and facility operation. Much like your car requires regular tune up and repair, your building's complex systems also require regular evaluation and adjustment.



---

DO YOU KNOW

# HOW YOUR BUILDINGS ARE PERFORMING?



# HOW YOU USE ENERGY

Now, let's learn about demand-side factors on your bill, or how you use energy, which is something you can control and influence.

## UNDERSTANDING ELECTRICITY DEMAND

The difference between demand and consumption is key to reducing your energy costs. **Consumption** is the energy used to perform an action, such as manufacture a medical device or operate the building HVAC system, whereas energy **demand** is the **rate of consumption**, or how quickly you use energy.

A simple way to understand these concepts is to picture the gauges on your car. The odometer represents how much electricity you use, the speedometer represents demand or how "fast" you use the electricity. If you floor the gas pedal for 15 minutes you would have a very high demand, but if you coast along and use electricity at the same rate every day then your demand will be much lower. Energy demand is registered during your highest sustained 15-minute draw during the month.

### How does electric consumption and demand impact your monthly electric bill?

Commercial and industrial customers are billed for both their consumption (measured in kWh) and their peak demand (measured in kW) for energy.

Consumption is the amount of energy you use during a billing period and the charge depends on your kWh prices. Depending on your geographic location and rate plan, you could be paying as low as \$0.07 per kWh in Louisiana or as much as \$0.30 per kWh in Hawaii.

For more details about how to read your utility bills, see page 27.

# WHAT CAN I DO TO IMPACT THE **COST OF MY ENERGY?**

**1** Look at your monthly usage pattern. You can track the data yourself manually, or you can invest in an energy management software. For example, using **JadeTrack's dashboard allows you to compare your usage in summer months to your usage in winter months.**

Energy producers reward users who have flat month-to-month "load profiles," because they are predictable and match the producers' year-round generation. Flattening your monthly load profile, even a little, can improve your price.

- For electricity, this means reducing your summer air-conditioning usage. (Some facilities may use electricity for heating as well).
- For natural gas, this means reducing your winter heating usage.

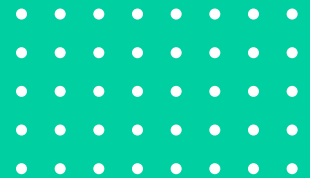
**2** Look at your monthly electric demand pattern. Does your demand spike much higher in one or two months than the other months? Your demand indicates the highest rate of usage in any month, and your supplier must reserve that capacity for you even if you use it only once or twice a year. Using efficient strategies to reduce your Demand will improve your price for electricity.

**3** Identify opportunities to manage your building's use by setting back temperatures or turning equipment off during unoccupied times. Efficient usage leads to cheaper energy pricing. JadeTrack offers Real-time Monitoring to understand how your building uses electricity and natural gas during the day, night and on weekends.

**4** Collect bids for your yearly energy purchase from a number of suppliers to ensure you receive competitive pricing. (If you are in a deregulate market.)

## How can you apply your new energy market intelligence?

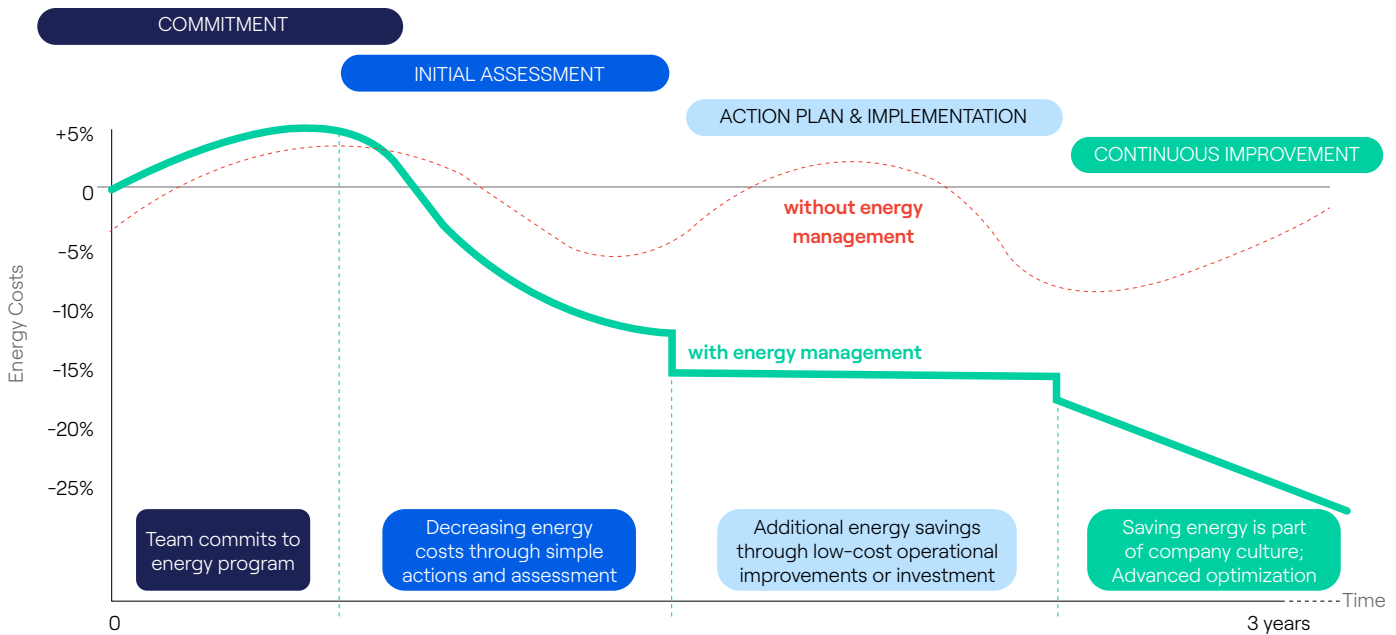
Understanding the market will help inform your ability to avoid the types of risks that volatile energy supply and prices can impose on your organization. The key is to stay current with market intelligence. If you need help with understanding the current energy landscape, [reach out to our team](#) for resources and support.



# AD HOC VS STRATEGIC APPROACH TO ENERGY MANAGEMENT

Every energy management team faces similar challenges: short-staffed, small budget, and heavy workload. This combination makes it easy to “set-it-and-forget-it” or just respond to issues as they arise, instead of taking a proactive approach to managing building systems like ventilation and lighting. In this situation, even well designed buildings can fall out of whack. A systematic approach helps organizations move from reactive energy management, typically driven by compliance and break-fix response, to proactive energy management.

## HOW CREATING AN ENERGY EFFICIENT CULTURE LEADS TO DECREASED ENERGY COSTS



The blue line represents an ad hoc approach to energy management, with fluctuating ups and downs in energy use and costs. The green line represents a strategic approach to energy management, demonstrating a persistent decline in energy use and costs over time.

This isn't an overnight process. Typically, it takes several years to really change your culture and align your operations. This playbook will help guide you to achieve a more strategic approach for your long-term energy approach.

Source: Kahlenbom et al. (2012) based on Lackner & Holanek (2007)

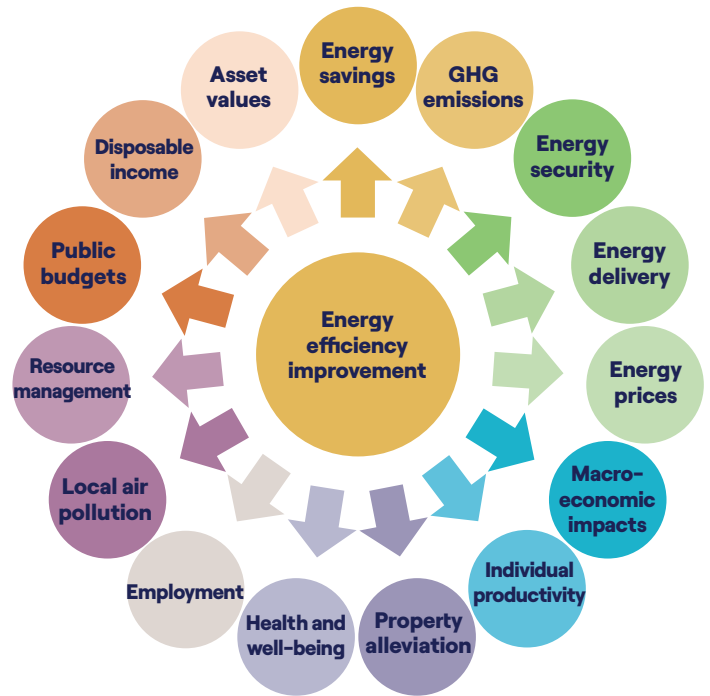
## BENEFITS OF STRATEGIC ENERGY MANAGEMENT

If every building in the U.S. reduced energy use by just 10%, we'd save \$40 billion in energy costs and prevent greenhouse gas emissions equivalent to taking 49 million vehicles off the roads.

According to ENERGY STAR, an energy use reduction of 10% or more is possible at little or no cost in most buildings.

In addition to the financial benefits, there are other advantages to implementing a strategic energy management approach, such as:

- Increase employee productivity
- Support community health and well-being
- Improve brand recognition and reputation
- Enhance operational safety and security

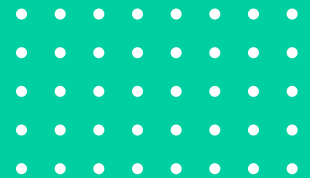


Note: This list is not exhaustive, but represents some of the most prominent benefits of energy efficiency identified to date.

Source: Unless otherwise noted, all material in figures and tables in this chapter derives from IEA data and analysis.

## Strategic Energy Management

is defined as taking a holistic approach to managing energy use in order to continuously improve energy performance.



## CASE STUDY

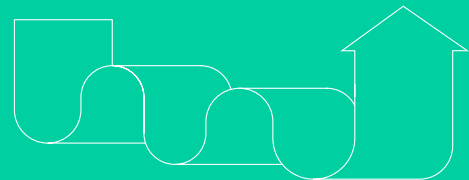
# SCHOOL DISTRICT SAVES OVER \$1 MILLION

In 2014, the Olentangy Local School District in Ohio began a strategic energy management program guided by **ENERGY STAR best practices**. Using JadeTrack to monitor electricity and gas usage, these efforts quickly paid off.

Today, Olentangy School District is one of the most energy efficient school districts in the United States, reducing costs per student to \$134.35 per school year compared to the national average of \$181.53.

Since 2014, the program has saved community tax payers more than \$1 million on utilities like electricity and gas. Teachers are also able to use JadeTrack as a hands-on learning tool by integrating the real-time data with the classroom curriculum around energy.

To see more examples of how customers like Olentangy's have leveraged JadeTrack to better report on energy and sustainability data, [check out more JadeTrack case studies here](#).





---

# MAKE A COMMITMENT: **WHERE YOU WANT TO GO**

Form a dedicated team and get buy-in from your key stakeholders.

Set the foundation for a solid culture of energy efficiency.

## **LEAD WITH CULTURE**

Your energy strategy should be tied to your company's overall **mission, vision, and values**. Make sure you understand how a better energy management approach fits into your overall company culture and how it will help achieve the goals of the organization.

For example, if you work in a hospital, saving energy will create more funding for new technology and equipment and provide more resources for research or patient care. If you work at a school, you are not just reducing energy costs, you are providing more predictability for the annual budget and reducing your impact on the environment to provide a better future for the next generation.

## **ENGAGE LEADERSHIP AND KEY STAKEHOLDERS**

You can't have a successful energy strategy without support from multiple teams - facilities and maintenance, IT, capital planning, finance, operations, and leadership.

If you want your work to be successful, get buy-in and support from leadership and other critical stakeholders. This may mean you build a business plan or proposal and sit down with the director of facilities, chief financial officer, CEO, or all three!

# "CHARACTER IS POWER"

Booker T. Washington, Educator, Author, Speaker, and Political Adviser



## **BUILD YOUR TEAM**

To create lasting change, you'll need committed champions and cheerleaders. Identify these people early on and bring them together to drive change. Make your team inclusive, and recognize that your biggest advocates may not always be members of your facilities or financial teams. Does your IT technician have a passion for sustainable agriculture and renewable energy? Get her on your team!

## **LOOK FOR "WE WIN"**

Next, find out what each individual can contribute to the organization's success and find collaborative solutions. Don't look for compromise: Look for "we win" situations. Many people think that better energy management means less occupant comfort, but this simply is not the case. Good energy managers focus on both occupant comfort and energy efficiency.

For example, did you know that people are more likely to be uncomfortably cold in office environments in the summer and that this discomfort impacts productivity? Adjusting your air conditioning set points to be higher in the summer will save energy and improve your colleagues' work environment. That's a clear win-win!



# INITIAL ASSESSMENT: **WHERE YOU ARE NOW**

Turning your utility bill into actionable data and information is a great starting point if you are just beginning your strategic energy management journey.

## UNDERSTANDING YOUR UTILITY BILLS

### **CHECK YOUR METER INFORMATION.**

The meter's serial number confirms the energy was measured at your building.

**TIP:** The meter may be replaced from time to time, so watch for this in your bill because sometimes billing errors occur.

### **REVIEW YOUR BILLING PERIOD.**

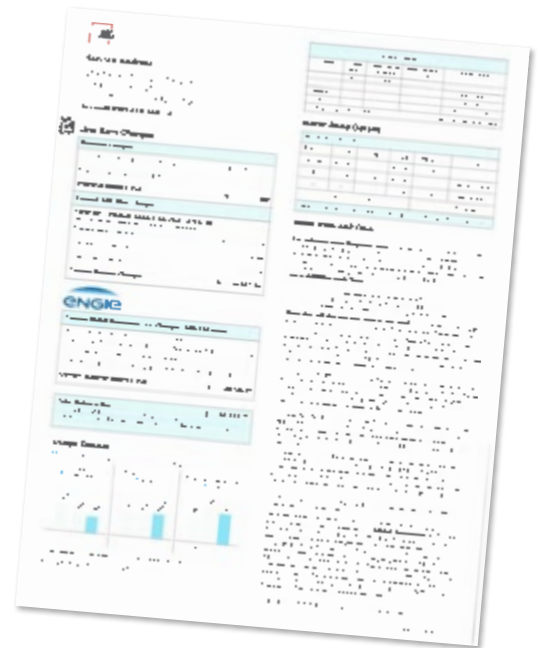
The beginning and ending reading dates define the billing period. Some billing periods are longer than others during the year. The length of the period typically ranges from 28 to 34 days.

### **KNOW YOUR USAGE.**

Usage is shown in kilowatt-hours (kWh) for electricity and hundred cubic feet (ccf) for natural gas. Usage is the amount of energy used during the billing period.

### **UNDERSTAND DEMAND.**

Demand generally appears on the electric bill only. It is shown in kilowatts (kW) and represents the building's highest rate of electric usage during the period.



---

# READING YOUR CHARGES

- Energy Charge is the cost for your actual usage, based on your kWh or ccf.
- Supply Charge is the cost to deliver the electric power or natural gas to your meter, based on your kWh or ccf.
- Demand Charge is the cost for your highest rate of electric usage, based on your kW.
- Many utilities have a Demand Ratchet, which is a minimum charge tied to your building's highest Demand of the year. The Ratchet may be higher than your building's actual Demand in a billing period. If so, your Demand charge will be based on the Ratchet rather than your actual Demand.
- A Pressure Multiplier may appear on your natural gas bill. Many commercial buildings use natural gas at pressures higher than standard. If your building does, the pressure multiplier corrects the meter reading of your compressed gas back to a standard, non-compressed volume. While the multiplier corrects your gas volume, it does not impact the cost of your energy.

If your state has deregulated utilities, you may have separate charges (or even a separate bill) from your third-party electric and/or natural gas energy supplier. Just add your utility's bill and your third-party supplier's bill to get your total cost for the month.

[Learn how JadeTrack's software caught a multiplier issue and saved the Ohio Department of Rehabilitation](#)

**\$380,000**

on their natural gas bill.



# UNDERSTANDING YOUR ENERGY USAGE

## **SOURCES OF ENERGY: FOSSIL FUELS VS RENEWABLES**

Start by comparing this month's electric and gas usage to the same month last year. On most bills, last year's monthly usage is displayed in a table or bar chart. If your usage is trending lower, great! If it trends significantly higher than last year, try to identify reasons for the change.

You can compare costs the same way. Compare this month's electric and gas cost to the same month last year. Is your cost trending lower or higher than last year?

You can fine-tune by looking at average rates. Divide your total charge by the kWh or ccf to get your monthly average cost per kWh or ccf. Compare your average rate to the same month last year, and to the previous month. Is your average cost trending lower or higher?

## **LOWER OR HIGHER?**

**Some of the most common reasons for variations in usage and billing costs include:**

### **BILLING PERIOD**

The length of billing period varies, based on the days between meter readings.

### **SEASONAL USE**

Long, warm summer days require more air-conditioning and fan energy. Short, cold winter days require more heating and lighting.

### **CHANGE IN OPERATIONS**

New business activity, new equipment, or operating hours can impact your bill.

# MONITORING YOUR ENERGY USAGE

While a single month's comparisons can provide insight, monitoring your usage and costs over a longer period provides the necessary data to support deeper analysis. Some organizations manually input monthly utility bill data into spreadsheets to track usage and cost over time.

If you would prefer an easier approach, [JadeTrack](#) automatically collects and analyzes your utility data for better visibility into how your building performs.

## CONDUCT AN ENERGY ASSESSMENT

If you really want to understand all the ways you use energy and how to best reduce your utility bills and improve operations, an energy assessment is the way to go. An Energy Assessment (aka Energy Audit) is a deep dive into the operations of your building, helping you understand how you use energy and how your building operates. An energy assessment will provide you with a list of areas for improvement, and help you prioritize measures to reduce your utility bills.

Your utility company may subsidize or provide rebates for companies that undertake energy efficiency efforts such as an energy audit. Make sure to check with your utility company about potential financial incentives before you start. [HEAPY](#) can help you conduct an energy assessment and evaluate what rebate and incentive programs are available in your area.

# CASE STUDY

HEAPY conducted an energy assessment for a school district in northeast Ohio. After reviewing the district's utility bills each month, we discovered that the district was not receiving a 2% discount to which they were entitled.

## THE SCHOOL DISTRICT RECEIVED A **\$22,000** UTILITY BILL REFUND!

Many utilities offer incentive programs for good energy management practices and reduced consumption, and they will often subsidize the cost of your investments or provide rebates for successfully reducing your energy usage. Examples of investments that would qualify for rebates include:

- an energy assessment/audit
- purchase of more energy efficient equipment
- a retro-commissioning project

These investments have a high return on investment, with a typical **payback period of less than 2 years.**

HEAPY offers comprehensive energy assessment services and will partner with you to get your building operating at peak performance.

[Check out our services HERE](#)



# IDENTIFY KEY METRICS &

# **BENCHMARK** AGAINST PEERS

Measure what matters. Greater awareness of how your building uses energy is critical to managing usage and costs. Do you know how your building's energy performance has changed over the last year? Do you know how it stacks up against similar buildings? By measuring your monthly utility data, you'll see how your buildings perform over time and be able to compare usage patterns, as well as benchmark against similar facilities.

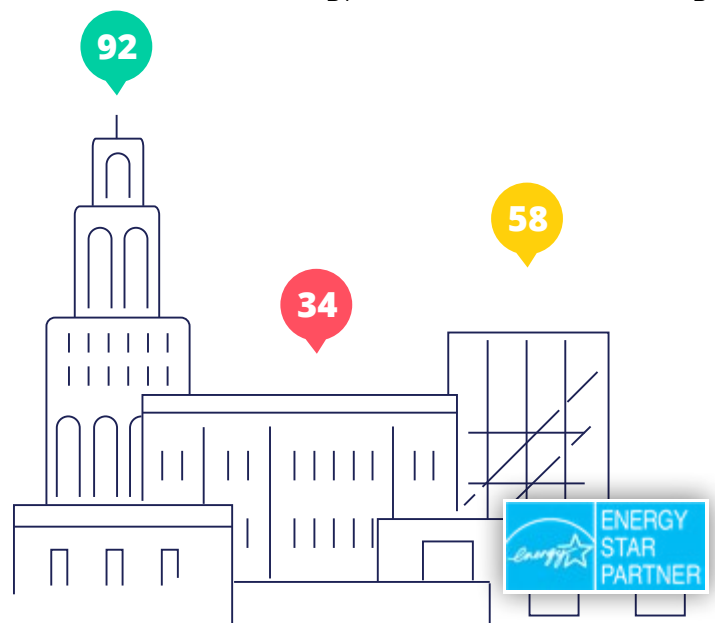
Read more to understand how to get a regular, systematic collection of your building's energy data to benchmark it against peer buildings. This information will be used to assess and compare the building's energy performance.

## **ENERGY USAGE PER SQUARE FOOT**

Commercial buildings house different types of businesses with different energy needs. An office building uses energy for heating, cooling, and lighting, while a supermarket uses energy for refrigeration, water heating, and cooking.

The Department of Energy keeps a database of over 30 different commercial building types and their corresponding energy use. The building types include K-12 schools, office buildings, healthcare, retail and warehouses, to name a few. Each building type includes the average electric energy intensity, or kWh per square foot. Here are a few examples:

- A high school consumes approximately 10.3 kWh/square foot annually.
- A grocery store consumes approximately 44.2 kWh/square foot annually.
- A professional office consumes approximately 16.9 kWh/square foot annually.





You can compare your building’s annual electric usage to the corresponding benchmark to see how your building performs.

[www.eia.gov](http://www.eia.gov)

The Department of Energy’s database includes natural gas usage for commercial buildings too. You can compare your building’s annual gas usage, in cubic feet/square foot, to the corresponding benchmark.

[www.eia.gov/consumption](http://www.eia.gov/consumption)

Energy Use Intensity (EUI) is the most common square-footage benchmark. It is a critical benchmark for all energy analysis, and it’s displayed on the front page of your JadeTrack dashboard. EUI is the sum of your electric and natural gas usage per square foot. Of course, electric units (kWh) and natural gas units (ccf) must be converted to a common unit in order to add them together. The common conversion is BTU. Energy Use Intensity (EUI) is shown in 1000 BTU/square foot, or kBTU/SF.

1 kWh = 3,412 BTU      1 ccf natural gas = 103,000 BTU

[www.eia.gov/consumption/commercial/](http://www.eia.gov/consumption/commercial/)

**UNIQUE BENCHMARKS**

If your building houses a unique type of business, you may need a different perspective to evaluate its energy performance and benchmark with others.

You can invent the metric that suits your business the best, as long as it’s applied consistently from year to year and from location to location.

For example, a company with manufacturing plants in different cities may want to benchmark each plant’s energy use per unit made. This specific benchmark would inform their management of how each plant stacks up against each other, in terms of energy use and production.

Correctional facilities have adopted their own benchmark of energy use per inmate. Since energy usage correlates with the population served, this benchmark levels the comparison between institutions.



---

## ACTION PLAN

# HOW TO SET **ENERGY MANAGEMENT** GOALS

### **NOW THAT YOU HAVE:**

- made a commitment
- gained buy-in
- created a team
- conducted an initial assessment

You're ready to set meaningful goals for your energy management approach.

We recommend setting realistic yet ambitious targets and taking a collaborative approach with your team to outline your goals.

In the next section, we offer a format for goal setting that we have seen be successful at other organizations. There are many valid approaches that can also be used. Try our approach out if you aren't sure where to start.

**"YOUR FOCUS DETERMINES YOUR REALITY"**

George Lucas, Film Director, Producer, Screenwriter, and Entrepreneur



---

# SET F.A.S.T. GOALS

## FREQUENTLY DISCUSSED

Fast goals are frequently discussed. Keep your goal in your sights at all times and make sure your team is meeting regularly to discuss progress, evaluate current efforts, and make adjustments if you veer off track.

**EXAMPLE: Make your goals a regular topic in your team meeting. Don't set it and forget it.**

## AMBITIOUS

Make your goals ambitious. This does not mean that your goals are unobtainable. You should be realistic, but don't settle. Goals should be almost out of reach, otherwise, you won't know how much your team can accomplish.

**EXAMPLE: We want to reduce our energy usage by 10%.**

## SPECIFIC

Your goals should be tied to simple, understandable outcomes, and your team should have clear expectations for how to reach your goals. Make sure goals are specific enough and that they are tied to tangible and measurable metrics. Specific metrics are easier to test and verify.

**EXAMPLE: We want to reduce our energy usage by 10% in 12 months using low-cost options with a payback period of less than one year.**

## TRANSPARENT

Make sure your goals, your metrics, and your progress are visible to your team members and to everyone in the organization. This means making your successes and your failures transparent. This can help you build support for your efforts because people can tie their individual behaviors to the company's goals.

**EXAMPLE: If everyone does a great job turning off equipment when not in use and you see progress on energy usage, share that success!**

Have a visible and easy to access place to track your progress.

JadeTrack will provide a dashboard to track your progress and make it easy to discuss your goals frequently.

You can also use JadeTrack to track specific metrics, share progress, and broadcast success to your team.

---

# TACKLE LOW-HANGING FRUIT FIRST

When it comes to energy management, you can make small, incremental changes that make a big difference, often at very little cost to your organization.

Good facility management and behavioral management goes a long way to reducing your energy usage, and all it costs you is a little time and attention.

## CHECKLIST: No-cost and Low-cost Fixes

### OPERATIONS AND MAINTENANCE:

- Calibrate thermostats and sensors.
- Make sure equipment is clean (especially filters and coils).
- Ensure appropriate maintenance and operations (dampers, belts, etc.).
- Major capital equipment should have regular, scheduled maintenance.

### SYSTEM OPERATIONS:

- Reduce heat or cooling when unoccupied by engaging night and weekend thermostat setbacks.
- Are people wearing sweaters in the summertime? Adjust your room temperature set points to a common setting.
- Optimize start-up time and equipment sequencing. This may be manual or automatic depending on the age of your systems. HEAPY can help your team if you need some expert guidance for proper system operations and controls.

### OCCUPANT BEHAVIOR:

- Increase awareness of energy usage impact. JadeTrack can help you with providing energy usage dashboards and real-time data to share with your colleagues so they can see progress.
- Turn off equipment and lights when not in use.
- Use power management software to automatically turn off unused computers.
- Ensure a comfortable setpoint for your indoor environment to discourage elective appliance usage.

### LIGHTING:

- Upgrade to LED lighting.
- Use occupancy sensors in conference rooms or areas with intermittent occupancy.

---

# CREATE A CULTURE OF ENERGY CONSERVATION

If you just ask people to turn off lights when not in use and tell them to forgo personal fans and heaters, you won't see a ton of progress. You have to create a culture of energy conservation. If you set goals that are transparent and frequently discussed, then you are well on your way.

To keep your team engaged and motivated, make achieving your goals fun through **GAMIFICATION**. This means turning your goals into games.



Gamified energy efficiency programs can achieve **energy savings of 3-10%** according to the American Council for an Energy-Efficient Economy.

## BEFORE YOU BEGIN:

- Set leading measures, such as people reporting they turned off the lights, as well as lagging measures, such as actual energy consumption.
- Ensure progress is easy to communicate and shared frequently with participants.

## HERE ARE SOME GREAT EXAMPLES:

1. Create a dashboard for each department and then give prizes to the group that can make the most progress in a set time period. Provide regular updates and celebrate the winners. Set multiple progress goals so everyone feels like they have a chance to compete and win.
2. Set an energy reduction target for the whole company. If the company reaches that target, everyone wins a free vacation day. This is a great strategy that is collaborative rather than competitive.



---

# OVERCOMING CHALLENGES AND BARRIERS

Every program has its challenges, so we want to help you stay informed of potential setbacks and challenges. We will also offer some potential solutions and tools to overcome them. And remember, some progress is better than no progress, so don't be discouraged if you encounter some resistance.

## **BARRIER: LACK OF INVESTMENT**

Decision makers don't see the value of investing in energy management. They want instant gratification and are resistant to spending money if there is no immediate return on investment.

## **SOLUTION: START WITH NO-COST/LOW-COST**

Earlier in this playbook we discussed how to gain initial buy in and form your team of stakeholders. Taking that proactive approach beforehand will pay dividends later and help you avoid this issue. However, leadership changes and so do organizational priorities. If you encounter this problem, try to focus on no-cost options first. It's hard to argue with free! Implement these initial improvements, then demonstrate the cost savings of reducing energy usage. You can then approach resistant leaders with low-cost investment options that have a quick payback period. They will likely be more receptive.

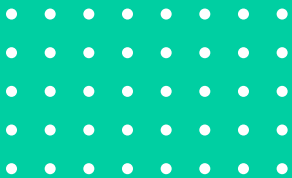
## **BARRIER: LOW MOTIVATION**

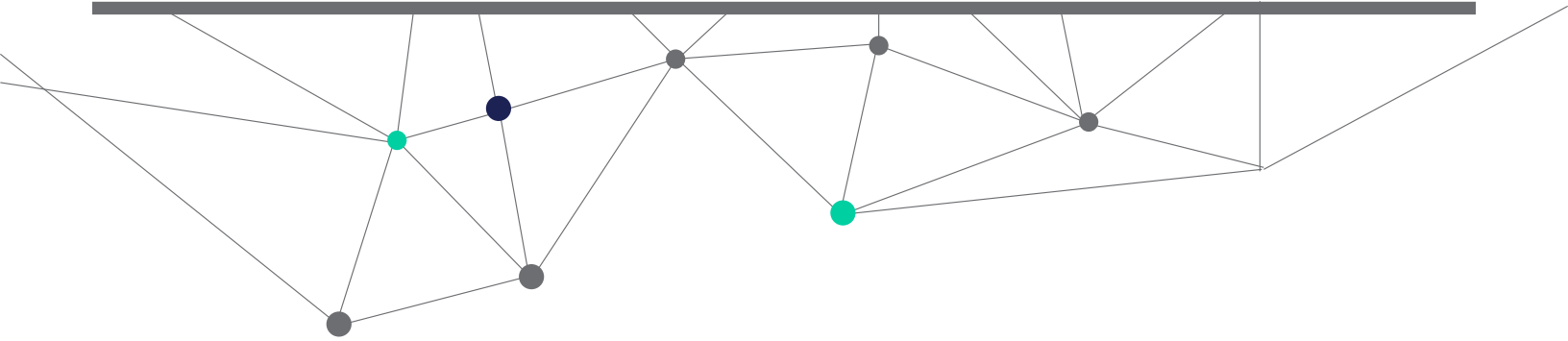
Some people do not have a strong enough motivation or incentive to change their behavior to reduce energy usage. For example, using a space heater because they don't want to be cold in the winter time.

## **SOLUTION: STAY CURIOUS AND POSITIVE**

In many cases, focusing on collaboration and team building up front will help win people over and make them more willing to change. In other cases, it might be beneficial to conduct interviews or surveys to find out why people do not want to take action or change their behavior. If the issue is comfort, then there may be a genuine issue with the building systems and controls that need to be addressed.

The bottom line is that you need to focus on the positive and don't be discouraged if everyone doesn't change right away. Creating and changing culture takes time and dedication, so stay focused on your goals and make incremental progress.





**BARRIER: INFORMATION SILOS**

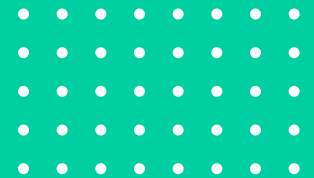
In many organizations, responsibility for energy management can be spread across the enterprise. Competing goals and silos of responsibility make it difficult to gain traction. It's not uncommon to get bogged down by a simple case of the left hand (the energy manager) not knowing what the right hand (the accountant) is doing.

**SOLUTION: INCLUSION AND COLLABORATION**

Build an inclusive and equitable team from the get-go. Before you set your goals and objectives, gather key stakeholders to help improve collaboration and build support across the organization. It takes time to build support for energy efficiency, but it is worth the investment! Every minute you spend on inclusion and collaboration will pay dividends in the future. You don't want to get to the implementation phase and then have your entire project derailed by a key player not being on board.



Our goal is to help you avoid these common problems with a proactive approach or navigate these challenges when they arise. If you need additional consultation, HEAPY and JadeTrack are always happy to chat about how to improve your energy management approach or to help you gain buy in from your team to move forward.



# WHAT'S NEXT?

## CONTINUOUS IMPROVEMENT

If you've followed the playbook to this point, then you accomplished what you set out to do.

You developed an energy management plan with support from advocates at all levels of your organization and are successfully implementing your first big projects.

So... now what?

### CELEBRATE

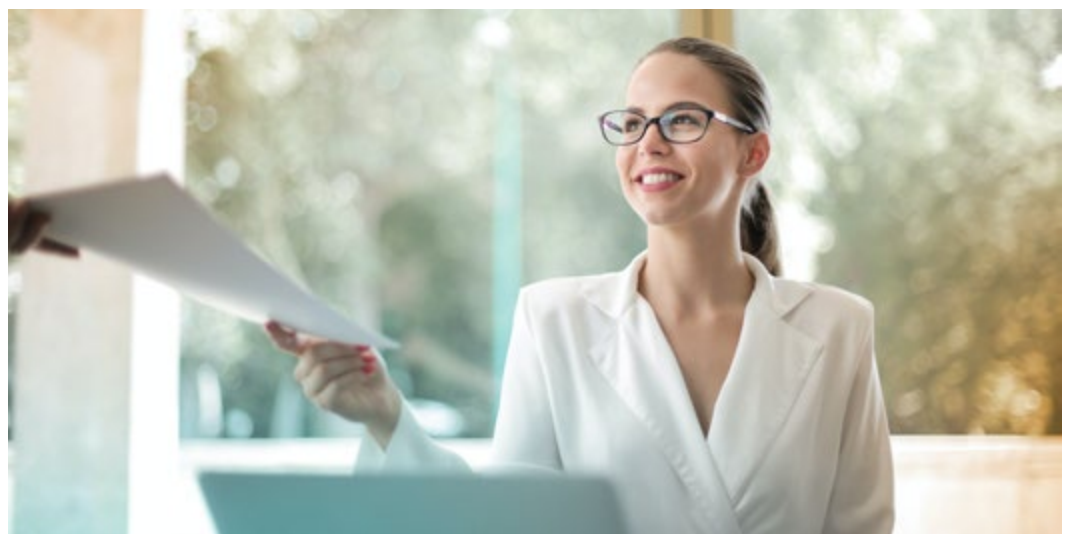
Recognize the success that you are having. Don't be afraid to shout it out! Internally and externally publish your achievements so far.

Use your energy reporting software, like JadeTrack, to share data and be transparent. Translate the data into understandable metrics for your organization. For example: "We've saved \$50,000 by reducing our annual utility costs, so we can now invest in new laptops for our teachers."

### REVIEW

Understand what is going well and where challenges are being experienced. Don't ignore challenges: Face them and overcome them as a team.

Talk with your team running the buildings and your occupants. Continue to maintain buy-in and trust by adjusting practices based on their input.





## MONITOR

Continuously use energy reporting software to catch energy increases before they impact your utility bills. It is important to monitor consumption as everyday building operations can lead to drift overtime and increased energy consumption. If you're struggling to get your building systems aligned with your goals, HEAPY can help fine-tune your building operations and ensure they are performing to your expectations.

Consider upgrading your BAS and Energy Management Software to provide real-time alerts when energy slippage occurs.

Consider setting up a program to review BAS change logs. Many times, the BAS system requires a short-term manual override or change while equipment is being fixed. Make sure these overrides are eventually removed and systems are returned to normal. If your team needs help with getting your building systems back to working order, reach out to [HEAPY](#).

Consider if further set-point or schedule adjustments can be made that would increase savings. At first, some organizations decide to institute moderate changes when implementing energy programs to help with occupant adjustment. Once occupants are used to these changes and the program goals, there is often opportunity for further adjustment.

## BE PROACTIVE

As your energy efficiency program grows, and you're seeing success implementing low-cost, high-savings projects, you can begin requesting more costly or lower ROI projects that still benefit your organization.

One way to successfully tackle capital expenditure projects is to develop a Green Revolving Fund (GRF). The idea of a GRF is that when project savings are attained they are put into the GRF to help finance future projects. Every year the savings from all energy projects are placed into the GRF, which can provide a continual funding mechanism for energy efficiency or renewable energy projects.

Without constant attention, building systems can drift over time and lead to wasted time and resources, as well as reduced occupant comfort.

HEAPY provides Intelligent Building Management to continually monitor building automation and energy systems, analyze-real time data, highlight anomalies, and identify precisely where your staff and resources are most valuable. We streamline facility operations and maintenance, functioning as an extension of your team so you can direct resources where they are needed most at precisely the right time.

**[REACH OUT TO OUR TEAM](#)** for more information if you need additional tools and resources to get your building operating in tip-top shape.

---

# ADVANCED ENERGY EFFICIENCY

Monitor and track your building's energy usage in real-time for a deeper understanding of building performance.

Keep on course with regular investment in Operations and Maintenance (O&M).

Begin to explore more robust solutions if it makes sense for your team and your long-term goals.

There are many ways to gain insight into your building's energy performance.

Your **BUILDING AUTOMATION SYSTEM (BAS)** is a combination of hardware and software that automatically controls various building systems like heating, ventilation and air-conditioning (HVAC), lighting, and security.

The core functions of the BAS are:

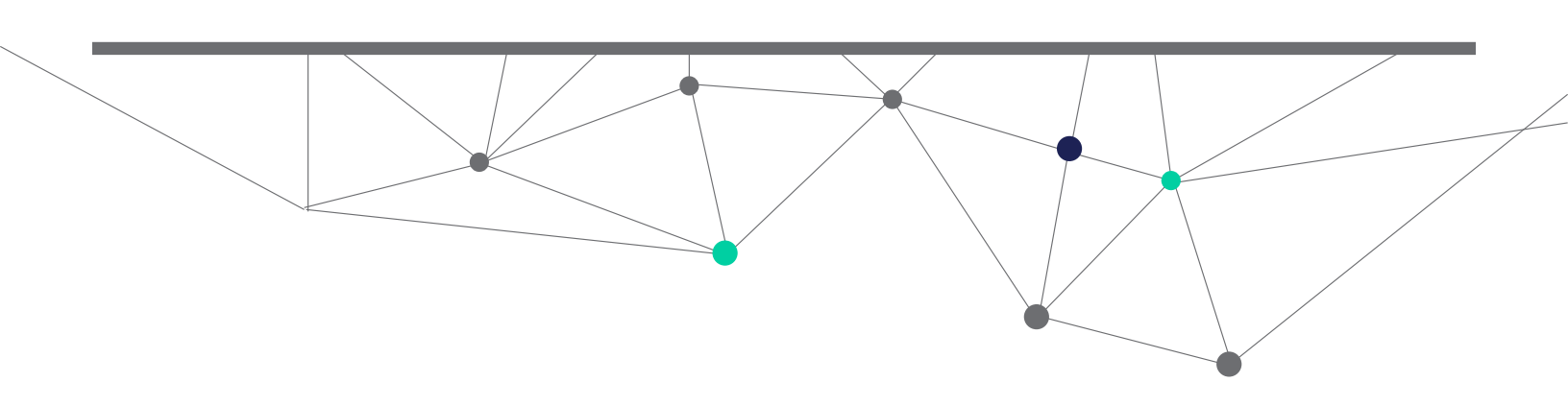
- Keep building climate within a specified range
- Light rooms based on an occupancy schedule
- Optimize efficient equipment performance
- Provide alarms for malfunctions

BAS can monitor some system performance in real time, typically HVAC energy consumption. Performance information can be used to drive decisions relating to overall building performance and energy efficiency, but the BAS plays no role other than providing the performance measure.

**REAL-TIME ENERGY MONITORING**, like JadeTrack, monitors all the energy used in the building, processes it and displays it as it's happening. Real-time monitoring does not have control or automation of the building systems. Instead, it collects and analyzes building energy consumption data to assist in decision-making and optimizing building efficiency.

Real-time monitoring often provides detailed reports and comparisons that are critical to understanding the building's whole energy performance. This information can lead to recommendations for optimizing energy efficiency – minimizing energy use and maximizing energy cost savings.





So which type of system is best?

Both systems play a role in making your building run efficiently.

The BAS automates your systems. Energy savings result through using the BAS logic to operate systems only when they are required. For example, turning on/off HVAC systems according to occupancy schedules.

Advanced logic can fine-tune the system operation to gain even more efficiency. For example, air temperatures and fan speeds can be automatically adjusted as conditions in the space change. Optimizing system efficiency depends on how many components are controlled by BAS, and how well the BAS is programmed. HEAPY specializes in programming, troubleshooting and fine-tuning building systems, and can lend a hand if you need help.

Real-time energy monitoring shows how the whole building is performing, not isolated systems. Electric, natural gas and water data is gathered from the utility meters. Usage data is collected, processed and displayed as it is happening.

BAS doesn't cover everything in the building that uses energy – computers, printers, refrigerators, water heaters, dishwashers – but real-time energy monitoring catches it all from the utility meters. Building users can quickly see inefficiencies and pivot operations to reduce energy use, before the inefficiencies impact the monthly utility bill, which will help your organization save on energy costs.

Users can also see the building's energy levels when they are not in the building, at night and on weekends, and can zero-in on equipment that runs in those off-hours, saving runtime and energy costs.

The real-time data dashboard can be shared with building users, driving energy awareness and behavioral changes to further enhance efficiency. Building occupants are more likely to take ownership of the building's efficiency when this data is provided frequently and shared openly.

## **FIND A COACH!**

An "outsider" perspective offers unique insight and removes obstacles that would otherwise prevent you from achieving your full potential. Real change takes time. After the initial excitement wears off, coaching will also keep everyone on task to change your energy culture.

If you're looking for expert advice, HEAPY will evaluate your building systems and ensure your operations are optimized for energy performance. JadeTrack can also support your efforts by providing accountability and actionable data for your team.

---

# A FINAL WORD

Most people fall into the trap of responding to urgent requests or implementing ad hoc energy management solutions, which have mediocre and sometimes detrimental results. We hope this playbook has helped educate you about how to avoid these common pitfalls and implement a successful program customized to the needs of your organization.

We want you to be inspired by the lessons learned and best practices shared in this playbook, but we know we have thrown a lot of information at you. The number one thing to remember is this:

**YOU DO NOT HAVE TO DO THIS PERFECTLY**

**YOU JUST HAVE TO START**

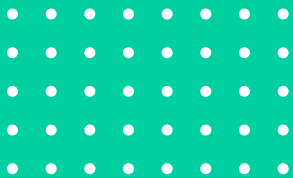
When it comes to reducing utility costs, managing energy usage, and making your organization more sustainable, your most valuable asset is your focus and persistence. Nothing matters more.

Keep your eye on the prize and make incremental progress. You'll be surprised by how much your team can accomplish.

If you still feel overwhelmed and you don't know where to start, our team is happy to point you in the right direction. We've helped hundreds of clients understand their utility bills, reduce energy usage, and improve operations.

Whether you want to start an energy audit or create a new energy usage dashboard, we have the expertise to help you get the job done right.

- **Know** what's driving your energy costs and how it impacts your business.
- **Spend less** money on building energy usage.
- **Reduce** your impact on the environment.
- **Report** on key energy usage metrics to drive change and make smart decisions.
- **Build** an energy efficiency culture to improve employee engagement.



---

# WE HOPE **YOU KEEP IN TOUCH!**



**Katie Williams**

Account Executive

**JadeTrack**

**JadeTrack** is an energy management software that can help your organization automate your utility bill data, ENERGY STAR benchmarking, and GHG emissions. If your team is manually entering utility bill data into spreadsheets, we can help you save time, as well as find low to no cost opportunities to reduce your energy spend.

If you have additional questions from the playbook, or would like to see a demo of JadeTrack, we hope you'll reach out. We look forward to learning more about your organization's energy, water, waste, and carbon reduction goals to see how we can best serve your needs.



**Patty Spangler**

PE, CEM, LEED AP  
Sr Energy Engineer

**HEAPY**

**HEAPY** is excited to share our lessons learned from decades of experience in building operations and energy management. We offer services and support that optimize energy efficiency, minimize operational costs, and provide comfortable and productive indoor environments.

HEAPY can continually monitor building automation and energy systems, analyze real time data, highlight anomalies, and identify precisely where your staff and resources are most valuable.

We hope you found valuable information and resources in the Energy Management Playbook by JadeTrack and HEAPY.

## **QUESTIONS?**

[info@EnergyManagementBestPractices.com](mailto:info@EnergyManagementBestPractices.com)