PennEngineering®

Global Energy Management Policy

PennEngineering®: Sustainability

PennEngineering recognizes that energy production and usage is a primary contributor to greenhouse gas emissions and a fundamental operational cost. Through better energy management, we can improve our emissions position and significantly reduce operational expenses. This policy is to help manage how we:

- Use energy directly to produce products
- Use energy throughout our business
- Generate energy
- Transition to green energy

Energy in this context is broadly defined. It is primarily electrical but also includes energy from natural gas, propane, gasoline, diesel, and steam where applicable.

This is a global policy covering all sites: manufacturing, distribution, and office. Each site's unique impacts should be considered in their own lens, but we must keep some high level goals in mind so that we are all working together to reduce our impact on the planet.

This policy integrates with our Sustainability goals and plans and not only stands alone as strong fiscal policy, but also helps us reach our climate goals.

These guidelines also serve as recommendations for all in our supply chain, and we encourage them to adopt and implement similar policies. To that end, this document is not held behind a wall of intellectual property, but rather shared freely.

Lastly, we publish this on our website and offer others to freely reference or use these guidelines in the creation of their own. It is only together that we can make a true, profound difference in the world.

Governance, Responsibilities, and Records

Each site is responsible for determining how it is using energy and documenting that use. Energy use comes in many forms and sites should consider all of the following, but may have other forms not listed:

- Energy from utilities (typically electricity and natural gas)
- Energy generated on-site (e.g., solar or wind)
- Propane tanks used for heating or powering vehicles (on- or off-site)
- Gasoline, diesel, or petrol used in vehicles (on- or off-site)
- Natural gas, gasoline, diesel, or petrol used in generators
- Natural gas, gasoline, diesel, or petrol used in processing equipment
- Gas, wood, or charcoal used for cooking and grilling

Documentation

All of these uses **shall** be documented in the Sinai.com carbon tracking platform for manufacturing sites. These are Scope 1 or 2 activities and are documented quarterly. Each manufacturing site **shall** designate one or more people responsible for this documentation.

Site usage shall be rolled up by the corporate Sustainability leader.

Whenever possible, key equipment should be outfitted with meters allowing measurement of energy use specific to the machine. This should be tracked and considerations should be made on improvements specific to these key machines. This may include adding insulation to prevent heat loss, cleaning or lubricating moving pieces, replacing bearing, or replacing old pumps and motors with ones having VFD drives.

Training

We strongly recommended that each site provide training and certification for energy management designees and their backups. This ensures they remain current on legislative changes, permit requirements, legal developments, and emerging technologies that could benefit the site.

Energy Efficiency Goals

The corporate Sustainability leader, in consultation with the sites, **shall** set company goals for energy usage that will be distributed to each site. The site **shall** track the site's progress to those goals which will become a tracked metric for the site. Usage goals will be set based on the historical usage and will take into account changes to the site such as expansions, equipment changes, and production.

Goals and tracking **shall** also note and accommodate major shifts in equipment including new equipment and the decommissioning old equipment. This may involve moving an external process inside and the influx of energy associated with that. In most cases that will offset Scope 3 energy associated with a vendor as well as transportation needs.

Progress to site goals and company goals **shall** be published annually. Quarterly results should be tallied and shared as well so that target tracking can take progress into account. These will be communicated to employees and other stakeholders including insurance companies and the board of directors. This communication will occur through the Global Environmental Council, meeting minutes, and our SharePoint site.

Sites should promote internally responsible energy use both for employees' personal use and within the scope of their work. This includes simple actions such as turning off lights when not in use, leaving the thermostat one or two degrees warmer in the summer or cooler in the winter, or using cold water when possible. Together we should promote a culture of environmental conservation and accountability to which energy use is only a part.

Risk Assessment & Management

Site Review

Energy efficiency audits are not required, but strongly encouraged at each site. Utilities will often provide these services, sometimes with added benefits or reduced costs.

Regular internal audits will help show where energy is used and wasted. They can examine overall site energy consumption or focus on specific processes and equipment. Simple fixes can often yield significant savings and provide opportunities to reduce energy use. Audits can also help identify and correct safety concerns such as daisy-chained cords and loose connections.

Actions should focus on high-impact areas where we can achieve the greatest energy and cost savings. Projects should be identified and, if not immediately feasible, documented for future budget plans. Prioritize projects with positive payback periods that demonstrate both short-term cost savings and long-term energy reductions.

Achieving ISO 50001 (Energy Management) certification is not required, but should be considered for each site.

Risk Assessment

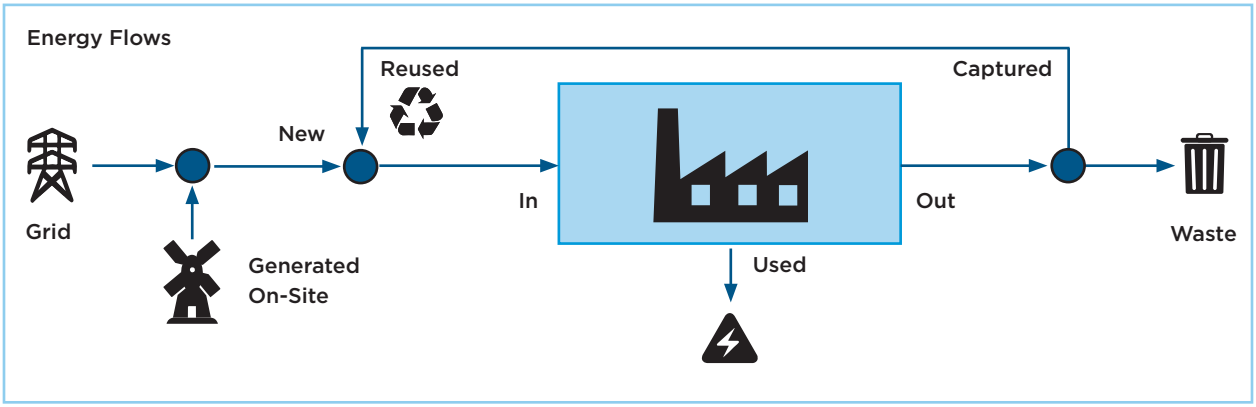
Each site's contingency plan shall include site energy risks. The site's Climate Risk Analysis will also include links to these potential effects. These may include (but are not limited to) the following:

- Service interruption
- Fuel leaks
- Fires and explosions

Plants should have mitigation plans for each potential risk.

Energy Use

Energy use within the plant can be broken down into inputs, outputs, and used energy. The used energy goes to powering processes and running the facility (lights, heat, equipment). Un-used energy outputs are generally waste, typically in the form of heat. Inputs can come from utility grids, on-site generation (such as solar or combustion), or captured and reused waste energy.



Sites should evaluate their energy sources and identify opportunities to improve each stage of their energy cycle. The following chart outlines common sources of each category but is not exhaustive.

Sources			
Generated (increase)	**Used (reduce)**	**Reused (increase)**	**Waste (reduce)**
Solar	Operations	Heat Reclimation	Heat/AC out building
Combustion	Pumps/Motors	Venting of hot air	Heat at machines
	HVAC	Pre-heating water	Heat at Heat Treat
	Lighting		Heat at Plating
	Systems		Heat at Cleaning
	Compressors		Heat at Compressors
	Vehicles (shop &road)		

This approach can help generate ideas for improvement within each plant's energy cycle.

Renewable Energy Generation

As energy prices continue to rise globally, it is more critical than ever to consider on-site energy generation. Green energy generation such as solar (or wind, tidal, or other) not only offers long-term savings, but also significantly reduces our carbon footprint and should be given priority consideration.

Energy Efficiency

Plants should seek ways to increase energy efficiency in their manufacturing equipment and other energy-using equipment. ENERGY STAR® or equivalent equipment should be prioritized during procurement. Replacing old, inefficient equipment with new, energy-efficient alternatives often delivers benefits beyond energy savings. Installing energy monitors on older equipment can help quantify additional operating costs and strengthen the financial justification for replacement.

Low-Carbon Transition

Transitioning to a low-carbon energy profile requires time and initial investment, but delivers financial returns over the long term. While these projects may not always offer quick payback periods, PennEngineering has prioritized decarbonization and will favorably review proposals that demonstrate both financial returns and decarbonization impact.

For long-term equipment such as vehicles, furnaces, or plating lines, gas or oil heating may appear more financially viable in the short term. But as fossil fuel prices continue to rise and electrical grids transition to renewable resources, electrical-powered equipment will become increasingly cost-effective. It is the position of the Sustainability team to give strong consideration to electrically powered equipment over fossil fuel alternatives, even when short-term financial analysis favors fossil fuel options.

Continuous Improvement

Each plant should invest in smart energy conservation and generation to continually improve energy management and reduce greenhouse gas emissions. We encourage the exploration of new technologies and techniques so we can continue to be on the forefront of energy stewardship. Ideas and projects should be shared with the Global Environmental Council so we can collectively learn and offer guidance to elevate PennEngineering's energy programs.

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www.pemnet.com

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