general motors

Energy Treasure Maps

User Guide

POWERING THE FUTURE *TOGETHER*

everybody in.

Energy Treasure Maps

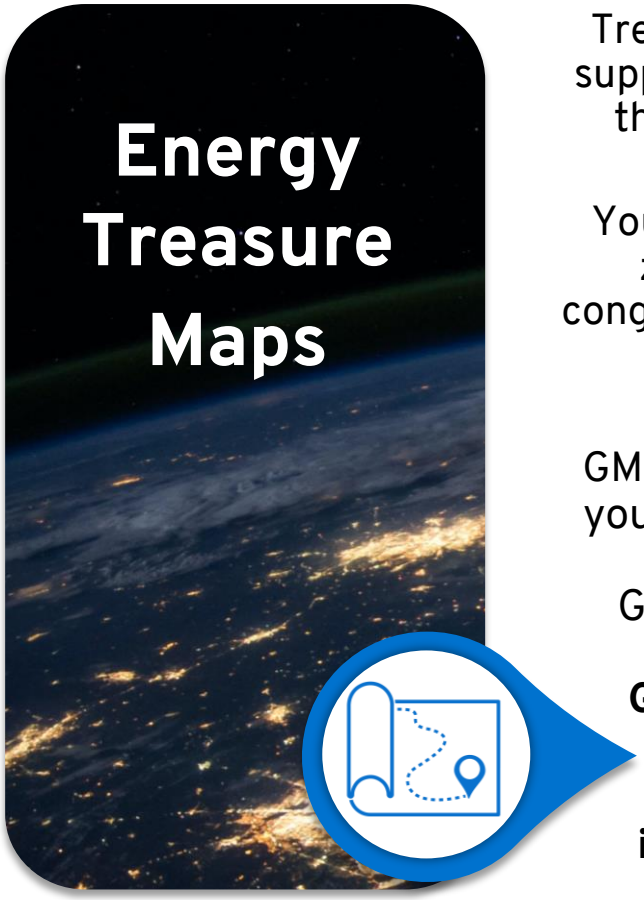
general motors

"I believe that the auto industry will change more in the next 5-10 years than it has in the last 50." Mary Barra, GM CEO

GET INVOLVED!

Participate in the different events and activities and gain access to our unique resources

Zero Crashes | ***Zero*** Emissions | ***Zero*** Congestion



Treasure Maps offers the opportunity for all suppliers to optimize energy efficiency within their manufacturing plants and buildings.

Your participation supports GM's mission of zero crashes, zero emissions, and zero congestion creating a healthier planet now and for the next generations to come.

GM will provide continuous support through your treasure maps journey. Please contact us at GPSCSustainability@gm.com or GMSupplyPower.com for any questions!

GM's Copyrighted documents that guide suppliers in documenting emissions, identifying opportunities for savings, and moving toward implementation.

GM is providing this tool to help its suppliers identify potential energy and cost savings. These potential saving are estimates only, and can fluctuate based on energy prices and other factors. By sharing this tool, GM does not assume any liability for any particular energy or cost saving estimates. By using this tool, supplier assumes all liability for the information put into the tool, and for any energy or cost savings estimated by the tool.

Index

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On the first tab, identify which projects are applicable to your Energy Treasure Maps analysis at the facility type. By clicking on individual project titles from the Index tab it will take you directly to the project worksheet

Worksheet Index - Energy Treasure Maps

Index

Energy Treasure Maps
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Worksheet Index - Energy Treasure Maps

Facility Information	
Start Date of Treasure Maps	<Insert Date>
Organization Name	<Insert Org Name>
Site Name	<Insert Site Name>
Site Sector	<Insert Site Sector>
Facility type *(dropdown)*	Industrial
Street Address	<Insert Street Address>
City	<Insert City>
State/Province *(dropdown)*	MI
Zip Code	<Insert Zip Code>
Contact Name	<Insert Contact Name>
Contact Email	<Insert Contact Email>
Number of employees	<Insert # employees>
Site Google Map Image	<Insert Below>

Each calculation tab will have standard cells highlighted in light red that will need to be populated with facility specific data. Once completed, calculations will be automatically generated to use as estimates for the action plan summary detail.

User inputs and outputs are color coded to guide the user on what information needs to be collected on the plant floor. Reviewing project worksheets before walking the facility is recommended to keep a safe work environment.

User Input Instructions	
Pink	Please input data ONLY in the pink cells.
Gray	Please DO NOT enter any data in the gray cells. They contain formulas
Green	Final outputs for Treasure Map Tab

Hovering over the column title will provide additional details of what information is being requested in the pink fields, or how the calculations were performed to get the outputs in the gray fields.

Equipment	Hp	Production Hrs/Yr				% system reduction	Cfm Reduced	HP Reduced	MWh Saved	Yearly Savings
	25	8760				1%	1	0.3	1.6	$ -
							-	-	-	$ -
							-	-	-	$ -
							-	-	-	$ -
							-	-	-	$ -
							-	-	-	$ -
				-	1%		-	-	-	$ -
								Total Yearly Savings	1.6	$ -

D12

Full year production hours/year (365*24)=8760

Another comment is in progress

Site Information

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Site Energy Data

Retrieve energy usage data: Once you have access to the energy monitoring system, navigate to the appropriate interface or dashboard. Look for options or tools that allow you to retrieve energy usage data. This may involve selecting specific time periods, choosing relevant parameters, or specifying the manufacturing site you are interested in.

Site Utility Data																					
																				Scope 2 Factor	Scope 1 Factor
																				0.450209074	0.18610616
MonthNumber	Production Units (total units/month)	Production Hours (total hours/month)	Electricity (Mwh)	Electricity (USD)	Electricity (USD/MWh)	Natural Gas (Mcf)	Natural Gas (MWh)	Natural Gas (USD)	Natural Gas (USD/MWh)	Water (M3)	Water (USD)	Water (USD/M3)	CDD (F)	HDD (F)	Electricity (MWh)/Unit	Natural Gas (MWh)/Unit	Water (M3)/Unit	MT CO2e - Electricity	MT CO2e - Natural Gas
Jan-23					$ -		-		$ -			$ -	-	-	-	-	-	-	-
Feb-23					$ -		-		$ -			$ -	-	-	-	-	-	-	-
Mar-23					$ -		-		$ -			$ -	-	-	-	-	-	-	-
Apr-23					$ -		-		$ -			$ -	-	-	-	-	-	-	-
May-23					$ -		-		$ -			$ -	-	-	-	-	-	-	-
Jun-23					$ -		-		$ -			$ -	-	-	-	-	-	-	-
Jul-23					$ -		-		$ -			$ -	-	-	-	-	-	-	-
Aug-23					$ -		-		$ -			$ -	-	-	-	-	-	-	-
Sep-23					$ -		-		$ -			$ -	-	-	-	-	-	-	-
Oct-23					$ -		-		$ -			$ -	-	-	-	-	-	-	-
Nov-23					$ -		-		$ -			$ -	-	-	-	-	-	-	-
Dec-23					$ -		-		$ -			$ -	-	-	-	-	-	-	-

Summary & Cost						
	12 Month Total	Unit	Cost	Unit	Intensity	Unit
Production	-	Count/yr				
	-	Hours/yr				
	-	Hours/month (avg)				
Electricity	-	MWhr/yr	$ -	$/Mwh	-	Mwhr/unit
Natural Gas	-	MWhr/yr	$ -	$/Mwh	-	Mwhr/unit
Water	-	M3/yr	$ -	$/M3	-	M3/unit

This is monthly usage, so savings reflected is just an estimate. GM is providing this tool to help its suppliers identify potential energy and cost savings. These potential saving are estimates only, and can fluctuate based on energy prices and other factors. By sharing this tool, GM does not assume any liability for any particular energy or cost saving estimates. By using this tool, supplier assumes all liability for the information put into the tool, and for any energy or cost savings estimated by the tool.

Water Balance

Water balance for a facility refers to the overall assessment and management of water usage within the facility. It involves tracking and analyzing the inflow and outflow of water, including water sources, consumption, recycling, and discharge. The goal of water balance is to ensure efficient and sustainable water management by minimizing water waste, optimizing water use, and maintaining water quality.

Site Water Data

		Supply/Input Water (M3)		Process Water (M3)								Water Reuse (M3)		Balance (M3)			
Month	Production Units	City	Surface & Ground	Sanitation	Swamp Cooler	Boiler	Cooling Tower	WWTP	Humidification	Fire Protection	*Insert Other*	Stormwater	WWTP	Process Usage	Water Supply	Reuse	Variance
Jan-23	0	0	0											-	-	-	
Feb-23	0	0	0											-	-	-	
Mar-23	0	0	0											-	-	-	
Apr-23	0	0	0											-	-	-	
May-23	0	0	0											-	-	-	
Jun-23	0	0	0											-	-	-	
Jul-23	0	0	0											-	-	-	
Aug-23	0	0	0											-	-	-	
Sep-23	0	0	0											-	-	-	
Oct-23	0	0	0											-	-	-	
Nov-23	0	0	0											-	-	-	
Dec-23	0	0	0											-	-	-	
													Total	0	0	0	

This activity is not needed for the Treasure Maps Process to proceed. It has been added as a best practice to map your energy usages to identify areas of largest opportunities. Water is a great place to start this activity and then should be replicated for electricity within your facility.

Virtual Energy

Visuals on how temperature and your region impacts your energy usage. This can be used as targeted months to change facility habits toward more efficient practices.

Data Analysis

Fuel

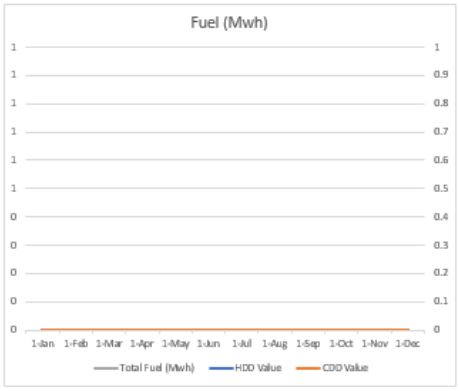
Month	CDD or HDD	Value	CDD Value	Production	Total Fuel (Mwh)
19-Sep	CDD	0	0	0	0
19-Oct	HDD	0	0	0	0
19-Nov	HDD	0	0	0	0
19-Dec	HDD	0	0	0	0
20-Jan	HDD	0	0	0	0
20-Feb	HDD	0	0	0	0
20-Mar	HDD	0	0	0	0
20-Apr	CDD	0	0	0	0
20-May	CDD	0	0	0	0
20-Jun	CDD	0	0	0	0
20-Jul	CDD	0	0	0	0
20-Aug	CDD	0	0	0	0

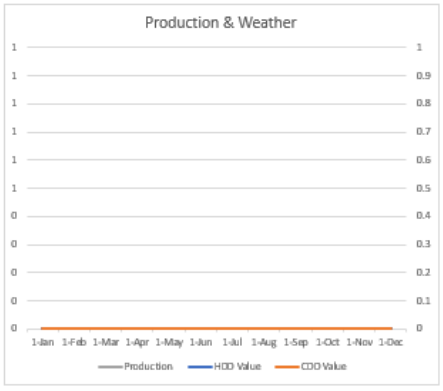
Electricity

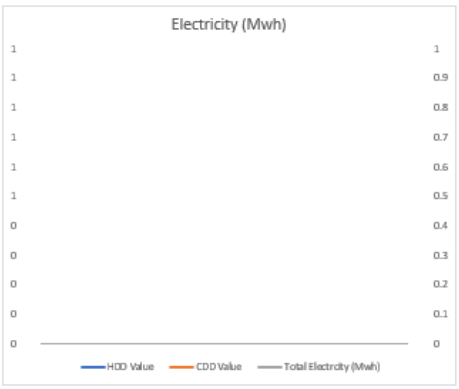
Month	CDD or HDD	Value	CDD Value	Production	Total Electricity
19-Sep	CDD	0	0	0	0
19-Oct	HDD	0	0	0	0
19-Nov	HDD	0	0	0	0
19-Dec	HDD	0	0	0	0
20-Jan	HDD	0	0	0	0
20-Feb	HDD	0	0	0	0
20-Mar	HDD	0	0	0	0
20-Apr	CDD	0	0	0	0
20-May	CDD	0	0	0	0
20-Jun	CDD	0	0	0	0
20-Jul	CDD	0	0	0	0
20-Aug	CDD	0	0	0	0

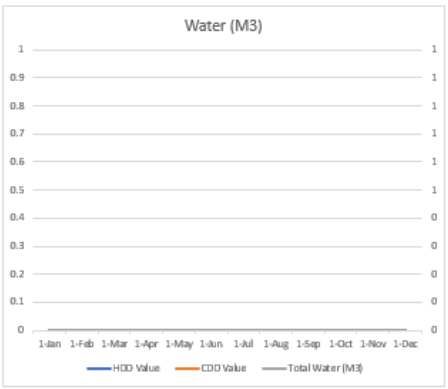
Water

Month	CDD or HDD	Value	CDD Value	Production	Total Water (M3)
19-Sep	CDD	0	0	0	0
19-Oct	HDD	0	0	0	0
19-Nov	HDD	0	0	0	0
19-Dec	HDD	0	0	0	0
20-Jan	HDD	0	0	0	0
20-Feb	HDD	0	0	0	0
20-Mar	HDD	0	0	0	0
20-Apr	CDD	0	0	0	0
20-May	CDD	0	0	0	0
20-Jun	CDD	0	0	0	0
20-Jul	CDD	0	0	0	0
20-Aug	CDD	0	0	0	0









Treasure Map Summary

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Project Summary

Treasure Map Summary is a summary of all projects that were worked with in a single facility. This is a great place to prioritize project implementation post evaluation. Once cost and savings are established payback periods guide you to top opportunities that should be targeted first.

Ref. No.	Title	Current State	Future State	Equipment	Energy Source	Total Cost (USD)	Total Savings (USD)	Payback (Years	lectricity Savings (MWh	Water (M3)	Propane/Methane (MWh)	Scope 2 Emissions Saved (Mt CO2e)	Scope 1 Emissions Saved (Mt CO2e)
1.1	Andon	Andon screens on 24/7	Tv monitors and Desk top computer - sleep mode during none production	Production Screen	Electricity	$ -	$ -	-	-			-	-
2.1	Building Envelope Leaks	Door leaks or Dock doors left open during idle truck loading	Fixed leaks and close doors when Trailer is not being processed	Doors	Electricity & Gas	$ -	$ -	-	-		-	-	-
3.1	Compressed Air Pressure Reduction	Current PSI	Reduction in Psi (full system or by decoupling heavy loaded items)	Compressed Air	Electricity		$ -	-	-			-	-
3.2	Compressed Air Leaks	Air leaks are > 20% in a system	Reduce air leaks to world class 20%	Compressed Air	Electricity	$ -	$ -	-	-			-	-
4.1	Energy Star - Vending Machines	Vending Machine (older models) non-Energy Star	Request and change out dated vending machines to "Energy Star"	Vending	Electricity	$ -	$ -	-	-			-	-
4.2	Energy Star - Water Cooler	Water Cooler (older models) non-Energy Star	Request and change out dated water cooler to "Energy Star"	Water Cooler	Electricity	$ -	$ -	-	-			-	-
4.3	Energy Star - Refrigerator	Refrigerator (older models) non-Energy Star	Request and change out dated refrigerator to "Energy Star"	Refrigerator	Electricity	$ -	$ -	-	-			-	-
4.4	Energy Star - Coffee Maker	Coffee Maker (older models) non-Energy Star	Request and change out dated coffee maker to "Energy Star"	Coffee Maker	Electricity	$ -	$ -	-	-			-	-
5.1	Fans	No Timer switch	Timing switch installed	Fans	Electricity	$ -	$ -	-	-			-	-
6.1	Groove Belts	Straight belts	Grooved belts	Motors	Electricity	$ -	$ -	-	-			-	-
7.1	HVAC Set back thermostats (CDD)	Current Thermostat temperature	Reduce thermostat temperate by Delta x°	Heating/Cooling	Electricity & Gas		$ -	-			-	-	-
8.1	LED Lighting	Fluorescent lights	LED lights	Lighting	Electricity	$ -	$ -	-	-			-	-
9.1	Lighting Lux	Current light candle	Reduction in candle light lumin on any fixtures that can support	Lighting	Electricity	$ -	$ -	-	-			-	-
10.1	Occupancy Sensors in Office Stations (Power Strips)	Office cubicles have devices on throughout the day	Devices in office spaces turn off when team member is not present	Multi-equip	Electricity	$ -	$ -	-	-			-	-
10.2	Occupancy Sensors in Workstation Cubicles (Power Strips)	Workstations are always on during production hours	Items in work areas turn off when operator is not present	Multi-equip	Electricity	$ -	$ -	-	-			-	-
11.1	Machine Sleep	Machine continuously runs in-between cycles	Items are slept or reduced during inactivity in between cycles	Machinery	Electricity	$ -	$ -	-	-			-	-
12.1	Panel Coolers	Current temperature under 35° C or 95° F	Temp set at 35°C/95°F	Panel Coolers	Electricity		$ -	-	-			-	-
13.1	VFDs Pumps and Fans	Motors run at 100% when ever in use	Variable Frequency Drive added to reduce speed during times it is not needed	Motors	Electricity	$ -	$ -	-	-			-	-
14.1	Air cooled Ice machines	Water cooled Ice Machine	Air Cooled Ice Machine	Ice Machine	Water	$ -	$ -	-		-		-	-
15.1	Water dripping calculations - (i.e. facets, spickets, piping)	water leaking (dripping water)	Eliminate leaks	Water systems	Water	$ -	$ -	-		-		-	-

Grand Total Cost (USD)	Grand Total Savings (USD) Per Year	Total Payback Period (Years)	Grand Total Electricity Savings (Mwh) Per Year	Grand Total Water Savings (M3) Per Year	Grand Total Methane/Propane (Mwh) Per Year	Grand Total Scope 2 Emissions Saved (Mt CO2e) Per Year	Grand Total Scope 1 Emissions Saved (Mt CO2e) Per Year
$0	$0		-	-	-	-	-

This is an overall summary of all projects combined. Great way to show impact energy efficiencies can have on a facility once implemented.

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Building Envelope

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Electricity and Natural Gas

Building Envelope

The exterior components of a building including:

- Roofs
- Doors
- Windows
- Walls
- Insulation

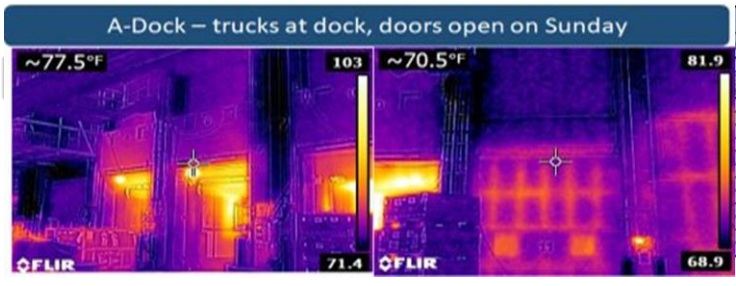
Impacts

Playing a crucial role in the energy efficiency of a building and directly impacting energy costs.

- Minimize Heat Transfer
- Control Air Leakage
- Optimize Solar Heat Gain
- Regulate Thermal Mass

Using The Tool

1. Determine building envelope leaks – Location and size.
   - Trailers in dock doors radiate temp into facility.
2. Determine temperature delta – Thermal cameras help.
3. Use this data against CDD and HDD data to determine how many days electricity and natural gas is used.
4. Calculate potential savings and create repair schedule.



Compressed Air

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Electricity

Pressure Reduction

Producing compressed air at lower pressure reduces the amount of work your compressors need to do per CFM of air supplied.

The industry rule of thumb is 1% energy savings for every 2 PSI reduction in pressure.

PSI Reduction Impacts

- Energy Savings
- Improved System Performance
- Improved Leak Reduction
- Potentially Extended Equipment Lifespan
- Environmental Impacts
- Safety and Noise Reduction

Using The Tool

1. The key to determining if a pressure reduction is possible is to know what pressure your equipment requires, and make sure your longest run is satisfied for flow and pressure.
2. Mapping Pressure needed and receiving to identify potential reductions. Input compressor size and PSI reductions to calculate potential energy savings.

Section 3.1 - Pressure Reduction

Equipment	Hp	Production Hrs/Yr	PSI Reduction	Cfm	Percent Factor	% system reduction	Cfm Reduced	HP Reduced	MWh Saved	Yearly Savings
				-	1%		-	-	-	$ -
				-	1%		-	-	-	$ -
				-	1%		-	-	-	$ -
				-	1%		-	-	-	$ -
				-	1%		-	-	-	$ -
				-	1%		-	-	-	$ -
				-	1%		-	-	-	$ -
								Total Yearly Savings		$ -

Compressed Air

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general motors

Electricity

Leak Reduction

A facility compressed air leak rate below 20% would be considered 'world class'. A total system leak rate of 30% is common.

Leak Reduction Impacts

- Energy Savings
- Improved System Performance
- Potentially Extended Equipment Lifespan
- Environmental Impacts
- Safety and Noise Reduction

Using The Tool

1. to determine leak rate, look at compressed air flow (CFM) during a complete production shutdown.
2. CFM during shutdown, divided by your typical full production CFM rate will be your % leak rate.
3. Input compressor size and current leak rate percentage to calculate potential energy savings if world class 20% leak rate were to be achieved.

Section 3.2 - Leak Reduction

Equipment Name	Hp	Production Hrs/Yr	Current leak Rate %	Cfm	World class leak rate	Leak Reduction potential	Cfm Reduced	Hp Reduced	MWh Saved	Yearly savings
				-	20%	-20%	-	-	-	$ -
				-	20%	-20%	-	-	-	$ -
				-	20%	-20%	-	-	-	$ -
				-	20%	-20%	-	-	-	$ -
				-	20%	-20%	-	-	-	$ -
				-	20%	-20%	-	-	-	$ -
				-	20%	-20%	-	-	-	$ -
								Total Yearly Savings		$ -

Energy Star Appliances

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Electricity

Energy Star

An ENERGY STAR appliance is a product that has been certified by the U.S. Environmental Protection Agency (EPA) as meeting or exceeding strict energy efficiency guidelines.

- Vending Machines
- Refrigerators
- Water Coolers
- Coffee Makers

Impacts

- Energy Savings
- Environmental Impacts
- Builds Sustainability Corporate Culture
- Vending Contracts for Equipment

Using The Tool

1. Identify appliances in facility that are not Energy Star Certified.
2. Input quantity of each appliance current kWh use per day.
3. Identify potential savings and develop replacement schedule – Appliance failure plan of replacement.

Reference			
Quantity of refrigerated machines	Old Vending Machine kWh/day	EPA Energy Star Vending Machine kWh/day	Savings Daily
	7	5.00	0.00
		Savings (MWh)	-
		Savings (USD)	$ -

Replace with Cook/Cold Water Cooler			
Quantity of Water Coolers	Old Water Cooler kWh/day	EPA Energy Star Cook/Cold Water Cooler kWh/day	Savings Daily
		0.13	0.00
		Savings (MWh)	-
		Savings (USD)	$ -

Quantity of Refrigerators	Old Refrigerator kWh/day	EPA Energy Star Refrigerator kWh/day	Savings Daily
		1.37	0.00
		Savings (MWh)	-
		Savings (USD)	$ -

Quantity of Coffee Makers	Old Coffee Maker Brewing Wattage	Hours Used Per Day	Old Coffee Maker Idle Wattage	Idle Used Per Day	Old Coffee Maker kWh/day	EPA Energy Star Coffee Maker Brewing kWh/day	EPA Energy Star Coffee Maker Idle kWh/day	EPA Energy Star Coffee Maker Total kWh/day	Savings Daily
				24.00	0.00	0.00	0.01	0.01	0.00
								Savings (MWh)	-
								Savings (USD)	$ -

Fans

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Electricity

Fan Timer Switches

This measure is most prudent for locations where personnel are not disciplined about manually turning off their fans at breaks or at the end of production shifts

Impacts

- Energy Savings
- Improved Air Quality
- Potentially Extended Equipment Lifespan
- Temperature Regulation
- Increased Safety and Noise Reduction

Using The Tool

1. Determine if users are good about turning off fans in work area, even good habits can be inconsistent.
2. Identify number of fans in facility that could benefit from timer switch (Group fans by Kw usage).
3. Determine how many hours fan can run when not needed and number of days a year they are used.
4. Identify potential fan electricity savings with timer switch.

Section 5.1 - Pedestal Fans Timing Sensor

Number of Fans	Kw	Hrs/Day off	Days/Year	Fan running hours	Cost per Fan Timer Installed (USD)	Total Cost (USD)	Yearly Savings MWh	Yearly Savings (USD)
				-	$ 63.20	$ -	-	$ -
				-	$ 63.20	$ -	-	$ -
				-	$ 63.20	$ -	-	$ -
				-	$ 63.20	$ -	-	$ -
					Total Yearly Savings		-	$ -
					Total Cost	$ -		

Groove Belts

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Electricity

Groove Belts

The V-shaped design of groove belts allows them to fit securely into the grooves of the pulleys, ensuring efficient power transfer and preventing slippage.

Impacts

- Energy Savings
- Potentially Extended Equipment Lifespan
- Increased Safety and Noise Reduction

It is important to get specific design and dimensions to ensure performance and longevity

Using The Tool

1. This item can should be best pursued with regular PM work.
2. Identify equipment make, model and horsepower.
3. Input horsepower and production hours in tool to identify potential savings.
4. Purchase appropriate Groove belt replacement equipment
    - Note cheaper belts tend to slip causing increase wear and energy costs.

HorsePower HP	Quantity	kW	Production Hrs/Year	MWh	2% Percent Factor	Yearly Savings (MWh)	Yearly Savings (USD)
25		*18.65*	7000	-	*2%*	-	$ -
50		*37.30*	7000	-	*2%*	-	$ -
75		*55.95*	7000	-	*2%*	-	$ -
100		*74.60*	7000	-	*2%*	-	$ -
				Total Yearly Savings		-	$ -

HVAC Temperature Setback

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Natural Gas

HVAC Temperature Setback

You can save as much as 10% a year on heating and cooling by simply turning your thermostat back 7°-10° F of 8 hours a day from the normal setting. The percentage of savings from setback is greater for buildings in milder climates than those in severe climates.

Impacts

- Energy Savings – Natural Gas
- Cost Reduction
- Potentially Extended Equipment Lifespan
- Environmental Impacts
- Schedule – Employee Comfort

Using The Tool

1. Identity HVAC unity within facility .
2. Identify current facility HVAC temperature settings and current production schedule.
3. Determine average heating degree days in cooling degree days.
4. Input data in tool adjusting temperature setting and hours run per day to calculate potential savings.

Cfm	Temp In °F	Temp Out (Avg of HDD °F)	Heating Degree days (HDD)	Run Hours per day	Delta T (°F)	Btu/ Hr	MWh/Hr	MWh per year	Yealy Savings (USD)
1500	72	30	60		42	68,040	0.02	-	$ -
					-	-	-	-	$ -
						Total Yearly Savings		-	$ -

Lighting LED

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Electricity

Lighting LED

LEDs will often use one third, to a quarter of the power. Depending on the application, the addition of occupancy sensor or daylight harvesting controls can reduce fixture run-time hours by 30% - providing additional savings.

Impacts

- Energy Savings – Electricity
- Cost Reduction
- Potentially Extended Equipment Lifespan
- Environmental Impacts
- Improve lighting control

Using The Tool

1. Identify current fixtures and watts not utilizing in the tool.
2. Note location and amount of similar fixtures.
3. Input current fixture data in the existing lighting table in tool.
4. Input replacement fixture data in the replacement LED lighting table in tool.
5. Review potential savings data and payback period to develop a replacement schedule against budget.

Existing Lighting

Equipment	Location	Fixture Quantity	Lamps per Fixture	Watts per Fixture	Watts per luminaire	Production Hrs/Yr	Yearly MWh	Yearly cost (USD)
Current Lamps					-		-	$ -
					-		-	$ -
					-		-	$ -
					-		-	$ -
					-		-	$ -
						Total	-	$ -

Replacement LED Lighting

Equipment	Location	Fixture Quantity	Lamps per Fixture	Watts per Fixture	Watts per luminaire	Production Hrs/Yr	Yearly MWh	Yearly cost (USD)
Future LED Lamps					-		-	$ -
					-		-	$ -
					-		-	$ -
					-		-	$ -
					-		-	$ -
						Total	-	$ -

Delamping

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Delamping

Delamping refers to the process of removing or reducing the number of lamps or light fixtures in each space. It involves intentionally reducing the lighting levels by removing unnecessary or excessive lighting fixtures.

Impacts

- Energy Savings – Electricity
- Cost Reduction
- Potentially Extended Equipment Lifespan
- Environmental Impacts
- Improve lighting control

Using The Tool

1. Identify areas that may be over lit – refer to industry standards.
    - Quality checks need high intensity than shop floor.
2. Note location/Area and number of fixtures.
3. Input current fixture data that light intensity could be lowered by delamping.
4. Review potential savings data and schedule maintenance.
    - Evaluate after delamping to ensure caving or dark shadow areas have not been created.

Name of Area	Number of fixtures	Lamps/fixture	Wattage/lamp	Proposed lamps/fixture	Operating Hrs/Year	Lighting kW	MWh/Year	Total Cost (USD)
Example: Loading dock	*200.00*	*4*	*28.00*	*2*	*6000*	*11.20*	*67.20*	*0.00*
						-	-	$ -
						-	-	$ -
						-	-	$ -
						-	-	$ -
						-	-	$ -
					Total Yearly Savings	-	-	$ -

Occupancy Sensors

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Occupancy Sensors Power Strips

Occupancy sensors detect the absence of movement and can automatically turn off or reduce the operation of the controlled devices.

Impacts

- Energy Savings – Electricity
- Cost Reduction
- Potentially Extended Equipment Lifespan
- Environmental Impacts
- Improve safety and security

Using The Tool

1. Identify areas that can be impacted with occupancy sensors.
    - Workstations on shop floor and office areas.
2. Determine equipment that is left active during non-use hours.
3. Input equipment data and run time that could be eliminated.
4. Review potential savings data and determine if an occupancy sensor power strip could be installed.

Equipment	Watts of Equipment	Number of Pieces of Equipment	Days Running per Yr	Hours Running Current	Hours Running Future	MWh Per Year Current Usage	MWh Per Year Future Usage	Annual Savings MWh	Total Yearly Savings (USD)
PC						-	-	-	$ -
Monitor						-	-	-	$ -
Desk Lamp						-	-	-	$ -
Fan						-	-	-	$ -
Heater						-	-	-	$ -
						-	-	-	$ -
						-	-	-	$ -
						-	-	-	$ -
							Totals	-	$ -

Machine Sleep

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Machine Sleep

Machine sleep is taking advantage of time not running due to part check and break activities.

Look at opportunities to use equipment logic to add sleep when machine is not needed.

Impacts

- Energy Savings – Electricity
- Cost Reduction
- Potentially Extended Equipment Lifespan
- Environmental Impacts
- New Equipment Purchase Thought Process

Using The Tool

1. Identify equipment that has cycle times that have dwell activities such as quality part check.
2. Look at items that don't need to run during dwell time activities (i.e.. Lights, fans, LED screen . . .).
    - Ensure any hydraulics stay running.
3. Note location, machine type/load, and number of machines.
4. Input data in tool for estimated savings turning off items not needed during dwell times.

Equipment	Quantity of Equipment	Equipment Load kW	Production Hours/Yr	Product cycle time (Min)	Equipment Cycle time (Min)	Time savings (Min)	Energy savings per machine (MWh per year)	Total Machine set Yearly Savings (MWh)	Yearly Savings (USD)
CNC Machine						-	-	-	$ -
						-	-	-	$ -
						-	-	-	$ -
						-	-	-	$ -
							Total Yearly Savings	-	$ -

Panel Coolers

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Panel Cooler

Ideal Panel temperature is 35°C or 95°F.

Sometimes panel coolers are maintained at a lower setpoint than is required by the equipment. Be sure to check the equipment cooling requirements before raising setpoints.

Impacts

- Energy Savings – Electricity
- Cost Reduction
- Environmental Impacts
- No Cost Energy Efficiency Change
- Reduction In Condensation

Using The Tool

1. Identify equipment that utilizes panel coolers.
   - Note equipment and current panel cooler setting.
2. Identify equipment that is appropriate to increase panel cooler temperature by type and quantity.
3. Input data in tool and review potential savings.
4. Adjust appropriate equipment.

# Panel Coolers	BTU's/Hr	Hrs/ Year	Original SP (°F)	Revised SP (°F)	MWh	Difference (For 1% improvement)	Yearly Savings (MWh)	Yearly Savings (USD)
	8000			95	-	95%	-	$ -
	12000			95	-	95%	-	$ -
				95	-	95%	-	$ -
				95	-	95%	-	$ -
					Total yearly savings		-	$ -

VFDs

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Electricity

Variable Frequency Drives - VFDs

A VFD works by converting the incoming fixed-frequency AC power supply into a variable-frequency output that can be adjusted to control the speed of the motor.

- Pumps
- Fans
- Compressors
- Conveyors

Impacts

- Energy Savings – Electricity
- Cost Reduction
- Potentially Extended Equipment Lifespan
- Environmental Impacts
- Soft Start and Stop
- Improve Power Factor

Using The Tool

1. Identify equipment (pumps, fans, compressors, conveyors) currently running without VFDs in facility.
2. Gather current equipment data and input into tool (load Factor %, Mother Efficiency %, and current Motor Hz).
3. Input proposed motor Hz with adding VFD.
4. Review potential savings and cost to retro fit current equipment.
    - If retrofit is not an option, consider VFD when replacement is needed.

					Currnet conditions			Proposed			Electric savings	
Equipment	Hp	Production Hrs/Yr	Load Factor %	Motor Efficiency %	Motor Hz	Demand kW	Consumption kWh/Yr	Motor Hz	Demand kW	Consumption kWh/Yr	Yearly MWh Savings	Yearly Savings (USD)
												$ -
												$ -
												$ -
									Total savings		-	$ -

Ice Machines

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Water

Ice Machine Air Cooler vs. Water Cooled

An air-cooled ice machine typically offers significant water savings compared to a water-cooled ice machine.

Impacts

- Energy Savings – Water
- Environmental Impacts
- Reduction in Water Discharge

Using The Tool

1. Identify the number of ice machine in your facility that is water cooled.
    - The end of the serial number will have an A indicating it is air cooled.
2. Identify the number of employees using each ice machine.
3. Calculate the current water usage (average is 100-200 gallons of water per 100 lbs. of ice produced.
4. Input data in tool and review potential water savings.

Quantity of Refrigerated Machines	# of Employees Using Ice Machines	Old Water Cooled Ice Machine Water Usage (Gal)	Ice Produced per Day (in 100 Gallons)	Air Cooled Ice Machine Water Usage (Gal)	Savings Daily (Gal)	Savings Yearly (Gal)
			-	20	-	-
				Savings (M3)	-	-
				Savings (USD)	$ -	$ -

Water Leaks

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Water

Water Leaks

Calculate the diameter of the orifice (inches) and the pressure in the pipe. Use those values in the chart below to calculate the rate & cost of the leak.

Impacts

- Energy Savings – Water
- Cost Savings
- Potentially Extended Equipment Lifespan
- Environmental Impacts

Using The Tool

1. Identify water leaks in facility.
    - Examples outside faucets, restroom sinks.
2. Determine the pressure and orifice size.
3. Input number of similar leak pressure and orifice size into tool.
4. Review potential savings and schedule maintenance.

# of Orifices of this Pressure/Size	Pressure in Pipe (PSI)	Diameter of Orifice, in.	Flow GPM	Flow M3/hr	Flow M3/Day	Cost Per Day ($)	Annual Usage (M3)	Annual Cost ($)
	30	1/64	-	-	-	$ -	-	$ -
	30	1/32	-	-	-	$ -	-	$ -
	30	1/16	-	-	-	$ -	-	$ -
	30	1/8	-	-	-	$ -	-	$ -
	100	1	-	-	-	$ -	-	$ -
Total:			-	-	-	$ -	-	$ -

Visuals

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Leadership Presentation

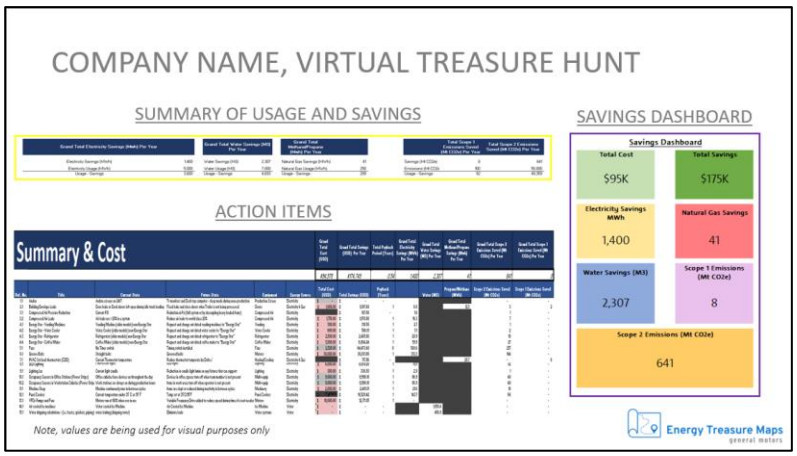
Graphs, Charts, and Values

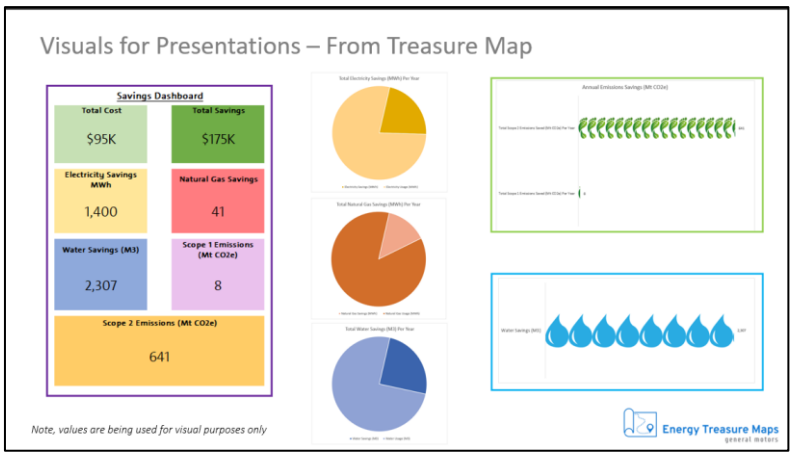
- Visuals are automatically generated based on data that are entered into the treasure map tool.
- Data from the tabs are pulled into the summary and cost portion.
- Graphics are designed to provide an “at a glance” review.

Using The Tool

- Use the “snip” function on your computer to clip visual graphics from the tool to use in presentations.

Sample Slides for Presentations





EPA Treasure Hunt Submission

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Instructions to Submit For EPA Treasure Hunt Recognition

Energy Star is a voluntary program of the U.S. Environmental Protection Agency (EPA) that helps businesses and individuals save money and protect our climate through superior energy efficiency.

Energy Treasure Hunts are one of the many tools that can help you do this.

How to Complete

1. Complete the form within the file.
    - Gray fields (*) indicate requirements.
2. Fill out separate line items for each site you are creating a treasure map for.
3. Email your completed form to treasurehunt@energystar.gov
    - Total attachments may not exceed 100MB in a single email.

Benefits of Completing

- Showcase the importance of energy efficiency and inspire others to make a difference!
- Be featured on the Energy Star Treasure Hunt website in the "What Others Have Done" section.
- Receive a printable certificate noting contribution.

general motors

Thank you!

You have completed the Energy Treasure Map User Guide.

Energy Treasure Maps