

Before we get started...

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Use code: **6223 4122**

What kinds of energy-saving opportunities are you pursuing?



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MARCH 6, 2024

Energy-saving Opportunities in the Mining Sector

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Goldfin Consulting

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Strategic Energy Management Consultant
SYNERGISE



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Today's objective: to help you find opportunities!

1

Identifying energy-saving opportunities

2

Common opportunities in the mining sector

3

Answering your questions

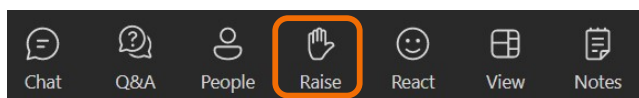
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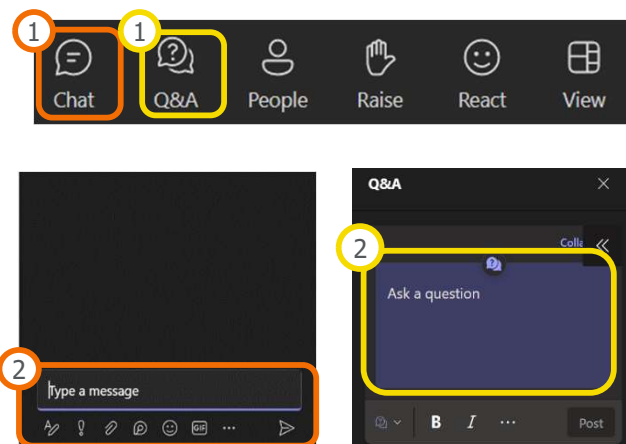
3

Participate in the discussion!

Raise hand or use the chat or Q&A to comment or ask questions.



To lower your hand, press the "Raise" button again.



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Follow along in your workbook

Have the workbook open or printed out

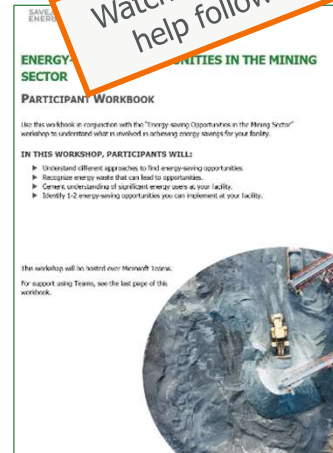
We will be using the Participant Workbook to summarize and reinforce key points and record your key takeaways.

Where to find the workbook:

- In the chat



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Watch for this icon to help follow along

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What do you do to find opportunities?

- 1st | Regularly scheduled energy hunts
- 2nd | Reviewing energy and equipment data
- 3rd | Employee suggestions
- 4th | Energy Audits
- 5th | Vendor Recommendations
- 6th | Other



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Practices to identify opportunities

Data analysis

- Energy baseline models
- Interval data analysis
- Benchmarking

Site investigation

- Energy audit
- Energy hunt
- Discussions with operators

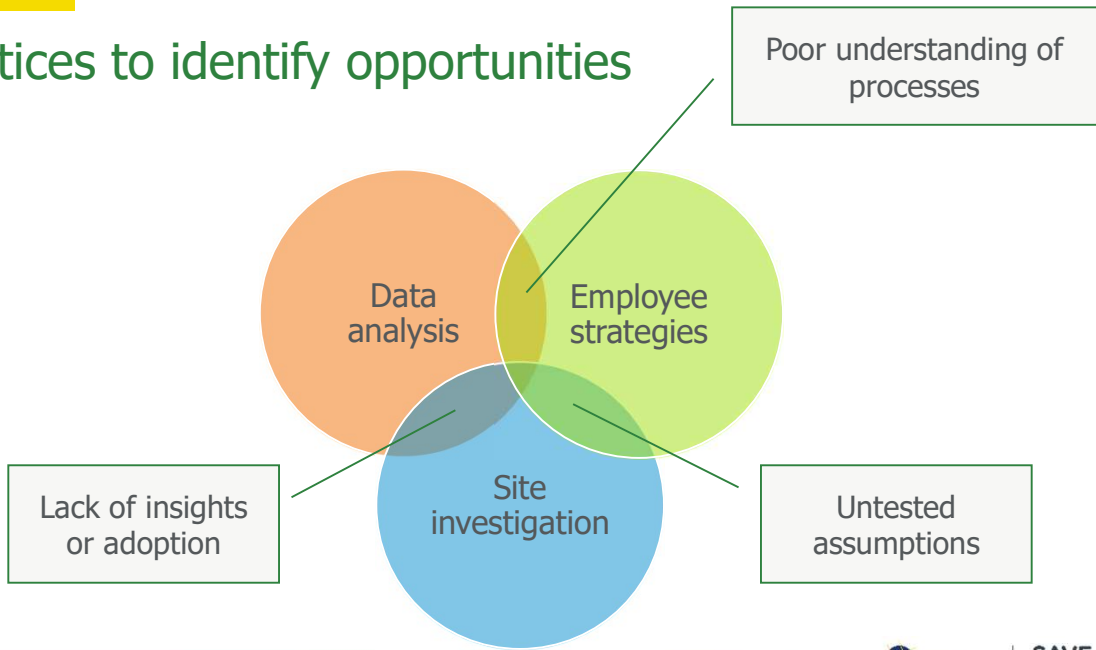
Employee strategies

- Energy training sessions
- Suggestion box
- Reviewing capital plans

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Practices to identify opportunities



How do you find your energy-saving opportunities?



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What strategies do you currently use at your facility and what future strategies you would like to implement?

HOW DO YOU FIND YOUR ENERGY-SAVING OPPORTUNITIES?

The "how" of identifying savings opportunities can be divided into general practices, and specific items.

GENERAL ENERGY OPPORTUNITY IDENTIFICATION PRACTICES

Circle or highlight the general practices you follow, and document practices listed here that you would like to adopt in the near future.

- Energy Audits
- Energy Management Systems
- Energy Benchmarking
- Reviewing Equipment/Energy Data
- Training on Energy Waste
- Suggestion Forms

Document the practices you will adopt in the near future, including those that may not be on the list above.

Nine types of energy waste review



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As we go through this next section, take notes on where this type of waste is likely occurring in your facility.

9 ENERGY WASTES

- Identifying energy wastes within your facility can lead to savings opportunities.
- Take a look at the table below for a few examples:

Type of waste	Examples of Opportunities	Opportunities within Facility
UNNECESSARY RUNNING OR IDLING	<ul style="list-style-type: none"> Equipment and lights on during non-operating periods. Running pumps, conveyors or operating heat treat furnace at full temperature during idle periods. 	
LEAKS	<ul style="list-style-type: none"> Compressed air leaks, uninsulated steam pipes, water valve leaks, broken duct work 	
FRICTION LOSS	<ul style="list-style-type: none"> Clogged filters, obstructed blower discharge, restricted flow due to damper settings, dirty heat and cold transfer services. 	
SUB-OPTIMAL EFFICIENCY	<ul style="list-style-type: none"> Replace existing equipment with higher efficiency models. Ensure proper installation of equipment and set to run at peak efficiency. 	
MALFUNCTIONS	<ul style="list-style-type: none"> Broken or stuck actuators, valves and switches. Malfunction/broken equipment. Bearing fixture. Broken or uncalibrated sensors and gauges. 	



Nine types of energy waste



Unnecessary running or idling



Leaks



Friction loss



Sub-optimal efficiency



Malfunctions



System imbalance



Misapplication



Underutilization



Traditional lean waste



Energy waste examples



Leaks

leaks in wash water systems, compressed air



Malfunctions

broken dampers or belts



Underutilization

crusher running at part load

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Energy waste examples



System imbalance

poor sequencing or controls on parallel pumps



Sub-optimal efficiency

old, inefficient motors



Misapplication

using compressed air for cleaning or personal cooling

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Energy waste examples



Friction loss
clogged filters



Traditional lean waste
product waste, running processes below optimal levels, product over-work

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Unnecessary running or idling



Equipment that is running or idling when not required continues to consume energy with no benefit


Examples

- Conveyers are running when no material is loaded
- Ventilation fans running when not required

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Where might unnecessary running be occurring in your site?

Waiting for responses ...




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What are your three largest energy users?

Ventilation Dewatering Transport Crushing Grinding Lighting Compressed Air Other



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Managing your significant energy users (SEUs)



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- Identify SEUs
- Identify variables and people affecting it
- Submeter SEUs
- Establish key performance indicators (KPIs)
- Establish standard operating procedures (SOPs)
- Monitor and pursue corrective action when needed



Image by fanjianhua on Freepik

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Andrew Cooper on potential opportunities



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Take some time to identify energy-saving measures applicable to your facility

NOTES ON ANDREW COOPER'S PRESENTATION

Summarize other topics/issues, whether they are your significant energy users, general practices or specific techniques for finding new opportunities, or new potential energy-saving projects that you learned about today and want to act on in the near future.

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Andrew Cooper on potential opportunities



<https://www.linkedin.com/in/andrewcooperenergy/>

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Underground compressed air



<https://www.flickr.com/photos/readontheroad/2588301556>

What can you see wrong with this picture?

22



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Underground compressed air



Photo from Ingersoll Rand - https://en.wikipedia.org/wiki/File:IngersollRand_R-series-R110.jpg

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Main challenges underground

- Compressor location
- Leaks
- Inappropriate uses



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Grinding



<https://www.flickr.com/photos/codeico/25763627152>

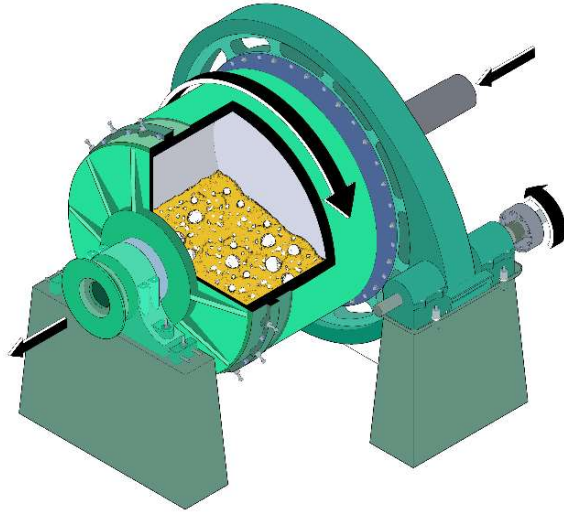
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- Most likely the largest energy consumer
- VERY inefficient



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Grinding circuit



By Rusch, Heather, creator - <https://www.loc.gov/pictures/item/co922.sheet.00021a>, Public Domain, <https://commons.wikimedia.org/w/index.php?curid=83451257>

Variables determine energy consumption:

- Feed rate
- Ore size

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Conveying



<https://www.goodfon.com/miscellanea/wallpaper-mining-conveyor-dust-rocks.html>

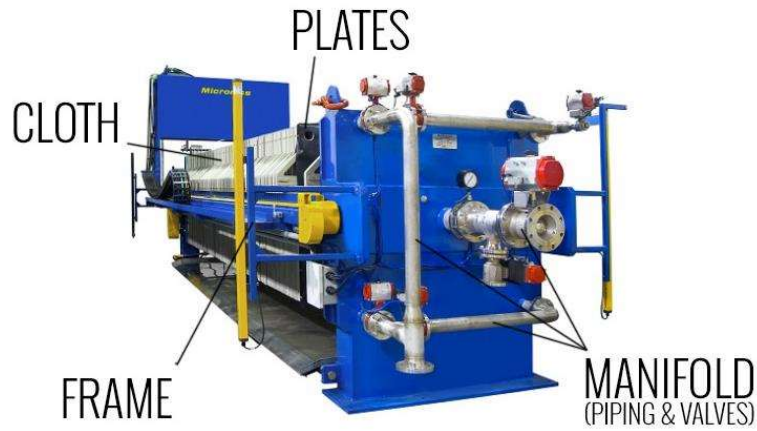
- Shut down when not in use, including belt magnets/tramp metal removal
- Optimize load

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Concentrate filter press systems



- Can be the largest user of compressed air in a mill processing plant.
- Opportunity lies in the control of the compressed air to the press.

<https://www.micronicsinc.com/filtration-news/filter-press-information/>

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Flotation cell – agitator speed



https://upload.wikimedia.org/wikipedia/commons/d/d0/Flotation_cell.jpg



https://mb.cision.com/Public/19166/3254415/8ae1c9ee1a77894b_400x400ar.jpg

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Optimize flotation blower performance



<https://airtechnicsolutions.nl/air-technology-home/centrifugal-fans-blowers/>



Author: Heather Smith, <https://commons.wikimedia.org/wiki/File:Butterfly-valve--The-Alloy-Valve-Stockist.JPG>, <https://creativecommons.org/licenses/by/3.0/deed.en>

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Surface vent fan speed controls



<https://www.howden.com/en-gb/industries/mining/mine-ventilation/mine-ventilation-fans>

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Underground ventilation management system



- If you are not using it, turn it off.
- Is the air going where you want it to go?
- Are you making it easy for the air to get where it needs to go?

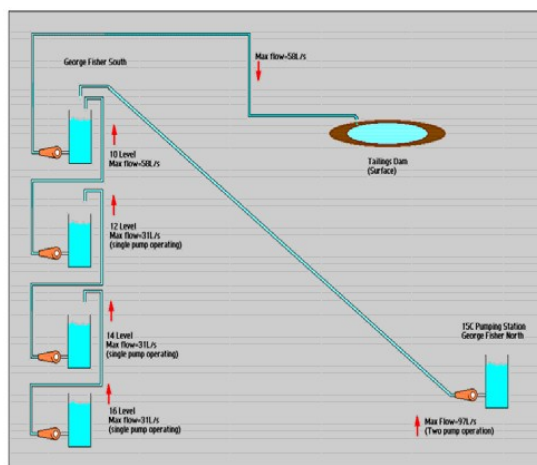
Photo by Ricardo Gomez Angel, https://unsplash.com/photos/red-and-black-truck-in-tunnel-F2lCP_knaj8?utm_content=creditCopyText&utm_medium=referral&utm_source=unsplash

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Underground pumping systems



Rasul, Mohammad & VERMEULEN, P., Improvement Strategies for Mine Dewatering Process. https://www.researchgate.net/publication/241778500_improvement_strategies_for_mine_dewatering_process



Author: Heather Smith, https://commons.wikimedia.org/wiki/File:Stainless_steel_swing_check_valve.jpg, <https://creativecommons.org/licenses/by/3.0/deed.en>

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Employee suggestions



<https://www.flickr.com/photos/jeepersmedia/1416211311>

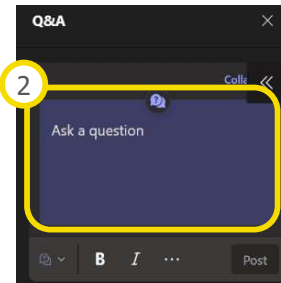
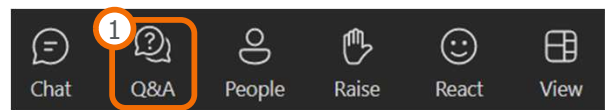
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Q&A with Andrew Cooper

Use the Q&A function to type out your questions.



Feel free to turn on your camera to ask questions as well!

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Energy opportunity implementation



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Note down commitments you will make to improve your energy performance at your facility.

ENERGY OPPORTUNITY IMPLEMENTATION

Make a commitment to 3 actions you will take to improve energy performance at your facility, and list more than 3 if you are inspired to do so.

Action	Timeframe
	Next week

Summarize other items, whether they are your significant energy users, general practices or specific techniques for finding new opportunities, or new potential energy-saving projects that you learned about today and want to act on in the near future.

Save on Energy: Strategic Energy Management Program

Get help improving your organization's energy performance and achieving your sustainability goals.



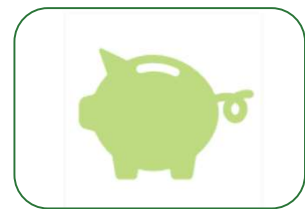
Training



Coaching & Activities



Peer Community



Incentives

Contact sem@ieso.ca for more information

Free expert support available through Save on Energy!



For more information:
trainingandsupport@ieso.ca

Post your questions on the [Energy Manager Learning Platform](#) discussion forum to get advice, coaching, and support on:

- ❑ Establishing or improving **energy management best practices**
- ❑ Identifying and implementing **industrial energy efficiency projects**

Register for the Energy
 Manager Learning Platform
 (emss.goldfin.ca)



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What will you do in the next week to start capturing energy saving opportunities?

Waiting for responses ...

You do not have permission to edit this Menti. ☹

Switch account

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Thank You



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Instagram.com/saveonenergy/