

A blue Volvo semi-truck is driving on a road through a mountainous, forested landscape. The truck is pulling a tanker trailer. The background features tall evergreen trees and rocky mountains under a clear sky.

VOLVO

Energy Awareness & Engagement Final Presentation

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2018 EDF Climate Corps

MS in Environmental & Energy Management

George Washington University

Agenda

- ❑ Introduction
- ❑ Sustainability Background
- ❑ Goals & Objectives
- ❑ Program Overview
- ❑ Implementation
- ❑ Recommended Next Steps
- ❑ Q&A



Introduction

Environmental Defense Fund (EDF)

An U.S. based environmental non-profit working with businesses to find market-based solutions that tackles environmental problems.

Each year, EDF embeds trained graduate students, called the EDF Climate Corps fellows, in organizations to accelerate energy projects over the summer

Volvo-EDF partnership

Since 2011, Volvo has hosted a EDF Climate Corps fellow every year, receiving assistance and recommendations for projects that could save over \$590,000 in annual energy cost

Sustainability Background

As a DOE's Better Plants partner, the Volvo Group North America has pledged to reduce its energy intensity by **25%** or more by **2020**

To achieve this goal, **HAG, LVO and NRV**, the three largest plants in North America (accounts for 85% of energy consumption) have undergone many **capital-intensive** engineering projects that reduced both energy consumption and carbon footprints

With all three facilities achieved the ISO 50001 and SEP, it is time to focus on the **behavioral and operational** aspects of energy saving opportunities

The Benefits of an Energy Awareness and Engagement Program

Volvo

- Reduce Operating Cost
- Increase company profitability & competitiveness
- Improve Employee Retention and reduce hiring costs
- Build Morale, Collaborative Culture
- External Marketing Opportunity

Environmental/Energy Team

- Reduce Energy Use
- Reduce Greenhouse Gas Emissions
- Build Support for Future Energy Conservation Measures
- ISO 50001 Compliance


Employees

- Have Fun
- Build Community
- Build a Sense of Pride of Workplace
- Leadership & Networking Opportunities
- Learning Opportunities to bring home
- Environmental Stewardship

Benefits Continued...

Moreover, an energy awareness and engagement program is:

- Low Investment
- Low Risk
- High Reward
- Heighten Awareness
- Engagement of End Users
 - Close doors during heating/cooling seasons
 - Equipment shut-down



Based on a research conducted by ACEEE, an energy employee engagement program can save 3%-15% in energy cost

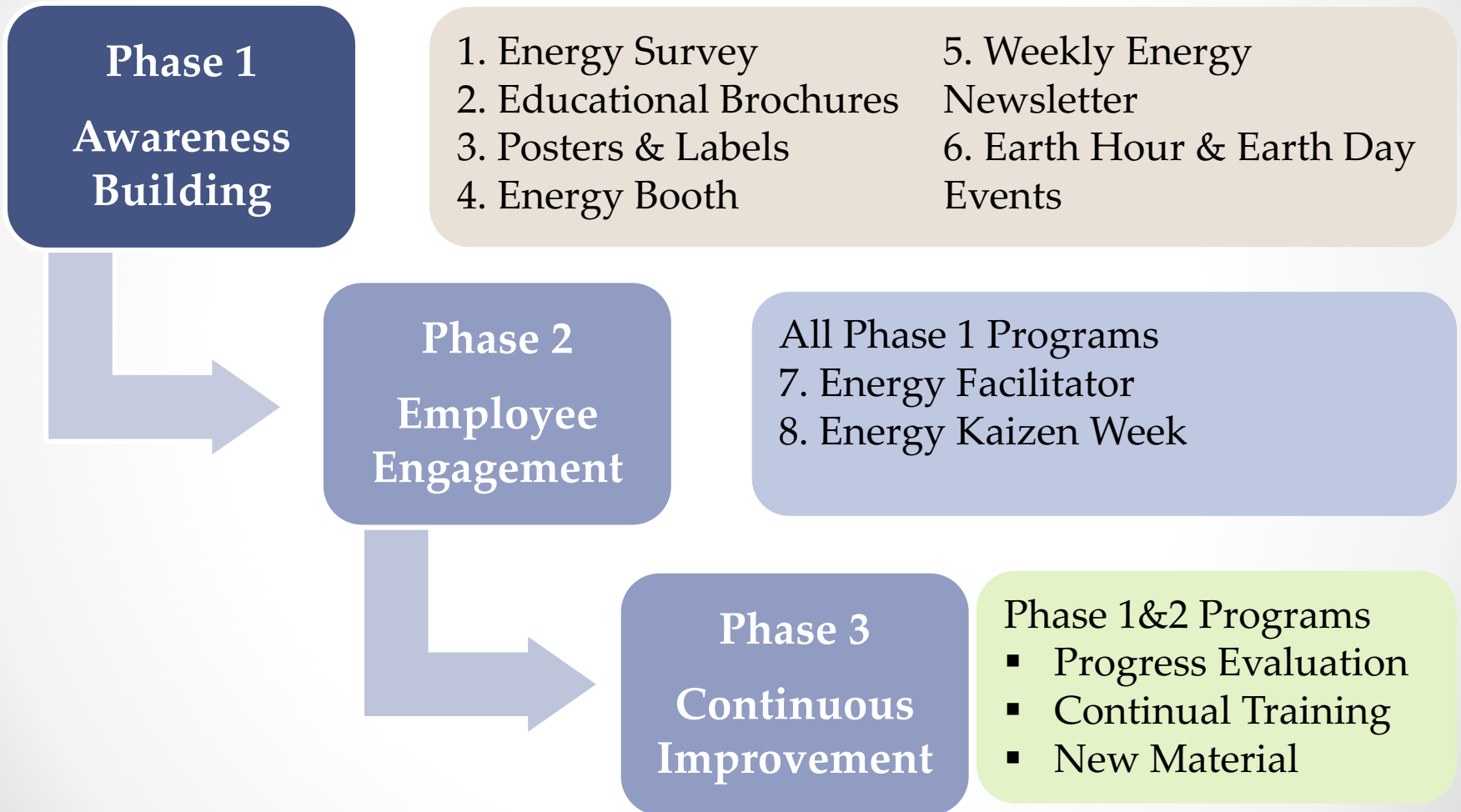
Objectives

- Understand employee's awareness baseline
- Identify areas of improvement that would led to positive behavioral change
- Design tools and programs that are both informative and engaging to Volvo employees
- Develop incentive mechanisms to motive employees
- Identify key personnel to manage, develop and implement the program

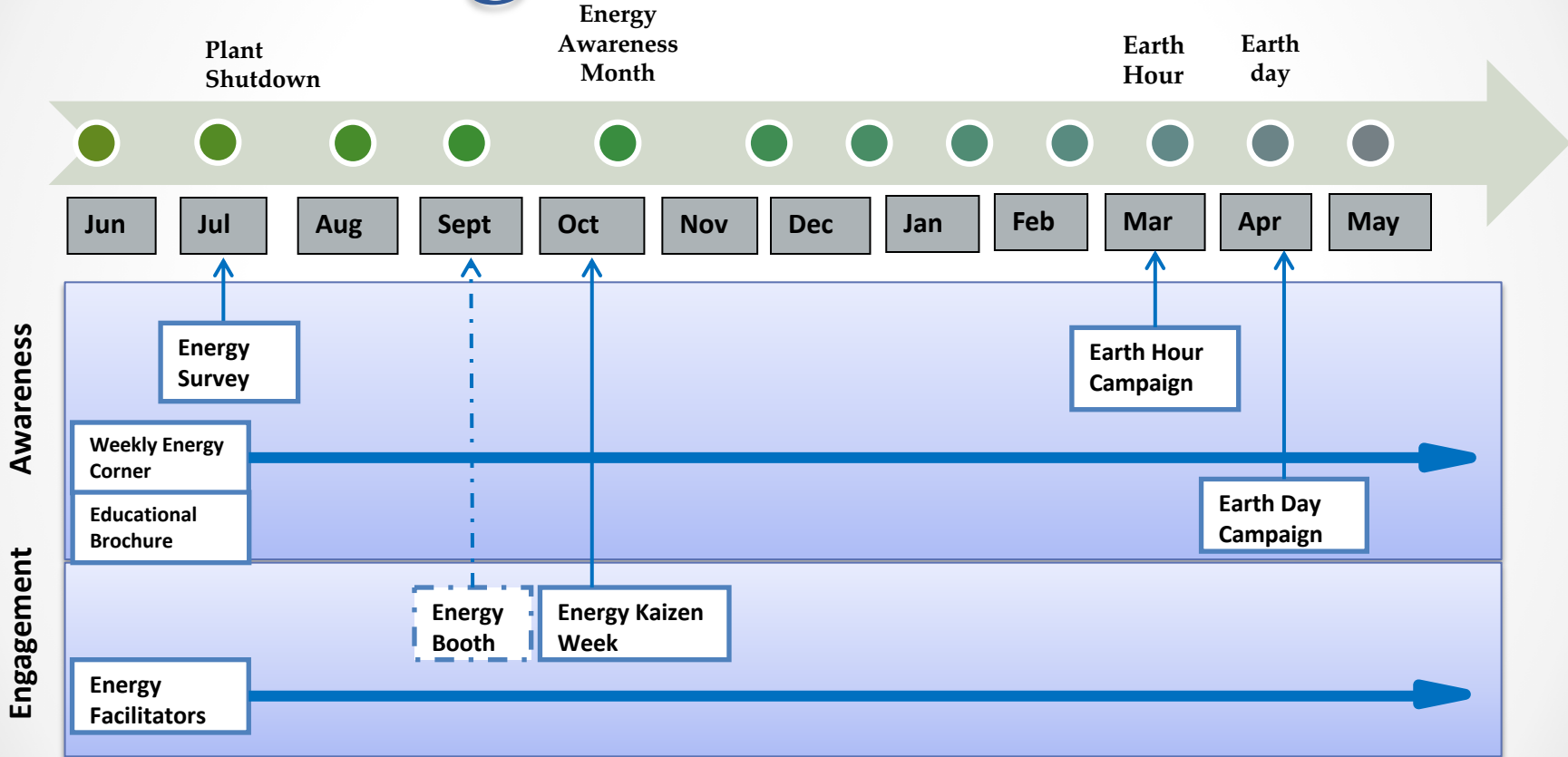
Program Structure

- Timing
 - Continual i.e. Posters and signage
 - Periodic i.e. Energy Awareness Month
- Scope
 - Location: HAG, NRV and LVO, with the possibility to be adapted into other facilities
 - Function: main focus is shop employees, while most program tools would involve office employees as well
 - Interest: Energy, with the possibility to be adapted into environmental, health and safety programs
- Measurement
 - Energy Survey
 - Participation Rate
 - Impact (Financial & Environmental)

Program Roadmap



Program Timeline



Note: it is recommended that Energy booth be hosted once a year at an existing company event, whichever date that is. E.g. HAG Power day.

1. Energy Survey



VOLVO GROUP NORTH AMERICA

ENERGY AWARENESS & ENGAGEMENT

Our Hagerstown plant was recognized as the winner of the Maryland Green Registry award for our exceptional environmental and sustainable business practices. To take our achievements to the next level, Volvo Group North America's Health, Safety and Environmental (HSE) Group, in cooperation with the 2018 EDF Climate Corps, are developing an energy program that can save our Hagerstown Plant up to 15% -- \$825,000 more in energy cost.

Hagerstown employees are invited to participate in an energy conservation survey, and for your time, you will be eligible to win one of 10 prizes allocated to Hagerstown employees.

[CLICK HERE TO PARTICIPATE](#)

or go to www.mentl.com | use code 15091

SURVEY OPEN NOW UNTIL TUESDAY, JULY 24
PRIZE WINNERS ANNOUNCED THURSDAY, JULY 26.



1 LEGO TRUCK

9 BEACH TOWELS



LVO News

Lehigh Valley Operations



A NEWSLETTER FOR EMPLOYEES WITHIN GROUP TRUCKS OPERATIONS, LEHIGH VALLEY OPERATIONS

July 12, 2018 – Week 28.4

DRAFT FOR REVIEW – DO NOT DISTRIBUTE

Energy Program Survey and Prize Raffle

Volvo's Health, Safety and Environmental (HSE) group and the Environmental Defense Fund (EDF) Climate Corps are designing an Energy Program for the Lehigh Valley Operations (LVO), Hagerstown Powertrain (H4C) and New River Valley (NRV) sites, and would like your input! The goal is to design a program that informs and educates employees about energy efficiency and cost savings at our manufacturing sites, while also providing employees with information they can use to save energy and lower energy costs at home.

All survey responses will remain anonymous. The Energy Program team will use findings from the survey in the program's overall design. They have created an employee survey with questions on energy conservation and usage. The survey will provide the Energy Program team with useful data, while also giving employees a chance to voice their opinion – and an opportunity to enter a raffle for prizes from the Mack Shop!

There are no right or wrong answers – we want to hear your opinions. Respondents who completely fill out the survey (on page two of this newsletter) are eligible to enter the raffle. Survey entry forms will also be located next to the drop boxes at the following locations:

LVO: Table In Front of Dispensary, F-7 Break Area, Break Area near MPC Room
MCC Cafeteria
LVLC Main Break Room

One entry per person. Please include your first and last name and phone number so we can contact you if you win. Survey deadline is close of business Tuesday, July 24. Good luck!



First Prize

Grizzly Personal Cooler

Second Prize Mack Igloo Playmate Cooler

Third Prize

Reusable Metal Tumbler

Fourth Prize Reusable Spill-proof Water Bottle

Fifth Prize

Magnetic Metal Flashlight

More %

Surveyed perceptions on energy use, which helped to establish a baseline, and asked for employee inputs about program design

Over **500** employees participated at HAG and LVO, and the survey was scheduled to be distributed in NRV post plant shutdown, around August 13th

Survey Results & Lessons

- The HAG and LVO results shows:
 - ❖ **98%** employees believe energy conservation is important and has a positive attitude towards it
 - ❖ Nearly **half** feels motivated to save energy at work
 - ❖ Employees want to learn about how to save energy at home
 - ❖ **60%** employees think energy saving tips aren't available to them at work
 - ❖ **25%-40%** employees are **not** aware of the site energy team
- Survey distribution via both web & paper copy is the most effective way
- Employees want to learn more but resources are not always easily accessible or available
- HAG employees hope to see more visual displays and educational materials, while LVO employees are more interested in training/workshops, games and contests

3. ENERGY STAR Posters

Saving Energy Saving Jobs

Last year, [Company or Facility Name] spent \$[XXXX] on energy.

Saving just 5% is the same as:


- Selling [XX] more [product]
- A [X]% increase in profits
- Saving [XX] jobs at this facility!

Energy management is good business.

To learn more about what our facility is doing to save energy with EPA's ENERGY STAR® program, contact:

[energy manager]
[contact information]
[insert intranet site]

Company Logo



ENERGY STAR® is a U.S. Environmental Protection Agency backed program helping businesses and individuals protect the environment through superior energy efficiency.

LEARN MORE AT energystar.gov

Be a Star

An ENERGY STAR®

Insert digital photo and name of individual

[Insert Name] saved energy by [insert activity that saved energy]. This saved our facility \$[XXXX] last year alone.

Your actions make a difference.

For more ideas on how you can save with EPA's ENERGY STAR program visit www.energystar.gov/industry or contact:

[energy manager]
[contact information]
[insert intranet site]

Company Logo



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LEARN MORE AT energystar.gov

Free Air? Guess Again.

Compressed air is our most expensive utility!

Company Logo


Top 5 Ways to Save Air

1. Find and fix leaks
2. Optimize pressure used
3. Understand and set controls accordingly
4. Turn off air to nonproductive equipment
5. Turn off equipment when not needed

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Shut It Off!

You don't leave your car running in the parking lot.

Why keep equipment on when not in use?

Eliminate waste and save money!



- Walk the facility during off hours to see what's left on
- Reduce lighting levels in unused areas
- Use shutdown procedures for the facility
- Turn off equipment during non-production periods

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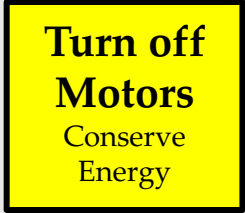
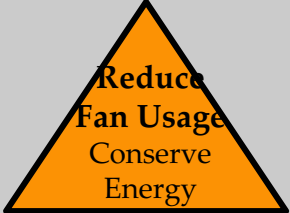
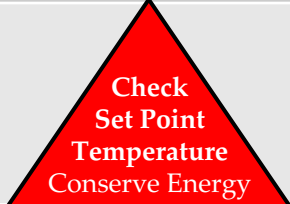
Company Logo

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LEARN MORE AT energystar.gov

- Co-branding with ENERGY STAR can add credibility to the message
- Posted at high traffic areas in the facility
- Obtained approval from communications teams and EPA

3. Energy Conservation Label

Skill Level	Description	Example	Symbol
No Skill / everyone	behaviors that can be intuitively adopted even without previous experience	Turn off fans, close doors, report air leaks, turn off TV	
Low Skill / supervisor, trained operators	need to look at/ask for instructions, but fairly easy to perform and repeat when needed	Turn off tools, motors, pumps	
Medium Skill / maintenance	individuals should carefully follow instructions. In addition, the performance of the behavior requires practical/physical skill, and in some cases the use of tools	Turn off exhaust fans, repair compressed air leaks	
High Skill / engineer	Almost always need professional help, hire someone to do the task	Modify paint booth set point temperature, operate on robots, CNC machines	

4. Energy Booth

Effectively raise employees' awareness in energy conservation through face-to-face interaction and short education sessions

Create excitement and engagement regarding energy conservation opportunities within the company

Provide knowledge access to company and plant-level energy initiatives and ongoing energy project

A chance for the energy team to interact with employees and establish connections

Energy Booth Set-up

- “Work-to-Home” themed posters
- At least two sets of posters to cover all plant population
- Small giveaways to attract attention
 - Reusable grocery bags, pens, stickers, key chains
- Three segment:

Poster 1

- The Volvo Group energy-related targets, initiatives and accomplishment
- Recognition & energy projects at the facility

Poster 2

- What can you do to help Volvo further energy goals
- Success stories, notable energy Kaizens, etc.
- Questions to ask

Poster 3

- What you can do to save energy at home
- ENERGY STAR posters for brand recognition & credibility

Energy Booth Implementation

Step 1. The site Energy team shall be responsible for content development & contacting vendors

Step 2. Energy Team work with communications to organize & set up

- Hosted once a year during a existing company event such as HAG Power Day, LVO annual Health & Safety Fair, and NRV Chamber of Commerce Fair
- Incentives/giveaways could be obtained free of cost from local utilities
- If the booth is successful, the energy team may choose to scale up and organize an energy fair

5. Weekly Energy Corner

- New section added weekly to the communication channel. E.g. NRV's Truck Talks
- The “Energy Corner” will include both energy and environmental contents, and there needs to be at least one energy content each month
- Content type will include:
 - Companywide/site energy-related initiatives and notable projects
 - Sustainability Tips
 - Environmental News
 - Member News and Success Stories

Energy Corner Master Calendar

Month	Important Dates	Newsletter Theme & Content
Jan		Energy - Heating Season: how to save energy at work & at home
Feb	International Polar Bear Day	Environment – global warming Energy - carbon footprint of energy uses
Mar	Earth Hour	Energy – how to spend earth hour? <ul style="list-style-type: none"> ○ Home Energy Saving tips ○ Member news – this is how I spent my earth hour
Apr	Earth Day	Week 1: CO2 emission Week 2: recycling Week 3: energy efficiency Week 4: water Eg: overpopulation, biodiversity, ocean pollution, climate change, ozone depletion, acid rain, food waste, deforestation, energy water nexus, etc.
May	International composting awareness week International Day for Biodiversity	Environment – biodiversity, composting Energy – Cooling Season: how to save energy at work & at home/summer energy saving tips
Jun	World Environment Day	Environment – Bottled water vs. Tapped water Energy – saving energy and reducing waste during fourth of July
Jul	Plant Shutdown World Population Day	Energy – things to do to eliminate energy waste during shutdown
Aug		
Sep	HAG: Power Day	Energy – HAG achievements
Oct	Energy Awareness Month	Week 1: lighting & automation Week 2: energy efficient equipment upgrade Week 3: operational energy efficiency Week 4: renewable energy
Nov		Energy –winner announcement from energy contest & tips on how to sustain progress
Dec	International Mountain Day Christmas	Environment – mountain top mining Energy – shop energy efficiency products for holiday gift-giving

6. Earth Hour/Day Events

Spread knowledge



- Share environmental success stories and a message challenging employees to take action
- Videos demonstrating different ways to spend earth hour
- Environmental-friendly practices

Engage Employees

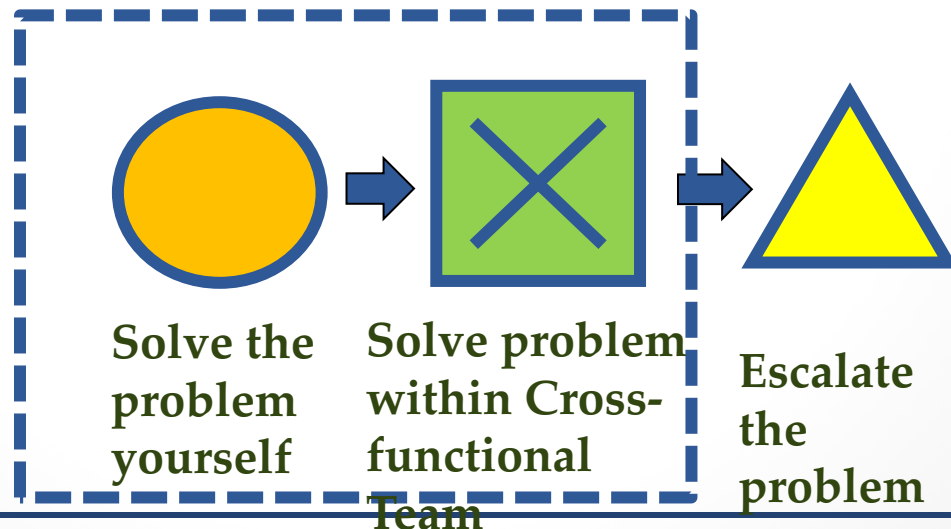


- Hosting an energy trivia
- Brown Bag, lunch & learn event
- Video contest: submit “how I spent my earth hour” short video to win an energy-efficiency home kit

7. Energy Facilitator

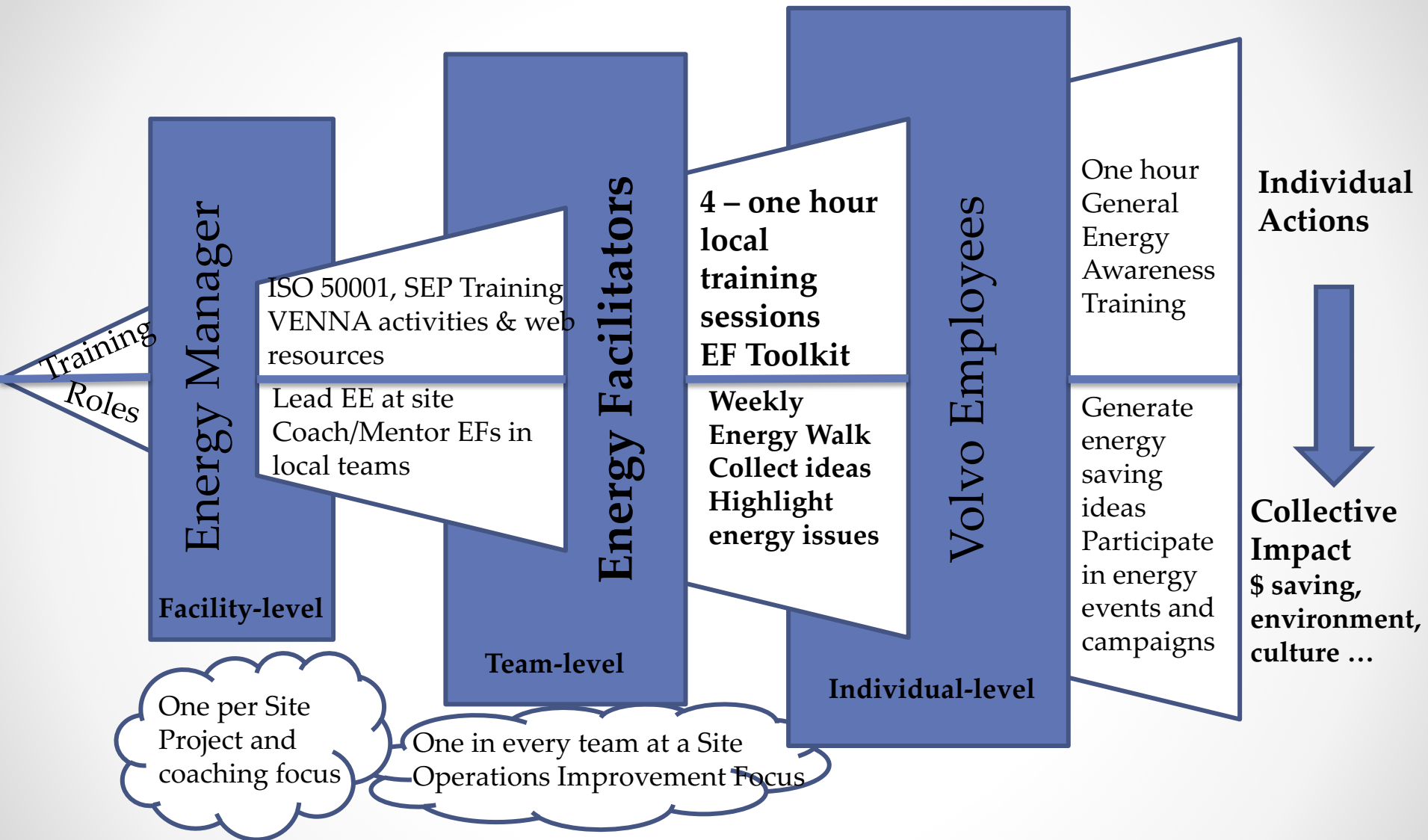
- Promote **operational energy efficiency**
- Build **trust**, enhance **collaboration** between management & shop employees
- **Individual empowerment** through knowledge on an **individual** level and **team** level

The
purpose of
energy
facilitators



Energy Facilitator

- Team-level, partial, voluntary role
 - The 16th person on each team
- Could be either a permanent role **or** a quarterly/annually rotational role
- Energy facilitator Tools & Resources
 - Orientation Training & Continual Trainings
 - Departmental Energy Checklist
 - Reference group: Site Energy Go Team



Energy Facilitator Training

- Three-hour total educational content, broken down to three 1-hour sessions
- Location will be the site training center
- Training will be delivered by site energy manager, or by multiple members of the energy team
- Topics include:
 - Energy 101
 - Site Energy Program Overview
 - Energy Audit Part I & II
 - Energy Economics
 - Tools & Resources

Implementation Feasibility: Energy Facilitator

Since it is a **team-level** position, there will be 100+ energy facilitators at each site

Requiring:

1. Not only upper management buy-in, but also blue collar leadership support
2. An awareness & basic knowledge foundation needs to be established prior to this program
3. A cross-functional reference group to answer any questions and provide assistance if needed
4. Incentive mechanism to motivate and reward their efforts

This is more likely to succeed if implemented during **phase 2** of the program

Energy Checklist

- Weekly assessment of energy usage and waste at the end-use level within each department
- Focus on the **behavioral** aspect of energy efficiency opportunities
- 15 minute energy walk with a change of focus each week
 - Compressed Air
 - Lighting
 - Idling Equipment
 - Comprehensive
- Result sent out to production leaders and supervisors

Weekly Energy Checklist				
Date:	Energy Facilitator Name:			
Week	Focus Area	Opportunity Item	Status (Y/N)	Area of Issue
Week 1	Compressed Air	Air compressor turned off?		
		Air tool disconnected from airline when not in use.		
		Air tool turned off when machine is not running.		
		Compressed air not used for personal cooling.		
		Compressed air not used to move parts.		
		Compressed air not used for spray blowing.		
		Compressed air not used for cabinet cooling.		
		Compressed air not used for padding.		
		No compressed air leaks detected.		
		Air compressor controls an energy efficiency mode?		
Week 2	Lighting	Air pressure to operate machinery is set at the minimum pressure.		
		Are the air valves shut off?		
		Process lighting turned off during non-production?		
		No need for light with more lux.		
		No burnt out lamps are found.		
		Lights near windows/skylights are left on.		
		Fluorescent far light is installed in seldom used area.		
		No fluorescent lamps to maintain require light level.		
		No lamp lenses are dirty or yellowed.		
		No additional task lighting is needed.		
Week 3	Idling Equipment	Time switches are installed on light fixtures with scheduled occupancy.		
		Paint-of-use fans are turned off.		
		TV and monitors are turned off.		
		Forklift charging station turned off when not in use.		
		Personnel carrier turned off when not in use.		
		Power saw features are enabled on appliance.		
		Machine motors turned off when not in use. (e.g. rollers, drag, work conveyors)		
		Process equipment turned off when not in use.		
		Auxiliary process equipment turned off.		
		Personal electronics unplugged.		
Week 4	Comprehensive	Equipment not in operation during machine's wait time.		
		Control cabinet air blower turned off.		
		Vending machines turned off when not needed.		
		Exhaust and/or supply fans are turned off.		
		Heaters turned off during idle time.		
		Dense are closed in heated air conditions dr space.		
		No water leaks due to heating coolant.		
		No Gaseous laser during non-production.		
		No compressed air leaks from the airline.		
		No cracks/holes are found on walls/celling/pipe.		
Chilled water that water pipes have proper insulation.				
Air conditioning system has adequate insulation.				
Dense have proper seals.				
No opening and air leakage is detected in the furnace.				
No air/water leaks from valves.				
Heat transfer surfaces are clean. E.g. radiant tube, heat exchanger, heater tubes, electrical heating elements.				

8. Energy Kaizen Week

- A rapid improvement effort where a cross-functional group focuses and attacks operational energy efficiency as an area in need of improvement
- Focus on the **operational** aspect of energy efficiency, and the **operators** will be the major players
- Contestants will be provided a competition toolkit including: kickoff workshop, reference group, DOE cheat sheet, DOE opportunity sheet, DOE calculation sheet, proposal templates

Recognition Structure

Recognition Structure	Description of Recognition
Participation-based	All participants gets rewarded in the form of a Pizza Party or others
Top Finishers	The top one, two or three teams in specific categories receive recognition. Categories may include: <ul style="list-style-type: none"> ➤ Greatest energy saving (in either % or kWh) in total energy usage ➤ Greatest cost savings (\$) ➤ Greatest reduction in GHG emissions
Qualitative Award	Recognize participants for qualitative achievement, such as overcoming unique challenges, implementation of no-and-low-cost practices, and innovative ideas
Multiple Awards	Present awards for different qualitative and quantitative achievements, such as Greatest energy savings and most innovative ideas

Energy Kaizen Week Implementation

Step 1. Need to work with Quality/VPS

- Integrate Energy Kaizen Week into their established process and ensures
- Ensure that Energy Kaizen Week's timing aligns with other Kaizen events



Step 2. Decide on the scale. The entire facility? Or select a few energy intensive departments as a pilot?



Step 3. Select a focus. Energy Kaizen Week focusing on one area, e.g. compressed air, or covering everything?



Step 4. Communications. Work with communications at least 2 months prior to design a communication strategy



Step 5. Reach out to manufacturing, process and maintenance engineering teams to recruit volunteers as the reference group for the event

Performance Metric

The program shall be evaluated on an annual basis, by the following metrics:

- # of responses to the energy survey
- Survey Results (statistical information)
- # of energy Kaizen submitted
- \$ energy savings from energy Kaizens

Implementation Timeline



July
2018

Energy Survey Pilot

Oct
2018

Educational Brochures
Posters & Labels Pilot
Energy Corner Pilot

March
2019

Energy Hour/Day
Events Pilot

July
2019

Re-administer survey
Progress Evaluation

Sept
2019

Energy Booth

Additional Phase 2
Pilots

Implementation Checklist

- Agreed a program launch date
- Roles and responsibilities agreed and scheduled
- Tools and materials delivered and/or produced
- Senior Management on board
- Blue-collar Leadership on board



Recommended Next Steps

- Continue with program development
- Finalize program branding – a logo & a slogan
- Establish a communication framework
- Get upper Management Buy-in
- Get supervisors' on board by attending weekly meetings
 - If time is constraint, start with the most energy consuming departments
- Program Kickoff & Publish Toolkit

A Special Thank You to ...

Energy Teams:

Mark & Dee (HAG)

Tom, Rob & Travis (LVO)

John & Chad (NRV)

Rick and Bert (VGNA)

Communications Teams:

Belinda (HAG)

Louise & Sylvia (LVO)

Marcus & Brooke (NRV)

Sheri (VGNA)



Volvo Group Trucks

Hagerstown, Maryland

Hagerstown- ISO 50001



Finding the ways that work

THANK YOU!
ANY QUESTIONS?

