



**Better  
Buildings<sup>®</sup>**  
U.S. DEPARTMENT OF ENERGY

## **Engaging your Suppliers to Multiply the Benefits of Energy Efficiency**

Andre de Fontaine, U.S. Department of Energy  
May 11, 2016

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# Today's Panelists

- Sean West, EH&S Program Manager, United Technologies Corporation
- Ethan Rogers, Program Director, Industry, American Council for an Energy Efficient Economy



# Why Supply Chains?

- Big energy and carbon impact
- Opportunity to leverage business relationships to reach small and medium-sized manufacturers
- Ability to transfer energy efficiency expertise and commitment from experienced companies to those just starting their energy management journey

# Challenges ...?

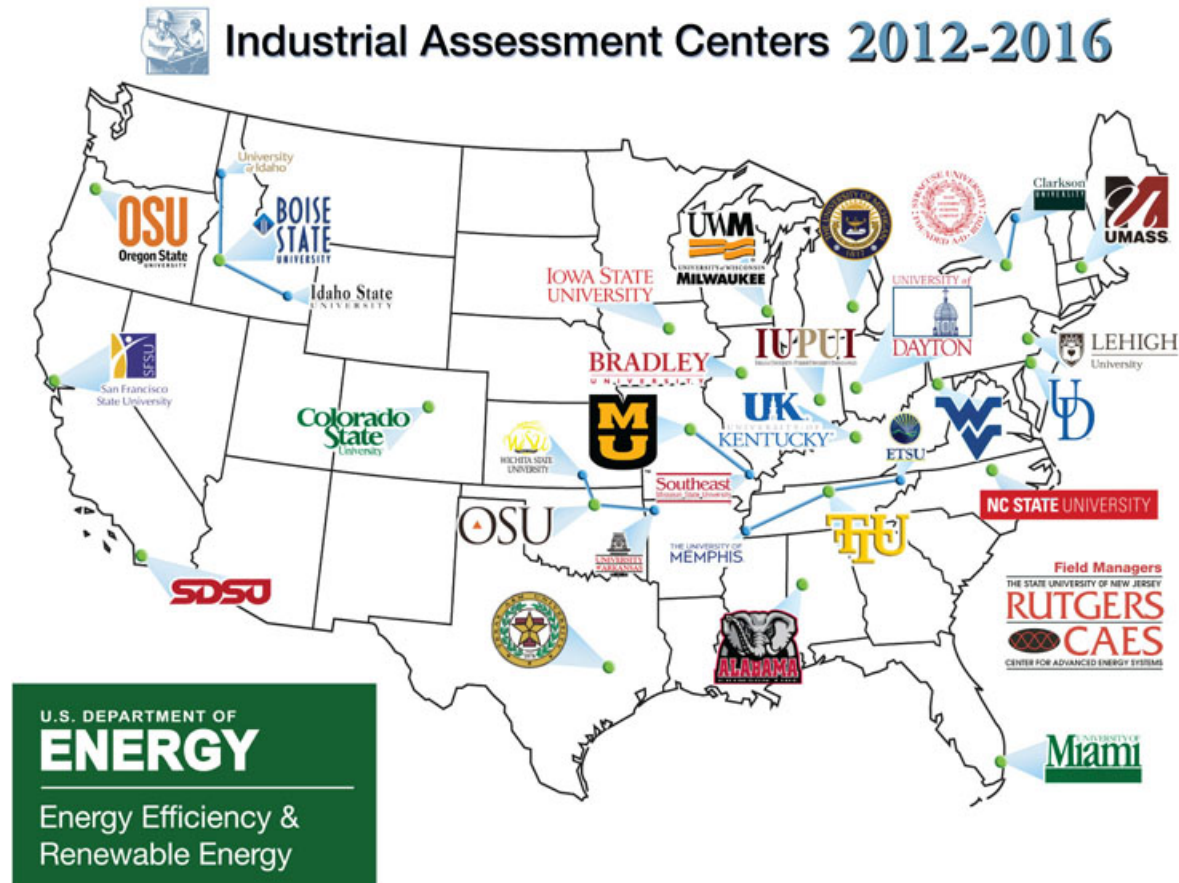
- What should we ask our suppliers to do or commit to?
- What kind of help should we provide our suppliers?
- How do we measure progress without imposing a large data collection burden on ourselves or our suppliers?
- How do we get our procurement team to buy in?

# Better Plants Supply Chain Pilot

- DOE is working with a select group of Better Plants partners to help them overcome these challenges
- Through this initiative, DOE partners with participating suppliers to:
  - Join the Better Plants Program
  - Set energy saving goals
  - Develop energy management plans
  - Track and report progress
- DOE provides suppliers with energy management webinars, data collection and analysis, and access to free, 1-day energy audits

# Energy Audits

- Qualifying suppliers are given priority access to free energy audits from DOE's IACs.
- IACs are university-based centers, led by professors and staffed by engineering students.
- Audit produces report with energy saving recommendations.
- Typical audit uncovers savings equal to about 8% of plant-wide energy consumption.



# Supply Chain Engagement

- Three Better Plants partners are working with 24 suppliers to set energy-saving goals and track progress

Legrand	UTC	Lockheed Martin
Chapco	GKN Aerospace	Cascade Engineering Technologies, Inc.
Coilplus	Hitchiner	Clearwater Engineering, Inc.
Complete Design & Packaging	MB Aerospace	Cooperative Industries Aerospace & Defense
Durex	RTI International Metals, Inc.	The Harva Company, Inc.
Lynam	Selmet, Inc.	Research Electro-Optics
Magnetic Metals	Weber Metals, Inc.	Savage Precision Fabrication
Rowley Spring & Stamping	Jedco, Inc.	Vanguard Space Technologies
Stanley Spring & Stamping		Tri-State Plastics, Inc.
		Mulgrew Aircraft Components

# For more Information

Andre de Fontaine, [andre.defontaine@ee.doe.gov](mailto:andre.defontaine@ee.doe.gov), 202-586-6585

[BetterPlants@ee.doe.gov](mailto:BetterPlants@ee.doe.gov)

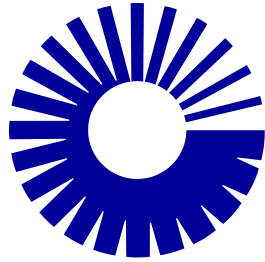
**Better Buildings, Better Plants:**

<http://eere.energy.gov/betterplants>

**Better Buildings Solution Center:**

<http://betterbuildingsolutioncenter.energy.gov/>





**United  
Technologies**

UTC Supplier Sustainability

May 11, 2016  
Sean West

# UNITED TECHNOLOGIES

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## Agenda

UTC at a glance

2020 Sustainability Goals

UTC Supplier Gold

Gold Supplier Health Assessment (SHA)

UTC – DOE Supplier Program Pilot

# UNITED TECHNOLOGIES

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## 2015 REVENUE \$56.2B



Heating, ventilating, cooling & refrigeration systems



Security & fire protection services



Elevators, escalators, moving walkways, people movers & horizontal transportation systems



Industrial & aerospace systems



Aircraft engines, gas turbines & space propulsion systems

No technical data subject to the EAR or the ITAR

# SUSTAINABILITY AT UTC

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## SOCIAL, ENVIRONMENTAL AND ECONOMIC



Our strategy is straightforward and effective:

Innovate to meet growing demand for sustainable products

Implement sustainable solutions in our operations

Encourage suppliers, customers and employees to achieve sustainable outcomes

# UTC 2020 SUSTAINABILITY GOALS



## 2020 SUSTAINABILITY GOALS

MOVING THE WORLD FORWARD



SINCE 1997, UNITED TECHNOLOGIES HAS **TRIPLED** THE SIZE OF OUR BUSINESS

WHILE REDUCING OUR GREENHOUSE GAS EMISSIONS BY **34%**

AND WATER CONSUMPTION BY **57%**

### ENGINEERING GOALS

Implement *Design for Sustainability* during the development cycle of new products

Implement *Life-Cycle Analysis* during the development cycle of new products

### SUPPLY CHAIN GOALS

INCENTIVIZING KEY SUPPLIERS TO IMPLEMENT

**11** SPECIFIC SUSTAINABILITY MEASURES

### ENVIRONMENT, HEALTH & SAFETY COMPLIANCE GOALS

- 0** Enforcement actions, non-compliance
- 100%** Inspections without enforcement actions
- 100%** Annual permit & program evaluations
- 100%** Passing compliance/assurance scores

Join the conversation **#NaturalLeader**

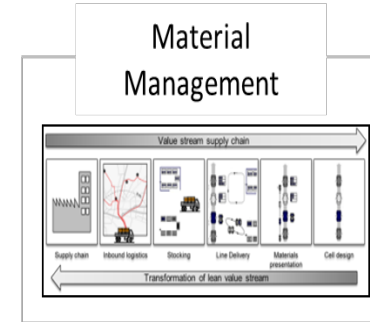
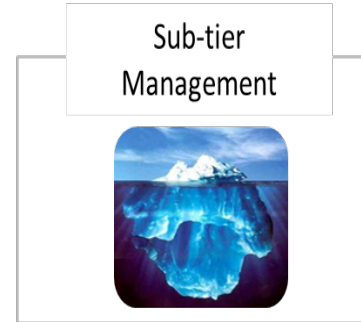
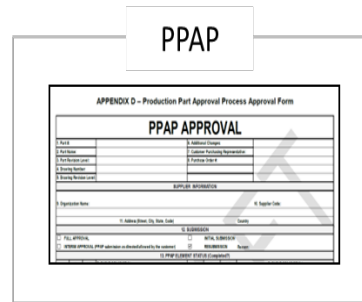
NaturalLeader.com UTC.com

No technical data subject to the EAR or the ITAR

# SUPPLIER GOLD

## Driving sustainable performance

Drastically reduces escape risks



Aligned with UTC 2020 vision



Tools to add value and eliminate risk

No technical data subject to the EAR or the ITAR

# SUSTAINABILITY PROGRAM EXAMPLES

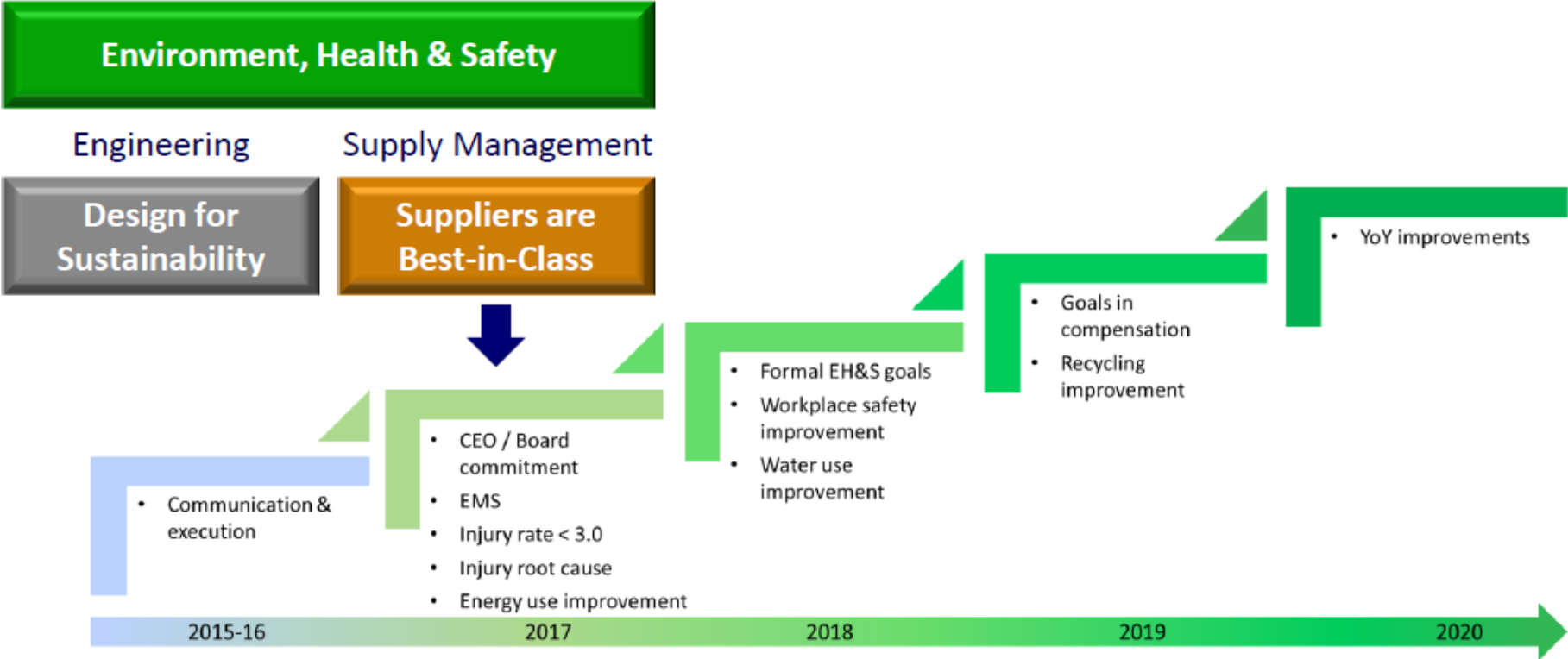


- Reduces operating costs
- Competitive advantage
- Our customers/shareholders expect it
- Attracts & retains talent
- Increases employee engagement
- Creates customer loyalty
- Increases brand value
- Risk management
- Compliance



# UTC 2020 SUSTAINABILITY GOALS

## UTC Supplier Gold Timeline



Supplier commitment over time

No technical data subject to the EAR or the ITAR



# UTC 2020 SUSTAINABILITY GOALS

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## Program structure

- Suppliers must answer the Supplier Health Assessment (SHA, ~80 questions)
- There are 11 EH&S sustainability requirements that suppliers must satisfy to be considered a “Gold supplier”
- The 11 sustainability requirements must be completed at predetermined dates between 2017-2019
- Current Gold suppliers are also required to meet sustainability goals by target dates
- Suppliers in the DoE Better Plants program satisfy energy management requirements

# PROGRAM REQUIREMENTS

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## 11 sustainability elements within SHA Questions

1. Supplier has **code of conduct** for ethics and sustainability appropriate for its business  
Required for Gold: 2017
2. Supplier has formal **CEO or Board level commitment** to continuous EH&S improvement  
Required for Gold: 2017
3. Supplier uses an appropriate, written workplace **EH&S management system**  
Required for Gold: 2017
4. Supplier has a current **injury incident rate < 3.0**  
Required for Gold: 2017
5. Supplier uses **root cause analysis following all serious or fatal injuries**  
Required for Gold: 2017
6. Supplier has demonstrated **annual improvements in its use of energy**  
Required for Gold: 2017
7. Supplier has **formal EH&S goals**  
Required for Gold: 2018
8. Supplier has **demonstrated annual improvements in workplace safety**  
Required for Gold: 2018
9. Supplier has demonstrated annual improvements in its **use of water**  
Required for Gold: 2018
10. Supplier includes attainment of **formal EH&S goals in executive compensation**  
Required for Gold: 2019
11. Supplier has demonstrated annual improvements in its **waste recycling rate**  
Required for Gold: 2019

# PROGRAM REQUIREMENTS

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## Sample question

Question #: 68

Does your Supplier Sustainability program include the following elements (check all that apply):

- |   |                          |  |
|---|--------------------------|--|
| 2 | <input type="checkbox"/> | Supplier has formal CEO or Board level commitment to continuous EH&S improvement |
|   | <input type="checkbox"/> | Supplier uses an appropriate, written workplace EH&S management system           |
|   | <input type="checkbox"/> | Supplier has a current injury incident rate less than 3.0                        |
|   | <input type="checkbox"/> | Supplier uses root cause analysis following all serious or fatal injuries        |
|   | <input type="checkbox"/> | Supplier has demonstrated annual improvement in its use of energy                |

# UTC 2020 SUSTAINABILITY GOALS

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## Supplier Gold summary

### Supplier Gold Requirements

- 12 months “0” quality rejections
- 100% on time delivery
- Customer satisfaction rating of “Very Satisfied” or better
- Score > 80% on Supplier Health Assessment plus 100% alignment of Sustainability Goals

### Supplier Gold Benefits

- Improved commercial terms
- Enhanced new business award opportunities
- Performance guarantees elimination
- Reduced buffer stock requirements

# UTC 2020 SUSTAINABILITY GOALS

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## UTC Supplier Program Pilot Highlights

Summary	Results
Number of Assessments	12
Number of Recommendations	56
Average Percent Savings Per Plant	13%
Average Cost Savings Potential	\$119,000
Average Simple Payback	0.9 years
Total Potential Savings	\$1.1 million

*Results include energy assessments for both UTC and Legrand suppliers.*

# UTC 2020 SUSTAINABILITY GOALS

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## UTC DOE Supplier Program Pilot Highlights

- 7 UTC suppliers set 10-year, 25% energy intensity improvement targets
- 4 energy management webinars conducted by DOE
- Good response to availability of IAC assessments
- 4 suppliers received IAC energy audits
- Auditors identified good energy savings opportunities
- Suppliers completed annual data reports (Establish Baseline, progress reports with TAM)

# Q&A

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Sean West  
EH&S Program Manager  
[Sean.west@utc.com](mailto:Sean.west@utc.com)  
(860) 728-7619

Catarina Rodrigues  
UTC Supply Management  
Catarina.Rodrigues@utc.com

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Environment, Health & Safety

United Technologies Corporation



American Council for an Energy-Efficient Economy

# **SCALING ENERGY EFFICIENT SUPPLY CHAINS**

**U.S. DOE Better Buildings Summit**

**May 11<sup>th</sup>, 2016**

Ethan A. Rogers

Program Director - Industry



# AGENDA

- Overview of ACEEE Scaling Energy Efficiency in Corporate Supply Chains project
  - Energy Hunt Concept
  - Project Partners
  - Data collection/Reporting
  - Identifying OEM participants
- ACEEE Supply Chain Research Projects
  - Past projects
  - Future projects

# Scaling Energy Efficiency in Corporate Supply Chains

## Project Partners

- American Council for an Energy-Efficient Economy
- Johnson Controls Incorporated
- Clinton Global Initiative
- Rutgers University
- Department of Energy

And many, many more...

*VISION & GOALS*

**"ENERGY  
HUNT"  
ENGAGEMENT  
MODEL**

**ORIGINAL  
EQUIPMENT  
MANUFACTURERS**

***KNOWLEDGE  
TRANSFER***

**SMALL- AND  
MEDIUM-SIZED  
MANUFACTURING  
SUPPLIERS**

***DOCUMENTATION &  
COMMUNICATION***

***ENERGY SAVINGS &  
PRODUCTIVITY BENEFITS***

**U.S. ECONOMY & ENVIRONMENT**

# Energy Hunts

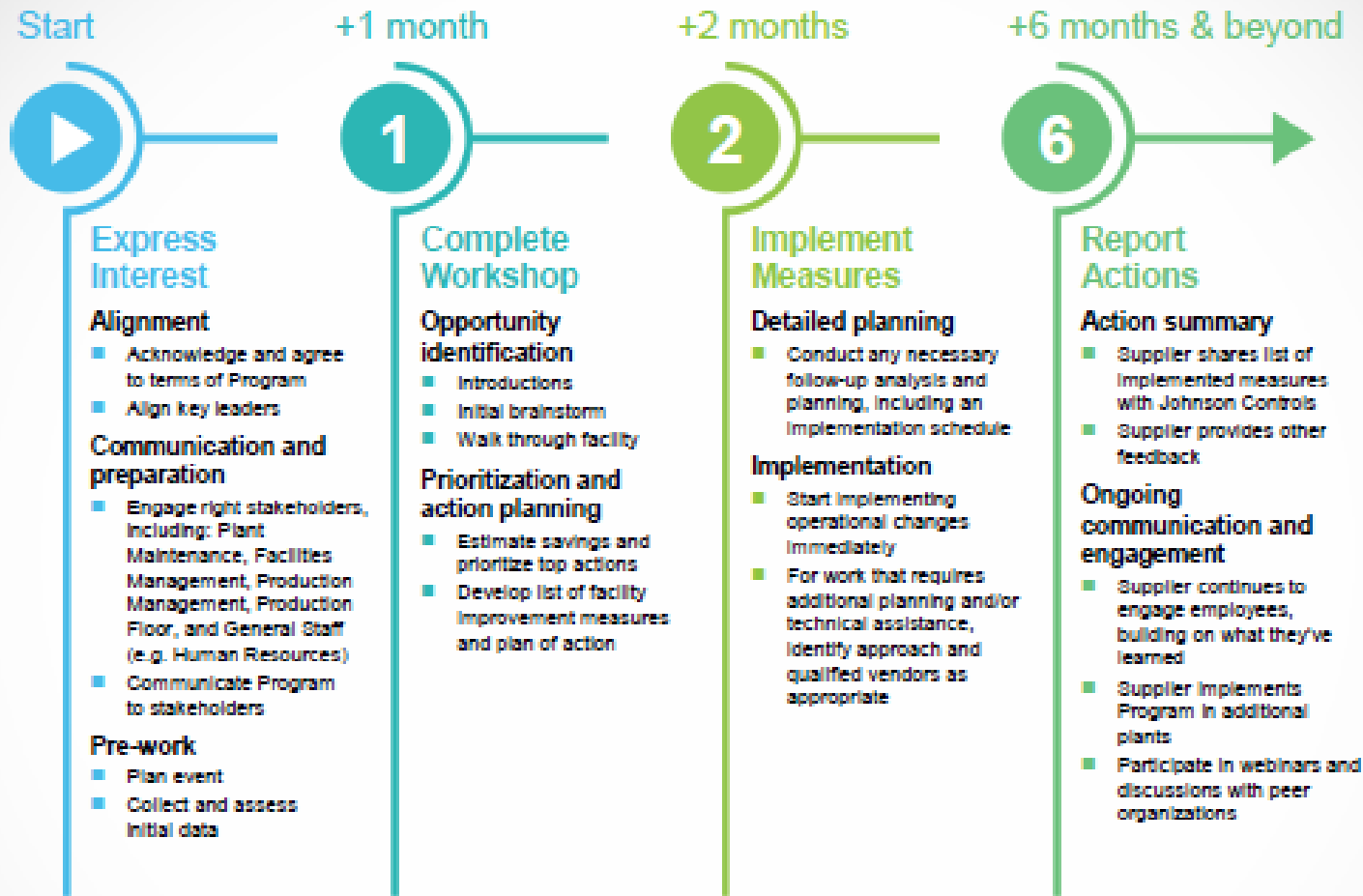
- Large Manufacturer engages its supply base
- Their Energy Champion visit a SME supplier's plant to assist in an assessment of energy savings opportunities (Energy Hunt)



- In the process, the Champion will
  - Train the SME's in-house energy team: equipment scheduling, energy management, lighting, HVAC, and compressed air
  - Lead plant walk through to identify low-cost and no-cost savings opportunities
  - Provide guidance for developing business cases
  - Share best practices and tools like check lists, and training materials

# Johnson Controls Supplier Efficiency Program

## CREATING A RIPPLE EFFECT



# Roles of Project Partners

PARTICIPANT	TYPE	FACILITATOR	OEM PROSPECTOR	TECH ASSIST	CONTENT CONTRIB.	TRAINING
ACEEE	NGO	X				
DOE	GOV			X	X	
EPA	GOV				X	
IIP	NGO		X			
JCI	MFG			X	X	X
NRDC	NGO		X			
RUTGERS IAC	UNIV			X		
OEM (x7)	MFG					X

# Project Goals

Metric	Goal
Manufacturing Partners	8
Suppliers	
Johnson Controls (20/year x 3 years)	60
8 Manufacturing partners (10/year x 3 years)	<u>240</u>
Total:	300
Trainers trained	300
Workers trained	1200
Energy Savings	
(kWh/year)	62,500
\$/year	4,500,000
CO2e / year reduction (metric tonnes)	31,500

# Benefits

- Manufacturers and supplier alignment
- Workforce training
- Cost savings
- Link to parallel agendas:
  - Workplace safety
  - Emissions compliance
  - Workforce development
- Awards/Recognition



# Data Collection & Reporting

Manufacturers



SMEs



Energy Hunts



Anonymized Data



# Prospective OEMs

Likely, but not exclusively, manufacturers of...

- Energy-using consumer goods
  - Appliances, automobiles, electronics, lighting fixtures...
- Energy-centric intermediate components
  - Motors, pumps, insulation...
- Any firm wishing to demonstrate sustainability

# Results

Johnson Controls Supplier Efficiency Program savings to date:

- 21% cumulative (vs. baseline)
- 8% annual (2014)
- Savings projects: lighting, compressed air, water leaks, equipment scheduling, maintenance, and culture,

# ACEEE Research on Intelligent Efficiency & Supply Chains

## Past projects

- *The Energy Savings of Smart Manufacturing* (Rogers 2014)
- *Smart Freight: Applications of ICT to Freight System Efficiency* (Langer and Vaidyanathan 2014)

## Future Projects

- *Smart Freight & Logistics*

# Thank you!

Ethan A. Rogers

Program Director, Industry

American Council for an Energy-Efficient Economy (ACEEE)

202-507-4751

[erogers@aceee.org](mailto:erogers@aceee.org)

***Save the Date!***

***2016 ACEEE Intelligent Efficiency Conference***

December 4-6, 2016; Hilton Austin, Austin, Texas

[aceee.org/conferences/2016/ie](http://aceee.org/conferences/2016/ie)