

Green Lean in Grundfos: Experiences, Learnings and Perspectives

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1

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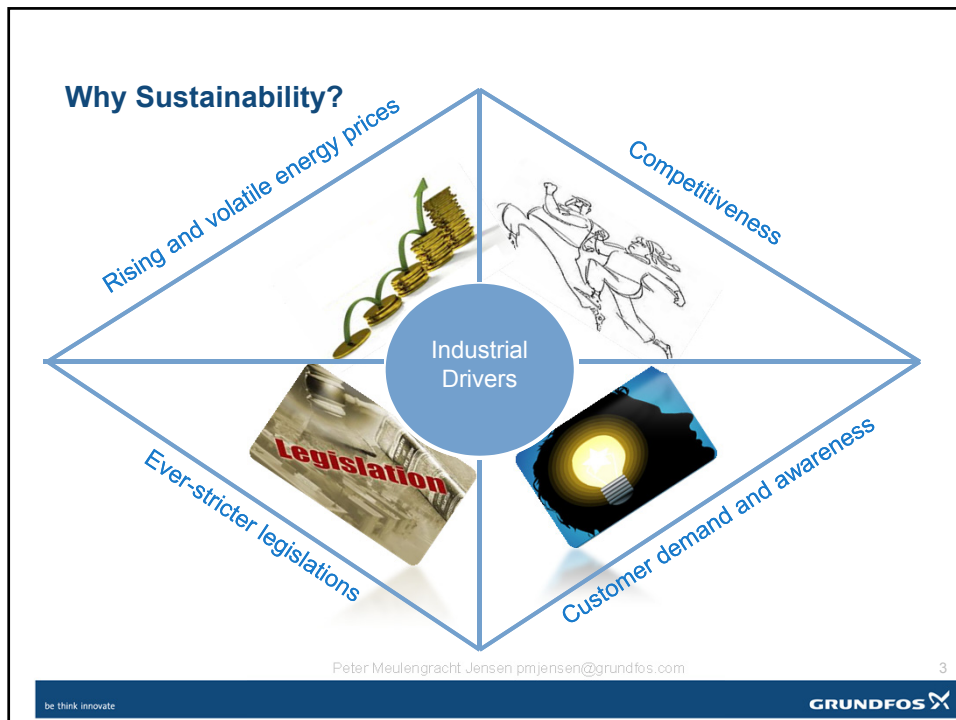


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Introduction

Name: Peter Meulengracht Jensen

Background: MSc in International Technology Management 2009

Company: Grundfos Holding A/S

Industrial PhD since July 2010 – July 2013

- Topic: Development and Implementation of Strategic Change Programs
- Case: Development of an 'Environmental Excellence' Program
- Collaborating University: Aalborg University, Center for Industrial Production (CIP)

Project Manager July 2013 ->

- Implementation of 'Environmental Excellence Program'

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Content

1. Background of 'Green' and 'Lean in Grundfos'
2. Green Lean in Grundfos: Experiences and Results
3. Green Lean in Grundfos: Learnings and Perspectives

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Grundfos in Brief

THE GRUNDFOS PURPOSE

Grundfos is a global leader in advanced pump solutions and a trendsetter in water technology. We contribute to global sustainability by pioneering technologies that improve quality of life for people and care for the planet.

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- Energy-efficient pump solutions
- Privately owned organization
- Headquarter: Bjerringbro
- Number of Employees: 17.000
- Manufacturing Sites: 27
- Sales Subsidiaries: +60



SUSTAINABLE



OPEN AND TRUSTWORTHY



FOCUSED ON PEOPLE



INDEPENDENT



PARTNERSHIP



RELENTLESSLY AMBITIOUS

15-10-2013

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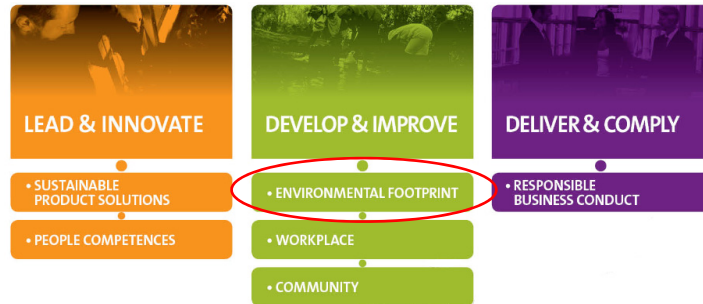
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Sustainability in Grundfos

6 STRATEGIC FOCUS AREAS



10/15/2013

Trondheim SMARTLOG Peter Meulengracht Jensen pmjensen@grundfos.com

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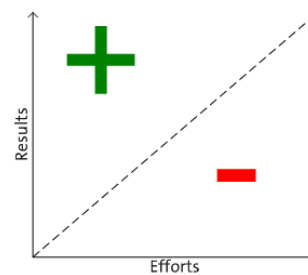
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Past and Current Challenges and Barriers in Grundfos

Scattered efforts & competencies



Efforts versus results



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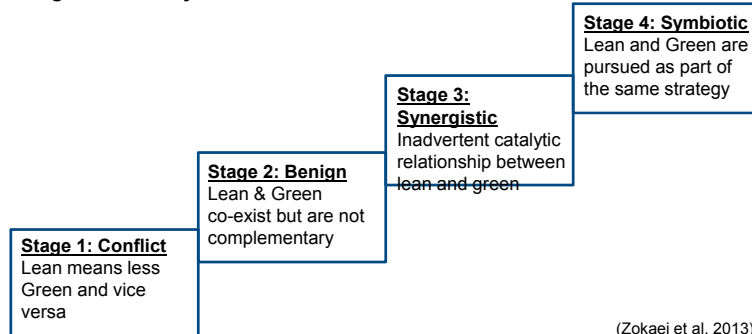
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Green Lean in Grundfos: Theoretical Underpinning

Stages of maturity



(Zokaei et al, 2013)

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What is Green Lean

The combination of reducing non value-adding activities

Lean:

- Overproduction,
- Defects,
- Unnecessary Inventory,
- Unnecessary Transport,
- Waiting,
- Inappropriate processes,
- Unnecessary Motion,
- Wasted Human Potential

Green:

- Excessive Energy Usage
- Physical Waste (solid/liquid)
- Excessive Water usage
- Air Emissions (GHG)
- Land contamination
- Discharges to water and effluent
- Noise and nuisance
- Lost People Potential

(Zokaei et al, 2013)

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Green Lean in Grundfos: Headings

Green Lean in Grundfos

"...is how we realize environmental improvements (remove waste) on the shop floor by combining green and lean competencies and tools"

The scope of Green Lean

"...is currently constrained to 'energy'. The ambition is to include all four environmental focus areas"

Why Green Lean?

"...because our production processes account for 50% of our total energy usage"

The goal of Green Lean

"...is to reduce Grundfos total energy consumption with 10%"

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Green Lean in Grundfos: Concept Overview

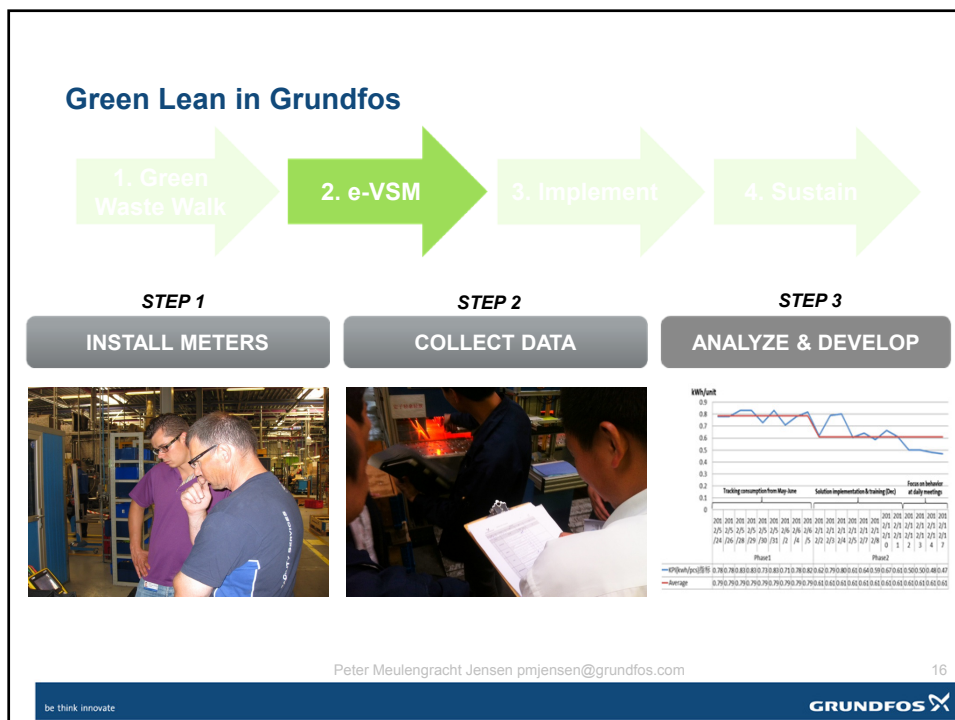
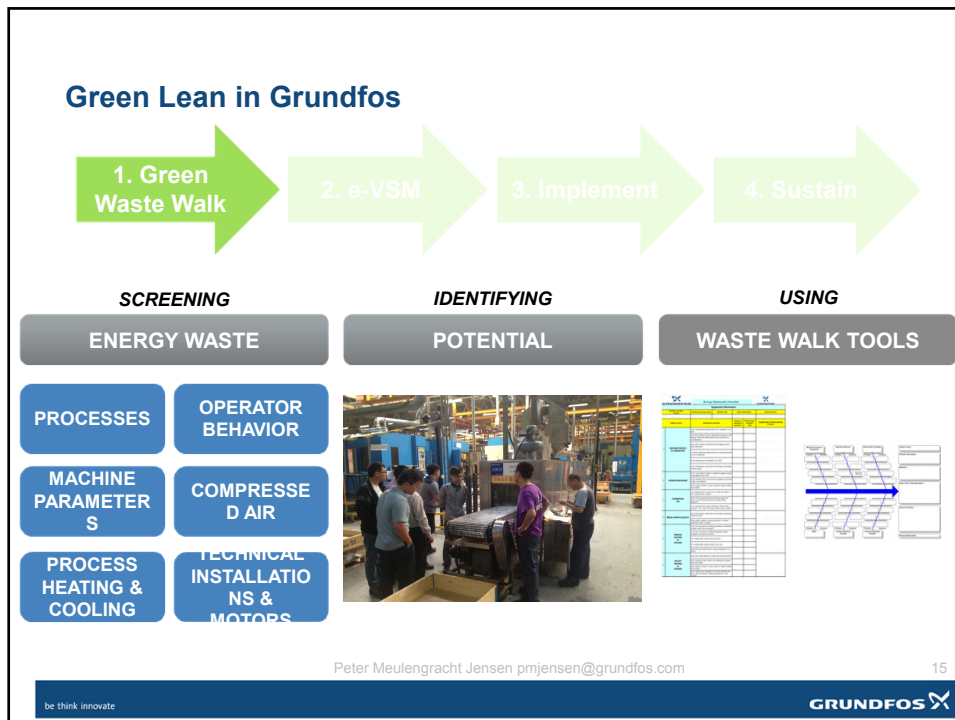


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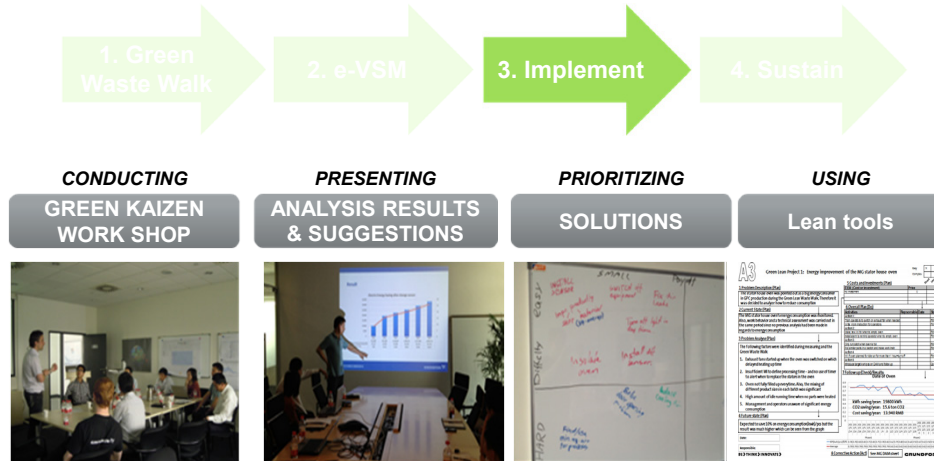
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Green Lean in Grundfos



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Green Lean in Grundfos



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Green Lean in Grundfos: Results

Project	Project Name	kWh Savings per year	CO2 Savings per year [T]	Cost Savings per year [€]	Investments [€]	Pay-back time [months]
Pilot	Velding Machine	113.685	43	11.450	19.500	24
#1	Stator Oven	19.800	16	1.700	0	0
#2	Laquer Machine	91.700	72	7.900	0	0
#3	Stator Oven	5.525	5	490	0	0
#4	Press	19.750	15	1.600	120	1
#5	CED	80.075	109	16.300	14.700	10
Total	6 Projects	330.535	260	39.440	34.320	9

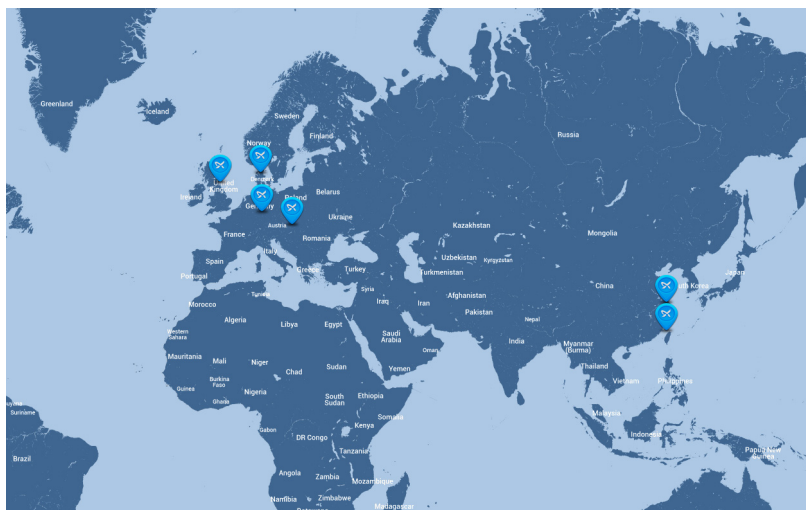
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19

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Green Lean in Grundfos: Perspectives for 2013/2014



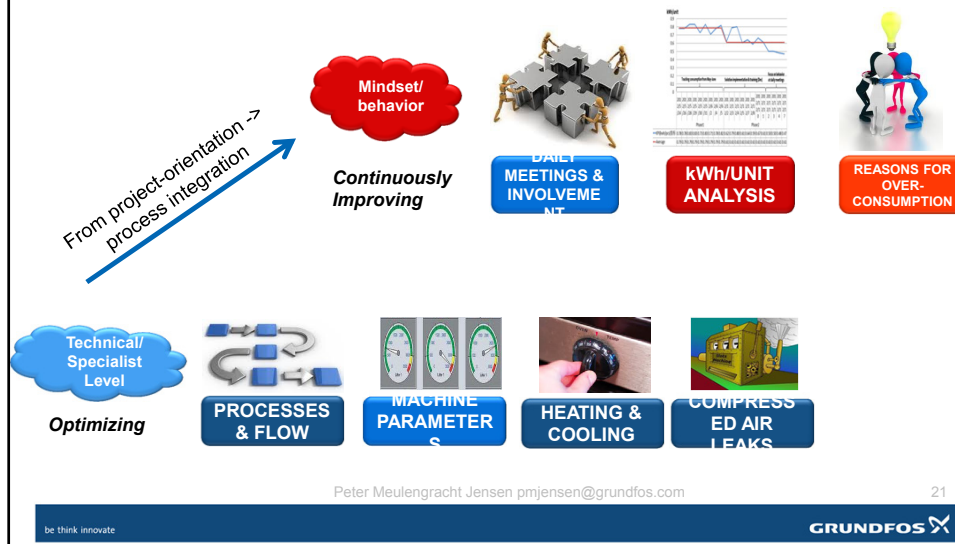
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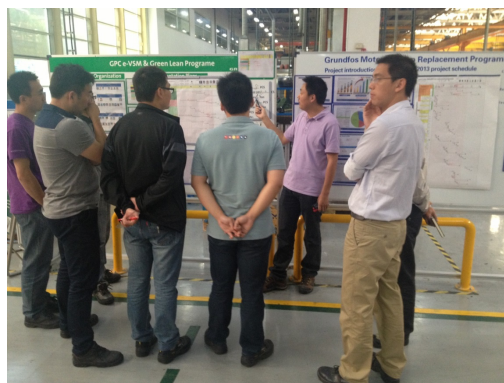
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Green Lean in Grundfos: Learnings



Green Lean in Grundfos: Prerequisites

1. Top management and local management commitment
2. Involvement of employees and competencies



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Green Lean in Grundfos: Benefits

1. Cost & CO2 Saving
2. Improved Productivity & Performance
3. Quality Improvements
4. Positive Influence on Preventive Maintenance
5. Employee Involvement
6. Next natural step in Lean/GSE
7. "One solution fits more"
8. Grundfos Core Value (Sustainability) in daily process

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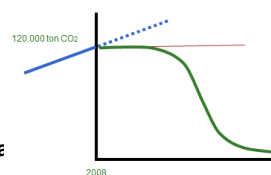
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Green Lean in Grundfos: Summary

- Green Lean is still "young" in Grundfos
- Still learning -> adding more components to the programme
- Initial results are excellent
- Estimated Business Case: +15.000.000 kWh / year



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