

Environmental and Energy Study Institute
Embassy of Denmark

On the Road to Copenhagen: Telling Denmark's Story

Grundfos: Technology Leadership in Pumping Solutions

Greg Towsley, LEED AP

Director of Innovation Platform

Zero-Impact Commercial Buildings

24 November 2009

BE > THINK > INNOVATE >

GRUNDFOS 

Grundfos in Brief



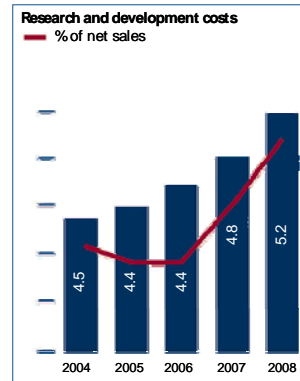
- Founded in 1945 by Poul Due Jensen
- Ownership today: 85% foundation, 12% family, 3% employees
- About 17,000 employees worldwide
- About 4,300 employees in Denmark
- Annual production of more than 16 million pump units
- Sales of \$4 billion in 2008
- Eight basic values
 - “Sustainability is a key concept at Grundfos. It is vital that our pumps demonstrate respect for the environment, especially in terms of energy consumption and use of materials.”

BE > THINK > INNOVATE >

GRUNDFOS 

Innovation is the essence

- Great importance to research and development
- Minimum 4% of annual revenue into R & D
- Making better products
 - 1976 – motors
 - 1990 – electronic components
- New Business - sustainable processes and technologies
 - Sensors
 - NoNOx
 - BioBooster



BE > THINK > INNOVATE >

GRUNDFOS 

Innovation is the essence

> Product Milestones



BE > THINK > INNOVATE >

GRUNDFOS 

Innovation is the essence

Design Awards



BE > THINK > INNOVATE >

GRUNDFOS 

Challenges of District Heating

Challenges:

- Always to deliver the **right amount** of energy
- Always to deliver the energy as **cost effective** as possible

Requirements:

- Adapting to variable demand - **flexibility**
- Have a **reliable** system
- Avoid unbalance - **overflow**
- Be prepared for the future - **system expansion**

Optimize district heating systems

BE > THINK > INNOVATE >

GRUNDFOS 

Energy Benefits of District Heating

- DH is a holistic approach
 - System thinking instead of individual building develop
 - Economy of scale
- Optimize the different areas in a district heating system to their specific needs
 - Dependent upon temperature and pressure fluctuations
 - Power plants
 - Sub-stations
 - Mixing loops in end-user installations
- Opportunities for pumps
 - Energy efficient pumps and motors
 - Variable speed
 - Optimized controls

Handwritten scribble

BE > THINK > INNOVATE >

GRUNDFOS 

Policy impact

> Energy labeling

- > The energy labeling scheme will make the energy consumption of pumps more transparent to customers
- > Grundfos' circulator pumps for the European market now carry energy-labels
- > The classification from A to G corresponds to that of the energy labeling scheme for household appliances, such as washing machines and refrigerators
- > Traditional circulators fall into category D; newer, variable speed – B; latest with digital regulation of performance in relation to consumption – A
- > 2009 mandate – effective 1 January 2013 – no circulators shall be sold below category A



BE > THINK > INNOVATE >

GRUNDFOS 

Themes for Zero-Impact Commercial Buildings in USA

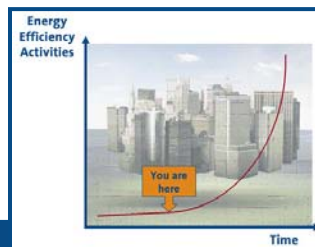
- Fragmentation of building sector
- Need for **integration**
- Performance based property value assessment
- Active **performance** management
- Financing of green investments
- **Metrics** – can't manage what you don't measure
- **Training** the building sector
- See it and believe it
- **Upgrading** existing building stock
- Coordinated design of buildings
- **Illuminate and empower** end users
- Green must be comfortable and convenient
- Balancing loads between buildings
- Multifunctional building envelopes
- Good **passive** design
- **Imitate** nature
- Community thinking
- Solutions for **energy efficiency** of buildings
- Solutions for **water efficiency**
- Consistency in efficient building **codes and standards**
- **Behavior** change
- Foolproof systems and components
- HVAC – moving from forced air to **hydronics**
- Take **risks**

BE > THINK > INNOVATE >

GRUNDFOS 

Summary

- Sustainability has been a basic value of Grundfos and the Danish culture for many years.
- A common and consistent energy direction with little or no barriers allowed companies like Grundfos to provide innovation and technology leadership.
- Taking risks and being proactive can move energy efficiency activities more quickly towards the desired outcome of reduced energy consumption.



Greg Towsley, LEED AP
(913)227-3400
gtowsley@grundfos.com

BE > THINK > INNOVATE >

GRUNDFOS 