
JAOCC 2009

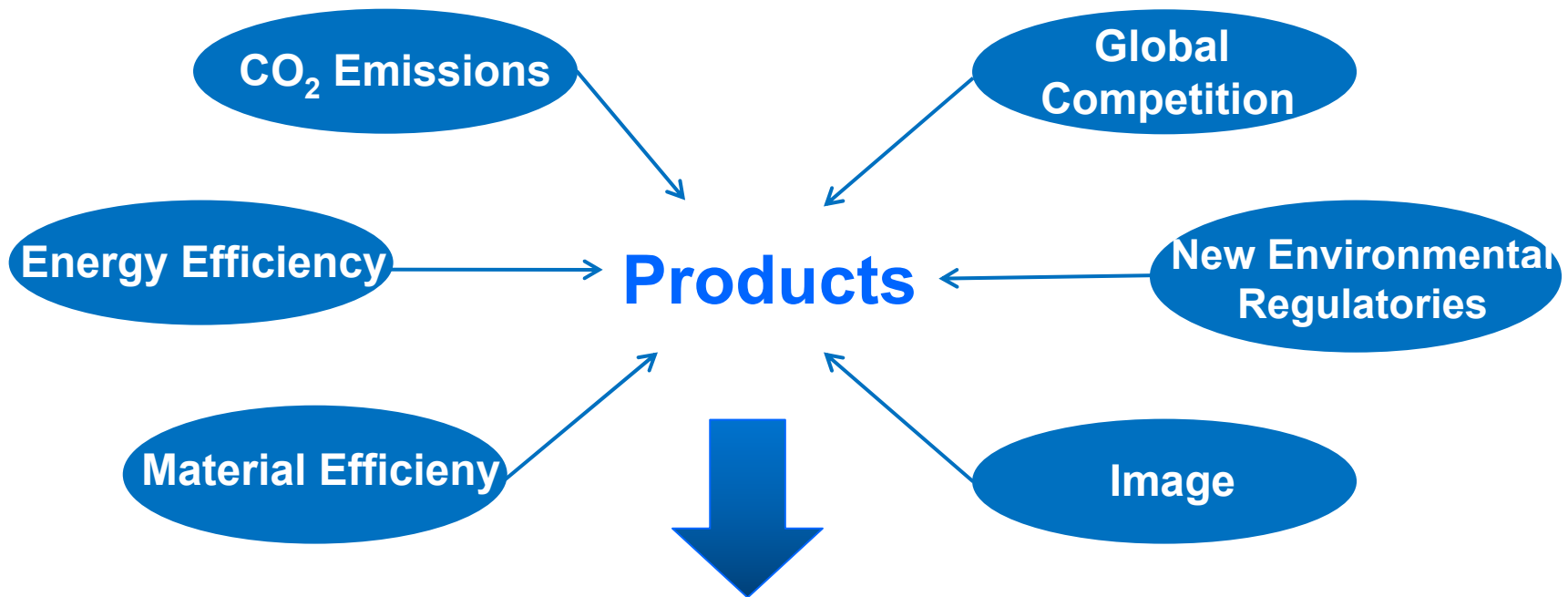
Product-Service Systems: Opportunities to Improve Sustainability

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Aalborg, 10. June 2009



Climate Change and limited natural Resources pose new Challenges to Industry



Product-Service System^{1,2}
– a viable solution?



Product-Service Systems: Opportunities to Improve Sustainability

Product-Service Systems:

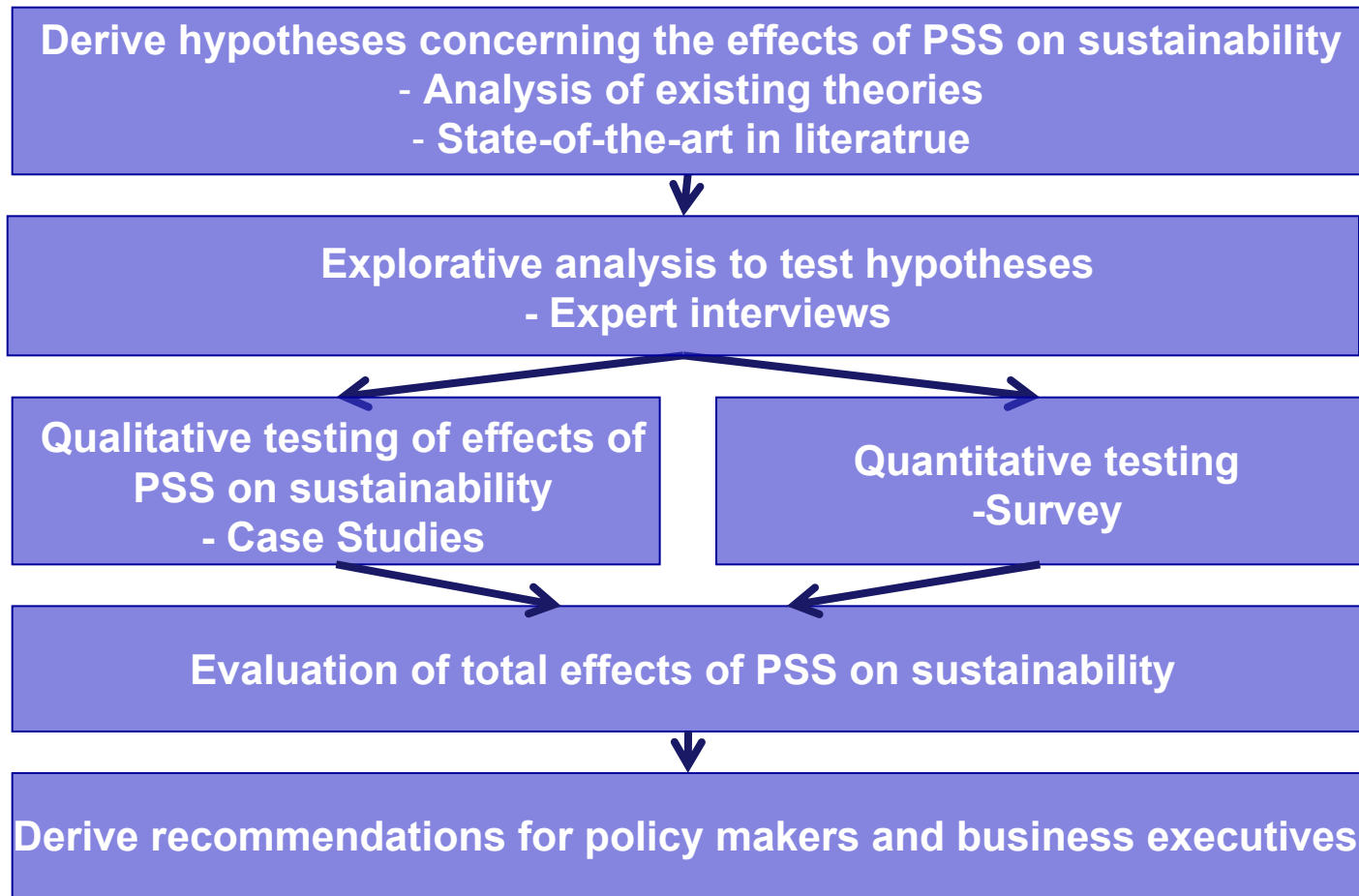
„Original“ definition: A tangible product and intangible service combined in a system to deliver required user functionality in a ~~way that reduces the impact on the environment.~~^{3,4,5}

Research Questions

- Do Product-Service Systems have a positive or negative effect on sustainability?
- What barriers or drivers exist for the implementation of sustainable Product-Service Systems ?
- How does regulation foster possible contributions of Product-Service Systems to sustainability ?



Working Packages: Triangulation Approach^[6]



-> Test Industries: Sewage Treatment, Chemical Industry, Compressor and Machine Tool Building Industry



Methodological Approach



Analysis of Existing Theory

Resourced Based View-> The special resources and competencies of a company are the basis for the creation of a competitive advantage -> Through PSS provider and client can focus on their core competencies. (Burr 2008) [10]

Transaction Cost Theory-> Transaction Costs vary depending on the type of organisation/governance structure -> PSS mitigates and invokes transaction hazards. (Toffel 2008)[8]

Property Rights Theory-> Resources should be kept by the actor which maximise their value. ->Through PSS incentives for the owner are generated to lower information asymmetries and opportunistic behaviour. (Hockerts 2002)[9]



Methodological Approach



Deriving Hypotheses from Theoretical Findings

H1: Product-Service Systems create value for the provider and customer, as both parties could concentrate on their core competencies. ->Resourced-based View

H5: Product-Service Systems offer incentives for the provider to expand the lifetime of his/her products and reduce the consumption of natural resources. -> Property-Rights Theory

H12: Product-Service Systems have positive effects on the number of employees at the providing company and opposite effects at the customer company. ->Intrinsic Service characteristics



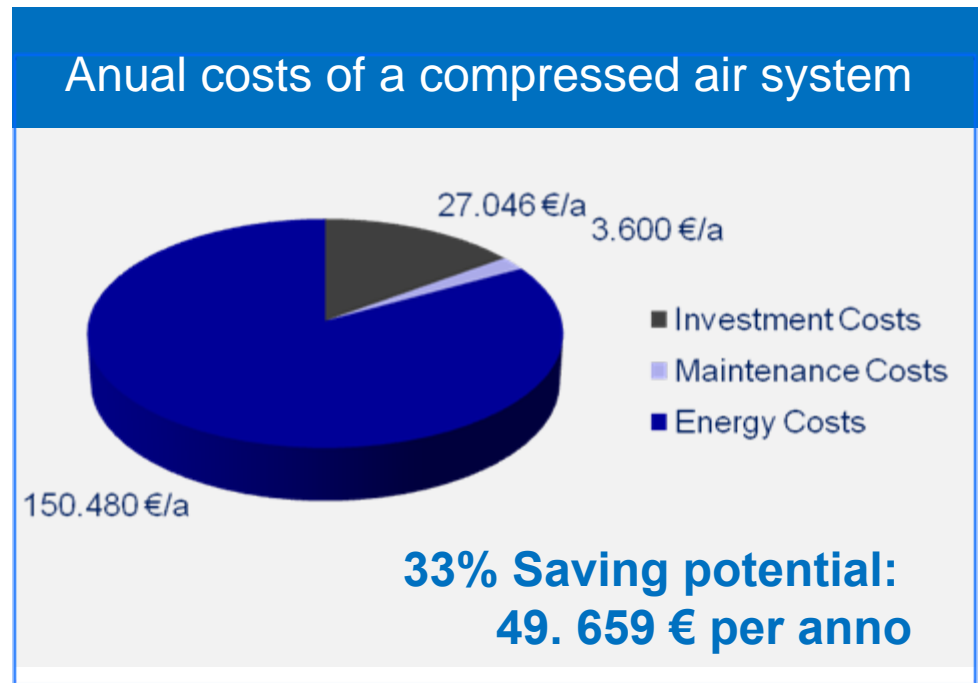
Example: The Compressor Market

Characteristics

➤ Factors determining an efficient generation of compressed air:

- Tailored size of the system
- Tailored construction of the machine.
- Intelligent controlling unit

➤ Volume of energy usage depends on efficiency of used compressor and the interplay and efficiency of the system components



Source: Compressed Air Switzerland (2006) [7]



Example: The Compressor Market

PSS without energy savings as prime goal

Characteristic features		Options				
Operating personnel		Equipment producer	Operating Joint Venture	Third party	Customer	
Maintenance personnel		Equipment producer	Operating Joint Venture	Third party	Customer	
Location		Equipment producer	Third party	"Fence to Fence" to the customer	Customer	
Payment modus		Pay per Unit	Pay per Use (Rent)	Pay for availability	Fixed rate	Pay for equipment
Ownership	During phase of use	Equipment producer	Equipment producer	Equipment producer	Equipment Producer Leasing bank	Customer
	After phase of use				Equip. Producer Leasing bank Customer	
Single/multi customer operation		In parallel operation for multi customer			Operation for a single customer	



Example: The Compressor Market

PSS with energy savings as prime goal

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Single/multi customer operation		In parallel operation for multi customer			Operation for a single customer		



Preliminary Results of the Compressor market

2 Expert
Interviews & 2
Case Studies

H1: Product-Service Systems create value for the provider and customer as both parties could concentrate on their core competences. YES. Only a few producers of components is active in the PSS model, mostly big energy supplying companies are in this market that are outsourcing the production.

H5: Product-Service Systems offer incentives for the provider to expand the lifetime of his/her products and reduce the consumption of natural resources->PSS without energy savings as prime goal: NO, but through the payment per m³ the customer gets an incentive to reduce consumption. PSS with energy savings as prime goal: YES

H12: Product-Service Systems have positive effects on the number of employees at the providing company and opposite effects at the customer company-> Compressed air systems hardly need personnel, but e.g. for block heat station personnel for analyzing monitoring data is needed. YES



Preliminary Results of the Compressor market

- Do Product-Service Systems have a positive or negative effect on sustainability?
 - > PSS without: minor
 - >PSS with: yes
- What barriers or drivers exist for the implementation of sustainable Product-Service Systems ?
 - > PSS with: Contract, Measurement, Monitoring, Reputation, Interest of the Customer
- How does regulation foster possible contributions of Product-Service Systems to sustainability ?
 - >“negative“ influence of International Accounting Rules & Emission Trading Principles(?!)



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Thanks for your attention.

THE END

