

Institute for Economy and the Environment



University of St. Gallen



**Sustainability Management & Innovation:  
Introduction to the Summer Academy Theme**

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oikos Ph.D. Summer Academy 2005  
Urnäsch, August 22, 2005

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## Outline

- 1. Why Innovating for Sustainability ?**
- 2. Some conceptual background: Roadmaps, Goliaths & Davids, Diffusion curves, System change**
- 3. Emerging Davids – the role of entrepreneurship in innovating for sustainability**
- 4. Greening Goliaths: Corporate Venturing in the Energy Industry**
- 5. Ideas for Further Research**

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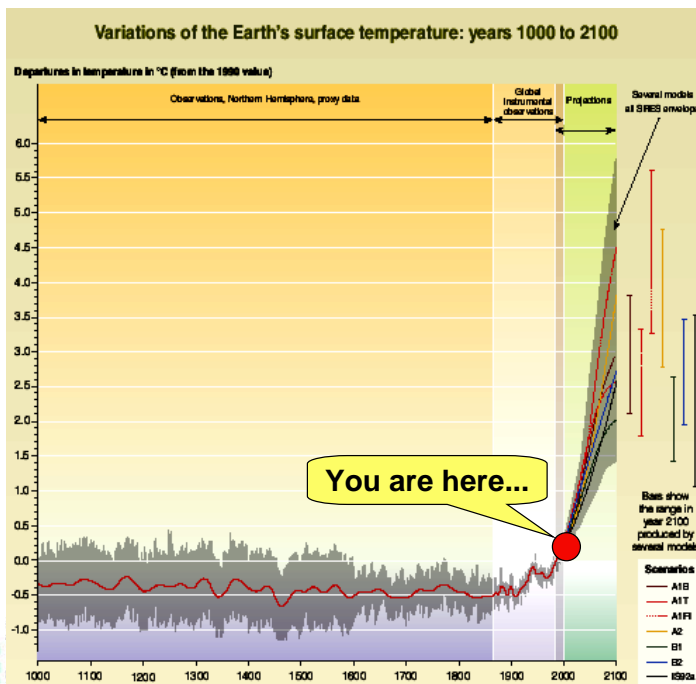
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## Climate Change: The fiction...



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## ...and the Science



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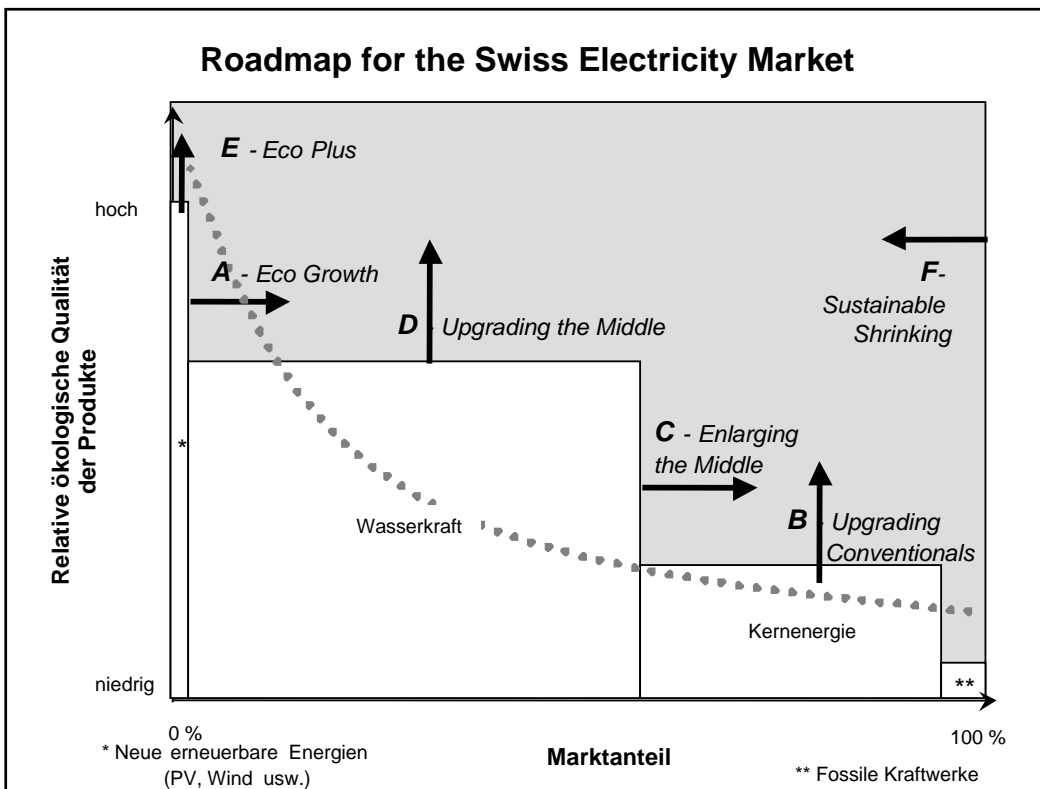
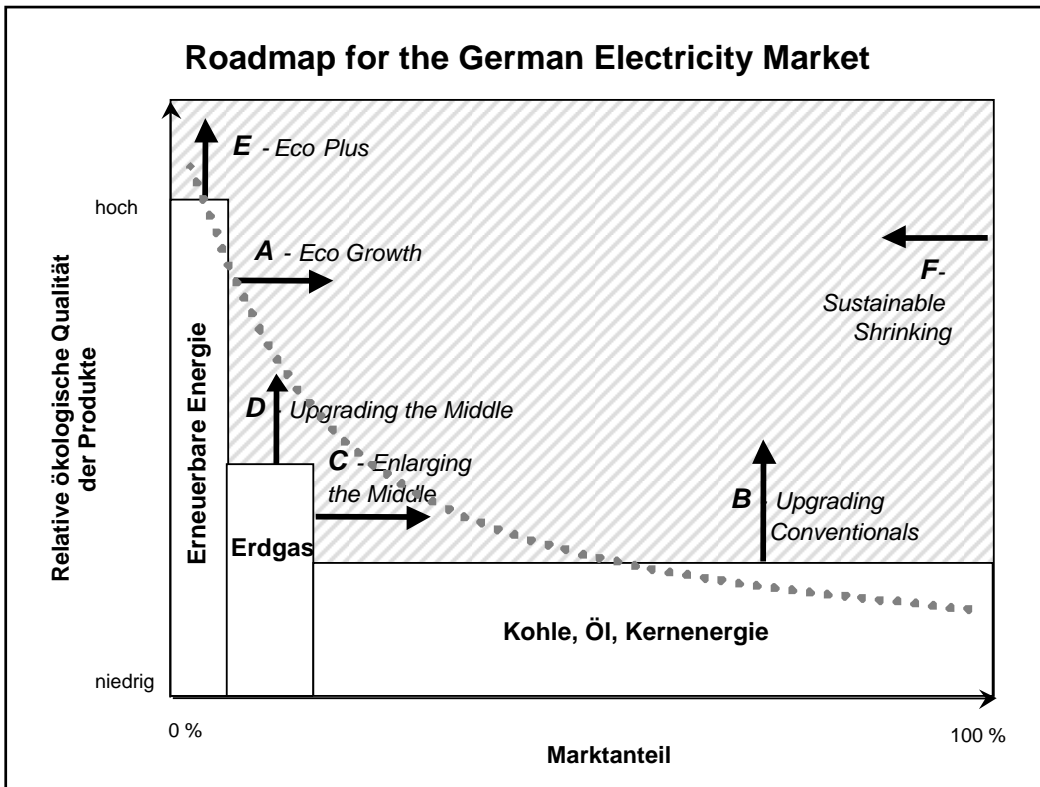
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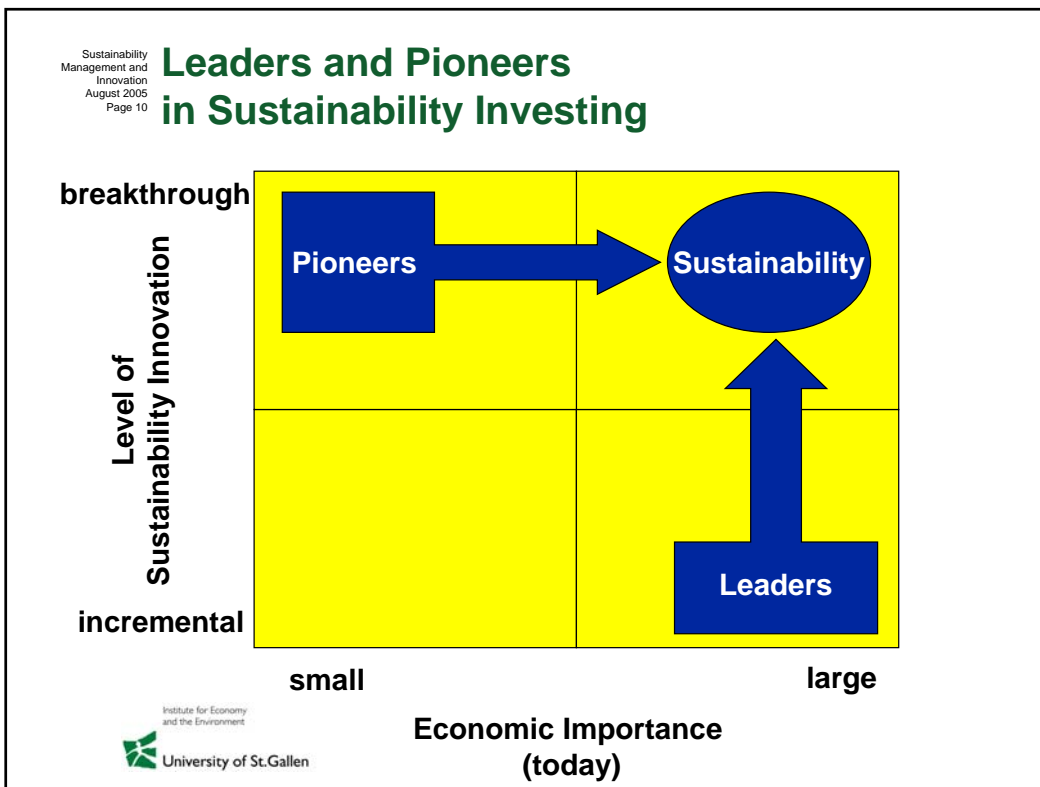
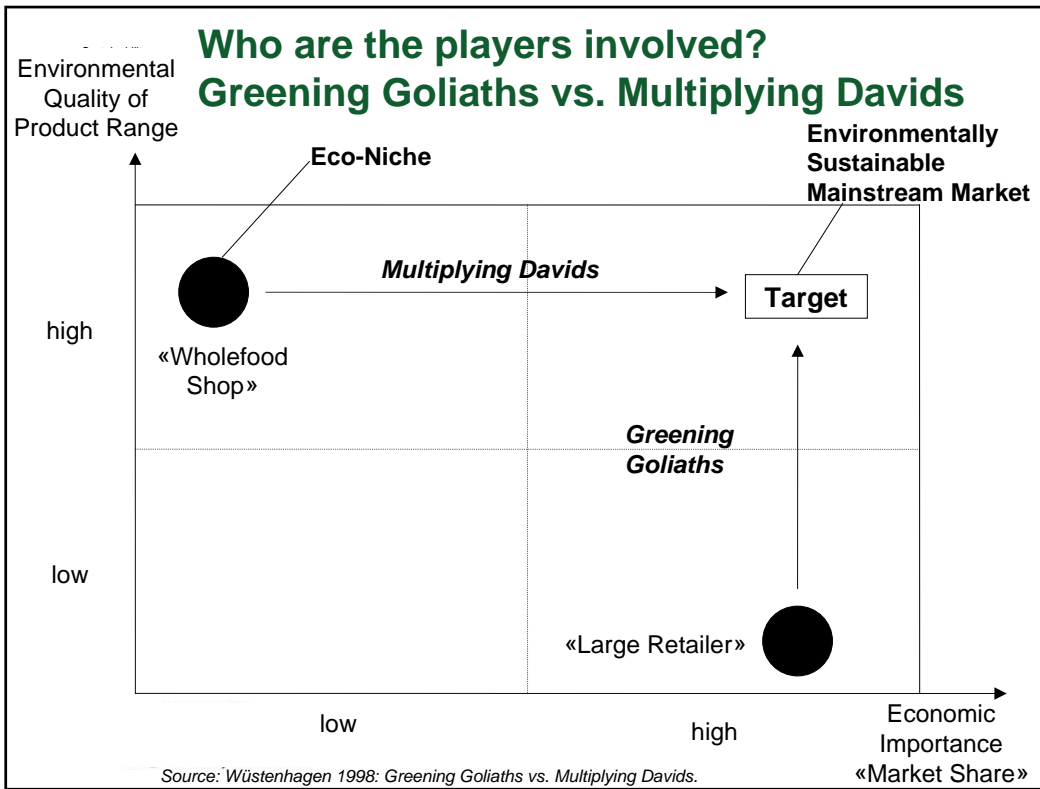
## The Sustainability Challenge on an Industry Level

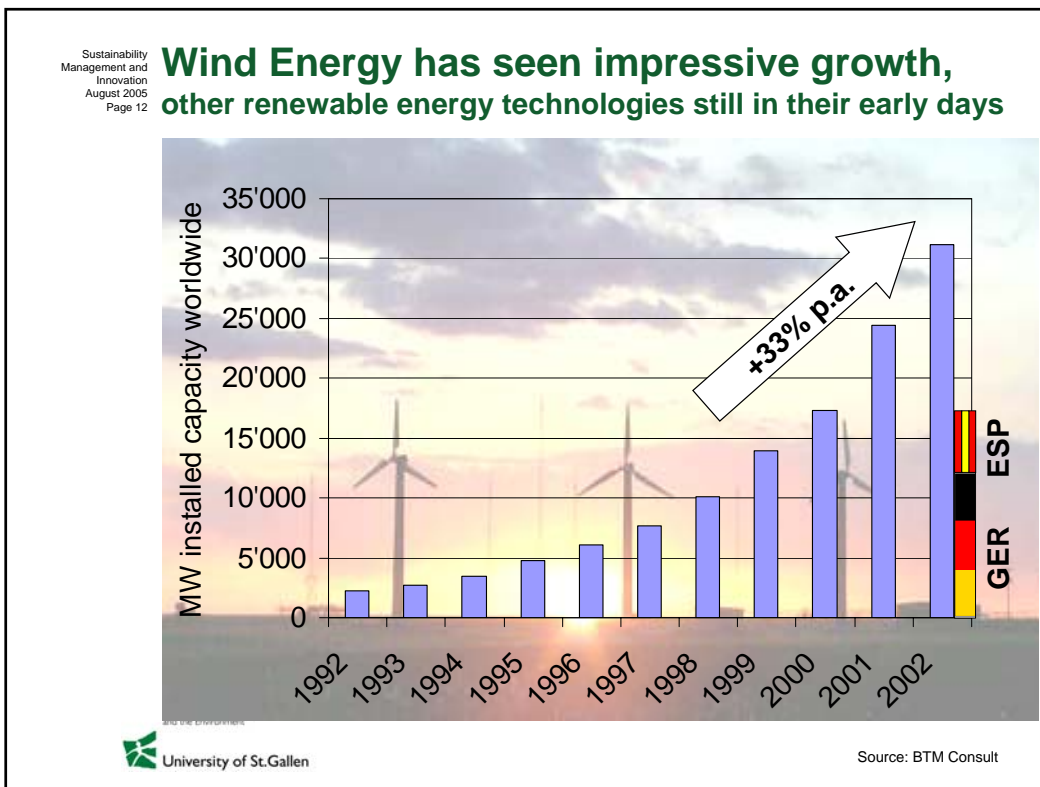
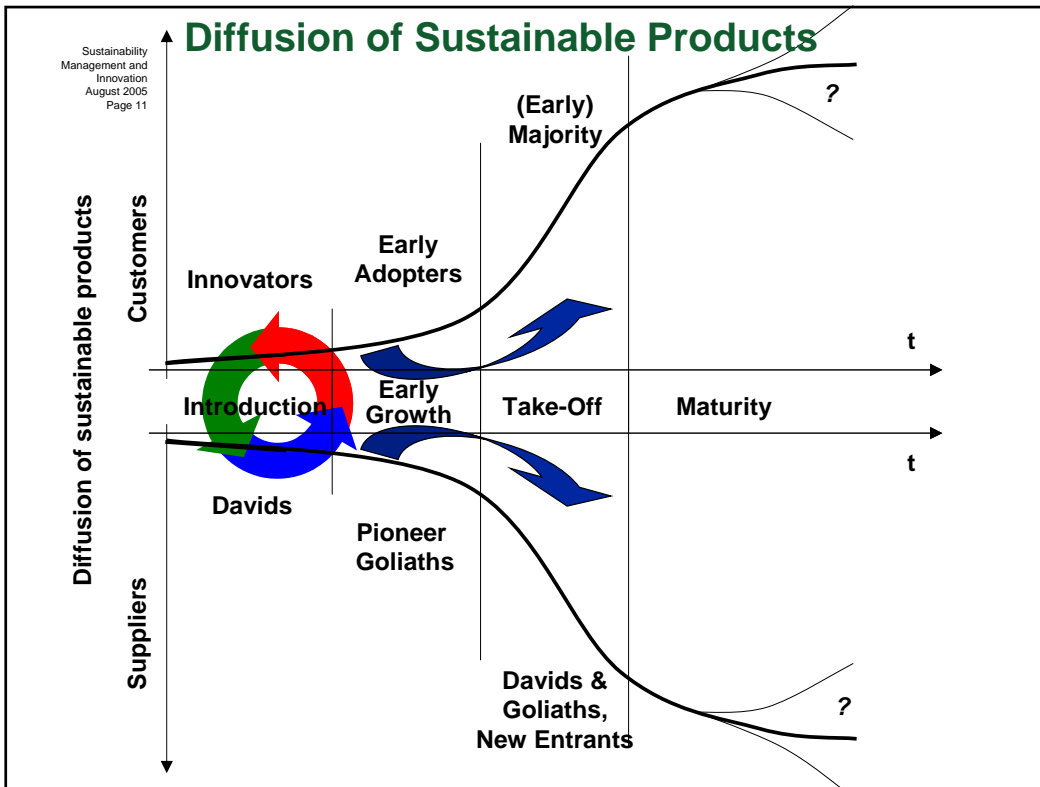
Source: Wüstenhagen/Meyer/Villiger 1999, SAM Sustainability Group

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x-Axis: World primary energy demand by fuel source, Data for 2001 ([www.eia.doe.gov](http://www.eia.doe.gov))  
y-Axis: Subjective estimates, based on GHG, nuclear radiation, social acceptance





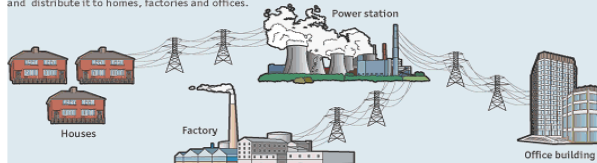


## Sustainable Innovation often involves System Change: The „Energy Internet“

### The shape of grids to come?

#### Conventional electrical grid

Centralised power stations generate electricity and distribute it to homes, factories and offices.

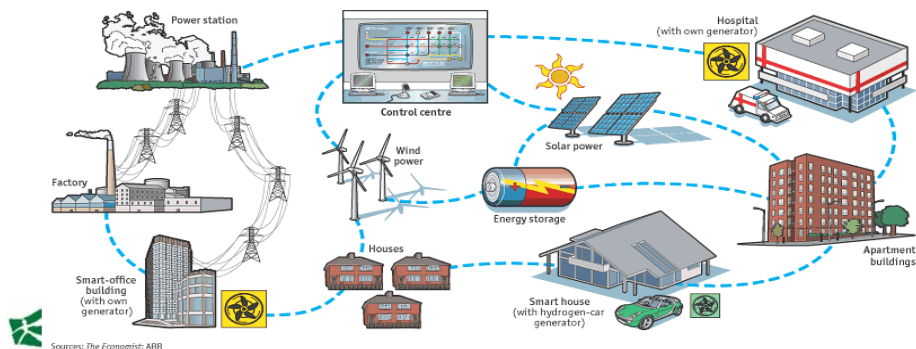


#### Energy internet

Many small generating facilities, including those based on alternative energy sources such as wind and solar power, are orchestrated using real-time monitoring and control systems.

Offices or hospitals generate their own power and sell the excess back to the grid. Hydrogen-powered cars can act as generators when not in use. Energy-storage technologies smooth out fluctuations in supply from wind and solar power.

Distributing power generation in this way reduces transmission losses, operating costs and the environmental impact of overhead power lines.



Sources: The Economist; ABB

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## Who is an entrepreneur (1)?

- William D. Bygrave: „An entrepreneur is someone who perceives an opportunity and creates an organization to pursue it.“

## Who is an entrepreneur (2)?

### “The Alchemist”

[ref: C Handy. “The elephant and the flea” ]

- A person that creates something out of nothing - the creative leader of the enterprise
  - Combines creativity with efficiency
  - Wants to shape events – not react to them
  - Has PASSION for what they are doing & the conviction that what they are doing is important to the extent that it justifies and defines their life
  - Ability to leap beyond the rational and the logical and stick with their dream
  - Doggedness – even arrogance to hold a dream against the evidence
  - A “third eye” – an ability to look at things differently

## Famous Examples of “Alchemists”

People whose identity is inextricably tied up with their project

- Henry Ford – motor cars
- Walt Disney – films
- Hewlett Packard
- Michael Dell - computers
- Virgin – Richard Branson
- Body Shop International - Anita Roddick
- WalMart

## Environmental Entrepreneurship

- Environmental Entrepreneurship, Ecopreneurship, Enviro-capitalism, Green Entrepreneurship, Green Venturing
- Bennett (Ecopreneuring, 1991), Berle (Green entrepreneur, 1991), Anderson/Leal (Environmentalism, 1991), Einsmann (Environment, 1992)
- Anderson/Leal (Enviro-Capitalists, 1997), Isaak (Ecopreneurship, 1998), Hockerts (Sustainability Innovations, 2003), Schönwandt (forthcoming)
- Menon/Menon (Enviropreneurial Marketing, 1997), Hartmann/Stafford (Enviropreneurial strategies, 1998), Schuyler (Merging, 1998), Larson (Sustainable innovation, 2000), Farrow/Johnson/Larson (Entrepreneurship, 2000), Larson/Teisberg/Johnson (Sustainable business, 2000), Adeoti (Small enterprise, 2000), Kyrö (To grow, 2001)
- Special issues of the Journal of Organizational Change Management (1-2/1998) and Greener Management International (38/2002) on Environmental Entrepreneurship.

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## Social Entrepreneurship

Deutsche Bank Microcredit Development Fund



- A stream of research (and practice) that deals with entrepreneurs who achieve socially desirable targets, often in – but not limited to – developing countries.
- Examples: Mobile phone services in villages in Bangladesh, PC training for kids in Brazil, ...
- Financing angle: Microfinance, Microcredit
- Schwab Foundation – Social Entrepreneur Summit

Deutsche Bank 

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## Sustainable Entrepreneurship

- **Sustainable Entrepreneurship is a process including the actions and functions related to the recognition, creation and exploitation of market opportunities and the creation of organizations to pursue them, whereby the market opportunity and the design of the organisation correspond to the concept of sustainable development.**

(C. Schönwandt: „Sustainable Entrepreneurship in the Renewable Energy Sector“, PhD Thesis, Univ. Kassel, forthcoming)

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## Two concepts of sustainable entrepreneurship

- Focus on the core technology or product
  - Clusters of key sustainable technologies, such as renewable energy, materials, food, water, transport
  - „What does the company do?“



- Focus on the „sustainable small enterprise“
  - Project Start-up-to-Sustain, University of Kassel/BMBF
  - „How does the company do what it does?“

## Example of sustainable entrepreneurship in the energy sector: Ocean Power Delivery Ltd.

- An “Alchemist” as founder and MD
- A skilled team with Passion
- Strong product/engineering skills
- Legislatively driven market for more renewables in own country [and others]
- Strong and supportive VC investors
- An acknowledgment of the fundamental importance of the commercialisation process
- BUT – a lot of work and many challenges to develop the market and a proven cost competitive product



Full-scale  
Length: 150m  
Diameter: 3.5m  
Rating: 750kW

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## Action and Motives of Sustainable Entrepreneurs in Renewable Energy Sector

Common features with entrepreneurs in general

Differences to „sustainability administrators“

Differences to entrepreneurs in general

**Driven by entrepreneurial spirit, creativity**

- Preference for freedom and independence
- Importance of Ideas and their realization
- Stress resistance
- Often high personal risk

**Fun**  
They are passionate about their job

**High importance of Sustainability**


- Activity in sector partly coincidence, partly planned
- Conviction resulting from / reinforced by „diving into“ the entrepreneurial activity
- Personal importance of sustainability and responsibility
- Integration of economic, environmental & social aspects with little perception of contradictions

Source: C. Schönwandt „Sustainable Entrepreneurship in the Renewable Energy Sector“, PhD Thesis, Univ. Kassel, forthcoming

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## Corporate Venturing: Ways for Large Organizations to address the Entrepreneurship Challenge

**Presence of Investment Intermediation**

Direct Investment in the Venture through the Corporation's Operating or Strategic Budgets      Indirect Investment in the Venture Using Financial Intermediaries

<b>Focus of Entrepreneurship</b>	Internal to the Corporation	a) Direct-Internal Venturing	b) Indirect-Internal Venturing
	External to the Corporation	c) Direct-External Venturing	d) Indirect-External Venturing

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Miles & Covin (2002)

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## Corporate Venturing: Striking a Balance between Synergies and Innovation

**CV Model**      Strong ties with parent co.      ?      ?      ?      Loose ties with parent co.

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## Issues for Further Research (1 - David): Sustainable Entrepreneurship

- What motivates sustainable entrepreneurs?
- How do individuals and organisations cope with the transition from idealistic start-up to commercial venture?
- Who finances sustainable entrepreneurs and why? What are barriers and driving forces on the market for sustainable („cleantech“) venture capital?
- How can government policies for Sustainable Development be designed in a way that benefits entrepreneurs rather than incumbents (e.g. emissions trading)?
- Where do sustainability ventures recruit their staff and what kinds of transitions do these people have to go through?
- How can universities support sustainable entrepreneurship (rather than supply the Goliath market)?



## Issues for Further Research (2 - Goliath): Corporate Venturing for Sustainable Energy

- Differences and similarities between different types of energy companies and their approach to sustainability innovation:
  - Electric utilities vs.
  - Oil Companies vs.
  - Equipment Manufacturers vs.
  - Others
- Company culture vs. CV approach:
  - GE vs. Siemens
- Managing the corporate venturing portfolio:
  - combining in-/external, direct/indirect CV activities
- Managing the parent co. – venture interface:
  - Profile of CV managers
  - Defining the right objectives and governance structure



## Issues for Further Research (3): Regulation and Governance (fka „Policy“)

- What are governance mechanisms that work in a globalized world?
- What is the relative importance of „Davids“ and „Goliaths“ in transforming markets towards more sustainability?
- What is the role of the financial sector in transforming markets towards more (or less) sustainability?
- Is mankind able to adapt at all?



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**Thank you!**

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