Social Acceptance of Renewable Energy Innovations

Low Carbon Societies
Stakeholder Seminar EU Roadmap

October 26, 2011 Brussels, Belgium

Nina Hampl
University of St. Gallen
Research Associate at the Good Energies
Chair for Management of Renewable Energies
Institute for Economy and the Environment (IWÖ-HSG)
St. Gallen, Switzerland
nina.hampl@unisg.ch

Low Carbon Societies Network

http://www.lowcarbon-societies.eu/

Institute for Economy and the Environment

University of St.Gallen

Social Acceptance of Renewable Energy Innovations

Nina Hampl
University of St. Gallen
Research Associate at the Good Energies
Chair for Management of Renewable Energies
Institute for Economy and the Environment (IWÖ-HSG)
St. Gallen, Switzerland
nina.hampl@unisg.ch

Stakeholder Seminar EU Roadmap 2050

Good Energies Chair for Management of Renewable Energies at the University of St. Gallen

- Established in 2009 (Chair: Prof. Dr. Rolf Wüstenhagen)
- Part of one of Europe's leading business universities
- Dedicated team (10-15 people)
- 30+ Bachelor/Master Theses, ≈ 3-4 PhD dissertations p.a.
- Research and teaching on...
  - Investment Decisions and Venture Capital
  - Consumer Decisions and Marketing
  - Business Models for Renewable Energies
  - Energy Policy
- Annual Forum and Diploma of Advanced Studies in Renewable Energy Management (REM-HSG)

Agenda

1. EU Roadmap 2050 & Current State of RES
2. Social Acceptance of RES Investments
3. Conclusion

Agenda

1. **EU Roadmap 2050 & Current State of RES**
2. Social Acceptance of RES Investments
3. Conclusion

EU Roadmap 2050
…on clean energy targets

- **Electricity will play a central role** in the low carbon economy

- Analysis shows that **electricity can almost totally eliminate CO_2 emissions (-93 – 99%) by 2050 in the EU,** and offers the prospect of partially replacing fossil fuels in transport and heating

- **Share of low carbon technologies in the EU electricity mix from 45% today to**
  - around 60% in 2020
  - 75 to 80% in 2030, and
  - nearly 100% in 2050

Source: EU Roadmap 2050, EU Commission (2011)

EU Roadmap 2050
…on investments in a low carbon future

- On average **additional public and private investments amount to approx. EUR 270 bn p.a.*** over the next 40 years in the EU
  - additional 1.5% of EU GDP p.a. on top of overall current investment (e.g. 19% of GDP in 2009)
  - **power sector only:** EUR 30 bn p.a. (approx. 11%)

- **Major challenge:**
  - **Unlocking the investment potential of the private sector and individual consumers!**

* Various forms of low carbon energy sources, their supporting systems and infrastructure, incl. smart grids, passive housing, CCS, advanced industrial processes and electrification of transport (incl. energy storage technologies)

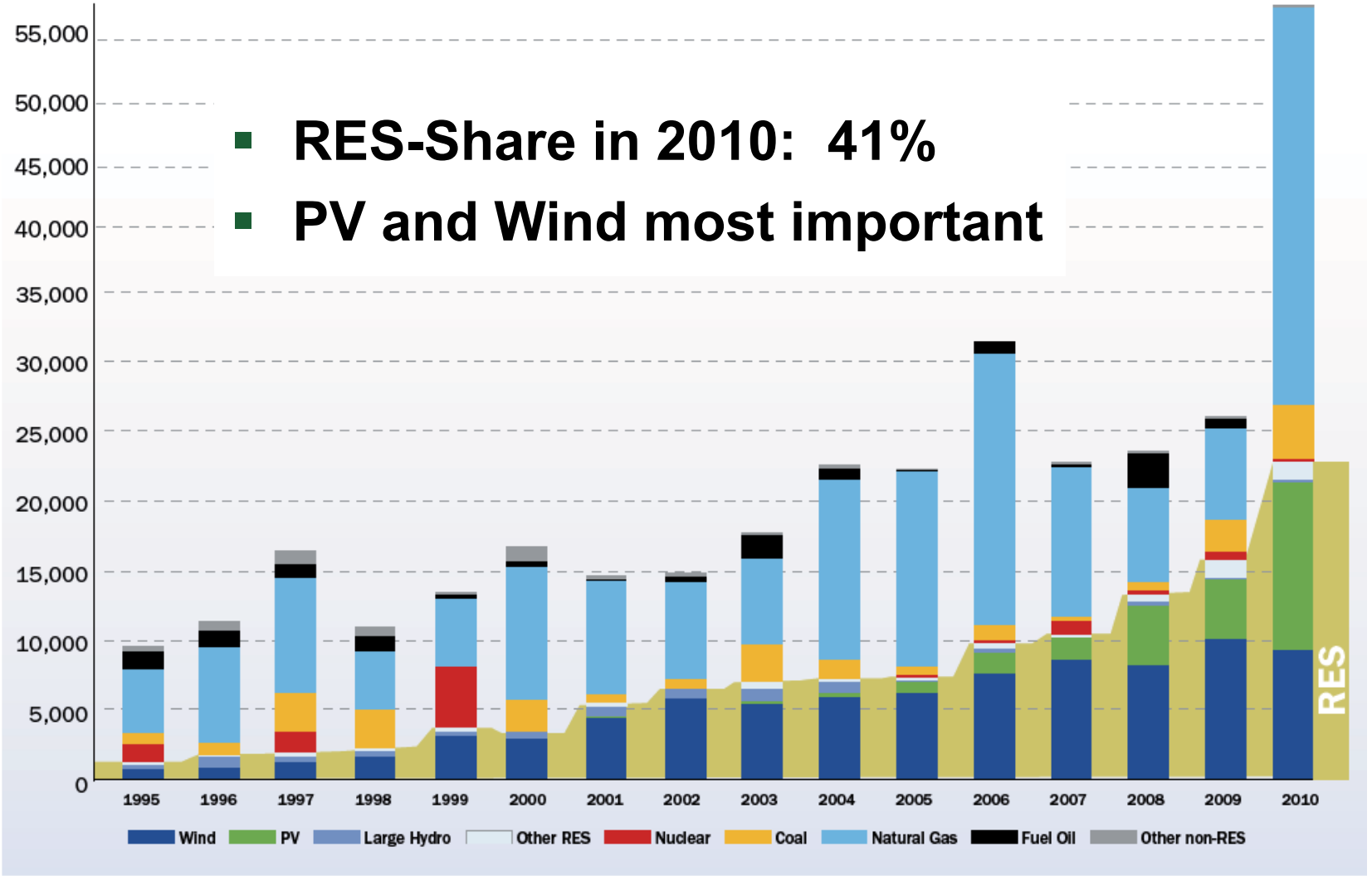
Source: EU Roadmap 2050, EU Commission (2011)

EU Roadmap 2050
…two questions remain…

- **What are the most important renewable energy technologies (today)?**

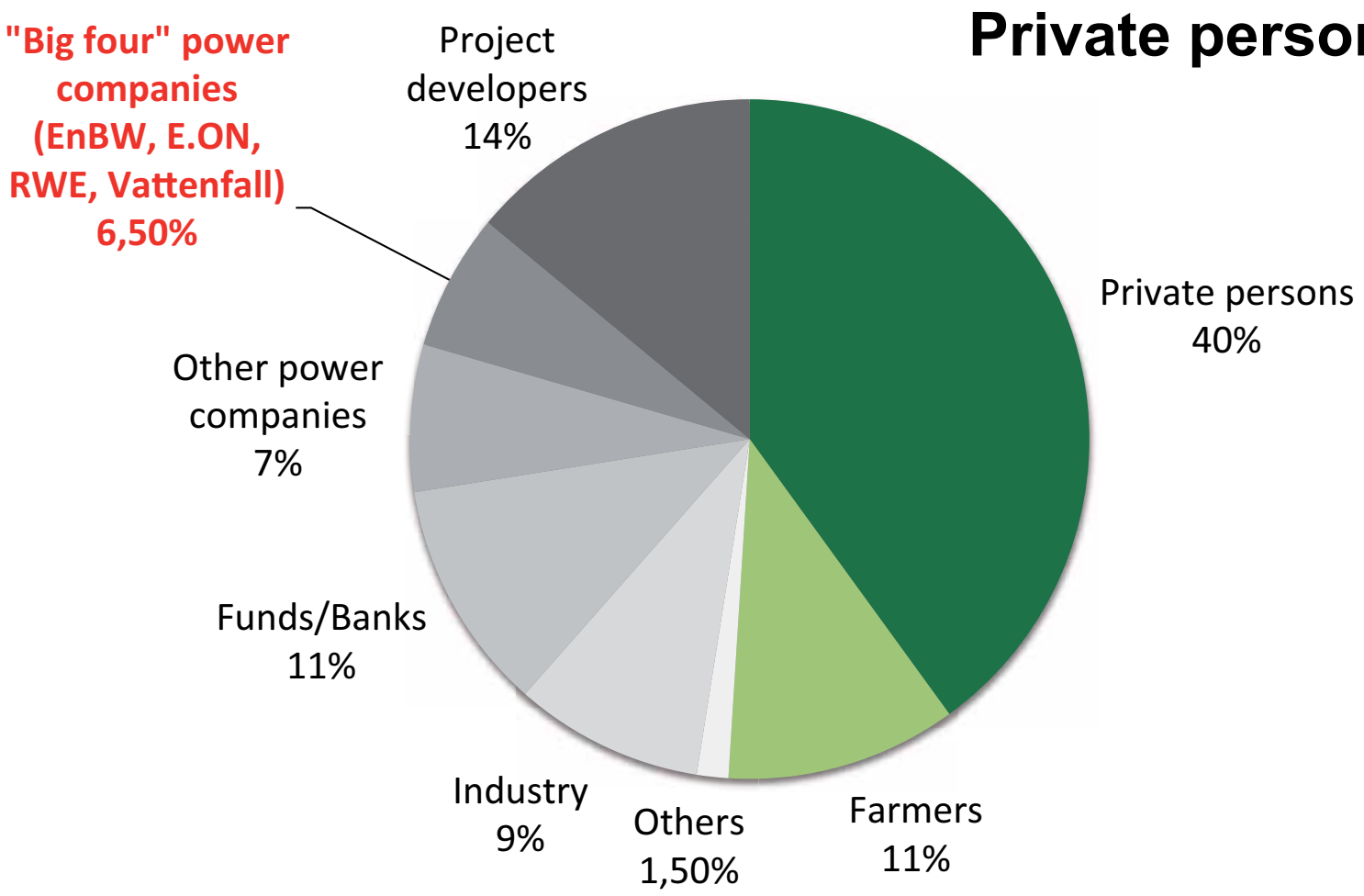
- **What does "private sector" exactly mean? Who is this?**

Newly installed power generation capacities per energy technology and per years in MW in the EU



Source: EWEA Annual Statistics (2011)

Investor structure for total RES in Germany 2010 (53 GW) …renewable energies in “private hands”



Source: trend research (10/2011)

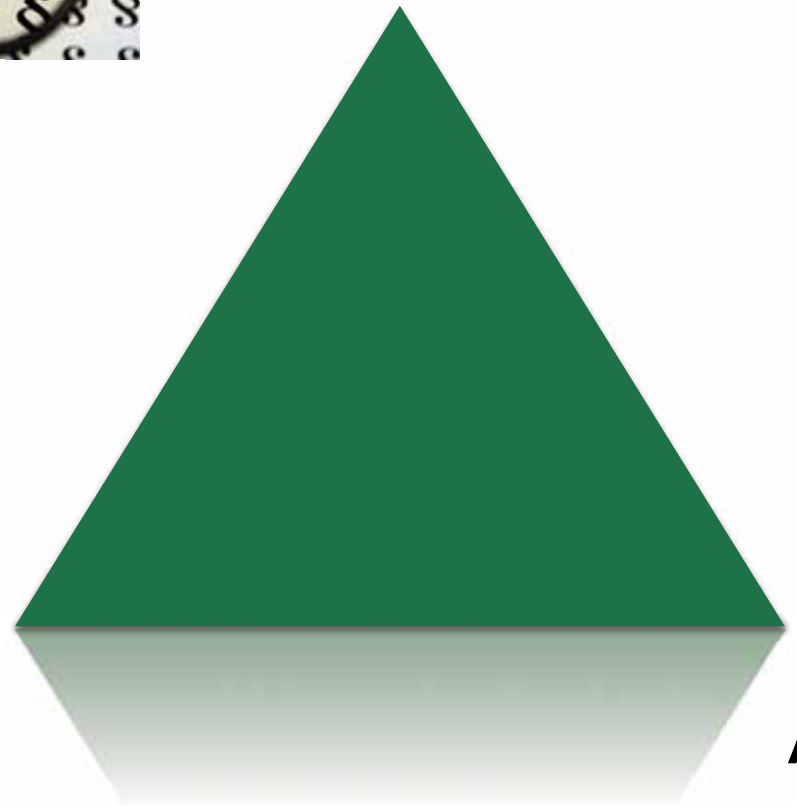
Agenda

1. EU Roadmap 2050 & Current State of RES
2. **Social Acceptance of RES Investments**
3. Conclusion

Social acceptance triangle of renewable energy innovation (Wüstenhagen et al., 2007)

Socio-political Acceptance

Community Acceptance



Market Acceptance

Source: Wüstenhagen, Wolsink & Bürer (2007)

Social acceptance triangle of renewable energy innovation (Wüstenhagen et al., 2007)

Socio-political Acceptance

Potential area of conflict!

Community Acceptance

Market Acceptance

- **Consumers**
- **Investors**

Source: Wüstenhagen, Wolsink & Bürer (2007)


Consumers

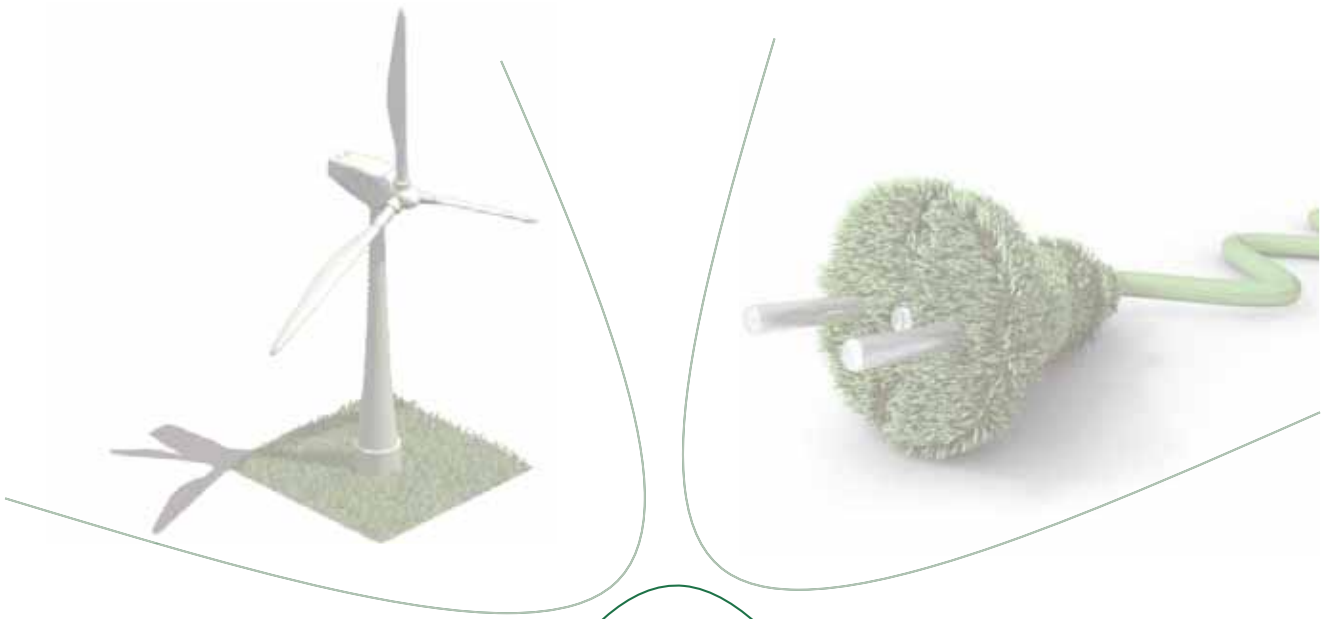
Three possibilities how consumers can engage in renewable energies

Large-scale RES power plants, e.g. wind parks

Green electricity

Small-scale RES power plants, e.g. residential PV

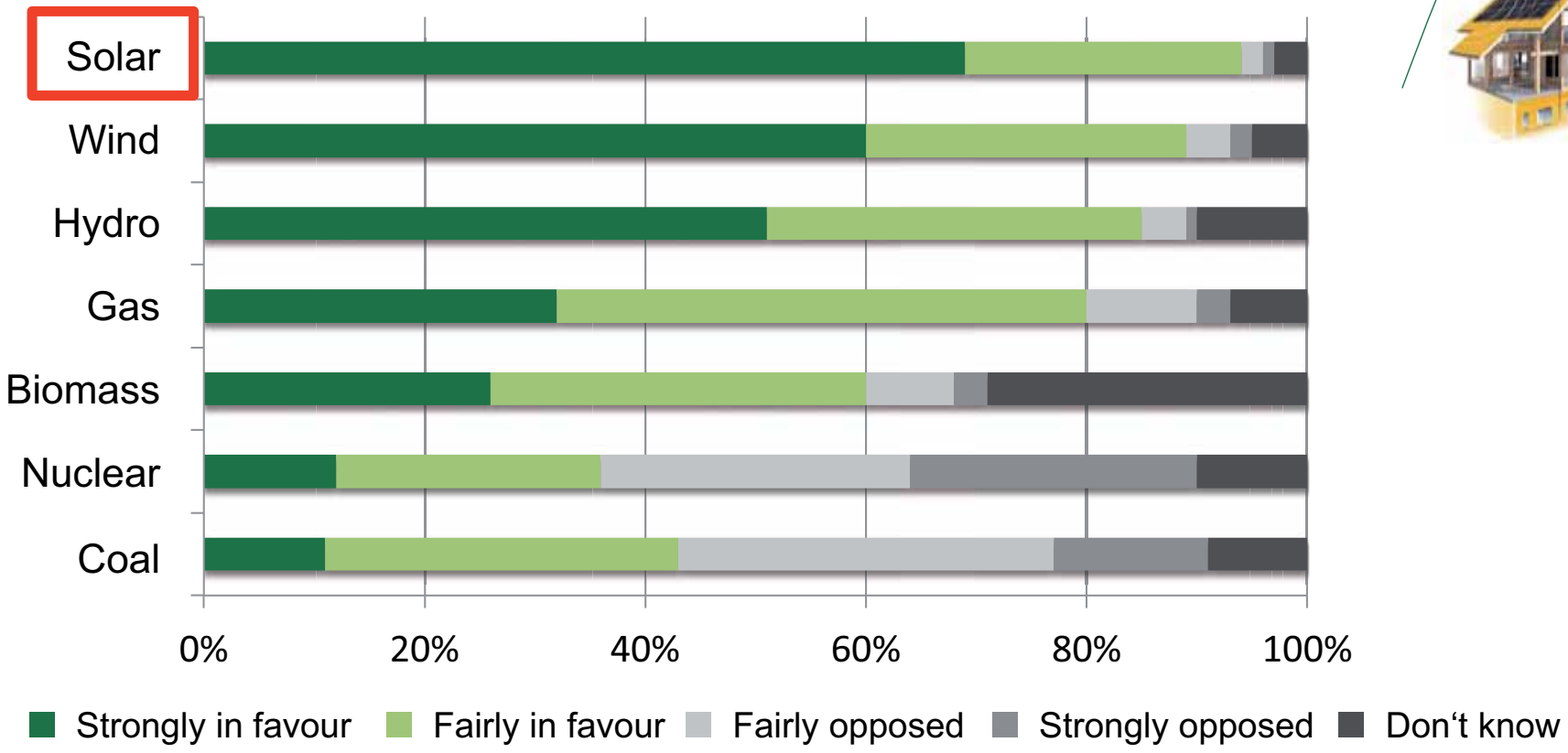
Three possibilities how consumers can engage in renewable energies



Small-scale RES power plants, e.g. residential PV

The puzzle about consumers – Problem (1)

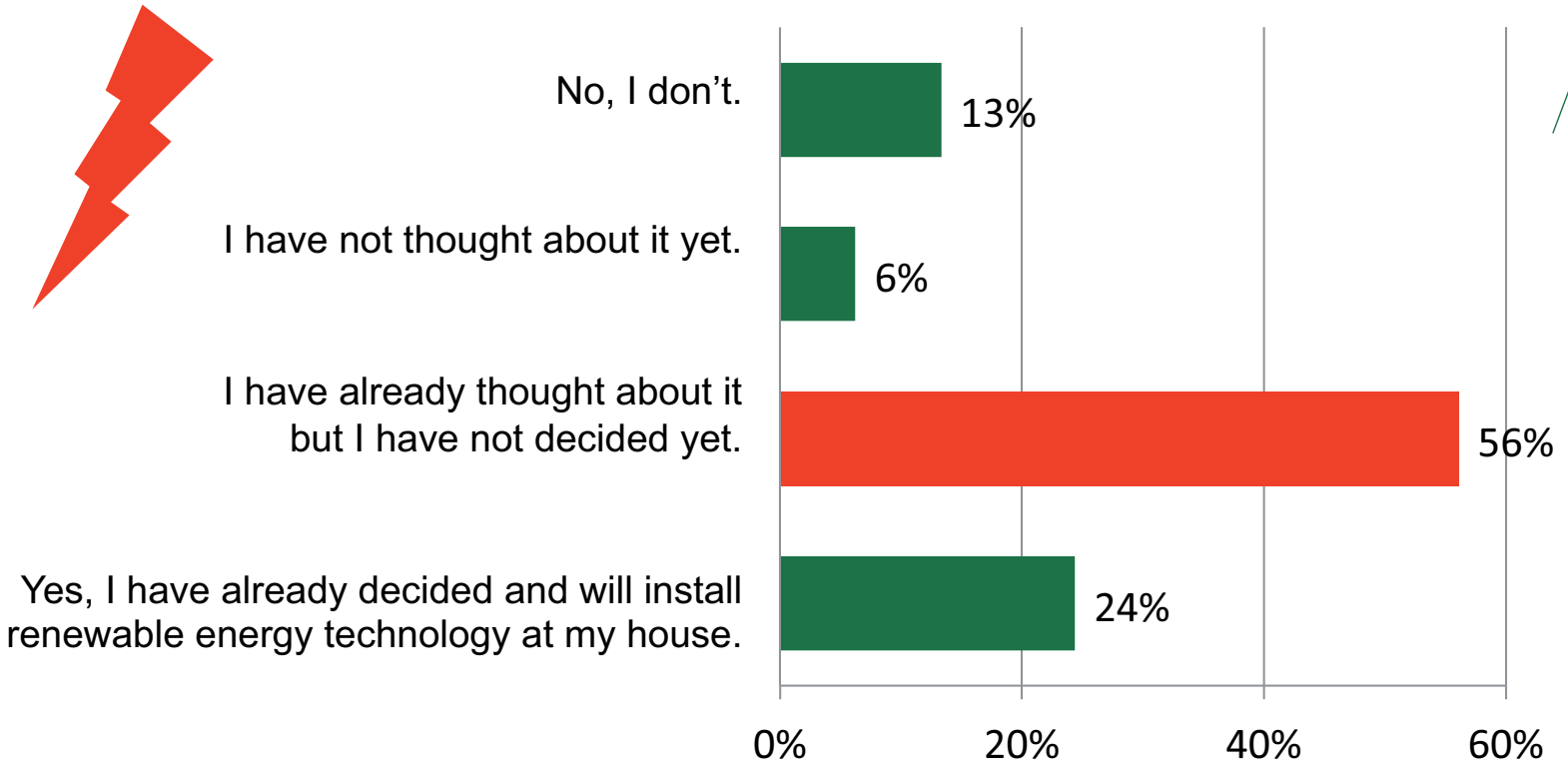
"To what extent are you in favour of or opposed to the use of the following sources of energy in (OUR COUNTRY)?"



Source: Eurobarometer 2011 (N=13,091; Survey from February 2011)

The puzzle about consumers – Problem (2)

“Do you plan to install renewable energy technology at your home“



Percentage of respondents (non-RES user only)

Source: IWÖ-HSG/Uni Halle/BMU (N=353; Survey from 2010)

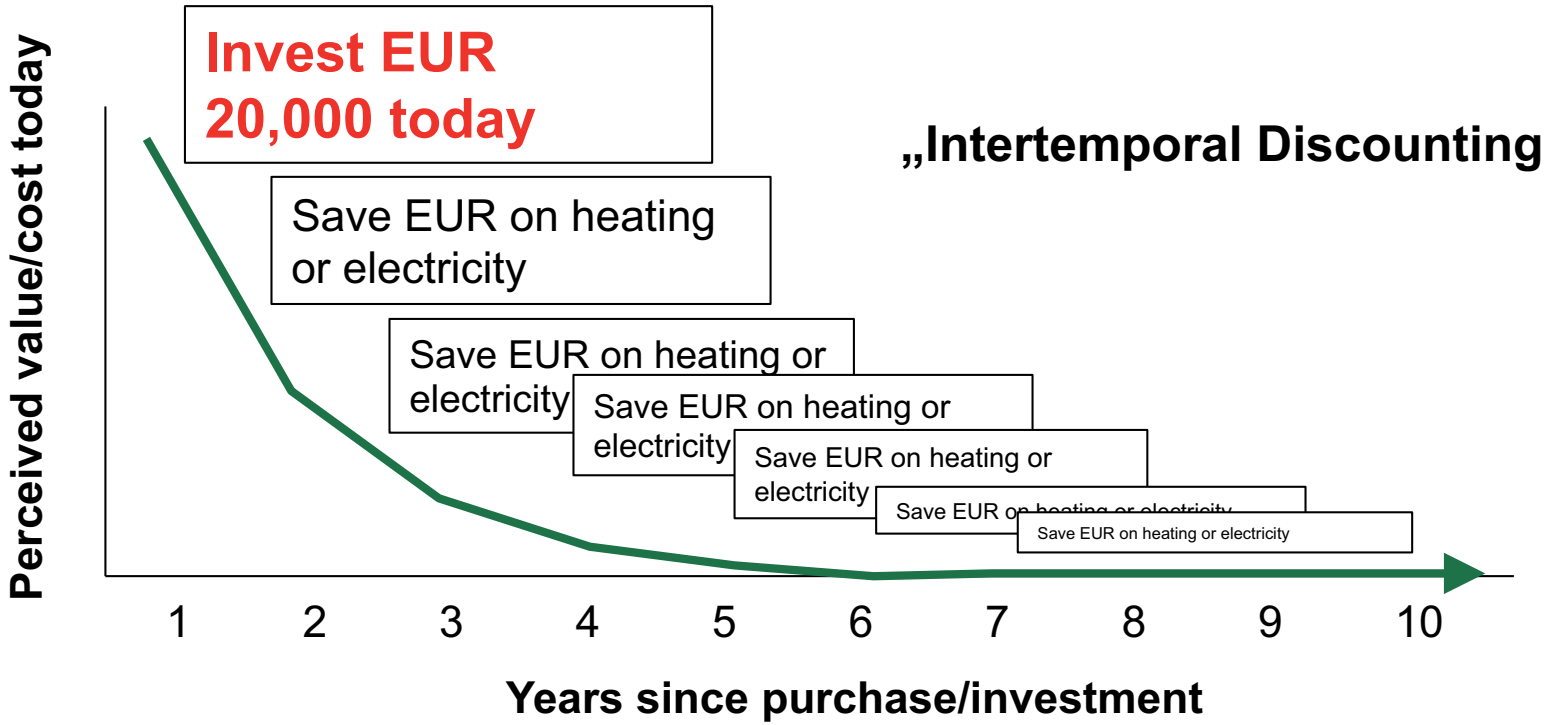
The puzzle about consumers – Problem (3)

“What are the barriers for an investment in RES?“

Source: IWÖ-HSG/BAER-Project (N=303; Survey Feb. 2011)

The puzzle about consumers – Solution (1)

Barrier: “No financial resources”



„Intertemporal Discounting“

Source: Loewenstein and Prelec (1992): „Anomalies in Intertemporal Choice“

The puzzle about consumers – Solution (2)

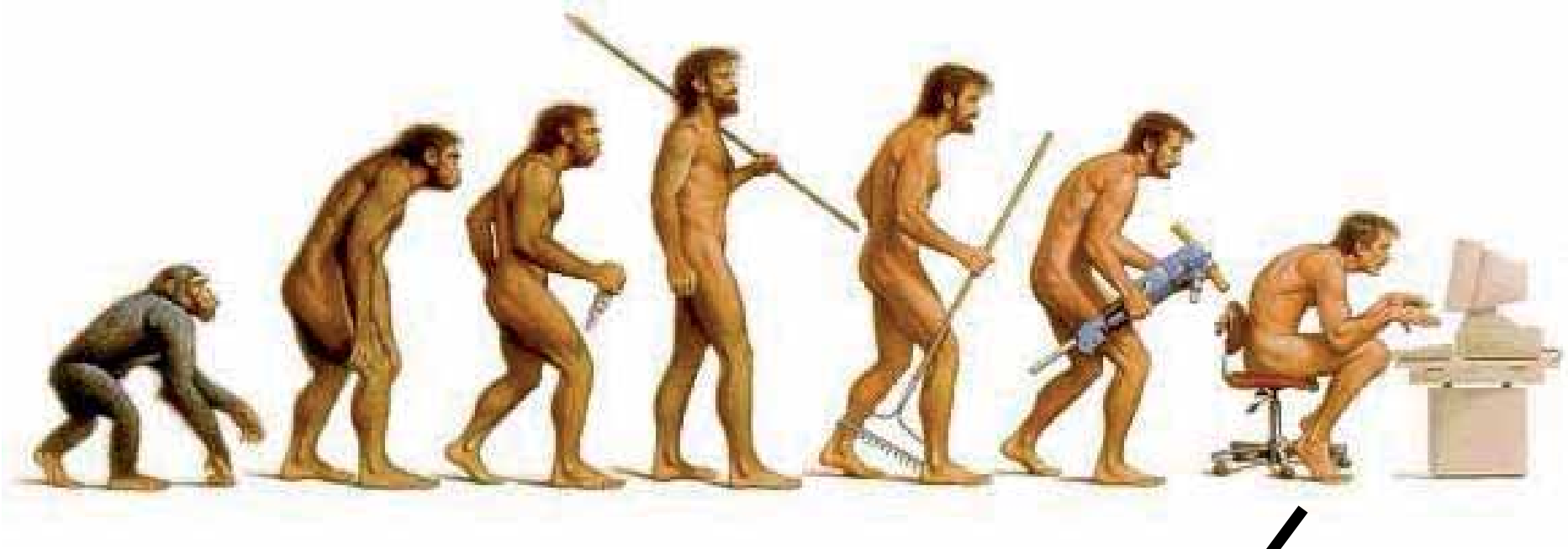
- **Costs are perceived to be less if amounts are smaller**
  - e.g. daily payment of EUR 1 over a whole year is preferred over a lump sum of EUR 365

- **Possible approach to solve problem:** new financing models e.g. solar leasing (residential PV or solar thermal)
  - Leasing contract with monthly payments over a period of 10 to 20 years
  - PV system remains in ownership of firm

Source: Gourville (1998): „Pennies a Day“

Investors

Homo oeconomicus?



Fully rational utility maximiser?

Source: von Neumann and Morgenstern (1944)

Example:
How Venture Capitalists perceive policy support in RES

"If there is no clear need for the government, let them stay out of the way."

– VC quote from Wüstenhagen & Teppo, 2006

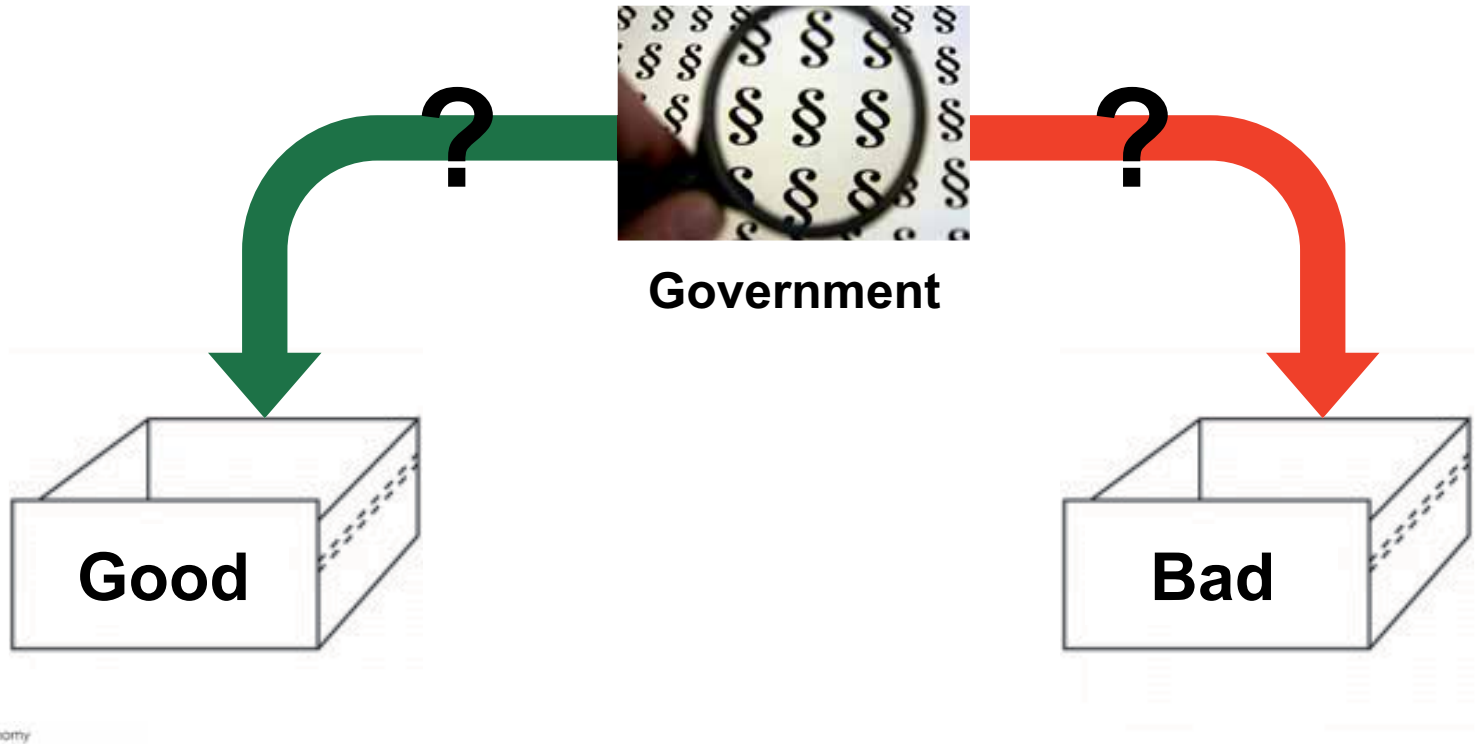
Institute for Economy and the Environment
University of St.Gallen

Source: Wüstenhagen and Teppo (2006)

Evidence for a “policy aversion bias”?

“Affect Heuristic”

(“Classify an object as ‘good’ or ‘bad’ before cognitive processes begin”)



Source: Slovic et al. (2002)

Evidence for a "policy aversion bias"…in VC decisions

Dep. Var.: Clean energy deals passed to due diligence	regression output	marginal effects
General experience as venture investor	0.090	0.076
Experience as venture investor in clean energy industry	0.079	0.067
Age	-0.065	-0.055
US / UK	0.423	0.356
Number of employees	0.003	0.003
Number of partners	0.117	0.099
Number of funds	-0.211***	-0.178***
Strongly policy averse	**-2.152*** **	**-1.812*** **
Policy averse	-1.363	-1.149
Constant	21.099***	
Observations	112	

Source: Chassot, Hampl and Wüstenhagen (2011)

Other Examples for behavioural or social phenomena…

Swiss PV project market:

- First investigation shows that **number and location** of realized projects can **only partly** be explained by **attractiveness of prevailing support system** and administrative processes

  → **"home equity bias"?** (Lewis, 1999): "individuals tend to hold too little of their wealth in foreign assets"

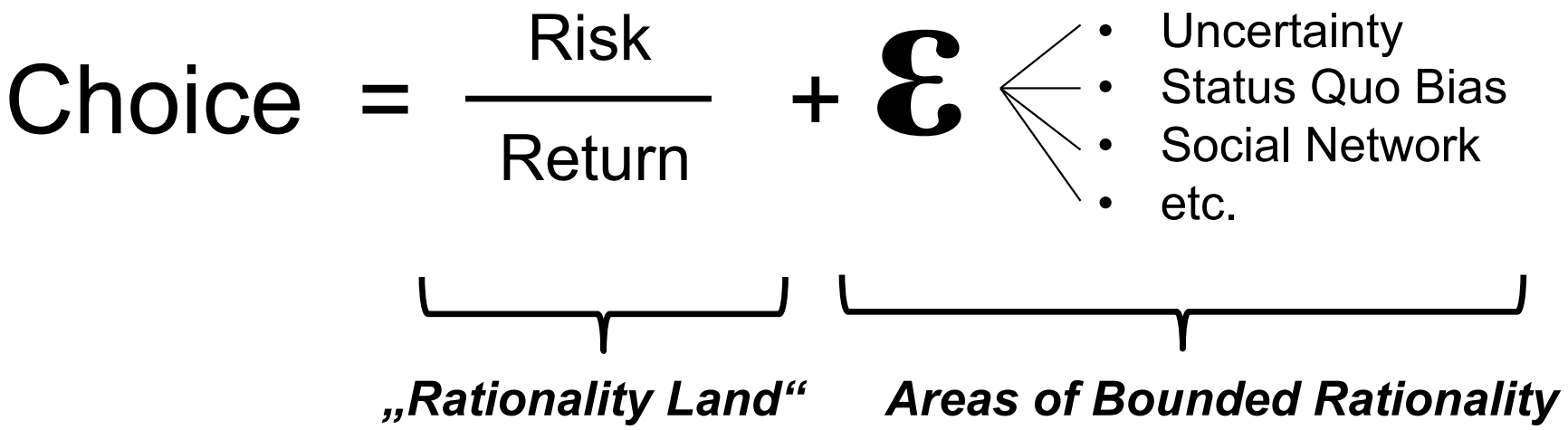
European/international energy market:

- Empirical evidence shows that **some energy companies are faster in adapting to new challenges** in the market than others

  → **"social embededdness"?** (Granovetter, 1973, 1985)

Source: Lewis (1999); Granovetter (1973, 1985)

A more realistic model of economic choice under uncertainty – e.g. the case for renewable energy



Source: Wüstenhagen (2011)

Agenda

1. EU Roadmap 2050 & Current State of RES
2. Social Acceptance of RES Investments
3. **Conclusion**

Conclusion

- In order to achieve a **low carbon future** according to the EU Roadmap 2050 **huge public and private investments are needed**
- Even if public support is given **private investments often lag behind**
- **Major challenge:** Unlocking the investment potential of the private sector and individual consumers!
- **Behavioural and social factors influence** decision making under uncertainty – what is the case for renewable energy investments
- **Policy makers should take into account behavioural and social effects** in decision making in renewable energy!

Questions? Thanks for your attention!

nina.hampl@unisg.ch

DAS Renewable Energy Management (REM-HSG)

- Diploma of Advanced Studies (DAS) Renewable Energy Management (REM-HSG)
- **Part-time executive education programme** in renewable energy management
- Programme started in February 2011 with **participants from 7 countries**
- **8 Modules** in St. Gallen, Berlin and Singapore
- **Next programme start:** February 2012; **application deadline:** November 15, 2011
- **More information:** http://www.es.unisg.ch/rem