Good Energies Chair for
Management of Renewable Energies

University of St.Gallen

ACTIVE INTERFACES – Understanding consumer and investor preferences to overcome barriers for a large use of building-integrated photovoltaics in the Swiss urban context

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Project Duration
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Partners:

ÉCOLE POLYTECHNIQUE FÉDÉRALE DE LAUSANNE

Haute école d'ingénierie et d'architecture Fribourg
Hochschule für Technik und Architektur Freiburg

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HOCHSCHULE LUZERN
Wirtschaft

OVERVIEW

While conventional rack-mounted rooftop photovoltaics, also known as building-attached photovoltaics (BAPV), have experienced an enormous growth in the last years, building-integrated photovoltaics (BIPV) still play a marginal role in the global solar market.

BIPV function both as active energy-producing power plants as well as integral construction elements of a building.

Frequently mentioned advantages of BIPV over BAPV are **an increased esthetical value for homeowners and a replacement of conventional building materials** like roof tiles or façade elements which may be associated with certain cost advantages.

In this research project we investigate the perceptions of key stakeholders concerning barriers, attitudes and motivations for diffusion of BIPV in Switzerland.

As a result, policy makers and business will be informed about key barriers to market penetration of BIPV and ways to overcome them.

RESEARCH QUESTIONS

- **What are the most important barriers for adoption of building-integrated photovoltaics (BIPV) in Switzerland, as perceived by consumers, architects, real estate developers, institutional investors and others?**
- **How important are various characteristics of (BI-)PV systems in influencing home owners' choices?**
- **Which role do peer effects play for homeowners' buying decision?**

METHODOLOGY

The project entails qualitative and quantitative research

Quantitative survey

WP1:
Representative sample of 6.104 participants and choice experiments with 408 homeowners in order to determine the importance of different product attributes in the purchasing decision for (or against) BIPV on roofs

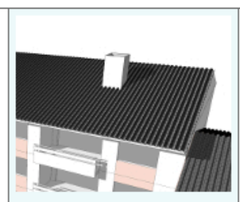
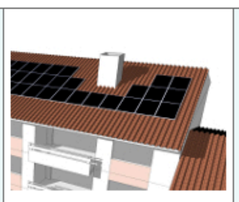
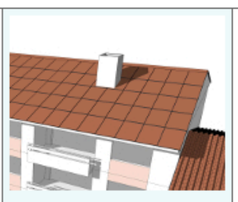
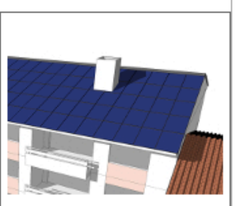
Qualitative survey

WP2:
>45 stakeholder interviews and a stakeholder workshop with homeowners, architects, real estate developers, installers, institutional investors and others in order to identify relevant barriers

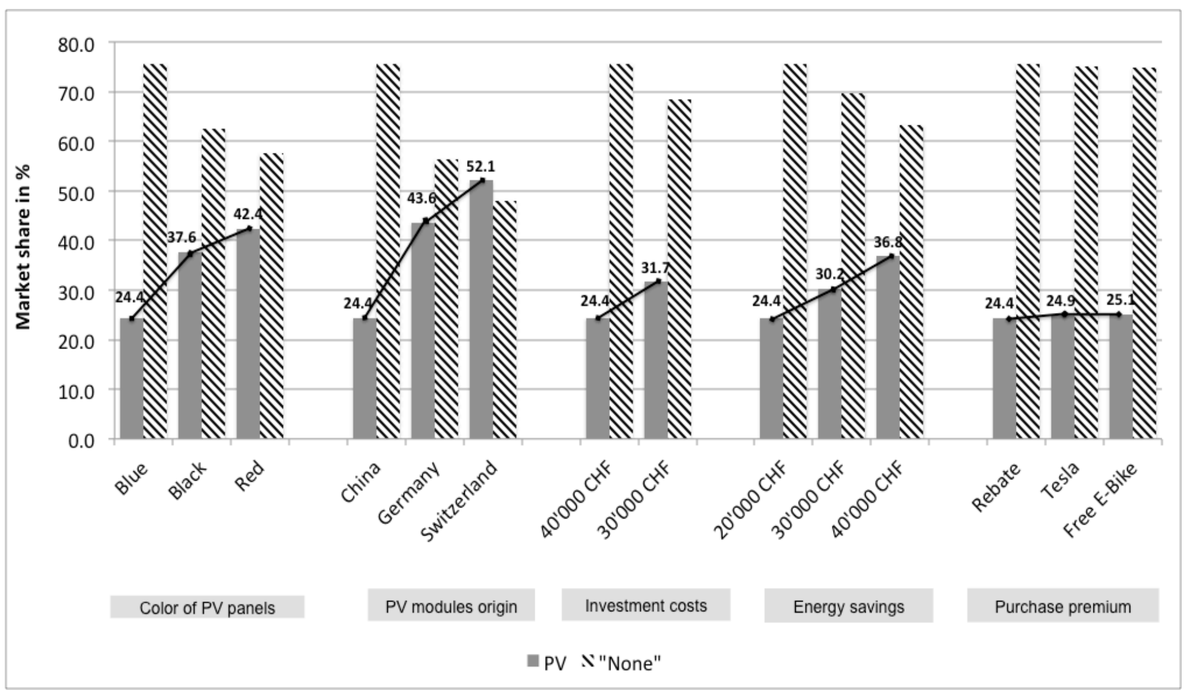
- In a **choice experiment**, each product is described in terms of a number of attributes.
- Respondents are shown a set of products created from a combination of levels from these attributes

Wir interessieren uns dafür, für welches Dach Sie sich bei Ihrer Dacherneuerung entscheiden würden, und ob für Sie auch eine Photovoltaik-Anlage (kurz: PV-Anlage) in Frage käme. Bitte geben Sie an, ob für Sie die untenstehenden Dächer eine Option wären. Schauen Sie sich die Spezifikationen zu den Dächern genau an, und entscheiden Sie dann jeweils. Führen Sie den Mauszeiger über die Attributsbeschreibungen linkerhand, um nähere Erläuterungen zu den Spezifikationen zu erhalten.

(1 von 6)

				
Dachbedeckung	**Keine PV-Anlage**	**Aufdach-PV-Anlage**	**Integrierte PV-Anlage**	**Integrierte PV-Anlage**
Farbe der PV-Anlage bzw. des Daches	Schwarz	Schwarz	Rot	Blau
Herkunftsland der PV-Module		Schweiz	Deutschland	Schweiz
Investitionskosten	20'000CHF	40'000CHF	50'000CHF	30'000CHF
Gewinne aus Stromverkauf nach 20 Jahren / Stromkostensenkung		-40'000CHF	-40'000CHF	-20'000CHF
Kaufanreiz				
	○ Möglich ○ Keine Option	○ Möglich ○ Keine Option	○ Möglich ○ Keine Option	○ Möglich ○ Keine Option

SOME PRELIMINARY RESULTS



- ✓ **Significant willingness to pay for BIPV.** House renovators are willing to pay a premium of 21.79% for a roof with a BIPV installation in comparison with a rack-mounted PV installation
- ✓ **The color and country of origin of the PV modules** are important drivers for increasing share of preference for PV
- ✓ Neither the product itself nor private home owners are the bottleneck of BIPV diffusion. **Missing incentives, path dependencies, general uncertainty and the complexity of the market** for other stakeholders as i.a. architects, as well as **administrative restrictions** play an important role
- ✓ **Peer effects matter.** PV systems in the neighborhood influence the likelihood to install PV. Peer effects are stronger for later adopters than for early adopters