

Building integrated PhotoVoltaics

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P
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Southern Switzerland

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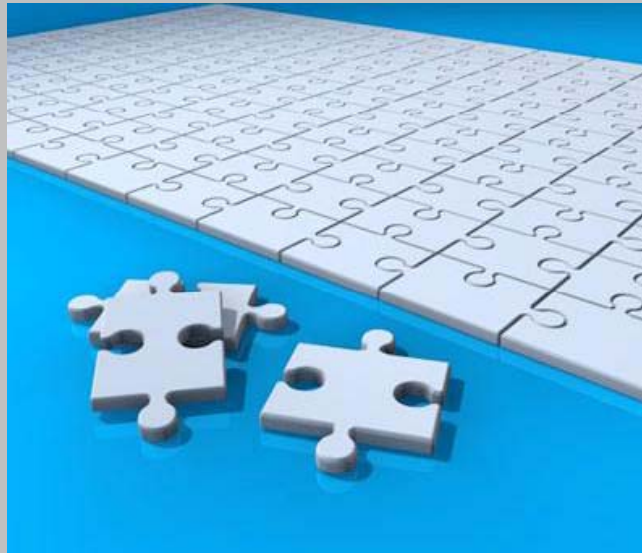
8° Symposium PV 04.02.2010 1

INTRODUCTION

SWISS BiPV
CENTRE OF COMPETENCE

Architects

PV industries



PV researchers

PV planners

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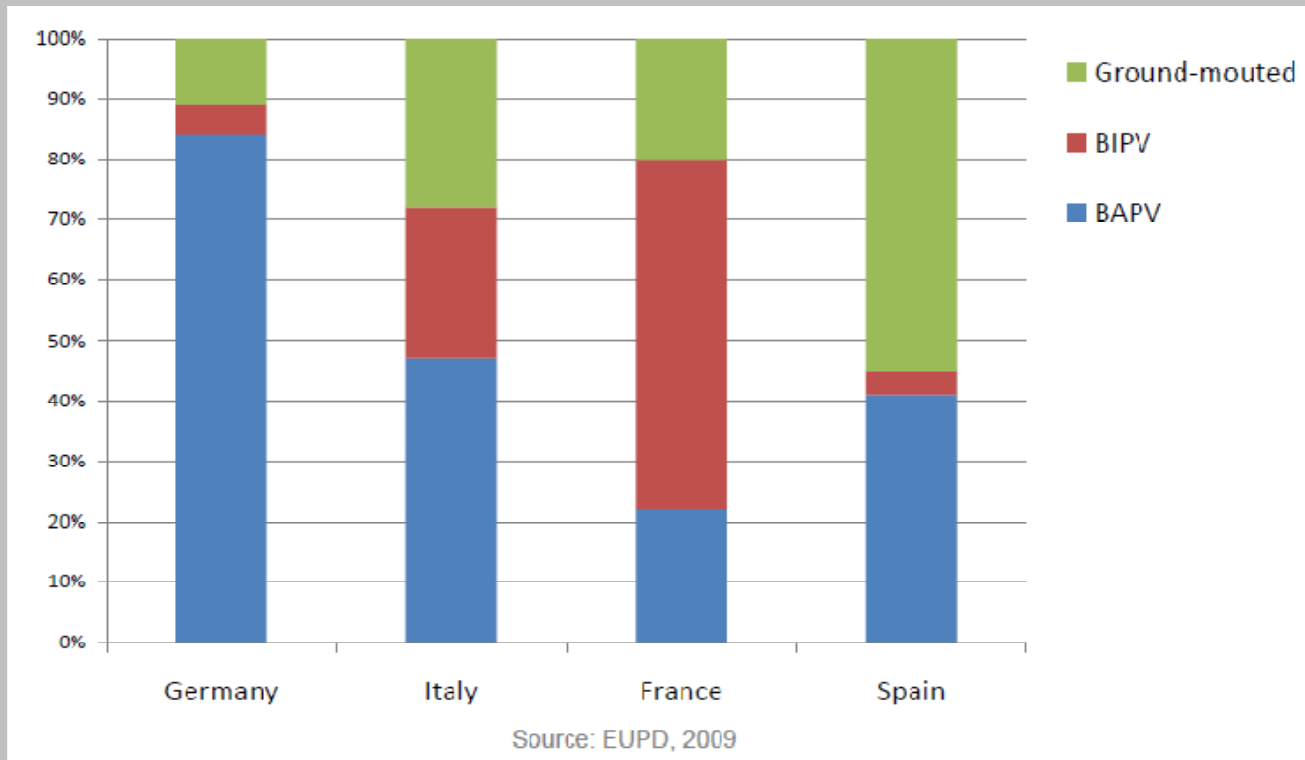
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Research

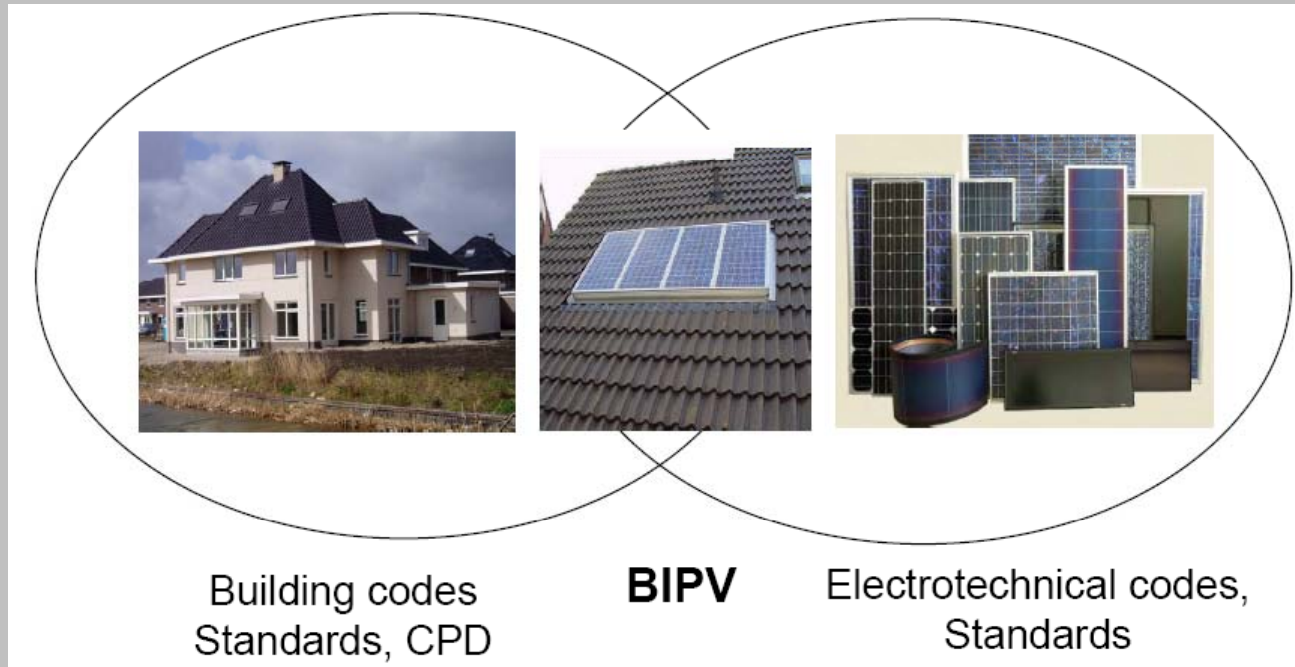
- The BiPV at a European level
- The BiPV at a Swiss Level

European BiPV Market



Picture courtesy: Brochure SP6, EUPD, 2009

“Performance” EU project, SP6 “PV as building product”



Picture courtesy: Brochure SP6



www.pv-performance.org

IEA SHC, TASK 41, “Solar energy & architecture”



Picture courtesy: Ecosinergie, Ruvigliana



www.iea-shc.org/task41

EU SUNRISE project, barriers for the introduction of PV in the building sector



Picture courtesy: Ecosinergie, Ruvigliana



www.pvsunrise.eu

BiPV annual conferences

- **EUPVSEC, BiPV Workshop**
- **Energy Forum, Bressanone**
- **OTTI, Gebäudeintegrierte Photovoltaik**
- **BiPV Summit, Shanghai-01.2010**

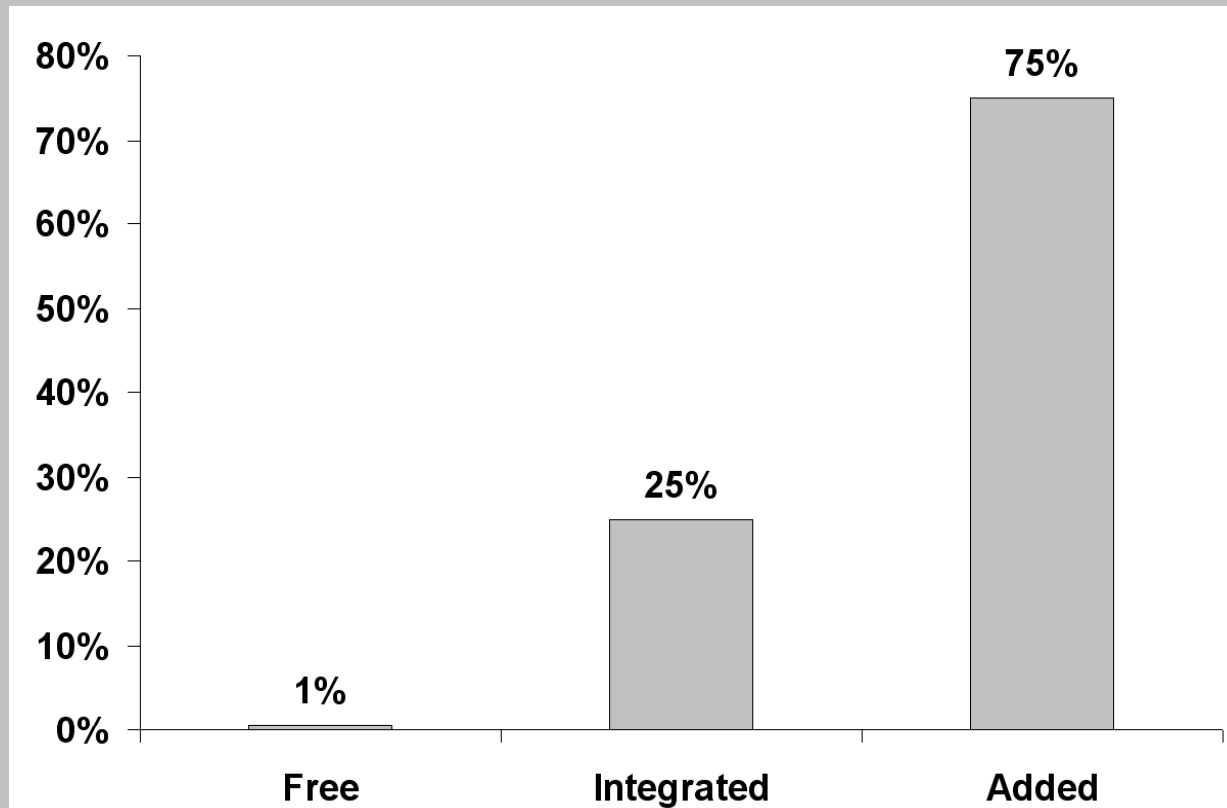
Switzerland and BiPV....A long story



Picture courtesy: EPFL-LESO

Demosite, IEA task 7, exhibition centre for PV integration, 1990

Swiss BiPV quota in KEV



Data from Swissgrid: status on 6th January 2010

Swiss BiPV Centre of competence



Picture courtesy: VHF-Technologies, Bellinzona

BiSol - Building integrated Solar Network

Workshops



brenet

www.bisolnet.ch

BiPVTEMP Project



BiPV products test facilities

SuRHiB - Sustainable renovation of historical buildings.



WP: Concepts for solar integration

UiSol – Urban integrated Solar systems

Architectonical integration criteria for active and passive systems		
General analysis		Evaluation
Shading	Passive solar	1
	Active solar thermal collector	1
	Active PV module	2

Consider shading according to the solar building element's position

Passive solar
At our latitude it is necessary to carefully ponder the positioning of the transparent and opaque building elements according to solar gain maximisation in winter and minimisation in summer. This elements need to be shaded considering seasonal irradiation and the needs of internal rooms. Also, solar protection must be provided.

Active thermal solar
Shading is obviously to avoid, but unlike for PV, partial shadows don't cause considerable losses or dysfunctions in the system.

Active PV solar
PV technology is particularly sensitive to shading. Indeed, shadows must be absolutely avoided since even a very small shadow can cause important productivity losses. It is possible to limit this negative effect by using bypass diodes and adequate cabling. The impact of shadows on the efficiency of thin film is lesser since the cell form is different (elongated), and therefore less sensitive to partial shadows, avoiding "hot spot" formation.
After having considered the impact of near shadows, modules should be arranged in a regular way, respecting the building's own characteristics (rectangular form), profile (especially its upper part) and assembling the panels. It is possible to use fake elements to visually improve the surface's homogeneity.

Collector
 $h \times 2.75$

Rule of thumb for the positioning of solar collectors and PV modules: consider, as the ideal distance to have between the object that could cause shading and the module, three times the height of this object. This object is the module.

When using integrated application method, transitional elements (glass or plastic) can be used for respecting the building's profiles.

critereon: shading

rating

introduction to the topic

solar passive

solar thermal

photovoltaics

information

Collaboration with HES-SO Fribourg and Academy of architecture Mendrisio

Internet Platform

Product name	Producer / Supplier
Sarnasol	Sika Sarnafil
Evalon Solar	Aluitra
General Solar PV	General membrane

www.bipv.ch

Thanks for your attention!



Picture courtesy: Sulfurcell, Berlin