

Energie Solaire vs Architecture?

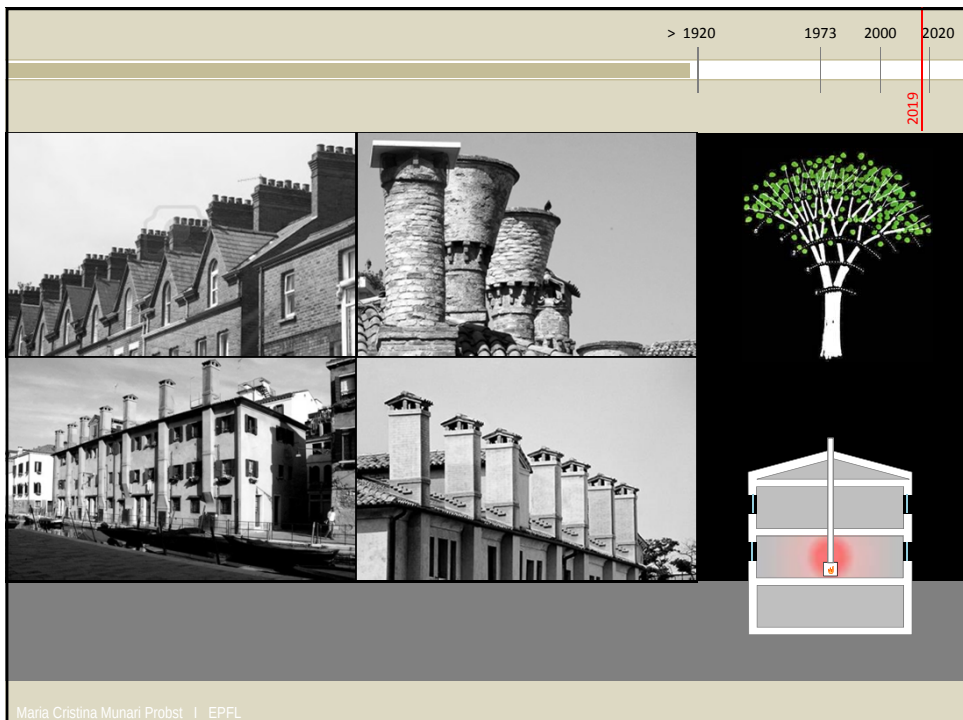
Maria Cristina Munari Probst | EPFL | Urbanités 7 octobre 2019

Energie Solaire vs Architecture?

1. Architecture et Energie
2. Qualité d'intégration
3. Facteurs clef

Maria Cristina Munari Probst | EPFL | Urbanités 7 octobre 2019

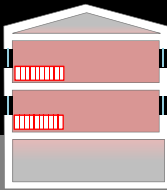
1. Architecture et Energie



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2019



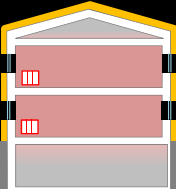


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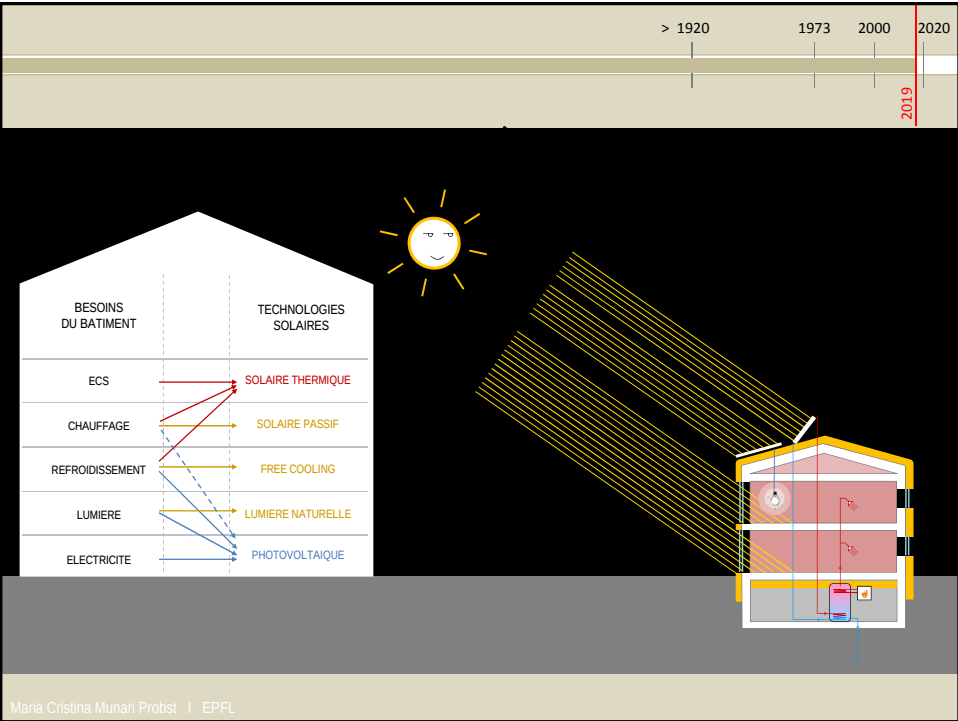
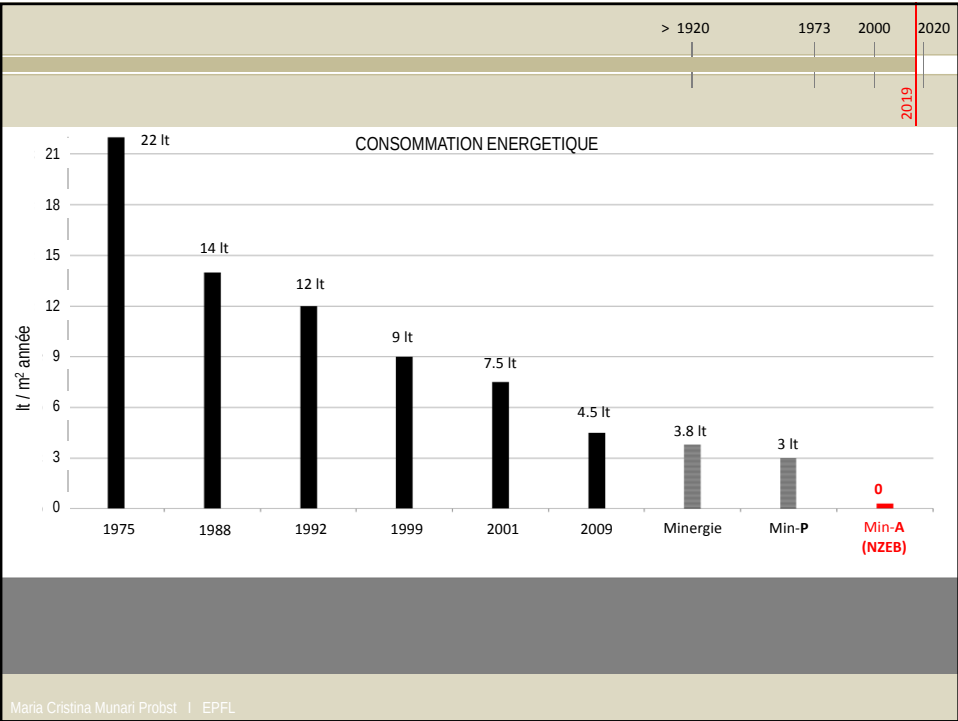
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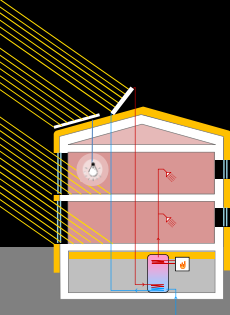


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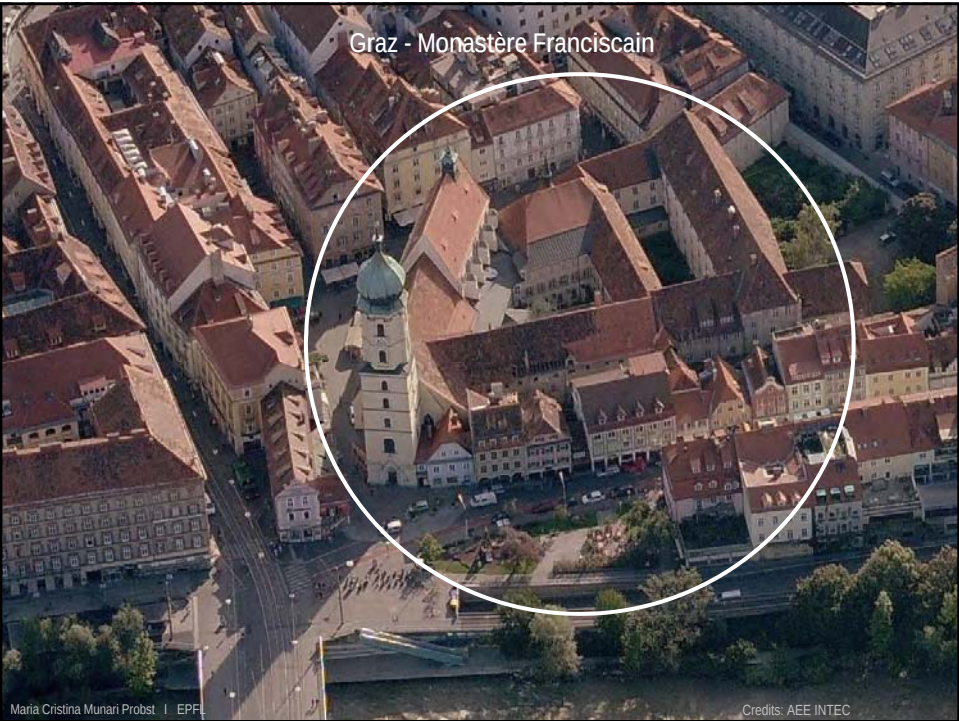


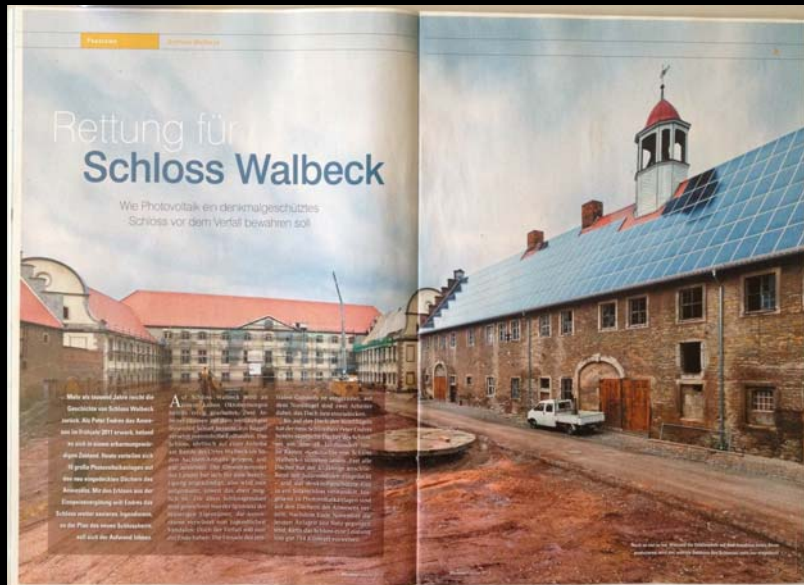
Arch. Mario Cucinella - Sino Beijing 2006
Arch. Mario Cucinella - M3 Headquarters - Poglietto (I) 2010

Arch. Tomas Herzog house in Regensburg (D) 1979
laac - Endesa solar pavilion Barcelona 2011

Maria Cristina Munari Probst. I. EPFL

et dans les contextes existants ?





Maria Cristina Munari Probst | EPFL



Schloss Walbeck castle (D) 2013

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... le futur ?



(Prix solaire Suisse 2016 ...)

Est-il possible de
maximiser l'utilisation du solaire
sans affecter négativement
la **qualité architecturale**
des contextes urbains

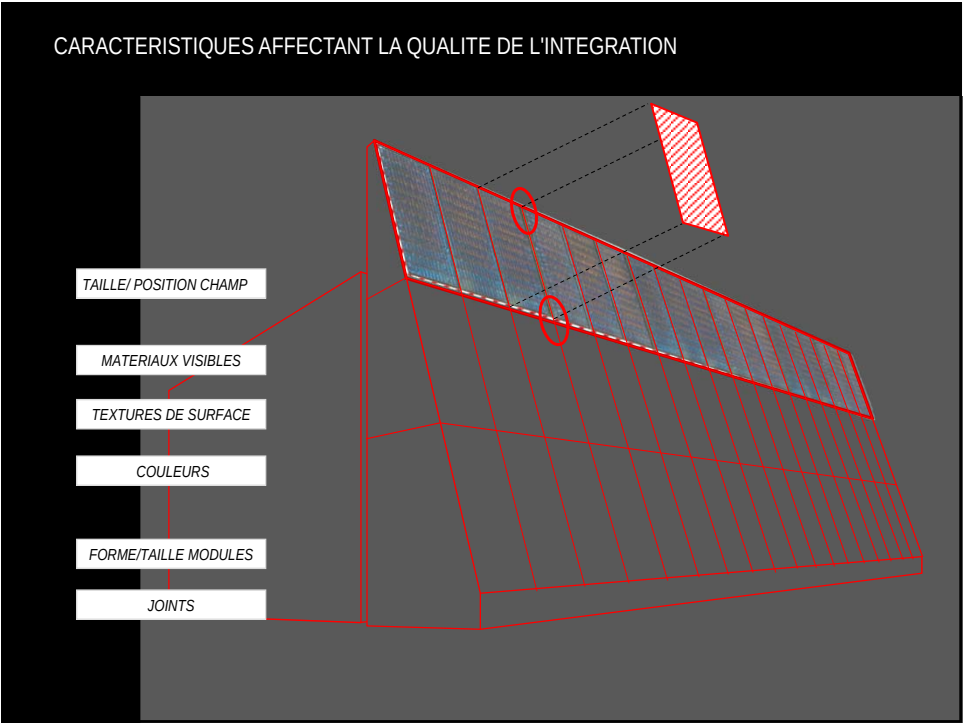


Intégration architecturale de l'énergie solaire

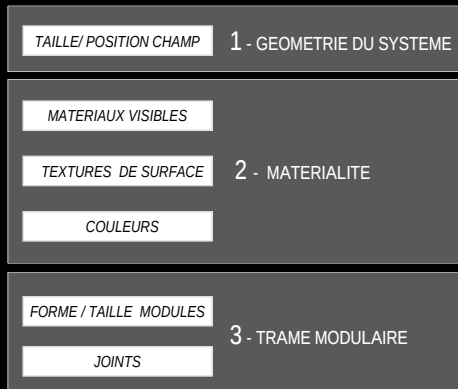
1. Architecture et Energie
2. Qualité d'intégration
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Est-il possible de
maximiser l'utilisation du solaire
sans affecter la qualité architecturale
des contextes urbains ?





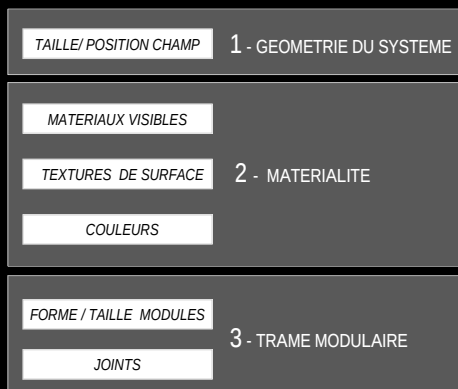
QUALITE D'INTEGRATION ARCHITECTURALE DEFINITION



TOUTES CES CARACTERISTIQUES

DEVRAIENT ÊTRE COHERENTES AVEC LA
LOGIQUE ARCHITECTURALE GLOBALE
DU BATIMENT!

FLEXIBILITE ATTENDUE D'UN SYSTEME:



DISPONIBILITE DE "FAUX" ELEMENTS (DUMMIES)

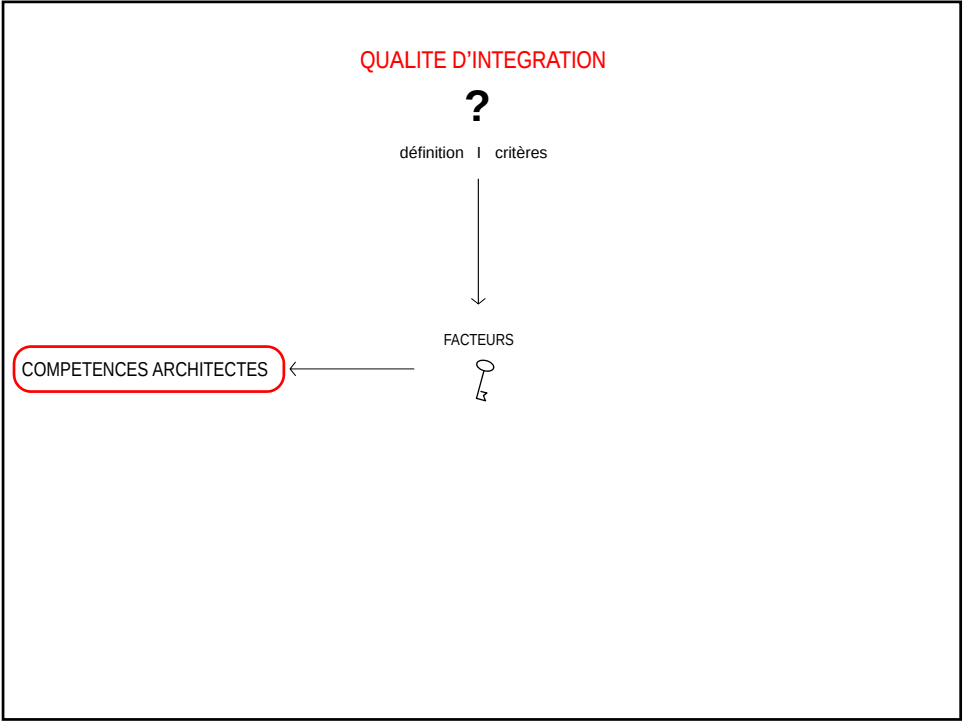
CHOIX DANS LE FINIS DE SURFACE (*textures, couleurs,...*)

FLEXIBILITÉ DIMENSIONNELLE

SYSTÈMES DE JONCTION ADAPTÉS

Intégration architecturale de l'énergie solaire

- 1. Architecture et Energie
- 2. Qualité d'intégration
- 3. Facteurs clef



QUALITE D'INTEGRATION



définition | critères



FACTEURS



COMPETENCES ARCHITECTES

- former les étudiants :
 - cours EPFL dès 2009
 - " IUAV 2016-18
 - " HEIA-FR dès 2019
- mais former aussi les professionnels déjà actifs !

IEA SHC Task 41 - Solar Energy and Architecture (2009-12)



SOLAR HEATING & COOLING PROGRAMME
INTERNATIONAL ENERGY AGENCY



TASK 41

What's New

Objectives

Subtasks

Task Participants

Task Highlights

Publications / Outcomes

Related Sites

Task Work Area

Home

SHC Home >

Solar Energy and Architecture

OVERVIEW

It is clear that solar energy use can be an important part of the building design and the building's energy balance to a much higher extent than it is today. This Task should help achieving high quality architecture for buildings integrating solar energy systems, as well as improving the qualifications of the architects, their communications and interactions with engineers, manufacturers and clients. The vision - and the opportunity - is to make architectural design a driving force for the use of solar energy.

The title of this Task indicates that focus is on both high architectural quality and high energy performance. Thus, it would be counterproductive to show the use of solar applications in buildings where the energy performance is poor or even worse than without solar applications.

This title also indicates a new way of approaching the use of active solar energy in buildings that sees architects composing their architecture with solar components conceived as building elements.

The illustrations above are from left to right:
Lærkevangen school by Box25arkitektur, Denmark;
Sunny Woods by Beal-Rampfen Architects, Switzerland;
and CeMN Bursin by atelier nivo, Switzerland

Task Information

Duration
May 1, 2009 - April 30, 2012

Operating Agent
Maria Wall
Energy and Building Design
Dept of Architecture and Built Environment
Lund University
P.O. Box 118
SE-221 00 Lund
Sweden
maria.wall@ebd.lth.se

Task News

[Task 2010 Highlights now Online](#)

What's New | Objectives | Subtasks | Task Participants | Publications | Task Work Area | Home

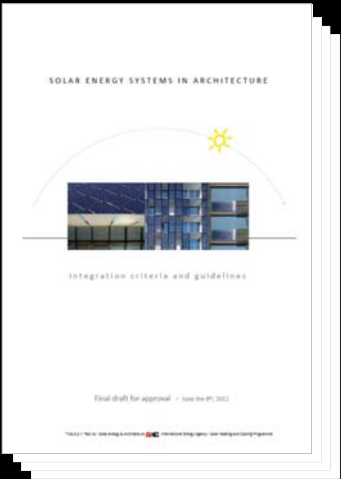
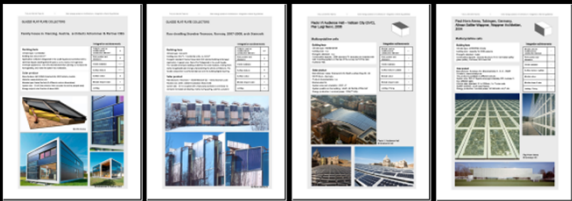
International Energy Agency Solar Heating and Cooling Programme

<http://www.iea-shc.org/task41/>

MANUEL POUR LES ARCHITECTES :

SOLAR ENERGY SYSTEMS IN ARCHITECTURE
-integration criteria and guidelines-

Bientôt disponible en français et Italien !



<http://www.iea-shc.org/task4/publications>

MC. Munari Probst | EPFL - LESO | Switzerland

QUALITE D'INTEGRATION

?

définition | critères

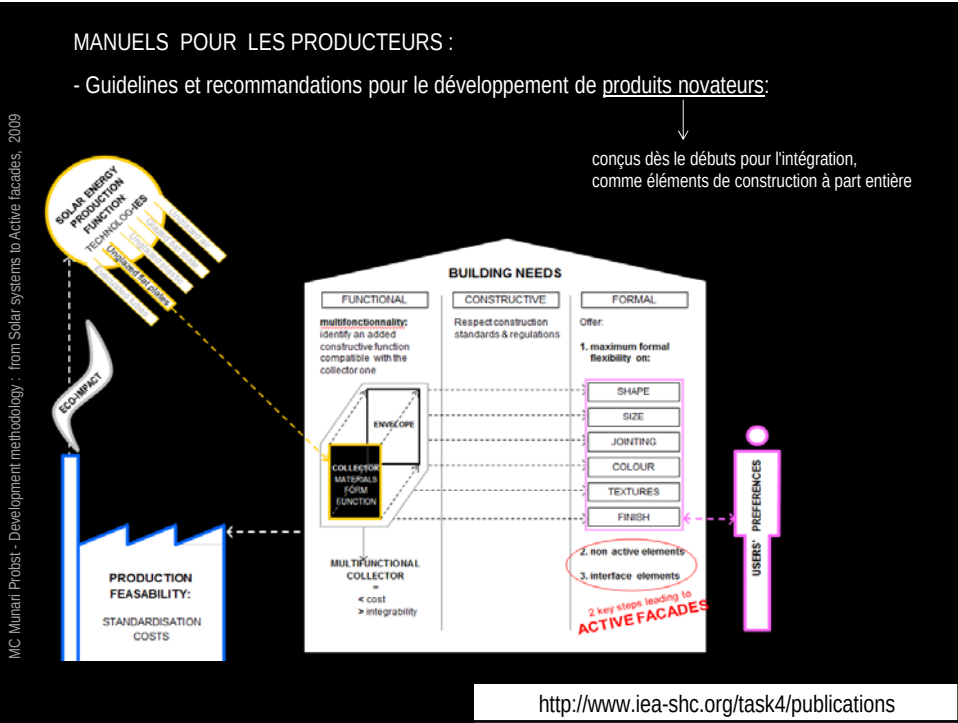
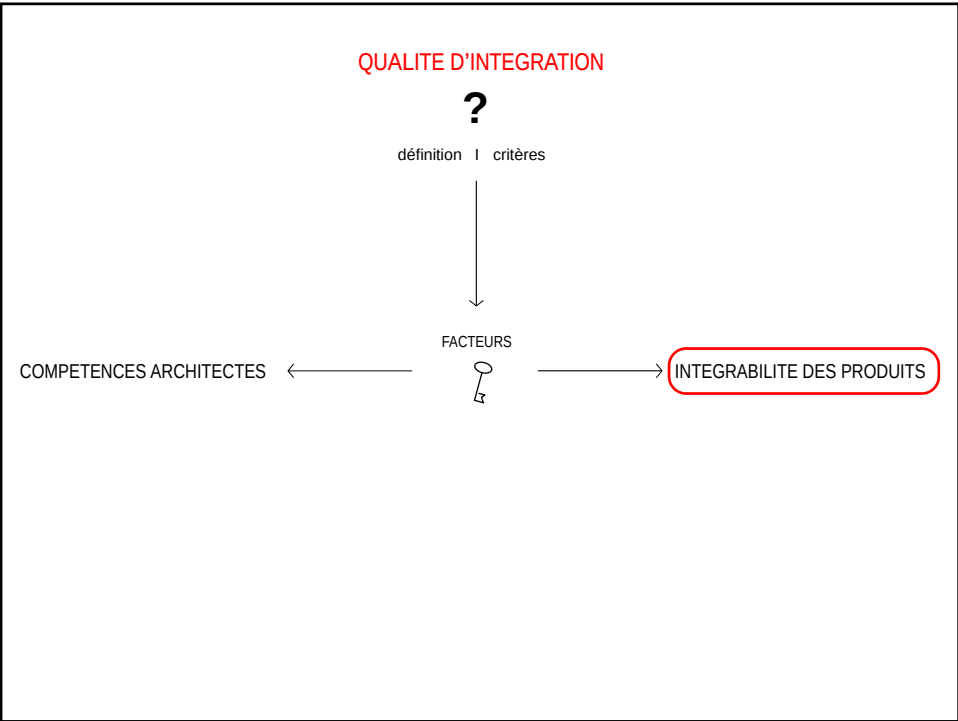


FACTEURS



COMPETENCES ARCHITECTES ←

→ INTEGRABILITE DES PRODUITS





Kromatix Swissinso - EPFL LESO



Kromatix Swissinso - EPFL LESO



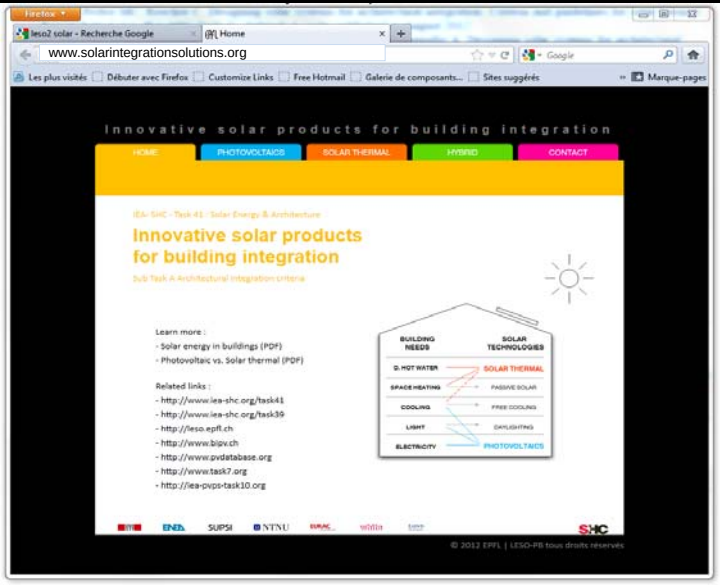
Christophe Ballif et Laure-Emmanuelle Perret-Aebi.

EPFL - CSEM (commercialisé par SOLAXESS et ISSOL)



:: csem

WEBSITE : PRODUITS SOLAIRES NOVATEURS POUR L'ARCHITECTURE





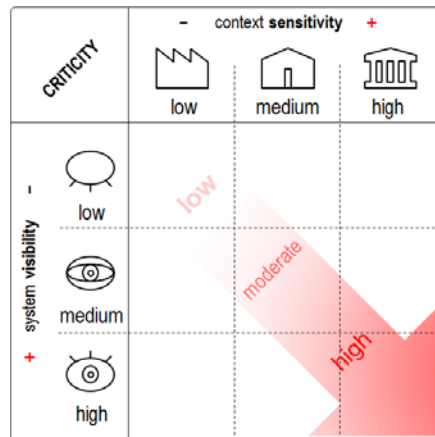


METHODE LESO QSV

CONCILIER PROMOTION DU SOLAIRE & PROTECTION DU PATRIMOINE

promouvoir le solaire ... et préserver la qualité du contexte urbain

= adapter la qualité d'intégration requise à la criticité de la situation



PRIX : Arets Framtidsbyggare
INNOVATEURS DE L'ANNEE | 2016

Maria Cristina Munari Probst | EPFL LESO

article sur la Méthode LESO QSV (publié en mai 2019)

Open access

Solar Energy 184 (2019) 672–687

Contents lists available at ScienceDirect



Solar Energy

journal homepage: www.elsevier.com/locate/solener



Criteria and policies to master the visual impact of solar systems in urban environments: The LESO-QSV method

Maria Cristina Munari Probst, Christian Roecker*

Laboratoire d'Energie Solaire (LESO), Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland



ARTICLE INFO

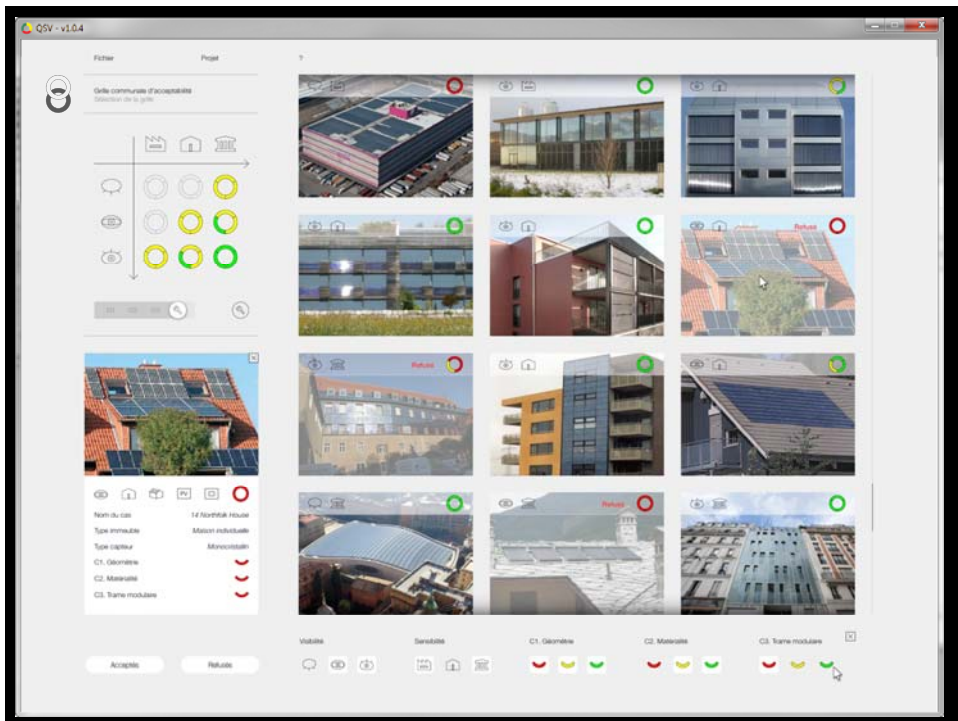
Keywords:
Urban acceptability
Solar policies
Architectural integration quality
Visual impact
Solar map
Criticity

ABSTRACT

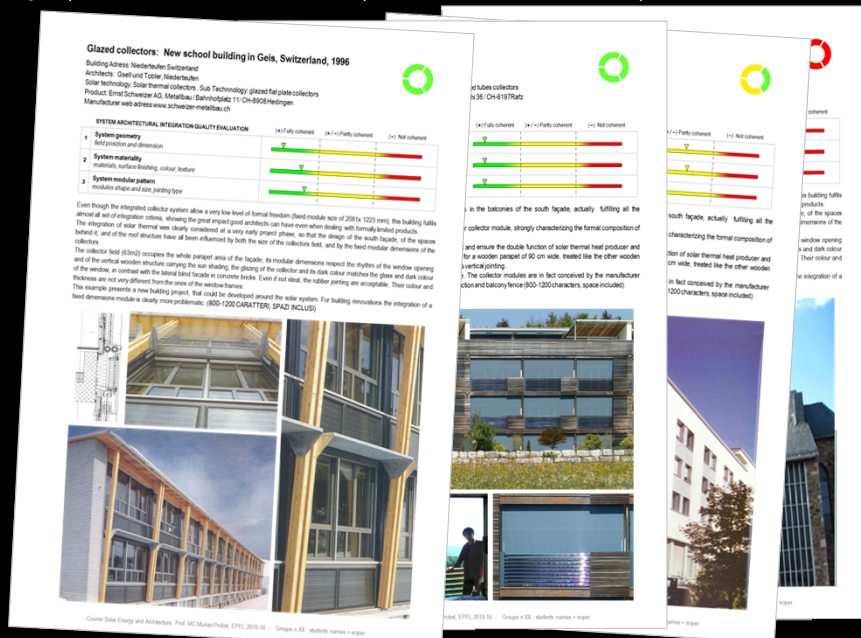
Increased use of solar collectors in buildings is necessary but poses major challenges in existing built environments, especially where architectural quality is an issue. The large size of solar systems at the building scale requires careful planning, as they may easily end up compromising the aesthetics of buildings, threatening the identity of entire contexts. A new method named LESO-QSV (for Laboratoire d'Energie Solaire – Qualité-Sensibilité-Visibilité) has been developed to help authorities promote solar energy use while preserving the quality of pre-existing urban areas. The vision underlining the approach is that solar integration is possible also in delicate contexts, if appropriate design efforts and adequate cost investments are made. The issue is then no longer to be in favour or against the use of solar systems in cities, but rather to define appropriate local levels of integration quality, and to identify the factors needed to initiate smart solar energy policies able to preserve the quality of pre-existing urban contexts while promoting solar energy use.

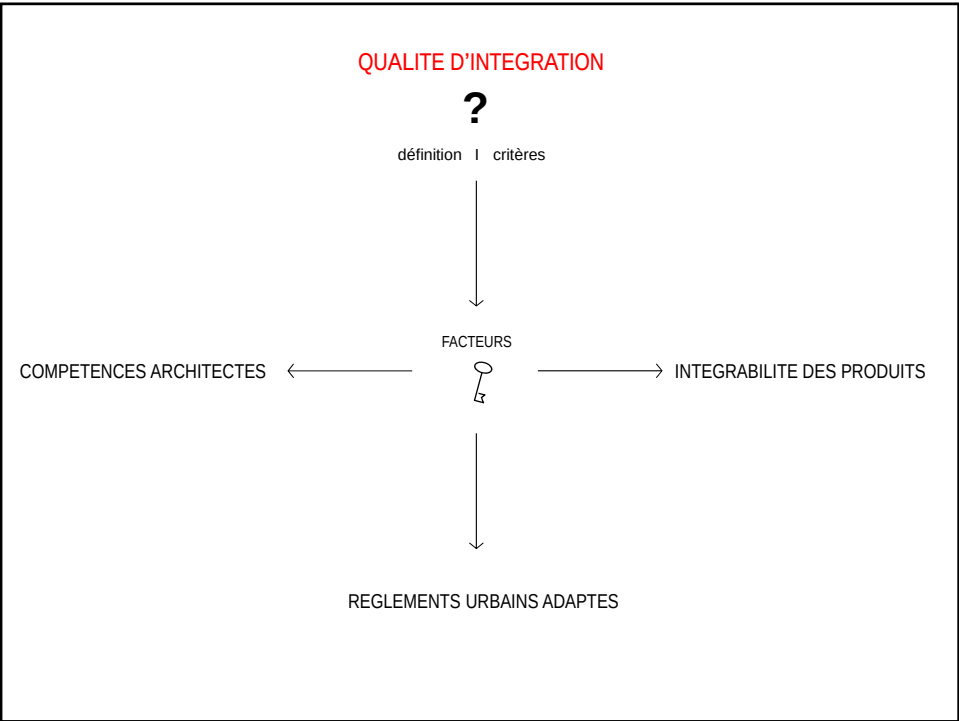
The LESO-QSV method helps tackle these issues with clear and objective proposals.

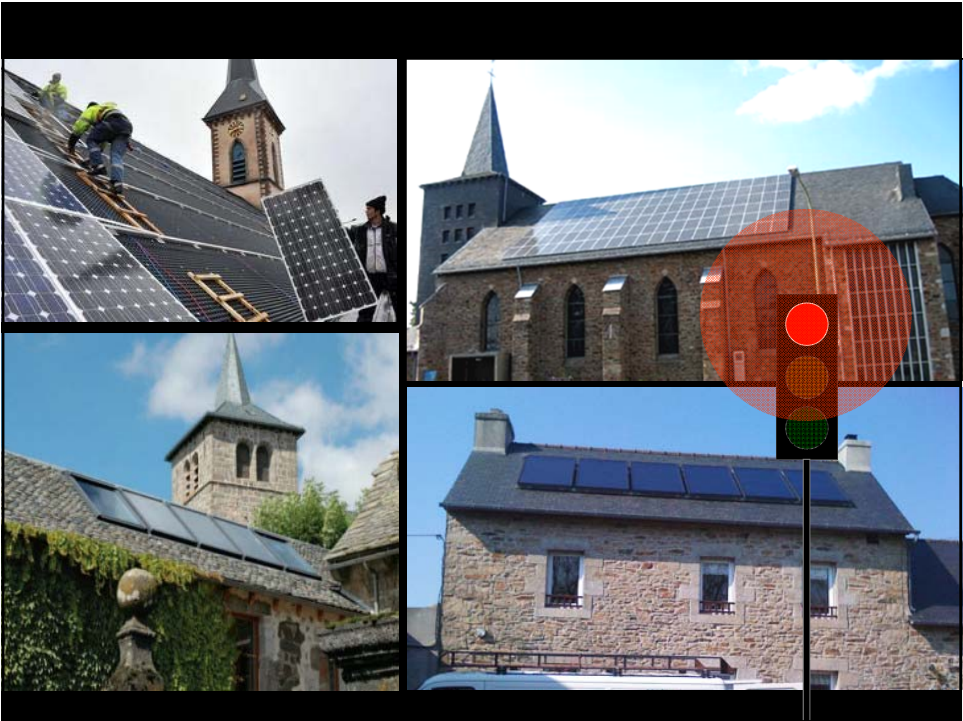
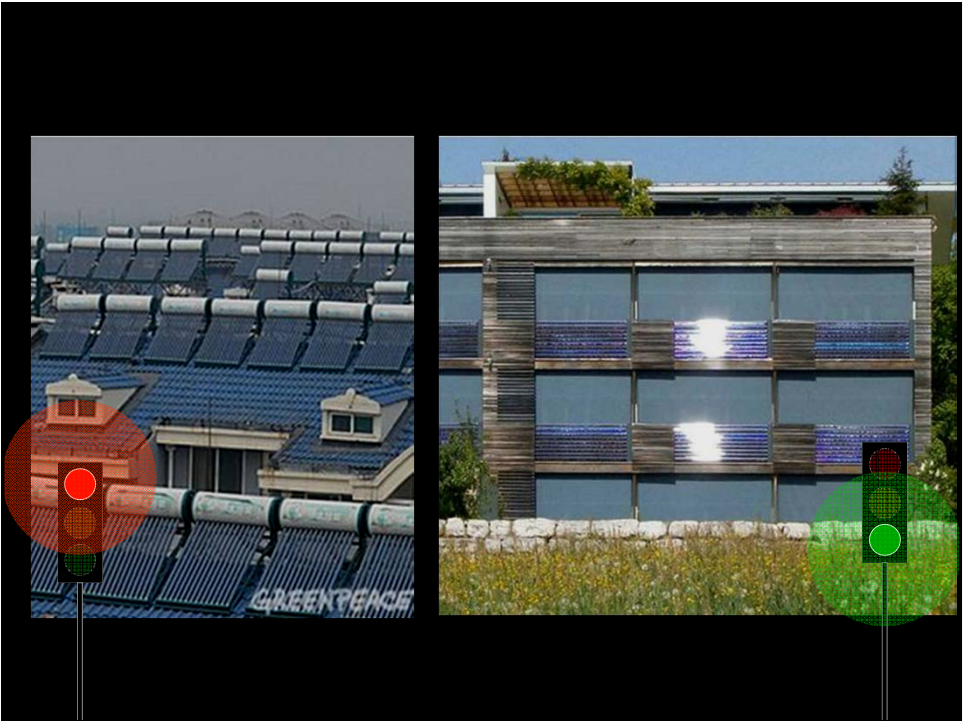
disponible sur : <https://doi.org/10.1016/j.solener.2019.03.031>



Quelques 500 cas collectés et évalués par les étudiants EPFL et IUAV pour le data base.





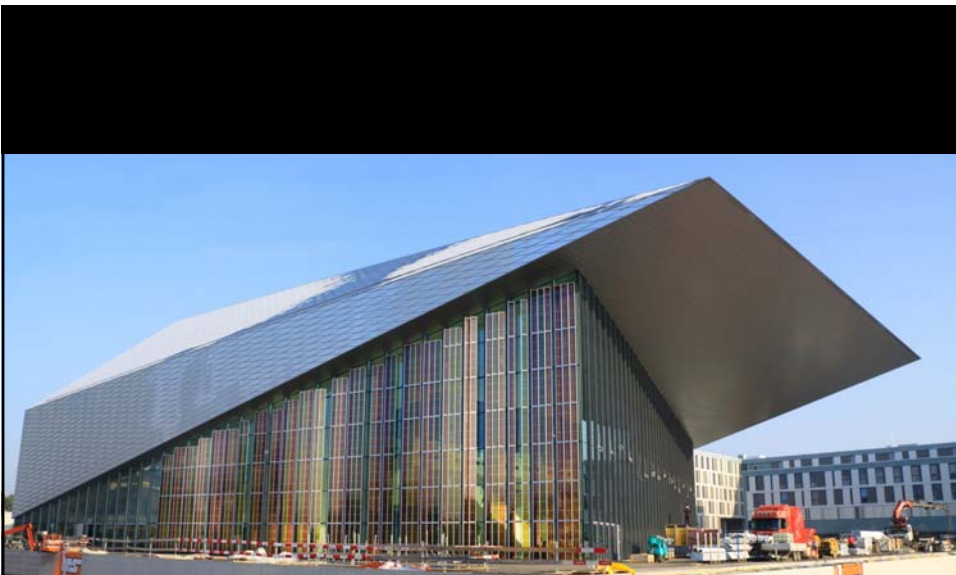




Copenhagen International School , CF Møller Architects



Cromatix Swissinso - EPFL LESO



Graetzell cells , Solaronix | Swisstech convention center - Richter Dal Rocha arch

merci

mariacristina.munariprobst@epfl.ch