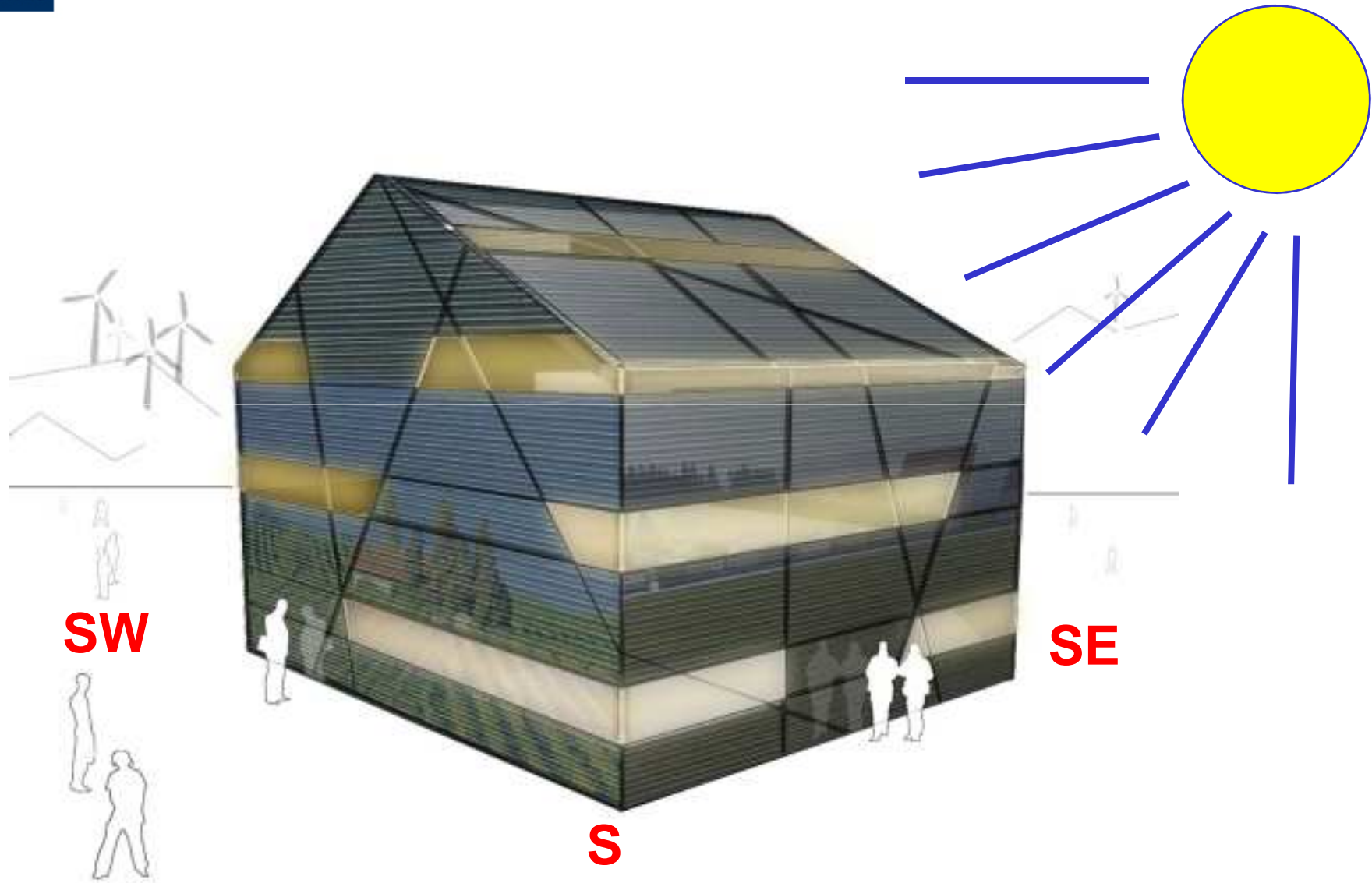




# **BUILDING INTEGRATION OF SOLAR COLLECTORS**

**Werner Weiss**

**AEE - Institute for Sustainable Technologies (AEE INTEC)**  
A-8200 Gleisdorf, Feldgasse 19  
AUSTRIA



# Physical Processes inside a Flat-Plate Collector



## Flat plate collectors – **ON ROOF**



Source:Wagner &Co /ESTIF



## On Roof Installation - Piping





## Flat plate collectors – **ROOF INTEGRATED**



## Flat plate collectors – **ROOF INTEGRATED**



Source: Conergy AG /ESTIF

## Flat plate Collectors – Roof Integrated





# Flat plate Collectors – Roof Integrated





## Flat plate Collectors – Roof Integrated



## Flat plate Collectors – Roof Integrated





## Flat plate Collectors – Roof Integrated



## Flat plate collectors – Installation on a flat roof





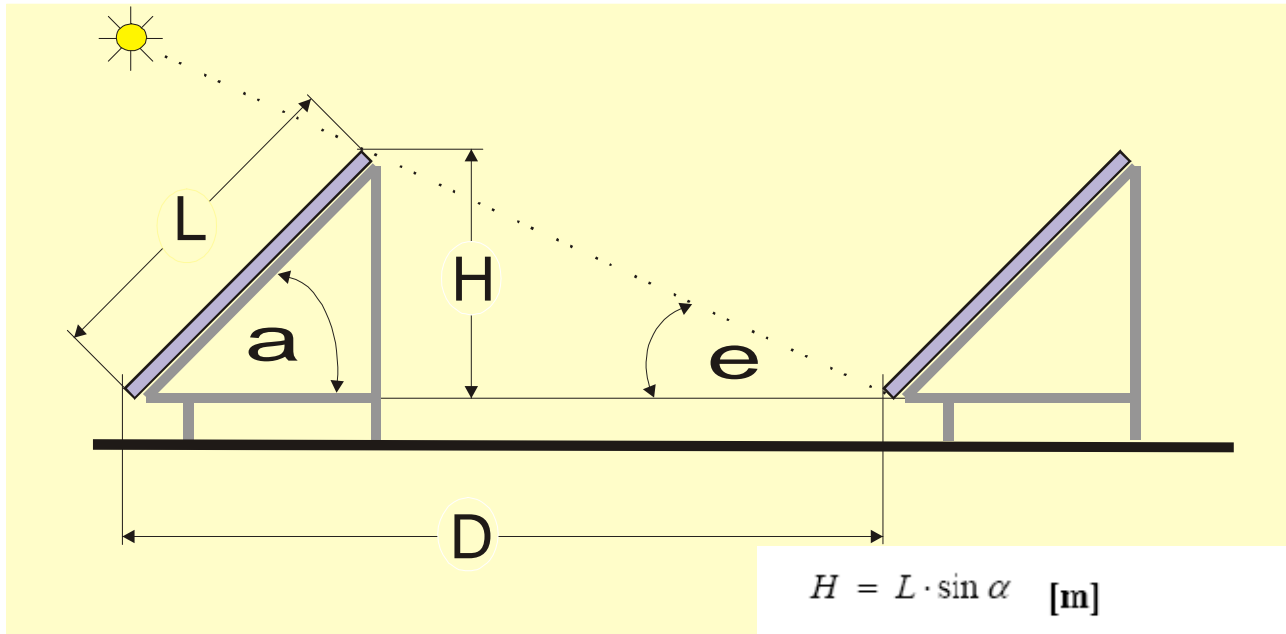
## Flat plate collectors – **Installation on a flat roof**



## Distance between the collector rows - 1



## Distance between the collector rows -2 (calc)



$$H = L \cdot \sin \alpha \quad [\text{m}]$$

$$D = \frac{L \cdot \sin[180 - (\alpha + \varepsilon)]}{\sin \varepsilon} \quad [\text{m}]$$

D	Distance between the rows of collectors [m]
L	Collector length [m]
H	Collector height [m]
$\alpha$ (a)	Collector inclination [°]
$\varepsilon$ (e)	Incident solar radiation angle [°]



# Building Integration



Source: S.O.L.I.D.



# Facade Integration in a Historical Building

## Design Study





# Pre-manufacturing





# Prefabricated Facade Elements for Retrofit



Source: gapsolution



# Prefabricated Facade Elements for Retrofit





# Facade Integration of Solar Collectors

