



# The Plus Energy House

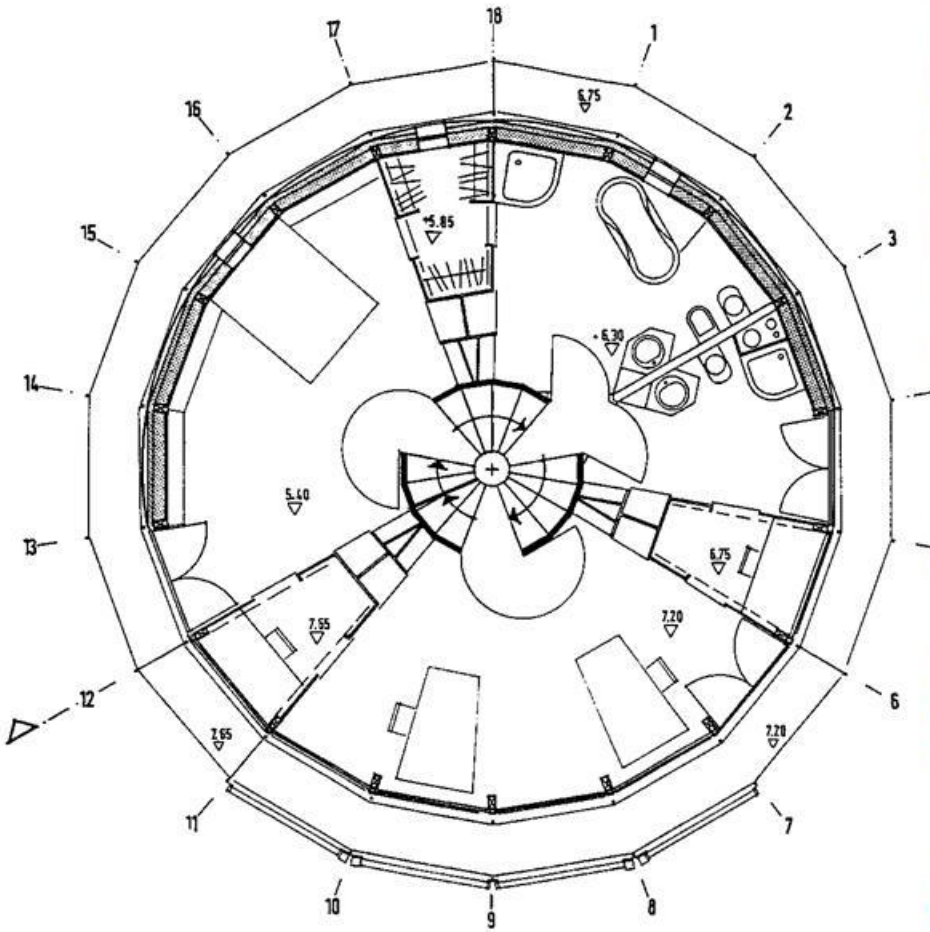


- 1. Heliotrope
- 2. Solar Settlement
- 3. Sun Ship
  
- 4. Costs and Gains
- 5. New Projects

# ■ 1. Heliotrope



# HELIOTROP® in Freiburg



It turns with the sun...  
like the sunflower.





# Solar-thermal collectors

rolfdisch SolarArchitektur

[www.rolfdisch.de](http://www.rolfdisch.de) | [info@rolfdisch.de](mailto:info@rolfdisch.de) | [www.plusenergiehaus.de](http://www.plusenergiehaus.de)



## ■ 2. „Solar Settlement“



# Front...

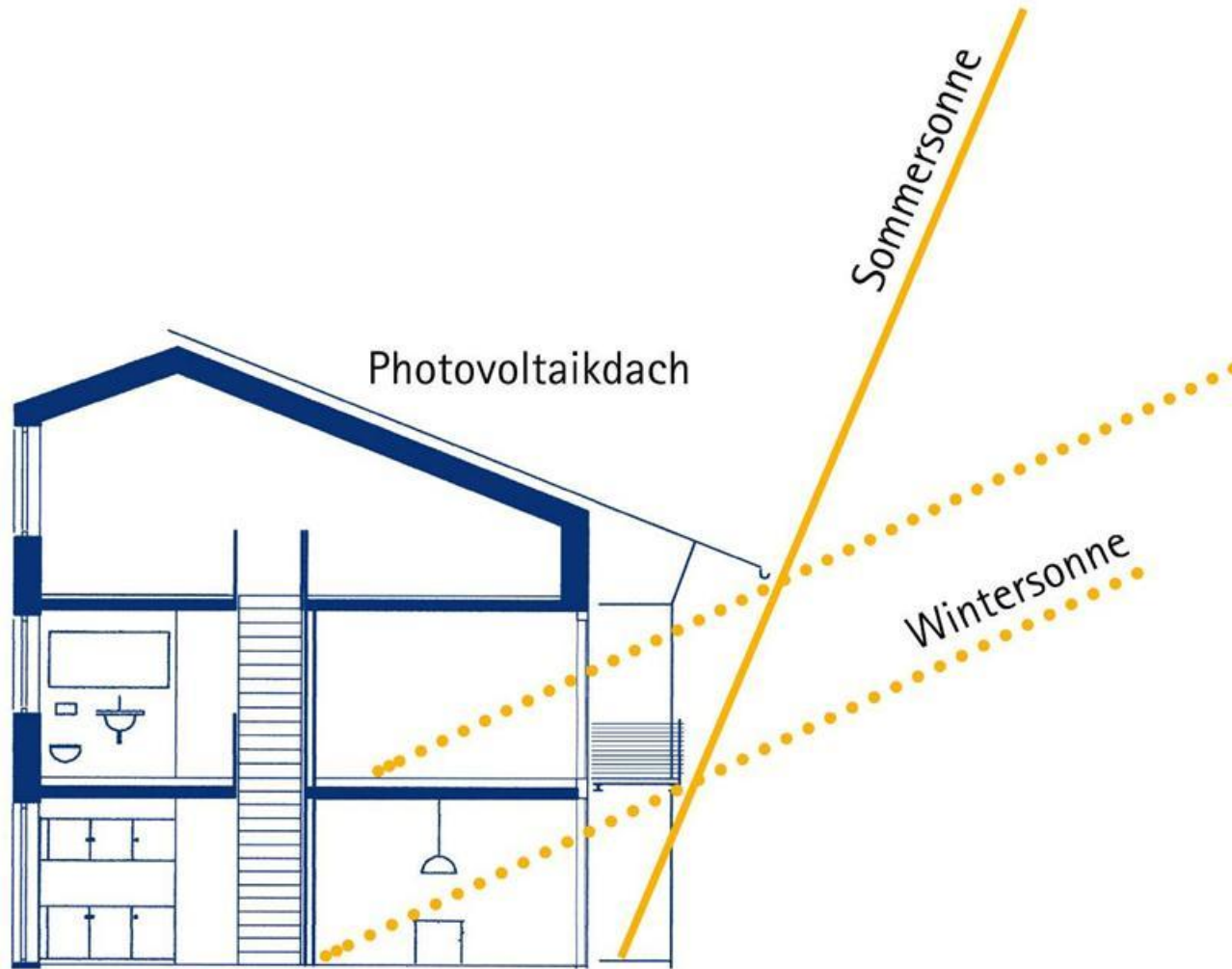




... and rear.



# Zoning





# PV roofs



# triple-glazed windows



## ■ 3. „Sun Ship“

# „Sunship“

- residential and commercial tenants
- EXPO 2000-Project
- Completion date: 2006
- Size: 6500 m<sup>2</sup>
- Building cost: 20 Mil. Euros





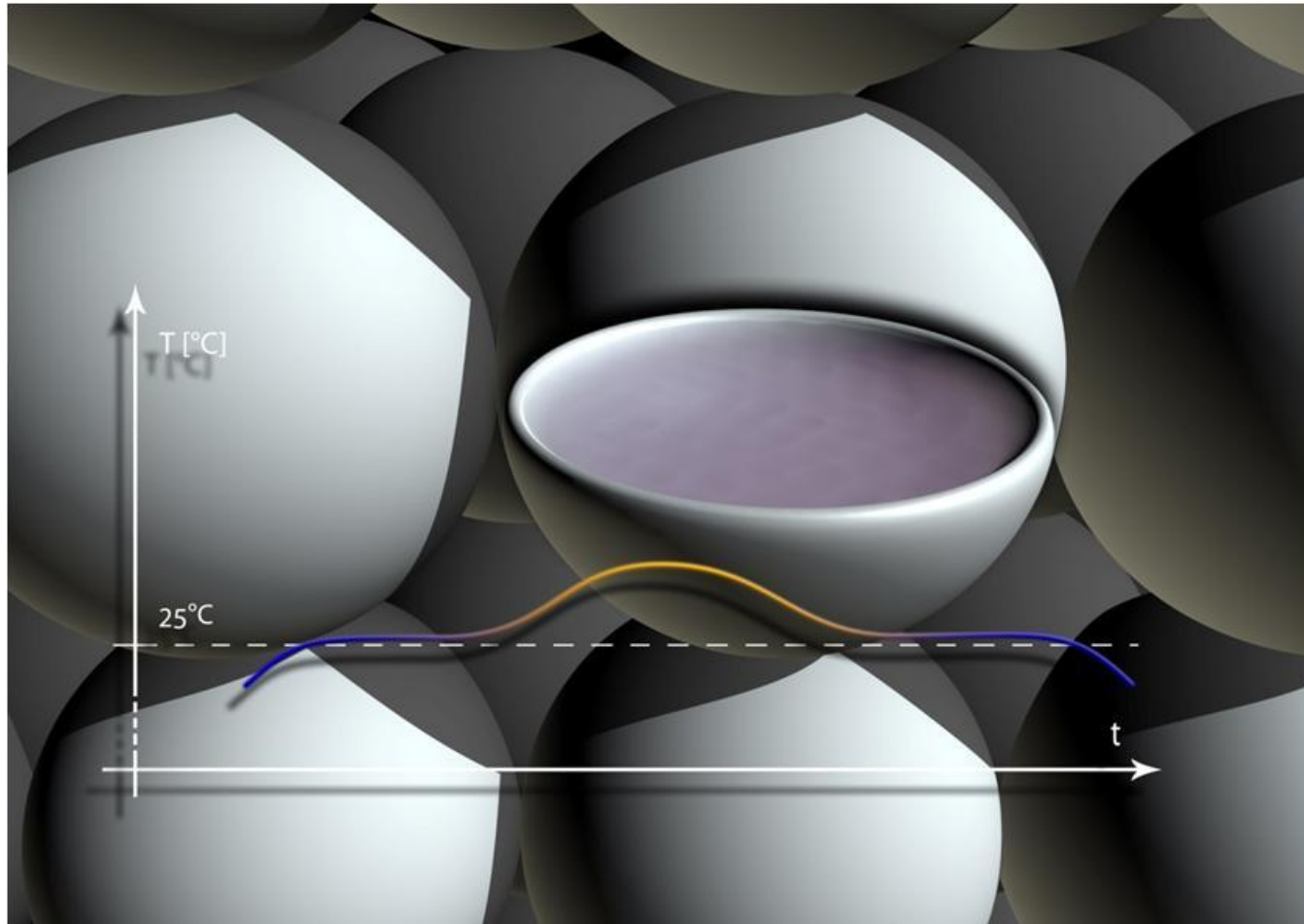
# Ventilation flaps for night cooling



# Vacuum insulation panels (VIP)



# Phase Change Material (PCM)





## Sustainable Architecture:

- light and pleasant rooms
- friendly-comfortable atmosphere
- healthy room temperature
- high quality lifestyle
- respect for the environment







## ■ 4. Costs and gains of sustainable architecture



## Feed-in tariffs...

- help to create a market for PV
- counterbalance subsidies for fossil-nuclear energy
- have been or are being adopted by 80 countries

# The Solar Settlement and „Sunship“

The Sunship produces 100.000 kWh sun-generated electricity per year.

Heat energy needs sink to 15 kWh/m<sup>2</sup>.

With a photovoltaic capacity of 443,5 kWp, the entire Solar Settlement produces 420.000 kWh solar electricity per year.

This replaces the consumption of 200,000 liters of oil, year after year.



# PlusEnergyHouse®

Sustainable-house concept for  
housing developments  
Created in 1997

- The Solar Settlement  
homes produce a surplus  
of 36 kWh / (sqm a)





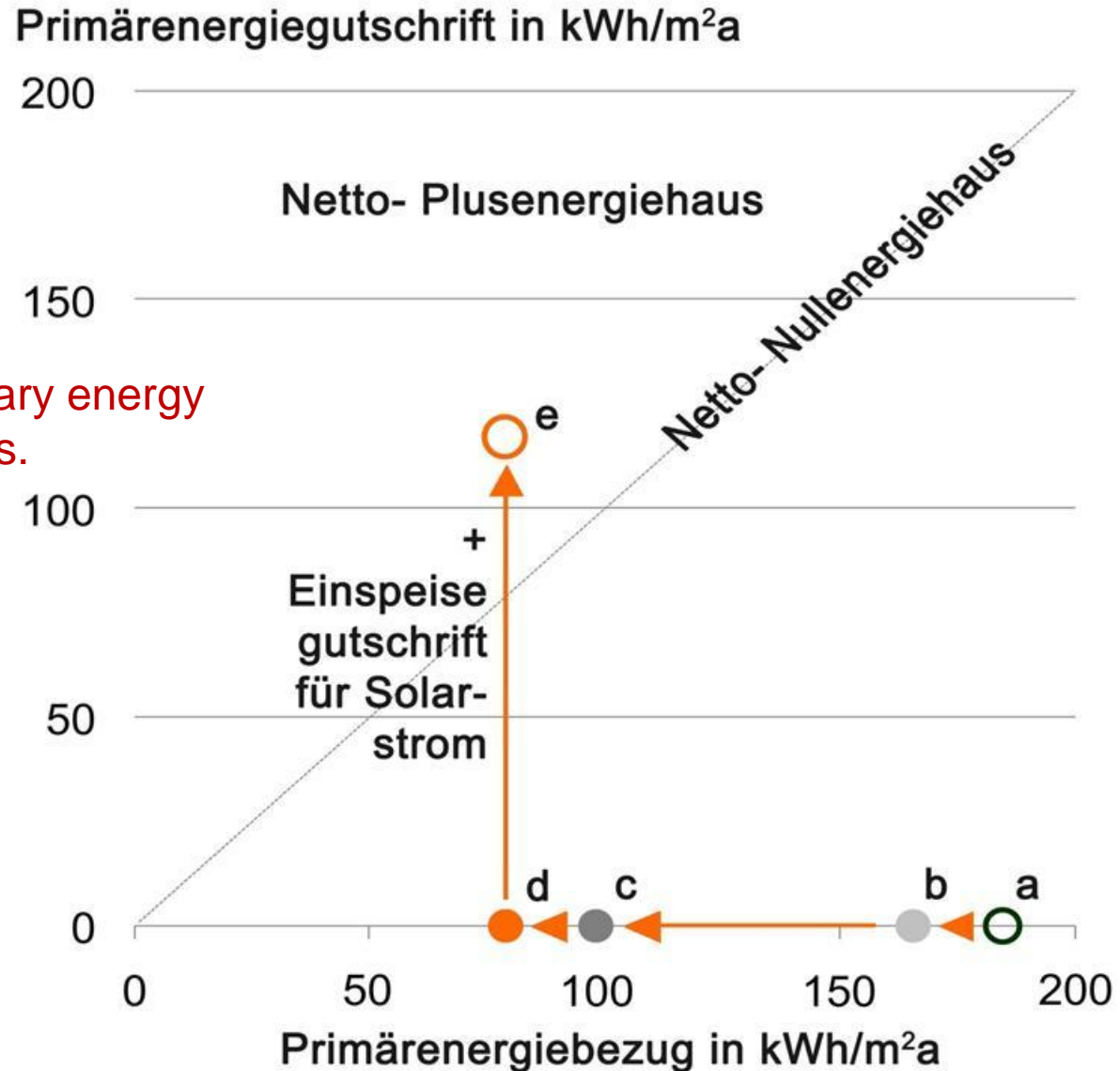
# Solar Settlement PlusEnergyHouses

## Monitoring

Bergische Universität Wuppertal

Illustration:  
 Explanation of the average primary energy  
 balance of the settlement houses.

- a House EnEV Standard
- b + low-current household
- c Passive house
- d + renewable energy
- e + compensation for generated solar power





# PlusEnergyHouse®

Sustainable-house concept for  
housing developments  
Created in 1997

- Heating costs are about 150 € per year. Owners save about 2,500 €.



# PlusEnergyHouse®

Sustainable-house concept for  
housing developments  
Created in 1997

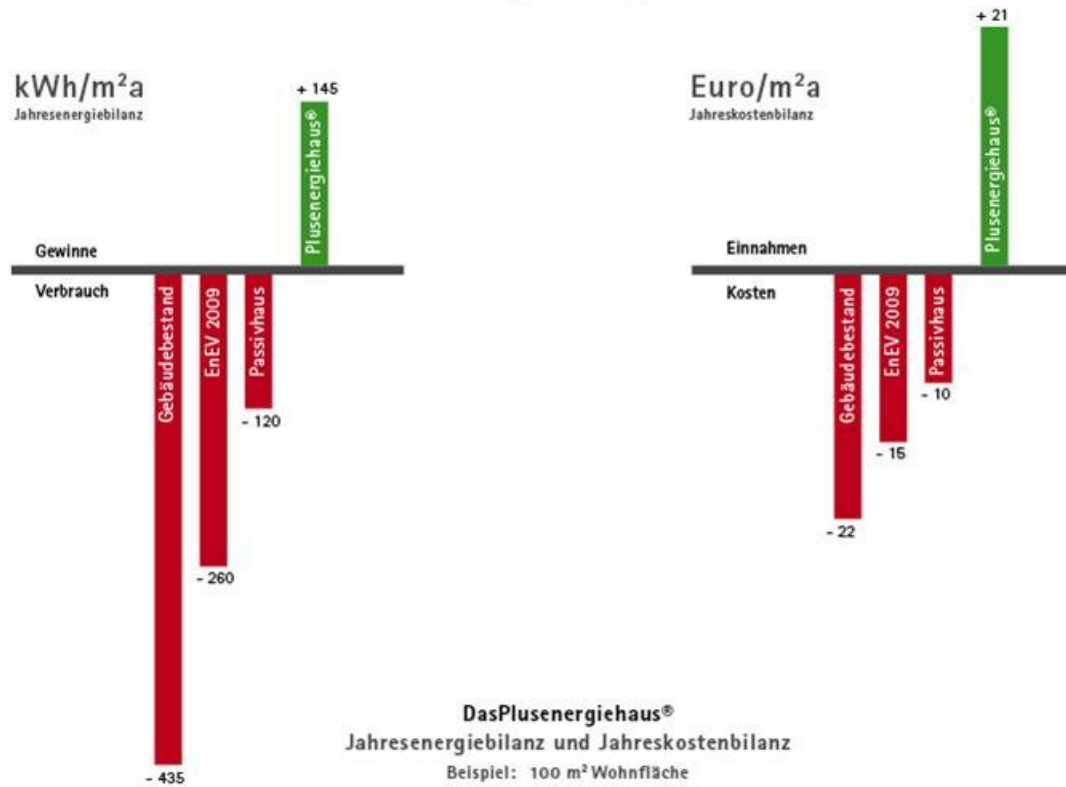
rolfdisch SolarArchitektur

[www.rolfdisch.de](http://www.rolfdisch.de) | [info@rolfdisch.de](mailto:info@rolfdisch.de) | [www.plusenergiehaus.de](http://www.plusenergiehaus.de)

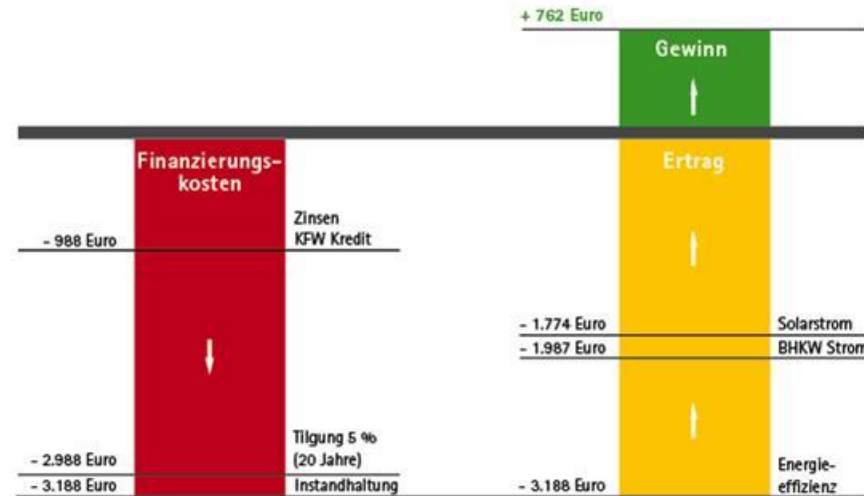
- The solar electricity is sold to the public grid. The average gains: 3,000 € a year.



## Durch Plusenergie im grünen Bereich



## Durch Plusenergie im grünen Bereich



### Plusenergiehaus® | Jahresbilanz

Kosten gegenüber Erträgen und Gewinnen in Euro/a  
 Beispiel: 100 m² Wohnfläche | Mehrinvestitionen 40.000 Euro

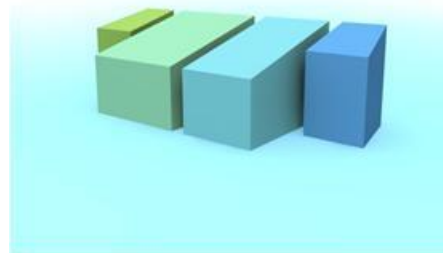
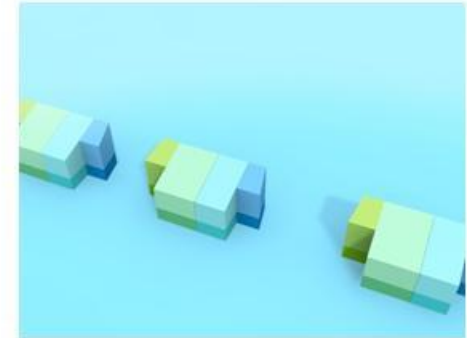
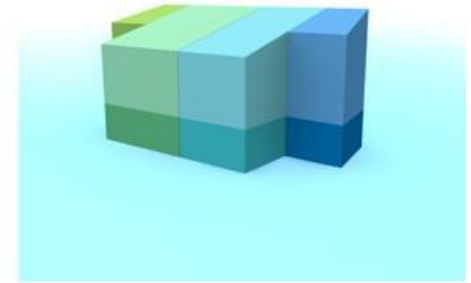


# 5. New Projects

# 11,000 Mayors Campaign

# Modules I

- Basic module
- With annex
- Semi-detached
- Additional floors
- Building group
- Housing estate





# Powerbox by Rolf Disch

Diagram of upper floor

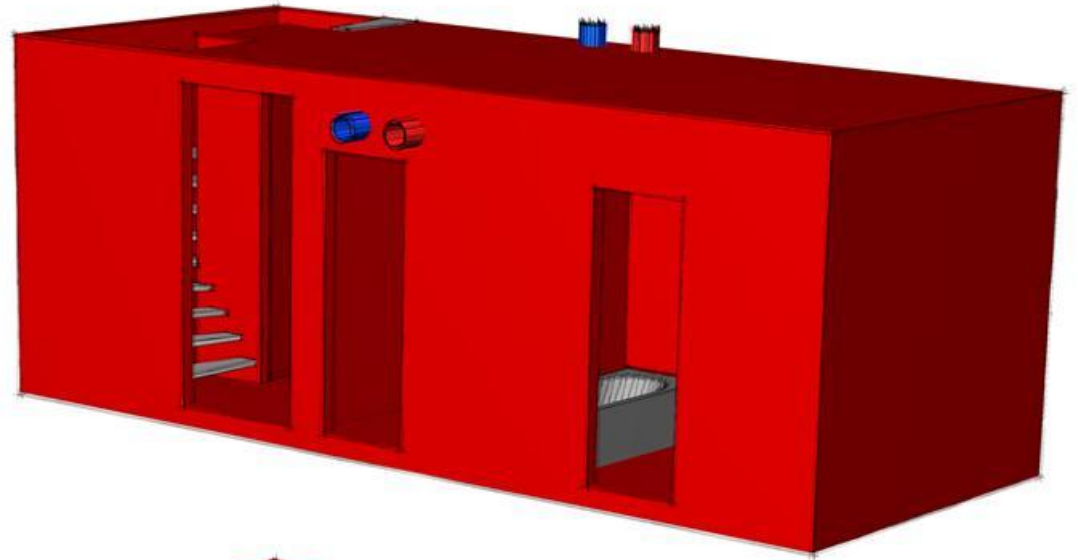
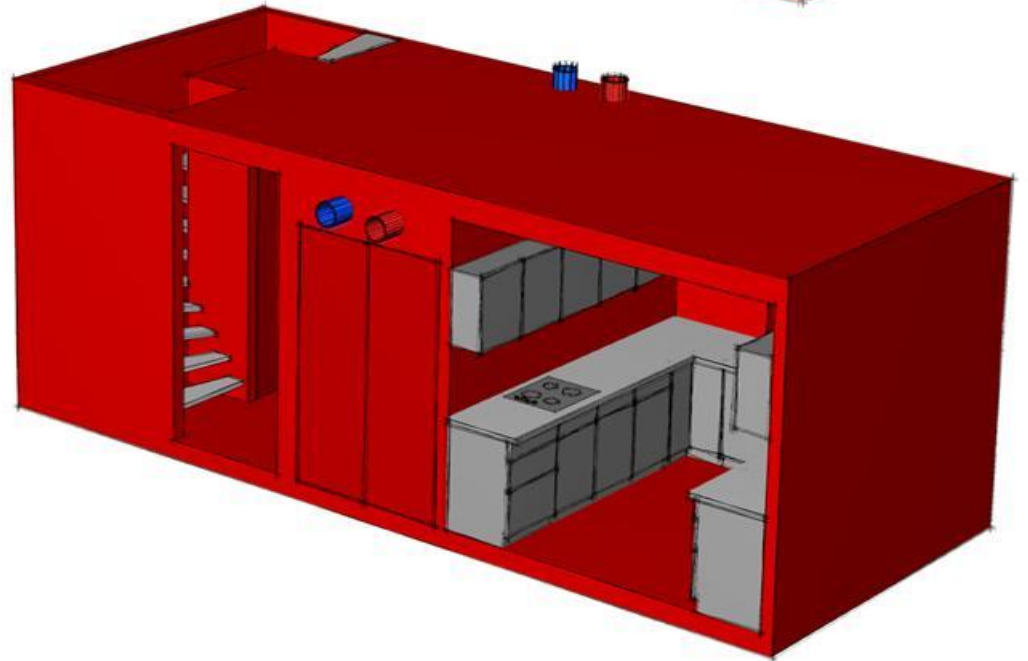


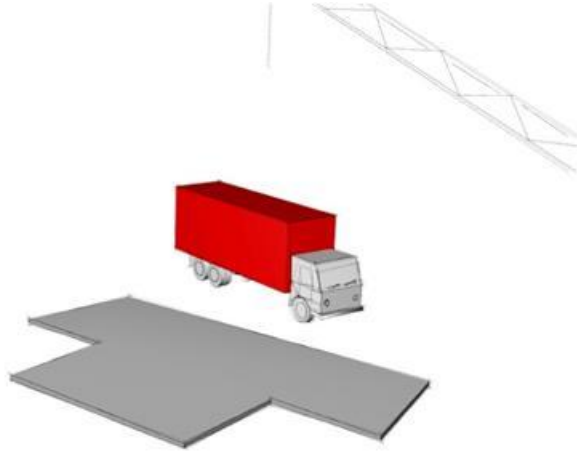
Diagram of ground floor



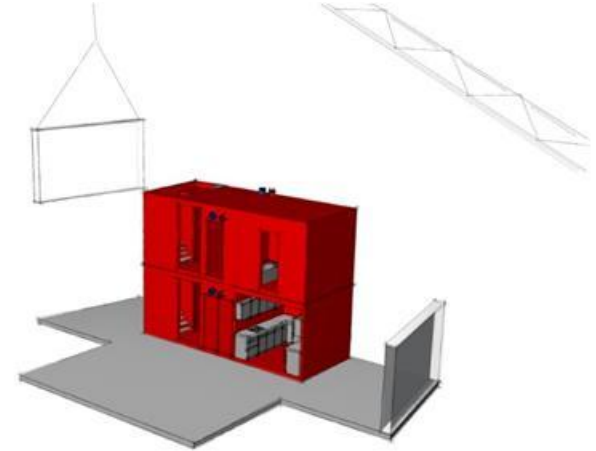
# PlusEnergyHouse® by Rolf Disch

## Construction process

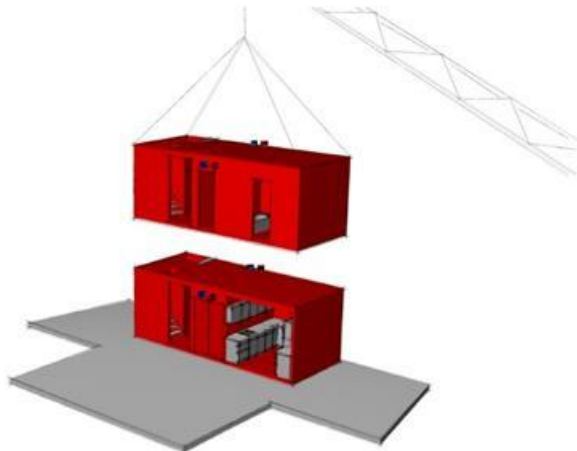
6 AM



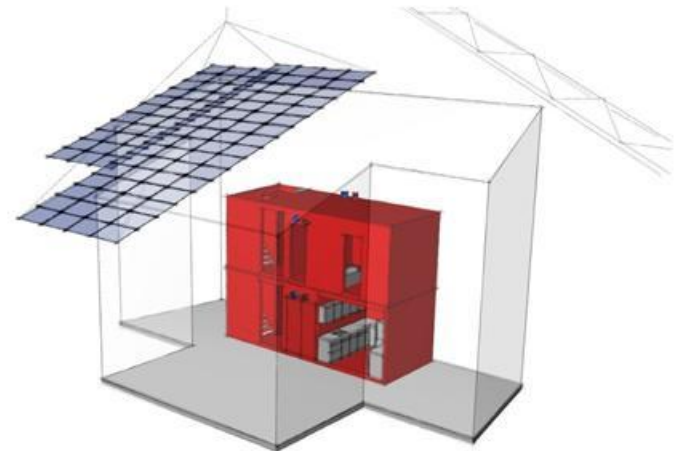
10 AM



8 AM



6 PM



# Some first results ...



# Solar Community Königsfeld

rolfdisch SolarArchitektur

[www.rolfdisch.de](http://www.rolfdisch.de) | [info@rolfdisch.de](mailto:info@rolfdisch.de) | [www.plusenergiehaus.de](http://www.plusenergiehaus.de)





# Solar Community Eichstetten

rolfdisch SolarArchitektur

[www.rolfdisch.de](http://www.rolfdisch.de) | [info@rolfdisch.de](mailto:info@rolfdisch.de) | [www.plusenergiehaus.de](http://www.plusenergiehaus.de)

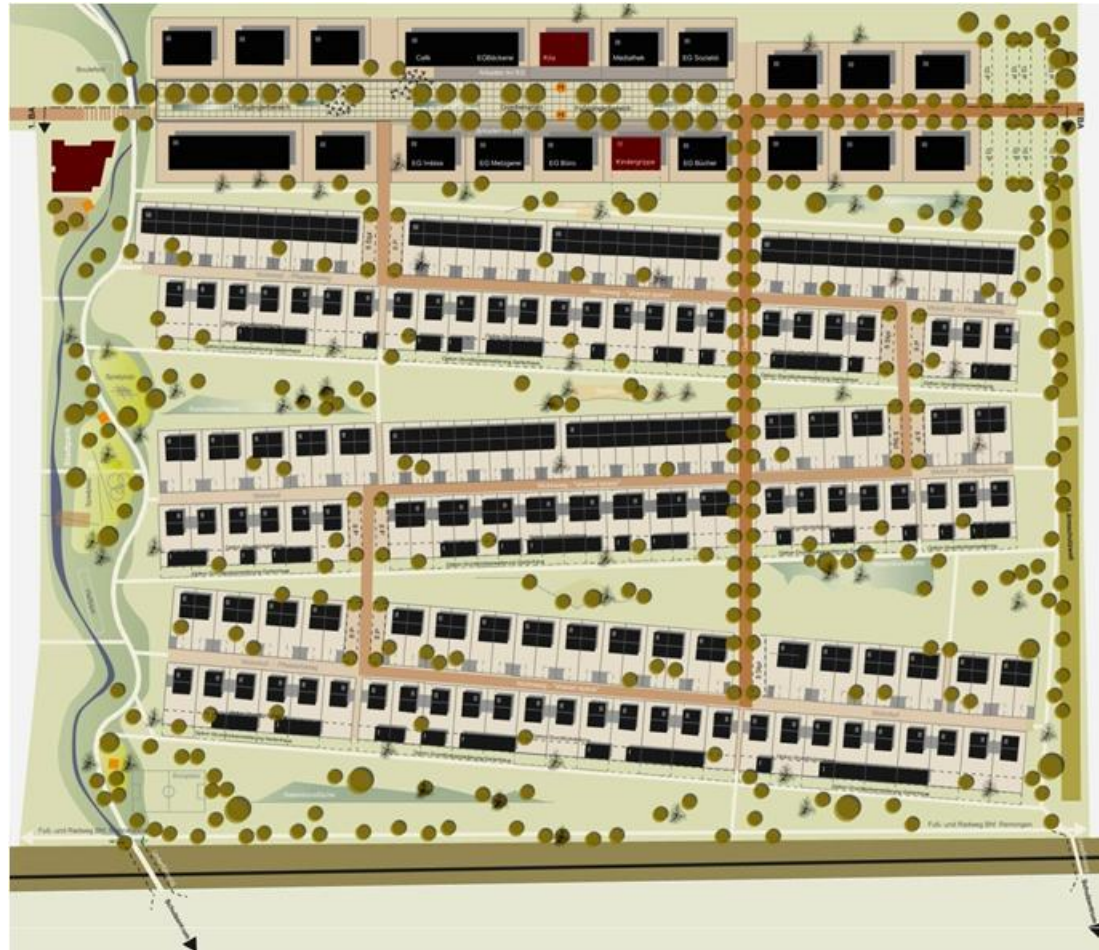




# Solar Community Cologne



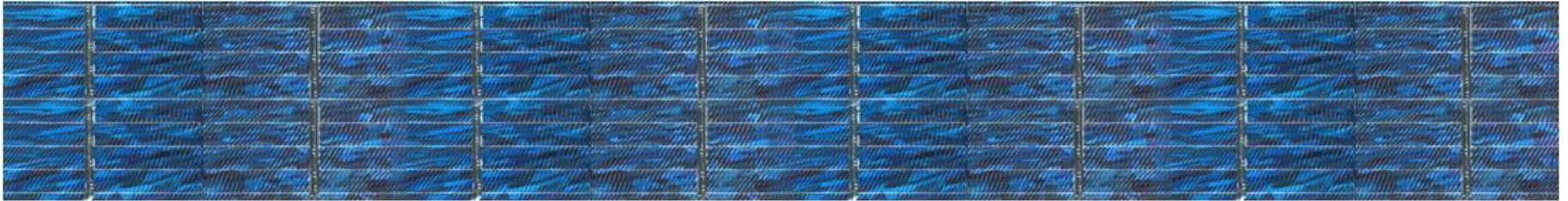
# Solar Community Renningen-Malmsheim





- Aarhus, Denmark
- Kristiansand, Norway
- Florianopolis, Brasil
- Beirut, Lebanon

# Plusenergy houses for all climates, for all purposes ...



## Thank you for your attention!

- Dr. Tobias Bube
- Rolf Disch SolarArchitecture, Freiburg, Germany
- [www.rolfdisch.de](http://www.rolfdisch.de)
- [Tobias.Bube@rolfdisch.de](mailto:Tobias.Bube@rolfdisch.de)