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Passive House as a solution for NZEB

Camille Sifferlen, Passive House Institute



What is a Passive House?



**PASSIVE
HOUSE**

„A building that can be
heated or cooled
solely via the fresh air
from a ventilation system “

Dr. Wolfgang Feist
& Bo Adamson

Speaker: Camille Sifferlen

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What is a Passive House?



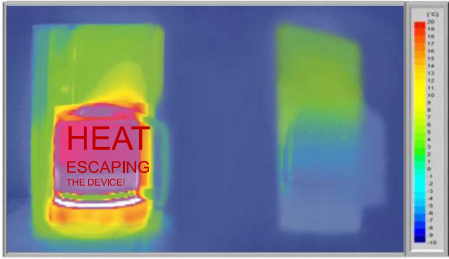



Speaker: Camille Sifferlen

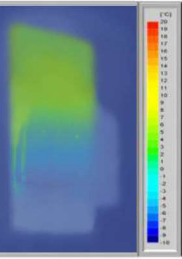
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ACTIVE



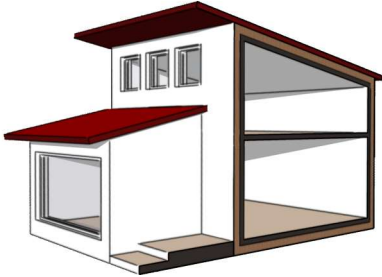
PASSIVE



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1. Continuous insulation



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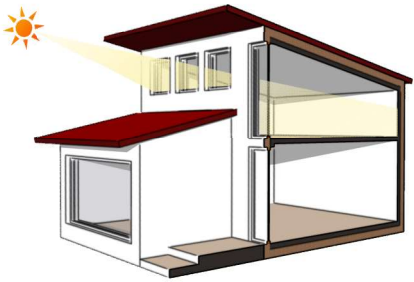
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1. Continuous insulation
2. Passive House windows



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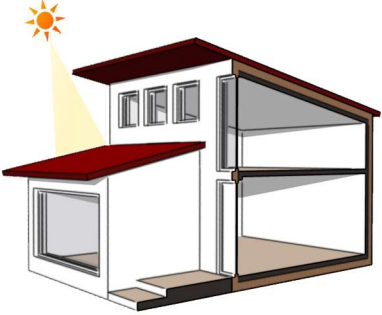
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1. Continuous insulation
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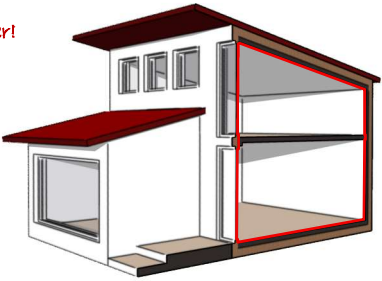


1. Continuous insulation
2. Passive House windows

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ONE continuous layer!

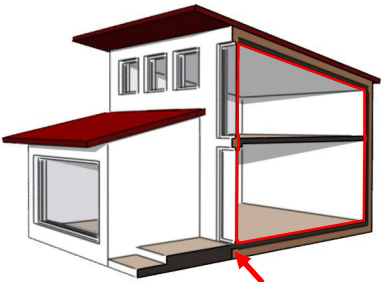


1. Continuous insulation
2. Passive House windows
3. Continuous airtightness

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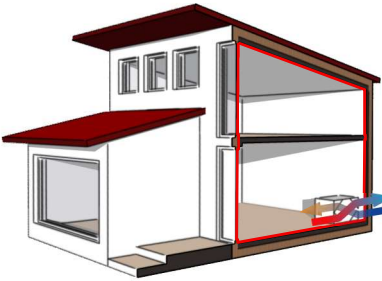
Don't interrupt the insulation layer!



1. Continuous insulation
2. Passive House windows
3. Continuous airtightness
4. No thermal bridges

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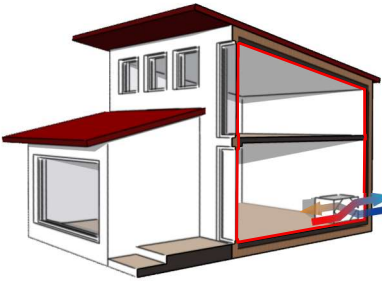


1. Continuous insulation
2. Passive House windows
3. Continuous airtightness
4. No thermal bridges
5. Mechanical ventilation w/ heat recovery

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Keeps the heat outside in summer!




1. Continuous insulation
2. Passive House windows
3. Continuous airtightness
4. No thermal bridges
5. Mechanical ventilation w/ heat recovery

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 **What is a Passive House?**
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Also works for retrofits!



Sustainable


Comfortable

Energy efficient



Cost-optimal

Mould-free

Excellent air quality

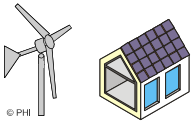


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 **Nearly Zero Energy Building**
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2019 : All public buildings are „Nearly zero energy buildings“
2021 : All new buildings

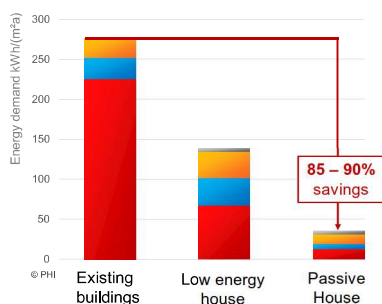
Each **member state** shall define its corresponding energy standard.



“ A NZEB is a building that has a **very high energy performance** [...] **Minimum requirements** have to meet at least **cost optimum** with respect to life cycle costs [...] Its energy demand **should** to a very significant extent be covered by **energy from renewable sources**, including renewable energy produced on-site or nearby. “

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 **Very high energy performance**
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Building Type	Space heating	Domestic Hot water	Household electricity	Ventilation
Existing buildings	~230	~30	~20	~10
Low energy house	~70	~30	~20	~10
Passive House	~10	~10	~10	~10

Heating and cooling demand
 $\leq 15 \text{ kWh}/(\text{m}^2\text{a})$

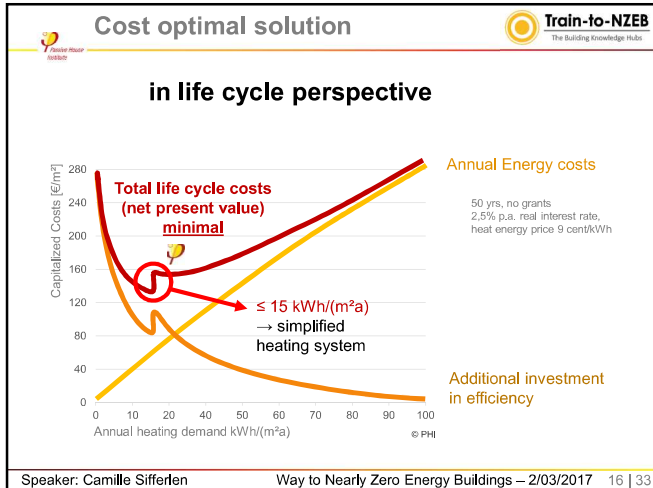
Very low heating/cooling load

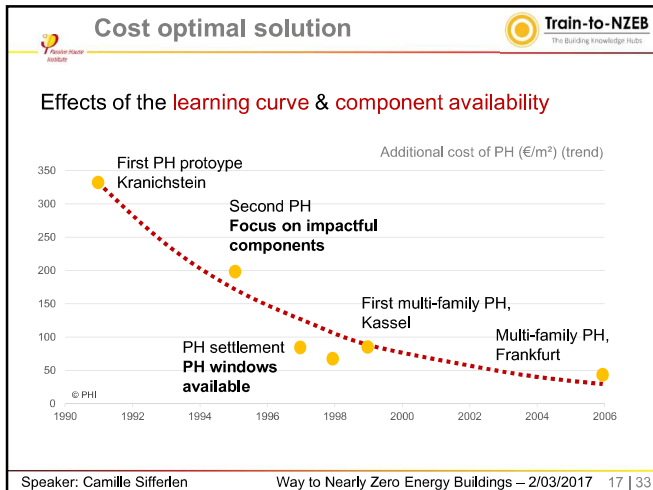
Primary energy demand
 $\leq 120 \text{ kWh}/(\text{m}^2\text{a})$

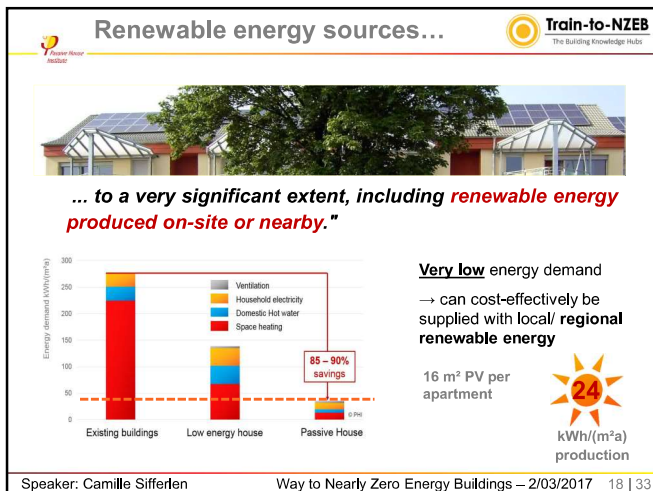
85 – 90% savings


- Ventilation
- Household electricity
- Domestic Hot water
- Space heating

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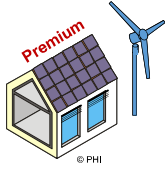
NEW Passive House classes






120

Renewable energy generation
[kWh_{PER}/(m²_{projected}*a)]




30




60


Plus



45



Classic




60


Total PER-demand
[kWh_{PER}/(m²_{TFA}*a)]


60

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Bottom line





Passive House + renewables = NZEB !!
All the requirements are met. It's tried and tested.

- ✓ Clearly specified criteria
- ✓ 25 years of experience
- ✓ Suitable for **all usage types** worldwide
- ✓ **Energy efficiency** comes first!

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PHPP

Passive House Planning Package

NZEB Tools

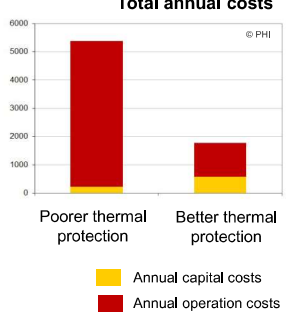
PHPP 9, designPH & learning material

Cost-effectiveness comparison

Source: www.passivhausprojekte.de

Total annual costs


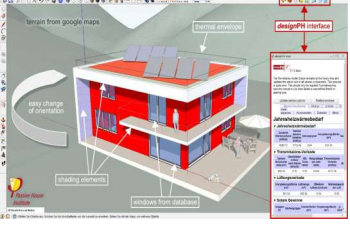


Thermal Protection	Annual capital costs	Annual operation costs
Poorer thermal protection	~500	~5000
Better thermal protection	~1000	~500

Legend:
■ Annual capital costs
■ Annual operation costs

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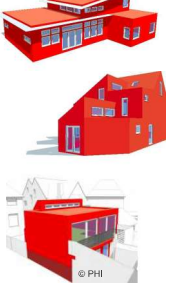
designPH

Plugin for the 3D design software SketchUp



- ✓ Design the Passive House project in 3D
- ✓ Import the model into the PHPP (quicker data entry)

For simple & complex design!



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Quality assurance

5600+ people worldwide

2500+ people worldwide

870+ components

30+ people

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21st INTERNATIONAL PASSIVE HOUSE CONFERENCE 2017

Vienna | Austria
28 | 29 April 2017
 with exhibition, workshops and excursions

www.passivehouseconference.org



16 – 18 June 2017
MID-YEAR PASSIVE HOUSE DAYS

10 – 12 November 2017
PASSIVE HOUSE DAYS

Passive House residents open their homes worldwide!

www.passivehouse-international.org



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