

## **AFTER Konferenz**

**Darmstadt, 28. August 2013**



# BuildTog 1.0 Das Passivhaus der Europaklasse

Kostenoptimierung durch europäische Kooperation

Sozialer Wohnungsbau im Fokus der Stadtwirtschaft | Darmstadt | 14.02.2013



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# EURHONET European Housing Network



**Eurhonet**  
Energy



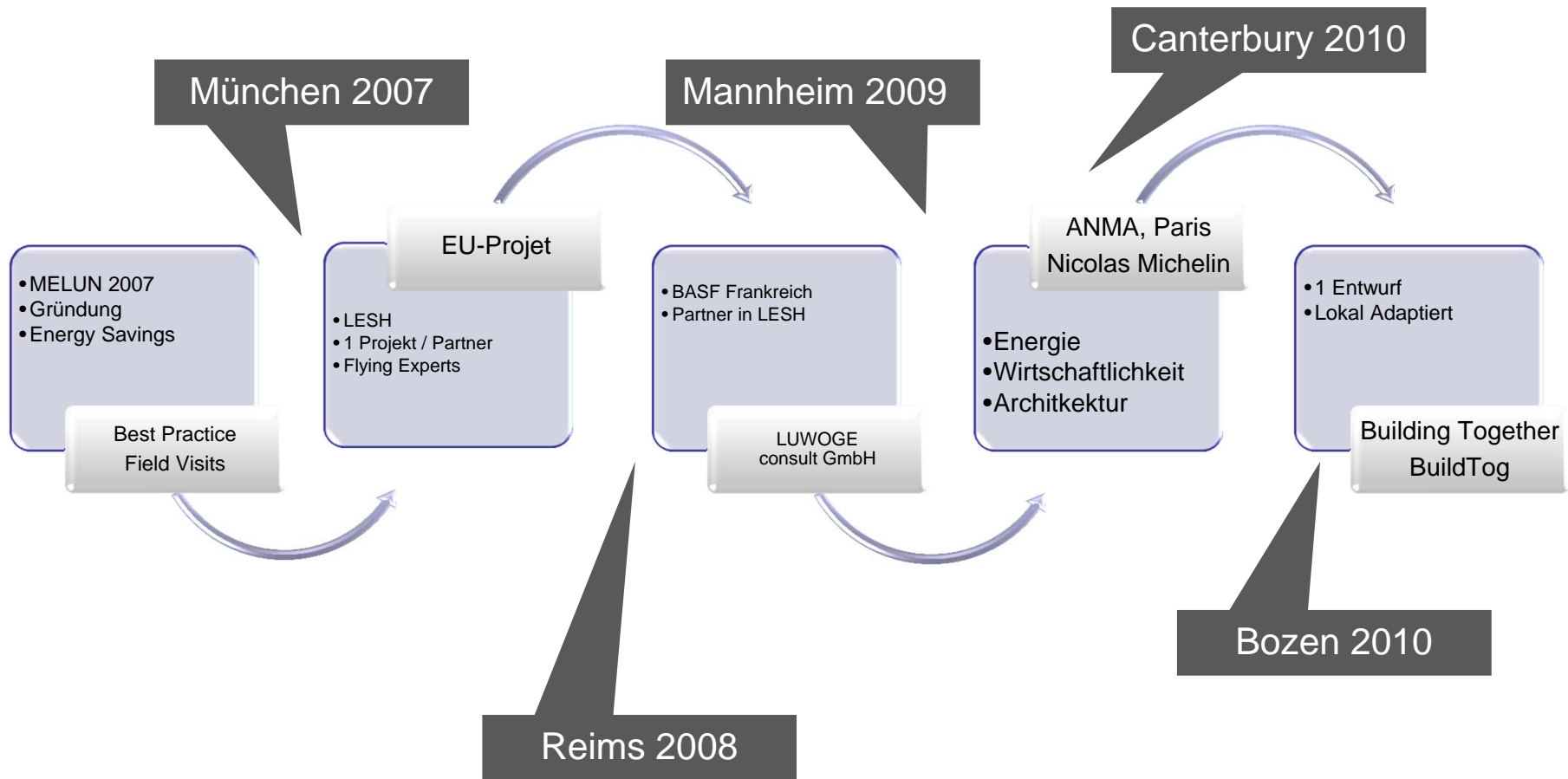
- 5 - Nationen
- 28 Wohnungsunternehmen
- 500.000 – Wohnungen



Innovative und energieeffiziente Wohnraumkonzepte für eine nachhaltige Reduzierung der Energieverbräuche und der CO<sub>2</sub>-Emissionen im Kontext der Wirtschaftlichkeit und bezahlbarem Wohnraum!



# Energy Savings European Housing Network





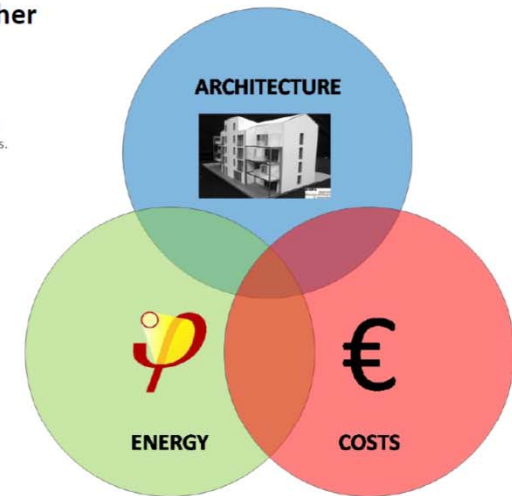
# BuildTog Building Together

## = BUILDing TOGether

Our companies have the same goals

To build, on a **large scale, high energy performance** buildings at a **reasonable price**, with **similar technical and architectural** approaches in our different countries.

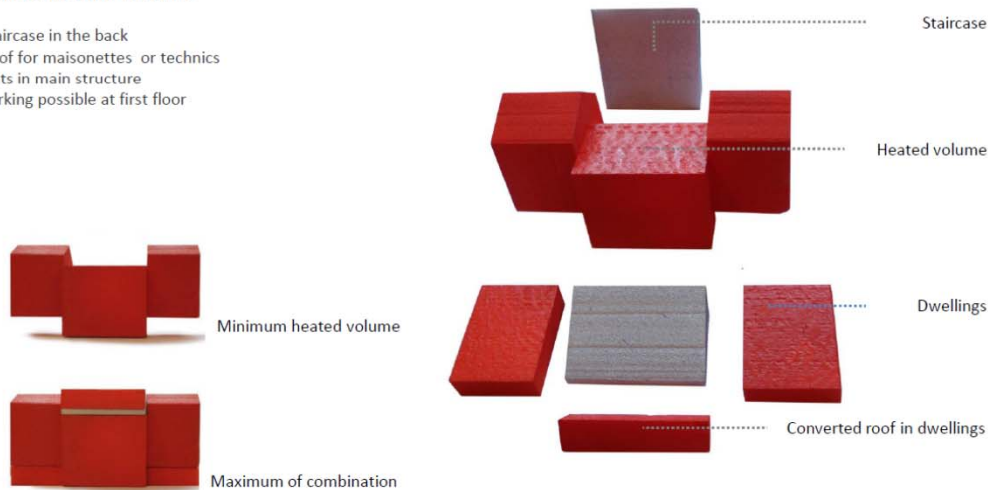
Then, why not to build a building on a common basis and compare concretely our different approaches to achieve the same goal?



### MODELS

#### VARIOUS HEATING VOLUMES

Staircase in the back  
 Roof for maisonettes or technics  
 Flats in main structure  
 Parking possible at first floor



Quelle: Cunz, Thilo; What a BuildTog is? – LUWOGÉ consult GmbH



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 Nicolas Michelini  
 & Associates



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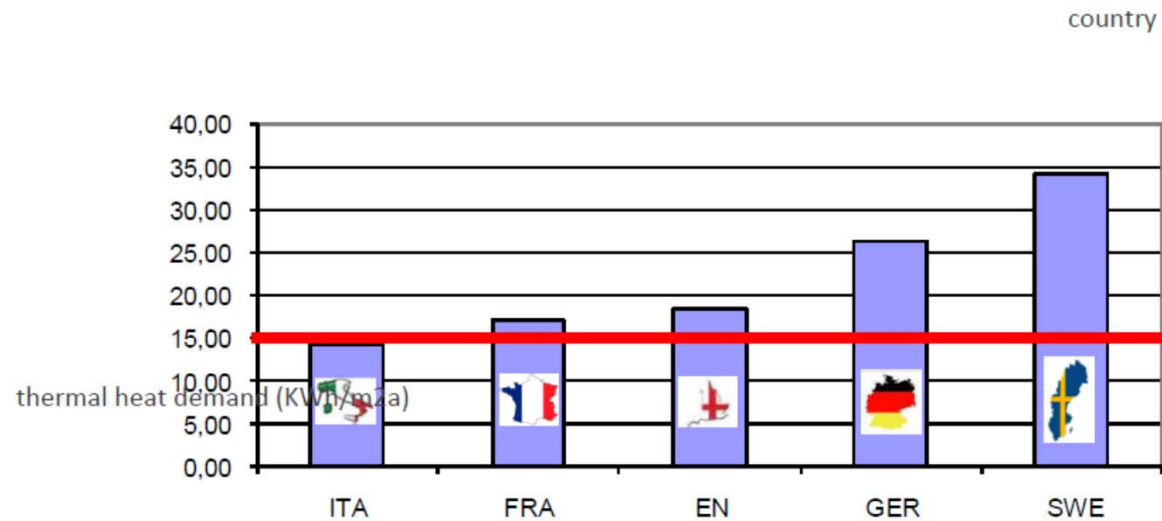


# Passivhaus im europäischem Vergleich

## THERMAL HEAT DEMAND

### ENERGETIC STANDARD OF AVERAGED CONSTRUCTION COMPONENTS

Compacity	0,7
Orientation	South
Insulation	20 cm
U-value window	0,8 W/m <sup>2</sup> K
Percentage of windows	27%
G-value glazing	0,5
Heat recovery	75%
Airtightness	0,6/h



Quelle: Cunz, Thilo; What a BuildTog is? – LUWOGÉ consult GmbH



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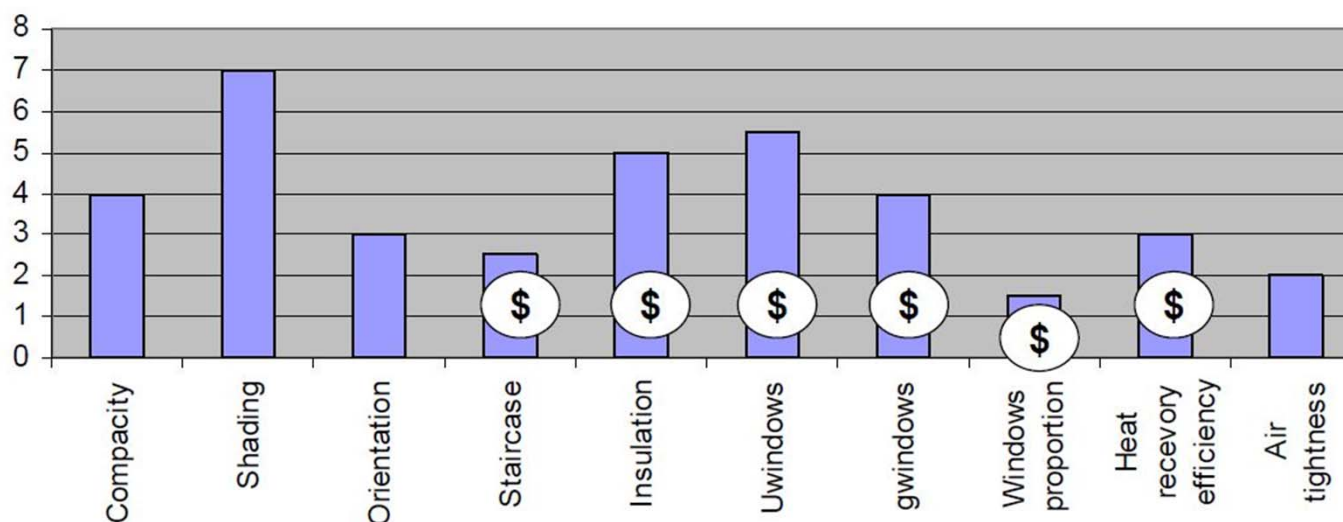
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# Optimierungsfelder

## Energiebedarf für Heizung (kWh/m<sup>2</sup>.a)



Quelle: Cunz, Thilo; What a BuildTog is? – LUWOG E consult GmbH



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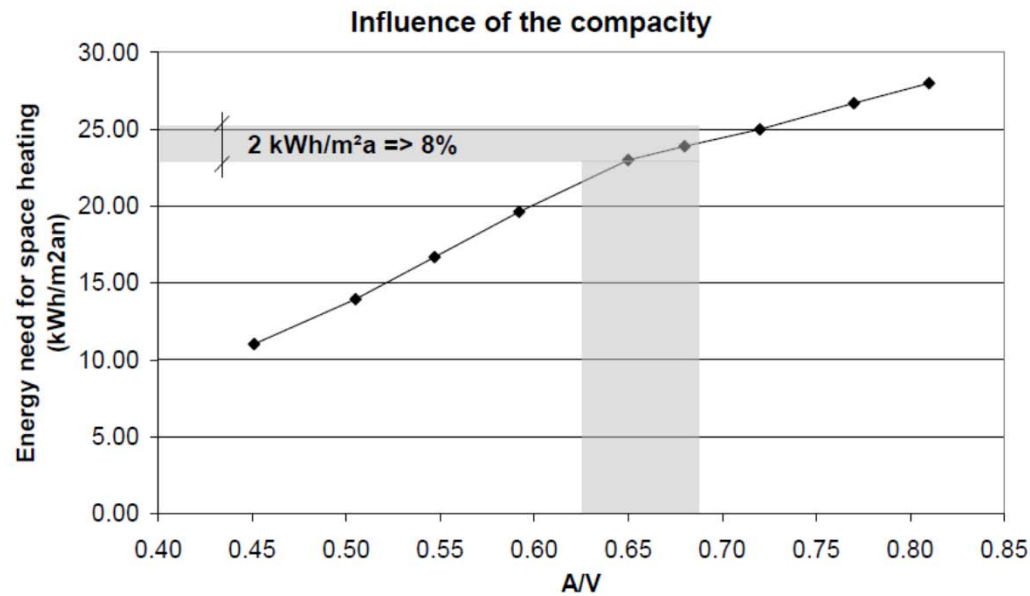
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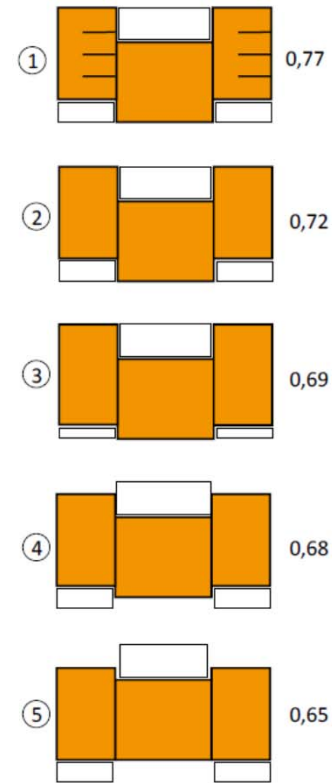


# Kompaktheitsgrad im Vergleich

EXAMPLE COMPACITY



Potential optimisation : 8%  
Cost : non (negative)

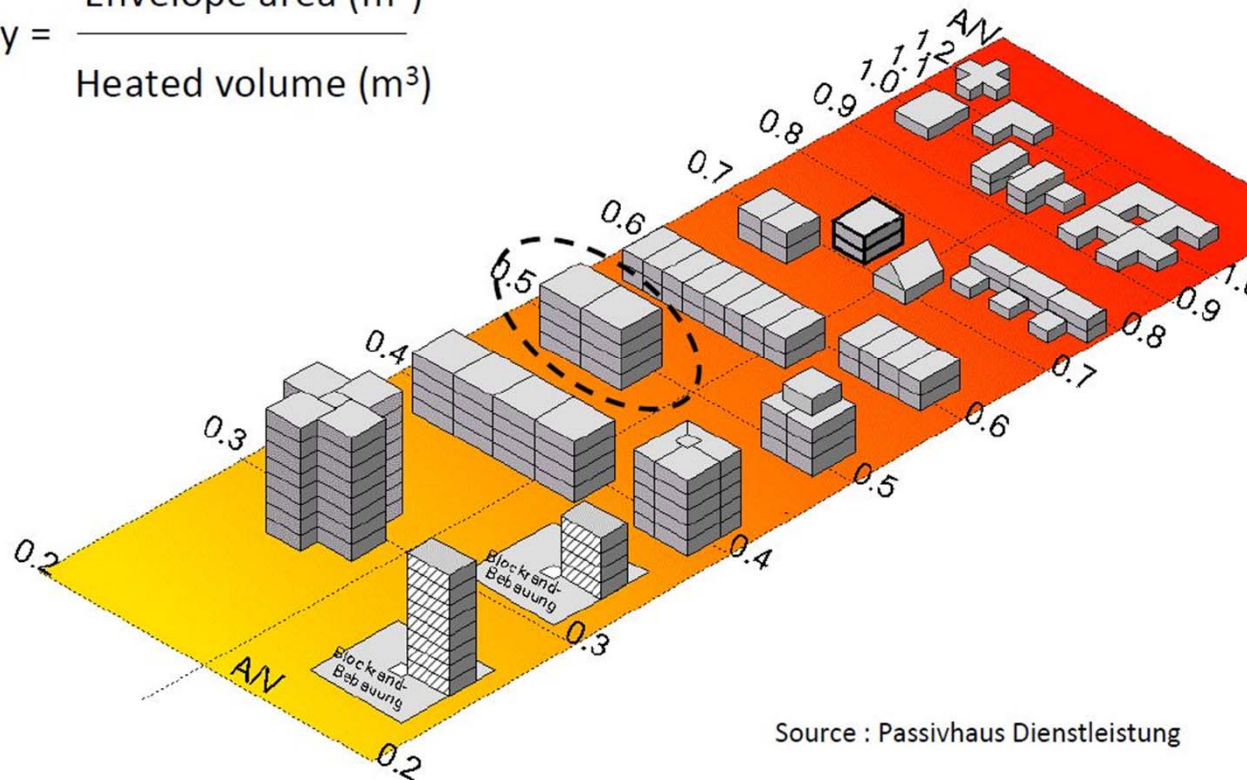






# Optimierungsfelder

$$\text{Compacity} = \frac{\text{Envelope area (m}^2\text{)}}{\text{Heated volume (m}^3\text{)}}$$



Source : Passivhaus Dienstleistung

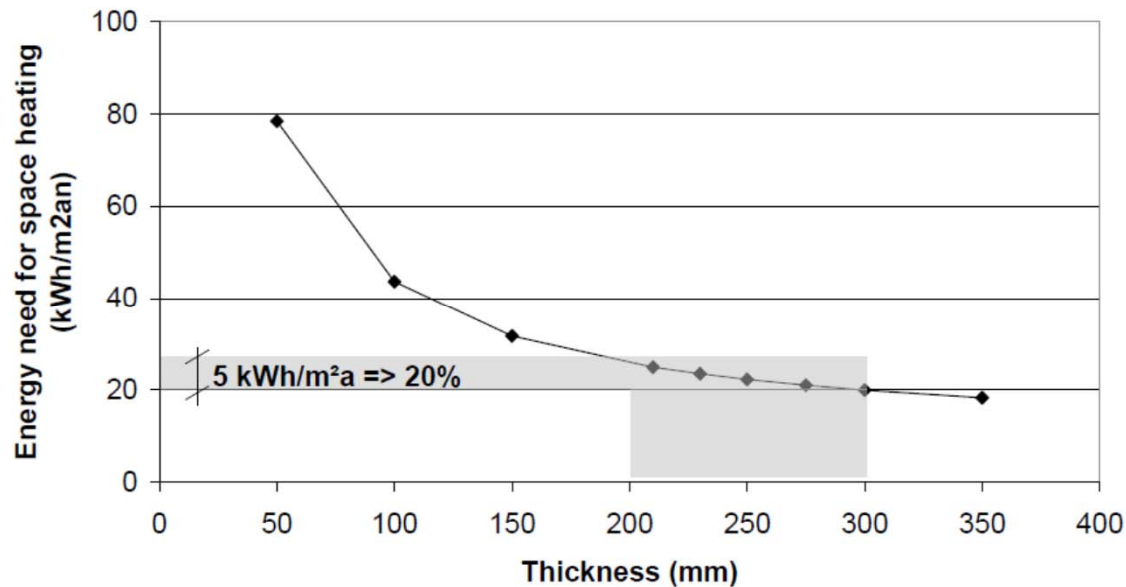


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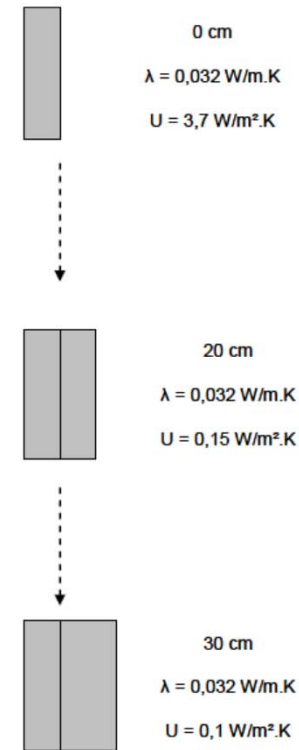
# Wärmedämmung im Vergleich

EXAMPLE INSULATION

Insulation (walls, roof, floor)



Potential optimisation : 20 %  
Cost: Yes  
Attention : Thermal Bridges



Quelle: Cunz, Thilo; What a BuildTog is? – LUWOGÉ consult GmbH



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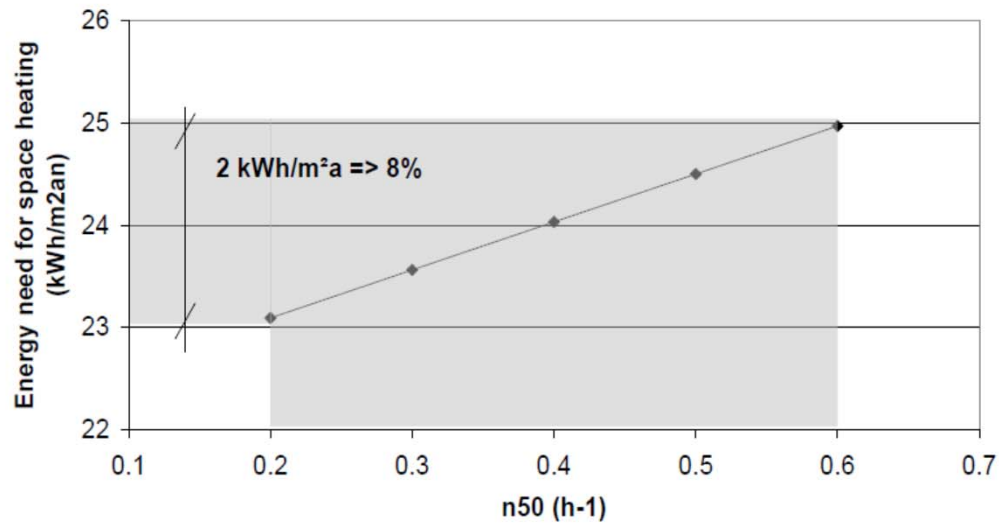
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# Luftdichtheit im Vergleich

EXAMPLE AIRTIGHTNESS

Air thightness



Potential optimisation : 8%  
 Cost: No  
 Attention : Value at the end of construction

$n_{50} = 0,6$  volumes/h



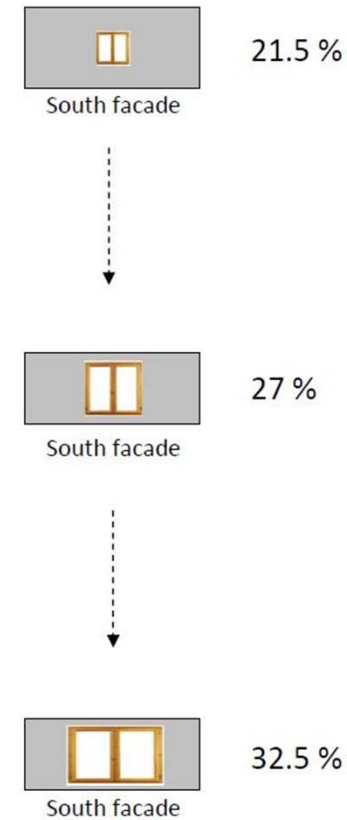
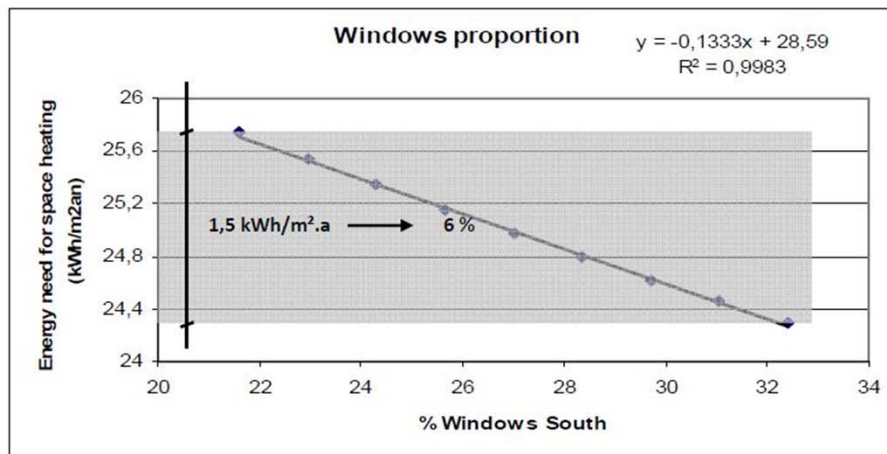
$n_{50} = 0,2$  volumes/h



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# Fensterflächen

- Compacity 0,72
- g windows 50%
- Heat recovery efficiency 75%
- Insulation  $U = 0,15$
- orientation N/S
- Air tightness  $n_{50}=0,6$
- $U_{\text{windows}} U=0,8$
- shading 35m
- Staircase out
- Windows proportion ???
- Climate GER



Quelle: Cunz, Thilo; What a BuildTog is? – LUWOGÉ consult GmbH



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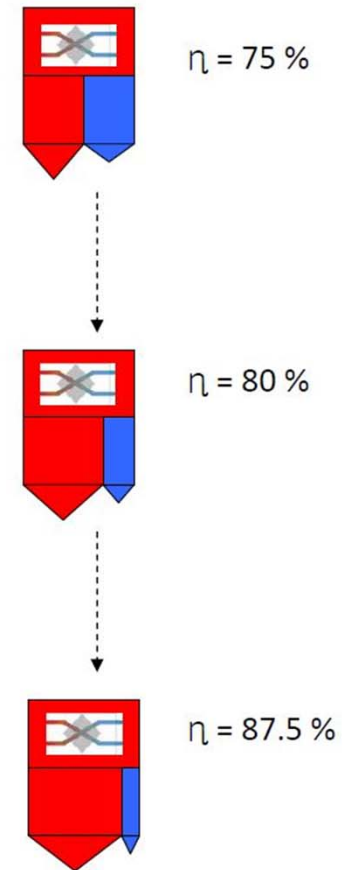
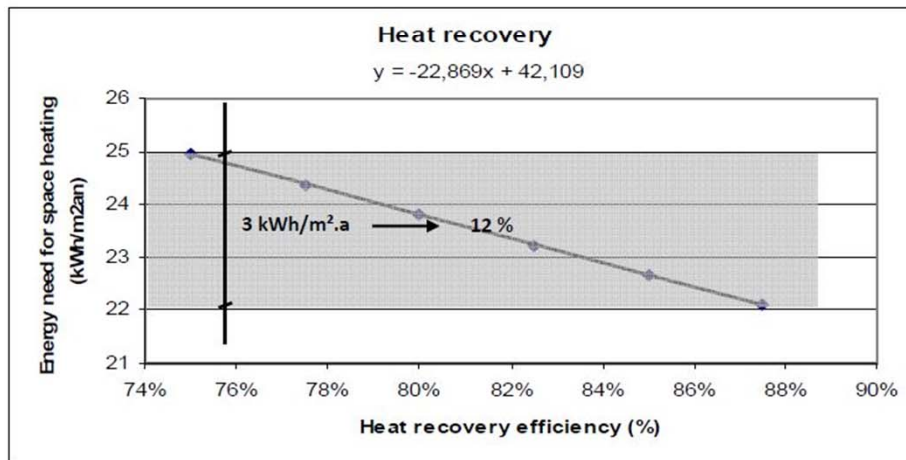
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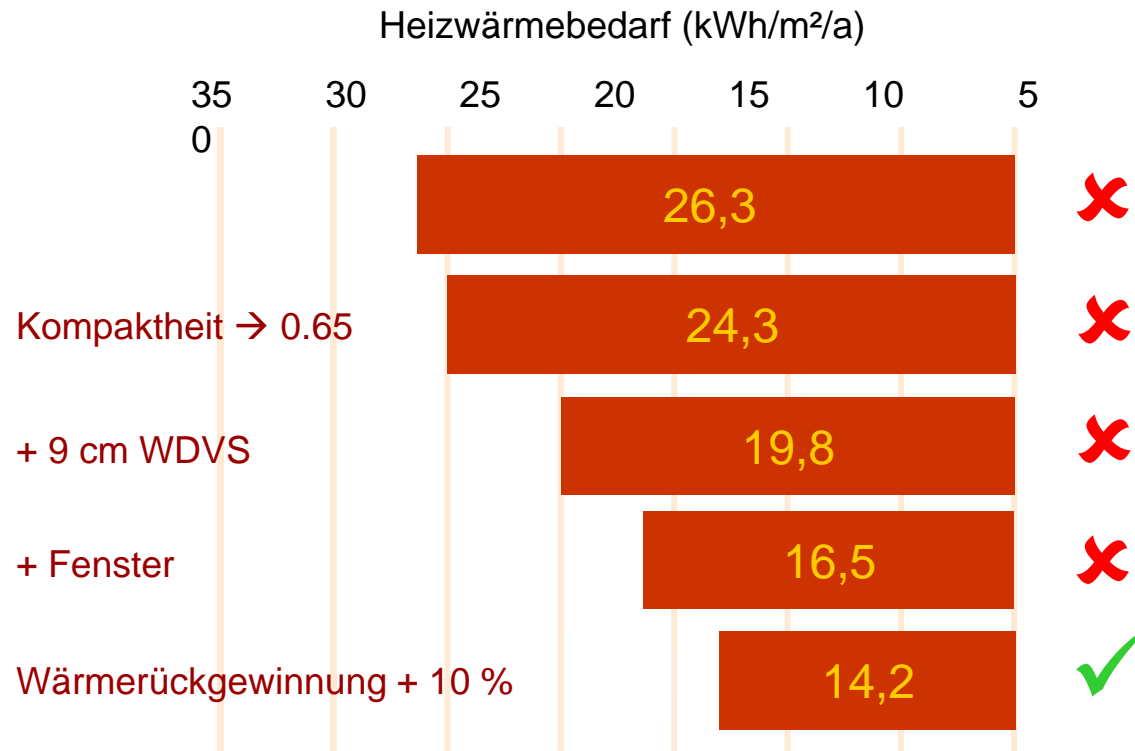
# Wärmerückgewinnung

- Compacity 0,72
- g windows 50%
- Heat recovery efficiency ???
- Insulation U = 0,15
- orientation N/S
- Air tightness n<sub>50</sub>=0,6
- U<sub>windows</sub> U=0,8
- shading 35m
- Staircase out
- Windows proportion 27%
- Climate GER





# BuildTog Passivhaus – Variante 1



Quelle: Cunz, Thilo; What a BuildTog is? – LUWOGÉ consult GmbH



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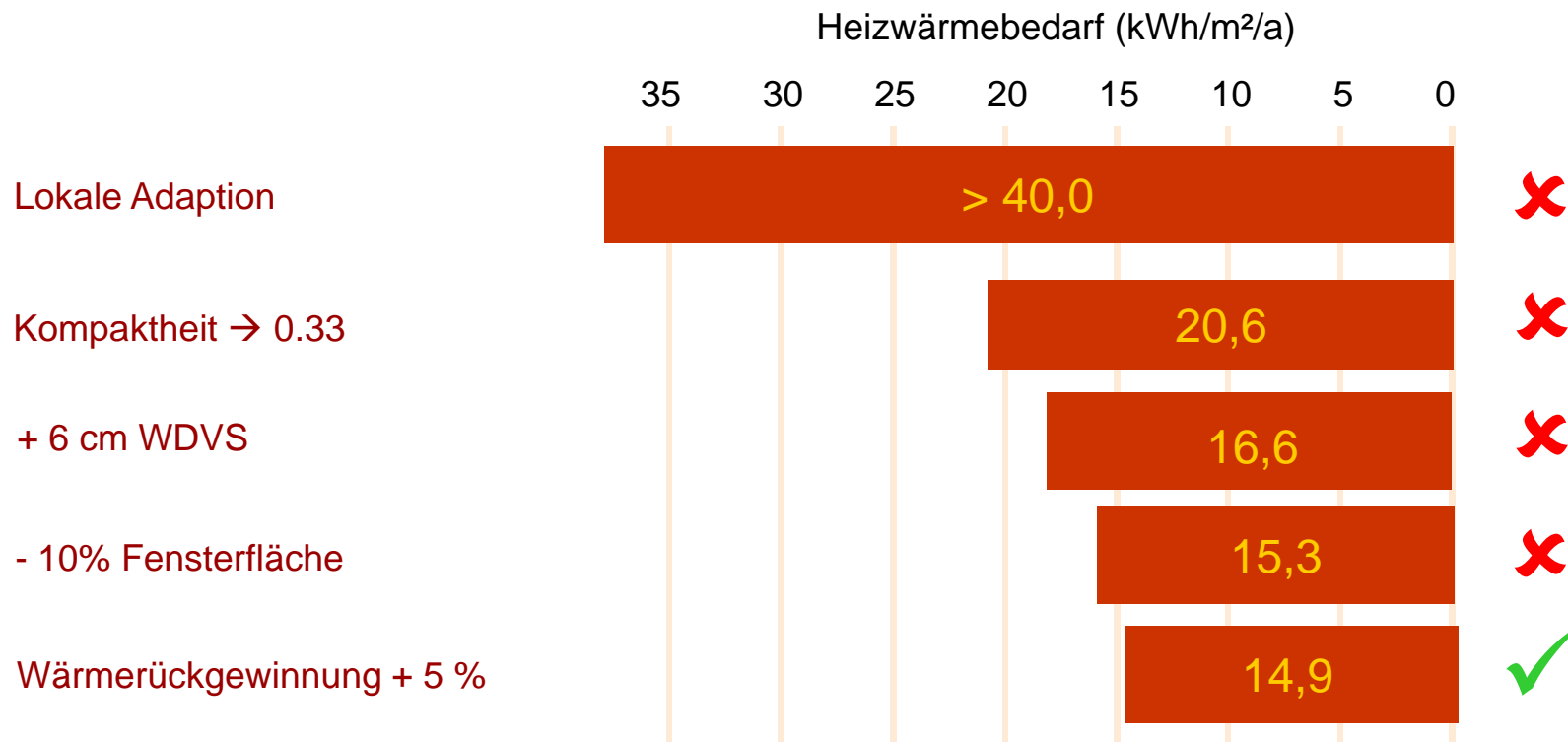


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# BuildTog Variante greenageone



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# BuildTog Perspektive







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# BuildTog Grundrisse



## WOHNUNG 22 – 4 ZIMMER – 117,4 M<sup>2</sup>

Zimmer 1:	14,67 m <sup>2</sup>	Abstell.:	1,20 m <sup>2</sup>
Zimmer 2:	12,14 m <sup>2</sup>	WC:	1,65 m <sup>2</sup>
Zimmer 3:	12,00 m <sup>2</sup>	Bad:	6,20 m <sup>2</sup>
Flur/Garderobe:	18,47 m <sup>2</sup>	Wohnen/Essen:	30,65 m <sup>2</sup>
Küche:	9,40 m <sup>2</sup>	Terrasse:	11,00 m <sup>2</sup>



# Passivhaus

## Energieeffizienzhaus Kostenvergleich

WohnArt 3 – Passivhaus		1.616 € (KG 300-400)
Rüdesheimer – EnEV Neubau	8%	1.490 € (KG 300-400)
BuildTog – Passivhaus		1.520 € (KG 300-400)
K6 Punkt 1 – EnEV Neubau	2%	1.489 € (KG 300-400)

Die **Kostendifferenz** zwischen einem **Passivhaus** und einem **Neubau** nach der **Energieeinsparverordnung** konnte **deutlich gesenkt** werden.



# Vielen Dank für Ihre Aufmerksamkeit



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