

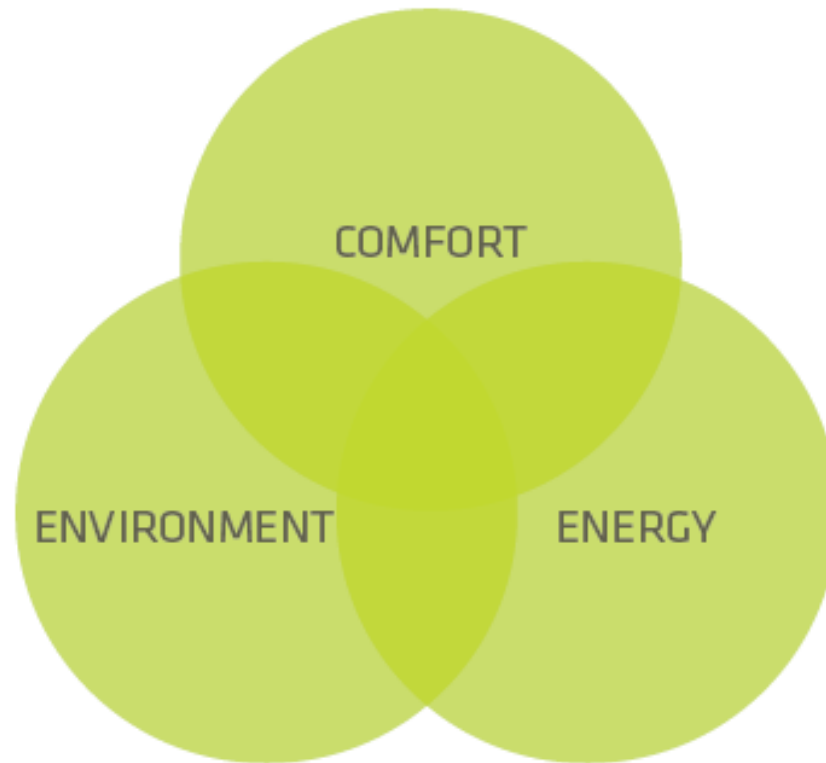
AKTIVHUS – Et eksempel på bæredygtigheds vurdering

INNOBYG Forårskonference

12.3.2015

Kurt Emil Eriksen
Secretary General
Active House Alliance

Active House – en vision



Active House er visionen om at skabe sunde og mere komfortable bygninger for beboere og brugere, med positiv indflydelse på klima og miljø

BYGGERIET SKAL BIDRAGE TIL DEN GRØNNE OMSTILLING

læs om hvordan

NYT

Ny analyse: Vind er billigst

Den billigste måde, Danmark kan skaffe sig ny elkapacitet på, er ved at sætte nye vindmøller op på land. Det viser en ny analyse...

Grønne ambitioner intakte med ny delaftale

Regeringen offentliggør i dag en vækstdeftale på energiområdet, som hovedparten af Folketingets partier er enige om. Klima-,...



KLIMA-, ENERGI- OG BYGNINGSMINISTEREN

Det er en betydelig udfordring at omstille det danske samfund. Det er afgørende, at vi tilrettelægger indsatsen, så den bliver både miljø- og ressourcemæssigt effektiv, og så den understøtter vækst og udvikling.

- Rasmus Helveg Petersen

GENVEJE

- Serviceeftersynet af Nordsøen
- Energiaftale
- Byggeprojekter
- Klimaforhandlinger i FN
- Hvad forhandler vi om i EU?
- COP19

"En frivillig bæredygtighedsordning kan være med til at give dansk byggeri en førerposition inden for bæredygtighed.

Vi har set med indførelsen af de frivillige lavenergiklasser, at branchen meget hurtigt integrerede dem i deres løsninger.

Det er den samme gradvise mekanisme, vi ønsker her"

The International Active House Alliance

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NETWORK AND KNOWLEDGE SHARING

- medlemmer og målgrupper



Members Of the Active House Alliance March 2015:



In cooperation with:



Stiftende partnere:



TEKNOLOGISK
INSTITUT

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NETWORK AND KNOWLEDGE SHARING

AktivHus Danmark

Aktuel medlemsliste:

VELFAC A/S

KFS Boligbyg A/S

Randers Arkitekten

Danfoss A/S

Visility ApS

Cenergia

Saint-Gobain Nordic A/S

Kuben Management

VELUX Danmark A/S

AART Architects

Teknologisk Institut

Cowi

Steni Danmark

Inwido Danmark

Grundfos DK A/S

Esbensen A/S



AktivHus Danmark

Foreningens formål er at udbrede bæredygtighed i dansk byggeri og adresserer i særlig grad små og mellemstore bygninger.

AktivHus Danmark fokuserer på en helhedsorienteret tilgang til byggeri, hvor både indeklima, energi og miljøparametre vurderes, og integreres i bygningens design. Vurderingen sker med udgangspunkt i Active House klassificeringsværktøj, der fungerer som et rationelt design- og evalueringværktøj for bæredygtigt byggeri, og sikrer dermed at omkostninger til processen holdes lave. AktivHus designstrategi og klassificering er relevant for både nybyggeri og renovering.

AktivHus Danmark er et nationalt initiativ, en forening der vil tage udgangspunkt i den Internationale Active House Alliances arbejde, som bl.a. involverer de danske virksomheder VELUX A/S, Grundfos A/S, Cenergia A/S samt forskningsinstitutionerne DTU-BYG, Aalborg Universitet og Teknologisk Institut. Foreningen etablerer sekretariatet ved Dansk Byggeri.

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BUILDINGS THAT GIVE MORE THAN THEY TAKE



Nyheder



16-01 | AktivHus Danmark klar til at spille en rolle

Den internationalt anerkendte Active House Alliance er nu en officiel spiller på det danske marked for designværktøjer til bæredygtigt byggeri

05-01 | AktivHus Danmark - Bæredygtig mærkning af mindre bygninger

→ [Se alle nyheder](#)

Medlemmer

KFS Boligbyg A/S
Randers Arkitekten
Danfoss A/S
Visility ApS
Cenergia
Saint-Gobain Nordic A/S
Kuben Management
Esbensen A/S
AART Architects
Teknologisk Institut
VELUX Danmark A/S
VELFAC A/S
Inwido Danmark
Steni Danmark A/S
Grundfos DK A/S
CowI



Bliv medlem

Foreningen henvender sig til arkitekter, ingeniører, konstruktører, typehusfirmaer, entreprenører, håndværkere, bygherrer, byggematerialeproducenter, etc.

For medlemskab samt yderligere information kontakt:

- Brian Møinichen Wendin,
brian.wendin@velux.com
- Mette Mens Rasmussen,
info@aktivhusdanmark.dk

Du er også velkommen til at ringe til sekretariatet på tlf. 72 16 02 54

→ [Se priser, vedtægter og mere om medlemskab her](#)

www.activehouse.info

Download SPECIFICATION og GUIDELINES



Beregn dit projekt og lav din egen radar



Se VIDEO om alliancen



Abonner på nyhedsbrev

02.03.2015

anmark A/S

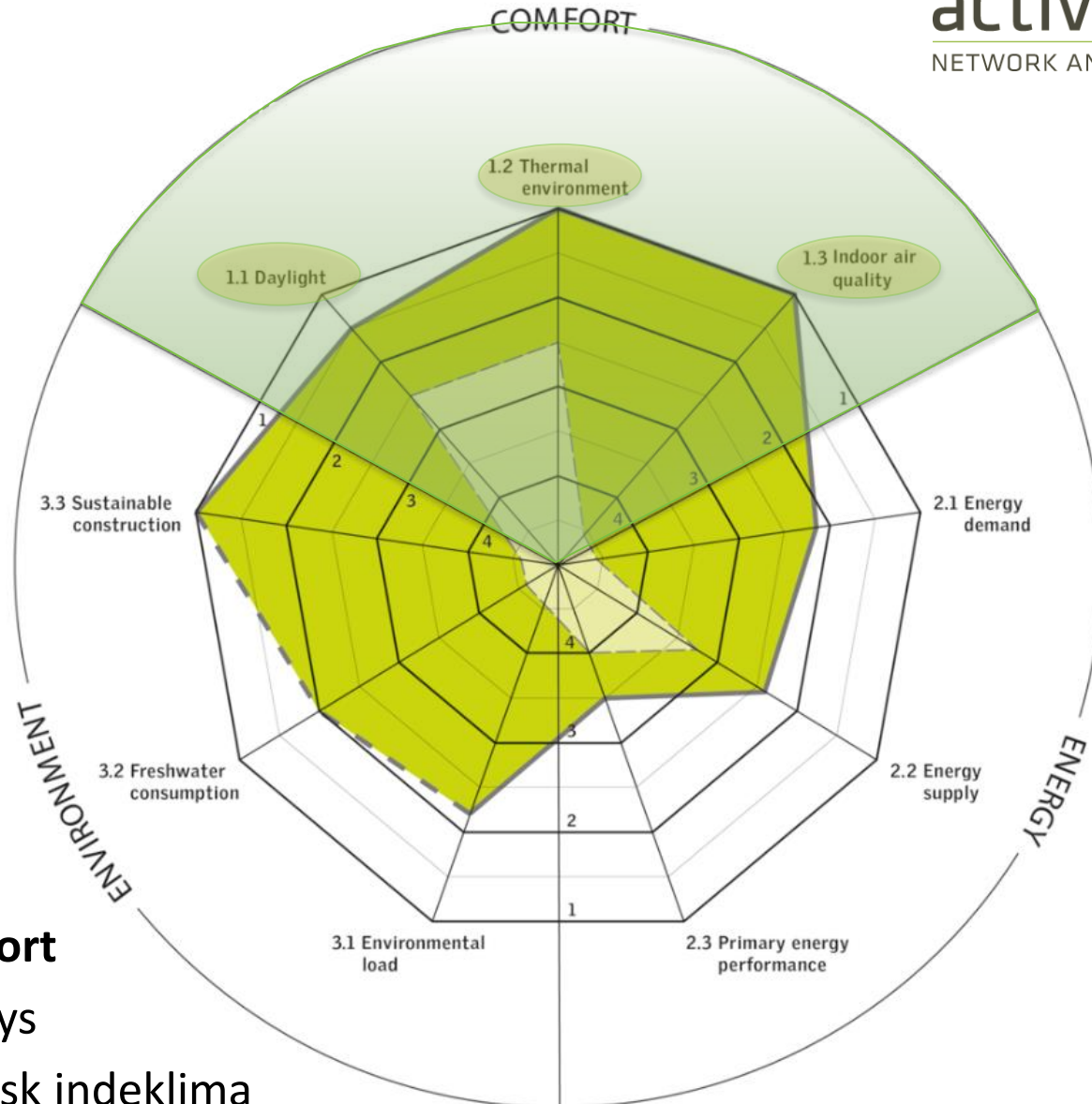


ACTIVE HOUSE - the specifications

for RESIDENTIAL BUILDINGS

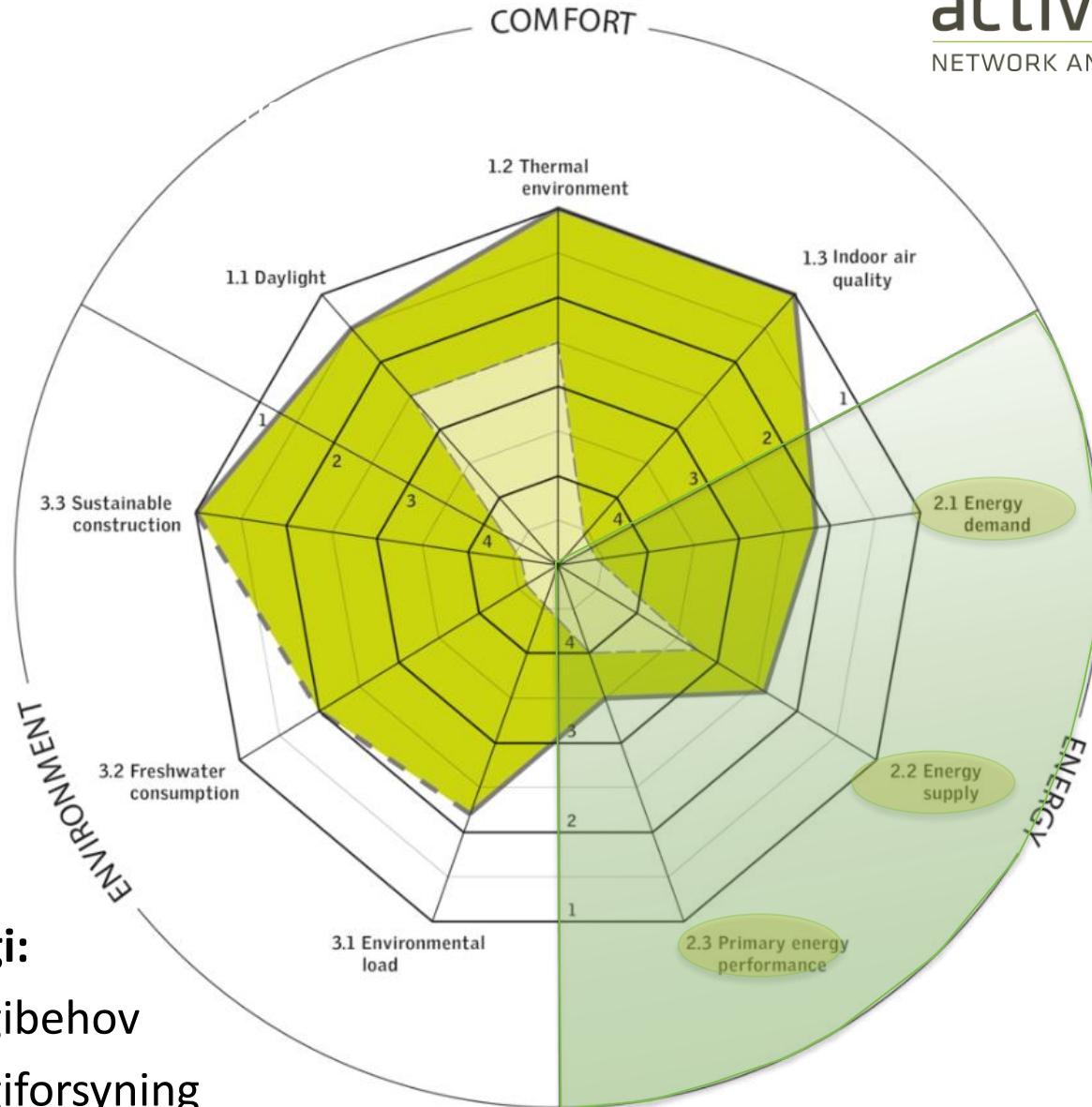
2nd edition

The Specificat



- **Komfort**
- Dagslys
- Termisk indeklima
- Luftkvalitet



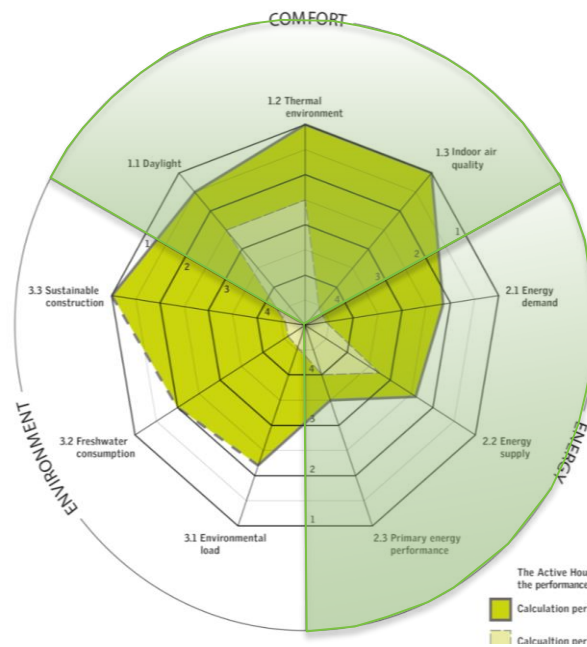


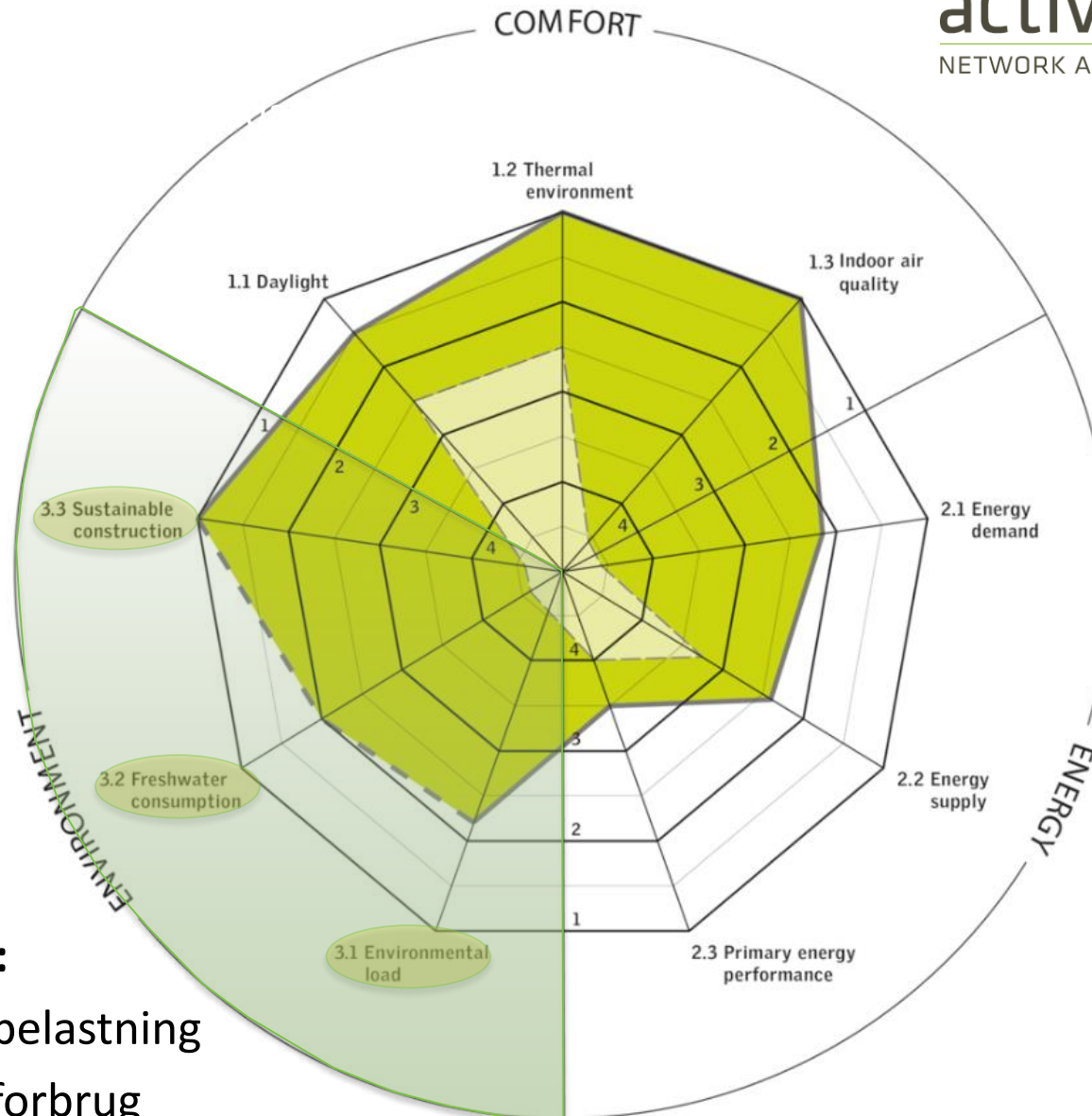
- **Energi:**
- Energibehov
- Energiforsyning
- Primær energi performance



National plan for nearly zero-energy buildings

Danish compliance with Article 9 of Directive 2010/31/EU of the European Parliament and of the Council of 19 May 2010 on the energy performance of buildings





- **Miljø:**
- Miljøbelastning
- Vandforbrug
- Bæredygtige byggematerialer



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NETWORK AND KNOWLEDGE SHARING

HELP

CLOSE

START

Active House calculation tool is designed by Danish Technological Institute for the Active House Alliance.

Copyrights belong to Active House Alliance.

**Use of the tool require membership of the Active House Alliance and is on users own responsibility.
Active House Alliance takes no responsibility for the use of the tool or for the results gained from it.**

Active House Tool - Version 1.04

Menu

P

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data

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ment

Results

26 days left

Licens

Save

as

Project data



Calculation

Calculation type:

Evaluation type:

Building information

Project name:

Street:

Postcode/city/country:

Building type:

Year of construction:

Owner/client information

Home owner(s) / client(s):

Email/phone:

Architect information

Architect:

Company:

Email/phone:

Mechanical engineer information

Engineer:

Company:

Email/phone:

Certification

Certified by:

Version: 1.04

Filename: Active House - Montfoort.xlsm

Results

Comfort

1.1 Daylight: > 3%

1.2 Thermal environment: best level

1.3 Indoor air quality: ≤ 500 ppm

Energy

2.1 Energy demand: 55,0 kWh/m²

2.2 Energy supply: 57,8 kWh/m²

2.3 Primary energy: -17,3 kWh/m²

Environment

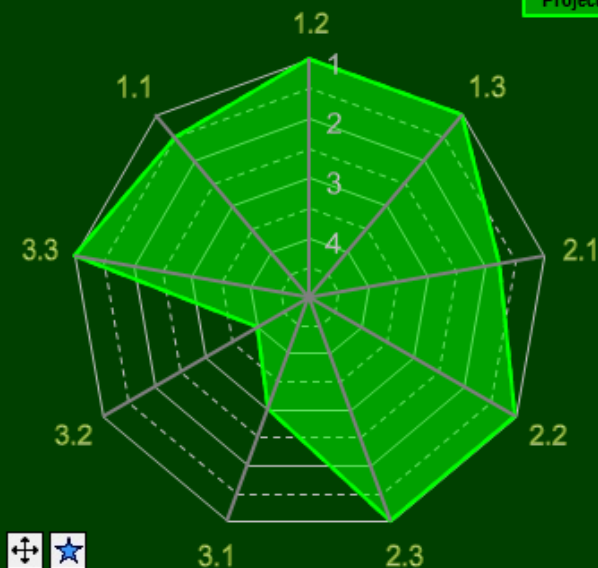
3.1 Environmental loads: Good level

3.2 Freshwater: 10 % savings

3.3 Sust. construction: Best level

Active House radar

Project



Menu

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Project

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data

Comfort

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Environ-
ment

Results

Save

Comfort

General information Number of rooms: 1.1 Daylight  Minimum daylight factor: Maximum sunlight: % of probable sunlight hoursDaylight score: 1.2 Thermal environment  Indoor environment category: Thermal environment score: 1.3 Indoor air quality  CO2-concentration above outdoor: ppmIndoor air quality score:

Results

Comfort

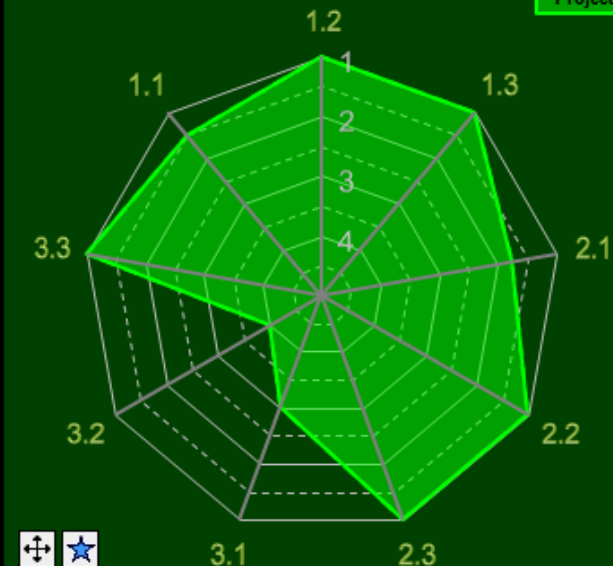
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Active House radar 

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Energy

General information

Treated floor area: m²2.1 Energy demand ?

Space heating:	<input type="text" value="33"/>	kWh/m ²	
Domestic hot water:	<input type="text" value="13"/>	kWh/m ²	
Mechanical ventilation:	<input type="text" value="3"/>	kWh/m ²	
Cooling:	<input type="text" value="0"/>	kWh/m ²	
Control systems:	<input type="text" value="0"/>	kWh/m ²	
Lighting:	<input type="text" value="6"/>	kWh/m ²	
Total:	<input type="text" value="55"/>	kWh/m ²	
Energy demand score:	<input type="text" value="1,8"/>		

2.2 Energy supply ?

Electricity produced by renewable energy:	<input type="text" value="18"/>	kWh/m ²	
Heat produced by renewable energy:	<input type="text" value="40"/>	kWh/m ²	
Total:	<input type="text" value="58"/>	kWh/m ²	
Percentage of renewable energy supply:	<input type="text" value="105"/>	%	
Energy supply score:	<input type="text" value="1,0"/>		

2.3 Primary energy performance ?

Total:	<input type="text" value="-17"/>	kWh/m ²
Primary energy performance score:	<input type="text" value="1,0"/>	

Results

Comfort

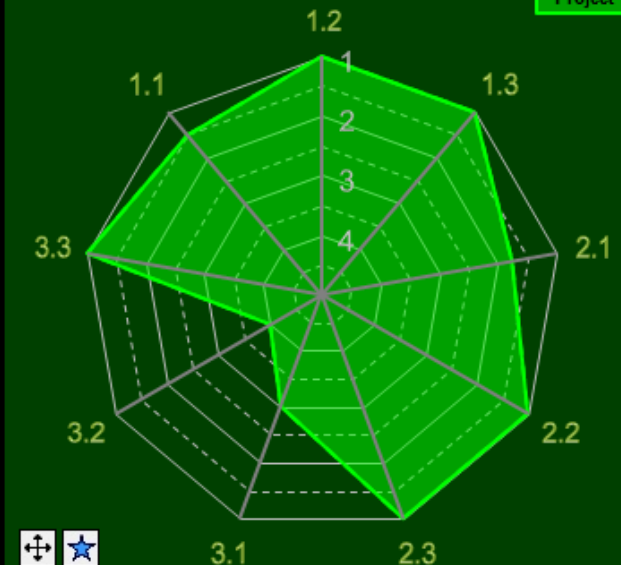
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Energy

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Environment

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Active House radar Project

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Environment

3.1 Environmental loads

Have you used the Active House LCA tool:

yes

PE consumption:

<150

kWh/m²

Score

3,0

GWP:

<40

kg CO₂-eq/m²

3,0

ODP:

<6.70E-06

kg R11-eq./m²

4,0

POCP:

<0.0070

kg C₂H₄-eq./m²

3,0

AP:

<0.075

kg SO₂-eq./m²

2,0

EP:

<0.0085

kg PO₄-eq./m²

3,0

Environmental loading score:

3,0

3.2 Freshwater consumption

Minimisation of freshwater consumption:

10 %

Freshwater consumption score:

4,0

3.3 Sustainable construction

Recyclabel content

Recyclabel content:

62 %

1,0

Responsible sourcing

Certified wood (FSC, PEFC):

100 %

Certified EMS:

100 %

Total score:

1,0

Total

Sustainable construction score:

1,0

Results

Comfort

1.1 Daylight:

> 3%

1.2 Thermal environment:

best level

1.3 Indoor air quality:

≤ 500 ppm

Energy

2.1 Energy demand:

55,0 kWh/m²

2.2 Energy supply:

57,8 kWh/m²

2.3 Primary energy:

-17,3 kWh/m²

Environment

3.1 Environmental loads:

Good level

3.2 Freshwater:

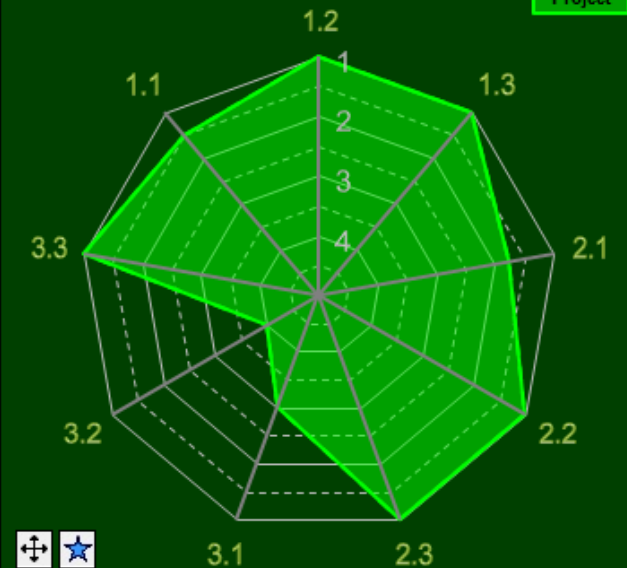
10 % savings

3.3 Sust. construction:

Best level

Active House radar

Project



Menu

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Energy

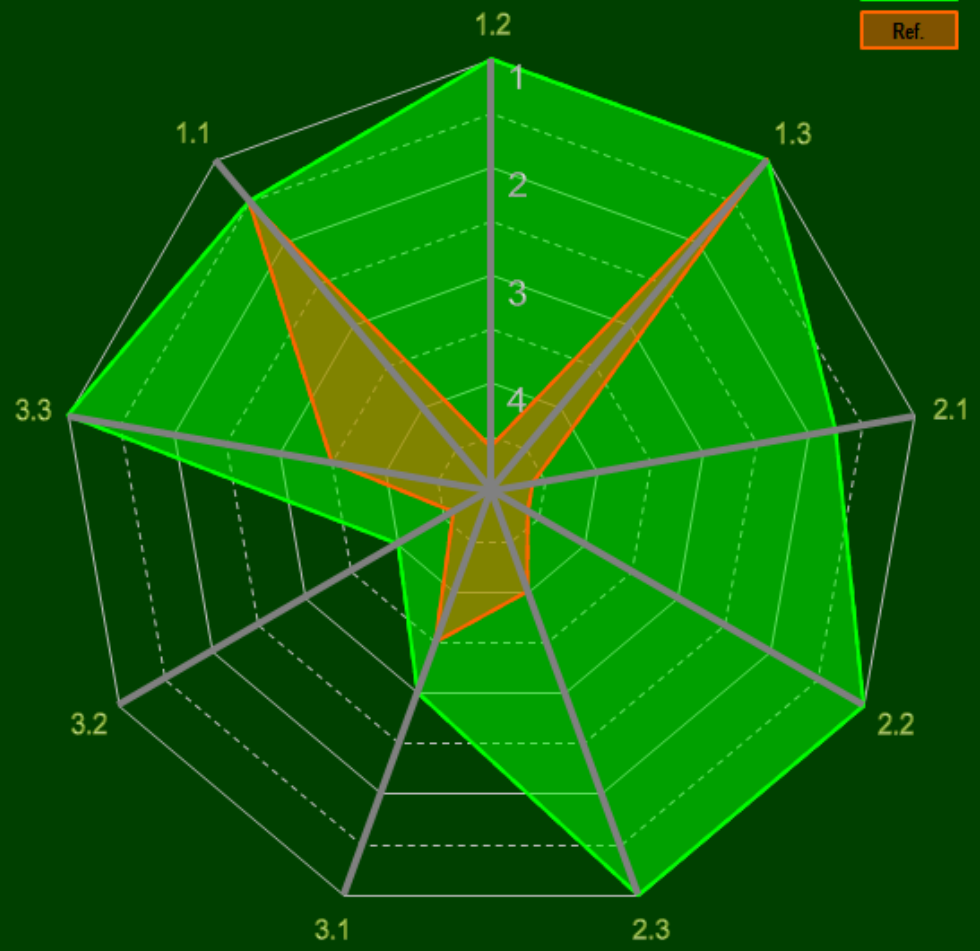
Environment

Results

Save



Radar



Project

Ref.

Results

Comfort

- 1.1 Daylight: > 3%
- 1.2 Thermal environment: best level
- 1.3 Indoor air quality: ≤ 500 ppm

Energy

- 2.1 Energy demand: 55,0 kWh/m²
- 2.2 Energy supply: 57,8 kWh/m²
- 2.3 Primary energy: -17,3 kWh/m²

Environment

- 3.1 Environmental loads: Good level
- 3.2 Freshwater: 10 % savings
- 3.3 Sust. construction: Best level

Contact information

Home owner(s) / client(s):	De Poorters of Montfoort
Architect:	nn
Engineer:	nn
Certified by:	none

Print



Results

Project informations

AktivHus designværktøj

- hurtig evaluering af forskellige løsninger

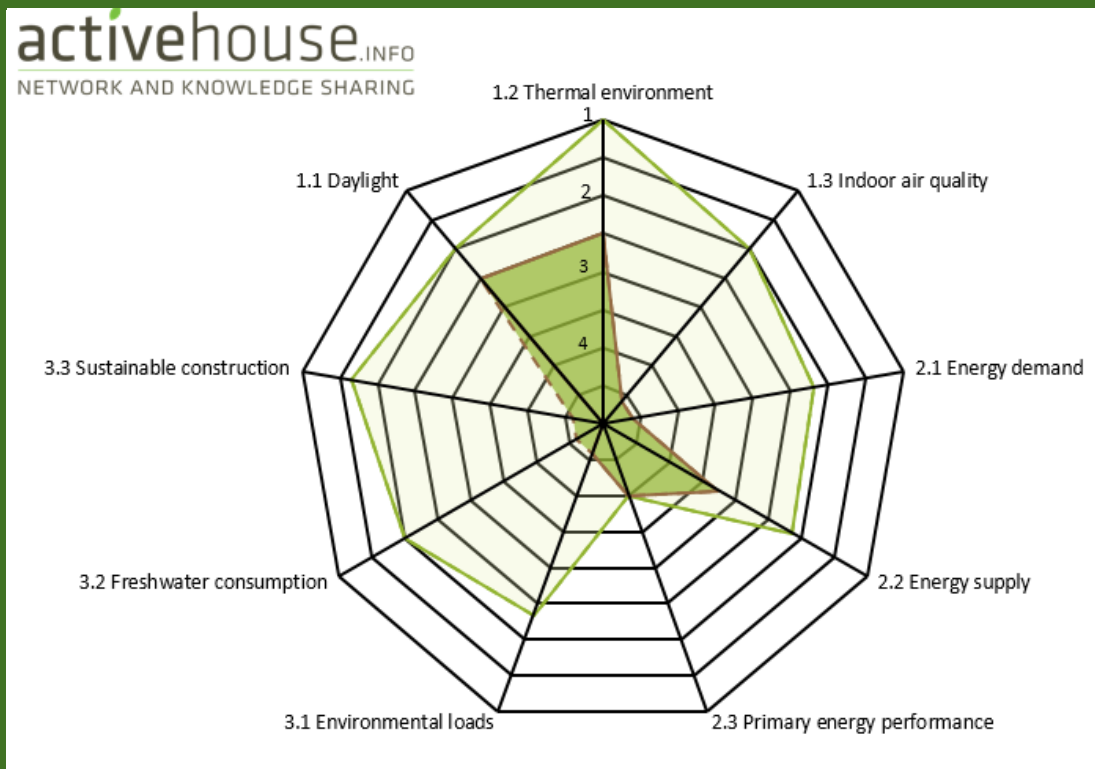
0: NZEB, but no focus on comfort	1a: scenario where all renewables are produced on the plot	1b: BNL 2015/nearly zero energy building Flanders	1c: scenario 1b but with condens. gas boiler	2a: Low energy building connected to a district grid with D system	2b: Low energy building connected to a district grid with C+ system	3: Budget scenario	4: Scenario FA
U < 0,15 W/m ² K 16cm XPS 0.035 + 5cm Isover Sørelfloor 20cm EPS black 0.032 10cm MW (95%), wood (5%) + 6cm MW (90%), wood (10%) 22cm MW (95%), wood (5%) + 5cm MW (90%), wood (10%) 20cm MW (95%), wood (5%) + 5cm MW (90%), wood (10%) 5 cm MW 0.035 U < 0,85 W/m ² K U < 0,85 W/m ² K (U < 1.0 velux 66)	U < 0,15 W/m ² K 16cm XPS 0.035 + 5cm Isover Sørelfloor 20cm EPS black 0.032 10cm MW (95%), wood (5%) + 6cm MW (90%), wood (10%) 22cm MW (95%), wood (5%) + 5cm MW (90%), wood (10%) 20cm MW (95%), wood (5%) + 5cm MW (90%), wood (10%) 5 cm MW 0.035 U < 0,85 W/m ² K U < 0,85 W/m ² K (U < 1.0 velux 66)	U < 0,15 W/m ² K 16cm XPS 0.035 + 5cm Isover Sørelfloor 20cm EPS black 0.032 10cm MW (95%), wood (5%) + 6cm MW (90%), wood (10%) 22cm MW (95%), wood (5%) + 5cm MW (90%), wood (10%) 20cm MW (95%), wood (5%) + 5cm MW (90%), wood (10%) 5 cm MW 0.035 U < 0,85 W/m ² K U < 0,85 W/m ² K (U < 1.0 velux 66)	U < 0,15 W/m ² K 16cm XPS 0.035 + 5cm Isover Sørelfloor 20cm EPS black 0.032 10cm MW (95%), wood (5%) + 6cm MW (90%), wood (10%) 22cm MW (95%), wood (5%) + 5cm MW (90%), wood (10%) 20cm MW (95%), wood (5%) + 5cm MW (90%), wood (10%) 5 cm MW 0.035 U < 0,85 W/m ² K U < 0,85 W/m ² K (U < 1.0 velux 66)	U < 0,15 W/m ² K 16cm XPS 0.035 + 5cm Isover Sørelfloor 20cm EPS black 0.032 10cm MW (95%), wood (5%) + 6cm MW (90%), wood (10%) 22cm MW (95%), wood (5%) + 5cm MW (90%), wood (10%) 20cm MW (95%), wood (5%) + 5cm MW (90%), wood (10%) 5 cm MW 0.035 U < 1,0 / 1,3 W/m ² K U < 1,0 / 1,3 W/m ² K U < 1,0 / 1,3 W/m ² K U < 1,0 / 1,3 W/m ² K U < 1,0 / 1,3 W/m ² K U < 1,0 / 1,3 W/m ² K	U < 0,15 W/m ² K 16cm XPS 0.035 + 5cm Isover Sørelfloor 20cm EPS black 0.032 10cm MW (95%), wood (5%) + 6cm MW (90%), wood (10%) 22cm MW (95%), wood (5%) + 5cm MW (90%), wood (10%) 20cm MW (95%), wood (5%) + 5cm MW (90%), wood (10%) 5 cm MW 0.035 U < 1,0 / 1,3 W/m ² K U < 1,0 / 1,3 W/m ² K U < 1,0 / 1,3 W/m ² K U < 1,0 / 1,3 W/m ² K U < 1,0 / 1,3 W/m ² K U < 1,0 / 1,3 W/m ² K	U < 0,24 W/m ² K 6 cm XPS 0.035 + 5cm Isover Sørelfloor 14 cm EPS black 11cm MW (95%), wood (5%) + 5cm MW (90%), wood (10%) 13cm MW (95%), wood (5%) + 5cm MW (90%), wood (10%) 10cm MW (95%), wood (5%) + 5cm MW (90%), wood (10%) 5 cm MW 0.035 U < 1,60 W/m ² K U < 1,60 W/m ² K U < 1,60 W/m ² K U < 1,60 W/m ² K U < 1,60 W/m ² K U < 1,60 W/m ² K	U < 0,24 W/m ² K (floor U < 0,30 W/m ² K) 6 cm XPS 0.035 + impact noise insulation is required! 14 cm EPS black 11cm MW (95%), wood (5%) + 5cm MW (90%), wood (10%) 13cm MW (95%), wood (5%) + 5cm MW (90%), wood (10%) 10cm MW (95%), wood (5%) + 5cm MW (90%), wood (10%) 5 cm MW 0.035 U < 1,80 W/m ² K U < 1,80 W/m ² K U < 1,80 W/m ² K U < 1,80 W/m ² K U < 1,80 W/m ² K U < 1,80 W/m ² K
no shading n50 < 0,6	all windows, shading 50% n50 < 0,6	all windows, shading 50% n50 < 0,6	all windows, shading 50% n50 < 0,6	shading 50% no shading on East Façade n50 < 0,6	shading 50% no shading on East Façade n50 < 0,6	shading 50% no shading on East Façade n50 < 1,5	no shading n50 < 3
system D+ with heat recovery 93% geothermal heat pump floor heating solar collector 4m ² storage tank 300	system D+ and peak NW with heat recovery 93% geothermal heat pump floor heating solar collector 4m ² storage tank 300	system D+ and peak NW with heat recovery 93% geothermal heat pump floor heating solar collector 4m ² storage tank 300	system D+ and peak NW with heat recovery 93% condensing gas boiler floor heating solar collector 4m ² storage tank 300	system D and peak NW with heat recovery 93% condensing gas boiler floor heating no solar collector no storage tank	C+ ventilation system (most advanced control system CO2control, m = 0.5) condensing gas boiler floor heating no solar collector no storage tank	system D+ and peak NW with heat recovery 93% condensing gas boiler radiators no solar collector no storage tank	system C+ (simplest C+ system; presence and moisture control, m = 0.76) condensing gas boiler radiators no solar collector no storage tank
PV panels 3.2 kWp (south, 30° inclination) no no control system	PV panels 2.4 kWp (south, 30° inclination) no VELUX Active	no PV panels buy green electricity VELUX Active	no PV panels buy green electricity VELUX Active	no PV panels buy green electricity VELUX Active	no PV panels buy green electricity VELUX Active	no PV panels buy green electricity no control system	no PV panels Standard electricity supply no control system
yes NZEB VL 2020 2015 ok	yes NZEB VL 2020 2015 ok	no NZEB VL 2020 2015 ok	no NZEB VL 2020 2015 ok	no from 2021 not ok 2015 not ok	no from 2021 not ok 2015 not ok	no from 2018 not ok 2014 ok, 2015 not ok	no not ok 2014 ok
not ok from 2017 because K > 20, ED will probably the criterion from 2019	not ok from 2017 because K > 20, ED will probably the criterion from 2019	not ok from 2017 because K > 20, ED will probably the criterion from 2019	not ok from 2017 because K > 20, ED will probably the criterion from 2019	not ok from 2017 because K > 20, ED will probably the criterion from 2019	not ok from 2017 because K > 20, ED will probably the criterion from 2019	not ok from 2017 because K > 20, ED will probably the criterion from 2019	not ok from 2017 because K > 20, ED will probably the criterion from 2019
13,77 < 15	14,28 < 15	14,28 < 15	14,28 < 15	16,2 > 15	19,35 > 16,17 (bvl), (VL: 24.4)	20,4 not ok (K < 35)	20,4 not ok (K < 35)
0 < 45	0 < 45	38,5 < 45	42,8 < 45	60,4 > 45	70,4 > 46,4		
Difficult	Difficult	Rather difficult	Rather difficult	Rather easy	Rather difficult	Easy	Easy
- extended garden shed for solar collector - PV panels on pitched roof (OR very large garden shed, but not included in cost estimation) - no green roof - no rainwater pump	- extended garden shed for solar collector - PV panels on pitched roof (OR very large garden shed, but not included in cost estimation) - green roof - rainwater pump	- extended garden shed for solar collector - green roof - rainwater pump	- extended garden shed for solar collector - green roof - rainwater pump	- normal garden shed - green roof - rainwater pump	- normal garden shed - green roof - rainwater pump	- normal garden shed - green roof - rainwater pump	- no garden shed - no green roof - no rainwater pump
€ 199.700,00 € 30.700,00	€ 213.500,00 € 50.500,00	€ 209.500,00 € 46.500,00	€ 196.500,00 € 33.500,00	€ 182.800,00 € 19.800,00	€ 177.700,00 € 14.700,00	€ 173.300,00 € 8.300,00	€ 152.800,00 € 10.200,00
€ 188.900,00 € 25.900,00	€ 208.200,00 € 45.200,00	€ 194.300,00 € 41.300,00	€ 191.600,00 € 28.600,00	€ 178.200,00 € 15.200,00	€ 173.000,00 € 10.300,00	€ 167.000,00 € 4.000,00	€ 149.000,00 € 14.000,00
€ 164.600,00 € 1.600,00 € 0,00 € 66.000,00 € 267.200,00	€ 181.500,00 € 18.500,00 € 0,00 € 66.000,00 € 330.100,00	€ 178.100,00 € 15.100,00 € 0,00 € 66.000,00 € 309.400,00	€ 167.000,00 € 4.000,00 € 0,00 € 66.000,00 € 286.400,00	€ 155.400,00 € 7.600,00 € 0,20 € 59.000,00 € 261.800,00	€ 151.000,00 € 12.000,00 € 0,20 € 59.000,00 € 245.800,00	€ 145.600,00 € 17.400,00 € 0,16 € 52.000,00 € 255.400,00	€ 129.900,00 € 93.100,00 € 0,00 € 52.000,00 € 230.700,00



Cirkulær Bæredygtighed

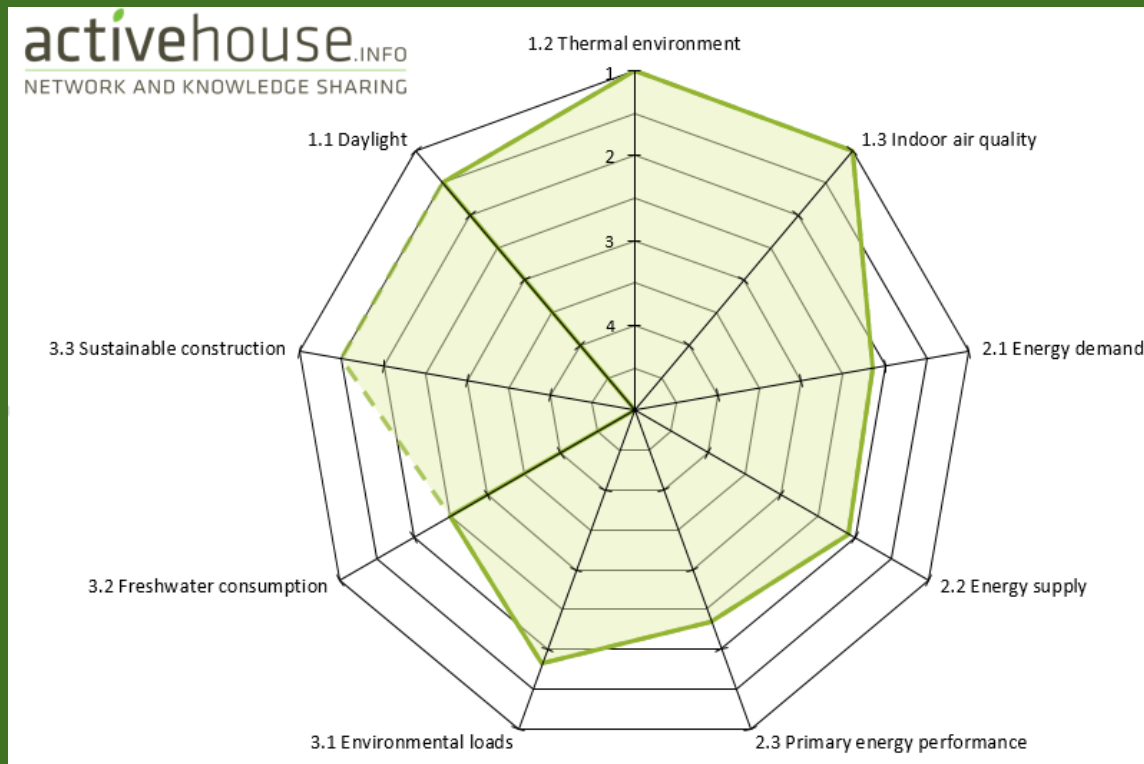


Green Solution House, Bornholm - Smart Room hotelværelser Renovering



AktivHus eksempler

Green Solution House, Bornholm – Konference afdelingen Nybyggeri



Bolig for Livet, Lystrup ved Århus

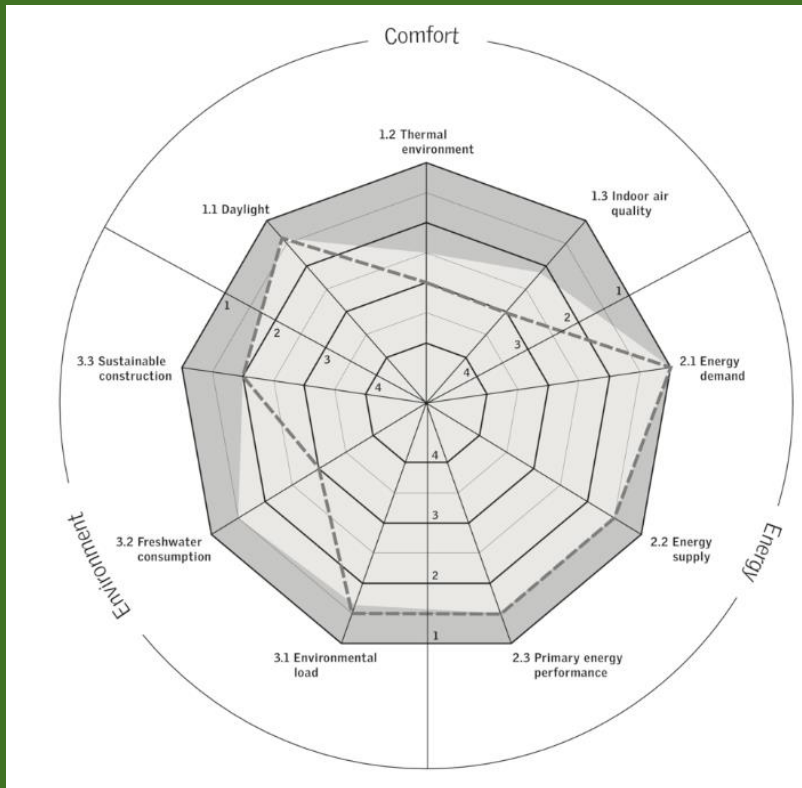
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NETWORK AND KNOWLEDGE SHARING



www.activehouse.info/cases/home-life

AktivHus eksempler

Nybyggeri - Bolig for Livet i Lystrup ved Århus



Osram Kulturhus, København



www.activehouse.info/cases/osram-culture-centre

AktivHus eksempler

Renovering – Osram Kulturhus, København N



KFS – BOLIGBYG

Lang Freddal 15, Sabro (v. Århus)

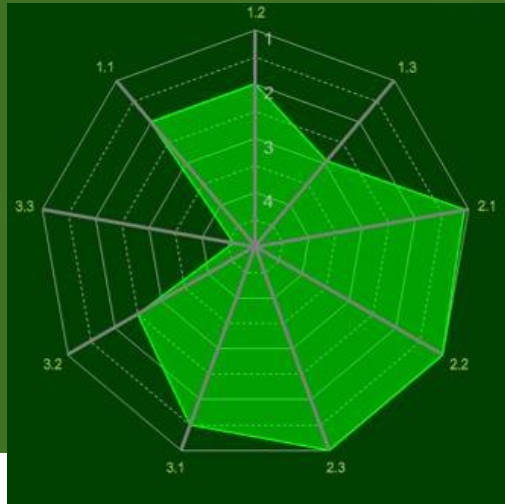


AktivHus eksempler

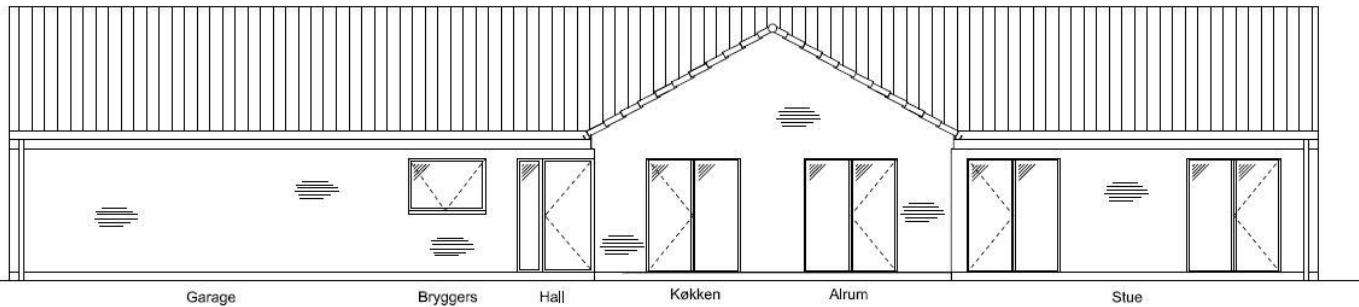
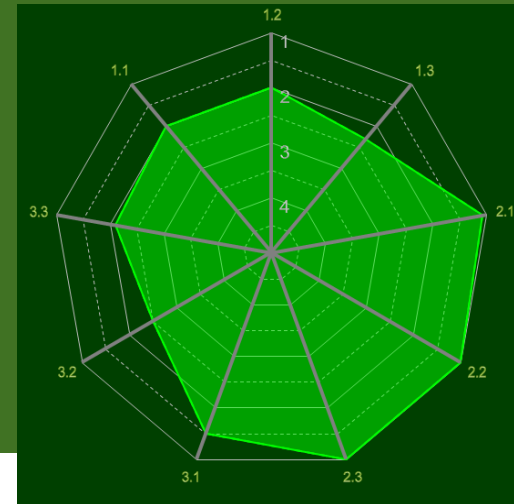
KFS – BOLIGBYG

Lang Freddal 15, Sabro (v. Århus)

Før...



VED FORBEDRING ...



Facade mod Vest

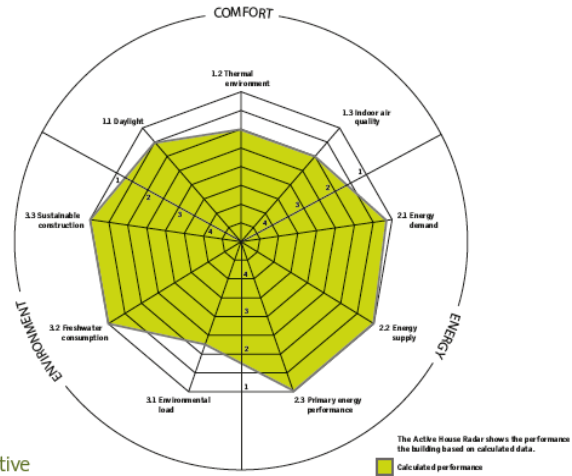


RhOME

– a home for Rome

Developer: UNIVERSITY OF ROMA TRE
Department of Architecture, Italy
Architect: Designed by students from the university in 2014
Location: Participated in Solar Decathlon 2014 in Paris

The RhOME project was the winner of the Solar Decathlon competition in Paris 2014. It was designed as a modernisation case and a roof-top renovation project. The intention was to describe architectural features and technological innovations in a roof-top renovation that could not be obtained in a common floor or in the ground floor. The project was designed based on the Active House criterias, optimising thermal and luminous comfort and at the same time minimising energy consumption.





ACTIVE HOUSE - the guidelines

Comfort
Energy
Environment

the guidelines

Næste aktiviteter

Lancering af nyt beregningsværktøj 23.3

Lancering af guideline 23.3

Åbent hus KFS Boligbyg på Byg og Bo i påsken

Seminar i bæredygtigt byggeri maj 2015

Healthy Building Conference Holland 18-19.5

AKTIVPlus symposium Tyskland 21.5

European Sustainable Energy Week – 16.6

Kurser efter behov

Bliv medlem!

Arkitekter, Ingeniører, Konstruktører,
Typehusfirmaer, Entreprenører,
Håndværkere, Bygherrer,
Byggematerialeproducenter, etc.