Good Energy Haus

by Tim Eian / 2021-03-15 19:14:07 / International / 3780 / EN

Primary energy need :

15.79 kWhpe/m².year

(Calculation method : Other)

ENERGY CONSUMPTION

Economical building *Building*

< 50	A
51 à 90	B
91 à 150	C
151 à 230	D
231 à 330	E
331 à 450	F
> 450	G

Energy-intensive building

Building Type : Isolated or semi-detached house
Construction Year : 2019
Delivery year : 2020
Address 1 - street : 3406 Benjamin St. NE 55418 MINNEAPOLIS, USA
Climate zone : [Dfa] Humid Continental Hot Summer, Wet All Year

Net Floor Area : 205 m² Other
Construction/refurbishment cost : 560 000 €
Cost/m2 : 2731.71 €/m²

Certifications :

Proposed by :

General informations

First Climate-neutral certified Passive House Plus in Minneapolis. Modern ultra-sustainable design.

The 'Good Energy Haus' is a truly carbon-neutral, urban certified Passive House Plus in Minneapolis, Minnesota. Designed by Tim Delhey Eian, principal of TE Studio, the home was built in 2019-20 by Tanner Construction and serves as a beacon for sustainability, as well as a demonstration showcase for the design firm and its partners.

‘Good Energy Haus’ is a case study for modern, sustainable urban living. It is a Certified Passive House Plus in US Climate Zone 6, and an insulated wood-frame construction with upcycled dense-pack cellulose insulation. It is powered by a photovoltaic system with 100% wind-electricity backup.

See more details about this project

https://testudio.com/projects/good-energy-haus/
https://www.slideshare.net/timeian/good-energy-haus
https://passivehouse-database.org/index.php?lang=en#d_5894

Photo credit

Corey Gaffer Photography

Stakeholders

Contractor

Name : Tanner Construction
Contact : Seth Tanner, seth[a]tannerconstructionllc.com, Watertown, MN, USA
http://www.tannerconstructionllc.com

Construction Manager

Name : TE Studio, Ltd.
Contact : Tim Eian, tim[a]testudio.com, Minneapolis, MN, USA
http://www.testudio.com

Stakeholders

Function : Structures calculist

Align Structural

Rick Johnson

http://www.alignstructural.com

Function : Manufacturer

Tanner Windows

Stephan Tanner, stephan[a]tannerwindows.com, Watertown, MN, USA

http://tannerwindows.com

Function : Environmental consultancy

Herz & Lang

Raphaël Vibert, raphael.vibert[a]herz-lang.de, Weitnau, Germany

https://www.herz-lang.de

Contracting method

General Contractor

Type of market

Realization

If you had to do it again?

Slab on grade concrete pour was too uneven for polishing. Ended up having to pour self leveler and install cork flooring. Would use a specialized concrete contractor in future and/or set slab at lower elevation and utilize self-leveling overpour as standard. Open living area sound is lively. Would utilize more sound-absorbing materials in future.

Building users opinion

Comfort is tremendous on sunny, cold days. Like a higher set point on cloudy, cold days. Air quality is stellar (is monitored 24/7). Illumination is wonderful (lots of daylight = need very little artificial light).

Energy

Energy consumption

Primary energy need : 15,79 kWhpe/m^2.year

Primary energy need for standard building : 47,34 kWhpe/m^2.year

Calculation method : Other

CEEB : 0.0001

Breakdown for energy consumption : Heating: 8.3 kWh/ m2 aCooling: 3.5 kWh/ m2 aHot water: 10.2 kWh/ m2 aHousehold electricity 8.8 kWh/ m2 a

Envelope performance

Envelope U-Value : 0,19 $W.m^{-2}.K^{-1}$

More information :
WOOD WALL
5/8" (16mm) drywall
7-1/4" (184mm) dense-pack cellulose insulation and 2x8 framing [0.039]
1/2" (13mm) OSB sheathing
9-1/2" (241mm) dense-pack cellulose insulation and I-Joists [0.039]
1/2" (13mm) wood fiberboard sheathing [0.055]

VENTILATED SIDING
U = 0.101
U-Wert = 0.095 W/(m2K)

SLAB
4" (102mm)polished concrete slab
8" (153mm) EPS [0.039]
U-Wert = 0.184 W/(m²K)

ROOF
Low sloped hot roof
5/8" (16 mm) drywall
5-1/2" (140mm) 457 service cavity
18" (457mm) dense-pack cellulose and trusses [0.040]
3/4" (19mm) plywood
average 2-1/2" (64mm) polyisocyanurate tapered insulation [0.035]
U-Wert = 0.079 W/(m2K)

WINDOW FRAMES
Tanner Windows, Lauda Premium
Wood frame exterior aluminum cladding
Tanner Lauda Premium frame: Uf = 0.81
U w-Wert = 0.68 W/(m²K)

GLAZING
Saint Gobin glazing: Ug = 0.53/ g = 0.545
Swiss Spacer
U g-Wert = 0.53 W/(m2K)
g -Wert = 545 %

SHADING
Hella Raffstores, Loxone MiniServer automation
ENTRY DOOR Tanner Windows Entry Door (= Tanner window)
Local fire-protection doorU d-Wert = 0.8 W/(m2K)

Building Compactness Coefficient : 0,34

Indicator : n50

Air Tightness Value : 0,22

Users' control system opinion :

Shades are automated with an interior temperature sensor and a roof mounted weather station. They can be manually overriden by occupants with an app.

More information

Energy monitoring started 12/ 2020 and is in process.

Real final energy consumption

Final Energy : -7,87 kWhfe/m^2.year

Renewables & systems

Systems

Heating system :
- Heat pump

Hot water system :
- Heat pump

Cooling system :
- VRV Syst. (Variable refrigerant Volume)

Ventilation system :
- Double flow heat exchanger

Renewable systems :
- Solar photovoltaic

Renewable energy production : 100,00 %

Solutions enhancing nature free gains :
Wastewater heat recovery unit

Smart Building

BMS :
Automated exterior shades

Environment

Urban environment

Infill lot in Minneapolis, MN

Land plot area : 1 000,00 m^2

Built-up area : 27,00 %

Costs

Health and comfort

Indoor Air quality

Monitoring with AirThings system.

Comfort

Measured indoor CO2 concentration :
628 ppm

Carbon

GHG emissions

GHG in use : -12,00 $KgCO_2/m^2/year$

Methodology used :

PHPP

Contest

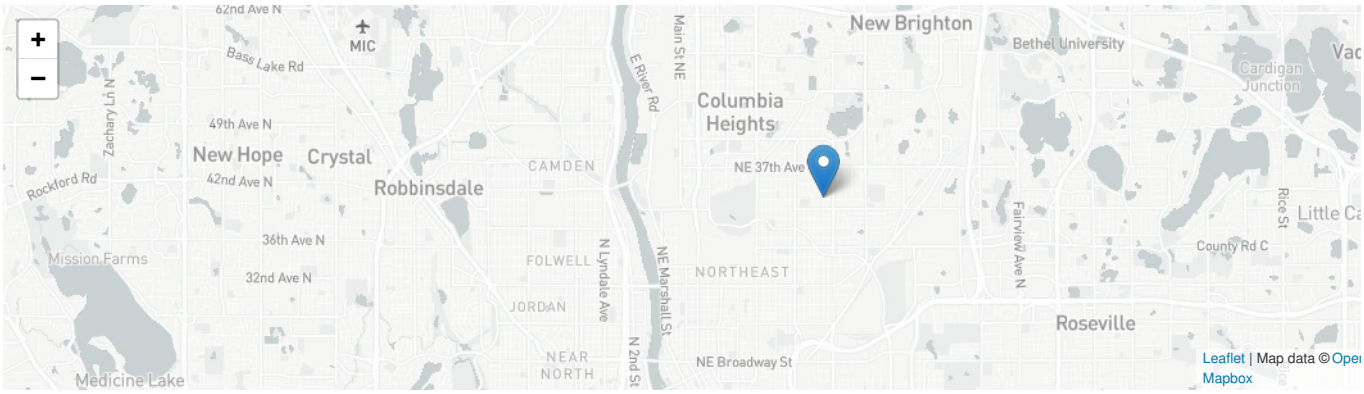
Reasons for participating in the competition(s)

- Certified Passive House Plus in US Climate Zone 6.
- Inuslated wood-frame construction with upcycled dense-pack cellulose insulation.
- Powered by photovoltaic system with 100% wind-electricity backup.

Building candidate in the category

Low Carbon

GREEN SOLUTIONS AWARDS
POWERED BY Construction21.org



Date Export : 20230308203729