


Public housing in Tarm

by Asta Justesen / 2023-03-15 17:17:45 / International / 11 / EN

New Construction



Primary energy need :
83 kWhpe/m².year
(Calculation method : Primary energy needs)

Building Type : Terraced Individual housing
Construction Year : 2022
Delivery year :
Address 1 - street : Radhus grunden 6880 TARM, Denmark
Climate zone : [Cfb] Marine Mild Winter, warm summer, no dry season.

Net Floor Area : 2 779 m² Other
Construction/refurbishment cost : 5 100 000 €
Cost/m2 : 1835.19 €/m²

Certifications :



General information

69% less CO2 footprint than BR23

Tarm is a climate-optimized **passive house-plus** housing development with 31 public housing units from 75 to 114 square meters. The homes replace a former town hall building on the site and are centrally located in Tarm by. Green outdoor areas create an oasis with rainwater beds and terraces between the houses. The building's **CO2 footprint is 69% lower than the requirements** of the Building Regulations 2023. The climate-friendly homes are designed to be as energy efficient as possible. BJERG has been the overall consultant and prepared the local plan.

Energy efficient dwelling in interaction with nature

The homes' **low energy consumption** is achieved, among other things with:

- An airtight construction, so that the houses have a very low heat loss from the walls, ceiling and floor.
- Tight and south-facing windows, so that the sun's heat is utilized.
- Controlled ventilation with heat recovery.
- Solar heating system used for domestic hot water.

The building is compact and open to the south and green outdoor spaces.

LAR elements such as rainwater beds and wet basins with reduced drainage ensure against cloudbursts and give the green areas a blue theme.

The LAR areas are planted with grasses. The homes are built in wooden constructions with facades in the natural materials slate and thermo wood.

Solar cells and a district heating integrated micro heating system contribute to the plus energy standard.

Photo credit

Jonas Krebs

Stakeholders

Contractor

Name : R&S Boligforening

Construction Manager

Name : Bjerg Arkitektur A/S

<https://bjerg.nu/>

Stakeholders

Function : Company

Erasmus & Partnere

<https://erasmus.dk/>

Mechanical Engineer

Energy

Energy consumption

Primary energy need : 83,00 kWhpe/m².year

Calculation method : Primary energy needs

Breakdown for energy consumption :

PE demand (non-renewable Primary Energy 83 kWh/(m²a) on heating installation, domestic hot water, household electricity and auxiliary electricity calculated according to PHPP:

- Air tightness: n50 = 0.6/h
- Annual heating demand: 13 kWh/(m²a)
- Heating load: 12 W/m²
- Cooling load: 0 W/m²

Primary Energy Renewable (PER):

- Demand: 40 kWh/(m²a)
- Supply: 66 kWh/(m²a)

Envelope performance

More information :

- External Wall

Wooden profile 20 mm

Air 25 mm

Wind barrier 8 mm

Wood with insulation 295 mm

Installation layer 95 mm

Gypsum 25 mm

U-value: 0.095 W/m²K

- Roof

Plywood and roofing felt 15 mm

Lath and air 50 mm

Wood with insulation 400 mm

Wood with insulation 70 mm

Cement-wood ceiling 25 mm

U-value: 0.084 W/m²K

- Floor

Insulation EPS with graphit 400 mm

Concrete 120 mm

Wooden/ Vinyl floor

U-value: 0.076 W/m²K

Renewables & systems

Systems

Heating system :

- Heat pump

Hot water system :

- Heat pump

Cooling system :

- No cooling system

Ventilation system :

- Double flow heat exchanger

Renewable systems :

- Solar photovoltaic

Other information on HVAC :

The Mechanical systems is one compact unit that provides ventilation, heating & domestic hot water.

Environment

Urban environment

Part of a renewing of the city center and Urban blue and green concept. A site for the former town hall was used to build social housing with integrated green and blue outdoor spaces. Blue spaces for rainwater biotop and climate robust solutions for future climate change.

Products

Product

Ventillation Compact P Nilan

Nilan

<https://www.nilan.dk/>

Product category : Structural work / Passive system

The Compact P is a ventilation and heating system that provides with ventilation, heat recovery and domestic hot water production. It ensures a daily renewal of the air by evacuating dust, odors and excess humidity for a healthy and pleasant indoor atmosphere. When it is hotter inside than outside the house, an integrated bypass lets fresh air in directly to cool down as much as possible without using additional energy.



Costs

Construction and exploitation costs

Total cost of the building : 510 000 €

Health and comfort

Life Cycle Analysis

LCA incl. PV and district heating - 3,8 kg/m² per year.

Water management

Rain water is running to a rain biotope. Grey water runs to a central cleaning plant.

Indoor Air quality

Indoor air quality in the summer: all rooms have windows to outside and opens to living area.

Comfort

Temperature level :

- Interior temperature winter 20°C
- Interior temperature summer 25°C

Quality of life and services

The building open to green outdoor spaces.

Carbon

GHG emissions

GHG in use : 3,70 KgCO₂/m²/year

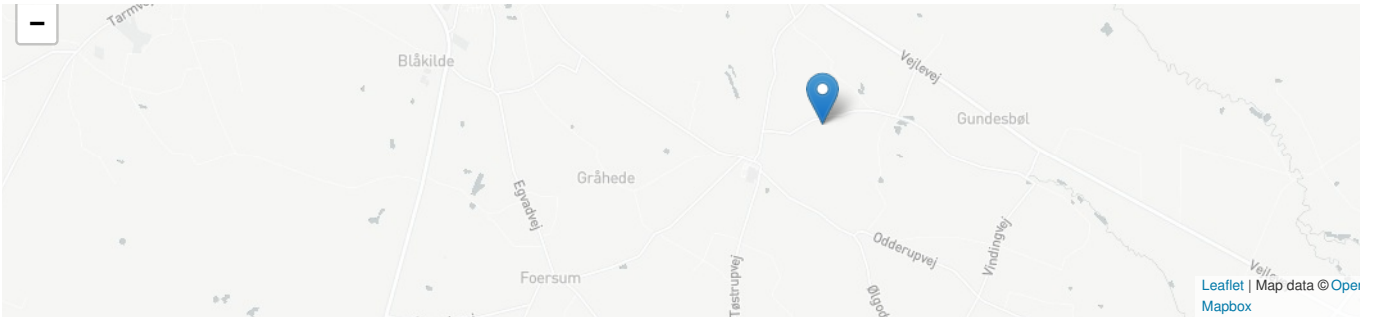
GHG emissions (GHG in use can be found in the PER sheet in the PHPP): 0 according to PER and CO₂/kWh final DK2035

Contest

Reasons for participating in the competition(s)

- The building's CO₂ footprint is 69% lower than the requirements of the Building Regulations 2023;
- The houses are climate-friendly and designed to be as energy efficient as possible;
- Rainwater beds and wet basins with reduced drainage ensure against cloudbursts and give the green areas a blue theme;
- The window surface temperature indicator shows comfort values on all major glacings. All U values better than comfort U values;





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