

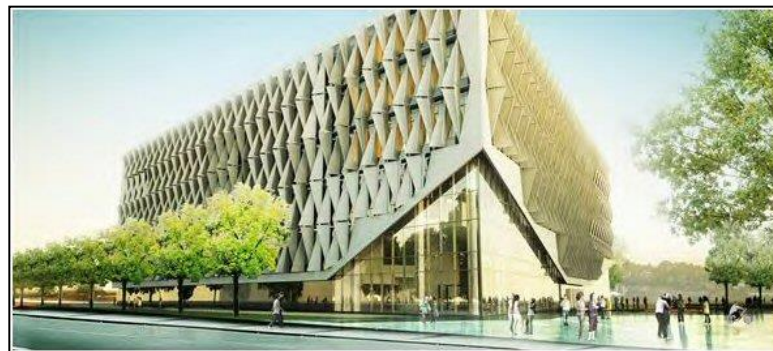


BYGNINGSSTYRELSEN

The Danish Building and Property Agency

Energy efficiency and refurbishments

Experiences 2010-2013





The Danish Building and Property Agency

- the preferred choice for customers and the state

The main task for the Danish Building and Property Agency is to provide work spaces and office and research environments of high quality for its customers, which include universities, the governmental administration, the police force and the courts.

Some facts:

- 1 million m² state property in the office area
- 2 million m² state property in the university area
- 1.2 million m² office rentals
- 220 employees



Energy Agreement

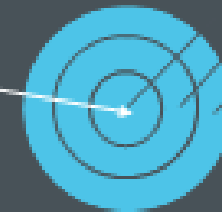
2013

2020

Energy consumption
reduced by 12 % in
2020

2035

Energy system
based 100 % on
renewable energy





1st Generation of Energy Projects

2009

Declaration from the Danish Government: all state institutions is to reduce their energy consumption by 10 % relative to the consumption in 2006

2010

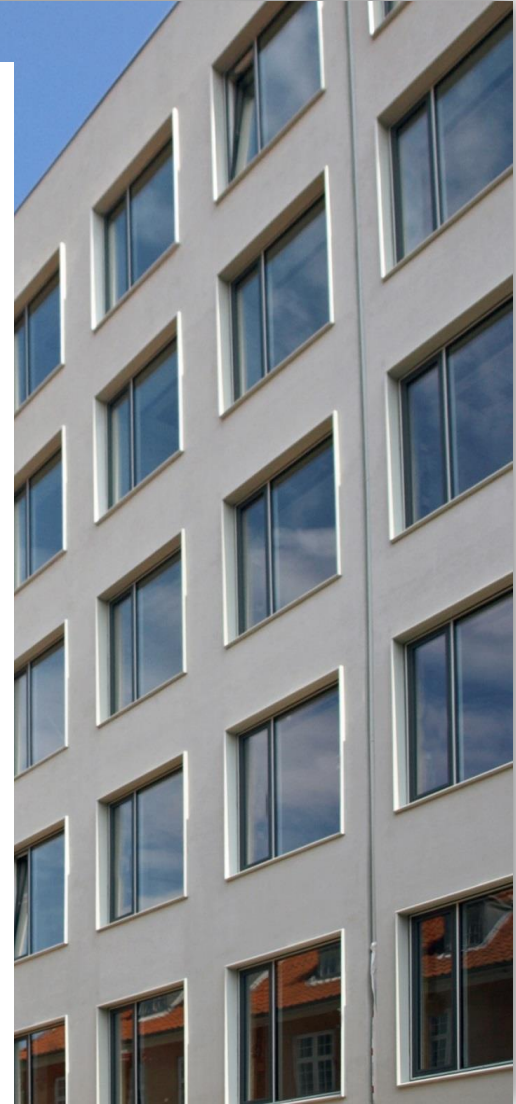
The Danish Government grants the Building and Property Agency EUR 32m to reduce energy consumption

2010

Energy screening of all state properties

2010-2013

Implementation of 56 energy saving projects



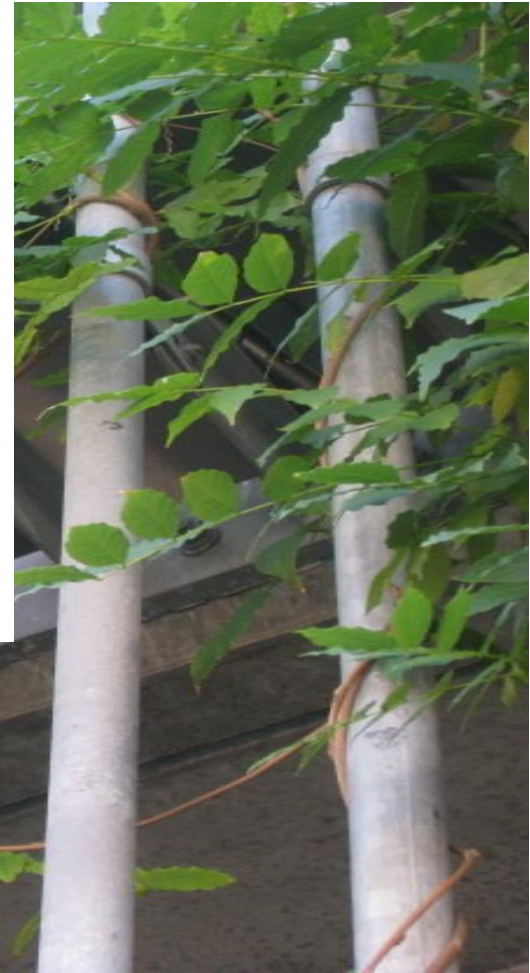


Finance

Owner:
Maintenance funds

Government:
Grants

Tenant:
Funds profitable initiatives





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CASE - VESTER VOLDGADE 123

Location: Copenhagen, Denmark

Property size: 7.000 m²

Project cost: EUR 3.2m

Built: 1938 as a post office building

Construction: Poured concrete on site

Owner: Building and Property Agency / The Ministry of Climate, Energy and Building

Tenants: Ministry of Education and their Kindergarten



2010



2013



- **Energy Label went from F to A (71% energy reduction)**
- **First project of this size to aim for Passive House Label certification worldwide**
- **Obtained Passive House Standard for new construction (max. 15 kWh/m² pr. year)**



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Intended renovation project:

- New windows
- Refurbishment of damaged concrete

Extended renovation project:

- External insulation
- New high-efficient windows
- Mechanical ventilation system
- Recycling of rain water
- Natural preheating and precooling of ventilation air
- Solar storage beneath the building
- Elimination of thermal bridges
- Efficient lighting and control of daylight

We asked for:

- Innovative as well as good technical solutions
- Coherency in technique and architecture

Advantages for tenants and owner:

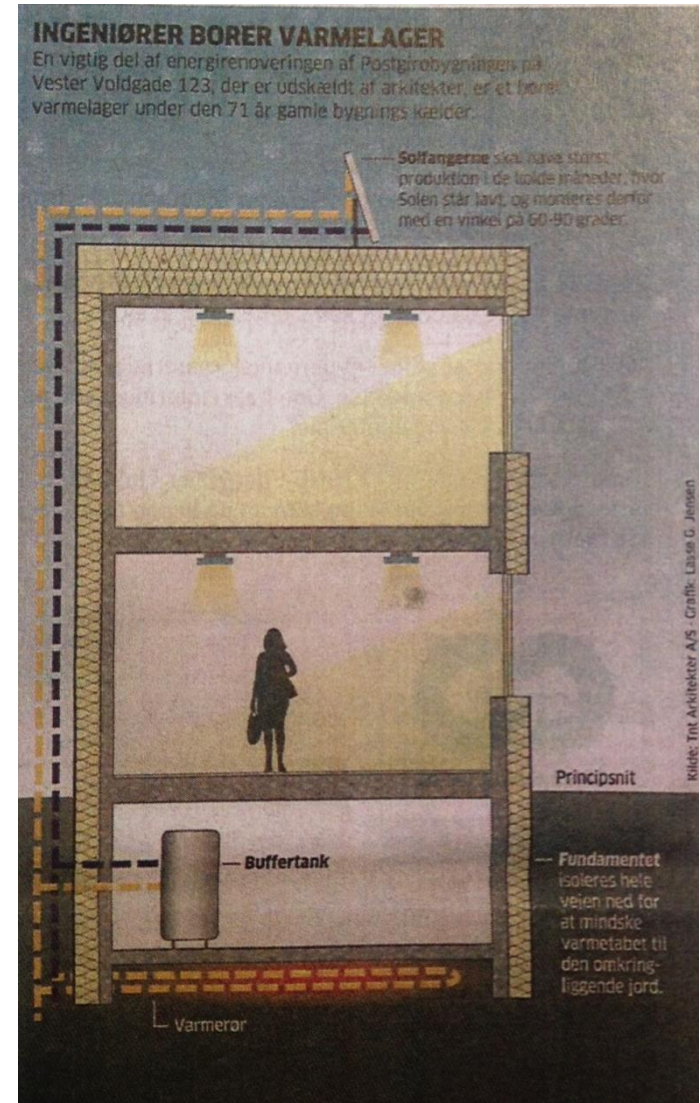
- Saving energy
- Saving money
- Saving CO2 outlet
- Better indoor climate
- Architectural lift
- Higher market value





Means

- External insulation
- Solar storage beneath the building



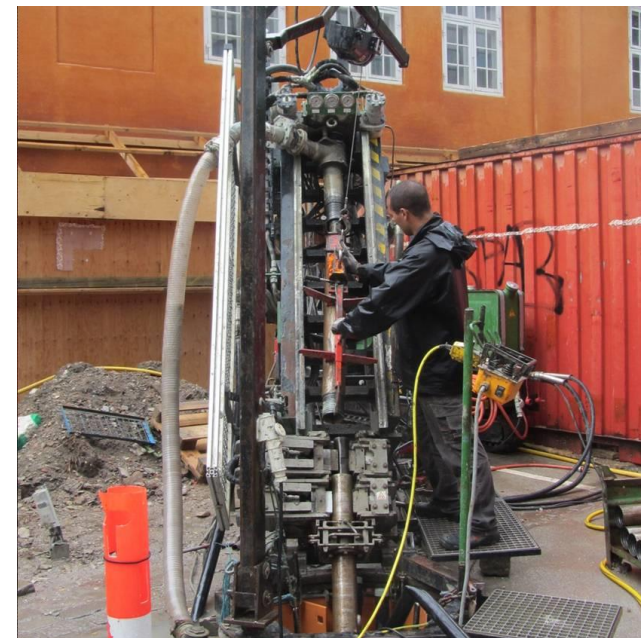
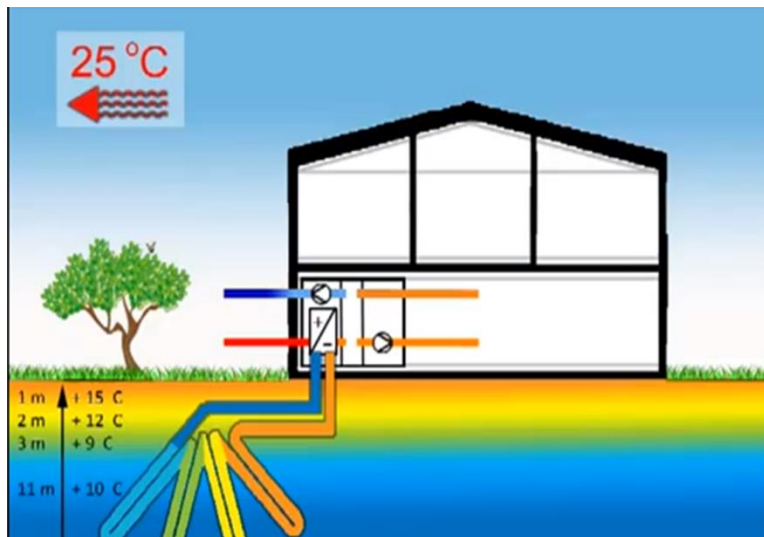


Reuse of rainwater

- Reduction of rainwater consumption
- Rainwater used for toilet flush
- No water to be led down the sewage system (municipality of CPH reward)

Natural preheating and precooling of ventilation air

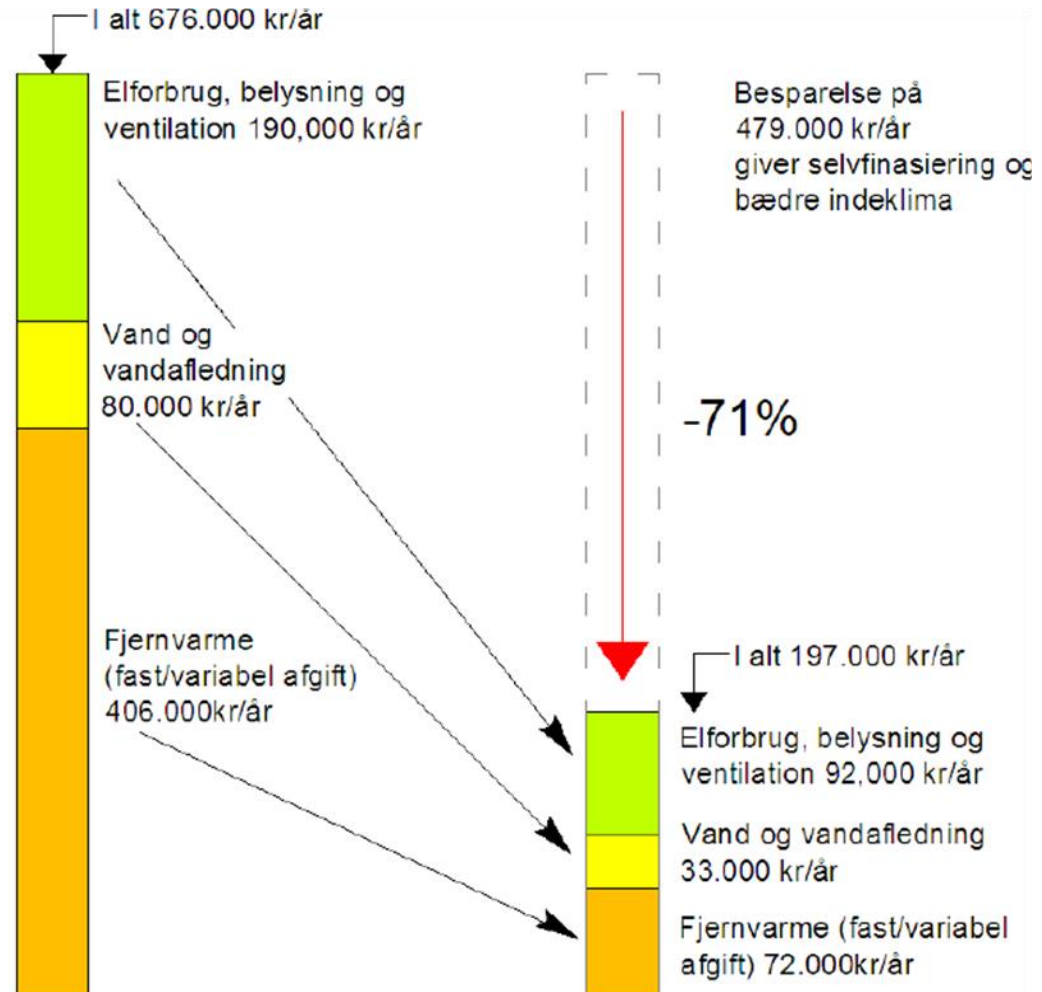
- 22 m vertical pipes





Energy savings

- Electricity = EUR 13,100 / year
- Heating = EUR 44,500 / year
- Water = EUR 6,300 / year





Certified Passive House in 2013 Nominated for RENOVER prize 201

Builder:

Building and Property, Ministry of Climate, Energy and Building
Project Leader, Arkitekt MAA: Eva Kunckel Architect MAA
Tenants advisor: Bente Nørregård

Consultants in architecture, construction and management:

TNT Architects AS, Martin Beck, Mogens Jørgensen

Consultants in engineering and technical installations:

Ørtoft Engineering AS
Strunge Jensen Engineering AS

Contractor:

GVL Entreprise AS, Jesper Zethner



1st Generation of Energy Projects 2010-2013

- What did we gain? A lot of experience. A lot of energy savings, but not as much as we should have...

2nd Generation of Energy Projects 2013-2016

- What's to be done?
- Warranty? What (kind of) warranty?



Thank you !