WelWonen

Energy from your own source.
Endless...

Ing E A J Weenink
0031499-486310
www.betonson.com
WelWonen - Better Living
Developed by Betonson
Trends and developments:

- EPN / EPC (0,8/1,0) Dutch Directives
- G.I.W en ISSO (Residential Areas)
- Low Level Energy Consumption for Heating
- Low Temperature Heating Systems (20-35)
- High Level Energy Consumption Cooling
- High Temperature Cooling Systems (16-20)
- Demand for comfort is rising rapidly
- Geothermal heating and cooling
- Heatpump Technology becomes a standard
- Constant rise of costs for energy consumption
Energie uit eigen bodem. Eindeloos...

Wel Wonen

Betonson
Development WelWonen-ENICON:

Prefabricated concrete Climate-floor systems:
- 1999 active with concrete activation technology for heating and cooling

Prefabricated energy piling system:
- 2000 first generation energy piles

**WelWonen - Better Living concept**
- 2004 combination of climate-floor and energy-pile

Energyroof:
- 2008 combination of climate-floor, energy-pile and energyroof
Prefabricated Climate Floorsystems
Production climate-floors
Energy-piles
Production Energy-roofs
Why ENICON:

By regenerating the soil by using the heat from the energy-roof, the soil temperature will remain constant for a long period.
The performance of the energy-pile is much higher (33%)
The performance of the heat-pump improves with 25%
By using the heat from the energy-roof, the use of energy for heating warm water is much lower
Advantages for ENICON user:

- Very low maintenance energy consumption costs.
- Perfect inside temperature quality
- Individual system, own energy source
- Integration in normal building elements
- Closed system, no connecting with soil
- Interesting investment level
For each type of building

Developed by CEPEZED

Stadskantoor Goes
Results of monitoring pilot project
Results of monitoring pilot project
Results of monitoring pilot project

- **Buitentemperatuur**
- **Temperatuur woonkamer**

![Graph showing temperature variations from August to October](image)
End results of monitoring pilot project

Comfort;
-Winter situation: hardly any temperature differences between the rooms

-Vertical temperature gradient is very small (0.5 K/m) and is much lower than class A NEN-EN-ISO 7730 (2.0 K/m)

-Summer comfort is extremely good despite of the large glass windows on the south site.

-The inside temperature never came above 25 degrees.
Comfort - Cooling

Temperature above 25 degrees annual

![Bar chart showing number of dwellings with comfort cooling using traditional and enicon systems.](image)
Energy savings

Energy costs in euro per year

- Traditional: 997 euros per year
- Enicon: 549 euros per year

Dwellings
Future developments:

**AM Duurzame Energie Strategie**
*In de richting van zelfvoorziening*

- **Verwarming [kWh]**
  - EPC = 1,0: 1,700
  - EPC = 0,8: 1,545
  - EPC = 0,6: 1,390
  - EPC = 0,4: 965

- **Warmtepompen [kWh]**
  - EPC = 0,8: 1,390
  - EPC = 0,6: 1,150
  - EPC = 0,4: 85

- **Huishoudelijk [kWh]**
  - EPC = 1,0: 3,200
  - EPC = 0,8: 3,500
  - EPC = 0,6: 3,800
  - EPC = 0,4: 3,950

- **Hulpenergie [kWh]**
  - EPC = 0,8: 1,150
  - EPC = 0,6: 1,150
  - EPC = 0,4: 1,150

- **Herinner voor Verwarmen & Warmtepompen [kWh]**
  - EPC = 0,8: 300
  - EPC = 0,6: 200
  - EPC = 0,4: 100

- **Wasapparatuur [kWh]**
  - EPC = 0,8: 1,800
  - EPC = 0,6: 1,200
  - EPC = 0,4: 600

- **Overig, incl. verlichting [kWh]**
  - EPC = 0,8: 2,150
  - EPC = 0,6: 1,550
  - EPC = 0,4: 950

- **Verlichting [kWh]**
  - EPC = 0,8: 800
  - EPC = 0,6: 400
  - EPC = 0,4: 200

- **Overig [kWh]**
  - EPC = 0,8: 1,350
  - EPC = 0,6: 950
  - EPC = 0,4: 550

**Duurzaam opwekken (Wind, PV, etc.)**
Future developments:

- More attention for energy management building
- Use of better heat pumps (COP=50) with fuel cells
- Use of hot fill washing machines and cold fill refrigerators
- Use of power LED lighting (savings up to 80%)
Involved:
- demand for comfort (cooling)
- less CO2 up to 40%
- Low EPC
- energy savings up to 45%

Reliable:
- self-supporting durable system
- delivering complete system
- guaranteed working system

BETONSON
This is what we must keep

If we not invest now, the next change will be in 2058
Thank you for your attention