

# ENBUS!

## Energising the building sector

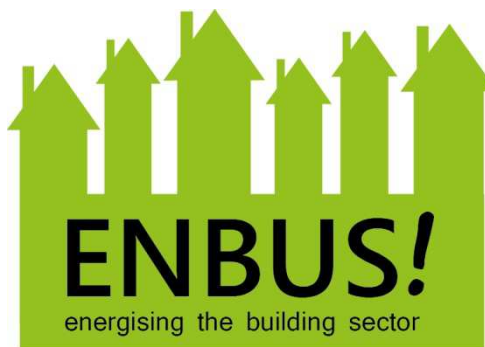
Międzynarodowa inicjatywa wspierająca efektywność energetyczną w budownictwie

dr inż. Piotr Danielski  
piotr.danielski@dbenergy.pl

DZIESIĄTA EDYCJA DNI OSZCZĘDZANIA ENERGII

**10.DOE**

PROJEKTOWANIE BUDYNKÓW  
NISKOENERGETYCZNYCH



# ENBUS!

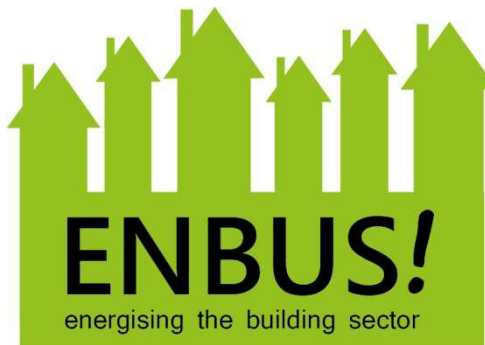
ENBUS jest pilotażowym projektem prowadzonym w celu sprawdzenia nowych możliwości przekazu informacji o technologiach i produktach energooszczędnych. W ramach prac projektowych stworzono aplikację na iPhone, opierającą się na uproszczonych modelach energetycznych.

Aplikacja ma za zadanie ułatwienie porównania i oceny efektywności energetycznej różnych rozwiązań energooszczędnych na etapie wstępnego wyboru technologii podczas remontów budynków mieszkalnych.

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# KONSORCJUM PROJEKTU

- 6 organizacji partnerskich
- 5 krajów Europejskich



# WPROWADZENIE

- 40 % globalnego Europejskiego zużycia energii to budynki mieszkalne
- Obszar budynków mieszkalnych bardzo powoli reaguje i dostosowuje się do nowych technologii dostępnych w celu podniesienia efektywności energetycznej

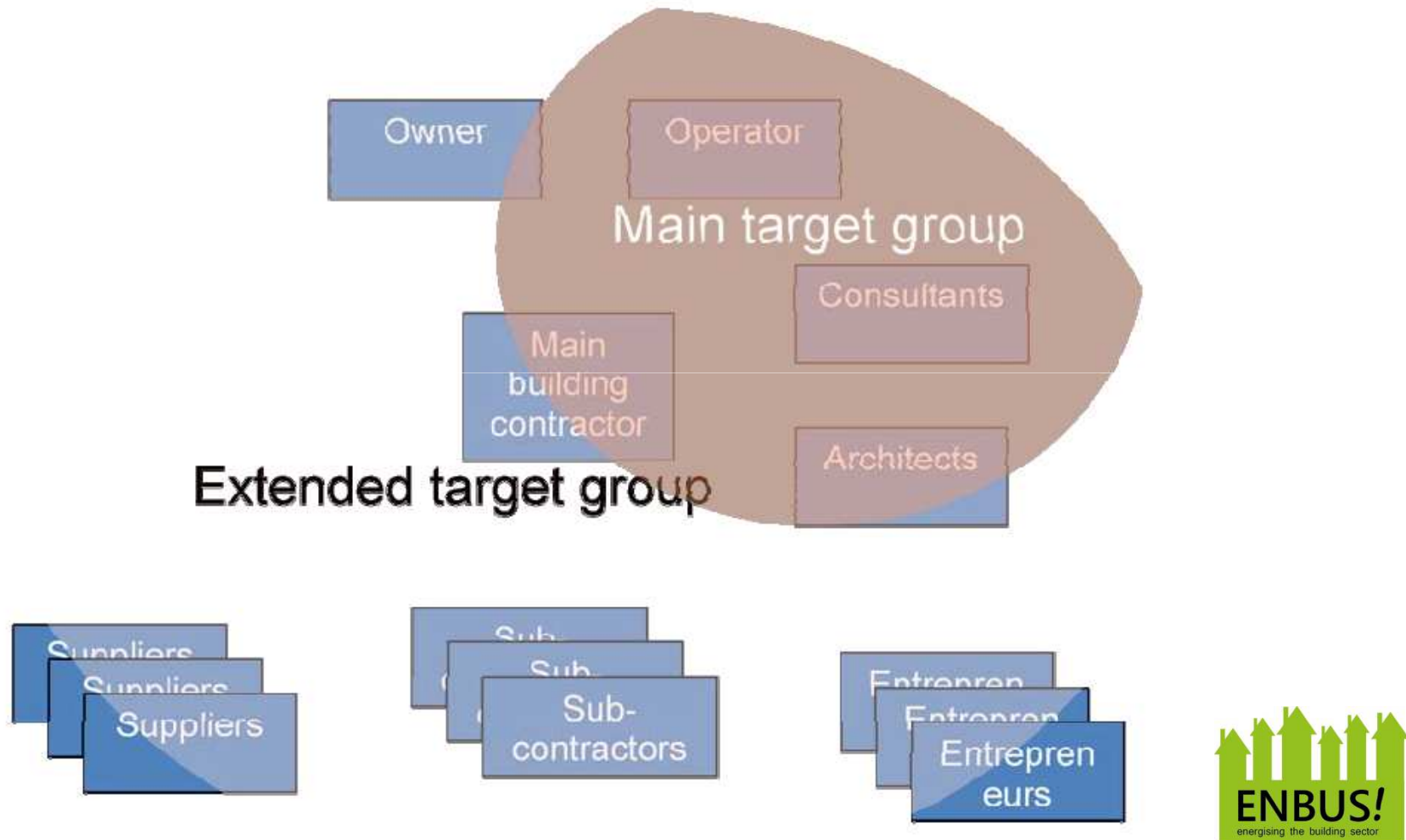


# WPROWADZENIE

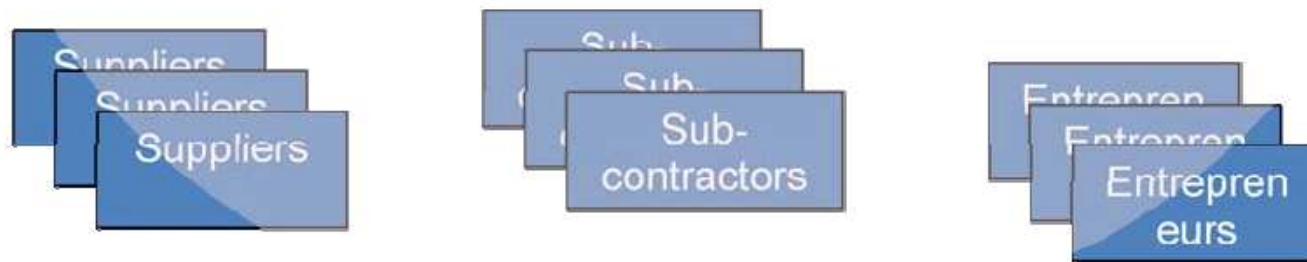
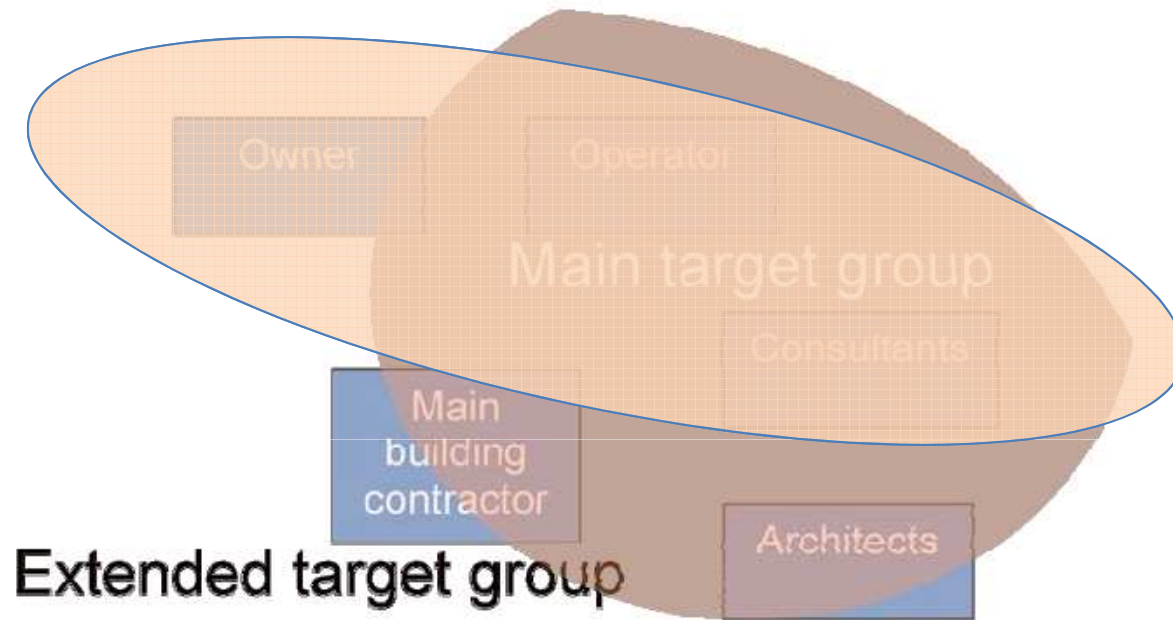
- Architekci, projektanci i konsultanci energetyczni są grupą najbardziej wpływową w prezentowaniu na rynku nowych rozwiązań i technologii,
- Obecne regulacje prawne, podobne we wszystkich krajach Europy, nie motywują do wprowadzania zmian technologicznych
- W naszej ocenie na rynku bardzo trudno jest znaleźć czytelną informację o nowych energooszczędnych technologiach



# DLA KOGO JEST ENBUS ?



# DLA KOGO JEST ENBUS ?



# CELE PROJEKTU

**ENBUS zredukuje zużycie energii w sektorze  
budowlanym i budynkowym**





# CELE PROJEKTU

- Zwiększenie świadomości, potrzeby i korzyści wynikających z redukcji zapotrzebowania na energię
- Zwiększenie wartości incjatyw związanych z ograniczeniem zużycia energii
- Polepszenie dostępności łatwoprzyswajalnej wiedzy z zakresu efektywności energetycznej
- Polepszenie możliwości w zakresie porównania i oceny efektywności energetycznej różnych produktów



# Swerea IVFs Energy declaration

## Energy Declaration

Company **AB Fagerhult**  
Product **Loop Light Lamell e-Sense 19404-217**

This Energy Declaration provides a quantitative description of the energy use of a Loop Light Lamell e-Sense, 19404-217, viewed from a life cycle perspective. It shows that most energy is used during the use of the system.

### The company

**AB Fagerhult**  
566 30 Habo  
Phone: +46 (0) 36-10 85 00  
Sweden  
Contact person: Gunnar Eliasson

AB Fagerhult is certified to ISO 9001, ISO 14001 and EMAS

The knowledge of the central importance of light for human activities and well-being is central to the

## FAGERHULT

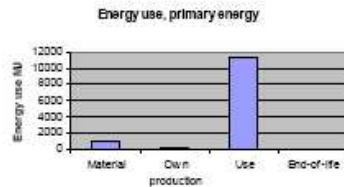
Fagerhult Group. With approximately 1,900 employees the Fagerhult Group is the largest lighting group in the Nordic region and a leading force in Europe. We develop, manufacture and market professional lighting systems for public environments as well as offering a range of decorative lighting. The main manufacturing site is located in Habo, Västergötland, as the company's headquarters.

### The product

Loop Light Lamell e-Sense, 19404-217, is a pendant office light fitting for general and working place lighting. The body is produced in extruded aluminium and offers many louvre options and different tube powers. This model is equipped with two 35 W T5 tubes, lamell louvre and integrated e-Sense sensor. The sensor offers daylight and presence control in combination with possibility for personal settings.



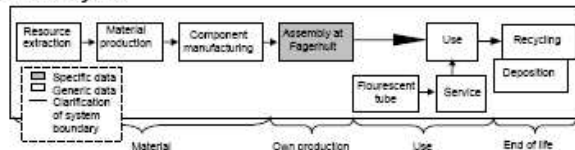
### Energy use through the life cycle



The diagram shows the withdrawal of primary energy resources from nature - oil, coal, wind etc - during the life cycle of the product. The unit is megajoule or MJ. For example, most of the primary energy during the use phase stems from electricity, which typically need 8-13 MJ primary energy resource per kWh electricity depending on where it is produced.

Note that cutting wastes are sent for materials recycling and the finished product is likely to be recycled at the end-of-life. The energy thus recovered is not credited to the product since it belongs to the next product system. However, since the product contains materials made from a mix of virgin and recycled materials the benefits of material recycling are accounted for.

### The life cycle



### The life cycle

All data are given for one Loop Light Lamell e-Sense, 19404-217, during 20 years of operation. Each of the two fluorescent tubes are assumed to be replaced twice during the lifetime.

The investigated life cycle begins with extraction of resources and production of the materials for the light fitting. Generic data are used.

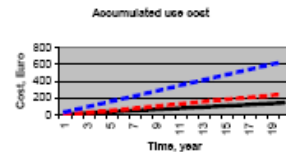
Our own manufacturing consists of assembly, surface treatment and warehousing. Electricity, district heating and car trips are the major energy using activities.

The energy use for the distribution of the unit from the factory to the client is very small compared to the total electricity consumption.

#### Assumed data:

- With the data assumed below the electricity use is 48,6 kWh/year (secondary energy) calculated in accordance with the international standard EN 15193.
- One-person office situated in Berlin sized 2,4\*4 meter with one window 1,2\*1,2 meter.
- Minimum Intensity of light, 500 lux on working area.
- Electricity for light is controlled by the e-Sense sensor but also turned off by a main switch during night 21.00-05.00.

### Life cycle cost



The diagram gives the accumulated cost during use for three types of lighting fittings. Purchase cost is not included. Data is assumed as below.

Black line - Loop Light Lamell e-Sense, 19404-217, with T5 fluorescent tubes and E-sense control for presence and daylight. Electricity use 48,6 kWh/year.

Red dotted line - Loop Light Lamell, 19404, similar to Loop Light Lamell, 19404-217, but without control for presence and daylight. Electricity use 112,4 kWh/year.

Blue dotted line - Traditional old type of lighting fittings with T8 fluorescent tubes and no control for presence and daylight. Electricity use 262 kWh/year.

#### Assumed data for LCC:

- Service cost for Loop Light is 2,7 EURO/year and for traditional type 7,5 EURO/year (including 6 original and spare fluorescent tubes for Loop Light respectively 20 for traditional type).
- Energy price 0,092 EURO/kWh according to EUROSTAT, Electricity prices January 2007.
- Electricity use for Loop Light Lamell e-Sense, 19404-217 is 48,6 kWh/year (calculated for the use scenario given above).
- Electricity use for Loop Light Lamell, 19404 is 112,4 kWh/year (calculated for the same use scenario).
- Electricity use for a similar traditional lighting fittings is assumed to be 262 kWh/year.

#### The example in the diagram above

- The accumulated cost for a specified number of years is consequently the number of years times 7,2 for the black line and 13,0 respectively 31,7 EURO/year for the other lines.

#### Calculate your own cost

- Calculate the use cost figures as: Energy use times Energy price plus Service cost.
- For your own calculation you may prefer to use an energy cost predicting the change in price for the years to come.
- For total cost add the purchase and installation cost available from your supplier.
- To calculate the cost for any other scenario than the one given here (office size 2'2,4 m etc) contact Fagerhult AB or any other supplier.

- See for example [www.energimyndigheten.se](http://www.energimyndigheten.se) for LCC-calculation.

### Improve the product's energy efficiency during use

- Install lighting fittings optimal to the use scenario. Fagerhult or other specialists can provide you expert help. Information is also given at [www.fagerhult.com](http://www.fagerhult.com).
- Clean the lighting fitting when replacing fluorescent tube or if otherwise needed.
- A lighting device contributes to the heating of your building and to the energy used for cooling. The overall effect is that a device with low energy use gives the lowest energy use for heating and cooling.

### Date of publication

This Declaration, published in May 2008, is valid until May 2011, if data do not change significantly.

### References

Energy mapping at AB Fagerhult 2008 according to Swerea IVF Report "Mall för Energikartläggning produkt" 2008-05-16. Swerea IVF AB.

This Energy Declaration has been prepared in cooperation between Fagerhult AB and Swerea IVF AB. It follows the Swerea IVF Report "Mall för Energikartläggning produkt". Fagerhult AB has the full responsibility for all data used for given figures.

swerea/ivf



# ENBUS Simplified Energy Profile

prosty profil  
energetyczny

This is a Simplified energy profile developed in the ENBUS project, [www.enbus.eu](http://www.enbus.eu).

This profile is a test

## Company and product

### Elitfönster

Elite Window is the largest window manufacturer in Sweden. We manufacture windows and doors for both single-family homes and large construction projects. Customer needs guide our development, both of products and organization. We are at the forefront with our environmental work and has contributed to most of the innovations in our industry. Among other things, we are a leading in the development of energy-efficient windows. The majority of our products are sold in Sweden through a nationwide network of approximately 400 skilled construction dealers and through our own sales force.



### Materials

Wood of laminated and finger-jointed Swedish pine. Exterior aluminum cladding Alutech.

### Impregnation

All wood parts are impregnated by Swedish P-labeling rules. The impregnation helps to provide good protection against rot, allowing extensive rot protection guarantees.

### Glass

3-glazing, self-cleaning glass, solar control glass (LT 61%, G 37%).  
 LT = Light transmission percentage of the 100th  
 G = Thermal transmittance in percent of a 100.  
 U-value 0.9 W/m<sup>2</sup> \* K.  
 U-value is set according to EU standard for size 1230x1480 mm.

### Glazing Fixtures

3-glazing type T4-16, with three pieces 4mm glass with two energy glass, 16 mm spacer with so-called "Warm edge" between the panes, two air spaces filled with Argon. Outer glass solar protected and self-cleaning.

[www.elitfonster.se](http://www.elitfonster.se) Sweden

## Energy use

Normal life time (years)	10 years
Total energy use per year	80 791 kWh
Savings per year compared to ENBUS standard house	3 801 kWh

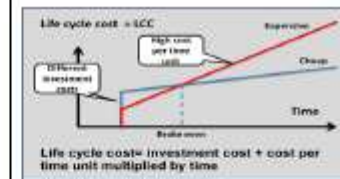
## Labelling

Elite Extreme AX88 has the Energy Class A



## Life cycle cost

Many times a more expensive product have a low cost during use that gives the lowest total accumulated life cycle cost, LCC.






Calculate your own cost saving. Add your own data. How much does this product save for you? You may also take change of energy price and interest rate under consideration.

NOTE – This Simplified Energy Profile is intended as a first draft to select a suitable product. Calculations are made with EnergyPlus based on a standardized house. Before final selection of product type and size, we recommend a more detailed study based on the actual parameters. For data regarding the standard house see, [www.enbus.eu](http://www.enbus.eu).

The Company Elitfönster has the full responsibility for all data. This Declaration, published 19-09-2013 and valid until 19-09-2015, if data do not change significantly. Data collected according to ENBUS, "Simplified Energy Profile, guide for data input".

# ENBUS Simplified Energy Profile



**Simplified  
Energy Profile**

Company	Swegon AB
Product	GOLD RX

This is a Simplified energy profile developed in the ENBUS project, [www.enbus.eu](http://www.enbus.eu).

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### Company and product


#### Swegon

Swegon AB is a company that manufactures and sells products and solutions for ventilation and indoor climate systems. Swegon is based in Sweden, but has an important world export organisation of sales companies with Scandinavia and Europe as main markets.

The production and technical development are located at our five factories in three in Sweden, one in Finland and one in Italy.

Swegon AB's Quality Assurance and Environmental management systems are certified to the SS-EN ISO 9001 and ISO 14001 standards.

[www.swegon.com](http://www.swegon.com)



#### Air handling unit with rotary heat exchanger

The GOLD units are designed for use in comfort ventilation applications. Depending on the variant selected, GOLD units can be utilized in buildings such as office buildings, schools, day nurseries, public buildings, shops, residential buildings etc.

GOLD RX is complete air handling unit with direct-driven supply air and extract air fans, supply air and extract air filters, rotary heat exchanger and integrated controls to apprehend the most energy efficient operation of the unit.

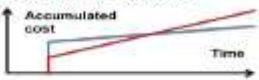
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### Energy use and Life Cycle Cost, LCC

(Example shows figures for a multifamily house, 1200 m<sup>2</sup> with DCV, Demand Controlled Ventilation)

Normal life time (years)	~ 15 years
Normal use time per year	24 hours
SFP	2,0


Information for energy use and energy savings are given in [www.enbus.eu](http://www.enbus.eu). Data are given for three different standard building in two climate zones





Many times a more expensive product have a low cost during use that gives the lowest total accumulated life cycle cost, LCC. Add your own data

My life time	
My energy use per time unit	
My total energy use	
My energy price	
My total energy cost	
My investment cost	

### Labelling or certification



<http://www.eurovent-certification.com/>

<http://passiv.de/en/>

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### Improve the product's energy efficiency during use

- Always follow instructions regarding maintains and service, and use only authorised personnel. Swegon has an organisation of qualified technicians who carry out initial adjustment, repair work and maintenance. <http://www.swegon.com/en/Contact/Swegon-Offices/>

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NOTE – This Simplified Energy Profile is intended as a first draft to select a suitable product. Before final selection of product type and size, we recommend a more detailed study based on the actual parameters. For data regarding the standard houses and climate zones see, [www.enbus.eu](http://www.enbus.eu).

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The Company Swegon has the full responsibility for all data. This Declaration, published 02-07-2013 and valid until 02-07-2015, if data do not change significantly. Data collected according to ENBUS, "Simplified Energy Profile, guide for data input".



# ENBUS Simplified Energy Profile

Produkty podzielono na kilka podstawowych grup:

- Systemy grzewcze
- Systemy wentylacyjne
- Izolacja
- Okna

Dla każdej z grup znaleziono parametry umożliwiające wyliczenie parametrów pracy w lokalizacjach projektowych. Obliczenia wykonano dla następujących przypadków:

Typ budynku	Lokalizacje
Budynek wolnostojący	Monachium/Kopenhaga
Szereg	Monachium/Kopenhaga
Mieszkanie	Monachium/Kopenhaga



# GŁÓWNE OSIĄGNIĘCIA

- Cykl szkoleń i seminariów promujących efektywność energetyczną w budynkach
- Proste profile energetyczne produktów dostępne na [www.enbus.eu](http://www.enbus.eu)
- Aplikacja na smartfona



UGENSERHVERV

FORSIDE BYGGERI EMBALLAGE LAGER & TRANSPORT ELEKTRONIK



**Ny App skal synliggøre energiforbruget i bygninger**

Teknologisk Institut er med i et projekt, der skal munde ud i en ny app til smartphones, der gør det lettere at sammenligne og vurdere den samlede energieffektivitet for forskellige produkter og serviceydelser med hinanden tidligt i projektfasen



# ENBUS aplikacja iPhone i wersja html

- Aplikacja i wersja html wprowadzają użytkownika w podstawowe pojęcia związane z efektywnością energetyczną w budynkach
- Przedstawiany jest zakres produktów wykonanych w technologiach energooszczędnych
- Aplikacja tymczasem tylko dla iPhone → dokumenty pdf i wersja html dostępne na [www.enbus.eu](http://www.enbus.eu)



# ENBUS!

DZIĘKUJĘ ZA UWAGĘ

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