



# The Concept of Facility Management in the Focus of Energy Effective Houses

**WOOD PROCESSING AND FURNITURE MANUFACTURING  
CHALLENGES ON THE WORLD MARKET  
Within**



**ASTAREA hotel – Mlini near Dubrovnik, Croatia  
October 7<sup>th</sup>-9<sup>th</sup> 2015**

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## The main goal is to present:

- influence of facility management in the preparatory phase of the investment process of construction energy efficient buildings
- the basic benefits of energy efficient wooden buildings,
- results of survey about complexity of offered FM services in Slovakia

**Reasons:** continual increase

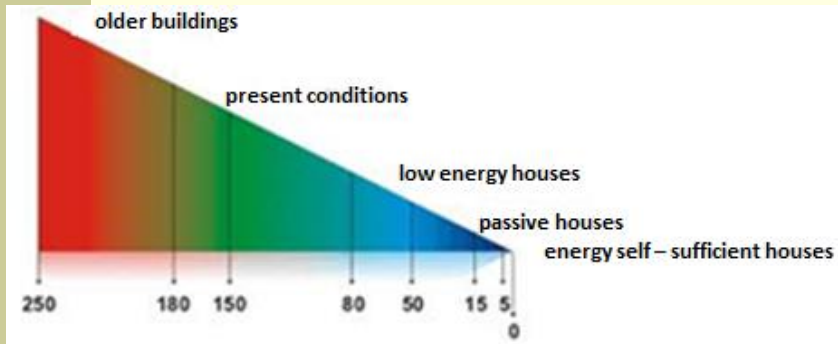
- of world population
- energy consumption
- CO<sub>2</sub> emissions

Buildings consume 40% of total energy, while their operation to heat/cool makes up 60% - 70% of the portion with the production 1/3 of the world production of CO<sub>2</sub>



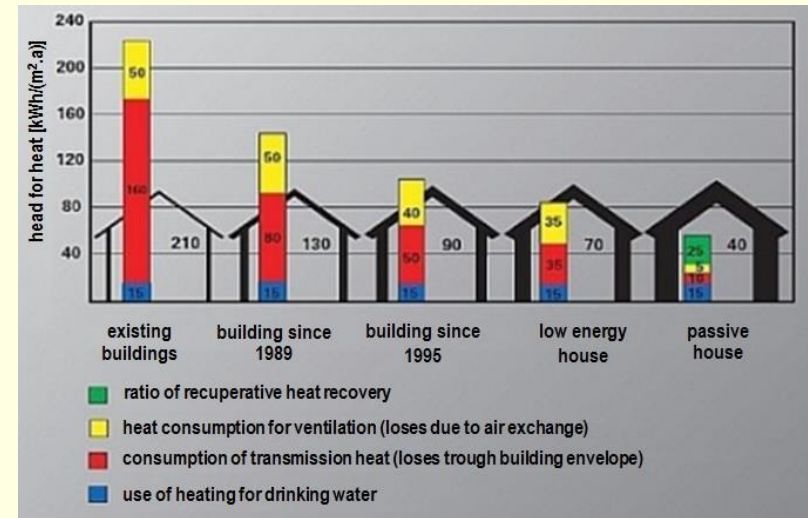
The most suitable solution means building houses with low energy demands which do not harm the environment  
**= energy efficient wooden buildings**

## Division of buildings according to heat consumption (kWh/m<sup>2</sup>/p.a.)



Source: <http://www.modernerodinnedomy.sk/archives/684>

## Energy performance of buildings



Source: <http://www.encerti.eu/termovizia/p0/n84>

- **low energy houses:** There is no global definition for low energy house because national standards vary considerably among countries. In Germany a “low energy house” has an energy consumption limit of 50 kWh/m<sup>2</sup>/year for space heating.
- **energy passive house:** The annual heat demand for passive house is very low - in the middle of Europe about 15 kWh/m<sup>2</sup>/year. The need for total primary energy use should not exceed 120 kWh/m<sup>2</sup>/year, including all household electricity
- **energy-self- sufficient buildings:** is completely independent of external power supply. Electricity and heat are produced and stored completely with e.g., micro power plants or active solarsystems in or at the building.

## THE BENEFITS OF ENERGY EFFECTIVE HOUSES



saving of thermal insulation characteristics



fast feasibility



long-term guarantee and lifetime



soundproofing



more interior space



pleasant living

Source: <http://www.drevodomzvolen.sk/-nizkoenergeticky-dom>

## COMPARISON CRITERIA OF SILICATE AND LOW ENERGY FABRICATED HOUSES

Comparison criteria	Silicate (brick) building	Wood (Low energy house) building
Ground plan dimension	96.76 m <sup>2</sup>	95.35 m <sup>2</sup>
Interior utility area	80.76 m <sup>2</sup>	84.15 m <sup>2</sup>
Wall thickness	40 cm	28 cm
U-value of building shell	0.53 W / (m <sup>2</sup> K)	0.22 W / (m <sup>2</sup> K)
Yearly heat consumption and heating	13, 500 kWh	5, 400 kWh
Weight of building material	115 t	17 t
Consumption of energy for production	253, 760 kWh	120, 080 kWh
Equivalent CO <sub>2</sub>	23.7 CO <sub>2</sub> ekv	9.1 CO <sub>2</sub> ekv

Source: [http://www.atrium-sk.sk/images/pdf/Atrium\\_speci\\_2014\\_web.pdf](http://www.atrium-sk.sk/images/pdf/Atrium_speci_2014_web.pdf)

**Problems in Slovakia - increase of wooden houses producers with low quality and experiences !!!**

## FACILITY MANAGEMENT (FM)

is an effective form of outreach business management which aims to provide relevant, cost-effective services to support the main business activities (core business) and allow them to optimize (Vyskočil, 2009).

International Facility Management Association (IFMA), defines FM as „the method in organisations that mutually coordinates personnel, work activities and work environment representing the principles of business administration, architecture, humanities and technical sciences“.



Source: <http://lhsecurity.com/services/facility-management/>

**Problems in Slovakia** – the low level of FM implementation in wood processing and forestry industry,  
 – the lack of complexity of offered FM services !!!



Life cycle of a building can be according to United Nations International Development Organization (UNIDO) as well as conditions of the Slovak Republic defined into 3 phases

	Building life cycle phases			
	Building acquisition		Building use	Building deconstruction
<b>UNIDO</b>	Pre-investment phase	Investment phase	Operational phase	
<b>Slovak Republic</b>	Phase of building preparation	Phase of building acquisition	Phase of building use	Phase of building deconstruction

**Tasks of a facility manager in individual building life cycle phases**

Building life cycle phases						
Investment, project preparation	Operational project design	Building Acquisition	Final building approval	Building use	Maintenance, servicing	De-construction
-counselling and procedure consultations, - defining of facility management requirements,	- consultancy and notes to individual project types, - design optimisation,	- continual control of task within individual projects,	- acceptance of building, operational documentation, - testing operation,	-coordination of support processes operation, - setting an effective and optimal building operation,	- calculation of effective use of building, -definition of maintenance, rebuilding and reconstruction requirements, - design of time frame schedules,	- deconstruction design, or calculation of further building effective use.



**Tasks of a facility manager**

## Building Life Cycle and requirements for energy efficient buildings in the phase of acquisition

- Into the terrain location of building it is necessary to design requirements of suitable big windows with the south orientation,
- avoid creation of thermal bridges and secure accumulation of passive energy profits in winter and shading the building against overheating in summer,
- to avoid energy losses it is important to design air tight walls, choose high quality windows and roof construction,
- controlled ventilation with heat recovery (ventilation with back trapping of heat) will secure necessary income of fresh air with the minimum energy loss.



Source: [http://www.modular.org/htmlPage.aspx?name=Durability\\_Adaptability\\_BSLP](http://www.modular.org/htmlPage.aspx?name=Durability_Adaptability_BSLP)

### The phase of using energy sufficient building

#### Advantages

- ✓ saving of energy costs for heating 50 -70 %
- ✓ high quality of interior air climate
- ✓ realization time factor
- ✓ more interior space
- ✓ soundproofing

#### Disadvantages

- more money for construction (higher quality heat insulation with specific characteristics, doors, windows)
- investing into heat recovery unit and requirements for highly qualified and quality construction details.

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**Thanks for your attention.**