

**PARP conference 19.10.2023**

**Bygg Reis Deg 2023 in Lillestrom**

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# Sustainable net-zero construction

for the planet  
for the user  
for the economy



Irena Łobocka 19.10.2023



# SUSTAINABLE INFRASTRUCTURE CLUSTER

cooperation platform for the

- development of sustainable construction
- smart buildings
- energy efficiency
- renewable energy sources

Location - Cracow, Poland (Malopolska Region)

2016, 2019, 2022 - obtaining the status of a National Key Cluster



# Sustainable Infrastructure Cluster in numbers

**2011** – cluster establishment

**140** members

**118** SMEs

**9** R&D institutions

**3** municipalities

**18 168** employees



# Sustainable net-zero construction

## Building a Sustainable Future

**Environmentally responsible and health conscious building practices  
come together to shape a better future**

- materials, designs, technologies
- minimizing environmental impact
- balancing resource efficiency
- social responsibility



Reducing emissions



Quality of life



Energy saving and low  
operating costs

# Sustainable net-zero construction

**What is  
the cheapest  
energy???**



# Energy demand of the building

250kWh/m2a



No thermal upgrading

100kWh/m2a



Standard building

15 kWh/m2a

70-90% savings



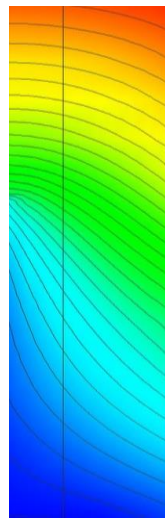
PASSIVE BUILDING



## PASSIVE BUILDING - what is that?

- shape of the body and placement of windows,
- proper thermal insulation and air tightness
- ventilation system with heat recovery

passively (passive) uses solar energy and **internal energy** sources for heating purposes



ENERGY SAVING FOR HEATING COSTS  
**75% – 90%**

# Sustainable net-zero construction

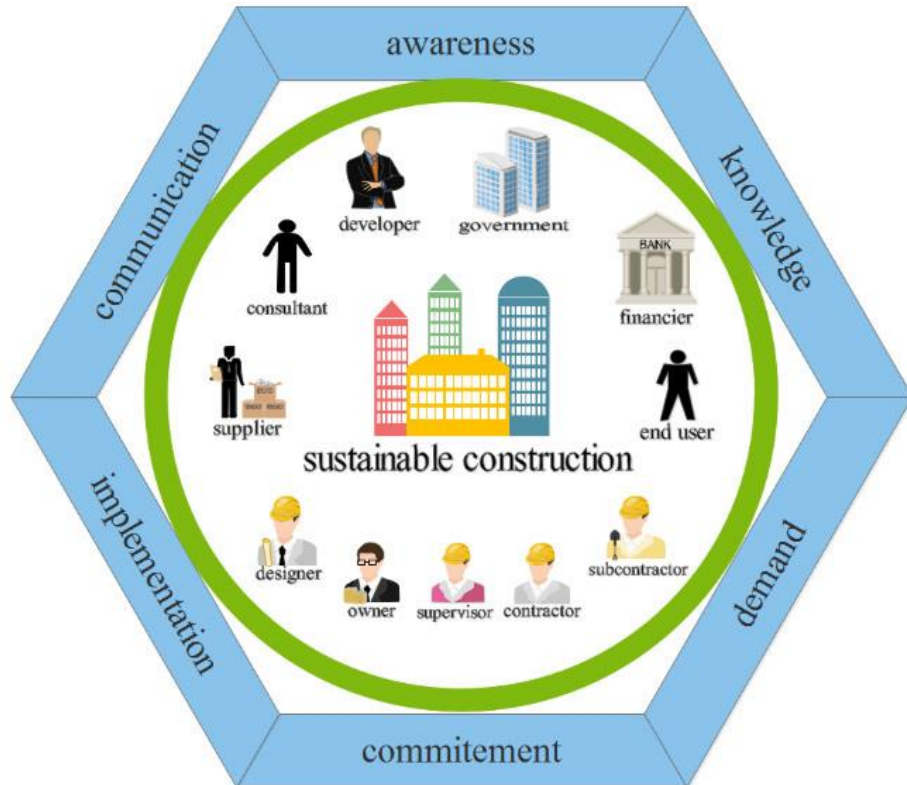
## KEY SUCCESS FACTORS

- proper design
- proper materials/technologies
- air tightness
- mechanical ventilation
- renewables
- energy storage
- BMS
- **aware users !!!**



## Sustainable Construction: Methods and Benefits

# Sustainable net-zero construction



## Development barriers:

- lack of awareness of investors (public and private)
- lack of proper trainings
- lack of competent architects
- lack of qualified construction workers
- traditional attitude
- lack of standards and unified certification system (bringing real market value)
- cost balance (greater investment, lower operating costs)
- lack of financial incentives

# Sustainable net-zero construction

## Building a Sustainable **HEALTHY** Future

**We must go on ENERGY DIET....but it's not everything....**

**"Indoor generation"**- 90% of our time is spent indoors

- Can a building/home be **HEALTHY** or SICK? **SBS - Sick Building Syndrome**
- Energy-efficient building = healthy building?
- Healthy **indoor microclimate** (temperature/humidity/CO2 level, lighting)
- Challenges of modern **construction** - **energy efficiency, comfort, health and ecology**

# Sustainable net-zero construction

## IMPACT OF LIGHT ON HEALTH



- the natural cycle of day and year
  - the proper biological rhythm -changing color of light
  - **unhealthy** expansion to light (flickering, glare, blue light)
- Effects:** sleep disorders, decreased productivity and mood, depression, concentration problems, weight gain/obesity



Schools? Offices?  
CO2 won't kill you....but....

# Sustainable net-zero construction FINAL CONCLUSIONS....



Encouraging people to change the way they have always done things is never going to be easy...



Humans resist change.....



We need to incorporate nature into our buildings to connect people with the natural world.... Because we really miss it...



Sustainable construction has broader community benefits, including job creation, economic growth, better quality of life.

# Sustainable net-zero construction

**Thank you!**

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