# PASSREG: THE STORY SO FAR

## Highlights from the Aspiring Regions

*19th International Passive House Conference*
*Leipzig, 18.04.2015*

# Urban district planning based on PH standard as a result of dedicated local policy

Nieuw Zuid_simulatie: atelier Kempe thill 1

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# Urban district planning based on PH standard as a result of dedicated local policy

Nieuw Zuid_simulatie: atelier Kempe thill 3

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# Urban district planning based on PH standard as a result of dedicated local policy

Sociale woningen Nieuw Zuid_simulatie: BOB361 Windows Photo Viewer

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# Creative funding without subsidies

- In UK (and Wales) there are *no financial incentives or subsidies to specifically promote Passivhaus buildings*
- Available schemes have very narrow focus:
  - Feed in tariff (FIT) for electricity producing RES
  - Renewable heat incentive (RHI) for heat RES
  - Green Deal loans for refurbishment – loan for energy measures paid back through energy bills
  - Nest & Arbed subsidy (Wales only) to lowest income areas for refurbishment to 'good' standard (not as high as Passivhaus or EnerPHit)

# Creative funding without subsidies

- 2 examples from Wales Beacon Regions
- Both Local Authorities wanting to trial Passivhaus as the solution for future NZEB requirements…
- …but do not have extra capital budget to cover increased cost to build to Passivhaus standard

- Passivhaus School (Carmarthenshire Council)
  → Lifecycle costs to justify construction
- Passivhaus Housing (~30 units) (Cardiff Council)
  → Accept reduced land value to cover increased capital cost of Passivhaus

# Lifecycle costs to justify higher capital

- Within Local Authority, department with capital budget different to department with operating budget
- By demonstrating ongoing operating budget would be much reduced by Passivhaus standard, able to put case for transfer of budget from operating to capital
- Overall ‘lifecycle’ cost less than school built to Regulations
- Enabled by Trust: examples of recent PH schools in England and reported costs helped make case
- Evidence of realistic performance key!

# Reduce land value to cover higher capital

- Cardiff Council effectively ‘selling’ their land to a partner Developer, with conditions on the sale for construction
- Wanted to make them build the site to Passivhaus but knew likely to cost more and had no capital to offer
- Balance of risk: Agreed to accept a lower value (than market price) on their land if Developer could not recover costs when sold – effectively creating a subsidy and reducing risk
- If houses sell for more, both parties take share of profit
- Longer term, hoped ‘EPC related mortgage’ would cover capital cost uplift for private sale

# The Climate Change Financial Instrument used for PHs support

Aim of CCFI is to prevent global climate change, adaptation to the effects of climate change and contribute the reduction of greenhouse gas emissions

The financing of the Tenders was formed by the Proceeds from the Assigned Amount Units (AAU) Purchase Agreements which were made within the international emissions trading under the Kyoto Protocol

Latvian Environmental Investment Fund provided supervision of implementation and post-implementation monitoring of projects co-financed by CCFI – National Implementing Agency (CCFI co-financing – 200 million EUR)

# Tender – Low energy buildings

**Objective:** reduction of $CO_2$ emissions by performing construction of low energy consumption buildings, as well as refurbishment or simplified renovation of existing buildings.

**Tender** call was announced - January 20, 2011.

**Project** implementation period - November 1, 2012 (November 1, 2013).

**The heat consumption** for space heating **not exceeding 35 kWh/m$^2$** per year.

**Support intensity:**

- up to 80% – for direct or indirect administrative institutions and municipalities;
- up to 65% – for micro and small enterprises and natural entities;
- up to 55% – for medium-sized enterprises.

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# Initial plan and results for space heating demand

| | Submitted (corresponding) projects | | Approved projects | | Implemented projects | |
|---|---|---|---|---|---|---|
| | No | % | No | % | No | % |
| ≤ 15 kWh/m2 | **25** | 36% | **25** | 81% | **14** | 100% |
| ≤ 25 kWh/m2 | **22** | 31% | **6** | 19% | **0** | 0% |
| ≤ 35 kWh/m2 | **23** | 33% | **0** | 0% | **0** | 0% |

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# Results achieved

## Open Tender “Complex Solutions for Greenhouse Gas Emission Reduction in State and Municipal Vocational Education Establishment Buildings”

**Objective:** reduction of CO2 emissions, by reducing consumption of heating energy and electricity for lighting in the buildings of vocational education establishments founded by State and municipalities of the Republic of Latvia (hereinafter – State and municipal vocational education establishments).

**Total CCFI financing:** EUR 16 989 000

**Beneficiary:** State or municipal vocational education establishment.

**Support intensity:** up to 85% of the total eligible costs of the project.

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# Possible next support programs – Emission quota auctioning tool

EQAT goal: Contribute to the reduction of greenhouse gas emissions (e.g., implementing activities to improve the energy performance of buildings in both public and private sector)

- **Low-energy buildings (the draft regulation is now in the development stage)**
- **Energy efficient refurbishments of historical buildings (the draft regulation is now in the development stage)**

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# Starting point

Comune di Cesena

PassREg

## Situation in Cesena at 1st May 2012 (PassREg starting date)

- 1 project with no willing of PH certification
- no spread knowledge in Cesena about PH
- no certified PH designers or tradespersons
- no events or dissemination about PH concepts
- no awareness between politicians and civil servants about PH concepts

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# Results

Comune di Cesena

PassREg

## Situation in Cesena **today** (after 36 months of PassREg)

- 1 project will be realized and certified
- 1 new project is now in construction phase and will be certified by Zephir
- a common knowledge in Cesena about PH has been built
- 20 people attended the Train the Trainer course
- 3 certified PH designers (1 is a civil servant)
- 14 certified PH tradespersons (3 are civil servants)

} 37 people trained

- 3 Passive House Days organized
- 3 Info sessions organized
- 2 Regional Building Forums organized

} more than 300 people involved

- secondary schools education laboratories about user behaviors
- communication campaign (pamphlets, poster, brochures, website, SoS)

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# Results

Comune di Cesena

PassREg

## Long-term city planning

- SEAP – Sustainable Energy Action Plan:

approved 2 years ago, now in the implementation and monitoring phase

- PSC – Municipal Structural Plan:

in phase of development, through participated process and competitions of ideas

**3 priorities:**

Reduction in the use of ground

Sustainable building and energy saving

Social Housing

# Results

Comune di Cesena

PassREg

## Involvement of stakeholders

- network of stakeholders established (beacon architects, public bodies, university, PH certifiers, construction companies, etc…)
- visits to PH with politicians, schools, civil servants and citizens
- politicians and civil servants involved in PH events (even as speakers)
- urban regeneration protocol to promote NZEB signed
- new collaboration and PH projects born

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IF YOU DO IT, DO IT THAN GOOD

# Our beacon
# first private zero energy dwelling in the Netherlands

POLITECNICO DI MILANO

eERG
end-use Efficiency Research Group
Gruppo di ricerca sull'efficienza negli usi finali dell'energia





# Monitoring of beacons and quality assurance


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PassREg

**Leipzig 18.4.15**

# Monitoring of beacon in Mascalucia (Sicily)



- Zero energy building
- Passive House certified
- Real scale/use test building
- Mediterranean climate
- Test-building in IEA-annex 62 (ventilative cooling)

Beacons ZEB Passivhaus in Mascalucia - Sicily , © eerg.it

**design team**:

•**Ing. Carmelo Sapienza** - www.sapienzaepartners.it

**energy simulations, design optimization, monitoring:**

•**eERG Group, Politecnico di Milano** - www.eerg.it

**technological partners:**

•**Rockwool, Siemens, PM Plastic Material e Herholdt Controls**

PassREg

# Monitoring Layout



- Detailed scientific monitoring to complete replicable system to measure:
  - Outdoor and indoor Temperatures (air and operative)
  - CO2 concentration and Relative Humidity
  - Temperatures, Mass Flow Rates, Energies of all loops of the heating, cooling, ventilation, and solar heating systems.
  - Climate data

- Output of monitoring under developing
  - the energy uses for heating, cooling, and domestic hot water,
  - the delivered electrical energy for lighting and electrical equipment,
  - the total primary energy demand,
  - the energy production by thermal solar and photovoltaic system
  - Comfort conditions according to EN15251, ISO7730, and new comfort indices
  - Load match index
  - Comparisons with calculated energy needs

PassREg

PT100

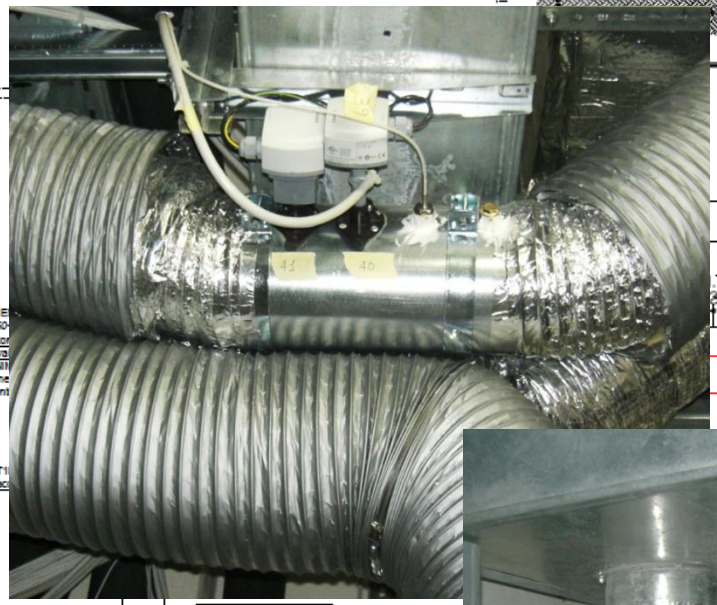
sensore temperatura Siemens (abbinato a misuratore di energia)

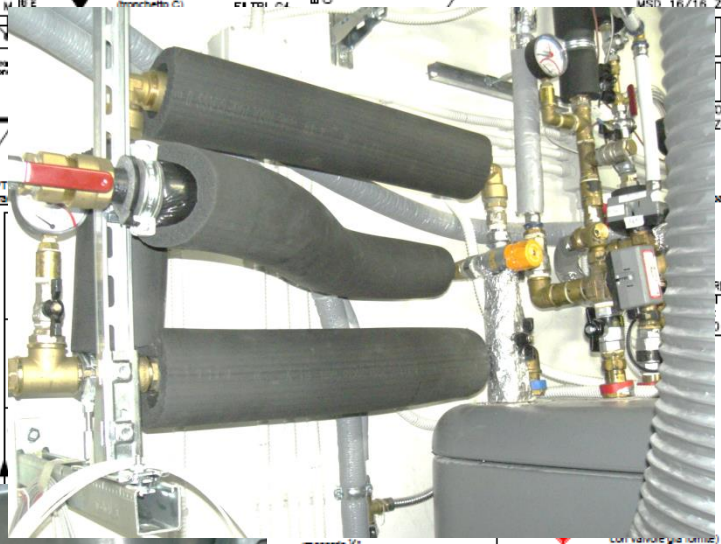
misuratore di energia in circuiti acqua

sensore di velocità aria

sensore di umidità relativa

sensore di concentrazione $CO_2$/VOC








v.06 | eERG Group - Politecnico di Milano | Ing. Pietrobon

# Air quality and Thermal comfort conditions monitoring





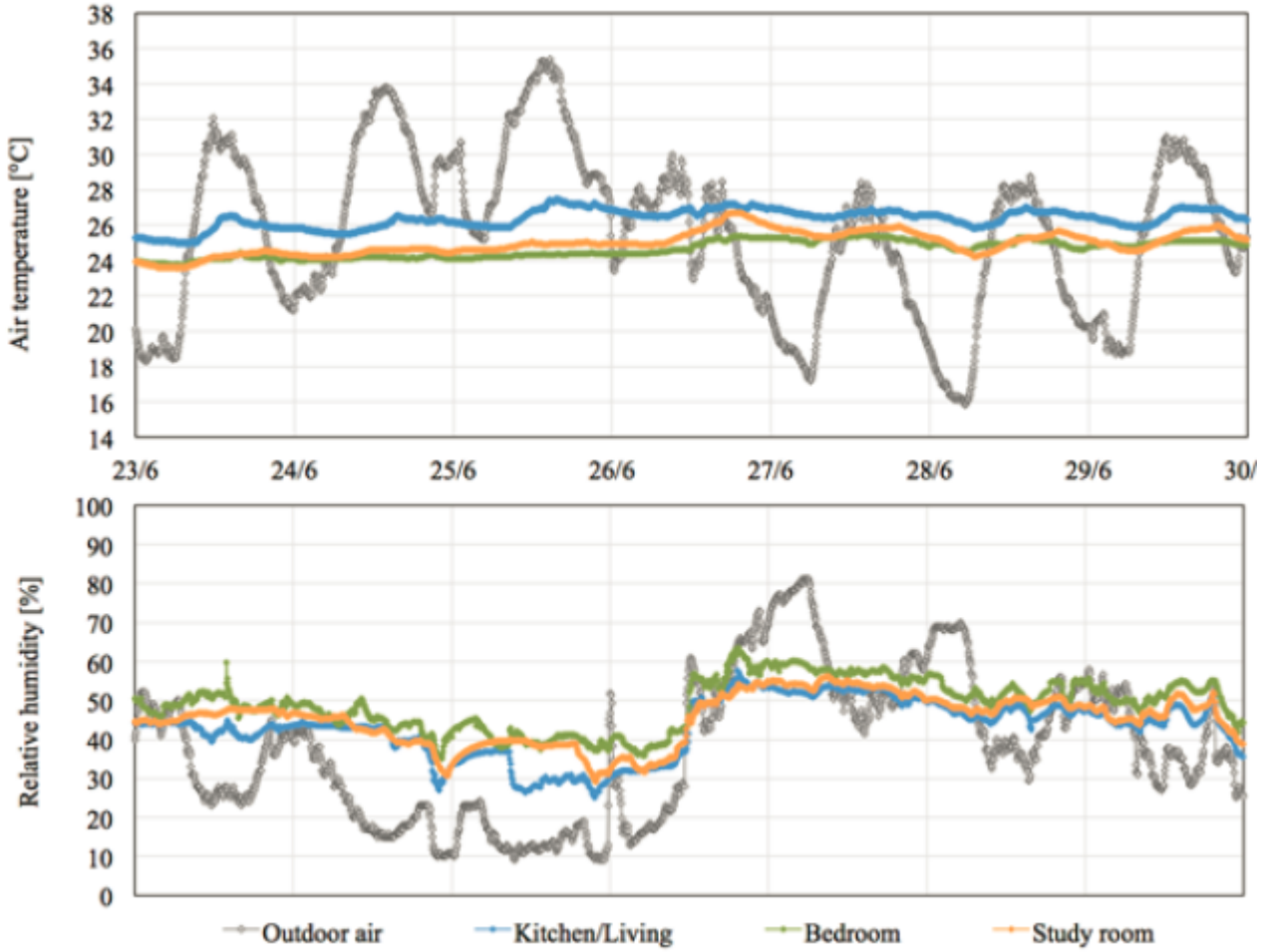

temperatura aria

umidità relativa

umidità relativa e temperatura aria (con schermo antiradiante per esterno)

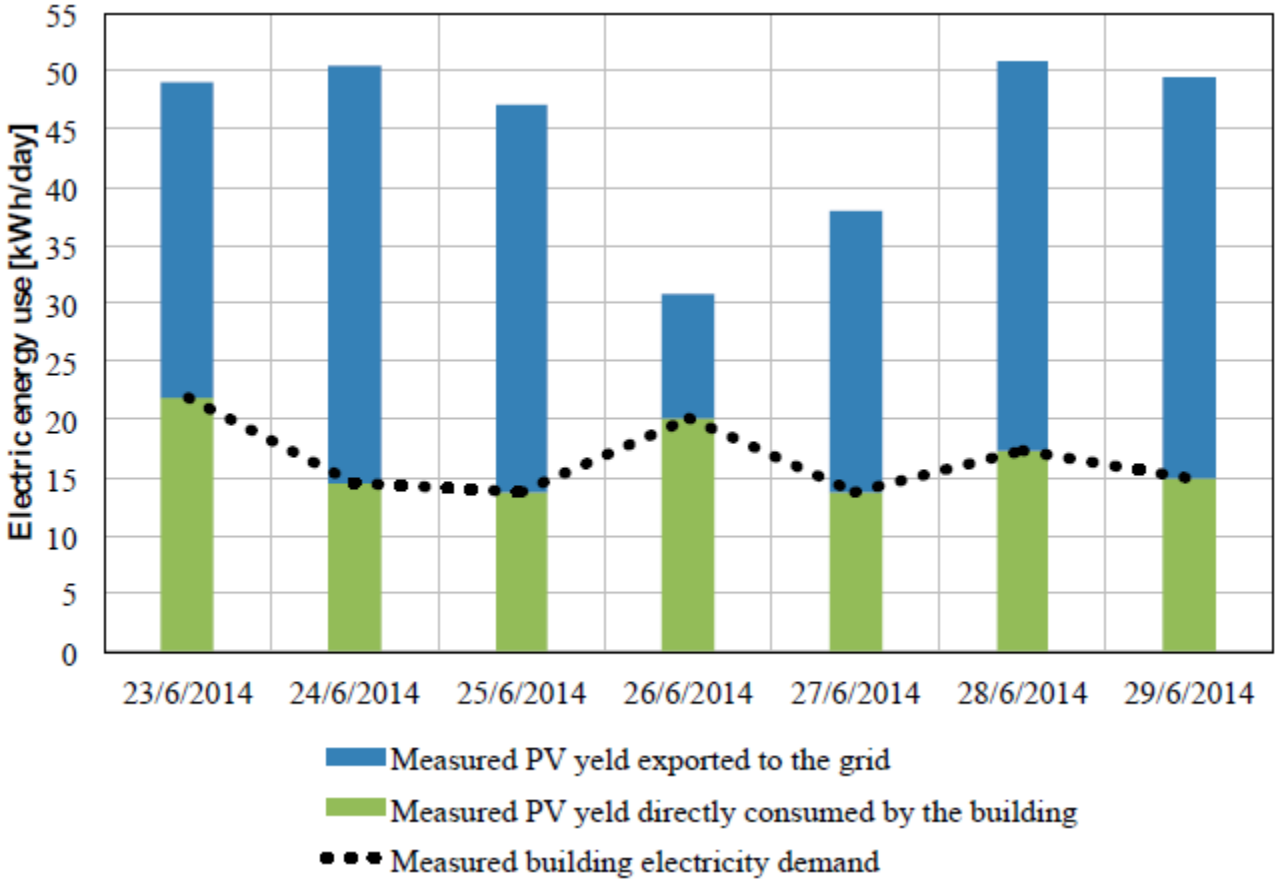
globotermometro

concentrazione di CO2




## Comfort in the beacon

example of measured values of air Temperatures and Relative Humidity
in kitchen/living room (Blue), bedroom (Green), study room (Orange), outdoor (Grey)
- hot summer week from 23rd to 30th of June 2014 -




## Positive energy balance in the beacon

daily electrical Demand for all uses (Dotted-line) and
daily electricity Production from on roof integrated PV [kWh/day]
(Green-bars directly consumed, Blues-bars exported to the grid)
- week from 23rd to 30th of June 2014 -

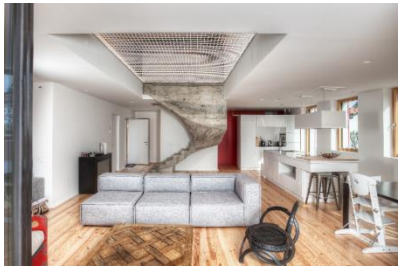
# Main results for Aquitaine

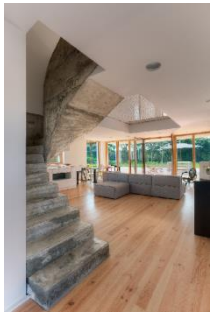
PassREg

## Highlight inspiring local projects → Demonstrate locally PH advantages

Beacon project within one of the largest urban planning operation in Aquitaine (office buildings, Groupe Pichet)

Passive house adapted to local architecture patterns (individual house in the typical style of the Basque Country, Carbone 64)





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# Main results for Aquitaine

PassREg

## Special events for information and debate

-Promotion of Passive House Days

-Debate and information sessions

-Regional Building Forum (february 2015)


Débatek

**Essential for a good communication between the local stakeholders!**

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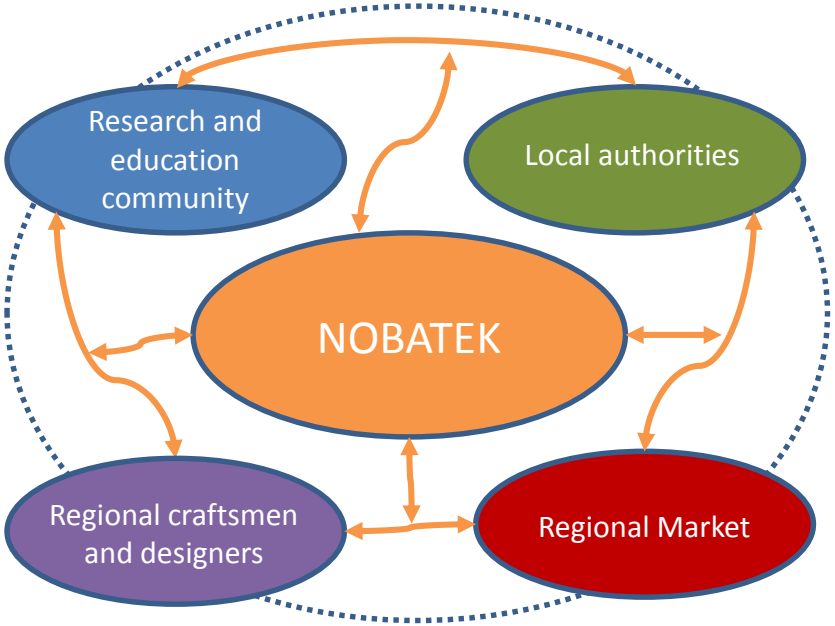
# Main results for Aquitaine

PassREg

**NOBATEK as an interface between the research community, the regional authorities and the building market**

- Make the most of the existing skills and competences
- Make all the stakeholders to know each other
- Help them to identify their interest and role
- Constitute complementary teams to develop PH standards in the region

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# Before PassREg project

1st May 2012

- **limited knowledge** about Passive House concepts in various administrative bodies in the City of Zagreb and residents of the City of Zagreb;
- **reduced number** of events which can increase knowledge about PH;
- **no awareness** of importance to raising the number of educated experts;
- **no certified** PH designers or tradespersons

Zagreb

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# During PassREg project

1st May 2012 – 30 April 2015

Training

M6 house

- Constantly increasing knowledge about PH; through events and trainings;
- Completing shining example; dissemination of the shining example (beacon project)
- Promotion campagnes: phamplets, brochures, website, presentations...

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# After PassREg project

**Results:**

- 3 Days of Passive Houses organized;
- 3 Info Sessions coordinated;
- 2 Regional Forums organized;

**More than 600 people informed.**

- 36 people attended Training Course; for municipal officials, politicians, designers and craftsmen to provide capacity buildings in the Region
- 1 project is realized and will be certified;
- included large amount of the elementary and secondary schools into a education process of using the energy wisely during the **Zagreb Energy Week;**
- promotion campagnes: phamplets, brochures, website, presentations

**More than 1000 people informed.**


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# Lessons learnt

1. Local Authorities are crucial because of their impact in driving changes- it is important that they are introduced to the Passive House Regions with Renewable Energies;

2. Importance of the trained individuals in the process of developing passive houses, also the good local example *(beacon)* which attention is to show benefits of PH;

3. The most important element is to increase the number of educated architects, construction managers and tradespeople not only about Passive House principles, yet use of renewable energy and building specifics; as the first step to rise the number of PH

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# Where did we start?

- ✓ Political will at local level, but lack of knowledge
- ✓ None Passive house on the territory of the municipality
- ✓ Low public awareness about the passive buildings
- ✓ Lack of in-depth knowledge within the administration
- ✓ Unawareness of the good practices in other European countries
- ✓ Lack of connection between producers, builders, designers
- ✓ Lack of available sources of information on the topic of passive buildings lack of public campaigns for citizens, including students

# What we did?

- ✓ Involved educational institutions – professional high school in building; school clubs from 3 schools.
- ✓ Increased awareness on the local authorities – learnt successful models in leading regions;
- ✓ With the support of the local authorities, the first passive building in Burgas is not only a dream, on contrary its in a process of preparation of a second similar project;
- ✓ In the last 3 years Burgas participated in international days of PH with various public events;
- ✓ Organized informational meetings with various stakeholders with a great success.

# What we achieved?

- ✓ Active civil society;
- ✓ Positive attitude toward applying the principles of the PH;
- ✓ Curiosity and motivation within the grown-ups;
- ✓ Increased interest within the professional community;
- ✓ Media interest.



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Burgas Beacon project


Info session

Passive House Days Event


Passive House Days Event

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# Enabling factors

## Gabrovo Municipality, Bulgaria

More than 20 years of experience in EE projects

Founders of EcoEnergy Municipal Energy Efficiency Network

Political will and continuity

Ambitious goals and resolution for their achievement

Support for innovative ideas and local capacity building

# A look to the future

## “Sun” Daycare Centre, Gabrovo, Bulgaria: beacon project on PassREg

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PassREg

# Thank you
# for your attention!

## www.passreg.eu

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