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Incentives and tools for behavioural changes in TOGETHER project

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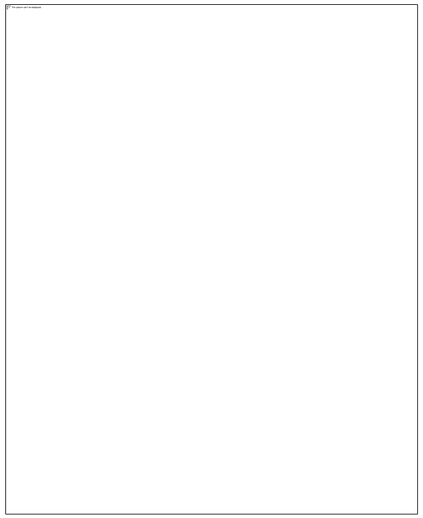
- our curve of learning
- possible tools and measures for behavioural changes
- applications in TOGETHER project
- considerations
- contacts



Energy efficiency entails a cultural change!

- **Behavioural aspects remain the often forgotten issue of the energy transition** even though a lot of scientific research exists on that topic, most works are rather to be found in humanities through sociologist of behavioural change, including specifically on energy consumption.

- Several solution going towards the field of behavioural change have emerged in recent year, **starting from a sociological and statistician conclusion**: **knowing one's consumption makes it possible to start an energy saving process**.

User behaviour matters a lot when it comes to improving energy efficiency!

- **Partners learnt that Energy efficiency has to consider energy consumption behaviour**
  TOGETHER community started to put itsself in the social behavioural sciences and psycologists' shoes, learning something new to be used in the daily working life.
  Various factors influence behaviour and consumption practices as human element are dynamic and static: they change overtime, rending the process of consumption practices somewhat irrational and unpredictable.

- **What drives human behaviors?**
  Psychologists have proposed some different ways of thinking about motivation, including one method that involves looking at whether motivation arises from outside *(extrinsic such as the incentive theory of motivation)* or inside (intrinsic) the individual *(e.g. the arousel theory of motivation, expectancy theory of motivation etc)*
  Incentive: Inducement or supplemental reward that serves as a motivational device for a desired action or behavior

Power of Agency to regain a control over consumption!

- **There is a need to form proper behavior and to break bad habits!**
  It not not an all-or-nothing process.
  A research team decided to figure out just how long it actually takes to form a habit. On average, it takes more than 2 months before a new behavior becomes automatic — 66 days to be exact. The only way to get to Day 500 is to start with Day 1.

- What has tried the TOGETHER project to provoke?
  Buildings stakeholders should get used to using power of agency in energy affairs!
  The concept of power of agency is linked to the instrumentality concept: whether people believe that they have a role to play in the predicted outcome.
  If the event seems random or outside of the individual's control, people will feel less motivated to pursue that course of action.
  If the individual plays a major role in the success of the attempt, however, people will feel more instrumental in the process.

Changes to provoke in the buildings stakeholders

- **Building owners and managers** have to tackle energy efficiency under an holistic perspective; have to own the problem such as a "good family man"
  - ***prepare for change*** *(set up a to do list, analyse to change the contract with the utilities, set up EPC)*
  - ***invest in*** *(audits, smart meter system, trainings and communications)*
  - ***get informed*** *(know the building, know the users, the consumption patterns, gaps and problems)*
  - ***mobilize the building actors*** **(***explain proper building use, communicate roles and tasks, Squeeze the work schedule to reduce the number of hours of lighting / heating / air conditioning)*
  - ***destabilize the status quo and old cemented procedures and organizational approaches***
  - ***identify the margins for improvement and optimization of the use of spa****ce*

- the **end-users** should: "**put themselves in the buildings managers and owner's shoes**"; starto to thking about bad habits that are repeated almost automatically
  - ***start to own the problem and to see energy consumption as a personal problem*** *(you pay the taxes! Change the attitude)*
  - ***aquire a pro-environmental attitude*** *(last out, power down…)*
  - ***aquire a sense of the limit*** *(there is no planet B!)*
  - ***Cooperate.. Together with the other buildings players!!***


If you want people to try something new, dont'just highlight the benefis of changing. Destabilize the status quo by emphasizing the costs of not changing!!
Adam Grant, Organisational psycologist at Wharton


you have to switch it! Who else?


no excuses!


turn off the light, save money!


last out = power down!

OUR «PIANO» METHODOLOGY

We have developed and tested the PIANO methodology which enables the buildings owner to mobilize the best energies of building users to achieve important savings TOGETHER.

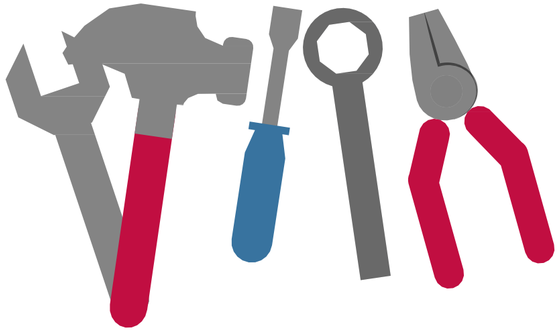
P stand for Plan, for you must design and schedule to make it happen

I stands for Investment in smart meters solutions and trainings

A stands for Action, where collective behavioural change is pursued

N stands for Nudges or a combination of **emotional stimuli**, **social tips** and **rational incentives** to change users behaviour including a innovative gain sharing mechanism between building owner users and an **Energy Performance Integrated Contract** scheme for the building's energy supply.

O stands for Outcomes which have been innumerable for us, well beyond the immediate energy savings touching upon the (re)creation of a local culture that is more responsible and collaborative than before



TOOLBOX AND MEASURES TO BE USED FOR ENGAGING ENERGY USERS IN ENERGY SAVINGS PROGRAMMES

- information delivery tools
- education and training tools
- instant feedback tools
- edutainment and gamifications tools
- financial and economic incentives
- Competition based and social networking

TOOLBOX AND MEASURES TESTED BY TOGETHER PARTNERS TO MOTIVATE AND INCENTIVISE

- 3D modelling in Hungary!
- training and in Vysočina Region!
- Target – oriented dashboards in Treviso, Zagreb, Hegyividek and Maribor!
- Edutainment in Zagreb and in Slovakia!
- Gamification in Hungary!
- Competition in Poland!
- Competition in Hungary !
- Competition in Italy!
- On line competition in Zagreb
- Building Alliances in Treviso

3D Modelling combined with BIM in PAKS!

The different areas of expertees, like engineers and architects can identify the same building in the cloud by this method.
The 3D models of Paks show the proposed constructions in different views and anyone can easily understand the measures and materials proposed.

In order to define where are the **lavish usage points** and inefficient parts of the buildings, official energy certifications have been conducted at each pilot buildings, defining the current energy category of the ***building***, the suggested interventions such as insulation of the building, installing solar panels on the roof, installing condensing boiler for heat production, indirect container instalment for domestic hot water, replacing radiators, installing fan-coil system for HVAC.) and the achievable energy category of the building.

To analyse the suggested refurbishment activities' feasibility, 3D modelling was used with a special software (ArchiCAD), that fulfils the criteria of Building Information Modeling (BIM). BIM is the 3D virtual model of buildings.

Energy trips and exchange of experiences in Vysočina Region !

Cultural change has to go through exchanges between individual!

Energy Agency of Vysočina has involved a total of 10 education buildings.
Several training activities aimed at putting the students together, investing in

1) **peer to peer activity and exchange of experiences:**
The students were introduced in energy efficiency issues and gained their knowledge and habits in the field of energy efficiency and waste management.
The involvement of pupils was supported by educational stories (mainly the Planet defenders' interactive game, which is commonly used in English language as a combination of English language and physics teaching), posters, labels, notice boards etc.

2) **exchange of experience between students** from different pilot schools, where they meet each other.
For students of pilot buildings were organised study visits. EAV took students to see other schools and prepared for them full day workshop together with study visit to special laboratories and energy quiz!

Peer to peer activities have an intrinsic leverage effect

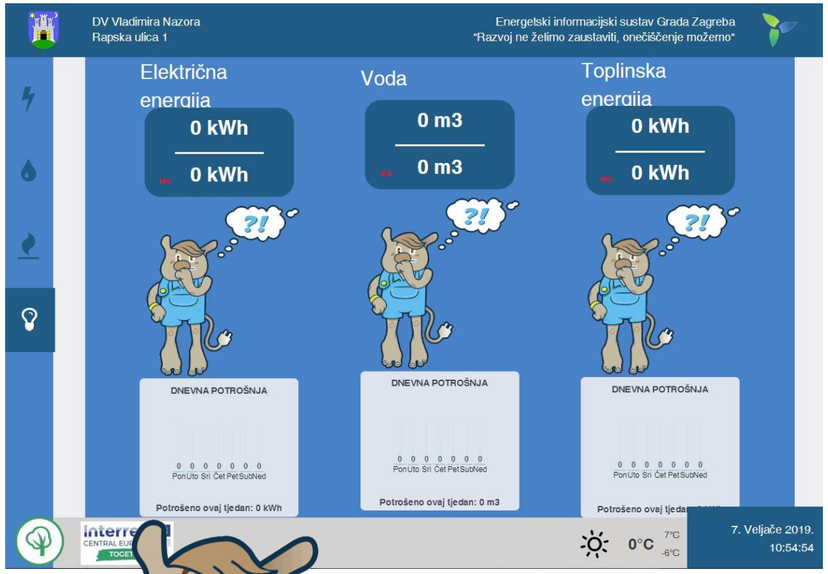
Dinamic and empath dashboard in Zagreb! *Don't make me cry*!

The E-poster allows you to spread the application for everything you need.

E-Poster has 6 pages that are being featured on the screen:

1. main page containing information about the building
2. electricity consumption – hourly, daily, weekly and monthly
3. heat or gas consumption – hourly, daily, weekly&monthly
4. water consumption – hourly, daily, weekly and monthly
5. **TOGETHER page (featuring the troll)**
6. weather information

The children are very happy of the troll and the fifth page. As the troll is crying if there is more expenditure of the energy and water as they need it in the building. If there is possibility for improvement the troll is thinking, and if there is energy saving the troll is happy. This is done by weekly basis.



«Emotional» dashboard integrated with sliding energy tips in Treviso!

The TOGETHER dashboard was developed collecting ideas and inputs from students involved in the so called linked *work-link training* activated in the framework of the project.

Through this dashboard, the users can check at any time the effect of the saving actions. The dashboard has thus become a graphic panel unto which all the heating and electricity consumption data detected in a building have been channeled: such data are subsequently represented pursuant to some well- defined "rules/algorithms", and the result is integrated on an Internet website.

By means of this dashboard, the teachers, the students and the administrative, technical and auxiliary staff can view in a schematic one or more indicators.

The users can see daily, weekly data consumption so they can react to achieve energy saving and see if the applied measure is working results in required savings or not).

The dashboard is installed in the most frequent place in the building.

The emoticon dashboard is connected to a more technical dashboard where is possible to consult real data, consumption graphs and historical information.

There are sliding energy tips such as «remember to switch off the lights before closing the schools» or "remember that you pay the bill"!

A double–side dashboard in Hegyvidék!

The dashboard concept was developed taking into account two types of users.

1) The basic interface was developed for general users, who don't have deep knowledge on buildings' energy consumption.
This meant that the measured data is organised in different graphs, which are easy to understand. In these graphs the metered consumption and the expected consumption are compared, thus simple conclusions can be made about the building and its energy consumption. In all cases there are several different graphs changing on the dashboard in 15 second intervals, thus it can be simply just observed, however the dashboards have touch screen, which allows the users to spend more time on each graph.

2) **The second user type consist of people who have deeper understanding of energy use in buildings.**
From the dashboard a more detailed interface can be reached, where more detailed analysis can be made and also different consumption types can be evaluated.
This interface is mainly useful building managers and the maintenance personnel.

i-Together InfoPoint in Maribor!

Dashboard data visualization is installed in four buildings.
In three student dormitories in Maribor and the Faculty of Energy in Krško. In student dormitories, large LCD screens (smart TVs) are located at the entrance, and in Krško, on the hallway of the faculty, where there is a great flow of people.

The **display shows the current consumption of heat, electricity**, outside temperature, interior temperature, brightness and relative air humidity in the building in the form of Dashboards, as well as information on the project, what it is intended for, and the like.

Daily Energy Efficiency Minimum Committment in Slovakia !

How to transform a practice in a good habit or… to break bad habits!

SIEA created an activity with a monitoring system, called „**The daily energy efficiency minimum** "where each **participating class committed itself to follow specific instructions on daily habits, setting an example that actually aimed to become a habit.**
Students were allowed to choose themselves activities they will apply into their everyday life.

The Daily Energy Efficiency Minimum had actions such as:
„turn of the light*"
„close the window "
"check the water and close it properly"
„stop the running water when washing your teeth".....

What was met with a big accomplishment was the **creative part of workshop** where we not just discussed topics about energy effective approach to daily life but also help the create education posters for the rest of the school students. Students were distributed large paper posters, all kinds of stickers, colour pencils and other materials.
They were given the chance to create any poster that would point out the need of energy effective.

Pupils are not only the target of the communication messages but they are the co-producers!
Eco-patrols have embedded the Living lab approach: the products and services are not only users oriented but users-centered!

Interactive on-line competition in Zagreb!

Planet defenders is online web based game which is used to change behaviour of people.

The game consists of three parts:

1. The Green encyclopedia
2. The City map with the energy points
3. The Competition

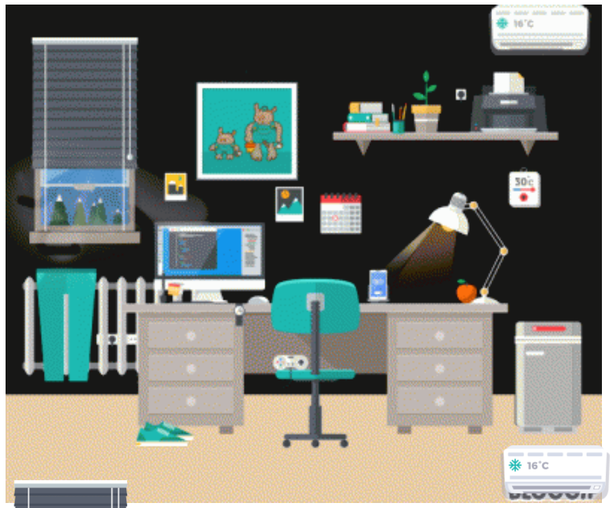
It contains information about topics related to energy, clime, environment, renewables sources, water, traffic. This is the part of the game where users can test their knowledge about all topics you can find in the green encyclopedia. Each energy point have couple of questions which are testing your knowledge.

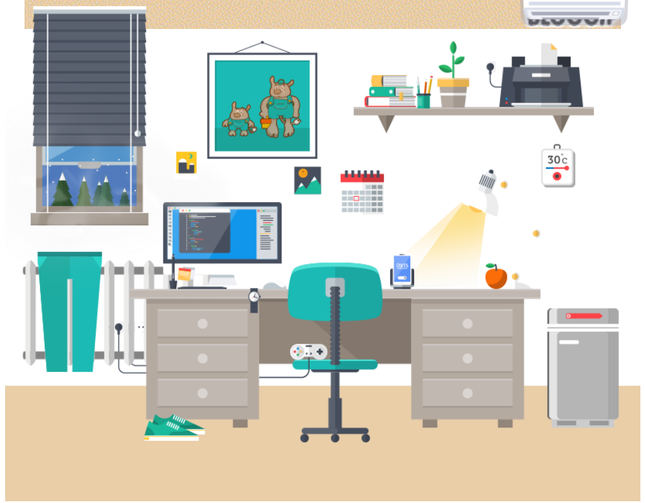
THE COMPETITION

Each user has his own account and this account is connected to the building where this pupil is going. When you „log in“ you can participate the game.
Each round consist 24 questions from diferent chapters
If people answer is wrong there is no penalty (it is still education game).
You stack your points for the building with other players/pupils from the same school.
In each school you can see the ranking of each pupil.

Game available! http://planet-defenders.zagreb.hr/

Energy Vampires Game in Hungary!



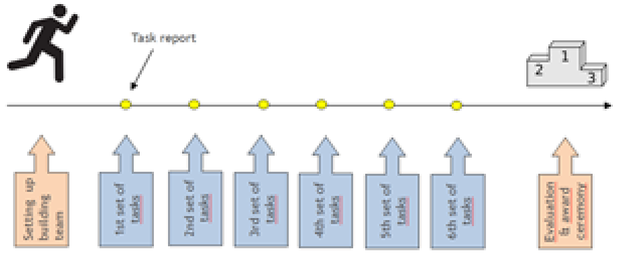


Help Humphrey to find all the energy wasting activities in the room!
It was a Christmas competition on the Facebook. It is part of awareness raising campaigns in the project: https://humerenergiavampirjai.hu/ (it is available also from the Facebook page of the Municipality)

So this is very simple, it is a one minutes time quick game when you have to identify the energy vampires in Humphrey's room and that's all. You can also find tips about energy saving (under the picture) and the game rules with the instructions.

https://humerenergiavampirjai.hu/en/humer_jatekszabalyzat-eng.pdf

Humphrey's Energy Vampires



The Energy-Saving Master competition in Poland!

In order to create sense of **rivalry and strive for the highest possible savings a competition for the "energy-saving master"** was organised with the building teams being rated both for level of savings achieved and for completing relevant tasks on the path leading towards them (with some extra points to be obtained for special creativity and finding "**untypical**" ways for energy saving).
Six tasks were prepare and given to the building team and PNEC's staff helped with the execution of some of them on the spot.

The tasks prepared are:
(1)internal energy review/audit of the building;
(2)social audit of the building;
(3)exploring and using heat saving potential;
(4)exploring and using electricity saving potential assoc. with lighting;
(5)exploring and using electricity saving potential assoc. with electric appliances.
(6)Each task was accompanied by a task report to be filled in by the building teams.

The teams were encouraged not only to explore building's energy saving potential but also to implement some of the measures identified (mostly low-cost and no-cost). Their job was to also engage building users in energy saving efforts as much as possible. In between the tasks the building teams received short thematic newsletters with further food for thoughts and energy-saving tips.
Installed smart metering systems are very important element of the pilot action, as they not only enable real-time monitoring of electricity & heat consumption and seeking possible optimizations, but also give immediate feedback on the results of implemented measures.

Energy Commandos… Senior Competition in Hegyvidék!

A senior competition marked TOGETHER.
The terms of reference were filtered and integrated by them in order to get their stronger commitment to convince schools to subscribe;
Energy efficiency competitions were organized between the pilot buildings with the participation of the so called **Energy commandoes** (group of pilot building users and managers).

All 9 pilot buildings involved in Project TOGETHER participated in the competition that was concretely aiming at registering energy reduction, monitored through the smart meters.

Two competing categories were introduced:
1) to save the most energy during a certain period and
2) to be the most active commando (members whom are taking an active role on maintaining and developing the buildings energy efficiency).

- In the kindergartens they have organised "*Energy days*" based on the theme of Humphrey, which in all cases was a huge success among both children and parents.
- In the Budai Art School they held an "*Energy week*", where students have formed groups and created various designs and concepts for raising energy awareness.
- In the Municipality building the energy commando team members were really active and was *raising energy awareness* by putting up stickers and notifying colleagues, which proved to be really effective and useful.

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Junior Competition and Energy Ranking in Italy!

Taking inspiration from the Green Schools Competition annually launched by the Province of Treviso and from the **gamification approaches** inspired by the Demand Side Management tools elaborated by the project, the Province of Treviso has launched the so-called **#Junior Competition** targeting the primary schools and lower secondary schools involved in the project.

The competition proposed aims to encourage the success of the activities planned by the schools in the form of a challenge intended as a virtuous confrontation that can, in a playful way, stimulate the children, the teachers, and all the school staff, **to "do together, to do better".**

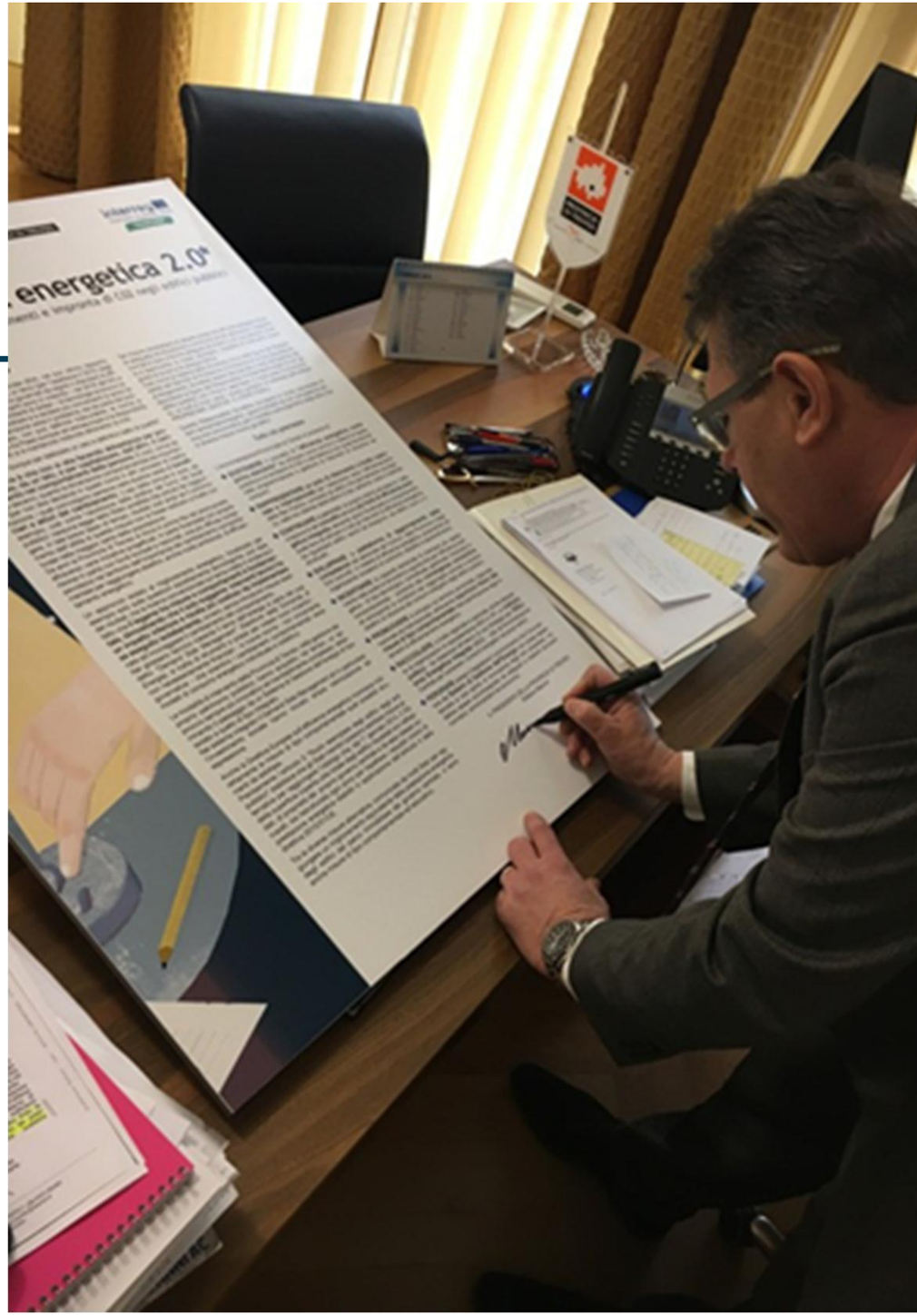
Building Alliances in Italy!

It has been tested in Treviso the implementation of 17 building alliances, signed between the building owner and the building manaters with the agreement of the building users. The Building Alliance identifies the common goals of energy reductions, the “profit sharing” approach, incentives etc. decided by the Negotiating Panel. The building Alliance is the result of a co-working approach that has to been adopted by all the project partners since the beginning of the project.

Each Alliance indicates:

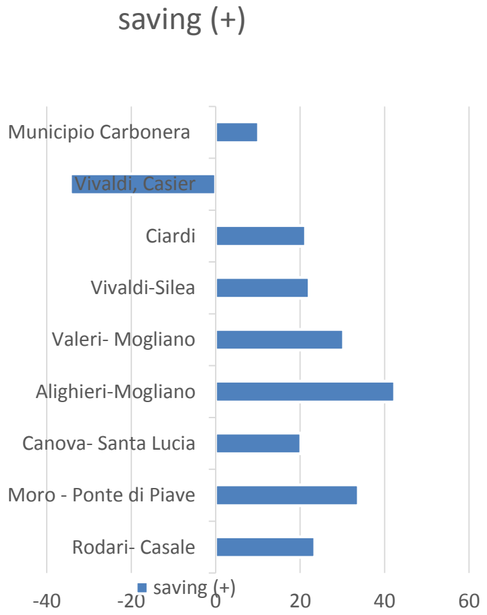
- the **percentage of reduction** to be achieved
- the **minimum level of reduction** to be achieved
- the **maximum amount** to be divided in case of achievement of the goal
- the **percentage to assign to the building management** in case of achievement of the minimum goal.
- the monitored consumption: electricity and or heating the role of the parties in the implementation of the Action plan

Seven building alliances signed by the Municipalities have planned to award the 100% to the building board in case of a full achievement of the goal. In these 7 pilots, the Reinvestment plan can be considered automatic as the whole amount generated by the energy savings will be rewarded and “reinvested”



Navigating the results of the Alliances in Italy!

- 9 Alliances signed between the Associated Municipalities and their pilot buildings (8 elementary and low secondary schools and 1 institutional buildings)
- Goal set: 3% of eletricity during the school year.
- The goal was achieved in 8 buildings with very positive results



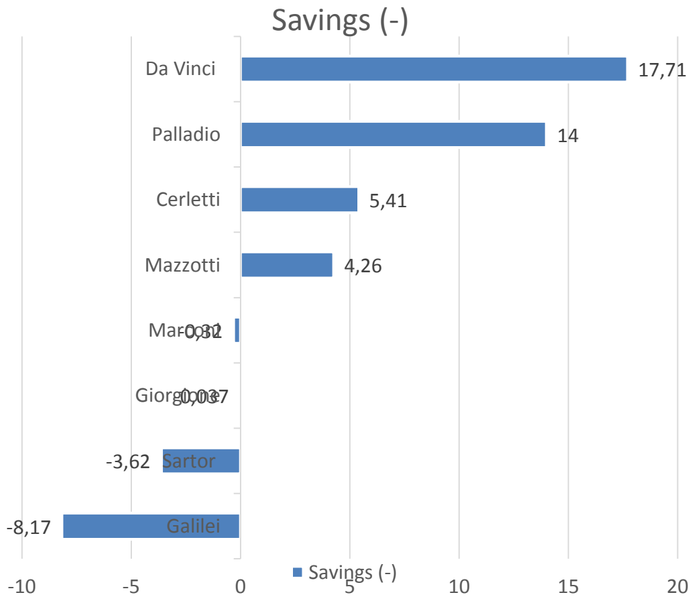
POSSIBLE REASONS OF THE ACHIEVED GOAL

- These pilots were “unchartered land” before the TOGETHER project. They started to work on energy efficiency issues with the TOGETHER project.
- Pupils are enthusiastic about novelties and get easily engaged in energy saving activities
- Gamification/competition activities are better received at lower school levels and appreciated as a learning tool

- Eletric Baseline : 294.049,68 Kwh
- Energy consumption registred: 231.961,00 Kwh
- Saved energy: 62.088,68 Kwh
- About 18,87% saved energy

Navigating the results of the Alliances in Italy… *hang in there!*

- 8 Alliances signed between the Province and 8 upper secondary schools.
- Goal set: 10% reduction of eletricity during the school year.
- None of the involved schools achieved this goal



POSSIBLE REASONS OF THE MISSED GOAL

- Upper secondary schools have been working on energy efficiency issues for several years and consequently the “novelty effect” has lost its appeal;
- The energy waste has reduced and consequently there is less margin of improvement;
- increased number of students using the interested buildings;
- Increased educational offers and activities during the evening hours;
- Increased use of electric devices for the smart learning such as multimedia whiteboard (IWB) and music instruments;
- There is less availability
- Reduced control during the summer period when high summer temperatures and a consequent misuse of the cooling devices, used by administrative offices even during the summer holidays
- Teachers and janitors turn over penalising a long term process

Sthrenghts

- Schools represent a fertile soil where to invest in programmes based on the engagement
- Students are reactive when there are new challenges and goals. They do not need acknowledgment of their work
- People appreciate real business cases, real experiences, not just theoretical plans

Weakness

- There is not an incentive scheme valid for all
- The changes in user behaviour are difficult to measure by simply
  referring to the amount of energy saved. This does not give a detailed
  account of who does what.
- EE programmes based on behavioural changes need to be constantly enriched by feedback, ideas and support to guarantee durable results
- Activities related to improvement of work spaces are not supported that much, in particular by segments of the working community covering the bottom places of the internal hierarchy (e.g. caretakers at schools).
- The attitude to change depends on the level of satisfaction in the working position/role.

Opportunities

- Transferable programmes with high potential of replication
- Expressed interest from other schools
- The willingness to apply learned principles to other buildings users is of
- great challenge.

Treats

- to fulfil pilot activities according to partner ideas on a sufficient scale require big negotiation power and great interest of involved groups.
- It is very difficult to reach some change, if there is no will to follow the project idea from the side of building occupants/representatives and/or building owners. It is a lot work to do and it is necessary to gain the interest of building users and motivate them to cooperate on EE activities
- Getting back to usual behaviour – gaining and keeping a new habit is not and easy task to do.

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