GAIA Newsletter

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Welcome to GAIA

The **Green Awareness in Action** (GAIA) project focuses increased awareness of and actions toward improved energy efficiency within the educational community by utilizing gamification and IoT. Targeting energy efficiency in the context of the educational community is clearly very important due to a number of reasons:

- Raising awareness among young people and changing their behavior and habits concerning energy usage is key to achieving sustained energy reductions;
- Educating children and young people to adopt energy-efficient habits will also indirectly affect their immediate family environment;
- Buildings are the pivotal center of our lives; and
- Historically, energy expenses in schools have been treated as relatively fixed and inevitable.

GAIA has created an innovative ICT ecosystem includes web-based, mobile, social and sensing elements that have been tailored specifically for school environments, taking into account both the users and buildings that will motivate and support citizens' behavioral change to achieve greater energy efficiency.

GAIA's trial schools include a mix of private and public school entities, universities and administrative buildings in the educational domain to conduct a well-designed set of trials. It also covers a wide range of important fields, aiding to a structured research approach. The GAIA consortium includes partners from five European countries, all of whom are focused on the implementation and testing of a pan-European approach, a mix that will guarantee a better match of the constructed solutions to the actual differences in lifestyle and behaviours related to the different cultures, as well as different requirements dictated by the variance in the physical environments.

Inside this issue

Impact in Brief

- 6,900 students and educators reached directly during the project
- 24 educational sector buildings in 3 countries covering North, Central and South Europe
- Educational material and handbooks will be produced, available in Italian, Greek, Swedish and English
- Reductions of over 15% on the energy that can be influenced by the end-users

Latest Events

The GAIA project presented at the Global IoT Summit 2017 on Thursday, 8 June during the "*Workshop on Energy Efficient Solutions based on IoT*".

The presentation of the paper "*Addressing Behavioral Change towards Energy Efficiency in European Educational Buildings*" was successful and the workshop was a great opportunity to network with other researchers involved in similar projects relating to energy efficiency.

GAIA's Objectives

GAIA's ICT ecosystem has been designed specifically for school environments, taking into account both the users (faculty, staff, students and eventually parents through their children) and buildings (schools, universities, homes) that will motivate and support citizens' behavioral change to achieve greater energy efficiency. The developed solutions will consist of an ecosystem of sensor deployments, services, applications and games focusing on different energy efficiency scenarios like: heating, electricity, transportation to school and collaborative use of resources. On the one hand, it will facilitate monitoring and profiling energy use of users, while on the other hand, it will provide guidelines to them in an educational manner, so that they may act as actuators regulating and defining their energy consumption.

In general, the objectives of GAIA are the following:

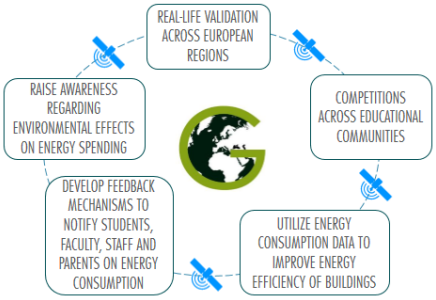
- Engage the Educational Community Development of a Culture for Energy-Efficient Living

- Utilization of Energy-Consumption Data to Improve Efficiency of Buildings

- Educate towards Collective Use of Resources

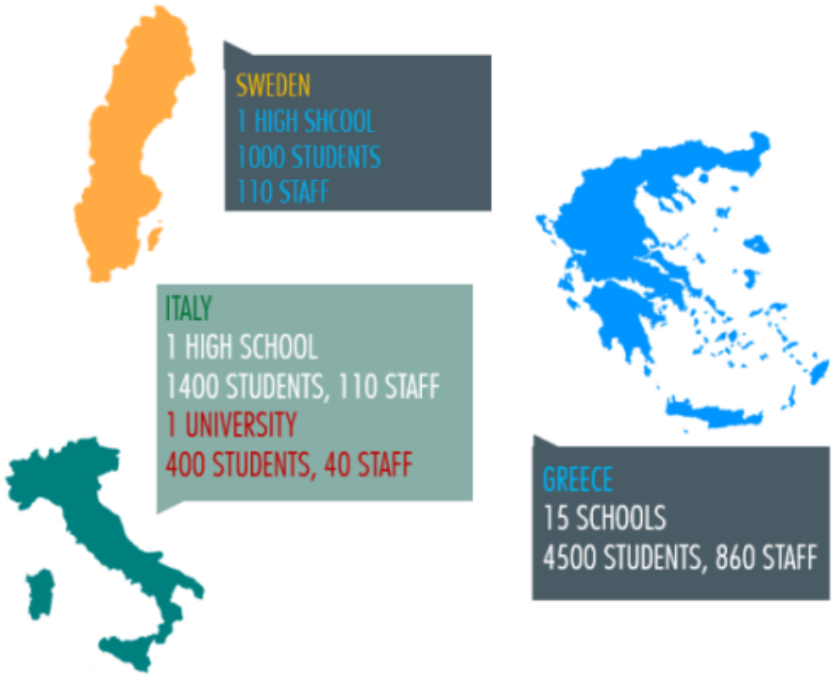
- Competitions Across Communities

- Operation at all Levels of Education and Real-Life Validation

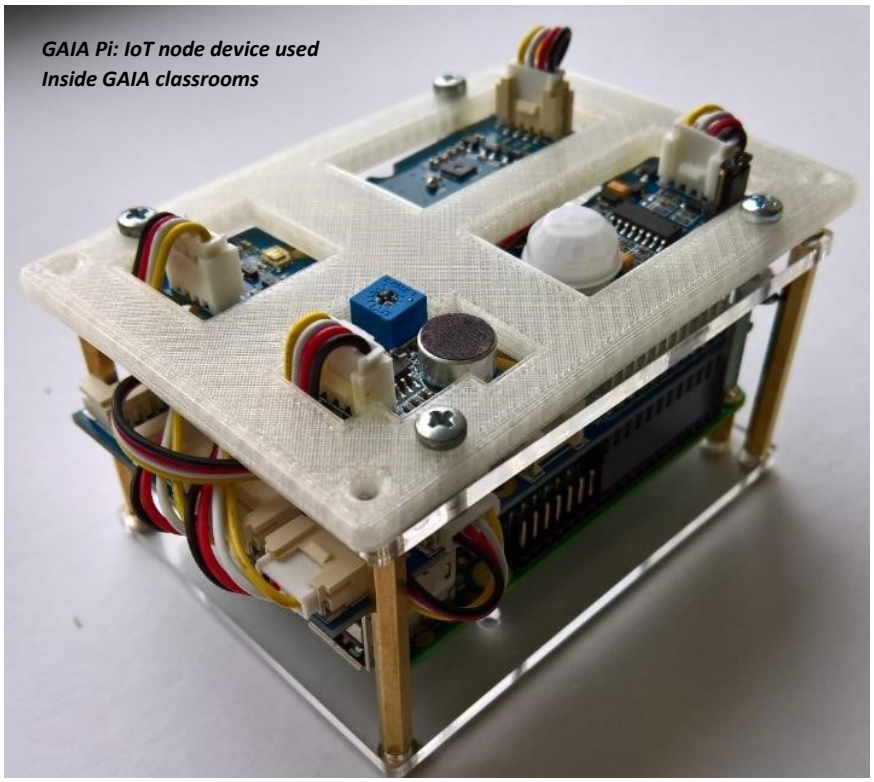


Our Schools

Scattered across Greece, Italy and Sweden, GAIA will be working in 15 different schools and one university. With over 7,000 students and nearly 1,000 teachers and staff members, many people will be directly exposed to our project's activities.



Our Technologies



GAIA Pi: IoT node device used Inside GAIA classrooms

Internet of Things (IoT) & Sensors

GAIA has utilised enhanced energy meter data gathering and management services and provide advanced data analytics, user and building profiling, recommendation and optimization services to construct an energy efficiency IoT service ecosystem with applications for different end-user groups. Both the services and applications are flexible and customizable enough in order to operate in a wide range of contexts and levels: climatic, social and educational. GAIA's use of indoor IoT infrastructure has been installed across a large number of educational buildings to allow for the continual monitoring of energy consumption, motion/ activity and environmental parameters.

Cloud Technologies – IoT Data Management & Analytics

GAIA is utilising existing cloud technologies for centralized and distributed real-time data analytics, in order to be integrated in the developed data storage platforms of the consortium, for the analysis and profiling of energy consumption data of buildings within the project that have been tailored to improve energy efficiency in schools buildings.

Open Source Hardware & Software, Datasets

The GAIA consortium are strong supporters of the open source movement and have followed an open source philosophy toward both the software and hardware, where possible. The consortium recognizes the importance of open access to datasets produced by research projects, and all datasets produced during throughout GAIA will be made publicly available, after being processed to ensure privacy and anonymity.

Quick Facts

* 9 Partners from 5 countries

* 15 Participating schools and a university from Greece, Italy and Sweden

* Project aims to reduce energy consumption in schools and educational buildings

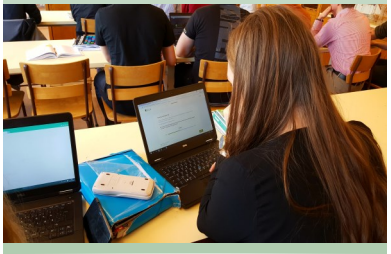
* Use IoT infrastructure to monitor energy consumption and environmental factors

* Use Real-time feedback through games and other interfaces

* Utilize gamification of issues to effect long-term behavioural change

* Work with students. teachers, building managers and relevant government officials to promote energy conservation

* Horizon 2020 funded



Our Trials:

October 1st, 2017 - June 30th, 2018

GAIA trials participant:

- 15 schools in Greece
- 1 school in Italy
- 1 university in Italy
- 1 school in Sweden

Actions combining:

- Pool of educational activities
- GAIA Challenge
- Building Manager System
- GAIA #ScavengerHunt
- GAIA laboratory exercises

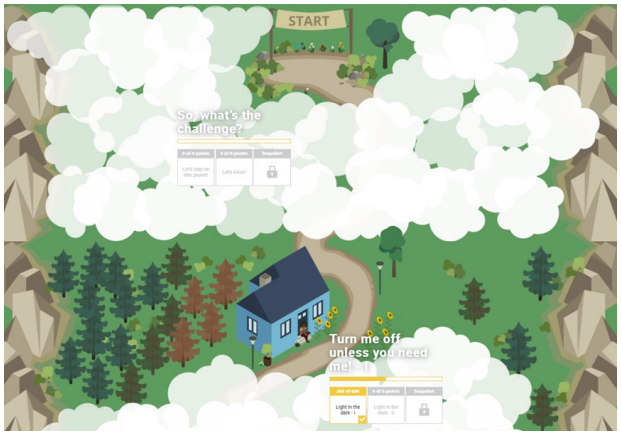
Contests:

- National contests
- Pan-European contest

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 696029. The sole responsibility of this publication lies with the author. The European Union is not responsible for any use that may be made of the information contained therein.

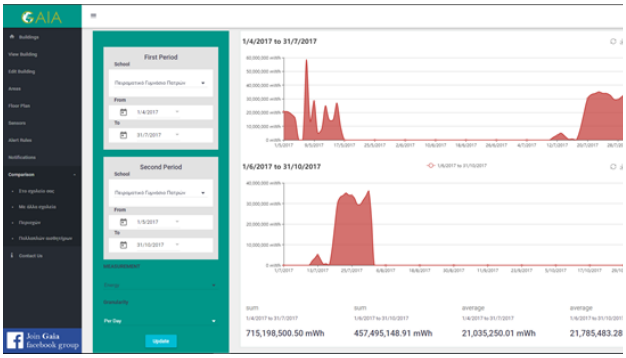
Our Games & Apps

GAIA has built a system that reads in data from the IoT sensors of the buildings, as well as data from participatory sensing, and uses this information to track how much energy has been saved over time. The energy consumption is then converted into virtual resources that empower the students to act and create new things within the virtual world of the GAIA Challenge educational serious game. The game has been built for students to:



- Keep them checking the status of energy in their schools
- Continue inputting the data that has to be collected through participatory sensing, and
- Empower them to change the way their educational building uses energy.

Additionally, the same system of sensors and their data have been used to create an application for building managers where they may have access to direct visualization of and aggregation of various forms of not only energy consumption information, but also metering of environmental conditions and comfort level sensing. Also, a web-based dashboard has been developed for building managers to identify saving potentials and/or malfunctions within their buildings.



Finally, a web-based scavenger hunt has been developed where online players from different countries are asked to answer certain weekly questions or undertake certain activities via their respective personal social media accounts. Their responses will be tracked by the hashtags they use and a weekly score between countries will be updated.

Visit us: GAIA Green Awareness In Action http://gaia-project.eu

... or contact us at: info@gaia-project.eu

The Consortium

The Computer Technology Institute and Press "Diophantus" (CTI) , project coordinator, is one of the major R&D institutes in Greece, employing more than 250 individuals. In the last 10 years, CTI has successfully participated in more than 100 R&D projects, exhibiting basic and applied research activity in areas such as algorithms, complexity and optimization, wireless and sensor networks, security, ubiquitous and distributed computing, complex information systems design and development, embedded systems, among other.

Söderhamns Kommun is an active Swedish municipality in terms of working with energy efficiency and sustainable development. During the past years Söderhamn has done extensive research in order to launch a large scale energy efficiency project with in the municipality and its public buildings. Linking the energy efficiency to ICT within the school environment is an important step for the city.

The Italian National Consortium for Telecommunications (CNIT) is a research body, joined by 35 Italian universities. CNIT has about 600 members from affiliate universities and over 40 own research and administrative staff. Over 90% of CNIT budget comes from research projects, funded by national and international bodies and industry. Since its foundation in 1995, its main purpose is to carry out research and project activities in the areas of telecommunications, computer networks and telematics, Mobile and Satellite Communications, Remote sensing and radar, Multimedia Communications.

Eurodocs AB is a next generation IT Company that concentrates its efforts and power into the ongoing development of smart, innovative and useful digital solutions converging primarily on technologies that assure Internet users of their anonymity, privacy and identity protection. Since the inception of the company in 2000, Eurodocs has continually created and distributed new IT solutions that can be best described as Web2.0S – where the S stands for Security.

Ellinogermaniki Agogi is a private organization, officially recognised by the state as a provider of education at all levels from pre-school to upper secondary. In 1995, the organization established a Research and Development Department, a dedicated structure within the school employing about 15 full time researchers which focuses on the design, implementation and support of pedagogical and technological innovation in educational practice, through work internally in the school and, most notably, through collaborations with numerous educational, research and commercial institutions in Europe and the world.

Synelixis Solutions Ltd. is a high-tech SME that delivers solutions for energy efficiency, precision agriculture, warehouse automation and advanced networking. With respect to energy efficiency, its solutions focus on smart grid control and energy consumption optimization. By utilizing modern software technologies, hardware installation and open platforms, Synelixis engineers are able to ensure an optimized solution that fulfills the project requirements. Synelixis Solutions' technology superiority is a result of extensive research activities.

Ovos Media Consulting Gmbh is a Vienna-based Interactive studio with a core team of 25 people with most diverse backgrounds. The studio was founded in 2004 and is working for national and international clients such as the Goethe Institute, Siemens, NASA, Swiss National Bank, Sony, Austrian postal Service, Volkswagen, etc. OVOS creates learning applications, serious games and gamified online services that help users to learn about the topics affecting its clients.

Over Technologies is a spin-off company of Sapienza Università di Roma, legally started in September 2012. The idea grow up since November 2011, thanks to the influence of two of the most relevant FP7 EU projects about smart houses and buildings. Over consists of the 7 full-time employees, plus the shareholders/founders.

SPARKWorks Ltd is a nascent technology company delivering advanced hardware and software products in the area of smart monitoring, building automation and ambient intelligence. The SPARK team comprises well-trained industrial and academic researchers, combining skills and expertise in the fields of Internet of Things and Advanced Medical Devices, proficient in offering high quality full stack development and integration services