BUSINESS CASE **ENERE**SCOLAS

PROGRAMME **ÁGUEDA | LISBON**

Virtual Power Solutions

Programme

ENERESCOLAS

SUMMARY

Energy Efficiency

Goals

- Reduce schools' energy consumption and its costs
- Raise awareness in students, parents, teachers and other elements of the educational community to the importance of energy efficiency
- Promote effective and lasting behavioural changes for a better use of energy resources
- Encourage students to be the main agents in the fight against energy inefficiency at school, at home and wherever they are

Description

The ENEREscolas is a learning project on energy efficiency and remote energy management, based on real-time monitoring of consumption and comfort parameters in schools. Children are the best audience to disseminate, discuss and deepen the theme of energy efficiency from the consumer point of view. So, who better than them to replicate, and multiply, the desired effects at their homes and across the entire community?

Virtual Power Solutions provides energy consumption data through its Kisense solution and a software designed for primary school children (developed together with another Portuguese company). This way, the whole school can know, in detail, when, how, why and where is the energy being spent.

Technical Solution

- Based on a centralised architecture
- Information is collected directly from the devices installed in each monitoring point and sent to the central system via the existing network infrastructure
- Electricity consumption and comfort variables (Temperature, Relative Humidity and CO_2 levels) are monitored

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ÁGUEDA

Six Primary

schools of the Águeda municipality adopted the ENEREscolas project as a means to, through education and technological innovation, form responsible citizens. At the same time, the objective was to reduce energy consumption in Barrô, Arrancada, Chãs, P3, Recardães and Aguada de Cima schools.

Results

The introduction of the energy efficiency theme was made in an empirical and fun way across the different subjects of the curriculum. All the work and the use of the interactive multimedia platform were supplemented with a plan of innovative activities, which led children to reach the proposed goals successfully, as the following table demonstrates.

Stages and Execution

- Workshop for project presentation to teachers
- Teachers oriented training
- Workshop for project presentation to students
- Establishment of a focus group
- Installation of equipment and software
- Work in class with students
- Project evaluation at mid-point
- Final report

	CONSUMPTION kWh		SAVINGS	
	2010-2011	2011-2012	kW/h	%
Average Consumption	29458	26523	2934	14,5
Biggest Savings Barrô School	13017	7539	5478	42,1

"99% of students said this project has changed their behaviour..."

"80% helped and taught their families to use energy more rationally..."

Achieved Benefits

- Consumption and energy costs reduced in schools
- Inefficient behaviour changes: at school, at home, and also in all environments
- Involvement of parents, teachers and other educational professionals
- Decrease of each student's ecological footprint
- Creation of innovative activities devised by the students, with goals achieved by them
- Education of future responsible consumers

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LISBON - SCHOOL +

Lisboa E-Nova

The Energy and Environment Agency Lisbon launched a competition which challenged 20 schools in the Lisbon metropolitan area to promote energy efficiency through an inter-school competition.

The objectives were to raise awareness among the school community for energy efficiency, to promote behavioural changes and to achieve effective reductions in electricity consumption in the short, medium and long term, in the Lisbon municipality Primary Schools. Of the 206 schools in the area covered by Lisboa E-Nova, the following were selected:

PUBLIC	PRIVATE	PRIVATE WALFARE
EB Bairro do Armador	EB Infante D. Henrique	Jardim Escola João de Deus - Olivais
EB1 P. José Manuel Rocha e Melo	Academia de Música de Sta. Cecília	Jardim Escola João de Deus - Alvalade (2)
EB Jorge Barradas	Externato do Parque	Jardim Escola João de Deus - Estrela
EB1 Alta Lisboa (1)	Externato São José	
EB do Lumiar - Alto da Faia	Colégio Cesário Verde	
EB Prof. José Salvado Sampaio (1)	Externato Marista de Lisboa	
EB1 S. José	Externato das Pedralvas	
EB1 Rosa Lobato Faria (1)	Colégio Valsassina	
EB Homero Serpa		

(1) Winning schools
(2) Special mention

> **"For me, the most important thing was my students' enthusiasm and motivation..."**
>
> | 2nd Grade Teacher
> Externato das Pedralvas

The Project

The implementation of ENEREscolas project took place during the 2014/15 school year. The focus was the school community education regarding energy efficiency, without underestimating the generated savings. The schools' final ranking was based on savings and evaluation of 4 challenges, made by a joint panel of the three entities that entered this project (Lisboa E-Nova, VPS and Lisbon Town Council).

In addition, each school benefited from the installation of a laptop computer and an LCD screen placed in a clearly visible and easy access location, allowing students, teachers, parents and staff to check - in real-time - the schools' electrical consumption and its evolution, as well as the environmental variables monitored (temperature, relative humidity and CO_2). These devices were offered to the schools at the end of the project.

The Project Reached:

- **Approximately 4000 students**
- **Over 1,500 teachers**
- **Over 12,000 members of the school community**

The Challenges

Besides the focus on the energy efficiency theme, during the school year in the various subjects, 4 stages of evaluation - 4 challenges - were set up, allowing the assessment of the project's impact on students and school community.

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LISBOA - SCHOOL +

1st Challenge

Model of an "Efficient School"

Building a 3D model of an "exemplary" school in terms of electricity savings (installed equipment and actions of daily school life). The model itself should reflect good environmental practices on the physical support and the choice of materials used.

2nd Challenge

"How I saved electricity at home during the Christmas holidays?"

Presentation of the results of work done at home with their parents to answer the question of the challenge. Students made reports of electricity-saving measures implemented in their homes during the holiday season through various formats: written composition, image, flyer, PowerPoint presentation, video, poster, illustration, Comic or a combination of different formats.

3rd Challenge

List of energy efficiency measures

To publicise this list, students conducted surveys of the various measures and appropriate behaviours concerning electricity savings in school and indicated, for each of them: it has been or is being implemented; if the savings are potentially small, medium or large; whether the measure can be performed by the students themselves (behavioural) or by the school (requires investment); and in which places in the school can it be implemented.

4th Challenge

Cover story on the school work during the project

The purpose of this final challenge was to evaluate if the work undertaken during the school year had been effective. The news story could be presented in various formats such as paper, video, brochure, digital presentation, etc. It could document all previous challenges, other initiatives regarding energy efficiency made by the school, the development of the school's energy consumption, the activities in the classroom (including the utilisation of the ENEREscolas platform), amongst others.

Communication and Promotion

So that the success of this project could be publicised, both internally and externally, several tools were used. A web page was built to constantly update results, news, work carried out, the ranking that was created, etc. There were 5 editions of a newsletter that served as a link between schools and as a platform to announce the main activities developed throughout the school year. Finally, public presentations were made at conferences, an interview for a local radio station and a workshop to announce the results.

Results

In terms of energy efficiency all schools benefited from this project. However, the three winning schools received educational and scientific kits containing equipment in order to explore the energy efficiency theme. The numbers speak for themselves:

- **30+ energy saving measures implemented on every school**
- **On average, each school saved 4.5% compared to the previous year** [1]
- **Average savings of 2.5% per student**

[1] Only 19 schools were included here, leaving out one school which increased its energy consumption compared to the previous year. This was due to the entry into operation of a canteen. But thanks to VPS solution, the operation of this new space has been optimised from the beginning.

VPS
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Solutions

> **I consider it very important because it is a way to raise awareness among everyone to this energy saving issue. At school, children are more aware, more awake, will talk at home, will alert families to this problem."**
>
> | Special Education Teacher
> EB Bairro do Armador

> **We liked it a lot and now every day we avoid wasting energy stupidly because we do not want to be destroyed by climate change..."**
>
> | 1st Grade Students
> EB São José

> **We enjoyed participating in this project! We learned! We engaged with the tasks! We are motivated to save energy and be more efficient!..."**
>
> | JE João de Deus - Olivais

MORE AND BETTER INFORMATION = INCREASED KNOWLEDGE = BETTER CONTROL ON THE ENERGY SPENT

VPS is an innovative, market leader in the design and operation of dynamic connected platforms, providing real-time granular data to consumers, network operators and utilities. Minimising consumption by increasing energy efficiency, optimising the time of use and realising the monetisation of loads.

With over 10 years of experience, VPS has a proven team of experts with a strong track record of providing significant benefits to all stakeholders in the modern energy network. Our aim is to become the largest builder and operator of Virtual Power Plants in Europe.

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