



IEE/07/710/S12.499412

Report for Feasibility Studies

Work package: **WP5 – Finalisation in the Participant Schools**

Partner responsible for D 5.2.:

Western University Vasile Goldis Arad (UVVG)

Author: **Horatiu Soim**

Version–Date: **FINAL - 12/04/2011**

Disclaimer: The sole responsibility for the content of this publication lies with the authors. It does not necessarily reflect the opinion of the European Communities. The European Commission is not responsible for any use that may be made of the information contained therein.

Index

Introduction to WP5	3
<i>Background and Overview</i>	3
<i>Feasibility Plans</i>	3
<i>Guideline for Feasibility Studies</i>	3
List of feasibility studies.....	4
Project 1. Austria - ENERGY EXHIBITION	4
Project 2. Austria - CLEVER DRIVING.....	5
Project 3. Austria - NEW HEATING	6
Project 1. Bulgaria - About Energy in seven days – problems and challenges	7
Project 2. Bulgaria - Travel Sensibly – Save Energy and Environment	8
Project 3. Bulgaria - Eco School	9
Project 1. Finland - Energy efficiency guide and increase commitment of staff and students.....	10
Project 2. Finland - Energy efficiency aspects in education and on the job learning	11
Project 3. Finland - Measurement of used energy in practical education	12
Project 1. France - “A week on energy saving“	13
Project 2. France - A solar power street lamp?.....	14
Project 3. France - A demonstration room for efficient lighting.	15
Project 1. Germany - COOL PAPER PROJECT– Recycling Paper is Energy Saving	16
Project 2. Germany - FAT Fundraising - Awareness - Trees	17
Project 3. Germany - Energy and Lighting Check	18
Project 1. Italy - A BIOMASS PLANT for CAMPUS SCHIO (Tron).....	19
Project 2. Italy - Schio for a Sustainable Mobility (Tron)	20
Project 3. Italy - Manufacturing firms train school teachers (Tron).....	21
Project 4. Italy - „TRAINING COURSE FOR ENERGY MANAGER OF THE SCHOOL” (CMTR)	22
Project 5. Italy - „AULA IDEALE” – „IDEAL CLASSROOM” (CMTR).....	23
Project 6. Italy - „SPORTELLO ENERGIA” (ENERGY-Info-Point) (CMTR).....	24
Project 7. Italy – “Aircraft illumination” (ISIS).....	25
Project 8. Italy - Il sole a scuola (The sun at school) (ISIS).....	26
Project 9. Italy – L’Aquila a new birth (ISIS)	27
Project 10. Italy - ENERGY MANAGEMENT SYSTEM (Province Mantova)	28
Project 11. Italy - “SCHOOL BUILDING” (Province Mantova).....	29
Project 1. Nederland - Lentmark 1	31
Project 2. Nederland - General Policy Plan Sustainability ROC Nijmegen.....	32
Project 3. Nederland - Maintenance Plan for school buildings.	33
Project 1. Portugal - Action Plan for Energy efficiency on ISCAC.	34
Project 2. Portugal - Action Plan for Energy efficiency on ESTV	35
Project 3. Portugal - Action Plan for Energy efficiency on ESTGOH.....	36
Project 1. Romania - ECO-GREEN SCHOOL	37
Project 2. Romania - THERMAL ENERGY EFFICIENCY	38
Project 3. Romania - ECO-TRAINING.....	39

Introduction to WP5

Background and Overview

The project Energy Education Governance Schools (EGS) aims at involving local communities in tackling energy issues and improving energy efficiency. The EGS project hypothesis is that the main actor that can contribute to involving the whole community and at the same time train the younger generation is the school. Consequently the main target group of the project are schools. Beyond the primary target group schools (teachers, students, and administrative staff) other related groups are addressed by the project and will benefit from the project results (parents/families, local entrepreneurs, local communities, stakeholders).

The main aim of work package 5 (WP5) is to provide tools and methods which

- support the forums established in WP4 to select the most suitable priorities.
- support the elaboration of feasibility studies concerning the selected prioritized approaches.
- support the selection of at least one pilot action per forum (13 in total) which shall be implemented during the project.
- support the monitoring of the pilot actions.

Feasibility Plans

The feasibility plans contain the following actions:

- Selection of priorities to be implemented
- Feasibility studies for at least 3 priorities in each forum
- Feasibility studies reporting
- Identification of at least one pilot action in each forum

Guideline for Feasibility Studies

The guideline for feasibility studies offers the framework and the description of the content they should have. A feasibility study is an analysis of the viability of an idea. Generally, a feasibility study precedes technical development and project implementation. In other words, a feasibility study is an evaluation or analysis of the potential impact of a proposed project.

The feasibility studies assess the necessary resources and the possible effects for the projects proposed, approximate values for the resources used in and the outcomes of the projects. These values can be used for the economical (cost-benefit Analysis) of the projects proposed. The starting points of feasibility studies are the Forum Action Plans resulted from the forums. The three priorities identified in each national forum are developed and evaluated according to the methodology described in the following chapters, resulting three feasibility studies. The conclusions drawn from the feasibility studies will point out to the best pilot project to be undertaken in each country.

List of feasibility studies

Project 1. Austria - ENERGY EXHIBITION

The organization

LFS Grottenhof-Hardt (Austria)

Title

“SONDERAUSSTELLUNG ENERGIE” (special energy exhibition).

The objectives

Raising awareness, improving and fostering the collaboration of the school with local and regional enterprises.

The target group

School staff, Teachers, Students, Parents/Families, Local economy.

The main activities

Organize exhibitions and events to raise awareness. Include the topic energy in the advertising of the public event. Contact and find interested local and regional companies to present their products and projects. Organize exhibition space and venue.

Results/outputs/benefits

Direct involvement of students and school staff. Awareness raised on school, regional and national level. Approximately 4.000 visitors. The Austrian competition will gain very big public awareness. Media presence.

Resources

Mainly school internal resources will be used for the organisation and implementation of the event. Tent for energy exhibition: approx. € 1500. Media involvement (professional TV spot): approx. € 1500

Option selection (Multi-criteria analysis)

Options	Option 1	Option 2	Option 3
Option value	8,5	16,6	15,8

Financial and economic analysis

Investment costs	Operational costs	Operational incomes	Benefits
C _i = 0	C _o = 3.000 Euro	I _o = 2300 Euro/year	B = 622 Euro/year

Indicators	NPV	IRR	B/C
Values (financial)	-€ 2.771	-4,17%	0,88
Values (economic)	€ 41.857	50,01%	2,93

Environmental benefits

CO2 emission saving = 737 kg per year. (increasing with 737 kg/year each two years)

Energy savings

E = n.a. kWh/year (or equivalent)

Project 2. Austria - CLEVER DRIVING

The organization

LFS Schlierbach and VRST (Austria)

Title

“SPRITTSPARWETTBEWERB” / "SPRITTSPARMEISTER" (Clever Driving Competition)

The objectives

To reduce consumption of fuel (diesel) and raise awareness about lower energy consumption by "clever driving"

The target group

School administration/teachers, Teachers, Students, Parents/Families, Local economy.

The main activities

Organization of the Austrian clever driving competition where will participate the best teams that have been selected at regional competitions. The action will be organized within a big agricultural fair to raise awareness.

Results/outputs/benefits

60-90 teachers plus more than 1000 students involved, 30 students competing in the Austrian competitions (winning teams from each province). Fuel saving potential in all participation schools about 10-15% realised. Awareness raised on school, regional and national level. Strong potential to reach local and beyond stakeholders.

Resources

Work-time, Machines (tractors and agricultural equipment), Other investments (a measuring system), publications (printings, advertisements), Event (Insurance costs, closure buffet, prizes for winners, rent of space and stage)

Option selection (Multi-criteria analysis)

Options	Option 1	Option 2	Option 3
Option value	21,4	23,7	24,2

Financial and economic analysis

Investment costs	Operational costs	Operational incomes	Benefits
$C_i = 0$	$C_o = 15.000 \text{ Euro}$	$I_o = 30.000 \text{ Euro/year}$	$B = 1.260 \text{ Euro/year}$

Indicators	NPV	IRR	B/C
Values (financial)	€ 186.933	n.a.	2,00
Values (economic)	€ 194.313	n.a.	2,08

Environmental benefits

CO2 emission saving = 78,9 tons per year.

Energy savings

E = n.a. KWh/year (or equivalent)

Project 3. Austria - NEW HEATING

The organization

LFS Grottenhof-Hardt (Austria)

Title

“NEW HEATING ” Replace existing by a up-to-date biomass heating system

The objectives

Increasing the efficiency of and developing a pilot project for local “district heating”.

The target group

School administration, local energy supplier, local authorities, local community.

The main activities

Discussions with relevant stakeholders (decision makers, investors, designers/technicians, firms). Organisation of bidding process. Specifications. Installation.

Results/outputs/benefits

New, up to date heating system. Lower operating costs. Better energy efficiency → lower emissions.

Resources

Work-time, Equipments (heating, tubes, pumps and control system are renewed).

Option selection (Multi-criteria analysis)

Options	Option 1	Option 2	Option 3
Option value	8,5	16,6	15,8

Financial and economic analysis

Investment costs	Operational costs	Operational incomes	Benefits
Ci = 120.000 Euro	Co = 0	Io = 12.000 Euro/year	B = 208 Euro/year

Indicators	NPV	IRR	B/C
Values (financial)	€ 6.481	3,66%	1,03
Values (economic)	€ 4.445	3,97%	1,02

Environmental benefits

CO2 emission saving = 13 tons per year.

Energy savings

E = n.a. KWh/year (or equivalent)

Project 1. Bulgaria - About Energy in seven days – problems and challenges

The organization

First Private Mathematical Gymnasium (Bulgaria)

Title

"About Energy in seven days – problems and challenges"

The objectives

Raising students and parents' awareness about energy and saving it.

The target group

Students, parents, companies, municipality.

The main activities

Providing a week of lessons about energy at school, saving energy activities at school and at home, setting a day for collecting recycling materials, issuing leaflets about renewable sources of energy, a day for planting trees and a school trip to a power plant.

Results/outputs/benefits

Reducing costs for lighting. Achieving energy saving lighting throughout the school.

Resources

Work-time, sponsorship from the school board and from a stakeholder.

Option selection (Multi-criteria analysis)

Options	Option 1	Option 2	Option 3
Option value	20.7	17	

Financial and economic analysis

Investment costs	Operational costs	Operational incomes	Benefits
Ci = 7620 bgn	Co = n.a.	Io = n.a.	B = n.a.

Indicators	NPV	IRR	B/C
Values (financial)	n.a.	n.a.	n.a.
Values (economic)	n.a.	n.a.	n.a.

Environmental benefits

CO2 emission saving = n.a.

Energy savings

E = n.a.

Project 2. Bulgaria - Travel Sensibly – Save Energy and Environment

The organization

First Private Mathematical Gymnasium (Bulgaria)

Title

“Travel Sensibly – Save Energy and Environment”

The objectives

Raising students, staff and parents’ awareness about energy saving and the need of sensible travelling.

The target group

The project is aimed at students, their parents and school staff, which will be actively involved in the activities. They will directly benefit on the project while involving it by not only saving on fuel, but only by cutting their travel expenses. The society will benefit, as far as the project leads at reducing carbon footprint and fuel usage.

The main activities

Three school buses to be bought to travel in three different directions and gather the students from those parts of the city. School run to be organized for those students that live in areas not covered by school buses. Parents to take carpooling: three or four kids living nearby could be driven to school by one parent. Students and staff to be encouraged to walk to school/work. The benefits of the project concern both students’ families and the environment. It will change students and their parents’ behaviour regarding energy and environment saving and will reduce fuel consumption and the emissions of CO₂.

Results/outputs/benefits

Reducing carbon footprint and fuel consumption.

Resources

The project will be fulfilled by school own resources as far as it is a private institution. The school authorities will buy the school vans. The organisation of the carpooling and the other alternative ways of travelling to school don’t need any special resources.

Option selection (Multi-criteria analysis)

Options	Option 1	Option 2	Option 3
Option value	23,9	20,7	17

Financial and economic analysis

Investment costs	Operational costs	Operational incomes	Benefits
C _i = 15.000 Eur	C _o = 6.750 Eur	I _o = 0	B ₁ = 11.250 Eur /year B ₁ = 246 Eur /year

Indicators	NPV	IRR	B/C
Values (financial)	€-178.572	n.a.	0,01
Values (economic)	€ 54.850	44,76%.	1,32

Environmental benefits

CO₂ emission saving = 9,5 tons per year.

Energy savings

E = n.a.

Project 3. Bulgaria - Eco School

The organization

First Private Mathematical Gymnasium (Bulgaria)

Title

“Eco School ” Installing energy saving light bulbs on the school corridors

The objectives

Reducing energy consumption, developing best practices at school.

The target group

School administration, local authorities, students, local community.

The main activities

Establishing a club „Young environmentalist”; Lessons aimed at raising students’ awareness about the importance of saving the environment and ways to do it; Planting the trees, bushes and flowers; Separate waste collection; Students to use email for sending assignments (where possible) to their teachers in order to save paper; Students to collect their notebooks at the end of the school year for recycling

Results/outputs/benefits

Raising students and teachers’ awareness about environmental issues. Saving paper – about 2,100kg a year, thus reducing CO2 and saving trees. (saving implicitly 2940 kWh energy).

Resources

Work-time, materials. Trees, bushes, flowers, flower pots, grass seeds – 1000 bgn Gardening tools - 260 bgn
Bins for separate waste collection - 1500 bgn, Teachers’ work (managing the Young Environmentalist Club, holding lessons) – 1000 bgn.

Option selection (Multi-criteria analysis)

Options	Option 1	Option 2	Option 3
Option value	17	n.a.	n.a.

Financial and economic analysis

Investment costs	Operational costs	Operational incomes	Benefits
Ci = 2760 bgn	Co = 1000 bgn	Io = n.a.	B = n.a.

Indicators	NPV	IRR	B/C
Values (financial)	n.a.	n.a.	n.a.
Values (economic)	n.a.	n.a.	n.a.

Environmental benefits

CO2 emission saving = n.a.

Energy savings

E = n.a.

Project 1. Finland - Energy efficiency guide and increase commitment of staff and students

The organization

Keuda Järvenpää Services

Title

“Energy efficiency guide and increase commitment of staff and students”

The objectives

Create awareness for energy efficiency and CO2 reduction needs.

To get all staff and student understand how to act more energy efficiency way in school.

The target group

Target groups are teachers, students, maintenance people and other stakeholders.

The main activities

Create energy efficiency guide to school, integrate Energy guide to part of energy management system (SD-management), introduction of teachers, students and other staff.

Results/outputs/benefits

Teachers, technical staff and administration (30) as well as students (370) were got introduction and involved to act more energy efficiency way in school. Awareness has risen on school, which have directly effect to actions and school have saved energy.

Resources

Work-time and voluntary work of students, teachers, energy experts; Small amount money of publishing guide.

Option selection (Multi-criteria analysis)

Options	Option 1	Option 2	Option 3
Option value	50,8	35	44,9

Financial and economic analysis

Investment costs	Operational costs	Operational incomes	Benefits
Ci = 600 Euro	Co = 3.000 Euro	Io = 6.000 Euro/year	B = 1800 Euro/year

Indicators	NPV	IRR	B/C
Values (financial)	€ 2 284	n.a	1,60
Values (economic)	€ 3 981	n.a	2,16

Environmental benefits

CO2 emission saving = 2,76 tons per year.

Energy savings

E = 12 000 KWh/year (or equivalent)

Project 2. Finland - Energy efficiency aspects in education and on the job learning

The organization

KeudaJärvenpää Services / Eco-One

Title

“Energy efficiency aspects in education and on the job learning”

The objectives

Create awareness for energy efficiency and CO2 reduction needs. To integrate energy aspects curricula and education. To integrate energy aspects on the job learning periods

The target group

Target groups are teachers, students and on the job learning companies staff.

The main activities

Integrate Energy guide to part of education. Teachers training. Integrate energy aspects on the job learning periods

Results/outputs/benefits

Teachers (30) will integrate energy aspects to education. Students (370) will get education and will involve to act more energy efficiency way in professional areas.

Resources

Work-time and voluntary work of students, teachers, energy experts.

Option selection (Multi-criteria analysis)

Options	Option 1	Option 2	Option 3
Option value	36,9	27,8	

Financial and economic analysis

Investment costs	Operational costs	Operational incomes	Benefits
C _i = 0 Euro	C _o = 2000 Euro/year	I _o = 4000 Euro/year	B = 2000 Euro/year

Indicators	NPV	IRR	B/C
Values (financial)	€ 1 904	n.a.	2,00
Values (economic)	€ 3 791	n.a.	3,00

Environmental benefits

CO2 emission saving = n.a.

Energy savings

E = n.a.

Project 3. Finland - Measurement of used energy in practical education

The organization

KeudaJärvenpää Services / Eco-One

Title

“Measurement of used energy in practical education”

The objectives

Increase students skills to influence energy efficiency in work by using right material, machine and work methodology. In the job learning places and later in other workplaces, increasing their knowledge from energy efficiency. To integrate energy aspects on the job learning periods.

The target group

Tarket groups are teachers, students and on the job learning companies staff .

The main activities

School administration/principal information about the key benefits of work. To audit energy measurement possibilities in practical working areas. Implement energy measurement to practical ares (machines). Integrate measurement part of education. Teachers training.

Results/outputs/benefits

Energy aspects integrated to curricula and practical education. 400 students and 50 teachers, staff etc. were directly involved. Integration Energy aspect to professional education practices.

Resources

Work-time and voluntary work of students, teachers, energy experts and stakeholders. Measurement equipments.

Option selection (Multi-criteria analysis)

Options	Option 1	Option 2	Option 3
Option value	20,2		

Financial and economic analysis

Investment costs	Operational costs	Operational incomes	Benefits
C _i = 1000 Euro	C _o = 1000 Euro/year	I _o = 3000 Euro/year	B = 1000 Euro/year

Indicators	NPV	IRR	B/C
Values (financial)	€ 952	n.a.	1,5
Values (economic)	€ 947	n.a.	1,3

Environmental benefits

CO2 emission saving = n.a.

Energy savings

E = n.a.

Project 1. France - “A week on energy saving“

The organization

AREHN : Regional agency for environment in Normandy

Title

“A week on energy saving“

The objectives

Make students and school staff aware of energy saving and renewable energy. Value the best practices of the school. Start actions, which will carry on over the year.

The target group

School administration, teaching and technical staff, students, families.

The main activities

To play a serious videogame about global warming called “ClimCity”. A photography workshop that start the campaign about increasing student’s awareness: “My message, our energy”. Distribution of energy saving light bulbs. Debates and exhibitions about global warming, greenhouse gases and energy. Presentation of the technical program and implementation of two solar lamps at school.

Results/outputs/benefits

Two solar street lamps implemented, 200 energy saving light bulb distributed, 60 students and teachers involved in the photography workshop, presentation of a solar panel and a small wind turbine, 7 conferences organized involving 220 students and teachers.

Resources

Work-time of AREHN and IUFM, brochures about energy, small budget to buy energy saving light bulbs, a photographer, work-time of a local association promoting renewable energy

Option selection (Multi-criteria analysis)

Options	Option 1	Option 2	Option 3
Option value	62,2	34,8	30,7

Financial and economic analysis

Investment costs	Operational costs	Operational incomes	Benefits
Ci = 0	Co = 1140 Euro	Io = 379 Euro/year	B = 5,2 Euro/year

Indicators	NPV	IRR	B/C
Values (financial)	€ 3,637	49,78%	4,35
Values (economic)	€ 3,448	50,81%	4,19

Environmental benefits

CO2 emission saving = 2,8 tons per year.

Energy savings

E = 57 600 KWh/year (or equivalent)

Project 2. France - A solar power street lamp?

The organization

AREHN : Regional agency for environment in Normandy

Title

“A solar power street lamp”

The objectives

Make students and school staff aware of energy saving and renewable energy. Value the best practices of the school. Start actions, which will carry on over the year.

The target group

School administration, teaching and technical staff, students, families.

The main activities

To implement 2 solar power street lamp in the school. To train students about renewable energies.

Results/outputs/benefits

Reduction of the energy consumption of the school. Promotion of solar energy. Good image for the school. Add values for the technical training of the school. Reduction of the energy consumption

Resources

Working hours (experts). 2 solar power street lamp.

Option selection (Multi-criteria analysis)

Options	Option 1	Option 2	Option 3
Option value		34,8	30,7

Financial and economic analysis

Investment costs	Operational costs	Operational incomes	Benefits
Ci = n.a.	Co = n.a.	Io = n.a.	B = n.a.

Indicators	NPV	IRR	B/C
Values (financial)	€ -7583	n.a.	n.a.
Values (economic)	n.a.	n.a.	n.a.

Environmental benefits

CO2 emission saving = n.a. tons per year.

Energy savings

E = n.a. KWh/year (or equivalent)

Project 3. France - A demonstration room for efficient lighting.

The organization

AREHN : Regional agency for environment in Normandy

Title

“A demonstration room for efficient lighting”

The objectives

Make students and school staff aware of energy saving and renewable energy. Value the best practices of the school.

The target group

School administration, teaching and technical staff, students, families.

The main activities

To create a demonstration room in which technological innovations in lighting could be tested.

Results/outputs/benefits

Creation of the demonstration room. Training students to energy efficiency. The opportunity to test technological innovations in lighting. An increased training quality for students.

Resources

Working hours (experts). A demonstration room. Material of lighting. Partnerships with other school or technical platform.

Option selection (Multi-criteria analysis)

Options	Option 1	Option 2	Option 3
Option value			30,7

Financial and economic analysis

Investment costs	Operational costs	Operational incomes	Benefits
Ci = n.a.	Co = n.a.	Io = n.a.	B = n.a.

Indicators	NPV	IRR	B/C
Values (financial)	n.a.	n.a.	n.a.
Values (economic)	n.a.	n.a.	n.a.

Environmental benefits

CO2 emission saving = n.a. tons per year.

Energy savings

E = n.a. KWh/year (or equivalent)

Project 1. Germany - COOL PAPER PROJECT– Recycling Paper is Energy Saving

The organization

ZIEL 21 – Centre for Innovative Energies e.V. & Viscardi Gymnasium Fürstenfeldbruck

Title

„COOL PAPER: Recycling Paper - Energy Saving“

The objectives

Create/Raise awareness of young people for how to consume “smarter” (greener) and protect the climate, the needs of CO2 reduction, how to save energy, water and resources. Move out prejudices against recycled paper (not useable for photocopier; grey not white etc.), inform young people how to consume “smarter” (greener) and protect the climate.

The target group

School family (school administration, teaching and technical staff, students, families, parents’ association), District administration, regional politicians.

The main activities

Recycling paper, finding out and implementing marketing ideas for recycled paper in a class project

Results/outputs/benefits

Teachers, technical staff and administration as well as students (1000) were involved and informed during school breaks (awareness raising, clearing prejudices). Raise the amount of sold exercise books made of recycled paper.

Resources

Work-time and voluntary work of students, teachers, energy experts. Incentives for book swap and exercise-books (involvement of local stakeholders). Small budget to buy exercise-books

Option selection (Multi-criteria analysis)

Options	Option 1	Option 2	Option 3
Option value	9,1	8,8	9,2

Financial and economic analysis

Investment costs	Operational costs	Operational incomes	Benefits
C _i = 0	C _o = 0 Euro	I _o = 160 Euro/year	B = 189 Euro/year

Indicators	NPV	IRR	B/C
Values (financial)	€ 1.99€	n.a.	1,21
Values (economic)	€ 4.16€	n.a.	1,46

Environmental benefits

CO2 emission saving = 523 kg per year.

Energy savings

E = n.a. KWh/year (or equivalent)

Project 2. Germany - FAT | Fundraising - Awareness - Trees

The organization

ZIEL 21 – Centre for Innovative Energies e.V. & Viscardi Gymnasium Fürstfeldbruck

Title

“FAT | Fundraising - Awareness - Trees”

The objectives

Create awareness for scarce resources and, CO2 reduction needs, Raise awareness how to save energy, water and resources, Inform young people about importance of trees for CO2 reduction and climate change prevention.

The target group

School family (school administration, teaching and technical staff, students, families, parents’ association), District administration, regional politicians.

The main activities

Fundraising activity: walkathon (sponsored walk), Information walking instead of driving by car, Tree planting activity.

Results/outputs/benefits

Teachers, students (1000) and their families as well as SMEs – involved, informed and encouraged:

- to attend the "walkathon for the climate" (students)
- to sponsor the walkathon (families, SMEs)
- to walk to school or come by bike instead of drive (or be driven) by car
- to plant trees (for CO2 reduction) and take care for them

Resources

Work-time and voluntary work of students, teachers, forestry fundraising "walkathon for the climate" for tree planting action.

Option selection (Multi-criteria analysis)

Options	Option 1	Option 2	Option 3
Option value	8.9	10.2	9.6

Financial and economic analysis

Investment costs	Operational costs	Operational incomes	Benefits
C _i = 0 Euro	C _o = 175 Euro	I _o = 2400 Euro/year	B = 189 Euro/year

Indicators	NPV	IRR	B/C
Values (financial)	€ 2,22€	n.a.	13.71
Values (economic)	€ 2,40€	n.a.	14.75

Environmental benefits

Environmental results are high: the walkathon saves 8000 kg CO2.
The tree planting saves 600 kg CO2 annually.

Energy savings

E = n.a. KWh/year (or equivalent)

Project 3. Germany - Energy and Lighting Check

The organization

ZIEL 21 – Centre for Innovative Energies e.V. & Viscardi Gymnasium Fürstenfeldbruck

Title

“Energy and Lighting Check”

The objectives

Create awareness for scarce resources and CO2 reduction needs, Raise awareness how to save energy in the classroom and at school, Inform young people about importance of energy efficient behavior for CO2 reduction and climate change prevention.

The target group

Classroom energy experts (students) at school (directly involved), School family (school administration, teaching and technical staff, students, families, parents’ association), District administration, regional politicians are indirectly involved due to dissemination of project idea and results.

The main activities

Development of a checklist (questionnaire) for energy experts, Information how to change behavior and save energy (in the classroom and at school), Collect data about problems regarding the heating system, windows, sun protection, lighting, Cooperate with the energy management and controlling team (technical experts) and the district administration.

Results/outputs/benefits

Teachers, students (1000) and their families were involved and informed, 30 energy experts were trained to use the checklist, Reduction of energy consumption in the classrooms (thanks to awareness and behavioral change).

Resources

Work-time and voluntary work of students, Small financial resources to buy CO2 monitoring devices, Work-time of experts and teachers covered by EGS, Printing costs covered by school

Option selection (Multi-criteria analysis)

Options	Option 1	Option 2	Option 3
Option value	9,5	12	

Financial and economic analysis

Investment costs	Operational costs	Operational incomes	Benefits
Ci = 1110 Euro	Co = 0	Io = 8340 Euro/year	B = 1885 Euro/year

Indicators	NPV	IRR	B/C
Values (financial)	€ 100.793	n.a.	33,08
Values (economic)	€ 124.282	n.a.	40,55

Environmental benefits

CO2 emission saving = 80 tons per year (10% energy consumption reduction due to behavioral changes).

Energy savings

E = ? KWh/year (or equivalent)

Project 1. Italy - A BIOMASS PLANT for CAMPUS SCHIO (Tron)

The organization

Municipality of Schio in cooperation with Liceo Scientifico Statale “N.Tron”, IPSIA “Garbin”, Liceo classico “Zanella”, VI ENERGIA.

Title

“A biomass plant for Campus Schio”

The objectives

Reducing the emissions of CO₂, saving public money and improving the comfort into the schools. To realize a good practice and to make students aware of they “power” in promoting “good changes.

The target group

The municipality of Schio and Provincial administration (Vi Energia), students, parents/families, school administration, local authorities, local community.

The main activities

Scientific analysis on availability of woody biomass in the territory of Schio. Technicians which made the study in preparation phase. Organisation and promotion Discussions with relevant stakeholders. Organization of acquisition process. Installation.

Results/outputs/benefits

Reducing the emissions of CO₂, saving public money and improving the comfort into the schools.

Resources

n.a.

Option selection (Multi-criteria analysis)

Options	Option 1	Option 2	Option 3
Option value	n.a.	n.a.	n.a.

Financial and economic analysis

Investment costs	Operational costs	Operational incomes	Benefits
C _i = n.a.	C _o = n.a.	I _o = n.a.	B = n.a.

Indicators	NPV	IRR	B/C
Values (financial)	n.a.	n.a.	n.a.
Values (economic)	n.a.	n.a.	n.a.

Environmental benefits

CO₂ emission saving = n.a. tons per year.

Energy savings

E = n.a. KWh/year (or equivalent)

Project 2. Italy - Schio for a Sustainable Mobility (Tron)

The organization

Liceo Scientifico Statale “N.Tron” in cooperation with Legambiente Schio, Tuttinbici Association, Samarcanda Association, Cicloffina, Municipality of Schio, IPSIA “Garbin”.

Title

“Schio for a Sustainable Mobility”

The objectives

Reducing the emissions of CO₂, saving public money and improving the comfort into the schools. To realize a good practice and to make students aware of they “power” in promoting “good changes”. To improve the “image of the biker”, to make bike-riding a safer practice, to increase the number of people using a bike, to reduce the emissions of CO₂ due to a reduction of the use of cars, replaced by bike riding.

The target group

Local Administration, Parents/Families, Students, School administration/teachers, local associations.

The main activities

Questionnaire on home-school mobility habits in other schools of Schio. On line communication. Schio High Schools Student event. Entertainment evening. Christmas tree lightened by bicycles. Students assembly. Training course for bicycle fixing, improvement and personalization. Participation to ‘M’illumino di meno’ (‘I use less energy’) national event 2011. Activities for the disabled Carnival floats moved and illuminated by bicycles.

Results/outputs/benefits

Good dissemination and awareness raising potential in all schools and citizenship. Creation of a communication campaign with several meeting opportunities. Direct involvement of students and school staff.

Resources

Work-time, Equipments (Christmas tree bikes). 10.000 Eur – organization costs.

Option selection (Multi-criteria analysis)

Options	Option 1	Option 2	Option 3
Option value	21,7	23,7	

Financial and economic analysis

Investment costs	Operational costs	Operational incomes	Benefits
C _i = n.a.	C _o = n.a.	I _o = n.a.	B = n.a.

Indicators	NPV	IRR	B/C
Values (financial)	n.a.	n.a.	n.a.
Values (economic)	n.a.	n.a.	n.a.

Environmental benefits

CO₂ emission saving = n.a. tons per year.

Energy savings

E = n.a. KWh/year (or equivalent)

Project 3. Italy - Manufacturing firms train school teachers (Tron)

The organization

Liceo Scientifico Statale “N.Tron”

Title

“Manufacturing firms train school teachers ”

The objectives

Make school teachers awaken to energy saving and renewable energy sources issues. Give them the opportunity of a training course in order to put them in the position to educate the new generations about these issues.

The target group

Directly: School administration, Teachers, Local economy and indirectly: parents, students and families

The main activities

Organization of a training course for school teachers kept by the school itself that involves directly firms and local authorities.

Results/outputs/benefits

About 60 teachers will be trained about how to deal in didactics with energy issues and about the use of new and more incisive teaching strategies. Some firms of the territory will be directly involved in a training project for school teachers. The project involves indirectly about 1000 students and their families.

Resources

Work-time, printing of brochures to advertise the course, printing of a certificate , organization of a coffee break, use of the aula magna of the school for the introductory meeting, if necessary the payment of a lecturer to support the person in charge to explain the meaning of the project and its spin-off for the didactics during the introductory meeting. 7.000 Eur – organization costs.

Option selection (Multi-criteria analysis)

Options	Option 1	Option 2	Option 3
Option value	20,5	20,9	

Financial and economic analysis

Investment costs	Operational costs	Operational incomes	Benefits
Ci = n.a.	Co = n.a.	Io = n.a.	B = n.a.

Indicators	NPV	IRR	B/C
Values (financial)	n.a.	n.a.	n.a.
Values (economic)	n.a.	n.a.	n.a.

Environmental benefits

CO2 emission saving = n.a. tons per year.

Energy savings

E = n.a. KWh/year (or equivalent)

Project 4. Italy - „TRAINING COURSE FOR ENERGY MANAGER OF THE SCHOOL” (CMTR)

The organization

School IPSIA „Cavour – Marconi” of Piscille – Perugia, School Art Institute „Alpinolo - Magnini” of Deruta – Perugia, School Professional Institute „Italo Calvino” of Città della Pieve – Perugia

Title

„Training course for energy manager of the school”

The objectives

Better manage energy consumption, communicate at any time the energy state of the art schools, expand / spread the Know How of its activities within the school and government

The target group

Teachers of high schools in the Province of Perugia (Energy manager of school).

The main activities

Train the teachers on the Energy Management issues: giving a solid basic knowledge about the field of energy management, touching both generic issues (sustainable development, renewables, national legislation and existing international environmental ,...) and specific issues (instrumental energy audit of buildings, upgrading the energy efficiency, green purchasing, clearing emissions).

Results/outputs/benefits

Nr. of teachers trained, nr. of schools involved, nr. of systems for monitoring energy consumption of school..., energy and cost savings, Reduction of CO2 emissions

Resources

Work-time, Classroom, Equipments (Computer, Projector, Blackboard, Internet connection).

Option selection (Multi-criteria analysis)

Options	Option 1	Option 2	Option 3
Option value	20		

Financial and economic analysis

Investment costs	Operational costs	Operational incomes	Benefits
Ci = 5000 Euro	Co = 0	Io = 1500 Euro/year	B = 46 Euro/year

Indicators	NPV	IRR	B/C
Values (financial)	€ 7.941	40,90%	2,64
Values (economic)	€ 30.962	41,42%	2,60

Environmental benefits

CO2 emission saving = 2,3 tons per year.

Energy savings

E = n.a. KWh/year (or equivalent)

Project 5. Italy - „AULA IDEALE” – „IDEAL CLASSROOM” (CMTR)

The organization

School IPSIA „Cavour - Marconi” of Piscille (Perugia, Umbria, Italy)

Title

„Aula ideale” – „Ideal classroom”

The objectives

Reducing energy consumption, developing best practices at school.

The target group

School administration, local authorities, local community.

The main activities

Discussions with relevant stakeholders. Organization of acquisition process. Installation.

Results/outputs/benefits

energy savings, centralized control, ensuring indoor comfort, minimizing waste, reduce CO2 emissions

Resources

Work-time, Equipments (Multimedia interactive whiteboard, presence detectors, twilight sensors to control exterior illumination, sensor lighting indoors, sensors opening on windows/doors, software).

Option selection (Multi-criteria analysis)

Options	Option 1	Option 2	Option 3
Option value	14,7	16,6	18

Financial and economic analysis

Investment costs	Operational costs	Operational incomes	Benefits
Ci = 35.000 Euro	Co = 0	Io = 1.500 Euro/year	B1 = 6000 Euro/year
			B2 = 46,44 Euro/year

Indicators	NPV	IRR	B/C
Values (financial)	€- 11.664	-1,57%	0,66
Values (economic)	€73.437	27,3%	3,17

Environmental benefits

CO2 emission saving = 1,78 tons per year.

Energy savings

E = n.a. KWh/year (or equivalent)

Project 6. Italy - „SPORTELLO ENERGIA” (ENERGY-Info-Point) (CMTR)

The organization

Istituto Professionale di Stato IPSIA „Cavour – Marconi”

Title

„SPORTELLO ENERGIA” (ENERGY-Info-Point)

The objectives

Reducing energy consumption, collecting and disseminating new techniques.

The target group

Educational institution, students, local authorities, citizens, local enterprises.

The main activities

creates a "garrison" (stable or occasional as the places and occasions) where people can ask questions and find answers to topics related skills and energy conservation and environmental sustainability.

Results/outputs/benefits

awareness of the meaning of sustainability, energy efficiency, clean energy combined with the knowledge of good practices for putting into practice the concepts first exposed, real time interaction,

Resources

Work-time, Equipments (laptop computer, second screen, answering machine, closet and collectors, containers made of recycled material).

Option selection (Multi-criteria analysis)

Options	Option 1	Option 2	Option 3
Option value	16.92	13.52	n.a.

Financial and economic analysis

Investment costs	Operational costs	Operational incomes	Benefits
Ci = 15000 Euro	Co = 3000 Euro/year	Io = 0 Euro/year	B = 1548 Euro/year

Indicators	NPV	IRR	B/C
Values (financial)	n.a.	n.a.	n.a.
Values (economic)	n.a.	n.a.	n.a.

Environmental benefits

CO2 emission saving = 77,4 tons per year.

Energy savings

E = n.a.

Project 7. Italy – “Aircraft illumination” (ISIS)

The organization

ISIS Andrea Ponti - Gallarate

Title

Aircraft illumination

The objectives

To make students planning an energy system, to involve local authorities, to extend EGS mission.

The target group

Students 4th grade

The main activities

The students will study – with the teachers’ help – a photovoltaic plant to illuminate an aircraft in the school compound. The students will make and implement the project testing their knowledge.

Results/outputs/benefits

Strengthen the choice for renewable energy. The aircraft illumination makes the school compound more adequate to its usage and gives visibility to the school. Students made a great experience.

Resources

Lamps, photovoltaic panels, battery supply, cabling

Option selection (Multi-criteria analysis)

Options	Option 1	Option 2	Option 3
Option value	23.7	22.4	20.9

Financial and economic analysis

Investment costs	Operational costs	Operational incomes	Benefits
$C_i = 3000$	$C_o = 3000/\text{year}$	$I_o = 0/\text{year}$	$B = 1000/\text{year}$

Indicators	NPV	IRR	B/C
Values (financial)	n.a.	n.a.	n.a.
Values (economic)	n.a.	n.a.	n.a.

Environmental benefits

CO2 emission saving = 77,4 tons per year.

Energy savings

E = n.a.

Project 8. Italy - Il sole a scuola (The sun at school) (ISIS)

The organization

ISIS Andrea Ponti - Gallarate

Title

Il sole a scuola (The sun at school)

The objectives

EGS theme dissemination in the schools

The target group

8th grade students

The main activities

Presentation of renewable sources of energy through lectures given by the ISIS teachers

Results/outputs/benefits

Greater awareness on energy saving

Resources

Presentation prepared by the ISIS teachers

Option selection (Multi-criteria analysis)

Options	Option 1	Option 2	Option 3
Option value	24	23,4	22,2

Financial and economic analysis

Investment costs	Operational costs	Operational incomes	Benefits
C _i = € 1000	C _o = 100 Euro/year	I _o = 0 Euro/year	B = 0 Euro/year

Indicators	NPV	IRR	B/C
Values (financial)	n.a.	n.a.	n.a.
Values (economic)	n.a.	n.a.	n.a.

Environmental benefits

CO₂ emission saving = ? tons per year.

Energy savings

E = ? KWh/year (or equivalent)

Project 9. Italy – L’Aquila a new birth (ISIS)

The organization

ISIS Andrea Ponti - Gallarate

Title

L’Aquila a new birth

The objectives

Planning a multifunctional centre in Assergi

The target group

Local community

The main activities

Planning, drawing, raising funds (through L’Aquila onlus) for the building of multifunctional center

Results/outputs/benefits

A great experience for the students who- under teacher’s guidance - have planned the all structure

Resources

Help of various stakeholders who have joined the project for: energy planning, building drawing, cabling

Option selection (Multi-criteria analysis)

Options	Option 1	Option 2	Option 3
Option value	20	20	20

Financial and economic analysis

Investment costs	Operational costs	Operational incomes	Benefits
Ci = ? Euro	Co = ? Euro/year	Io = Euro/year	B = 57.000 Euro/year

Indicators	NPV	IRR	B/C
Values (financial)	na	na	na
Values (economic)	na	na	na

Environmental benefits

CO2 emission saving = ? tons per year.

Energy savings

E = 125 KWh/year (or equivalent)

Project 10. Italy - ENERGY MANAGEMENT SYSTEM (Province Mantova)

The organization

Istituto Istruzione Superiore “Manzoni” (Suzzara, Italy)

Title

“ENERGY MANAGEMENT SYSTEM”

The objectives

To reduce consumption of electricity and fuel (natural gas) and to raise awareness about lower energy consumption by matching technology, physical data monitoring, good communication and behaviors oriented to sustainability (perfezionare)

The target groups

School staff/teachers/students/parents, other schools’ staff/teachers/students/parents

The main activities

Teachers and students training on Energy Management System. Monitoring electricity and natural gas consumption through an advanced monitoring system designed by experts of a local industrial cars manufacturing company, in collaboration with the school staff. Orienting school population behaviors toward energy saving. Quantifying energy and the CO₂ saved. Disseminate the experience among other schools.

Results/outputs/benefits

A reliable, effective, efficient Energy Management System enabled. Electric energy and fuel saved at 10%. 20-25 teachers plus 800 students involved. Environmental awareness raised on schools and students’ families. A permanent collaboration on energy saving established between the school and a local important industrial car manufacturer. Strong transferability potential to other schools of the Energy Management System realized as a result of collaboration between public bodies (the school, Mantova Province, Agire, Labter-Crea) and a private company.

Resources

Work-time, Monitoring equipment (Energy Flow, Temperature, Lighting), other investments (PC-equipment interfaces, software), publications (printings, advertisements), web sites

Option selected (Multi-criteria analysis)

Options	Option 1	Option 2	Option 3
Option value	41,1	31,0	n.e.

Financial and economic analysis

Investment costs	Operational costs	Operational incomes	Benefits
Ci = 11.630 Euro (Y1) 1000 Euro (Y2 – Y5)	3130 Euro (Y1) 500 Euro (Y2 – Y15) 700 Euro (Y16 – Y20)	11630 Euro (Y1) 1000 Euro (Y2 – Y11)	2025 Euro (Y1-Y3) 500 Euro (Y4 – Y20)

ENERGY MANAGEMENT SYSTEM

Indicators	NPV	IRR	B/C
Values (financial)	€ 72.042	n.a.	3,63
Values (economic)	€ 74.270	n.a.	3,75

Environmental benefits

CO₂ emission saving = 8.820 kg CO₂ /year (Y1-Y3) ; 13.230 kg CO₂ /year (Y4-Y20)

Energy savings

E = 22.000 KWh/year (Y1-Y3) ; 33.000 KWh/year (Y4-Y20)

Project 11. Italy - "SCHOOL BUILDING" (Province Mantova)

The organization

Istituto Istruzione Superiore "Manzoni" (Suzzara, Italy)

Title

"SCHOOL BUILDING"

The objectives

To reduce consumption of electricity and natural gas. To raise awareness about lowering energy consumption. To develop behaviors oriented to energy saving and sustainability. School population aware of the energy dynamics related to the building and be part of the challenge of saving. To obtain the active participation of the students in the training process that will lead them to become awared citizens who take part in the life of the global community.

The target groups

School staff/teachers/students/parents, other schools' staff/teachers/students/parents

The main activities

The interaction between students, teachers, the operators who manages the lighting and heating plants, and the owners of the building will be supported; it is aimed at raising the awareness that the behaviors of everyone will perform energy saving. Electricity and natural gas consumption will be monitored by students in collaboration with the school staff. Quantifying energy and the CO₂ saved.

The behaviors of the school people will be monitored to compile a list of energy saving practices.

Energy aspects will be evaluated according to these evaluation criteria:

- Energy efficiency lighting
- Energy efficiency in boiler and heating system
- Energy efficiency in air conditioning system.

Disseminate the experience among other schools.

Results/outputs/benefits

A reliable Energy Management System enabled and based on a set of good practices chosen and adopted by the school population.

Electric energy and fuel saved at 10%. 20-25 teachers plus 1000 students involved.

Environmental awareness raised on schools and students' families.

School population sensitized on issues of energy saving

Practical implementation of five new procedures based on changing behaviours

Development of an explanatory document on the management system adopted and potential impact on territorial application of such procedures.

Adoption of the manual by the province of Mantua, and two other schools.

Resources

Work-time, Monitoring equipment (Energy, Flow, Temperature, Lighting), Other investments (PC-equipment interfaces, software), publications (printings, advertisements), web sites

Option selected (Multi-criteria analysis)

Options	Option 1	Option 2	Option 3
Option value		31,0	

Financial and economic analysis

Investment costs	Operational costs	Operational incomes	Benefits
Ci = 11.630 Euro (Y1) 1000 Euro (Y2 – Y5)	3130 Euro (Y1) 500 Euro (Y2 – Y15) 700 Euro (Y16 – Y20)	11630 Euro (Y1) 1000 Euro (Y2 – Y11)	2025 Euro (Y1-Y3) 500 Euro (Y4 – Y20)

SCHOOL BUILDING

Indicators	NPV	IRR	B/C
Values (financial)	€ 49034	175,15%	3,08
Values (economic)	€ 44382	n.a.	3,24

Environmental benefits

CO2 emission saving = 8.192 kg CO₂ /year (Y1-Y3) ; 20.480 kg CO₂ /year (Y4-Y20)

Energy savings

E = 8.800 KWh/year (Y1-Y3) ; 22.000 KWh/year (Y4-Y20)

Project 1. Nederland - Lentmark 1

The organization

ROC Nijmegen

Title

“Lentmark 1”

The objectives

At least 10 youngsters will develop their competences, two groups of students to qualify for their study

The target group

City council of Nijmegen, the inhabitants of the village Lent

The main activities

Construct a 18 meter high watch tower in the village of Lent, built with used materials and acting as sight connection (land mark) for the city of Nijmegen with the new expanded suburb.

Results/outputs/benefits

Experience in building according to regulation from another country. Experience in working under regulations from another country.

Resources

People to build the house, which can be unemployed, employees of regional constructors, students from vocational schools, all materials necessary to build a house.

Option selection (Multi-criteria analysis)

Options	Option 1	Option 2	Option 3
Option value	26,1		

Financial and economic analysis

Investment costs	Operational costs	Operational incomes	Benefits
Ci = 250.000 Euro	Co = n.a. Euro/year	Io = n.a. Euro/year	B = n.a. Euro/year

Indicators	NPV	IRR	B/C
Values (financial)	n.a.	n.a.	n.a.
Values (economic)	n.a.	n.a.	n.a.

Environmental benefits

CO2 emission saving = n.a. tons per year.

Energy savings

E = n.a. KWh/year (or equivalent)

Project 2. Nederland - General Policy Plan Sustainability ROC Nijmegen

The organization

ROC Nijmegen

Title

General Policy Plan Sustainability ROC Nijmegen

The objectives

Developing a policy plan.

The target group

The SME's and organisations where the students follow their work placement. The organisations involved in developing, execution and implementation of the curricula.

The main activities

Delivering good practices in sustainable behaviour at their working environment. Delivering the goals for the curricula to met in terms of sustainability and propose several assignments and materials for lessons to the teachers.

Results/outputs/benefits

There will be no structured and to be steered results. Benefits will be achieved by accidents and are not to be influenced by structured policy actions.

Resources

For each activity resources will be assembled by the individual involved.

Option selection (Multi-criteria analysis)

Options	Option 1	Option 2	Option 3
Option value	5,5		

Financial and economic analysis

Investment costs	Operational costs	Operational incomes	Benefits
Ci = n.a.Euro	Co = n.a. Euro/year	Io = n.a. Euro/year	B = n.a. Euro/year

Indicators	NPV	IRR	B/C
Values (financial)	n.a.	n.a.	n.a.
Values (economic)	n.a.	n.a.	n.a.

Environmental benefits

CO2 emission saving = n.a. tons per year.

Energy savings

E = n.a. KWh/year (or equivalent)

Project 3. Nederland - Maintenance Plan for school buildings.

The organization

ROC Nijmegen

Title

Maintenance Plan for school buildings.

The objectives

The buildings which are owned by the ROC will be examined, in order to determine their need for maintenance over a longer term.

The target group

The main stakeholder is the ROC Nijmegen. This organisation owns the buildings and wants to realise a good quality maintenance plan.

The main activities

Invite a professional organisation to develop a maintenance plan (tender procedure, inform the professional organisation about the buildings, evaluate their findings).

Results/outputs/benefits

A good quality maintenance plan

Resources

ROC Nijmegen will be responsible to deliver the resources: finance and materials.

Option selection (Multi-criteria analysis)

Options	Option 1	Option 2	Option 3
Option value	16,6	14,6	

Financial and economic analysis

Investment costs	Operational costs	Operational incomes	Benefits
Ci = maximum of 15 of the housing costs from the ROC	Co = n.a. Euro/year	Io = n.a. Euro/year	B = n.a. Euro/year

Indicators	NPV	IRR	B/C
Values (financial)	n.a.	n.a.	n.a.
Values (economic)	n.a.	n.a.	n.a.

Environmental benefits

CO2 emission saving = n.a. tons per year.

Energy savings

E = n.a. KWh/year (or equivalent)

Project 1. Portugal - Action Plan for Energy efficiency on ISCAC.

The organization

ISCAC- Instituto Superior de Contabilidade e Administração de Coimbra

Title

“Action Plan for Energy efficiency on ISCAC”

The objectives

Providing the institution with tools that allow induce energy management practices in a systematic way;
Establishing procedures that contribute to the minimization of energy consumption and to obtain information that allows support future investment decisions in this area.

The target group

This project involves teachers, students, parents, local community, school management, local authorities.

The main activities

- Placement of clocks and sensors for lighting.
- Definition of the operating system for consumers.
- Control of HVAC Systems.
- Appointment of Manager (or Team) Power Management.
- Awareness campaign.

Results/outputs/benefits

It would reduce 3% energy costs. Economic benefits: Energy Saving, about 3% of KWH per year. Environmental benefits: Reduction of CO2 emissions.

Resources

Human resources: 1 energy manager, Material: Watches, light sensors, Financial: 3775,00 (1st year)

Option selection (Multi-criteria analysis)

Options	Option 1	Option 2	Option 3
Option value	27		

Financial and economic analysis

Investment costs	Operational costs	Operational incomes	Benefits
Ci = 3.250 Euro	Co = 525 Euro/Year	Io = 1.054 Euro/year	B = 19 Euro/year

Indicators	NPV	IRR	B/C
Values (financial)	€ 4.337	18%	1,38
Values (economic)	€ 5778	20%	1,49

Environmental benefits

CO2 emission saving = 944 kg per year.

Energy savings

E = 6437 KWh/year (or equivalent)

Project 2. Portugal - Action Plan for Energy efficiency on ESTV

The organization

ESTV- Escola Superior de Tecnologia de Viseu

Title

“Action Plan for Energy efficiency on ESTV”

The objectives

Obtaining a good knowledge of the facility, identifying opportunities for energy rationalization. Provide information relevant to a more technical-economic analysis based on the possible replacement of less energy efficient equipment.

The target group

This project involves teachers, students, parents, local community, school management, local authorities.

The main activities

Installation of energy meters.
 Characterization of the operating system for consumers.
 Implementation of the monitoring system.
 Loading Regulators Operating Mechanisms.
 Implementation of a centralized system.

Results/outputs/benefits

It would reduce 5% energy costs. Economic benefits: Energy Saving, about 5% of KWH per year. Environmental benefits: Reduction of CO2 emissions.

Resources

Human resources: 1 energy manager, students, Material: energy meters, regulators operating mechanisms, Financial : 59275 € (1st year) from which Equipment and Installation costs: 58750 €.

Option selection (Multi-criteria analysis)

Options	Option 1	Option 2	Option 3
Option value	35,1		

Financial and economic analysis

Investment costs	Operational costs	Operational incomes	Benefits
Ci = 58.750 Euro	Co = 525 Euro/year	Io = 12.009 Euro/year	B = 215 Euro/year

Indicators	NPV	IRR	B/C
Values (financial)	€ 86.839	23,9%.	2,38
Values (economic)	€89.842	24,2%.	2,44

Environmental benefits

CO2 emission saving = 10,75 tons per year.

Energy savings

E = 73314 KWh/year (or equivalent)

Project 3. Portugal - Action Plan for Energy efficiency on ESTGOH

The organization

ESTGOH- Escola Superior de Tecnologia e Gestão de Oliveira do Hospital

Title

“Action Plan for Energy efficiency on ESTGOH”

The objectives

Provide the institution with tools that allow induce energy management practices in a systematic way; To establish procedures that contribute to the minimization of energy consumption and to obtain information that allows support future investment decisions in this area.

The target group

This project involves teachers, students, parents, local community, school management, local authorities.

The main activities

- Placement of clocks and sensors for lighting.
- Definition of the operating system for consumers.
- Control of HVAC Systems.
- Appointment of Manager (or Team) Power Management.
- Awareness campaign.

Results/outputs/benefits

It would reduce 3% energy costs. Economic benefits: Energy Saving, about 3% of KWH per year. Environmental benefits: Reduction of CO2 emissions.

Resources

Human resources: 1 energy manager, Material: Watches, light sensors, Financial: 3.775 (1st year), out of which Equipment and Installation costs: 3.250 €.

Option selection (Multi-criteria analysis)

Options	Option 1	Option 2	Option 3
Option value	16,2		

Financial and economic analysis

Investment costs	Operational costs	Operational incomes	Benefits
Ci = 3.250 Euro	Co = 525 Euro/year	Io = 1.134 Euro/year	B = 20 Euro/year

Indicators	NPV	IRR	B/C
Values (financial)	€5.521	22%	1,49
Values (economic)	€ 6.207	24%	1,57

Environmental benefits

CO2 emission saving = 1 ton per year.

Energy savings

E = 6923 KWh/year (or equivalent)

Project 1. Romania - ECO-GREEN SCHOOL

The organization

Economic Highschool Arad (Romania)

Title

“ECO-GREEN SCHOOL” Installing energy saving light bulbs on the school corridors

The objectives

Reducing energy consumption, developing best practices at school.

The target group

School administration, local authorities, local community.

The main activities

Discussions with relevant stakeholders. Organization of acquisition process. Installation.

Results/outputs/benefits

Reducing costs for lighting. Achieving energy saving lighting throughout the school.

Resources

Work-time, Equipments (energy saving light bulbs).

Option selection (Multi-criteria analysis)

Options	Option 1	Option 2	Option 3
Option value	19	20,7	26,2

Financial and economic analysis

Investment costs	Operational costs	Operational incomes	Benefits
Ci = 120.000 Euro	Co = 0	Io = 12.000 Euro/year	B = 206 Euro/year

Indicators	NPV	IRR	B/C
Values (financial)	€ 6.954	n.a.	5,07
Values (economic)	€ 5.806	n.a.	5,38

Environmental benefits

CO2 emission saving = 462,5 kg per year.

Energy savings

E = 1056 KWh/year (or equivalent)

Project 2. Romania - THERMAL ENERGY EFFICIENCY

The organization

Economic Highschool Arad (Romania)

Title

“Thermal energy efficiency”

The objectives

Reducing energy consumption, developing best practices at school, increasing competitiveness among schools, on a local and national level, increasing the prestige of the school through involvement in local projects that are in line with European priorities.

The target group

This project involves local authorities, public schools, school principals, teachers, parents and stakeholders. The direct beneficiaries of the project are students, teachers, school management, staff and indirectly the town hall.

The main activities

Discussions with relevant stakeholders. Organization of acquisition process. Installation.

Results/outputs/benefits

Obtaining heat faster and keeping the heat in the room. Conserving heat.

Resources

Work-time, Equipments (Aluminum radiators).

Option selection (Multi-criteria analysis)

Options	Option 1	Option 2	Option 3
Option value	20,9	20,7	28,8

Financial and economic analysis

Investment costs	Operational costs	Operational incomes	Benefits
C _i = 9000 Euro	C _o = n.a. Euro/year	I _o = n.a. Euro/year	B = n.a. Euro/year

Indicators	NPV	IRR	B/C
Values (financial)	n.a.	n.a.	n.a.
Values (economic)	n.a.	n.a.	n.a.

Environmental benefits

CO₂ emission saving = n.a. tons per year.

Energy savings

E = n.a. KWh/year (or equivalent)

Project 3. Romania - ECO-TRAINING

The organization

Economic Highschool (Romania)

Title

“ECO-TRAINING ”

The objectives

Increasing awareness of the importance to use solar energy resources, developing best practices at school;
 Reducing energy consumption; increasing competitiveness among schools, on a local and national level;
 Increasing the prestige of the school through involvement in local projects that are in line with European priorities;

The target group

This project involves public schools, school principals, teachers, parents and stakeholders. The direct beneficiaries of the project are students, teachers, school management, staff and indirectly the town hall.

The main activities

Organizing training courses for teachers and students.

Results/outputs/benefits

Raising awareness among teachers and students concerning energy efficiency.
 Lower heating and electricity bills.

Resources

Posters, worksheets, CDs, DVDs, video projector

Option selection (Multi-criteria analysis)

Options	Option 1	Option 2	Option 3
Option value	23,2	19	20,9

Financial and economic analysis

Investment costs	Operational costs	Operational incomes	Benefits
Ci = n.a. Euro	Co = n.a. Euro/year	Io = n.a. Euro/year	B = n.a. Euro/year

Indicators	NPV	IRR	B/C
Values (financial)	n.a.	n.a.	n.a.
Values (economic)	n.a.	n.a.	n.a.

Environmental benefits

CO2 emission saving = n.a. tons per year.

Energy savings

E = n.a. KWh/year (or equivalent)

Project 1. Slovakia - Model of Passive House

The organization

Stredná odborná škola

Title

“Model of Passive House”. Construction of a model and promotion of energy saving buildings.

The objectives

Reducing energy consumption, construction of the model of a passive house, but also promotion of ideas of building of these modern buildings.

The target group

Pupils, teachers, parents, community, cooperation Klub Kon-Tiki and IEPD – approach to new target group of pupils and teachers.

The main activities

EGS Forum at school. Creation of a model. Presentation of a model. Promotion of idea.

Results/outputs/benefits

Construction of educational tool, Article in Dalekohlad, Direct involvement of students and school staff. Strong potential to collaborate with others Schools and local authority. Enhanced interest in theme of passive houses

Resources

Work-time, Mainly Klub Kon-Tiki and school internal resources will be used. Material for construction of the model: approx. € 70.

Option selection (Multi-criteria analysis)

Options	Option 1	Option 2	Option 3
Option value	n.a.	n.a.	n.a.

Financial and economic analysis

Investment costs	Operational costs	Operational incomes	Benefits
Ci = n.a. Euro	Co = n.a. Euro/year	Io = n.a. Euro/year	B = n.a. Euro/year

Indicators	NPV	IRR	B/C
Values (financial)	n.a.	n.a.	n.a.
Values (economic)	n.a.	n.a.	n.a.

Environmental benefits

CO2 emission saving = 3,27 tons per house built.

Energy savings

E = n.a KWh/year (or equivalent)