

TAKING
COOPERATION
FORWARD

📍 Block 5: FEEDSCHOOLS applications
5.2 Financial application

💬 **D.T4.3.1 e-learning course**

👤 FEEDSCHOOLS, by ENEA (Maria-Anna Segreto)

BLOCK 5: FEEDSCHOOLS APPLICATIONS

5.2 FINANCIAL APPLICATION

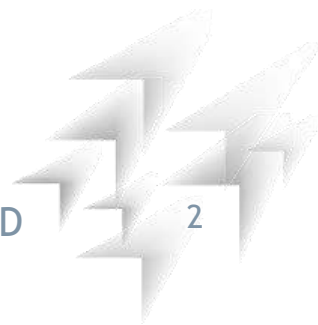
Learning Objective: The FEEDSCHOOLS project address the identified challenges with an holistic approach which takes in account the **financial**, environmental and energy aspects of NZEB renovation of public buildings. The project also support the **analysis and application of financial schemes** applicable such as the energy performance contracts but also other **innovative mechanisms**. The purpose of this block is to make people understand what the added value of financial analysis is. In fact, an energy refurbishment project cannot be considered complete and effective without a financial analysis that gives information on the economic feasibility.

5.1.1
Financial Analysis

[\(link\)](#)

5.1.2
FEEDSCHOOLS
Financial App

[\(link\)](#)



BLOCK 5: FEEDSCHOOLS APPLICATIONS

4.1 FINANCIAL APPLICATION

5.1.1

Financial Analysis

5.1.1 objective

This unit aims to give an overview of the Financial Analysis for energy improvement actions.



ITALIAN FINANCING SCHEME FOR SCHOOL BUILDINGS

The recast of the energy performance of buildings Directive (EPBD) describes a **comparative methodological framework** to promote energy efficiency and establish minimum energy performance requirements in buildings at the lowest costs. The aim of the **cost-optimal methodology** is to foster the achievement of nearly zero energy buildings (nZEBs), the new target for all new buildings by 2020, characterized by a high performance with a low energy requirement almost covered by renewable sources

Improving and investing in energy renovation of the EU building stock is a key aspect not only for the derived savings and CO₂ emissions reduction, but also for the potential growth and employment that this sector can provide.



ITALIAN FINANCING SCHEME FOR SCHOOL BUILDINGS

Improving and investing in energy renovation of the EU building stock is a key aspect not only for the derived savings and CO₂ emissions reduction, but also for the potential growth and employment that this sector can provide. According to the EPBD, Member States have to consider cost-optimality to establish minimum energy performance requirements in buildings at the lowest costs.

A methodology is provided by Delegated Regulation No. 244/2012 and its Guidelines to derive cost-effectiveness from a technical and economic perspective. The methodology foresees a comparison in terms of costs and energy performance of construction alternatives to be taken into account both in new and existing buildings undergoing major or non-major renovation.



ITALIAN FINANCING SCHEME FOR SCHOOL BUILDINGS

The cost optimal is influenced by different factors, such as building typology, variants, discount rate, energy price, and cost data. As a heterogeneous situation characterizes Member State in relation to cost-optimal levels mainly depending on building types and climates, there is the need to develop a common methodology: we can do this using universally recognized economic indicators.

The FEEDSCHOOL project aim is the identification of the strategies and optimal solutions for the renovation of existing school buildings. The methodology presented helps the decisional and management process of the designers who want to guarantee comfort and cost-optimal solutions in school retrofitting, being a useful tool for municipalities at the same time. It shows how providing a reduction of energy consumption and greenhouse gas emission in a cost-effective way during building's lifecycle.



SELF ASSESSMENT TEST

The aim of the cost-optimal methodology is:

- 1.To spend less
- 2.to foster the achievement of nearly zero energy buildings**
- 3.To obtain incentives

A methodology for cost optimal analysis is provided by:

- 1.Delegated Regulation No. 422/2012
- 2.Delegated Regulation No. 242/2012
- 3.Delegated Regulation No. 244/2012**

The FEEDSCHOOL project aim about cost optimal analysis is:

- 1.the identification of the strategies and optimal solutions for the renovation of existing school buildings**
- 2.the identification of the strategies and optimal solutions for the renovation of new school buildings
- 3.the identification of the strategies and optimal solutions for the renovation of both existing and new school buildings



BLOCK 5: FEEDSCHOOLS APPLICATIONS

4.1 FINANCIAL APPLICATION

5.1.2 FEEDSCHOOLS Financial App

5.1.2 objective

This unit aims to give an overview of the Financial App included in the FEEDSCHOOLS Web Tool



As any activity, energy renovation has its related costs, which vary according to the refurbishment depth (number and complexity of implemented energy efficiency measures). Therefore, any decision on energy renovation of a building must carefully evaluate these costs and ensure financing, in order to reap the benefits after the implementation.

The most usually utilized **financing models** include: own funding, loan financing, ESCO model (Energy Performance Contracting - EPC), public-private partnership (PPP), grant schemes or some combination of the before mentioned models

There is no universally best solution, but for each particular situation (country, region, building) **an optimal solution should be tailor-made.**



Usually, especially in the public sector, it is possible to **combine** a maximum of two **different funds**, to make the refurbishment operation more feasible.

The activities of FEEDSCHOOLS project presented, in different report, available **financing models** in each participating country and, based on the Project partners' feedback, provided a **comparative analysis** of availability, current usage and planned usage of different financing models.

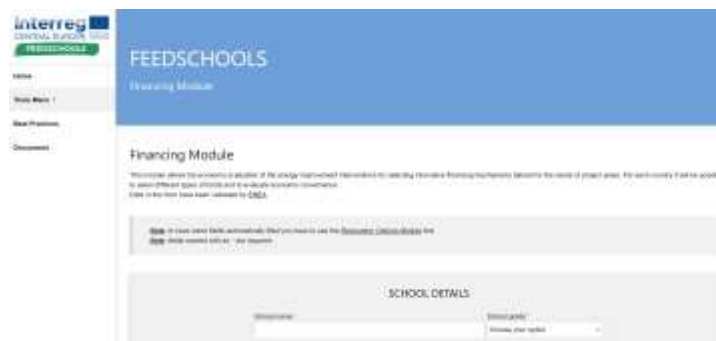
The results of this in-depth analysis, performed by HEP Esco (Croatian project partner), were used to introduce a **financial app within the web tool**.



FEEDSCHOOLS FINANCIAL APP

The feasibility of Energy Efficiency refurbishments depends on both technical potentials of applied measures in terms of energy savings and on the conditions of financing mechanisms available for their support.

Within FEEDSCHOOLS project, a calculation model for school buildings has been developed aiming at analyzing different available financing models and deciding on the optimal model.



Calculation parameters (7), like available grant rates or loan interest rates are obtained through **feedback of Project partners** and are presented in Table below:

Criteria/ Model
Interest rate
Discount rate
Life cycle of EE renovation (years)
Administrative, legal and architect cost
Other bank cost
ESCO cost
PPP cost

The indicators in the table vary according to the country and must be carefully evaluated in order to obtain valid results.



The analysis included 5 models:

Analysis
Budget financing
Loan (credit) financing
ESCO financing
PPP financing
Combination of ESCO and subsidy (with 95% subsidy rate)

The Financial App also determine the subsidy rate needed to break even.

The model was validated through the results of performed energy audits for each school, for each country, in order to ensure the correctness of the results.



FEEDSCHOOLS FINANCIAL APP

To apply the financial module, user add information about school, investment, saving and Country. The user can manually enter the data or, if he used the Renovation Option Module, he can import them automatically.

SCHOOL DETAILS

School name*

Carducci school

School grade*

Primary

State*

Italy

Municipality* ⓘ

Bologna (BO)

Address*

Via Dante

INPUT MONEY DATA

Investment*

1693500

Saving*

7501133

Automatically rates are calculated.
If the user deems it useful, he can values.

RATES

Administrative, legal and architect rate*

0.1

Other bank rate*

0.01

Interest rate*

0.025

ESCO rate*

0.3

Public-Private Partnership rate*

0.22

Net Present Value discount rate*

0.025

Life cycle of Energy Efficiency renovation (years)*

25

Max rate of subsidy needed to be feasible*

1



Then the calculation is returned. An indicator (green, yellow or red face) is also inserted next to the result: it indicates whether the final solution is **feasible**, **almost feasible** or **not feasible**

RESULT

Financing gap (Subsidy needed to breakeven)


Subsidy	Total cost
1.00	0.00

Payback

0.00

Net Present Value (NPV)	Internal Rate of Return (IRR)
95889655	0.0000

Project is feasible





SELF ASSESSMENT TEST

Is there a solution universally considered the best in analyzing optimal costs?

1. Yes, the one with the least payback time
2. Yes, the one with the least cost
- 3. No, because for each particular situation (country, region, building) an optimal solution should be tailor-made.**

The feasibility of Energy Efficiency refurbishments depends:

1. Only on technical potentials of applied measures
2. Only on the conditions of financing mechanisms available
- 3. On both technical potentials of applied measures and on the conditions of financing mechanisms available**

How many economic indicators are calculated by the FEEDSCHOOLS financial app?

- 1.3
- 2.7**
- 3.5



SELF ASSESSMENT TEST

How many models are analyzed with the FEEDSCHOOLS financial app?

- 1.3
- 2.7
- 3.5**

The FEEDSCHOOL financial model was validated through:

- 1. Stakeholder suggestion
- 2. Partner feedbacks
- 3. Performed energy audits**





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