

PEDIA Project

Ranking System for prioritising buildings for energy upgrades

Deliverable 2.1

Responsible Partner: Cyprus Energy Agency

Authors: Savvas Vlachos, Marios Petrakkas, Maria Achilleos

Date and version: 21/04/2021 Version.Final_Updated

Dissemination Level: Public



This project has received funding from the European Union's Horizon 2020 programme under grant agreement no 893938



Contents

1. Introduction.....	2
2. Task Description	3
Task 2.1 Technical evaluation and selection of final Pilots	3
3. Analysis of the Ranking Tool.....	5
3.1 Construction.....	7
3.2 Social Aspects.....	12
3.3 Energy.....	13
3.4 School Use & Educational Aspects.....	17
3.5 Electromechanical Systems	19
3.6 Users	22
3.7 Comfort.....	24
3.8 Renewable Energy Sources	25
3.9 Support.....	26
3.10 Location.....	27
3.11 Sustainable planning.....	28
3.12 Cultural Value.....	29
3.13 Added Value	30
3.14 Type of school.....	32



1. Introduction

The large-scale energy renovation of school buildings contains a high perceived investment risk, while the involvement of several actors results in more complex procedures. The EU-funded PEDIA project contributes towards national and European climate and energy targets by removing legal, administrative, technical and market obstacles. PEDIA connects a wide range of actions aiming to improve the energy performance and the indoor conditions of at least 25 public school buildings in Cyprus, reaching the nearly-zero-energy building level. Ultimately, the PEDIA project will directly trigger EUR 7.5 million in public and private investments and will establish a solid long-term energy renovation strategy for all public-school buildings.

Thus, PEDIA introduces a procedural framework for schools' energy upgrade to meet NZEB level, by integrating to the existing renovation practices a selection ranking system, energy audits, Green Public Procurement (GPP), and an Innovative Financing Solution. The ranking system, which is the first part of the methodology, will assist the Cyprus Ministry of Education, Culture, Sport and Youth (MoECSY) to the selection process of school buildings for energy upgrade, based on environmental, energy, educational and socioeconomic criteria.

After the establishment of the list which will include the schools with the highest score, and thus the highest impact, the energy audits' results will indicate the cost optimal energy interventions, which in turn will provide the technical specifications for the Green Public Procurement. As a final step, the establishment of an Energy Management System for the school buildings, will ensure future energy savings and continuous improvement of energy performance.

This report answers to the **D2.1 Ranking System for prioritising buildings for energy upgrades**.



2. Task Description

Task 2.1 Technical evaluation and selection of final Pilots

This Task is dedicated to the establishment of a suitable ranking system which will lead to the pilots' selection. It is divided in two Sub-Tasks to serve its purpose.

In specific, Sub-Task 2.1.1 Ranking System, from which this Deliverable originates, includes the evaluation of all public schools (around 590 eligible schools), upon their application. The ranking system creates the priority list for energy upgrading of the schools, enabling the PEDIA partners to objectively select 25 representative buildings, as pilots for the Energy Audits and the Energy Upgrades. This ranking system was developed with the support of key stakeholders, including the Technical Services of the MoECSY, the Energy Service of the Ministry of Energy, Commerce and Industry, and the Directorate General for European Programmes, Coordination and Development, to ensure that it follows an integrated approach, including various aspects that can affect the decision making for schools' energy upgrading.

The ranking of the schools is based on various assessment criteria following a holistic approach. More specifically it addresses the school's construction, energy usage, electromechanical systems, Renewable Energy Sources [RES] and school use, but also examining other factors that can affect the energy consumption and the internal conditions of the school, such as the users, the support from other initiatives, and the building's location and cultural value. More 'abstract' aspects, related to social and educational criteria, are also taken into account, without excluding any other added value, such as the flexibility of reshaping outdoors area, which arises from the ability of the schools to be transformed into lighthouse projects. The assessment takes also into account comfort parameters and exogenous factors, such as the existence of a Sustainable Energy and Climate Action Plan, that can affect the decision for energy upgrades. Lastly, the ranking system is independent of the school's level of education, as schools from all educational levels will be included in the final list, ensuring an indicative sample of all public-school buildings.

Overall, the ranking system will assess all the schools that are willing to participate in the energy upgrading, ensuring:

- Good promotion and wider outreach of the PEDIA project to all schools across Cyprus.
- Higher interest from schools in the project giving a bigger sample of schools to choose from.
- The possibility on using the already ranked list for the future energy upgrading of the schools by the MoECSY.

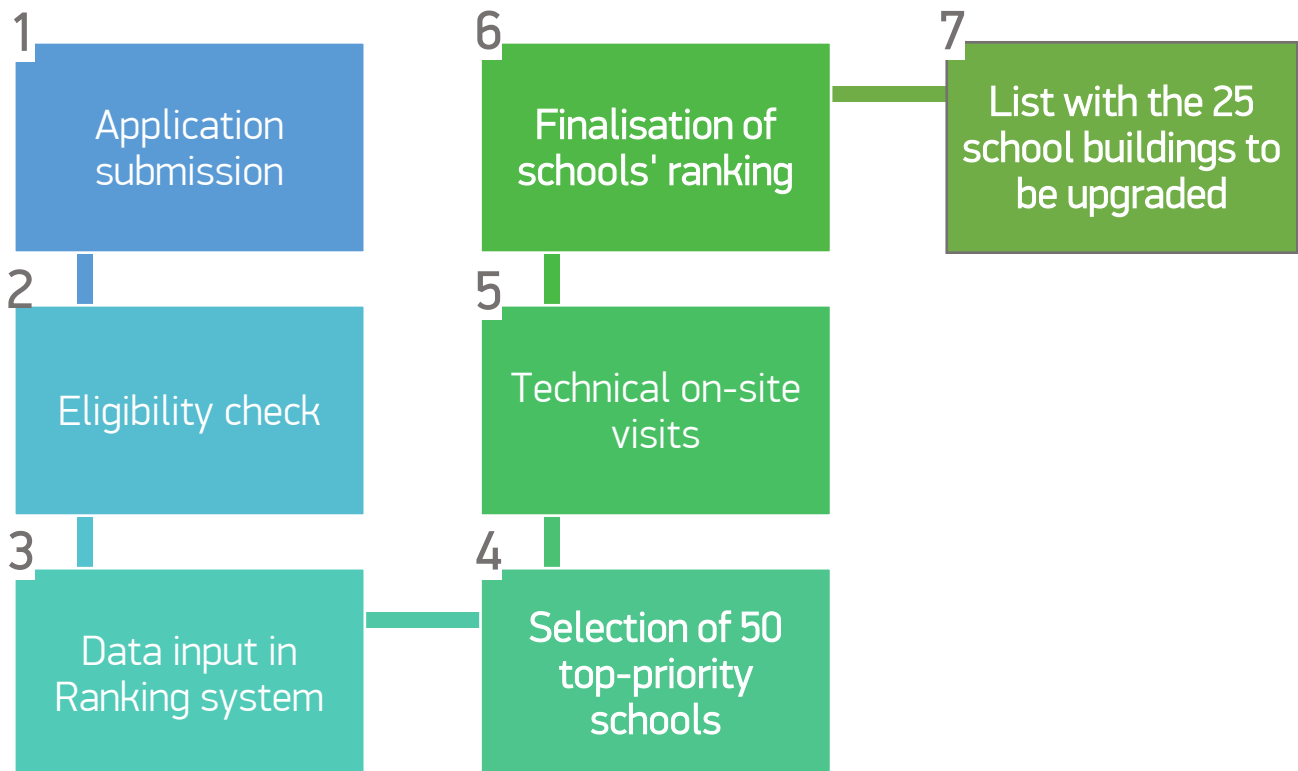
It is noted that from the total of about 730 schools in Cyprus owned by the MoECSY, a number of schools (144) are excluded from the ranking system, and hence from the upgrading process. These include:

- New schools (with built permit after 1/1/2010) that fall within the energy categories B, B+ and A on the Energy Performance Certificate.
- Schools that have already undergone energy upgrades in the past and fall within the energy categories B, B+ and A on the Energy Performance Certificate.
- Schools that have an anti-seismic upgrade planned or under study, that will include measures for their energy upgrading leading to higher Energy categories according to the Energy Performance Certificate.



It is noted that the ranking system was built to be highly adjustable, facilitating its utilisation for similar tasks, such as large-scale energy renovations of public buildings of different types.

This sub-task will be followed by sub-task 2.1.2 for the pilots' selection, ranking the schools in order to identify the 50 top-priority schools as a first ranking step. The project partners will then proceed with technical on-site visits at the 50 schools, which will be used to collect additional data in order to complete the ranking system and finalise the list with the 25 school buildings to be upgraded, within the framework of the project. The graph below illustrates the selection methodology PEDIA will follow to identify the 25 schools.



Graph 1: Selection methodology for the 25 school buildings



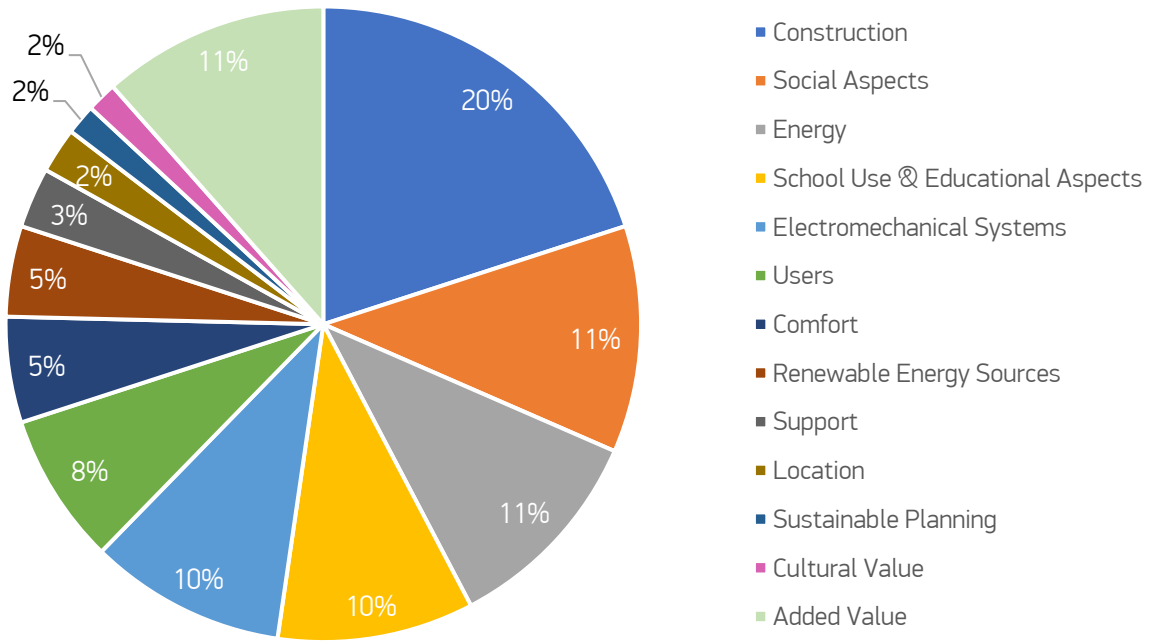
3. Analysis of the Ranking Tool

The tool is built in an Excel spreadsheet and therefore the analysis provided below, describes the methodology for the assessment of the applicant schools. To ensure a holistic approach, the assessment is divided into 13 assessment areas with weighted allocated points, depending on their importance to the implementation of the project. It is noted that one category, the 'Type of school', does not have allocated points, as a separate assessment will take place, ensuring that the number of schools selected within the 25 from each type of school, is proportional to the actual percentage from the whole school stock. The final result will be a total of points, with the highest collections of points indicating the highest priority for energy upgrading of a school building. The maximum available points for a school to obtain are **650**.

Table 3-1: Assessment areas of the ranking tool

Assessment Area	Points	Proportion
Construction	130	20%
Social Aspects	75	11.5%
Energy	70	11%
School Use & Educational Aspects	65	10%
Electromechanical Systems	65	10%
Users	50	7.5%
Comfort	35	5.5%
Renewable Energy Sources	30	4.5%
Support	20	3%
Location	15	2.5%
Sustainable Planning	10	1.5%
Cultural Value	10	1.5%
Added Value	75	11.5%
Type of School	n/a	n/a
Total available points	650	100%





Graph 3-1: Allocation of total points per assessment area



3.1 Construction

The construction area consists of sub-categories as indicated below. The total available max points are 130.

3.1.1 Building area

Explanation

The building area is proportional to the cost for renovation, but also proportional to the energy consumption of the school buildings. In general, the energy upgrading of larger buildings will have a greater impact. To ensure an equal comparison, a specific scale for building area was created for each type of school.

Assessment

Assessment criteria	Condition	Specific assessment	Score
Building area (Kindergarten)	-	0-200	2
	-	201-400	4
	-	401-600	6
	-	601-800	8
	or	-	801+
Building area (Primary School)	-	0-500	2
	-	501-1000	4
	-	1001-2000	6
	-	2001-3000	8
	or	-	3001+
Building area (Secondary School)	-	0-1500	2
	-	1501-3000	4
	-	3001-4500	6
	-	4501-6000	8
	or	-	6001+
Building area (High School)	-	0-2500	2
	-	2501-5000	4
	-	5001-7500	6
	-	7501-10000	8
	or	-	10001+
Building area (Technical School)	-	0-3500	2
	-	3501-7000	4
	-	7001-10500	6
	-	10501-14000	8
	-	14001+	12

Total max points: 12



3.1.2 Types of facilities additional to classrooms and admin

Explanation

Facilities such as labs, multipurpose rooms and other spaces, such as cooking rooms, laundry rooms etc, have a different consumption profile to typical classrooms and admin offices, with often specialised equipment that has high energy demand.

Assessment

Assessment criteria	Condition	Specific assessment	Score
Types of facilities additional to classrooms and admin	-	Labs	add 3
	-	Multipurpose	add 4
	-	Other	add 3
			Total max points: 10

3.1.3 Year of Construction

Explanation

Older buildings which do not fall within the high cultural value category, are typically less energy efficient and present thermal comfort issues. Buildings constructed after 2008 were obliged to install thermal insulation, whereas from 2010 until 2015 the regulations regarding the energy performance became stricter, leading to the most recent standards that have minimal room for improvement with regards to energy efficiency.

Assessment

Assessment criteria	Condition	Specific assessment	Score
Year of Construction	-	Before 1950	10
	-	1951-1960	9
	-	1961-1974	8
	-	1975-1995	7
	-	1996-2007	5
	-	2008-2010	2
	-	2010+	EXCLUDED
			Total max points: 10

3.1.4 Year of Renovation

Explanation

Buildings that have been renovated before 1990 are unlikely to have taken energy efficiency into consideration. Buildings that have been renovated between 1990-2009 might have taken some measures (e.g. double glazing or roof insulation) and buildings that were renovated after 2010, were legally obliged to improve the energy performance on big scale renovations.



Assessment

Assessment criteria	Condition	Specific assessment	Score
Year of Renovation	-	Before 1990	8
	-	1990-2009	5
	-	after 2010	0
			Total max points: 8

3.1.5 New buildings area

Explanation

In the case that the building has not been extended, the general approach for energy efficiency measures is more integrated, making the energy renovation more straight forward and the investment more attractive. New building areas decrease the attractiveness of the renovation as they make it more complicated and less financially and energy sound. This however, depends on the year the new areas were built, as after 2014, the legislation forced the buildings to consider energy efficiency measures which are close to today's standards and thus reduce the cost of the full renovation. Buildings with large percentage of new areas regardless the year of construction make the investment for energy upgrading less attractive.

Assessment

Assessment criteria	Condition	Specific assessment	Score
New buildings (extensions and additions)	YES		0
	NO		20
New buildings area before 2010	-		5
New buildings area 2010-2014	-	0-10%	5
	-	11-30%	4
	-	31-50%	2
	-	51%+	0
New buildings area after 2014	-	0-10%	2
	-	11-30%	8
	-	31-50%	5
	-	51%+	2
			Total max points: 20

3.1.6 Already installed double-glazing [before 2017]

Explanation

Double-glazing before 2017 is unlikely to meet the NZEB standards but is also financially unattractive to replace due to their high cost and to the minimum impact they will have on the overall energy performance.



Assessment

Assessment criteria	Condition	Specific assessment	Score
Already installed double-glazing [before 2017]	YES	-	0
	NO	-	10
	-	0-25%	8
	-	26-50%	4
	-	above 50%	0
Total max points: 10			

3.1.7 Already installed thermal insulation on the roof [before 2017]

Explanation

Buildings with roof thermal insulation installed before 2017, do not present an ideal scenario for energy upgrading as it is one of the most cost-effective measures and replacing existing insulation is not common practice. Moreover, since the NZEB standards and the requirements of the new legislation are stricter in terms of the overall heat transfer coefficients, existing thermal insulation in high percentage does not meet the current standards, and at the same time it does not leave much space for improvement.

Assessment

Assessment criteria	Condition	Specific assessment	Score
Already installed thermal insulation on the roof [before 2017]	YES		0
	NO		10
	-	0-25%	6
	-	26-50%	4
	-	51-70%	2
	-	above 70%	0
Total max points: 10			

3.1.8 Anti-seismic upgrade

Explanation

The anti-seismic upgrading of schools is an ongoing process. The MoECSY in the past few years combines the anti-seismic upgrades with energy efficiency upgrades (budget is already allocated), therefore PEDIA will not see into buildings that are planned to undergo this upgrading. Older buildings that have been anti-seismically upgraded without implementing energy upgrades are the most suitable for the project's activities.

Assessment

Assessment criteria	Condition	Specific assessment	Score
Anti-seismic upgrade	YES	-	10
	NO	-	5
	PLANNING	-	0
Total max points: 10			



3.1.9 Visual structural and building issues

Explanation

Buildings with structural issues will require a higher budget and expertise beyond the energy audits to be upgraded and therefore are less attractive to be included within the project. Building issues that are visible but less critical can be addressed within the renovation and hence, provide an overall improvement without an additional financial burden.

Assessment

Assessment criteria	Condition	Specific assessment	Score
Visible structural issues	YES	-	0
	NO	-	15
Visible building issues	YES	-	10
	NO	-	0

Total max points: 25

3.1.10 Standardised design

Explanation

Schools designed by the Ministry's Technical Services are bigger in numbers and have standardised design, therefore providing the opportunity for replication.

Assessment

Assessment criteria	Condition	Specific assessment	Score
Standardised design	YES		5
	NO		0

Total max points: 5

3.1.11 Previous implementation of other Energy Efficiency measures

Explanation

When other energy efficiency measures besides the aforementioned, have been implemented, any further investment is less desirable as the measures will be more fragmented and away from a holistic approach.

Assessment

Assessment criteria	Condition	Specific assessment	Score
Previous implementation of other Energy Efficiency measures	YES	-	0
	NO	-	10

Total max points: 10



3.2 Social Aspects

Explanation

Social aspects are high on the agenda of the project, since the energy renovations are just the first step to achieve the long-term vision of the project for improving the quality of education within the public school. The project aims to improve the infrastructure of the public education in order to enhance the sustainable education through embracing the multicultural approach, and by providing equal opportunities to students from different social classes. Moreover, a newly renovated school is also more likely to attract (and keep) students and young people of various backgrounds in an area, reducing the depopulation or the gentrification of these areas.

Assessment

Assessment criteria	Condition	Specific assessment	Score
Special Education schools	YES	-	25
	NO	-	0
Multicultural schools	YES	-	5
	NO	-	0
Gentrification of the Area	YES	-	0
	NO	-	5
Depopulation of the Area	YES	-	0
	NO	-	5
Schools in close proximity to buffer zone	YES	-	10
	NO	-	0
Areas of low income or social housing (refugee settlements)	YES	-	10
	NO	-	0
Impact on the community (regional schools)	Very Important	-	15
	Important	-	5
	Less Important	-	0

Total max points: 75



3.3 Energy

The energy area consists of sub-categories as indicated below. The total available max points are 70.

3.3.1 Yearly Electrical Energy Consumption (kWh/m²)

Explanation

The higher the energy consumption from electricity per m² of the building, the higher the environmental impacts of the project when upgraded.

Note: The range of the specific assessment, were calibrated, re-evaluated and adapted upon the assessment of all available data.

Assessment

Assessment criteria	Condition	Specific assessment	Score
Yearly Electrical Energy Consumption (kWh/m ²)	-	below 5	2
	-	5-14	4
	-	15-24	8
	-	25-34	10
	-	35+	15
			Total max points: 15

3.3.2 Yearly Heating Fuel Consumption (L/m²)

Explanation

The higher the heating fuel consumption per m² of the building, the higher the environmental impacts of the project when upgraded.

Note: The range of the specific assessment, were calibrated, re-evaluated and adapted upon the assessment of all available data.

Assessment

Assessment criteria	Condition	Specific assessment	Score
Yearly Heating Fuel Consumption (L/m ²)	-	below 1	2
	-	1-1.9	4
	-	2-2.9	8
	-	3-3.9	10
	-	4+	15
			Total max points: 15



3.3.3 Yearly electrical energy per user (kWh/user)

Explanation

The higher the electricity consumption per user, the higher the energy impact of the proposed measures.

Note: The range of the specific assessment, were calibrated, re-evaluated and adapted upon the assessment of all available data.

Assessment

Assessment criteria	Condition	Specific assessment	Score
Yearly electrical energy per user (kWh/user)	-	below 75	2
	-	75-149	4
	-	150-224	6
	-	225-300	8
	-	300+	10
			Total max points: 10

3.3.4 Yearly heating fuel per user (L/user)

Explanation

The higher heating fuel consumption per user, the higher the energy impact of the proposed measures.

Note: The range of the specific assessment, were calibrated, re-evaluated and adapted upon the assessment of all available data.

Assessment

Assessment criteria	Condition	Specific assessment	Score
Yearly heating fuel per user (L/user)	-	below 10	2
	-	10-19	4
	-	20-29	6
	-	30-39	8
	-	40+	10
			Total max points: 10



3.3.5 Yearly Electricity cost (€/m²)

Explanation

The higher the energy consumption from electricity per m² of the building, the higher the financial benefit of the project when upgraded. In contrast to the electrical energy consumption (kWh/m²) category, the cost may vary depending on the reference consumption year (price fluctuation), as well as appear lower when a net-metering PV system is in place. Consequently, there is a need for a separate assessment of the cost.

Note: The range of the specific assessment, were calibrated, re-evaluated and adapted upon the assessment of all available data.

Assessment

Assessment criteria	Condition	Specific assessment	Score
Yearly Electricity cost (€/m ²)	-	below 2	-
	-	2-2.9	-
	-	3-3.9	-
	-	4-4.9	-
	-	5+	-

Total max points: N/A [indicator for comparison purposes]

3.3.6 Yearly Heating cost (€/m²)

Explanation

The higher the heating fuel consumption per m² of the building, the higher the financial benefit of the project when upgraded. In contrast to the heating fuel consumption (L/m²) category, the cost may vary depending on the reference consumption year (price fluctuation). Consequently, there is a need for a separate assessment of the cost.

Note: The range of the specific assessment, were calibrated, re-evaluated and adapted upon the assessment of all available data.

Assessment

Assessment criteria	Condition	Specific assessment	Score
Yearly Heating cost (€/m ²)	-	below 0.5	-
	-	0.5-1.4	-
	-	1.5-2.4	-
	-	2.5-3.4	-
	-	3.5+	-

Total max points: N/A [indicator for comparison purposes]



3.3.7 Yearly Electricity cost (€/user) & Yearly Heating cost (€/user)

Explanation

These indicators will help identify the schools with a high cost per user and make comparable scenarios.

Note: The range of the specific assessment, were calibrated, re-evaluated and adapted upon the assessment of all available data.

Assessment

Assessment criteria	Condition	Specific assessment	Score
Yearly Electricity cost (€/user)	-	below 20	2
	-	20-29	4
	-	30-39	6
	-	40-49	8
	-	50+	10
Yearly Heating cost (€/user)	-	below 5	2
	-	5-14	4
	-	15-24	6
	-	25-34	8
	-	35+	10
Water Consumption (m ³ /user)	Observation only	N/A	N/A

Total max points: 20



3.4 School Use & Educational Aspects

The school use and the educational aspects are indicated below. The total available max points are 65.

3.4.1 School use

Explanation

Schools that are used beyond the typical school timetable, have excess energy demands and present a bigger opportunity for energy savings. In addition to the energy savings these schools have a better payback period, once the energy saving measures are introduced and thus, they are more attractive for investments.

Assessment

Assessment criteria	Condition	Specific assessment	Score
Used for all-day school or DRASE (Extracurricular activities)	YES	-	10
	NO	-	0
Used for other purposes (AGO, Training Courses etc)	-	Training courses	add 5
	-	AGO, Dance, Clubs etc	add 5
	-	None	0
Used in the afternoon (Classrooms, Labs and Other)	-	up to 2	0
	-	3-5	4
	-	5-7	6
	-	8-10	8
	-	more than 10	10
Used in the afternoon (Multipurpose)	YES	-	2
	NO	-	0
Used for summer classes	YES	-	10
	NO	-	0
Used for summer classes (Number of spaces)	-	up to 2	0
	-	3-5	3
	-	more than 5	5

Total max points: 47

3.4.2 Educational Aspects

Explanation

Schools that have the environment high on their educational agenda, are considered more likely to combine the energy renovations with additional activities and educational tools. These will be used for raising awareness on energy saving and climate change adaptation and mitigation, increasing the project's impact and ensuring the longevity of the results. Active and sensitized staff are also very important for identifying suitable measures through the energy audits and for achieving a maximum impact of energy renovations. It is common for schools that are implementing these awareness activities, to utilise differently their premises which also includes extra-curricular activities beyond the regular timetable.



Assessment

Assessment criteria	Condition	Specific assessment	Score
Environmental Education Activities	YES	-	10
	SOME	-	5
	NO	-	0
Active and sensitized staff	YES	-	8
	NO	-	0

Total max points: 18



3.5 Electromechanical Systems

The Electromechanical Systems area consists of sub-categories as indicated below. The total available max points are 65.

3.5.1 Boiler condition

Explanation

In the case a boiler needs replacement, it will pose an additional cost to the renovations. Boilers in good condition with slight adjustment needs provide a low-cost (soft) measure with high energy saving potential.

Assessment

Assessment criteria	Condition	Specific assessment	Score
Boiler condition	-	Sufficient	5
	-	Needs replacement	0

Total max points: 5

3.5.2 Presence of AC in school spaces

Explanation

The project will examine the solutions for passive cooling, since the use of AC in the classrooms is not permitted by the technical specifications for school buildings. When there is a need for achieving thermal comfort conditions in the summer, fans are usually installed in classrooms, ensuring an adequate air quality and lower indoor temperatures. Where there are already installed fans, it is expected that the cost for energy interventions will be lower, thus preferable. In the cases where AC systems are installed in classrooms, those intervene with the project's proposed solutions which focus on improving the indoor air quality with passive strategies or with soft measures. On the other hand, AC systems in administrative rooms, labs and special education classes (which is included in the technical specifications), decrease the cost for AC installation through the project, making them more preferable.

Assessment

Assessment criteria	Condition	Specific assessment	Score
Presence of AC in Staff rooms	YES	-	5
	NO	-	0
Presence of AC in Classrooms	YES	-	0
	NO	-	5
Presence of AC in Laboratories	YES	-	5
	NO	-	0
Presence of AC in Special Education	YES	-	5
	NO	-	0
Fans cooling system	YES	-	10
	NO	-	0

Total max points: 30



3.5.3 Hot Water

Explanation

Hot water is mostly available in kindergartens, in schools with showers, and in specific school spaces such as toilets, canteens, cooking rooms, infirmaries, kitchen etc. In general, there is a great variation among the systems that are installed in schools, as there are no specific guidelines or restrictions for the system's selection. Solar thermal systems are more preferable as they proved to be sufficient for Cyprus' climate. Systems connected to the heating system and combinational systems are also more preferable in terms of energy savings and environmental impact.

Assessment

Assessment criteria	Condition	Specific assessment	Score
Hot Water	-	Solar Thermal	7
	-	Electric water heater	0
	-	Instantaneous heater	2
	-	Connected to the heating system	5
	-	Combination	5
	-	No system	0

Total max points: 7

3.5.4 Well established maintenance and inspection plans

Explanation

In the cases where schools have in place well established maintenance and inspection plans provide additional benefits for energy renovations, since the already installed systems are in better conditions and because in the case of new installations, those will be preserved more efficiently. This also implies a higher readiness level for the adoption of energy management system.

Assessment

Assessment criteria	Condition	Specific assessment	Score
Well established maintenance and inspection plans	YES	-	10
	NO	-	0
	Periodic maintenance	-	5

Total max points: 10

3.5.5 Equipment

Explanation

Schools usually have typical equipment which includes computers, smart boards, projectors, copying and printing machines, small fridges and limited number of microwaves and cooking ovens. Nonetheless, kindergartens, technical schools, and schools with a significant number of labs, require more specialized equipment which consumes higher energy. In these cases, the higher energy demand and consumption is to be taken into consideration.



Assessment

Assessment criteria	Condition	Specific assessment	Score
Equipment	-	Typical Consumption	0
	-	High Consumption	3

Total max points: 3

3.5.6 Percentage of LED lights**Explanation**

Lighting system upgrading is considered one of the most financially sound measures and the ones that ESCOs will consider investing in, and therefore already installed LED systems, will reduce the potential energy savings.

Assessment

Assessment criteria	Condition	Specific assessment	Score
Percentage of LED lights	YES	-	0
	NO	-	10
	-	0-25%	6
	-	26-50%	4
	-	51-70%	2
	-	above 70%	0

Total max points: 10



3.6 Users

Explanation

The higher the number of users the bigger impact the project will have. Schools that less than 25 students are excluded from the project's purposes due to the high risk of shutting down permanently. In the cases where the schools terminate their operation, the facilities are no longer under the responsibility of MoECSY, hence there is a high investment risk. Moreover, an almost equal female to male ratio, ensures an equal impact of the project. Lastly, classrooms with high student density are more susceptible to low indoor air quality.

To ensure an equal comparison, a specific scale for the number of students was created for each type of school.

Assessment

Assessment criteria	Condition	Specific assessment	Score
Number of total School users	-	below 100	4
	-	100-149	5
	-	150-299	6
	-	300-449	7
	-	450-599	8
	-	600-799	10
	-	800+	15
Number of Staff	-	below 14	4
	-	15-24	5
	-	25-34	6
	-	35-44	7
	-	45-59	8
	-	60-79	9
	-	80+	10
Number of Students (Kindergarten)	-	below 20	EXCLUDED
	-	20-29	4
	-	30-39	5
	-	40-49	6
	-	50-59	7
	-	60-69	8
	-	70-79	10
or	-	80+	12
Number of Students (Primary School)	-	below 25	EXCLUDED
	-	25-49	4
	-	50-99	5
	-	100-149	6
	-	150-199	7
	-	200-249	8
	-	250-299	10
	-	300+	12



or			
Number of Students (Secondary School)	-	below 50	EXCLUDED
	-	50-99	4
	-	100-199	5
	-	200-299	6
	-	300-399	7
	-	400-499	8
	-	500-599	10
	-	600+	12
or			
Number of Students (High School)	-	below 50	EXCLUDED
	-	50-99	4
	-	100-249	5
	-	250-399	6
	-	400-549	7
	-	550-699	8
	-	700-849	10
	-	850+	12
or			
Number of Students (Technical School)	-	below 50	EXCLUDED
	-	50-149	4
	-	150-299	5
	-	300-449	6
	-	450-599	7
	-	600-749	8
	-	750-899	10
	-	900+	12
Ratio of School female to male [students]	-	45-55%	3
	-	other	0
Student Density per classroom (student/classroom)	-	below 15	0
	-	15-25	5
	-	above 25	10

Total max points: 50



3.7 Comfort

Explanation

Schools that present comfort issues are a priority for the project. Through the energy efficiency upgrades the project aims in increasing the level of comfort of the users and thus increase their productivity levels. Common comfort issues include thermal discomfort in summer and winter, acoustic discomfort, visual discomfort and poor indoor air quality.

Assessment

Assessment criteria	Condition	Specific assessment	Score
Summer thermal comfort Issues	YES	-	9
	NO	-	0
Winter thermal comfort issues	YES	-	9
	NO	-	0
Acoustic comfort issues	YES	-	3
	NO	-	0
Visual comfort issues	YES	-	2
	NO	-	0
Indoor air quality	YES	-	12
	NO	-	0

Total max points: 35



3.8 Renewable Energy Sources

Explanation

The availability for the installation of PVs on school buildings is one of the most important criteria for a building to reach NZEB level. Several schools have already installed PV systems, but some issues may arise from this. In some cases, schools are unable to expand their system to cover a larger percentage of energy consumption. In other cases, schools that have installed PV under one scheme, cannot change into another scheme such as net-metering or net-billing due to their contractual agreement. The availability of roof area for the installation of the PV system is also of high importance since there is usually no available area besides the roof. The participation of the schools to the Electricity Authority of Cyprus [EAC] scheme is considered positive as it will decrease the investment cost for the implementation of the project.

Assessment

Assessment criteria	Condition	Specific assessment	Score
Participation in RES scheme (contract)	YES	-	0
or	NO	-	5
Participation in RES scheme (net-metering)	YES	-	5
or	NO	-	0
Participation in RES scheme (net-billing)	YES	-	5
	NO	-	0
Participation in RES scheme (EAC)	YES	-	5
	NO	-	0
Available area for RES	YES	-	15
	NO	-	0

Total max points: 30



3.9 Support

The support area consists of sub-categories as indicated below. The total available max points are 20.

3.9.1 Potential financial support by Local Authority

Explanation

Financial support by other means will aid in the development of the project.

Assessment

Assessment criteria	Condition	Specific assessment	Score
Potential financial support by Local Authority	-	None	0
	-	Low (0-5%)	4
	-	Medium (5-9%)	8
	-	High (above 10%)	10

Total max points: 10

3.9.2 Readiness for support by School Board

Explanation

School boards have an important role within the project as they handle the finances of the school. Furthermore, an active school board will be more likely to successfully manage the implementation of the ISO 50001.

Assessment

Assessment criteria	Condition	Specific assessment	Score
Readiness for support by School Board	-	None	0
	-	Low	4
	-	Medium	8
	-	High	10

Total max points: 10



3.10 Location

Explanation

Cyprus is divided into 4 climate zones. Climate zone 4 (mountainous) has significantly different climate conditions than the other 3 zones, experiencing much colder winters with higher demand in heating. Furthermore, the majority of areas in climate zone 3 (semi-mountainous) and almost all areas in climate zone 4, are more sparsely populated and experience desertification as the population reduces. These areas also have school buildings which are non-typical in relation to the rest of the school building stock.

Assessment

Assessment criteria	Condition	Specific assessment	Score
Climate Zone 1 (coastal)	-	-	N/A
Climate Zone 2 (lowland)	-	-	N/A
Climate Zone 3 (semi-mountainous)	-	-	5
Climate Zone 4 (mountainous)	-	-	10

Total max points: 10



3.11 Sustainable planning

Explanation

A number of Local Authorities [LA's] have committed in reducing their CO2 emissions in a voluntarily basis by implementing Sustainable Energy Action Plans [SEAPs] or Sustainable Energy and Climate Action Plans [SECAPs]. The SEAPs/SECAPs consider the consumption in all sectors of the area which also includes the schools. Furthermore, some kindergartens are owned (but not managed) by the LAs, which may provide additional motivation to the LAs to commit budget for school renovation projects. On another aspect, LAs which have the environment high in their agenda and might have other initiatives in place, such as the regeneration of urban environment, are considered to have more possibilities to support schools' upgrades.

Assessment

Assessment criteria	Condition	Specific assessment	Score
No plan in place	-	-	0
Local Authority has a SEAP or other plan in place	-	-	5
Local Authority has a SECAP	-	-	10

Total max points: 10



3.12 Cultural Value

Explanation

Buildings with high cultural value which are under conservation status (listed buildings or ancient monuments), present less opportunities for interventions and therefore will be difficult to reach NZEB level. Large interventions may alter their heritage character and hence are less attractive for big scale renovations. However, some of these schools may have a percentage of extensions that present a large space for improvements therefore they provide room for action.

Moreover, in some cases, there are buildings with significant cultural value, which are not officially protected (declared), therefore they can undergo energy renovations in respect to their character, contributing to their energy upgrade and, at the same time, highlighting their cultural value.

Assessment

Assessment criteria	Condition	Specific assessment	Score
Listed Building/Ancient Monument [declared]	YES	-	N/A
	NO	-	N/A
Listed Building/Ancient Monument Area	-	below 20%	10
	-	21-40%	8
	-	41-60%	4
	-	61-90%	2
	-	91-100%	0
Not declared building but important cultural value	YES	-	10
	NO	-	0

Total max points: 10



3.13 Added Value

The Added Value area consists of sub-categories as indicated below. The total available max points are 75.

3.13.1 Planned energy upgrading up to 2023

Explanation

The Technical services of the MoECSY have already planned energy and anti-seismic renovations in a number of schools. These schools are preferable to be avoided since there might not be enough time to implement the energy audits and decide the suitable measures. Furthermore, double funding for one school building should be avoided.

Assessment

Assessment criteria	Condition	Specific assessment	Score
Planned energy upgrading up to 2023	YES	-	0
	NO	-	5
Total max points: 5			

3.13.2 Solutions' applicability

Explanation

Further to the typical energy saving measures, some schools may provide the opportunity for other soft measures or the testing of innovative solutions which will complement the energy efficiency upgrading and can act as educational tools.

Assessment

Assessment criteria	Condition	Specific assessment	Score
Possibility for green roof (accessibility)	YES	-	10
	NO	-	0
Flexibility of reshaping outdoors area (garden)	YES	-	10
	NO	-	0
NZEB feasibility	YES	-	20
	NO	-	0
Vegetation presence (bioclimatic)	YES	-	5
	NO	-	0
Shading presence	YES	-	5
	NO	-	0
Total max points: 50			



3.13.3 Previously audited through TEESCHOOLS project

Explanation

The TEESCHOOLS project has already examined 5 school buildings which have shown willingness to improve. Energy audits were implemented in these schools providing energy saving measures and the baseline on which PEDIA was built, thus putting the schools on the front-foot for faster implementation of the project.

Assessment

Assessment criteria	Condition	Specific assessment	Score
Previously audited through TEESCHOOLS project	YES	-	20
	NO	-	0

Total max points: 20



3.14 Type of school

Explanation

The type of schools to be selected needs to have all the levels variation and cover a percentage relative to the total percentage of the school building stock with regards to education levels (types of schools).

Special education schools represent all educational levels, but to their particularity and the strong community impact, they are included in the 'Social Aspects' category and are awarded with additional points.

Assessment

Assessment criteria	Condition	Specific assessment	Score
Kindergarten	-	-	N/A
Primary school	-	-	N/A
Secondary school	-	-	N/A
High school	-	-	N/A
Technical school	-	-	N/A
Special Education	-	-	N/A under this category

Total max points: N/A





Cyprus
Energy
Agency



MINISTRY OF EDUCATION, CULTURE
SPORT AND YOUTH



ΜΟΝΑΔΑ ΕΚΠΑΙΔΕΥΣΗΣ
ΓΙΑ ΤΟ ΠΕΡΙΒΑΛΛΟΝ ΚΑΙ
ΤΗΝ ΑΕΙΦΟΡΟ ΑΝΑΠΤΥΞΗ

October 2020 [Updated: April 2021]

Disclaimer: The sole responsibility for the content of this document lies with the PEDIA project and does not necessarily reflect the opinion of the European Union.

