ESMES – Energy Smart Mediterranean Schools Network

WP3: Institutional capacity building for sustainable energy policy making & rehabilitations management

Task: Each PP, with support of the National Energy Hub, **reviews current policies, procedures, strategies for rehabilitations management** in its country.

Regulation: type and name	National or Regional Level	Summary	Impact	Current Status	Comments
Law & Bylaw Renewable Energy and Energy Efficiency Law (Law. No. 13 for the year 2012) and Bylaw No. 73 for the year 2012 on regulating energy conservation and	National - Jordan	As a result of passing the Renewable Energy and Energy Efficiency Law No. 13 for the year 2012, a directive on regulating the procedures pertaining to energy efficiency and conservation practices was passed. This directive stresses adherence of consumers (which use more than 50 thousand tons of oil equivalent of energy annually) to energy efficiency building codes (detailed below), as well as energy efficient/conservation practices. It also dictates that these consumers conduct energy audits on an ongoing basis to ensure that highest energy efficiency practices are being utilized.	Ensuring energy efficient practices are integrated and enforced for a specific consumer segment.	Active	

efficiency procedures					
National Action Plan Green Growth National Action Plan	National - Jordan	Includes national actions to implement a number of EE upgrades in public buildings in Jordan and the residential sector.	Nationwide effort to implement energy efficiency strategies in existing buildings.	This action plan covers the years 2021 - 2025. Thus, its implementation is still in progress.	
National Action Plan Energy Efficiency Midterm Action Plan (NEEAP)	National - Jordan	The NEEAP has established coherent measures tackling issues pertaining to energy supply by managing demand efficiently. It has set targets for energy saving until the year 2020 and proposed a variety of measures for the following sectors: residential, commercial, services, industrial, water pumping, street lighting, municipal level, and transport sectors. The measures deal with both	NEEAP has been developed for the implementation of good practice standards in the matter of policy making for energy efficiency, as well as set targets to achieve energy efficiency targets.	Covered 2017-2020. Further work is needed, in the energy conservation sector.	

		demand and supply. For example, one target was to reduce energy usage by 15% in Jordanian public buildings.			
Guide Jordan Green Building Guide	National - Jordan	The Green Building Guide develops local green building assessment tools that suit the context of Jordan environmentally, socially, and economically with the aim to provide a basis for designing sustainable buildings. It contains parameters and credits that are suitable for Jordan's climate, resources, legislation, policies & policies instrument, building techniques and strategies. This Guideline is attached to a voluntary rating system that is connected to an incentive scheme given by the government.	This Guide develops a comprehensive and integrated approach to set a sustainable building performance and achieve building sustainability.	Published in 2013. A rating system for existing buildings is currently being developed.	
Jordanian National Building Codes Thermal Insulation Code and Thermal Insulation Manual	National - Jordan	The Thermal Insulation Code defines building thermal design principles and the methods for calculating the thermal characteristics of different structural elements. Additionally, it sets the minimum thermal requirements for these elements (design requirements). The Thermal Insulation Manual is an explanatory guide for the original Thermal Insulation Code. It provides information about thermal insulation	These resources facilitate the best selection of different structural elements by engineers to achieve thermal comfort in buildings.	The Thermal Insulation Code was first issued in 1985. A second edition was developed and published in 2009. The Manual was published in 2018. However, Jordanian building codes are generally not entirely implemented in	

		materials available in the Jordanian market, basis for their selection, strategies for implementation, and practical solutions and methods for insulating buildings that meet the requirements of the Jordanian Thermal Insulation Code. It discusses solutions to improve thermal insulation in existing buildings.		the construction sector for reasons that include lack of awareness and the high initial costs associated with implementing the required codes.	
Jordanian National Building Codes Energy Efficient Buildings Code and Energy Efficient Buildings Manual	National - Jordan	The Energy Efficient Buildings Code provides minimum requirements for energy efficiency in buildings in the design, construction, operation and maintenance phase of the building. It also includes a mechanism to verify the application of the code requirements. The Code includes requirements for new systems and devices in all existing buildings too.	The Energy Efficient Buildings Code aims to lower energy consumption in buildings and improve thermal performance. By providing guidelines, minimum requirements, and standards for all buildings, engineers and architects are able to make evidence-based decisions when designing and retrofitting buildings to maximize energy efficiency.	The Energy Efficient Buildings Code was published in 2010 and is currently being updated.	
Jordanian National Building Codes	National - Jordan	This Code provides data for specialists, engineers, and designers on the importance of daylight in design, methods for calculations, methods for control, and energy saving potential from using natural light instead of artificial electric lighting.	Evidence-based decisions when designing and retrofitting lighting in buildings to maximize energy efficiency.	This code was first published in 1992. A second edition was developed in 2018.	

Natural Lighting Code		This Code includes requirements that apply to existing buildings (modification and extension)			
Jordanian National Building Codes Natural Ventilation Code	National - Jordan	The Code provides requirements and design methodology to incorporate natural ventilation mechanisms when designing and retrofitting buildings. This Code requires that existing buildings are adjusted to fit the requirements (without energy consumption increase).	Evidence-based decisions when designing and retrofitting building ventilation to lower energy consumption.	This code was first published in 1992. A second edition was developed in 2020.	
Jordanian National Building Codes Central Heating Code	National - Jordan	The Code includes everything related to the design, implementation, and operation of central heating systems that use hot water, and the use of devices and equipment such as section radiators and underfloor heating systems. It aims to provide ways to reduce energy consumption by organizing design, construction, installation, quality of materials, location, operation, maintenance and control in central heating systems. Retrofitting existing buildings can be based on this code.	Evidence-based decisions when designing and retrofitting building central heating systems to lower energy consumption. The Code aims to provide the minimum requirements for comfort and public health and safety when designing central heating systems.	This code was first published in 1990. A second edition was developed in 2018.	
Jordanian National Building Codes	National - Jordan	This Code includes information needed to carry out the work of designing mechanical ventilation and air conditioning systems for buildings and facilities, implementing, installing, testing and operating	This Code aims to provide the minimum requirements for comfort, health, general safety and security resulting from mechanical ventilation systems and air	This code was first published in 1988. A second edition was developed in 2018.	

Mechanical Ventilation and Air Conditioning Code		them. Retrofitting existing buildings can be based on this code.	conditioning for space while achieving energy saving.		
Guide Building Envelope Retrofits for Optimising Energy Efficiency & Thermal Comfort in Jordan	National - Jordan	The main target of this Guide is to fill the gap of knowledge concerning energy retrofitting existing buildings in Jordan by creating referencing material that addresses and focuses on the main pillars of the energy retrofit of the existing building envelope in Jordan. It identifies the current building envelope technologies, documents them through drawings, and calculates their performance for thermal transmittance. Secondly, it includes guidelines/strategies for retrofitting the main components of building envelopes to be used by building stakeholders, including professionals working in the construction sector and the government, which develops policies on this issue. In addition, the Guide highlights the importance of paying more attention to retrofits, as they offer a significant potential for reducing energy usage on a	This Guide promotes the green building/sustainability movement in Jordan (and the surrounding region) as a viable business opportunity by demonstrating facts, figures and success stories. The Guide highlights economic benefits by showing numbers on the initial costs and the reduction of operational costs, payback periods, impact on occupants' health and productivity. Understanding why it is important to retrofit existing buildings will kick off the community's effort to move towards a green society. The retrofitting of existing buildings is a realistic, economically smart, and feasible way to enhance buildings not only aesthetically, but for one's health, as the smallest retrofitting changes reap big results.	Published in 2018 by the Jordan Green Building Council, a cross-sector non-governmental not for profit organization founded in 2009 in Jordan–Amman reporting to both ministries of social development and of environment.	

		countrywide scale and, therefore, reducing GHG emissions.			
European Energy Policy	European - Italian	Defines a climate and energy action plan for the EU, proposed by the European Commission in 2007 as an integrated package of measures.		Active	
2020 Package	European - Italian	The package sets three key targets: 20% cut in greenhouse gas emissions (from 1990 levels) 20% of EU energy from renewables 20% improvement in energy efficiency The targets were set by EU leaders in 2007 and enacted in legislation in 2009.		Active	
The EU Covenant of Mayors for Climate & Energy	European - Italian	Brings together thousands of local governments voluntarily committed to implementing. The Covenant of Mayors was launched in 2008 in Europe with the ambition to gather local governments voluntarily committed to achieving and exceeding the EU climate and energy targets. Not only did the initiative introduce a first-of-its-kind bottom-up approach to energy and climate action, but its success quickly went beyond expectations. The initiative now gathers 9,000+ local and regional authorities across 57 countries drawing on the	The signatory cities undertake to support the implementation of the EU target of a 40% reduction in greenhouse gases by 2030, and the adoption of a common approach to tackling climate change mitigation and adaptation.	Active	

		strengths of a worldwide multi-stakeholder movement and the technical and methodological support offered by dedicated offices. *https://www.eumayors.eu/about/covenant-initiative/origins-and-development.html*			
The Italian Energy Policy	Italian	Public administration has a strategic and exemplary role in energy efficiency: - at a central level: it exercises institutional functions for energy efficiency policies - at territorial level: it implements specific energy policies for the implementation of interventions and in the management and use of resources.	At the same time, the public administration is itself one of the sectors with the highest energy consumption and is obliged to adopt virtuous behavior. According to the most recent data the annual expenditure incurred by the PA is around €8.9 billion (source: Consip 2018 elaborations on data from the Ministry of Economic Development, Milan Chamber of Commerce, Arera, Terna, Enea, GME, EEX, TTF) "Consip and the energy efficiency of PA".) From 2019 all new public buildings will have to comply with European parameters, adapting to the nZEB - Nearly Energy Zero Building - standard with very high performance levels.	Active	

Climate Change and Energy Transition Law.	National - Spain	Spanish Climate Change Law aims to reach a emissions neutral status in carbon dioxide (CO2) in 2050. This law also establishes that by 2050, the electrical system will be 100% renewable. One of the 6th main pillars of this law is urban planning and transport, where is included the rehabilitation of existing buildings. That is the reason why main measures are concentrated in the field of energy renovation of buildings, another key segment in the economic reactivation plan that, in addition, is a pillar of the fight against energy poverty. According to the law, the Government will promote and facilitate the efficient use of energy and the use of renewable sources in buildings, aligning with the long-term Strategy for the renovation of buildings with the objectives of the successive INECP strategies.	Energy efficiency and renewable energy. Climate change adaptation. Biodiversity.	Approval is underway.	The Law is expected to be approved on 2021.
Law 8/2013, 26th June, on urban refurbishment	National - Spain	The aim is to boost the refurbishment of buildings and urban areas as a means of reconverting the traditional construction sector as long as promoting the sustainable development including energy efficiency criteria.	Energy efficiency and renewable energy in buildings and urban areas	Came into force on 28th June 2013	

		The present law set up the so-called "Building Evaluation Report" that will show the level of conservation of the buildings and the energy efficiency (other issues included but not relevant for our project objectives) as mandatory in the European Directives 2002/91/EC and 2010/31/EU. This Spanish new law provides certain deadlines to dispose of the Building Evaluation Report such as: a) Collective residential buildings typology older than 50 years, must have the report prepared in five years (since the date building reaches that age) b) All buildings which are going to be refurbished using public funds/subsidies c) Other kind of buildings depending on regional or local regulations			
RD 235/2013 5 April, approving the basic procedure for energy efficiency certification of buildings.	National - Spain	RD 235/2013 establishes the obligation to make available purchasers and/or users of buildings an energy performance certification document. The referred certificate must include information about the energy efficiency of a building and reference values such as minimum energy efficiency requirements (for owners or tenants' knowledge).	Energy efficiency of buildings	Date of document: 5th April 2013. Into force the 14th April 2013	Repealing RD 47/2007. Transposing partially Directive 2010/31EU

		It is expected that energy certification of buildings will promote the development of more efficient buildings and foster investments in energy efficiency. This RD also establishes the procedure that must follow the basic methodology for calculating the energy efficiency rating, considering the factors that have the greatest impact on energy consumption, as well as the technical and administrative certifications for energy efficiency buildings. The construction of new buildings using nearly zero-energy emissions building criteria by 31st December 2020 is included in the present RD.			
RD 238/2013 of 5 April, on thermal Building Regulations	National - Spain	RD 238/2013 modifies some technical instructions of the Regulation for Thermal Installations of Buildings (RITE) with the aim of transposing the provisions for thermal installations of buildings on Directive 2010/31/EU. This RD determines minimum energy performance rates for building thermal equipment/facilities related to calculation, control and installation.	Energy efficiency of buildings	Date of document: 5th April 2013. Into force the 14th April 2013	Amending (and updating) RD 1027/2007. Transposing partially Directive 2010/31EU.

RD 106/2018 of 9th March, regulating the Spanish National Plan for promoting house rental, rehabilitation of buildings, as well as the urban renewal, 2018-2021.	National - Spain	Royal Decree 106/2018, regulating the National Plan for promoting rents, building refurbishments, urban recovery and renewal 2018-2021, covers a very wide-range of issues such as a new concept of building, more linked to sustainable development, and the recovery of the building sector by means of bringing urban planning in line with social and environmental needs. Accomplishment and adaptation to Technical Building Code (CTE in Spanish) requirements is one of the main objectives. The plan is formed by several sub programs. Paying attention to RES & RUE issues, the interesting sub plans are the followings: 1) Building rehabilitation programme. Focused on financing refurbishment interventions on residential buildings (built before 1981). It includes actions such as improvement of building envelops in order to reduce its energy demand or substitution/upgrade of common building facilities (cooling, heating, ventilation, domestic hot water). Or the installation of RES facilities with the aim or reducing the consumption of conventional energy sources. 2) Urban regeneration and renewal. The aim is to finance neighbourhoods' rehabilitation. The	Energy efficiency of buildings and renewable promotion	Came into effect on 11/03/2018.	

		objective is to improve urban areas. Regarding the actions related energy funded: improvement of energy efficiency and renewable energies, as well as district heating and cooling, and sustainable mobility.			
Valencian Government Decree 112/2009, on 31st July, regulating the building energy efficiency procedures in the Valencian Autonomous Community	Regional - Spain	The present decree appoints a Valencian regional body as the competent organism for checking and monitoring the building energy efficiency certification at Valencia Autonomous Community. The certification register is enabled for new buildings. By means of Order 1/2011 of the Valencia infrastructure and transport regional ministry, the registry for energy certification of Valencia buildings was created.	Energy efficiency in buildings	Entry into force: 5 August 2009	
RD 1027/2007, on 20th July, approving the review of the current 'Regulations for thermal	National - Spain	The need to transpose Directive 2002/91/EC of 16 December on the energy performance of buildings and the approval of the Technical Building Code by Royal Decree 314/2006, of March 17, obliged Spanish government to prepare a new text repealing and replacing the old Regulation of Thermal Installations in Buildings (RITE) approved by RD 1751/1998 and incorporates also the	Buildings (Energy efficiency and renewable energy)	Published on the 20th of July 2007.	Inspection may be regulated by the Autonomous Communities (Spanish

installations in Buildings (RITE)'		experience of its practical application in recent years. The new Regulation of Thermal Installations in Buildings (RITE) sets out the conditions to be met by facilities, designed to satisfy the demand for thermal comfort and hygiene through heating, cooling and hot water, for rational use energy. Higher energy efficiency requirements established by the Royal Decree are reflected in: • Increasing energy efficiency in heat and cold generation, as well as for the transport of fluids. • Better insulation in equipment and pipelines of thermal fluids. • Better regulation and control to maintain design conditions provided in air-conditioned premises. • Using available renewable energies, especially solar and biomass. • Incorporation of subsystems energy recovery and waste energy utilization • Mandatory metering systems of consumption in the case of collective installations. Avoiding most polluting solid fuels			regional governments). Partially modified by RD 1826/2009 of 27th November.

		• Refraining from using the less efficient energy generation equipment.			
RD 47/2007, on 17th January, on the Basic Procedure for Energy Performance Certification of new buildings	National - Spain	The requirements for energy certification of buildings set out in Directive 2002/91/EC were transposed by Royal Decree 47/2007 by which approved a basic procedure for certification of new buildings energy efficiency. Subsequently, Directive 2002/91/EC was amended (and repealed) by Directive 2010/31/EU and forcing to transpose back to Spanish legal framework the changes made with respect to the amended Directive. Accordingly, by this Royal Decree partially transposes Directive 2010/31/EU with regard to the certification of energy efficiency of buildings, merging the RD 47/2007 with the addition of basic procedure for certification of existing buildings energy efficiency. Royal Decree 235/2013 approving the basic procedure for certification of energy efficiency of buildings, application was voluntary until June 1, 2013. Nowadays, the submission or provision of buyers or tenants of energy performance certificate	Buildings (Energy efficiency and renewable energy)	Published on the 31st of January 2007.	The regulation for new buildings was applicable to the new buildings whose permits were dated before RD came into force. Repealed by RD 235/2013

		for all or part of a building, as applicable, shall be payable for contracts of sale or renting concluded after that date.			
Royal Decree 314/2006, of 17 March, approving the Technical Building Code	National - Spain	The Spanish Technical Building Code (TBC or CTE in Spanish) is the regulatory framework that establishes the safety and habitability requirements of buildings set out in the Building Act (LOE). To promote innovation and technological development, the TBC has adopted the most modern international approach to building norms: Performance-Based Codes or objectives. The use of these new regulations based on performance calls for the configuration of a more flexible environment, easily updated in accordance with the development of techniques and the demands of society, and based on the experience of traditional norms. The TBC is intended as a structured normative framework and seeks to facilitate their application and fulfilment, in harmony with European regulations. European regulations will be regarded as basic documents whose consideration will be mandatory	Buildings (Energy efficiency and renewable energy)	Came into force in September the 17th 2006	Transposing Directive 2002/91/EC.

		in drawing up the TBC. The TBC, as stipulated in the LOE, may include other norms as dictated by the different competent authorities.			
Law 38/1999 of November, on the regulation for constructions (LOE)	National - Spain	The purpose of the law is to regulate the essential aspects of the building process by establishing the obligations and responsibilities of the agents who intervene in the process as well as the guarantees needed to ensure that the process is conducted appropriately and to ensure quality through the compliance with certain basic building requirements and to protect users interests. The Act sets in terms of objectives the "basic building requirements" on functionality, safety and habitability, which includes requirements on accessibility, structural and fire safety, safety in use, hygiene, health and environment protection, noise protection and energy and thermal insulation. These general objectives just set and briefly defined in the Act, have to be developed by the Government in the Technical Building Code (CTE).	Energy efficiency on buildings	Date of document: 5th November 1999; Came into force: 6 months later (May 2000)	Spanish Building Act. Developed in RD 314/2006.
Law 24/2013, of 26 December, on	National - Spain	It sets up the principle of financial and economic sustainability: the system revenues have to cover all the system costs. Regarding renewable energies, it	Electricity sector.	Approved on 26 December 2013, and	Replacing the Law 54/1997.

the Electricity Sector (LSE).		supersedes the existing special regime for electricity producers, maintaining the fundamental principle of previous supporting schemes: a reasonable return. This law includes the provisions for calculating the electricity generation using renewable energy sources, high-efficiency cogeneration and waste to energy plants. It states that remuneration of renewable energies, high-efficiency CHP and waste to energy facilities, will be based on the necessary participation in the market by these facilities, and will supplement the market revenues with a specific regulated subsidy that will enable these technologies to compete on an equal footing with other technologies in the market. This specific subsidy will be sufficient to attain the minimum level required to cover the investment and operating costs that these technologies cannot recover in the market and may enable them to obtain a suitable return.		entries into force on 28 December 2013	
Royal Decree 413/2014, of 6 June, on electricity generation by	National - Spain	Royal Decree 413/2014 provides for the review of RES remuneration scheme by establishing statutory periods of six years. Each statutory period is divided into two three-year regulatory sub-periods. At the	Renewable energy	Entries into force the 11/06/2014.	

means of renewable, cogeneration and waste facilities.		end of each regulatory sub-period, the MITECO may amend the remuneration for investment to reflect: ● changes in expected future wholesale electricity prices, with a corresponding adjustment to remuneration for investment; and ● deviations in wholesale electricity market prices (as determined and published by the CNMC) as against expected future wholesale electricity market prices as established during the previous regulatory sub-period.			
RDL 17/2019, of 22 November 2019 for urgent measures for the adoption of a remuneration framework for electricity production sector.	National - Spain	The RDL 17/2019 is a modification of the legislation that currently regulates installations that produce energy derived from renewable sources. It provides for urgent measures for the adoption of a remuneration framework that will guarantee, under certain conditions, the remuneration for such installations throughout the next two regulatory periods (2020-2025 and 2026-2031). It is important to distinguish between: ● facilities in operation after 14 July 2013, for which the rate of return for the next regulatory period (2020-2025) has been set at 7.09 per cent; and	Electricity sector. Renewable energy.	Entries into force on 24/11/2019.	

		● facilities in operation before 14 July 2013, which may either: i. keep the current rate of return of 7.398 per cent for the next two regulatory periods (2020–2025 and 2026–2031) provided that they drop any arbitration or litigation proceeding against Spain concerning the regulatory changes of the economic regime of renewables approved since 2007; or, ii. application of the 7.09 per cent rate of return for 2020–2025 and of the subsequent rates of returns to be afterwards approved for the following regulatory periods. In addition to economic incentives, other policies that promote the development of renewable energies in Spain are the following rights granted to renewable generators: ● the priority of access to the grid. Renewable energy generators have priority over other operators to access and connect to transmission and distribution networks; and ● the priority of dispatch of electricity generated in the wholesale market. Under equal market conditions, renewable energy generators have priority over other conventional generators to deliver their electricity in the wholesale market.			

Royal Decree Law 15/2018, of 5 October, on urgent measures for energy transition and consumer protection	National - Spain	This decree law (RDL) aims to accelerate the transition to a decarbonised economy by increasing integration of renewable energies into the Spanish economy and promoting energy efficiency. It aims to use economic signals to incentivise consumers, companies and others to adopt renewable energy and energy efficient technologies. In order to accelerate Spain's transition to renewable energies, the law introduces a number of fiscal measures, including (1) a tax exemption for producers of energy incorporated into the electricity system for a period of six months, (2) a tax exemption for the use of energy products intended to produce electricity in power stations or the production of electricity or the co-generation of electricity and heat in combined heat and power stations, (3) a tax exemption for self-consumed energy of renewable origin, co-generation or waste..	Renewable energy.	Entries into force on 07/10/2018.	This document derives from Law 24/2013 on the energy sector
Royal Decree 244/2019, of 5 April, regulating administrative, technical and economic types of electricity supply	National - Spain	This RD seeks to promote the self-consumption of energy, and particularly renewable energy, by regulating the sector. It notably: 1. Updates the framework for the connection and energy supply to the electricity grid, and the economic compensations attached to different schemes;	Electricity production. Renewable energy.	Entries into force on 07/04/2019.	

and generation with self-consumption.		2. Authorises the self-consumption for a group of people (beyond single owners), and; 3. Ease the regulatory process for small-scale producers. This RD regulates the administrative, technical and economic conditions of self-consumption in Spain. This rule supplements the regulatory framework promoted by RDL 15/2018; whose main measure was the repeal of the so-called 'sun tax'. This decree thus represents a new energy scenario that is committed to a model based on distributed generation and renewable energies. It is worth highlighting: ● Recognition of the figure of shared self-consumption, which enables to several users the possibility of benefiting from the same generating facility. This is of vital importance for industrial sites, which can take advantage from better locations and reduce the overall investment; ● Simplification of bureaucratic procedures and deadlines for the legalization of facilities; ● Introduction of a simplified compensation for generation surpluses. It consists of a balance in economic terms of the energy consumed in the billing period;			

		• Self-consumed energy from renewable sources, cogeneration or waste, as well as surplus energy discharged into the transport and distribution network, will be exempt from all types of charges and tolls.			
Royal Decree 960/2020, 3 November, regulating the new economic regime for renewable energy (REER) for electricity production.	National - Spain	The purpose of RD 960/2020 is to regulate the so-called "economic regime for renewable energies", achieved through a system of auction. RD 960/2020 provides for a regime that will be available to generation facilities from renewable non-fossil energy sources. It includes installations made up of more than one technology or which have storage systems. It is an essential requirement that the facilities are the result of a new investment made after the auction: • Either by investing in a new facility as a whole; • Either by investing in an extension or modification of an existing facility. An auction mechanism is going to grant the economic regime. Although RD 960/2020 contains extensive regulations in this respect, the	Renewable energy.	Entry into force: 05/11/2020	

		corresponding ministerial order will complement it. The product to be auctioned will be the installed capacity, the electrical energy, or a combination of both, and the bid variable will be the price per unit of electrical energy expressed in euros/MWh. Participation in the auctions requires providing financial guarantees. The ministerial order regulating the auction mechanism may provide for the participation of renewable energy communities and the exemption of small installations (less than 5MW) and demonstration projects from participating in this procedure. The resolution calling the auction shall set a maximum price (reserve price) and may set a minimum price (risk price). Bids above the reserve price or below the risk price will be rejected. The same company or business group may not be awarded more than 50% of the total volume of the product auctioned, and the ministerial order regulating the auction may reduce this percentage. Because of the auction, each participant will obtain an allocation of power or energy. The award price will correspond to their economic offer. The successful bidders in the auction will be for maximum and minimum energy. They must reach			

		the minimum auction energy within a maximum period of between 10 and 15 years (exceptionally extendable to 20 years), with penalties if the minimum figure is not reached within the established period. The auction price received by the successful bidder may increase by the difference between the market price and the auction price multiplied by a percentage up to 0.5 depending on certain variables. Finally, another feature to take into account is that the market operator (OMIE) will settle the positive or negative difference between the market price and the auction-clearing price.			
Royal Decree-Law 9/2013, 12th July, on the adoption of urgent measures to guarantee the financial stability of the electricity system. Measures affecting production facilities using	National - Spain	RDL 9/2013 aimed to reform the Spanish energy sector. The implementation of the entire reform is foreseen to be carried out by means of a new energy sector law the present RDL and several Royal Decrees. To date Spanish Government only has approved RDL 9/2013 which implements some urgent measures to guarantee the financial sustainability of the energy system. The main aims of the energy reform are:	Energy sector, cogeneration and renewable energy sources	Entered in force on 14 July	Derogates RD 661/2007, of 25 May, which regulates power generation under the special regime and RD 1578/2008, of 26 September,

renewable energy, cogeneration and waste		1. To establish a regulatory framework to guarantee financial stability of Spanish electricity system. 2. To remove the economic deficit in the electricity sector once and for all, preventing future deficit and guaranteeing supply to consumers at the lowest possible cost and with increased transparency. 3. To simplify and clarify electricity bills and encourage competition in domestic electricity tariffs to foster competition towards consumers. Regarding renewable energies, RDL announces a new remunerative regime for electricity generation from renewable sources, cogeneration or waste that will be established by a next RD. It is mentioned that feed-in tariff and a guaranteed bonus schemes will be replaced by a so-called "specific retribution system" in addition to electricity market price. The specific retribution system will be the sum of the retribution of a standard investment plus the retribution corresponding to standard operation costs of the plant. The non-peninsular electricity System (Balearic and Canary archipelago, Ceuta and Melilla) will have			on the remuneration of electricity production using solar photovoltaic technology

		additional incentives due to renewable energies reduce the electricity generation mix costs. Furthermore, RDL creates the Administrative Registry of Self-consumption with the aim of properly monitoring consumers that have elected energy supply formats that include self-consumption.			
Law 2/2011 of 4 March on Sustainable Economy	National - Spain	The purpose of the Sustainable Economy Act is to introduce the structural reforms needed to create conditions that favour sustainable economic development into the legal system. A cross-cutting law created with the aim of promoting, among others, RES & RUE initiatives as a key tool to undertake the current economic crisis. Law 2/2011 is structured in four main titles. The first is dedicated to improving the economic environment. The second addresses competitiveness and the third, environmental sustainability. The fourth deals with the tools for implementation and evaluation of the Law. The purpose of the Law is to support sustainable economic development, including several legislative	Energy efficiency and renewable energy	Entry into force: 6 March 2011	

		reforms. A specific title on environmental sustainability sets out provisions related to: sustainable energy, reduction of emissions, transport and sustainable mobility, and rehabilitation and housing.			
Integrated National Energy and Climate Strategy (INECP) 2021-2030	National - Spain	The INECP 2021-2030 is intended to reflect this commitment and Spain's contribution to the international and European effort. Spain's INECP identifies the challenges and opportunities within the five dimensions of the Energy Union: decarbonisation, including renewable energy; energy efficiency; energy security; the internal energy market; and research, innovation and competitiveness. The Plan also gives the necessary signals to provide certainty and direction to all players while also bringing flexibility and manageability to the energy transition and the decarbonisation of the economy. Spain's INECP 2021-2030 is aimed at making progress with decarbonisation, laying down a firm foundation for consolidating a climate-neutral path for the economy and society by 2050.	Energy efficiency and renewable energy.	Pending its approval by EC.	Based on Paris Agreement (2015) and 'Clean energy for all Europeans' rules package (so called 'winter package').

		The measures provided for in the INECP are expecting to allow the following results to be achieved in 2030: ● 23% reduction in greenhouse gas (GHG) emissions compared to 1991; ● 42% share of renewables in energy end-use; ● 39.5% improvement in energy efficiency; ● 74% share of renewable energy in electricity generation. These results will enable progress to be made towards the longer-term objective of this Plan, namely to achieve GHG emission neutrality in Spain by 2050, in line with the positions adopted by the European Commission and the majority of Member States. This objective represents a reduction of at least 90% in total gross greenhouse gas (GHG) emissions by 2050 compared to 1990. In addition, the aim is to achieve a 100% renewable electricity system by the same date.			
Spanish long-term decarbonization roadmap 2050.	National - Spain	This roadmap is an outcome of Paris Agreement by which signatory countries should draw a long-term low greenhouse gas emission development strategy to reach EU climate-neutral by 2050.	Climate change. Energy efficiency. Renewable energy.	Approved on 03/11/2020.	

		Concerning tertiary sector stock (including public buildings) the roadmap by 2030 foresees renovation actions on the thermal envelope, thermal installations and lighting systems. By 2050, new buildings are built under nZEB criterion. Related to existing building stock, besides energy efficiency measures covered with the Long-term strategy for energy renovation in the building sector, main actions will address the decarbonization of cooling & heating systems and the production of renewable energy in-site and other systems such as vehicle charging infrastructure, energy storage batteries or energy management systems.			
Long-term strategy for energy renovation in the building sector in Spain pursuant to article 4 of 2012/27/UE directive.	National - Spain	This strategy was stated with the aim of creating a long-term strategy beyond 2020 for mobilising investment in the renovation of residential and commercial buildings with a view to improving the energy performance of the building stock. The strategy should address cost-effective deep renovations which will lead to a refurbishment that reduces both the delivered and the final energy consumption of a building by a significant percentage compared with the pre-renovation levels, resulting in strong energy performance. Such	Energy efficiency	2014	Updated in 2017 (ERESEE 2017) and, lastly in 2020 (ERESEE 2020).

		deep renovations could also be carried out in stages. a. This Strategy responded to the abovementioned obligation and includes the following elements: an overview of the national building stock based, as appropriate, on statistical sampling; b. identification of cost-effective approaches to renovations relevant to the building type and climatic zone; c. policies and measures to stimulate cost-effective deep renovations of buildings, including staged deep renovations; d. a forward-looking perspective to guide investment decisions of individuals, the construction industry and financial institutions; e. an evidence-based estimate of expected energy savings and wider benefits.			
2020 update of the long-term Strategy for energy renovation in the building sector in Spain (ERESEE 2020).	National - Spain	Specifically, this updated document supposes, as a novelty with respect to 2014 and 2017 strategies, the introduction, among others, of the following issues: policies and actions addressed at all public buildings, establishment of a roadmap with measures and measurable indicators of progress at national level, put the focus on energy poverty and finally, implement a participatory process allowing	Energy efficiency & renewable energy.	2020 strategy update.	

		to gather the vision of the different sectors that play a decisive role on energy renovation of buildings. What refers to public buildings' renovation, 2020 strategy extends the obligation to renovate National Government public buildings (included at article 5 of Directive 2012/27/EU) to the Autonomous and Local Administration and at the same time, the establishment of an additional 3% renewal on the National Administration buildings.			
Buildings renovation programme. Programme PREE.	National - Spain	Energy Renovation of Buildings Programme that aims to promote deep energy renovation actions on any type of building. Three typologies of actions: thermal envelope, thermal facilities and lighting systems. Improvement of thermal facilities include replacement of conventional power with solar, geothermal power or air-conditioning. Actions of the projects must improve the total energy rating of the building by at least 1 letter with respect to the initial energy rating of the building. Beneficiaries are holders and owners of all types of residential and other tertiary uses buildings. Two	Energy efficiency & RES in buildings.	Ongoing.	ERDF funds.

		aid modalities: direct grant and loan. Actions can range from €30,000 to €4million. Total budget 300 M€.			
Decree-Law 14/2020 of 7 August on measures to accelerate the implementation of facilities for the use of renewable energies in the Valencian autonomous region	Regional - Spain	Decree-Law 14/2020 introduces measures to promote renewable energies in the Valencian autonomous region. This regulation contains relevant developments in the administrative processing of projects for photovoltaic installations and wind farms that seek, in general, to reduce the bureaucratic burden and facilitate their implementation. The most relevant aspects introduced, applicable to photovoltaic plant and wind energy facility projects whose authorisation corresponds to regional government, are detailed below: ● Photovoltaic plants and wind power facilities are declared "investments of strategic interest", which are under the jurisdiction of the Valencian government which will have a preferential treatment in terms of their implementation and start up; ● Modifies several sector regulations in order to simplify and speed up the commissioning of	Renewable energy.	On 29 August 2020, Decree-Law 14/2020 of 7 August entered into force	

		both electrical grids and renewable production facilities; ● Specifies which installations (e.g. for self-consumption without surplus, or isolated generation installations) will be totally excluded from the administrative authorisation regime; or which will only need an operating permit (mainly small-scale production installations); ● Seeks to promote and facilitate the installation of these photovoltaic plants on urban and developable land through the direct compatibility of the photovoltaic installations without the need for modifications to the current planning. In addition, the installation of photovoltaic modules on the rooves of new buildings, or those that have changed their use, of more than 1,000 square metres in surface area, whether public or private, has been made obligatory.			
Climate and Energy Strategy of Valencia Region 2030	National - Spain	The 2030 Strategy for Climate Change and Energy in Valencian Community includes 43 climate change mitigation measures, 28 adaptation measures and 7 common ones. The reduction of greenhouse gas emissions (40% reduction by 2030 comparing with 1990), the	Climate change. Energy efficiency. Renewable energy.	Approved on 6th September 2019.	

		increase in renewable energy of at least 32% of the final gross consumption as well as an increase in energy efficiency at least 32.5% are the general objectives. The mitigation measures will be implemented in the public sector, energy, the carbon footprint and sectors such as mobility and transport, agriculture and livestock, waste, scuppers and health. The promotion of organic production, as well as local trade are some of the measures taken with the reduction of pesticides and the efficiency of agricultural operations. Sustainable tourism and a rational occupation of soil are among the mitigation points. In the adaptation will also work on health, the area of response to emergencies, biodiversity and forestry, water resources, coastal areas, landscape and social environment. As for the common ones, it will focus on research, development and technological innovation, awareness-raising, training and participation, as well as cooperation and sustainable development. In the Public Administration, the incorporation of environmental criteria that lead to a minimization		

		of emissions will be promoted. CO2 in purchasing and contracting procedures with the development of digital transformation plans, as well as safe and sustainable mobility. At this point, it will influence new models with actions on vehicles, responsible for almost 25% of emissions by the preferential use of petroleum-based fuels that represent more than 90% of total energy consumed in Spain. Concretely, focusing on buildings energy rehabilitation, measure 26 deals with building energy consumption reduction of public and private sectors, at the same time that promoting the RES installation. Measure number 3 is addressing the promotion of energy efficiency measures at educational buildings. Moreover, measure number 86 is dealing with the realization of communication actions about climate change through the educational sector.			
Valencian Regional Law on Climate Change and Ecological Transition	Regional - Spain	This future law sets the goal to Valencia Region become carbon-neutral by 2050 and also sets up an intermediate goal of reducing emissions by 40% from 1990's level by 2030.	Climate change. Energy efficiency and RES.	Approval underway	

		This draw document includes more than 100 measures focusing on the different topics shown below: ● Mobility; ● Natural resources and biodiversity; ● Housing and urban planning; ● Energy; ● Productive processes and fiscality; ● Environmental education.			
Pla EDIFICANT	Regional - Spain	EDIFICANT is plan created by Valencian Autonomous Community to build new educational infrastructures and/or renovate constructed schools. This plan was born with the objective to build 200 new 'schools' and invest for rehabilitating 500 old educational centres. It's foreseen to invest 1000 M€ with EDIFICANT.	Energy efficiency.	Operating since 2018, until 2024.	Depending on educational ministry of Valencia Autonomous Community.
Plan to promote local energy communities at Valencia Region 2030	Regional - Spain	This is a strategy whose main goal is to create at least one local energy community (LEC) at 100% of Region of Valencia municipalities by 2030. There is 4 main action lines: 1. To promote the interest of society and its involvement in energy transition and in particular with LEC;	Renewable energy.	Approved on 2021.	IVACE is yearly funding the creation of LEC at Valencia Region providing subsidies up

		2. To train the different agents that participate in the model to facilitate the development of new LEC; 3. To facilitate the technical-administrative development of LEC; 4. To encourage cooperation, acting as a catalyst for synergies.			to 45% of eligible costs.
IVACE-ENERGIA -Renewable energy and biofuels regional programme	Regional - Spain	The objective of the present funding programme is the promotion of endogenous energy sources, including biofuels. IVACE programme was financed partially with ERDF European funds. Funds are addressed to companies (including ESCOs), persons, municipal councils, public entities and NGOs. Program comprised non-refundable subsidies up to 45% of project total eligible costs. Actions subsidized: 1) Solar thermal facilities and/or biomass & solar thermal hybrid systems; 2) Stand-alone photovoltaic plants and/or hybrid wind & photovoltaic powered facility (PV power > 0.5kW and wind turbine power< 50 kW) 3) Stand-alone wind systems (<50kW)	Renewable energy and biofuels	Annual call for projects	Information collected refers to 2021 programme call

		4) Thermal and electric biomass plants and the necessary equipment for biomass (forestry and agriculture) treatment 5) Biogas 6) Geothermal facilities 7) Mini hydro plans (power <500kW) 8) Biofuels: supply pumps (fuels stations) and biofuels production/transformation plants			
IVACE-ENERGIA – Energy efficiency regional programme	Regional - Spain	The IVACE energy efficiency programme embraces several funding lines depending on different sectors: 1) Private sector energy efficiency programme: Substitution of conventional energy consumption facilities by other based on high efficiency technologies for reducing energy consumption and CO2 emissions 2) Construction sector: reducing installation energy consumption of existing buildings; improving energy efficiency of indoor lighting facilities; and promotion of high rate energy performance building (A or B) 3) Cogeneration: high efficiency cogeneration in tertiary sector; high efficiency cogeneration with an electric power <150 kW 4) Energy diversification: Shifting of petrol products consumption to natural gas.	Energy efficiency	Annual call for projects	Information collected refers to 2021 programme call

Law of energy conservation: 72-2004 and 7-2009	National - Tunisia	Energy management is considered a national priority insofar as it constitutes a main element of sustainable development and which has a close relationship with economic and social development and with the protection of the environment.	- the implementation of thermal regulations for buildings -this law places energy conservation as a national priority in line with the new socio-economic situation and sustainable development		
Law n° 2013-54 and Decree n° 2017-983	National - Tunisia	The creation of an Energy Transition Fund(FTE) to replace the National Energy Management Fund (FNME) to finance the energy transition.	This Fund, in addition to the investment bonuses in energy management actions granted by the FNME, is involved in the granting and subsidization of loans as well as participation in the capital of projects		
Law n° 2015-12	National - Tunisia	Law to promote the production of electricity from renewable sources	this law allows establishments in the building sector to connect to the national electricity grid		
Decree n° 2016-1123 and decree n°105 du 2020	National - Tunisia	Decree setting the conditions and modalities for carrying out projects for the production and sale of electricity from renewable energies	this decree contains the specifications of the requirements of renewable energy installations to connect to the national electricity network		
Decree 2004-2144	National - Tunisia	Setting the conditions for subjecting energy consuming establishments to the mandatory and periodic energy audit, the content and frequency of the audit and the categories of energy consuming	- Realization of energy audits,		

		projects subject to prior mandatory consultation, the terms of its performance as well as the conditions for exercising the activity of expert auditors.	- Creation of a core of expert energy auditors, - They make it possible to identify the optimization measures to be undertaken, to determine the investments to be mobilized and to set clear quantitative and qualitative objectives.		
Joint order of the Minister of Equipment, Housing and Regional Planning and the Minister of Industry, Energy and Small and Medium-Sized Enterprises of July 23, 2008	National - Tunisia	This joint order sets the minimum technical specifications aimed at saving energy consumption for construction and extension projects for office buildings or the like	each building, during its construction or extension must comply with this ministry order, which limits the needs for air conditioning and heating by passive measures linked to the architecture of the building		
Publication of the Prime Minister, No. 29 and 30 of 2005 on energy conservation in public institutions	National - Tunisia	this publication obliges establishments to appoint an energy manager	energy managers must monitor the consumption of their building and draw up an annual energy monitoring report and send it to their ministry and the ANME		

NEEAP 2016-2020	Action Plan - Lebanon	The second national energy efficiency action plan for the republic of Lebanon		Issued 2016	Voluntary
NREAP 2016-2020	Action Plan - Lebanon	The National Renewable Energy Action Plan for the Republic of Lebanon 2016-2020.		Issued 2016	Voluntary
NREAP 2021-2025	Action Plan - Lebanon	The third National Renewable Energy Action Plan for the Republic of Lebanon 2016-2020.		Under development	Voluntary
REMap	Plan - Lebanon	This study provides an in-depth assessment of the policy, regulatory, financial and challenges that must be overcome to achieve the targets set out for 2030.		June 2020	Voluntary
NEEREA	Financing Mechanism - Lebanon	The National Energy Efficiency and Renewable Energy Action (NEEREA) is a national financing mechanism that allows private sector entities to get subsidized loans for any type of energy efficiency and renewable energy projects. NEEREA is active through all Lebanese commercial banks under the leadership and management of BDL. It includes guidelines to be followed.		Issued 2016	Voluntary
The Thermal Standard for	Code - Lebanon	TSBL 2005 is a report including a set of recommendations for those willing to develop energy efficient buildings.		Since 2005	Voluntary

Buildings in Lebanon (TSBL 2005)					
Solar Ordinance	To be adopted as a Decree -- Lebanon	The solar ordinance consists of the obligation of all types of buildings (new and under major renovation) to opt for solar water heaters and/or heat pumps for the production of domestic hot water. It takes into account the types of buildings, hot water consumption, occupancy, technology used and multiple other facets.		Ongoing	
Energy Conservation Law	Law - Lebanon	This law tackles some measures relative to the building sector, it includes three articles related to the development of MEPS and labelling for all types of electric equipment. The law is a framework law that should be followed by executive decrees for the technical, inspection and compliance aspects development.		Under study	
The General Budget Law 2019 in article 66	Law - Lebanon	The law does not tackle technical specifications however it only specified the benefits/incentives for the developer/end-user in sustainable constructions.		Since 2019	Mandatory

Lebanese Building Law (646), year 2004	Law - Lebanon			Issued 2004 by parliament	Mandatory
ARZ	Rating System - Lebanon	The first green building rating system tailored to Lebanon, limited to existing office buildings. A system designed to measure to what extent existing commercial buildings are consuming the right amount of energy and water, while having a low impact upon the natural environment		Finalized in 2013	Voluntary
LIBNOR Standards	Standard - Lebanon	It is applicable to new buildings of different types. Specific requirements are put in place for the different elements of the building that influence energy: building envelope, heating equipment, cooling equipment, pumps and fans etc. This standard will be published as a voluntary standard then can be transformed to mandatory		Under development	
Criteria for Green Buildings in Lebanon	Guideline - Lebanon	Developed by the OEA (Order of Engineers and Architects)		Developed in 2015	Voluntary

Lebanon's NDC	Plan - Lebanon	Provides conditional and unconditional targets for GHG emission reduction.		Updated in 2020	
Minimum energy performance standards (MEPS)	Standard - Lebanon	• Refrigerant and AC (MEPS In development) • Solar water heaters + Compact fluorescent lamps (Mandatory Standards for testing performance are in place) Residential appliances (MEPS In development)		On-going	Voluntary

Task: Each PP proposes **3 best practices** to be shared with other PPs, stressing challenges and breakthroughs.

Best practices	Description of the school renovation plan with REEE solutions	Challenges addressed	Advantages	Disadvantages
PP1 – 1 Lighting system Redesign and Retrofit	The lighting system will be redesigned to meet specific room usage lighting needs. This includes the number, location and light intensity of fixtures. All fixtures to be used will be low power consumption units.	Low light quality and high energy demand.	Better light quality that meets international standards, while reducing energy consumption.	Might require external wiring or construction.

PP1 – 2 Window sealing and maintenance	Windows will either be maintained and sealed to increase the thermal insulation of the building envelope or replaced with double pane windows.	Loose sealant and low thermal insulation that results in high energy demand to keep school at a comfortable temperature.	Better overall thermal comfort and lower heating and cooling energy consumption.	If windows are replaced, then recycling and waste management are an issue.
PP1 – 3 PV system installation.	Installing PV systems to cover the school's energy consumption.	High energy bills from fossil energy sources. Limited budget to properly heat and cool the school.	Lower energy bills, migrate to a free sustainable energy source to better thermally manage the school.	Will require routine cleaning and maintenance.
PP2 - 1	Programme for the Energy Requalification of Central Public Administration Buildings - PREPAC	Public authorities' interventions in their building stock can contribute to reducing both public expenditure on energy and CO2 emissions and, at the same time, help to ensure a better quality of life for citizens. For the public sector, legislation stipulates that from 2014, 3% of the surface area of public buildings must be made energy efficient every year until 2020.		
PP2 - 2	Energy efficiency and building renovation: more than 15 billion from the National Recovery and Resilience Plan (NRP)	Mission 2 'Green Revolution and Green Transition' of the National Recovery and Resilience Plan (NRP) aims to improve the sustainability and resilience of the economic system and ensure a fair and inclusive environmental transition.	Substantial tax incentives are provided to increase the energy efficiency of private and public buildings. The measures allow for the renovation of about 50,000 buildings per year.	

		The green transition pillar stems directly from the European Green Deal and the EU's twin goals of achieving climate neutrality by 2050 and reducing greenhouse gas emissions by 55 per cent compared to the 1990 scenario by 2030.	Italian buildings account for more than a third of the country's energy consumption and most of them were built before the adoption of energy saving criteria and related legislation. The measures therefore intercept a very significant dimension for the reduction of consumption and for the abatement of CO2 emissions, significant also with reference to the exposure to seismic risk of our country. In particular, the planned measures are expected to save 209 Ktoe per year of final energy and 718 KtCO2 per year when fully operational. In addition to the objective of saving energy and preventing seismic risks, the measures included contribute to giving a strong boost to the	

			country's economy and employment, and to promoting social resilience by improving the population's housing conditions and alleviating the problem of energy poverty. In particular, the component consists of three lines: Implementation of a programme to improve the efficiency and safety of the public building stock, with interventions concerning in particular schools and judicial citadels (Plan for the replacement of school buildings and energy upgrading) Introduction of a temporary incentive for energy and seismic upgrading of private and social housing, through tax deductions for the costs incurred for the interventions	

			(Energy and seismic upgrading of private and public housing - SUPERBONUS 110%) Development of efficient district heating systems.	
PP3 – 1	Miguel Hernandez School (Badalona, Spain). ZEMEDS project. Sustainable energy actions proposed are the following: ● Fenestration renovation, solar protection installation (exterior mobile slats); ● Mechanical ventilation with heat recovery (control when occupancy), walls and roof insulations, lighting replacement in classrooms; ● Replacement a more efficiency gas condensing boiler in primary school; ● 14kWp Solar PV installation; ● Energy and ventilation control system;	This school was built on 1979 and, at this moment, there weren't any energy efficiency building code at Spain. Renovation needs: school energy consumption is very high. Total energy consumption is: Electricity -> 48174 kWh/y and Natural Gas-> 105524 kWh/y in conditioned area. Winter discomfort exists among users and it is due the lack of zoning in the heating circuit between north and south faces. During summer, some classrooms with lack of comfort controlled with natural ventilation and solar protections. In general, both	School renovation measures ensure the achievement of nZEB standards.	Measures related with walls and/or roofs insulation, windows replacement and mechanical ventilation & heat recovery at Mediterranean countries mean an investment payback around 20-30 years. Rest of measures are considering a payback period around 8-10 years.

	Energy saving programme for school community.	buildings are surrounded by vegetation and uneven terrain producing solar protection. The aims of the renovation are based on nZEB requirements: - To produce primary energy consumption produced by local renewable energies. - Final energy consumption yearly (heating, cooling, ventilation and lighting) per conditioned area <25kWh/m2.		
PP3 – 2	Lluis Vives school (Alzira). TEESCHOOLS project. All buildings have similar building construction features: brick wall, exposed bricks with no isolation materials; Hipped Tile Roof. No insulation. No mechanical ventilation; ventilation by opening windows (in the classrooms).	Electricity consumption average is 8.000kWh/month, about 1200€/month. Natural Gas consumption average is 2000-2600 kWh/month. Diesel estimated consumption is around 13000 L/year. Year of construction: 1975	School renovation measures ensure the achievement of nZEB standards.	Economic assessment states that envelope actions payback is around 30 years. Rest of actions vary from 5-15 years payback.

	Windows features: Single-glazed with aluminium frames with thermal bridge. There are some renovated windows: Double-glazed Climalit windows with aluminium frames. Energy plan actions proposed are the following: ● Outdoor façade insulation, adding outdoor 40 mm polystyrene panels to insulate in brick wall facade. Installed with adhesive mortar and mechanical fixations. ● Low emissivity glass windows (low-E coatings) installation. ● Replacement main building existing windows to double glazed with aluminium frames. ● Replacement of diesel boilers by natural gas boiler. ● Replacement current luminaires to LED technology improving efficiency. It is proposed to replace all the lights in the dining room.	School community have comfort problems in cold days and of course in hot days. There are several pathologies in the buildings: The metal structure works are in bad conditions. Windows are bad insulated. The heating system (diesel, 2 boilers) is old and it has a low energy performance. There is natural gas boiler for Pre-School Building. The aim of the renovation plan is proposing technical solutions to reduce the energy consumption and CO2 emissions to achieve a NZEB standards. Impact of measures implementation is estimated as shown below: 1. Energy Consumption Savings/ Year: 163.615 kWh/year; 2. CO2 emissions reduction: 40.71 T/year. Required investment: 350,000 €.		

	● Presence detectors installation. ● PV solar panels installation. ● Energy management system software. Software to know the energy consumption and deviations. Consumption saving around 5%.			
PP3 – 3	Santa Maria d'Avià School. ZEMEDS project. In order to ensure school building deep renovation towards nZEB schools' requirements, this is the list of measures to implement: ● Fenestration renovation and solar protection installation and mechanical ventilation with heat recovery; ● Facades and roof insulation; ● Lighting replacement in classrooms, offices and corridors, heating replacement (gas condensing boiler) and PV system installation to cover heating,	Year of construction of this public school: 1977. Renovation needs: The school was built before the Spanish Building Standard on Thermal Conditions (NBE-CT-79) and must be renewed globally. The main objectives are to improve user comfort, comply with new regulations and optimize energy consumption, based on a deep renovation plan.	School renovation measures ensure the achievement of nZEB theorical standards: ● Requirement 1: C_{PE}-$Prod_{RES} \leq 0$ ● Requirement 2: $C_{FE} \leq$ 25 kWh/m2 y.	Investments economic analysis states that payback is around 47 years. Fenestration (payback 30 years) and wall & roof actions (payback 15 years) increase the time to recover the investment.

	cooling, lighting, ventilation and DHW in preschool;			
PP4 – 1	the implementation of an energy management system in accordance with ISO 50001	• the strong commitment and responsibility of management • the constitution of an energy management team • Carrying out a global energy audit Raising the awareness of all staff	-Reduction in building energy costs, -Reduction of the building's ecological footprint, -Involvement of employees and students, through new behaviours aiming to use energy rationally, in the energy strategy of ISSAT Sousse	The certification ISO 50001 is not free
PP4 – 2	Install automation and control systems in all ISSAT Sousse buildings	- Respond to energy challenges - Ensure the well-being of students and occupants - simplify of the operation of the installation	- improved living comfort thanks to centralized technical management, management of building equipment is centralized and made easier - savings on the energy bill, - positive ecological impact	-The complexity of implementation, the main drawback of smart buildings -The investment of such an installation is expensive - The installation requires regular maintenance
PP4 – 3	Renovation of existing lighting and installation of PV system	- Measure the efficiency of the energy performance of equipment and work carried out on the envelope,	-Access to more thermal comfort on a daily basis -The reduction of its electricity bill by acting for the environment	

		- Evaluate the overall performance of energy renovation, Understand and share the conditions for a successful energy renovation	-Valuation of real estate heritage	
PP5 – 1	Within the Sustainable Energy Access and Climate Action Plan (SEACAPS), CEDRO 5 project is targeting the installation of solar PV systems in 5 municipalities and 1 union of municipalities in Lebanon, aiming at reaching the sustainable targets set in the SEACAPS. The targeted facilities include municipalities, public schools, private schools, technical schools and colleges, and healthcare centers. 19 potential facilities have been identified so far, including 10 schools and 3 technical schools aiming at implementing 10 initiatives (5 financed through full grants and 5 through crowd-funding)	Crowd-funding limitations due to different factors lack of platforms and level of energy awareness among target audience.	Local authorities to lead by example through the use of renewable energy in public buildings and help in popularizing the concept of using renewable energy in municipal and private buildings. Utilize and empower the use of crowd-funding platform(s)	Due to dependency on crowd-funding, the CEDRO 5 project will manage the turnkey process once the budget is secured for the remaining 5 projects.
PP5 – 2	Building Energy Performance (BEP) Tool / BUILD_ME project	The BEP tool provides users with a free software application to calculate the overall energy performance of buildings and the cost-effectiveness	The tool considers local climatic conditions as well as exact building specifications such as the geometry and	The software is undergoing updates, additional features and enhancements will be

		of building energy efficiency measures. The BEP tool could be very useful to project developers, financial institutions, architects, researchers, or even non-technical users. It provides answers to questions related to energy performance in buildings.	orientation of surfaces before applying the complex calculations of the standard. In addition to the fact that the BEP tool is free, easy, user friendly, it contains modules covering all relevant aspects that influence the energy performance of buildings and the life cycle costs of energy efficiency measures.	added to the BEP Tool over the course of 2021.
PP5 – 3	A Japanese grant dedicated to install solar PV systems in 122 public schools (Total 1.136 MWp) in Lebanon, managed by the Ministry of Education and Higher Education.	With 113 public schools to be implemented with PV systems in a short period, design considerations for each school and time limitation were the major challenges.	Major advantage is increasing the share of renewable energy in public schools as well as reducing the schools' energy bills. The systems would serve as an awareness tool for students.	Probably better to deal with less number of schools but deliver more self-sufficient solar PV systems (i.e. due to time limitation, it was not possible to visit all the identified schools to customize the solar PV designs accordingly)