



Lessons Learnt & Policy recommendations

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step by step
renovation
towards nearly
zero energy
SPORT buildings



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- Most sports hall owners haven't heard about the opportunities for implementing EE measures through companies providing energy services (ESCO)
- It is not rare that sports hall owners, both state and private, stress that they feel deprived in terms of available funding opportunities, as they are usually not eligible for EU funding or do not have access to bank credits with preferential interest rates.



- Abnormally low prices for the EE construction & assembly implementation works in Public tendering.
- Investments, including ESCO, are diluted by the necessary improvement of basic conditions and implementation of the basic energy systems (i.e. HVAC).
- Comfort levels and living conditions in sport buildings are below average, due to the higher energy intensity of the old building stock.



- Sport building (excluding swimming pools) are characterized with required heating temperature of 18°C, which decreases the energy demand, increasing the payback period of any intervention.
- The majority of the sport buildings in Bulgaria (excluding individual fitness centers) are publically owned. The sport club itself doesn't generate enough funds to implement any large renovation, thus in order to implement EE measures they rely only on third party aid.



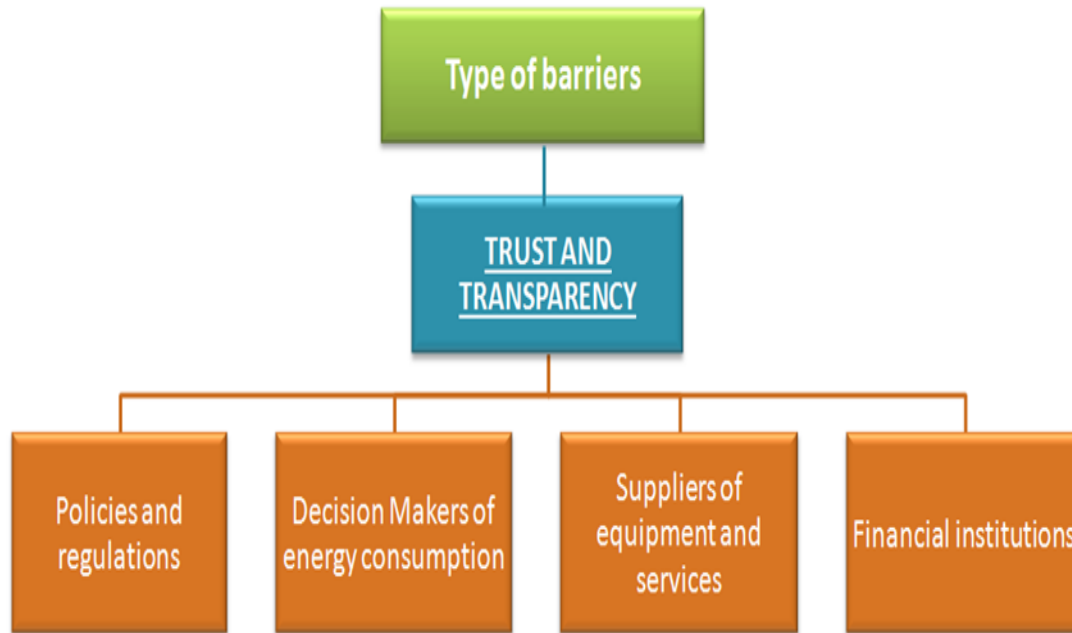
- There is still no financial mechanism in Bulgaria directly supporting improving EE, and particularly sport buildings.
- EE remains outside of the priorities of the Municipality of Plovdiv.

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- **Technical assistance to apply for funding:** Sport owners and sport facility managers do not have knowledge and time required to apply for funding through the Spanish national energy efficiency fund since a lot of technical documents must be submitted, including the energy performance rating of the sport building.
- **Inadequate national funding mechanisms for renovating public sport buildings:** For public sport buildings a tender procedure is required by law and it's not possible to indicate in advance the name of the companies which are going to renovate the sport complex.

- **Organization of guided visits in frontrunners pilots:** the guided visits organized in the pilot sports facilities that implemented energy improvement measures have been an effective strategy to replicate the measures to other sport buildings
- **Low knowledge of public administration about ESCO models:** capital expenditure (“capex”) within EPCs should be treated, by default, as government expenditure, and as a consequence, the debt level of public authorities will be increased. Projects have to be approved by supervisory bodies.

- Not thorough investigation of financing mechanisms before finalizing pilots
- Lack of commitment of municipalities to improve energy efficiency through existing budgets and not as extra actions.
- Provision of possibility of performing preliminary energy audits (not detailed energy audits) as one of the tasks of the project before finalizing the pilots—possible use of energy consumption data from local SEAPs (Covenant of Mayors)
- Repayment of loans from banks according to energy performance not possible
- Lack of crowd funding mechanisms at local level

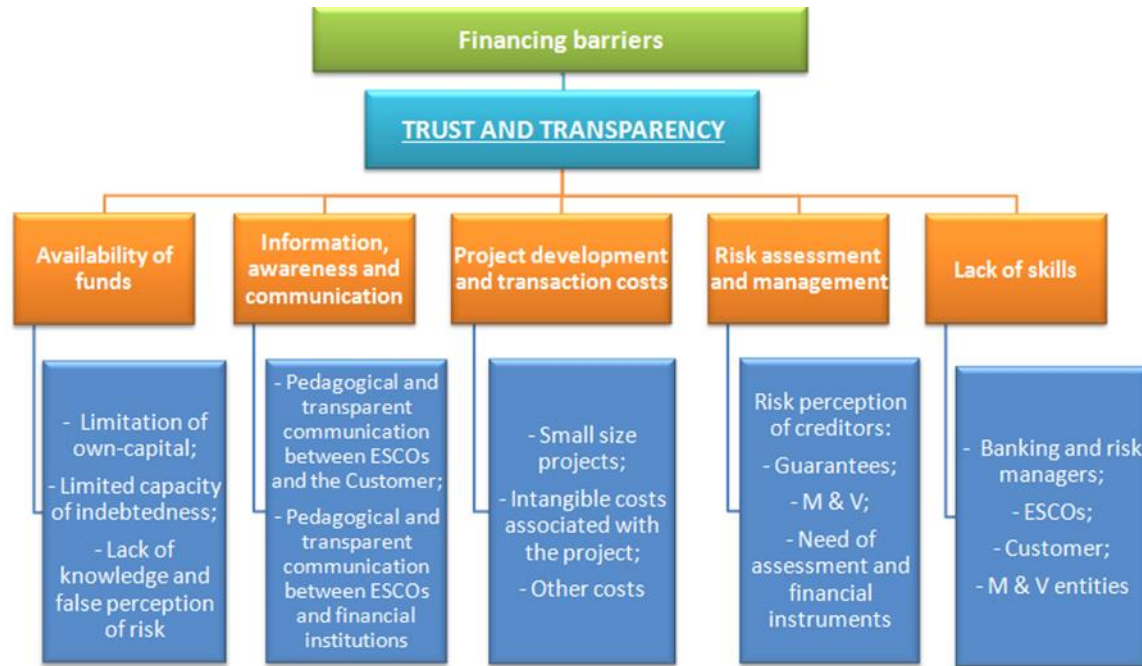


➤ **Policies and Regulations:** The policies are poorly orientated and the existing regulation is poorly applied;

➤ **Decision makers of energy consumers:** With some exceptions, the sports buildings decision makers do not prioritize the energy efficiency as they have more concerns with investment directly linked with the production sector and they don't possess the appropriate skills to evaluate these projects;

➤ **Equipment suppliers:** Most companies in this market have lack of adequate skills and therefore there is an inherent lack of trust in them;

➤ **Credit Entities:** Don't possess the adequate lines of credit.



- **Availability of funds:** The use of own capital has other priorities;
- **Information:** Lack of adequate technical communication between clients and credit entities;
- **Costs of development:** The costs of development and engineering may undermine other projects, especially those of low investment;
- **Management and evaluation risks:** Financial entities aren't orientated towards the technical evaluation of these type of projects;
- **Lack of skills:** Lack of appropriate knowledge and skills on various levels.

➤ **Energy Performance Contracts**

- ✓ Lack of financial interest on behalf of ESCO or private funds;
- ✓ The Energy Performance Contracts costs, where applied to Public entities, are considered as a public debt.

➤ **Loans**

- ✓ Low national banks funds;
- ✓ Interest rate is not suitable for Public Bodies;
- ✓ Inexistence of specialized credit lines for EE investments.

➤ **Own funds**

- ✓ Lack of own financing resources of the sport facilities;
- ✓ Energy efficiency is not always a management priority;
- ✓ The Public sector budget cuts within the last years have led to difficulties for sports buildings to invest in energy efficiency or renewables measures;



➤ **National Energy Efficiency Funds**

- ✓ Limited and scarce available funds for EE projects;
- ✓ The existing national funds have been cut or eliminated significantly due the Government changes;
- ✓ Financial crisis;
- ✓ Some public funds are used in other strategic areas and poor allocations of resources are available to implement energy efficiency or renewables measures;
- ✓ When the funding is approved and allocated, several months can be still required until the start of implementation works.



- National sports buildings are wasting a huge amount of energy, especially in thermal;
- Large number of national sport buildings need refurbishment, namely the public buildings;
- Legal issues and changes related with the ownership of the sports buildings;
- ADENE, the Portuguese Energy Agency, is still developing the nZEB definition;
- Often the sport building manager is not the same person (or entity) who has the decision to invest on the building (the sport owner). Lack of required capabilities, knowledge or interest regarding the energy savings;



- The Mayor and Councilors change frequently (every 4 years) and that can cause delays in the project. Due to the long duration of contracts this can also lead to change previous negotiation decisions;
- The Municipality staff initially involved may change several times during the course of the project;
- If the sports owner is not included since the beginning of the energy process and the intention to perform renovations, it will be difficult to decide positively for the investment authorization;
- The Energy Performance Contracts are not completely understood or communicated in a proper way.

- Energy efficiency measures with a long depreciation time (> 6-8 years) are rarely accepted as a real market and commercially acceptable measure.
- Environmental and total resource argument may be appealing only to certain types of property developers, municipalities etc.
- Reinvestments only in equipment that have reached their technical-economic service life and the urgent maintenance costs are very high



- Sweden lacks of national and regional funds that support investments in energy efficiency measures.
- Mistrust in the EPC business model. The Swedish ESCO market experienced a boom 10 years ago. However in 2009, the development came to an abrupt halt when the financial scheme OFFROT ended. This coincided with an unsuccessful EPC procurement process in Stockholm, causing a dispute between the parties which ended up in court.

- Administration of sport facilities does not have knowledge about energy in buildings and energy balance,
- Administration of sport facilities is not aware about available subsidies,
- Without external funding it is hard to implement energy efficiency measures,
- As sport facilities are mostly owned by state, unless it is absolutely necessary, administration of facilities are not interested in modernization financed by loans or ESCO.

The implementation and financing of energy renovation works in sport buildings is **complex and slow**, even after clear renovation plans were produced and the technical assistance provided to get funding.

Current policies are **insufficient to achieve the necessary depth of deep energy renovation in sport buildings**, and a breakthrough is needed that can stimulate and foster this market,



- **Governments need to create a framework to foster appropriate financial mechanisms for stimulating the energy renovation of sport buildings.**
- The **banking crisis** has caused the requirements for mortgage loans to be tightened, which prevents owners from borrowing more for renovating their buildings.
- Nowadays, **the development of innovative financing products is often blocked by legislation.**



- **National legislation should be adapted** in Member States to allow more flexible financing products (e.g. financial models for EPC, national energy efficiency funds, etc.) favoring deep energy renovations of sport buildings. **Incentive programmes** could then make public funding conditional on the level of energy performance achieved.
- Governments shall **define new financial instruments** in order to undertake an exemplary role in the energy retrofit of public sport building stock.



- **Address the EU and national accounting rules to allocate the capital expenditure in EPC.** Since 2015 all capital expenditure (“capex”) within EPCs should be treated, by default, as government expenditure. As a consequence, the levels of public debt increase with the energy renovation expenditures, being a significant barrier for public authorities facing budgetary constraints. The impact of energy efficiency-related investments on the debt and deficit of governments in order to promote Energy Performance Contracting as an instrument to speed up the energy renovation of sport buildings should be explored.



- **Awareness raising activities of sport owners/sport facility managers on energy efficiency.** Governments should provide information to improve the awareness levels of public authorities and sport owners about the importance to renovate sport facilities with the aim to reduce the energy use but also to guarantee thermal comfort of the users. In some EU countries (e.g. Bulgaria, Hellas), energy efficiency in sport facilities remains outside of the priorities of the municipalities.



- **Use public funding to finance a facilitator role for guiding owners through the renovation process.** A facilitator could provide guidance and personalized support to sport owners/sport facility managers to get funding to renovate their facilities. These advisors could also support the tendering process and provide contacts of qualified suppliers and building professionals. **For a public authority the task to prepare and implement an EPC project without previous EPC experience is very challenging.** The figure of a facilitator at local/regional level can be effective to handle the complexity of the whole retrofitting process lifecycle. The facilitator role could be played by the local/regional government or the private sector. The **Roadmap towards Nearly Zero Energy Sport Buildings** developed in the framework of STEP-2-SPORT could be an effective tool to be considered for facilitators.



- **Member States should define specific nZEB definitions for sports facilities** since their energy usage is completely different from other non-residential buildings. Member States should give more attention to sport buildings when defining energy policies, and especially in the transposition of the EPBD. Some EU Member States have only set a single numerical indicator for non-residential buildings without differentiating the seven non-residential building types (offices, educational buildings, hospitals, hotels and restaurants, sports facilities, wholesale and retail trade services buildings, and other types of energy consuming buildings) recommended in the Annex I of the EPBD recast.



➤ It is recommended to include a **numerical indicator of the maximum primary energy use at least for the following two sport building types:**

a) sports facilities with indoor swimming pools:

b) dry sports facilities (e.g. gyms, sport halls, ...)

Since the energy consumption differs highly between both sport building types, **different requirements should be defined**. Sports facilities with indoor swimming pools are the most energy intensive sports facilities and should meet less stricter nZEB levels than dry sports facilities. Further studies should be conducted at national level to determine whether it is necessary to include ice rink arenas as an additional category with specific nZEB requirements.



- To set **less stricter nZEB levels for existing sport buildings compared to new construction**. In new nZEB construction, passive strategies can be considered in the building design phase. Furthermore, in some existing sport buildings as a consequence of its initial design, it can be unfeasible from the technical point of view to integrate renewable energies.
- Set the **minimum share of energy from renewable sources**: according to EPBD, a significant amount of energy demand should be covered by on-site or nearby renewable energy sources.



- To be **sufficiently flexible and adaptable to local climate conditions**: nZEB thresholds should be defined for different climatic zones (when necessary) since weather conditions can differ in different regions of a country.
- To be ambitious in terms of environmental impact. **nZEB levels should be more ambitious than cost-optimal energy performance levels**. The results from energy audits conducted in 26 pilot sports facilities under STEP-2-SPORT project reveal that in existing sport buildings, a nZEB retrofit today can lead to energy savings of over 50% additional category with specific nZEB requirements.



- Member States should also **develop policies in order to stimulate the transformation of buildings that are refurbished into nZEB**. So far the European Commission only addresses directly new buildings, without establishing mandatory nZEB requirements for existing buildings. Some countries/regions (e.g. Austria and Brussels Capital region) have also set primary energy demand for existing buildings, while other countries (e.g. Bulgaria, Cyprus, Denmark, Latvia) have decided to keep the same nZEB levels for new and existing buildings.



- The **development of standard EPC contract models for sports facilities**, the **organization of activities aimed to explain EPC benefits** to the sector and the **support from governments** are factors that may stimulate this market.
- Development of a **mechanism for overcoming split incentives**, different from Energy Performance Contracting, consisting on the addition of green clauses in the contract agreement between the sport owner and the sport facility manager, setting mutually agreed performance targets to reduce the energy consumption of the facility during the contract duration.
- There is a need to **disseminate information to the sport sector on the available financial instruments** that support energy renovations, such as national energy efficiency investment funds, citizen financing, grants, etc.



- An **integrative and holistic approach** is needed to accurately determine the **energy performance of a sport building**, which is influenced by the interactions of many elements and processes within the building and its immediate external environment.
- **Occupancy - variations** in hours of operation between sport buildings can be significant. In addition, **occupant densities** can vary significantly.
- Another issue is the behavior-based approach by the managers/owners of a sport facility to re-consider the existing heating pattern, so as to **provide the required “thermal comfort” conditions to the users** (athletes and audience) of the sport facility. This “thermal comfort” is also a requirement by all International sports Federations.



- The parameter of **CO₂ emissions** is missing in many EU M-S EPCs. It is a vital parameter, as CO₂ is responsible for the existing climate change, and any attempt to reduce it can be clearly presented to the managers/owners of a sport facility.





Thank you for your attention!



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