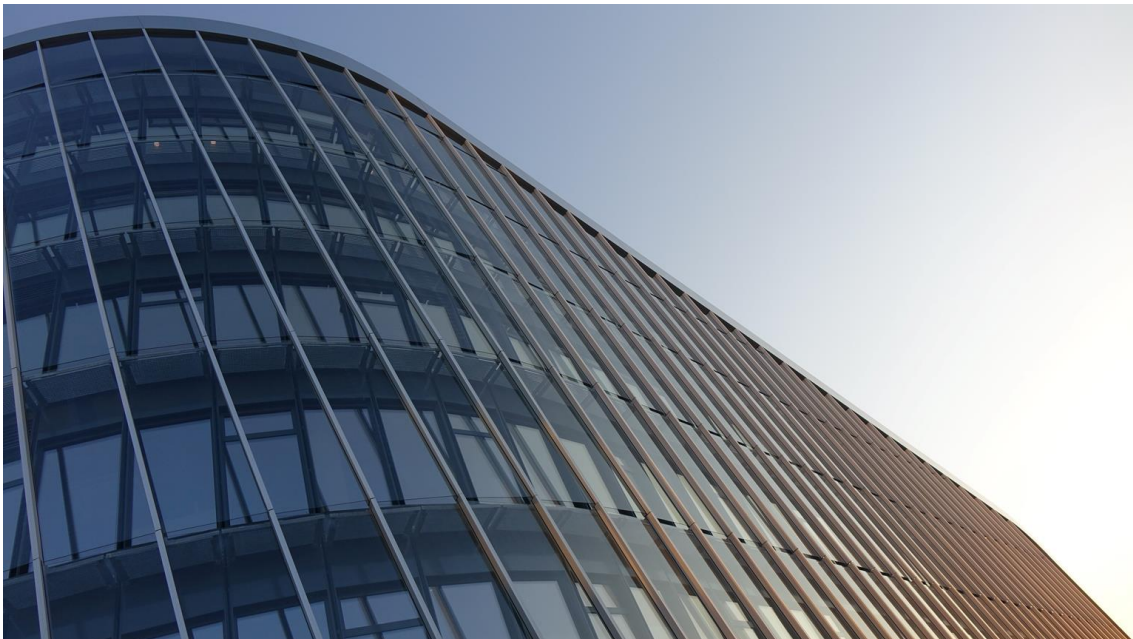**Energy Efficiency Performance-Tracking Platform for Benchmarking Savings and Investments in Buildings**

Training material package for using EN-TRACK by FI and investors (initial report)

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WP6
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Abbreviations and Acronyms

Acronym	Description
AC	Avoidance Cost
EEM	Energy Efficiency Measure
ECSI	Energy Cost Saving Intensity
ESI	Emissions Savings Intensity
EUI	Energy Use Intensity
EUSI	Energy Use Saving Intensity
FI	Financial Institution
ICP	Investor Confidence Project
NIC	Normalised Investment Cost
NPV	Net Present Value
PI	Profitability Index
IRR	Internal Rate of Return

1 List of figures

2 Executive summary

The objective of this report is to create and provide the basis for the training material aimed at financial institutions using the EN-TRACK platform. This report can act as a direct manual for financial institutions in guiding them through the platform functionalities and outputs. The content in the report can also be fed into other material for training purposes. The report focuses on creating content and language that can be reproduced for other purposes to support use of the EN-TRACK platform.

The report begins by identifying the target audience for the material and establishing how that audience can best be addressed. It proceeds with a walkthrough of the back end of the data collection module, and explanations of the methodology and quality of the data within the platform, explaining why this platform and data is beneficial for the target audience. It then goes on to describe the outputs of the EN-TRACK platform, how each can be used by the target audience, and why it is important to their operations. The "how to use this output" section (5.4) is the focal point, containing **the key messages to be communicated at this stage: what EN-TRACK can do for you and how EN-TRACK can help you do your job better, and get your buildings to perform better.**

The report further describes why EN-TRACK is the only platform allowing all these services in one platform and how EN-TRACK stands out from the rest when it comes to the credibility of data, the access to real data.

This report is the first of two connected parts, and the work in this deliverable will be further built upon in D6.4 training material package for using EN-TRACK by FI and investors (final report).

3 Background

EN-TRACK, which stands for Energy Efficiency Performance-Tracking Platform for Benchmarking Savings and Investments in Buildings, is a critical and timely project that seeks to address several key barriers holding back greater investments in building energy efficiency. The core objectives of the project, which is funded through the European Union (EU) Horizon 2020 research and innovation programme under grant agreement number 885395, are to:

- Enable massive gathering of data on the before-and-after performance of energy efficiency measures in buildings.
- Create a continuous data collection process through structured engagement with stakeholders.
- Adopt standard data descriptions that align with current international standards and existing data platforms, notably the De-Risking Energy Efficiency Platform (DEEP)
- Create a self-sustaining solution that continues to be viable after the completion of the project in 2023.

There is a data gap which creates risks and barriers to investments in building efficiency upgrades and EN-TRACK has an ambitious objective to build a platform with knowledge on the performance of thousands of public and private buildings and the efficiency measures implemented.
EN-TRACK aims to be a 'one-stop-shop' for insights on the energy, financial and other performance of buildings. To achieve the aims of the project the platform must be useful and appealing to financial institutions (FI). One critical step is to identify functionalities and outputs definition by the (FI) to match their current needs.
The above objectives will all come together in the EN-TRACK platform which is currently under development and will provide services defined to target stakeholders.

4 Introduction

EN-TRACK aims to be a 'one-stop-shop' for insights on the energy, financial and other performance of buildings. Part of the work in developing this solution and enabling widespread adaptation is to ensure that the user has sufficient knowledge about the platform and can use it in an effective and meaningful way. Therefore, part of the work within WP6 revolves around producing training material to achieve this.

The purpose of this document is to provide an EN-TRACK platform user manual for financial institutions, explaining not only how to use the platform but also what it's potential value is to them. For this reason, the material in this report necessarily covers several areas of use of the platform and contemplates a variety of both printed and online material. Throughout the stakeholder engagement in the project to date, care has been taken to identify the services required by financial institutions and the mathematical indicators required to provide those services. This document builds on this groundwork and aims to meet those specifications of requirements. It provides the basis for the material that will guide the user through those services and indicators. It will also help to ensure that the user can quickly learn how to get the most out of EN-TRACK platform.

The report begins by identifying the target audience for the material and establishing how that audience can best be addressed. It proceeds with a walkthrough of the back end of the data collection module and explanations of the methodology and quality of the data within the platform, explaining why this platform and data is beneficial for the target audience.

As a key section, the report describes the outputs of the EN-TRACK platform and how each can be used by the target audience, facilitating their work and adding value to their operations. This report focuses on the value and credibility of the platform. It aims to serve as promotional material for the full training package, D6.4 training material package for using EN-TRACK by FI and investors (Final Report), that will become available later, once the platform is fully developed. This subsequent package will focus more on practicalities of using the platform and navigating the system.

5 EN-TRACK for financial institutions (FI)

The core users of the EN-TRACK platform have been determined as building owners and operators, policy makers, and financial institutions (FI). This report focuses on the utility of the EN-TRACK platform for financial institutions. In contrast, D6.1 details building owner related services and use of the platform.

"Financial institutions" is a very broad category and, although the EN-TRACK platform can conceivably be of use to any FI, it is useful to be a little more precise in order to focus on where EN-TRACK provides the most added value. Thus, the material in this report targets companies that are involved in financial and monetary transactions such as loans, investments, and financial markets that are already investing in or are interested in investing in energy efficiency and renewable energy projects. To be specific, **the focus is on investment funds, commercial banks, investment banks, brokerage firms and insurance companies**. These FI have a good understanding of the energy conservation measures and energy savings and are keen to gain further understanding into how energy efficiency measures can be bankable in certain environments. For examples of these FI and their understanding and needs in the market, refer to D6.5 which provides an overview of EN-TRACK stakeholder engagement in the first year of the project.

5.1 What is EN-TRACK

EN-TRACK, which stands for Energy Efficiency Performance-Tracking Platform for Benchmarking Savings and Investments in Buildings, is a 'one-stop-shop' for insights on the energy, financial and other performance of buildings. EN-TRACK builds on the extensive work done under the auspices of the Energy Efficiency Financial Institutions Group (EEFIG) to create the De-Risking Energy Efficiency Platform (DEEP).

The EN-TRACK platform provides access to two categories of data sets. Data on energy efficiency measures, and data on buildings energy performance, including 56 energy efficiency measures (EEM) typologies and 15 building typologies. Figure 1 shows a prototype page of the EN-TRACK platform indicating how this will be presented.
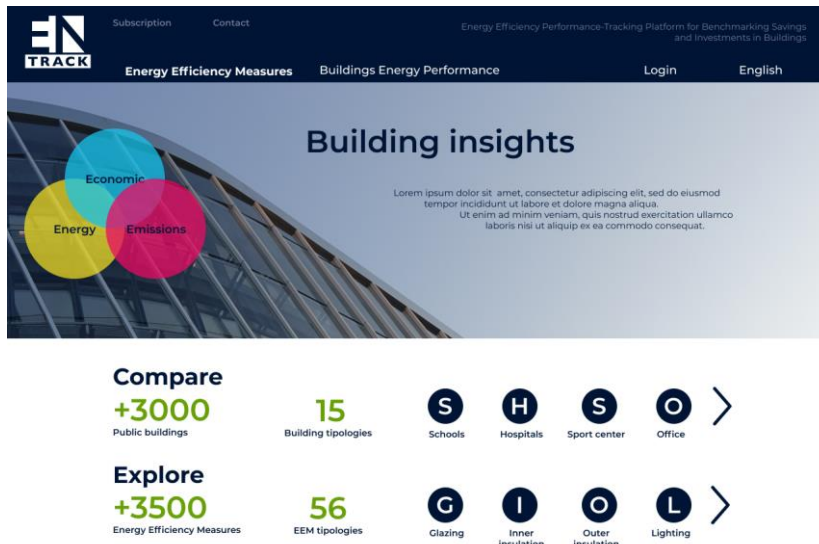
Figure 1: EN-TRACK platform landing page

The data and the EN-TRACK platform can be used for various purposes, such as:
- Benchmarking and comparing the performance of buildings before and after the installation of EEMs
- Benchmarking and comparing the financial performance of EEMs
- Track the impact of subsidies and incentives on building energy performance or EEM implementation, and track projects certified by ICP the investor confidence project or other rating systems

Figure 2 shows an example of how you can compare EEMs in the EN-TRACK platform.

Figure 2: EEM comparison page
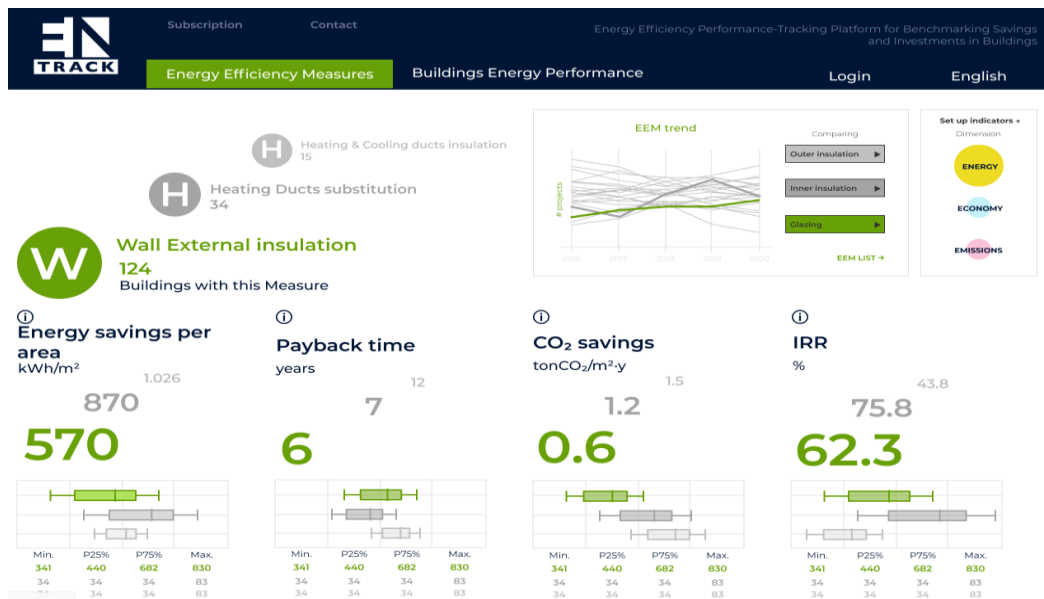
5.2   Benefits for financial institutions

For investors and financial institutions to make sound and reliable decisions, they need access to quality data. EN-TRACK provides this access through data standardization and allows stakeholders to analyze, compare, and benchmark this data. This enables them to produce reliable empirical evidence on the energy efficiency measures and investments. This, in turn, enables better, more informed, decision making.

An "operational" database supporting portfolio benchmarking analysis, built on increasingly available data from smart-metering and other sources, has been a long-standing request from many financial institutions and industry stakeholders. EN-TRACK provides this and represents a big step towards having a reliable (consistent and comparable) and recognised project performance rating system. Achieving this will make a significant contribution to making energy efficiency investments a mainstream activity of the financial sector.

EN-TRACK enables a web application which offers services for performance tracking of building portfolios and actual financial performance. This provides financial institutions with a tool to facilitate for more informed and faster decision making. The ultimate goal of this is de-risking the investments in energy efficiency projects.
Data sources include metered energy consumption, EEM and verified real investment data, energy audit and/or simulation info as well as information on the drivers for investment and non-energy benefits.

Analytics in EN-TRACK allows sensitivity analysis for risk assessment from different EEM perspectives, both in terms of value and appropriateness, thus reducing the risk in

decision making for investments.

Data is collected from various sources, aiming to maximise data collection whilst also being selective about input data in order to maintain high data quality standards. Data sources are decentralised and may change over time. The data quality may vary, and the EN-TRACK platform is not responsible for any issues or spurious analyses arising from poor quality data. Data quality is a powerful indicator of the investability, verifiability and measurability of projects and their impacts. Ultimately, it is up to user to set the standard for their data quality.

5.3   What does EN-TRACK provide as output

EN-TRACK provides various indicators of the financial and energy performance of buildings and EEMs. These indicators are at the core of the services of benchmarking and comparison purposes for financial institutions. In this section, the indicators relevant for financial institutions are presented alongside reflections upon how they can be used, and what users can learn from them. These outputs are accessed through the platform interface and are downloadable in Excel spreadsheet format.

Benchmarking is defined as an evaluation by comparison to a standard. In the context of energy performance of buildings, it is an ongoing review of the building's energy consumption to determine if it is getting better or worse, or how it stands in comparison to similar buildings.

The indicators for EEMs focus on the savings and the return on investments and there are four methods for reporting and benchmarking these indicators in the EN-TRACK platform:

- Simple tracking:
    - o Simple tracking plots some relevant performance indicators over time. By tracking monthly or annual energy consumption of a building, changes in energy use over time can be quantified to identify increases and decreases in consumption and/or expenditures. Simple tracking is the starting point for the other analysis methods and is the first step in measurement-based approaches to energy management.

- Longitudinal benchmarking:
    - o Comparison of the building's performance over time. Compares the energy use in a fixed period for a building, system, or component to a baseline period of the same length and ideally corrects by factors such as climate. Allows user to determine if performance has deteriorated or improved, to identify opportunities for improvement, to set goals, or to detect unexpectedly high energy consumption.

- Cross-sectional benchmarking:
  - Comparison of the building's performance with a group of similar buildings. The first step to determine if a building has the potential to improve its energy efficiency. It is usually done at the whole-building level, to assess a building's overall energy efficiency, using metrics such as EUI.

- Cross-sectional benchmarking with time dimension:
  - Comparison of a building's or EEM's performance indicator with similar ones from a peer group of buildings. Indicators such as the Energy Use Saving Intensity (EUSI) or the Energy Cost Saving Intensity (ECSI) of an EEM, or the Energy Use Intensity (EUI) of a building might have a trend varying in time due to the gradual change of the baseline building technologies over which the EEM is applied, changes of the energy costs or the energy use in the building.

5.3.1   Energy Use Saving Intensity (EUSI)

When the user benchmarks buildings in EN-TRACK, one of the key indicators you will see is energy use saving intensity (EUSI). The energy use saving intensity (EUSI) is used when you want to compare the energy saving performance of energy efficiency measures in different buildings. A low EUSI generally represents a building which already has good energy performance, or lower potentials for saving energy through EEMs however, building typologies with higher energy use intensities tend to portray higher EUSI, (For example, a hospital uses significantly more energy than a school).

5.3.2   Energy Cost Saving Intensity (ECSI)

This indicator is used for comparing the performance of the savings generated by the EEMs in different buildings.

This is highly relevant to use if the user is looking into structuring an energy performance contract or similar financing method for a project and would like to compare how the potential projects could compare to other existing projects and buildings around the EU.

5.3.3   Emissions Saving Intensity (ESI)

The ESI indicator tells the user how the EEMs are performing in terms of CO_2 reductions. For financial institutions who are heavily involved in investments related to energy efficiency and renewable energy, this is a highly relevant indicator as the targets of CO_2 reductions highly influence the decision making when it comes to investments. Using EN-TRACK, the user can, through this indicator, get an insight into how they can use energy

efficiency in their building portfolios to reach their CO2 targets while maintaining a profitable investment in the best way for each building typology.

5.3.4 Normalised Investment Cost (NIC)

NIC tells the user how much the EEM has cost relative per square metre. The user can utilise this indicator to understand the true earnings per EEM and that have the most accurate assessment of how an EEM will affect the building regardless of its size.

5.3.5 Avoidance Cost (AC)

AC is suitable for demonstrating how much cheaper saved energy is compared to purchased energy. AC is also useful for comparing with other methodologies for reducing carbon intensity/energy costs, such as purchasing Green Certificates, buying offsets, switching fuels, etc.

Avoidance Cost provides the total cost per unit of energy saved by an EEM. When used in conjunction with the value of energy savings, the avoidance cost can provide a net cashflow per unit of energy saved.

Avoidance cost is the measurement of energy and cost savings directly related to certain EEMs. In other words, avoidance cost is the monetary amount you can avoid spending because of the implementation of these EEMs.

The below are examples of what can provide and/or improve avoidance costs:
- Retrofit projects (such as LED and HVAC)
- Efficiency improvements
- Cutting hours of use

And the below are examples of independent variables, related to avoidance cost, which cannot be controlled:
- Colder or warmer weather
- Occupancy hours
- Days in billing periods
- Changed tariffs rates

5.3.6 Simple Payback (Years)

The payback period is the time it takes to recover the cost of an investment or the time an investor needs to reach breakeven.
Shorter paybacks generally mean (depending on own investment criteria) more attractive investments, and the payback period is calculated by dividing the amount of the investment by the annual cash flow.
This is commonly used by financial institutions and fund managers to determine if an investment is worthwhile.

The payback period is favoured when the user has short-term cash flows as a concern, a short payback period can then be more attractive than a long-term investment even if said long-term investment has a higher NPV.

Using this indicator in EN-TRACK allows the user to understand which EEMs suit your current cash flow needs and risk profile best.

5.3.7   Net Present Value (NPV)

NPV is used in capital budgeting and investment planning to analyse the profitability of a projected investment or project. If the NPV of a project or investment is positive, it means that the discounted present value of all future cash flows related to that project or investment will be positive, and therefore attractive.

In EN-TRACK, a default discount rate of 5% is assumed for the NPV calculation. The user is allowed to introduce a custom discount rate for specific calculations.

A positive NPV means that, after accounting for the time value of money, you will be profitable if you invest. Therefore, any project with a positive NPV, when considering all costs (including debt and risk), should be implemented

5.3.8   Profitability Index (PI)

The PI is an appraisal technique commonly applied in project finance. PI is calculated by dividing present value of future expected cash flows by the initial investment amount in the project. It is helpful to FIs because it effectively allows a range of projects to be ranked in terms of value per investment unit. A PI of 1 is the lowest acceptable measure on the index; any value lower than 1 would indicate that the project's present value (PV) is less than the initial investment. A higher PI means that a project will be considered more attractive. As with the NPV calculation discussed above, PI calculations require a discount rate to be applied to future cash flows. In EN-TRACK the default discount rate is preset at 5%. The user can change the discount rate for specific calculations.

When limited capital is available, the project opportunity with the highest profitability index should be chosen as it shows the project with the most productive use of the limited capital. For this reason, the PI is also referred to as the benefit-cost ratio.

The PI essentially shows which of a range of projects represents the best value for any asset allocation.

5.3.9   Internal Rate of Return (IRR)

The internal rate of return (IRR) is a metric used in financial analysis to estimate the profitability of potential investments. The IRR is the annual rate of growth that an investment is expected to generate. The higher an internal rate of return, the more desirable an investment is to undertake. IRR is uniform for investments of varying types

and, as such, can be used to rank multiple prospective investments or projects on a relatively even basis. In general, when comparing investment options with other similar characteristics, the investment with the highest IRR probably would be considered the best.

5.4 How to use this output

You can use the above services and indicators in several ways, combined and as stand-alone outputs, and depending on your own internal investment criteria and strategy, they can serve to identify new opportunities and help in the decision-making process.

- Use EN-TRACK to identify low performing buildings (which represent a good investment opportunity). For example, identify that user "x" in the EN-TRACK platform has 10 buildings with poor energy performance and, according to EN-TRACK benchmarking, these buildings could produce a healthy level of savings. This represents a sound investment opportunity. Similarly, see in the platform that public buildings in Spain (for example) represent a significant opportunity due to their energy use characteristics and replicability (that are highlighted and easily analysed in/by EN-TRACK).
- Identify costs and savings associated with your investment portfolio. If the user has a pipeline of buildings they are looking to potentially invest in, they can use EN-TRACK to see what costs and savings would be associated to the building typology and suggested EEMs and rank the buildings and potential investments in the pipeline according to priorities such as economic return, energy saving and CO_2/GHG avoidance.
- Risk and sensitivity analysis of EEM portfolios in different settings. The user can utilize EN-TRACK to, for example, see what the relevant risks are for an investment opportunity under consideration, and thanks to this, make an more informed decision on whether to invest or not.
- Assess and report on carbon savings. EN-TRACK allows the user to assess the potential carbon savings in an investment portfolio and as well report on the actual carbon savings once the EEMs are implemented.
- Identifying trends in EEM financial performance to improve investment strategies and financial forecasting. The user can take advantage of the data in EN-TRACK to identify trends in investment areas they previously have avoided, thus opening new potential and new markets for the FI thanks to data.
- Looking at variations in financial performance across EEM portfolios to determine the portfolio's risk of underperformance. For example, if the user is planning to finance the implementation of a certain technology in several buildings, but they are not too familiar with the technology in question, they can use EN-TRACK to better understand the risks related to both energy and financial performance.
- Track investments and performance in competing technologies. Understand which technology is the best for the opportunity at hand and make an informed decision

based on the EN-TRACK data of those technologies.
- Identify replicable investment trends and strategies. See the trends happening all over Europe and analyse what lies behind these trends and how this can be replicated or used in own strategic decisions.

6 Further development

All information and guidance in this report will initially be used as the basis for the creation of various training materials, and also in communication and dissemination activities. It will also be put to good use in the quarterly FI forum that aims to encourage existing, and gain more, FI users. Future iterations of this training material will include a video along with a system wiki and with options for assistance by a platform partner when needed. Users will be able to report problems and request assistance via the platform. A contact will be available in case of urgent matters.

Once the platform is fully developed and in active use, this training material will be further developed to include step by step guidance to use of the platform. User trials will help develop the platform and to gain insight into which parts of the platform might warrant additional guidance material and active support.

7 Summary

Most financial institutions will be familiar with the indicators and methodologies in this report, probably already understand how to use them for EE related matters and appreciate their value to their organization. For this reason, this report does not aim to provide training on how to apply the indicators and methodologies. Rather it simply provides a summary catalogue of EN-TRACK's key functions and provides insight into why FIs should use these functions in EN-TRACK and what the added value is that EN-TRACK can provide. To summarise:

• EN-TRACK is the only platform offering all these services in one platform
• EN-TRACK stands out from the rest when it comes to the credibility of data, the access to real data

This report has highlighted how EN-TRACK works for financial institutions and attempted to show the value and usage of EN-TRACK in the form a guidance material of the platform basics. This will be further complemented by a second report in WP6 that will focus more on the practicalities of the platform. The two documents in combination will provide a solid basis for the training materials to be produced in various formats, such as videos, platform wiki, and communication materials.