

D3.1

Energy Financing Standard for National and Transnational Energy Efficiency Financing

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1. INTRODUCTION

Increasing energy efficiency in all consuming sectors plays a vital role in coping with future energy challenges. Reducing energy consumption by increasing energy efficiency is a highly successful way of meeting the key energy policy targets of supply security, affordable costs of energy services and environmental reliability.

The lack of standardization in terms of reporting definitions and dynamic data sets is a significant obstacle to the development and improvement of energy efficiency projects, and hinders transparency, viability and risk assessment.

In this way, the main objective of this report is to map and analyze the energy and financial reporting criteria, needed to define common standards for financing of energy projects, with focus on maximized investment security for investors' and project developers' environment and social impact, as a technical part of the E-FIX Toolbox.

The Quality Criteria Catalogue, with focus on alternative and innovative financing sources and financial feasibility of energy projects, is providing a "Project Description" template together with a granular technical and financial criteria description, also an evaluation tool (refer to separate Excel calculation file) of the proposed criteria.

The evaluation tool contains a project description template structured in compulsory and additional optional information, containing general, technical and financial parameters but also environmental and social issues, creating a unitary presentation form for analyzed energy projects. Using the features from the project description template the user can easily select the necessary data for input in the calculation file.

In the calculation file the quality criteria are defined and split in compulsory and optional, technical, financial and environmental, also structured of types and having defined assessments.

The calculation and evaluation mode is defined in chapter 4. Evaluation Tool, where a brief "How to" manual is presented.

2. PROJECTS DESCRIPTION TEMPLATE

Compulsory Information about the Project

I. General Information

(Personal data, company description, short project description)

A. Information about the project owner & company

A.1	Legal form <i>[individual, association, sole proprietorship, company]</i>
A.2	Company name
A.3	Company identification number
A.4	Address (Street, Number)
A.5	Postal code, place
A.6	Legal representative (Name)
A.7	Telephone
A.8	E-Mail
A.9	Sector of operation (NACE Code)
A.10	Area of intervention <i>[local, regional, national, international]</i>
A.11	Founding date
A.12	Purpose of the business
A.13	Number of employees
A.14	Annual turnover
A.15	Balance sheet

B. Investment location

B.1	Address (Street, Number)
B.2	Postal code, place

C. Contact person

C.1	Name
C.2	Address (Street, Number)
C.3	Postal code, place
C.4	Telephone
C.5	E-Mail

D. Project description

D.1	Company description <i>[type of products/services produced/sold?]</i>
D.2	Briefly description of the energy project and technology requiring financing <i>[type of investor: private or public, location of project, environmental and social impact]</i>
D.3	Financing requirements
D.3.1	in LCU - Local Currency Unit (net)
D.3.2	in EUR (net)
D.3.3	Exchange rate EUR / LCU
D.4	Period of investment
D.5	Project volume
D.5.1	in LCU - Local Currency Unit (net)
D.5.2	in EUR (net)

II. Technical Information

1	Project type <i>[dropdown]</i>
2	Type of investment measure <i>[dropdown]</i>
3	Type of technology used <i>[dropdown]</i>
3.1	Information about the investment <i>[description of the actual and envisaged status, including essential technical parameters (performance input/output, surface, quantities), reference projects]</i>
3.2	Project phase <i>[indication of planning phase: approval phase, tendering phase or implementation phase]</i>
4	Equipment/facility lifetime (in years)
5	Energy savings - form of energy saved <i>[fuel, electricity, heat]</i>
5.1	Calculated energy savings (in kWh/year)
5.2	Lifetime energy savings (in kWh/year) <i>[calculated automatically]</i>
5.3	Methodology used for the verification of energy savings <i>[description of the methodology used, e.g. IPMPV - International Performance Measurement, or similar]</i>
5.4	Baseline consumption (reference) - in kWh/year
5.5	Baseline year
6	Expected date of initial operation
6.1	Technology provider/installer <i>[general contractor or individual contractors/suppliers name(s) of the company(s) competences, references]</i>
6.2	Project documentation required <i>[plans, decisions, tender, offers legal documentation: permits, licenses, authorisations (for construction & operation)]</i>
6.3	Visual representation of the equipment/facility <i>[sketches, photos, ...]</i>

III. Financial Information

7	Capital expenditure (EUR/LCU)
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1	50 000 (example figures)
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7.1	Financing plan
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own funds in %	30%	own funds in EUR/LCU	15 000
subsidies in %	25%	subsidies in EUR/LCU	12 500
share of innovative financing in % (share of CF/CI, Leasing, EPC)	20%	share of innovative financing in EUR/LCU (share of CF/CI, Leasing, EPC)	10 000
other debt financing in %	25%	other debt financing in EUR/LCU	12 500
Total (100%)	100%	Total (EUR/LCU)	50 000

7.2	Debt Service Coverage Ratio (DSCR) <i>[Net Operating Income / Annual Debt Payments]</i>
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7.3	Possible financial incentives <i>[description of availability of state subsidies, soft loans or other financial support instruments other financial incentives: tax advantages, reduced VAT, import tax deductions, etc.]</i>
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7.4	Financial securities <i>[securities that can be monetized in the event of the project failing (own funds, other securities)]</i>
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8	Operational expenditures (EUR/year) <i>[operational & maintenance expenditures (OPEX, O&M) including personnel, energy, maintenance and repair (estimation, recommended price, offer, assigned sum)]</i>
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9	Energy Cost savings in EUR/year
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10	Project duration (months)
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IV. Environmental Information

14	Greenhouse gas emission reductions (t CO2/year)
15	Renewable resources <i>[increase in output/energy input]</i>
16	Environmental Impact Assessment required? <i>[yes/no]</i>

V. Other Relevant Information

	Project interesting for a case study? <i>[yes/no]</i>
	Potential replicability of the project/approach? <i>[if yes, describe how]</i>

Additional Optional Information about the Project

I. Financial Information

11	Profitability calculation <i>[amortisation time dynamic calculation: NPV, IRR]</i>
12	Quality of cash flow prediction <i>[provide assumptions for annual cash flows]</i>
13	Financial risks <i>[price and cost developments exchange rate volatility risk return ratio]</i>

II. Environmental Information

17	Reduction of other emissions and wastes (t/year)
18	Reduction in the use of resources (fossils, water, etc.) in t/year
18.1	Reduction of (non-renewable) resources: consumption/output

III. Other Relevant Information about the Project

19	Energy security <i>[reduced outages of production contribution to grid stability increased use of local resources (independence from imports)]</i>
20	Information and motivation of users <i>[development of a concept for the motivation of users establishment of a suggestion scheme for clients to improve energy efficiency provision of action-oriented information on the subject of energy efficiency]</i>
21	Image / market appearance <i>[reference, certifications obtained by the entity]</i>
22	Social impact <i>[added value, benefits (for the community), awareness raising for energy efficiency/integration of renewables]</i>

3. DEFINED QUALITY CRITERIA

Proposed quality criteria, a granular technical and financial description, have been defined using three key approach: relevance, effectiveness and efficiency, impact and sustainability, providing the possibility for evaluating alternative solutions.

- **Relevance**

Relevance is used to assess whether the project fulfils an important function from a development perspective ("priority"), and whether its design is fundamentally suited to achieving the goals associated with the project ("validity of the results chain"). This means that an assessment is made of whether the project appropriately addresses an important development goal.

- **Effectiveness and Efficiency**

Effectiveness is used to assess whether a project achieves its goals. In order to allow a meaningful comparison of the targeted and actual outcomes, the project's goals should be express in the form of quantifiable levels of production or consumption. Any unintended positive or negative effects that can be observed are also included in the evaluation.

Efficiency is used to assess a project's cost-effectiveness. The central issue here is the economical use of resources. The evaluation is carried out on two different levels. On the one hand, an assessment is made of whether the effort required to provide goods or services is appropriate ("efficiency of production"). However, even more important is what we call "allocation efficiency" – achieving an adequate ratio between the funds used and the effects achieving. This involves looking into what other methods are available that could achieve similar results.

- **Impact and Sustainability**

In addition to a project's direct goals, there is also the overarching developmental impact, the big objectives that are the reason why the decision is made to promote the project in the first place. It is not always possible to measure overarching impacts. In such cases it is necessary to check their plausibility and estimate them using circumstantial evidence.

Our aim is to achieve not only short-term improvements but also sustainable results. For this reason we investigate whether any improvements are likely to endure. We consider sustainability to have been met if the project-executing institution or target group is in a position to successfully continue the promoted project once the external financial or technical support is been withdrawn.

Quality Criteria for Financing

Quality criteria	Assessment
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I. Compulsory

Technical			
	1. type of project	1.1	energy efficiency
		1.2	renewable energy
	2. type of measure	2.1	greenfield investment: energy-efficient equipment/facility
		2.2	energy efficiency measure in an existing building/facility (retrofit)
		2.3	energy efficiency equipment
		2.4	renewable energy installation
	3. type of technology	3.1	thermal insulation of walls, roofs and windows
		3.2	heating, ventilation and air conditioning (HVAC)
		3.3	process heat generation and distribution (including heat pumps and district heating systems)
		3.4	steam generation and distribution
		3.5	compressed air generation and distribution
		3.6	waste heat recovery
		3.7	pumping systems
		3.8	other efficient production equipment
		3.9	transportation means
		3.10	control-regulation-monitoring
		3.11	solar water heaters
		3.12	photovoltaic systems
	4. lifetime		equipment facility lifetime
5. energy savings	5.1	form of energy saved: fuel, electricity, heat	
	5.2	calculated energy savings	
	5.3	lifetime energy savings	
	5.4	methodology used for the verification of energy savings (IPMPV)	
	5.6	baseline consumption (reference)	
	5.7	baseline year	
6. initial operation		expected date of initial operation	

Financial	7. capital expenditure		investment
	8. financing plan	8.1	own funds, subsidies, share of innovative financing, other debt financing
		8.2	capital expenditures (CAPEX, investment costs)
8.3		debt/equity coverage ratio	

Environmental	9. operational expenditures		operational & maintenance expenditures (OPEX, O&M)
	10. cost savings	10.1	energy cost savings
		10.2	price and cost development
		10.3	development of annual savings of energy costs and operating costs
	11. duration		project duration
	12. emission reduction		greenhouse gas emission reductions
	13. renewable resources		increase in output/energy input
14. impact assessment		environmental impact assessment needed	

II. Optional

Financial	15. profitability	15.1	dynamic calculation: NPV, IRR
		15.2	amortisation time
		15.3	quality of cash flow prediction
	16. financial risks	16.1	price and cost developments
		16.2	exchange rate volatility
16.3		risk return ratio	
16.4		economic sector environment	
16.5		hedging opportunities	
Environmental	17. emission reduction		reduction of other emissions and wastes
	18. resources reduction	18.1	average reduction in the use of resources (fossils, water, etc.)
		18.2	reduction in consumption/output
Other relevant	19. energy security	19.1	reduced outages of production
		19.2	contribution to grid stability
		19.3	increased use of local resources (independent from imports)
	20. motivation of users	20.1	development of a concept for the motivation of users
		20.2	establishment of a suggestion scheme for clients to improve energy efficiency
		20.3	provision of action-oriented information on the subject of energy efficiency
	21. image / market appearance		reference, certifications obtained by the entity
22. social impact	22.1	added value	
	22.2	benefits (for the community)	
	22.3	awareness raising for energy efficiency	
	22.4	integration of renewables	

4. EVALUATION TOOL

The defined quality criteria were integrated in a calculation scheme, realized in an Excel-file, which gives the possibility to a standardized evaluation of a proposed energy project, with rating being summarised using a numerical scale.

The criteria are ranked according to the defined range and scale to reflect the needs, objectives, and priorities of the relevant stakeholders.

Scales of relative importance for evaluation criteria, discrete non-quantitative variables or continuous variables that provide empirical information on key energy performance elements, have been established with numeric values or with formulas that relate the evaluation parameter to a numeric weight.

Evaluation and computing formula are traceable to requirements, scenarios, business case assumptions, business objectives, or other documented sources.

For using the tool, a user just needs to enter the basic data found in the "Project Description" file, data that came from the analysis of the project documentation that is the subject of evaluation.

There are some criteria highlighted in yellow which are correlated financial parameters, project oriented and the user must have a self rating using a scale from 1 (low) to 3 (high). In this way the evaluation is not influenced by the investment amount but it is calculated by efficiency and performance.

After entering the data, the evaluation tool will automatically generate value points for each defined quality criteria. The sum of the generated value points will immediately give a defined value for the project.

The goal of the evaluation tool is not only to have an evaluated value for the project, it is to provide also evaluated values for the different financing mechanisms, Leasing / EPC / Crowdfunding using the E-FIX approach. For this, the tool has a calculation matrix that automatically generates value points of the impact for each defined quality criteria in using a specific financing mechanism for the energy efficiency or renewable energy project that is analyzed.

Criteria impact in the "Calculation Matrix"

Assessment	Leasing	EPC	CF / CI
* impact evaluation			
energy efficiency	1	3	2
renewable energy	3	2	3
greenfield investment: energy-efficient equipment/facility	3	1	3
energy efficiency measure in an existing building/facility (retrofit)	1	3	2
energy efficiency equipment	3	1	2
renewable energy installation	2	1	3
thermal insulation of walls, roofs and windows	2	3	3
heating, ventilation and air conditioning (HVAC)	2	3	3
process heat generation and distribution (including heat pumps and district heating systems)	2	3	3
steam generation and distribution	2	3	3
compressed air generation and distribution	2	3	3
waste heat recovery	2	3	3
pumping systems	2	3	3
other efficient production equipment	2	3	3
transportation means	1	3	2
control-regulation-monitoring	1	1	1
solar water heaters	3	2	3
photovoltaic systems	3	1	3
equipment facility lifetime (years: 5 -10 = 1, 10 - 15 = 2, 15-20 = 3;)	3	2	2
form of energy saved:			
fuel	1	1	1
electricity	1	1	1
heat	1	1	1
calculated energy savings	1	1	1
lifetime energy savings (years: 5 -10 = 1, 10 - 15 = 2, 15-20 = 3;)	1	1	1
methodology used for the verification of energy savings (IPMPV)	1	1	1
baseline consumption (reference)	1	1	1
baseline year (since 1=3, 2=2,3=1)	1	1	1
expected date of initial operation (months: 5 -10 = 1, 10 - 15 = 2, 15-20 = 3;)	2	1	3
investment	3	2	2
own funds, subsidies, share of innovative financing, other debt financing (<20%=1, <40%=2,<60%=3)	3	1	2
capital expenditures (CAPEX, investment costs)	3	1	2
	3	1	2
debt/equity coverage ratio	3	1	2
operational & maintenance expenditures (OPEX, O&M)	1	3	1
energy cost savings	1	1	1
	1	1	1
price and cost development	3	3	1
	3	3	1
development of annual savings of energy costs and operating costs (<10%=1, <20%=2,<30%=3)	3	1	2
project duration (months: 5 -10 = 1, 10 - 15 = 2, 15-20 = 3;)	1	3	2
greenhouse gas emission reductions (>100=1, >200=2,>300=3)	1	1	1
increase in output/energy input (<10%=1, <20%=2,<30%=3)	1	1	1
environmental impact assessment needed	1	1	1

Assessment	Leasing	EPC	CF / CI
* impact evaluation			
dynamic calculation: NPV	3	1	2
IRR	3	1	2
amortisation time (years: 5 -10 = 1, 10 - 15 = 2, 15-20 = 3;)	3	1	2
quality of cash flow prediction	3	1	2
price and cost developments	2	3	1
exchange rate volatility	2	3	1
risk return ratio	2	3	1
economic sector environment	2	3	1
hedging opportunities	2	1	3
reduction of other emissions and wastes (>100=1, >200=2,>300=3)	1	1	1
average reduction in the use of resources (fossils, water, etc.) (<10%=1, <20%=2,<30%=3)	1	1	1
reduction in consumption/output (<10%=1, <20%=2,<30%=3)	1	1	1
reduced outages of production	1	1	1
contribution to grid stability	1	1	1
increased use of local resources (independent from imports)	1	1	1
development of a concept for the motivation of users	1	2	3
establishment of a suggestion scheme for clients to improve energy efficiency	1	2	3
provision of action-oriented information on the subject of energy efficiency	1	2	3
reference, certifications obtained by the entity	1	2	3
added value	1	2	3
benefits (for the community)	1	2	3
awareness raising for energy efficiency	1	2	3
integration of renewables	1	2	3

PROJECT EVALUATION RESULT (for example)

Value Points	Leasing	EPC	CF / CI
32	65	48	56

After entering the data, a project value and one value for applying one of the three proposed financing mechanisms, Leasing / EPC / Crowdfunding will be calculated and displayed.

Value Points provide the general evaluation of the considered project, they can be compared with other value points achieved for other projects (or project variants) assessed. In addition, the project evaluation result provides an indication for the three different financial mechanisms considered, for which a value is provided with a recommendation (in using one of the purposed mechanisms). The higher the value, the more recommended is a financing mechanism for the considered project.

Computational formulas are easily accessible so that the impact assessment can be easily adapted to the specificity of a country, region or any other requirements.

The results give a quick view about the potential of the project and also a comparison between the three different financing mechanisms in order to help in taking decisions.



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