



**Structural and Cohesion Funds for Sustainable Energy Investments**

**Contract N°: IEE/09/09/681**

## **Work Package 2**

**Technical Input and best practices for Managing  
Authorities (and potential beneficiaries)**

**Deliverable 2.1: Sustainability Assessment Criteria and Methodology for  
SCF financed energy projects**

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# TABLE OF CONTENT

<b>1</b>	<b><u>INTRODUCTION .....</u></b>	<b><u>2</u></b>
1.1	OBJECTIVE OF SF ENERGY INVEST – WORK PACKAGE 2 .....	2
1.2	OBJECTIVE OF SF ENERGY INVEST – THIS DELIVERABLE .....	2
<b>2</b>	<b><u>SUSTAINABILITY ASSESSMENT CRITERIA .....</u></b>	<b><u>4</u></b>
2.1	SUSTAINABILITY ASSESSMENT.....	4
2.2	POSSIBLE SUSTAINABILITY CRITERIA .....	4
2.2.1	LITERATURE USED .....	6
2.2.2	LONG LIST OF CRITERIA .....	10
2.3	CRITERIA SELECTION .....	13
<b>3</b>	<b><u>CONCLUSIONS .....</u></b>	<b><u>17</u></b>
<b>4</b>	<b><u>ANNEX - COMPLETE OVERVIEW OF CRITERIA.....</u></b>	<b><u>18</u></b>

# 1 Introduction

## 1.1 Objective of SF Energy Invest – Work Package 2

The aim of this Work Package (WP) is first, to develop Sustainability Assessment Criteria aiming at supporting the Managing Authorities in the 9 campaigning regions and the 5 pilot regions in identifying and evaluating RES and EE projects.

Managing Authorities often express commitments to sustainability, yet the assessment of sustainability in EE/RES projects remains limited to traditional environmental assessment (EA), leaving the energy related aspects aside. Furthermore, while traditional EA focuses on mitigating negative effects, achieving true sustainability demands that each new undertaking make a positive contribution to desirable and durable futures. This can only be achieved if Managing Authorities are able to consciously and publicly specify and use sustainability-centred criteria to identify good RES/EE projects and to weigh trade-offs. A Sustainability Assessment should cover all aspects of the core requirements of sustainability including the creation of basic criteria, handling trade-offs, practicalities in application, implications for process design and uses in decision-making, as well as examining the range of tools and examples available to assist implementation of sustainability assessment.

In this assessment we will therefore not only look at mitigating negative environmental impacts, but also at aspects of social and economic development, as sustainability assessment is based on environmental, economic and social criteria.

Therefore, the sustainability criteria will be supported by the illustration of 10 best practice projects in the field of RES/EE financed through SCF in Europe. The aim is to highlight the differences and provide feedback to managing authorities. This approach aims to serve as a handhold Managing Authorities (and for potential beneficiaries as well) in other countries by identifying the individual lessons learnt in each project, increasing the reproducibility of success factors.

Although WP 2 focuses on the needs of the Managing Authorities, the output is extremely useful for the beneficiaries as well since they will be able, among others, to acquire practical information on what are the existing calls for RES/EE projects; how to develop successful project ideas and how to finance such projects and also by being motivated by the project design and ideas of the already successfully implemented best practice projects. They will also learn the problems, pitfalls and possibilities that Managing Authorities are confronted with.

WP2 provides the technical basis for the other WPs in this project. The Sustainability Assessment Criteria will be used in the identification of pilot projects in WP3 and used as materials for the study visits and the Energy Investment Day to be organized in WP5. The analysis of the OPs will be used as backbone information for the Energy Investment Days and logically forms the basis for the further identification of financing possibilities for the pilot projects in WP3.

## 1.2 Objective of SF Energy Invest – this deliverable

Within this deliverable, the Sustainability Assessment Criteria for evaluation of sustainable energy projects have been defined, using a pool of existing criteria. These criteria have been gained from existing Member State, European and other international initiatives in the field of sustainability assessment.

The analysis includes not only technical but also economic, environmental and social aspects important for the sustainable development of the region. The Sustainability Assessment Criteria have

been identified in two steps, first a matrix of the existing criteria will be made and their applicability to RES/EE projects and SCF will be checked.

After development of this matrix a clear set of Criteria has been developed with the input of the other project partners. To enable the participation of the managing authorities in the development of the Sustainability Assessment Criteria this deliverable will be discussed with managing authorities in the campaigning (and later in the pilot regions) for comments. This document will be disseminated to managing authorities and beneficiaries during the Energy Investment Days and the study visits organized within the SF Energy Invest project and as well as on the project website and potentially also at international events.

## 2 Sustainability assessment criteria

### 2.1 Sustainability assessment

Sustainability assessment can be defined in different ways. Available definitions in literature are the following:

- “Sustainability assessment is ... a tool that can help decision-makers and policy makers decide what actions they should take and should not take in an attempt to make society more sustainable”
- “The aim of sustainability assessment is to ensure that plans and activities make an optimal contribution to sustainable development”

SF Energy Invest will propose criteria to carry out such a sustainability assessment aimed at selecting projects for funding through SCF that will maximally support sustainable development of the country or region where the project will be implemented

As the concept of sustainability has three dimensions, environmental, economic and social, sustainability assessment criteria are as well divided into three groups:

- Environmental criteria, related to pollution to air, water and soil, climate change, the consumption of energy and water, waste generation, biodiversity
- Economic criteria, separated over two subgroups:
  - Micro-economic impact – economic/financial parameters of the proposed project
  - Macro-economic impact – economic impact of the proposed project for the wider region
- Social criteria, related to health, safety, employment (also economic criterion), workforce education etc.

Within SF Energy Invest we look at criteria for energy efficiency / renewable energy / housing projects, and therefore specific energy and building related criteria have been studied as well.

### 2.2 Possible sustainability criteria

This chapter gives a description of the selection of sustainability assessment criteria to be used for RES/EE projects. As many studies have been published during the last decade related to sustainability assessment criteria, the choice was made not to try to develop own criteria, but use the literature available. The most relevant sustainability criteria will be selected and then discussed with the managing authorities for applicability in operational programmes.

The methodology used was the following:

- Within the project consortium about 20 reports, scientific papers, guidelines and Operational Programme selection criteria were selected that listed a number of sustainability assessment criteria. So partly already existing selection criteria (from some Member States) were taken, but sustainability assessment criteria from other reports / studies were taken to get as much criteria as possible. The sources of information were selected based on their possible relevance for projects in the field of the environment, energy efficiency and renewable energy sources (including transport).
- All the named criteria were structured in a matrix comparing the sources and the criteria used. This led to a matrix with 60 sustainability assessment criteria. As some criteria were very specific for a certain type of study/research and some of the criteria were comparable, a selection was made.
- A first selection of criteria was made based on how often a criterion was mentioned, this led to a “short list” of 20 criteria.
- The matrix including the selection was reviewed by the SF-Energy Invest project partners and based on that some criteria were merged, others were added, as they were viewed crucial for the assessment of energy projects. This finally led to a list of 26 criteria relevant for use in projects financed through SCF.
- This analysis is reported (this document)
- The final step within WP2 will be to discuss the selected sustainability assessment criteria with the managing authorities, leading to a final selection (per country).

Figure 1 below shows a sample of the analysis of the sustainability assessment criteria.

Figure 1 – sample of criteria analysis matrix

## Overview of sustainability assessment criteria

Source	Criterion								
E.g. Report / Scientific Paper / Guideline / Operational Programme selection criteria	<b>Environmental</b>								
	Energy & water use and savings	Raw materials use and savings	Greenhouse gas emissions	Carbon sinks	Air pollution	(Ground and surface) water pollution	Depletion of fresh water resources	Soil pollution	soil degradation
Testing Framework for									
1 Sustainable Biomass (Cramer Report)			1	1	1	1		1	1
IDB Biofuels									
2 Sustainability Scorecard	1		1	1					
RSB Principles &									
3 Criteria for Sustainable Biofuel Production			1	1	1	1			1
4 FAIRBiotrade project							1		1
5 Sustainability Criteria for Bioenergy Systems - Expert Survey	1	1	1			1	1	1	1
6 Environmental Assessment Spain			1			1			1
7 WWF - Good Energy Projects in Europe									
8 Rapid Impact Assessment Matrix (RES Portugal)			1			1	1		
9 Guidance on EIA (EIA Review Checklist - Section 4)		1	1			1	1	1	
10 Environmental Impact Assessment - Czech Republic	1	1				1	1	1	
11 Selection criteria OP Austria	1					1	1		
12 Selection criteria OP Germany									
13 Selection criteria OP Czech Republic	1								
14 Programme scorecard Netherlands		1	1			1	1		
15 Sustainable Energy Development Indicator (SEDI) - LEI	1		1			1	1		1
16 MCDA - Electricity Systems - Germany			1						
Multicriteria Sustainability Assessment of Residential Buildings - Slovenia									
18 Comparative Sustainability Assessment (Hirschberg)			1						
19 Sustainability of Urban Infrastructures - COST C8	1					1	1		1
20 Mackenzie Gas Project - Sustainability Assessment Criteria	1	1	1			1	1	1	
<b>Score</b>	<b>8</b>	<b>6</b>	<b>11</b>	<b>3</b>	<b>12</b>	<b>10</b>	<b>8</b>	<b>4</b>	<b>5</b>

### 2.2.1 Literature used

The literature reviewed for the collection of suitable sustainability assessment criteria is shortly described below. It includes a set of reports related to:

- Sustainability criteria for biomass and biofuels
- Literature / guidelines and legislation on environmental impact assessment
- Selection criteria for projects within Operational Programmes
- Sustainability criteria for energy (infrastructure) projects
- Sustainability criteria for building construction projects

#### "Testing Framework for Sustainable Biomass (Cramer Report)"

Final report of the project Group "Sustainable Production of Biomass", chaired by Mrs. Jacqueline Cramer - former Dutch Minister of Environment. The Dutch government has set up this project group in order to formulate criteria for the production and the processing of biomass in energy, fuels and chemistry. To ensure that biomass as a source of renewable sustainable energy is produced and processed in a responsible manner the Dutch government wishes to incorporate sustainability criteria for biomass into the relevant policy instruments. In the short term this regards the Dutch subsidy arrangement for electricity production and the obligation for biofuels for road transport. In the longer term the Dutch government wishes to promote a wider application of these sustainability criteria.

#### "IDB Biofuels Sustainability Scorecard"

The Sustainable Energy and Climate Change Initiative (SECCI) and the Structured and Corporate Finance Department (SCF) of the Inter-American Development Bank (IDB) have created the IDB Biofuels Sustainability Scorecard based on the sustainability criteria of the Roundtable on Sustainable Biofuels (RSB). The primary objective of the Scorecard is to encourage higher levels of sustainability in biofuels projects by providing a tool to think through the range of complex issues associated with biofuels. Since the scientific debate around these issues continues to evolve, the Scorecard should be seen as a work-in-progress and will continue to be updated and revised as needed.

#### *"RSB Principles & Criteria for Sustainable Biofuel Production"*

The Steering Board of the Roundtable on Sustainable Biofuels (RSB) published draft principles for sustainable biofuels production in 2007, as the basis for a global stakeholder discussion around requirements for sustainable biofuels. End of 2009, a final set of principles have been published.

The RSB Principles & Criteria for Sustainable Biofuels (RSB-STD-20-001) provides guidelines on best practices in the production and processing of biofuel feedstock and raw material, and for the production, use and transport of liquid biofuel for transport. The standard described herein specifies requirements for the certification of sustainable biofuel operations along the entire supply chain.

#### *FAIRBiotrade project*

This study is part of the FAIRBiotrade project, which is aimed to identify and quantify the impact of sustainability criteria on the potential of bioenergy. The goal of this study is to make a first attempt to analyse the impact on the potential (quantity) and the costs (per unit) of bioenergy that the compliance with various sustainability criteria brings along. This nature of this work is exploratory, because of the broad set of issues covered very little work has been published on which could be build. Ukraine and Brazil are used as case studies, because both regions are identified as promising bioenergy producers. This study has been carried out by Edward Smeets, André Faaij and Iris Lewandowski - University of Utrecht

#### *Sustainability Criteria for Bioenergy Systems - Expert Survey*

Sustainability Criteria for Bioenergy Systems: Results from an Expert Survey (Thomas Buchholz\*, Valerie A. Luzadis, Timothy A. Volk) - Input on sustainability criteria for bioenergy systems was based on ratings and rankings from 46 international experts from academia, business and NGOs. The experts completed a survey ranking a suite of 35 criteria found in emerging sustainability assessment frameworks for the attributes of relevance, practicality, reliability, and importance.

#### *Environmental Assessment Spain*

ENVIRONMENTAL ASSESSMENT IN MID-TERM EVALUATION OF STRUCTURAL PROGRAMMING - Spain - With a view to the mid term evaluation of structural programming, in 2002 the Spanish Environmental Authorities Network prepared a manual to provide guidance in the environmental evaluation of the current programming period. The intention is that all evaluators should be in possession of common criteria which are coherent with those developed and applied to date.

#### *WWF - Good Energy Projects in Europe*

This paper details a number of sustainable energy projects across the EU, some of which that have received EU funds. Along these projects good examples of projects suitable for financing through Structural and Cohesion Funds are shown according to a set of criteria.

#### *Rapid Impact Assessment Matrix (RES Portugal)*

Subjective Sustainability Criteria Applied to a Renewable Energy Installation – This paper uses the Rapid Impact Assessment Matrix to evaluate Civil Engineering works. It analyses and presents in a structured, friendly and transparent environment the numerous parameters and alternatives of an EIA. It considers all 4 components of sustainability: physical / chemical, biological / ecological, social / cultural, economic / operational. These are then evaluated using qualitative criteria common to all impact considerations. This Matrix was applied to the EIA of a future hydroelectric installation in Portugal.

#### *Guidance on EIA (EIA Review Checklist - Section 4)*

The aim of the guidance is to provide practical help to those involved in all three stages of the EIA process (screening, scoping and EIS review), drawing upon experience from around Europe and worldwide.

#### *Environmental Impact Assessment - Czech Republic*

Requirements are shown for the elaboration of an EIA from one new MS (the Czech Republic) according to its national legislation.

#### *Selection criteria OP Austria*

Selection criteria for Operational programmes in Austria taken from the publication "Overview of the mechanisms of Structural and Cohesion Funds" - IEE Project PromoSCene

#### *Selection criteria OP Germany*

Selection criteria for Operational programmes in Germany taken from the publication "Overview of the mechanisms of Structural and Cohesion Funds" - IEE Project PromoSCene

#### *Selection criteria OP Czech Republic*

Selection criteria for Operational programmes in the Czech Republic taken from the publication "Overview of the mechanisms of Structural and Cohesion Funds" - IEE Project PromoSCene

#### *Programme scorecard Netherlands*

Selection criteria for Grant programmes Operational programmes in the Netherlands taken from the publication "Overview of the mechanisms of Structural and Cohesion Funds" - IEE Project PromoSCene

#### *Sustainable Energy Development Indicator (SEDI) – LEI*

Sustainability assessment of policies and technologies - D. Štreimikienė (Lithuanian energy institute) – This presentation shows an example of sustainability assessment of energy technologies carried out along the SEDI framework.

#### *MCDA - Electricity Systems – Germany*

Sustainability of electricity systems – Life Cycle Assessment applied in External Cost and Multi-Criteria Assessments - Roberto Dones - Paul Scherrer Institut (PSI) - Switzerland

Sustainability assessment of energy technologies requires quantification of effects in the ecology, social and economy realms. Life-Cycle Assessment (LCA) provides the methodological basis for addressing a wide spectrum of environmental burdens, by means of inventories and simplified impact assessments (LCIA). This paper provides examples of sustainability assessments, utilizing the two integrating methodologies for current and future electricity technology options.

#### *Multicriteria Sustainability Assessment of Residential Buildings – Slovenia*

A simple method for the assessment of sustainability of a residential building. The method consists of two steps. First, areas that influence sustainability level of the building (e.g. building architecture, design, in-built materials) are identified. In the second step, the indicators are aggregated according to their influence on individual sustainability aspects.

#### *Comparative Sustainability Assessment (Hirschberg)*

State-of-the-art Indicators for Comparative Assessment: Methodology, Result Examples and Current Developments. This paper develops and applies methods and databases for interdisciplinary assessment of energy supply options to support sustainable decisions in the energy sector.

#### *Sustainability of Urban Infrastructures - COST C8*

The scope of the paper is to overview the different approaches for evaluation of urban infrastructure sustainability. In this context, urban infrastructure covers transportation, energy, water, sewage and information networks as well as waste management and blue-green infrastructure, in terms of both the supply and demand side. A common effort of partners in the European project —C8—Best Practice in Sustainable Urban Infrastructure, developed under the Cooperation in Science and Technology program (COST), in brief COST C8, was focused on defining the methods, indicators and criteria for evaluation of sustainability, and resulted in a guidebook for decision-makers in local authorities

#### *Mackenzie Gas Project - Sustainability Assessment Criteria*

"Sustainability-based assessment criteria and associated frameworks for evaluations and decisions: theory, practice and implications for the Mackenzie Gas Project Review" The report describes the basic principles of sustainability assessment and the main approaches used for large energy infrastructure projects like the Mackenzie Gas Project (Northern Canada) - includes also possibilities to assess broader impacts and trade-offs for the region where the project is located.

### **2.2.2 Long list of criteria**

The criteria found in 20 sources of literature have been divided over the following groups of criteria:

- ✓ Environmental criteria
- ✓ Economic criteria
- ✓ Social criteria
- ✓ Energy related criteria
- ✓ Building related criteria
- ✓ Other criteria

This includes the three basic types of criteria for sustainability assessment (Environmental, economic and social) plus some other criteria that could not be automatically grouped in the first three categories.

Based on the 20 sources of literature, the following criteria were found:

#### **2.2.2.1 related to environment**

- Energy & water use and savings
- Raw materials use and savings
- Greenhouse gas emissions"
- Carbon sinks
- Air pollution
- (Ground and surface) water pollution
- Depletion of fresh water resources
- Soil pollution
- soil degradation
- Waste creation & disposal
- Use and management of hazardous chemicals and waste
- Impact on biodiversity (or flora and fauna)
- Impact on landscapes or land use
- Crop diversity
- Use of Genetically Modified Organisms
- Deforestation
- Noise

#### 2.2.2.2 *related to economy:*

- Financial (or micro-economic) feasibilityMacro-economic feasibility
- Cost efficiency
- Secured financing
- Chance of success
- In accordance with good management practise
- Application of best practices, to reduce emissions
- Monitoring system in place
- added value of the project
- employment creation
- Strategic vision, LT impact

#### 2.2.2.3 *related to society*

- Health issues (mortality and morbidity)
- Safety issues (e.g. accident rates)
- Influence on food security
- Influence on food prices
- Social well-being
- Effects on the distribution of wealth
- Local income generation
- Education component /capacity building / awareness raising
- conservation of (cultural) heritage
- Human and labour rights
- Influence on working conditions
- Equal opportunities
- Participation of local stakeholders
- Improving quality of building stock
- Reducing poverty

#### 2.2.2.4 *Specifically energy related:*

- Minimum energy efficiency of the technology
- Preferential use of RESUse of waste heat
- Reduction in the use of non-RES

- Use of new technologies
- Average Load Factor
- Peak load response
- Impact on energy prices
- Security of supply

#### **2.2.2.5** *Specifically building related:*

- Environmental impact of building materials
- Indoor comfort
- Architectural functionality and flexibility
- Recognition of architectural design
- Structural efficiency (safety and economy)
- Service life costs for maintenance and repair
- Operational costs (energy efficiency)
- Environmental impacts of energy flow (building EE and RES use)

#### **2.2.2.6** *Other criteria:*

- Compliance with laws and regulations
- Preference for SMEs

Chapter 3 shows all available criteria and how often they have been mentioned in each study.

## 2.3 Criteria selection

The 20 criteria presented in the table below appeared most often in the matrix. This way of selection was taken as a first indication of what criteria might be most important for energy related projects.

It was, however, not possible to completely rely on this relatively simple way of selection. A lot of literature analysed bioenergy and biofuels projects and activities and this gave a certain bias towards criteria important in this field.

The 20 most-used criteria			
No.	Criterion	Category	Score
1	Energy & water use and savings	Environment	8
2	Raw materials use and savings	Environment	6
3	Greenhouse gas emissions	Environment	11
4	Air pollution	Environment	12
5	(Ground and surface) water pollution	Environment	10
6	Depletion of fresh water resources	Environment	8
7	Soil degradation	Environment	5
8	Waste creation & disposal	Environment	8
9	Use and management of hazardous chemicals and waste	Environment	5
10	Impact on biodiversity (or flora and fauna)	Environment	12
11	Impact on landscapes or land use	Environment	8
12	Noise	Environment	8
13	Cost efficiency	Economic	7
14	Employment creation	Economic	9
15	Health issues (mortality and morbidity)	Social	8
16	Safety issues (e.g. accident rates)	Social	5
17	Influence on food security	Social	6
18	Local income generation	Social	5
19	Education component /capacity building / awareness raising	Social	5

20	Equal opportunities	Social	5
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For the selection of the final set of criteria (the document that will be consulted with the managing authorities) two other steps had to be taken:

1. merge criteria that are comparable and could give a similar assessment
2. a review done by the project team (including / editing) criteria that are useful for application in SCF project selection.

Based on these steps the following criteria were merged:

- Merging the criteria “greenhouse gas emissions” with “carbon sinks” into “greenhouse gas emission balance” – this gives a better possibility to assess all greenhouse gas emissions from a certain activity.
- Merging “soil degradation” with “soil pollution” into “soil pollution and degradation” – soil degradation was very often mentioned in reports related to bioenergy. Soil pollution was not, however, and has been included now as well.
- Merging “waste creation and disposal” and “Use and management of hazardous chemicals and waste have been merged into one criterion to assess the impact of all types of waste.
- The criterion “Employment creation and (local) income generation” was created from two criteria to be able to assess impact on local/regional economy of a certain project.
- Originally, the idea was raised to merge the criteria “impact on biodiversity” and “impact on landscapes and land use”. In the end this was not done, given the difference between the two. Impact on landscapes now also includes “visual contamination”

Other changes / additions were:

- “Financial / economic feasibility” of a project is included as one criterion (assessing e.g. NPV, IRR, Cash Flow). This criterion differs from “cost efficiency” where costs per saved energy unit, costs per CO2 emission reduction of costs per kWh RES produced are assessed
- Addition of the “replication potential of a project” – here we mean the potential for replication of the same project without any grants in the (near) future – added in the category economic criteria
- Addition of “good management practices” of a project – added in the category economic criteria
- Adding the social criteria “human and labour rights” and “local stakeholder participation”
- Adding two building related criteria:
  - “Specific energy consumption”, to be expressed in kWh/m<sup>2</sup>\*year
  - “Specific CO2 emission”, to be expressed in kg/m<sup>2</sup>\*year

These changes led to the following list of criteria

The 20+ criteria selected			
No.	Criterion	Category	Variable (proposal) <sup>1</sup>
1	Energy & water use and savings	Environment	% of energy/water saved
2	Raw materials use and savings	Environment	in tons
3	Greenhouse gas emission balance	Environment	CO <sub>2</sub> emissions (equivalents)
4	Air pollution	Environment	Emissions of NO <sub>x</sub> , SO <sub>2</sub> , particulate matter
5	Water pollution and use	Environment	BOD, COD
6	Soil pollution and degradation	Environment	
7	Waste creation & disposal (incl. hazardous waste)	Environment	In tons and description of disposal
8	Impact on biodiversity	Environment	
9	Impact on landscapes and land use	Environment	
10	Noise	Environment	In dB
11	Cost efficiency	Economic	Costs per tCO <sub>2</sub> emission reduction
12	Employment creation and (local) income generation	Economic	
13	Financial / economic feasibility	Economic	NPV, IRR, Cash Flow
14	Health issues (mortality and morbidity)	Social	
15	Safety issues (e.g. accident rates)	Social	
16	Influence on food security	Social	
17	Education component /capacity building / awareness raising	Social	

<sup>1</sup> If no measurable unit is available, then a form of relative scoring could be used, for example a scoring from -3 to +3. A scale of -3 and +3 gives the possibility to distinguish substantially the impact. The meaning would be the following; +3 – very positive, +2 – positive, +1 – slightly positive, 0 – neutral / no impact, -1 – slightly negative, -2 – negative, -3 – very negative. A more detailed variation (e.g. between -5 and +5) would make the choice less clear.

18	Equal opportunities	Social	
19	Minimum energy efficiency for technology	Energy	
20	Compliance with laws and regulations	Legal	
21	Replication potential of a project	Economic	
22	Good management practices	Economic	
23	Human and labour rights	Social	
24	Participation of local stakeholders.	Social	
25	Specific energy consumption	Building	kWh/m2 per year
26	Specific CO2 emission	Building	kg/m2 per year

### *3 Conclusions*

Within this exercise, a set of 26 criteria have been identified, that can possibly be used when selecting projects within the Operational Programmes.

In reality, not all criteria will be used for the selection of projects. Some criteria are more suited for specific renewable energy projects, e.g. biomass projects or wind energy projects, others more for energy efficiency projects.

The main reason for selecting such a broad set of criteria was that it gives the managing authorities the possibility to choose the most suitable criteria for the projects they are supporting through the Operational Programmes. As shown in the analysis of the operational programmes (deliverable 2.2), the projects supported vary between (industrial) energy efficiency projects, renewable energy projects and housing/ urban renewal projects.

## 4 Annex - Complete overview of criteria

Overview of sustainability assessment criteria

Source	Criterion															
	Environmental															
	Energy & water use and savings	Raw materials use and savings	Greenhouse gas emissions	Carbon sinks	Air pollution	(Ground and surface) water pollution	Depletion of fresh water resources	Soil pollution degradation	soil	Waste creation & disposal	Use and management of hazardous chemicals and waste	Impact on biodiversity (or flora and fauna)	Impact on landscapes or land use	Crop diversity	Use of GMOs	Deforestation Noise
Testing Framework for Sustainable Biomass (Cramer Report)				1	1	1	1		1	1			1			
IDB Biofuels																
2 Sustainability Scorecard RSB Principles & Criteria for Sustainable Biofuel Production	1			1	1						1	1	1			
3 FAIRBiotrade project				1	1	1	1			1	1	1	1	1	1	1
5 Sustainability Criteria for Bioenergy Systems - Expert Survey	1	1	1			1		1	1	1	1	1	1	1	1	1
6 Environmental Assessment Spain			1			1		1		1		1	1			
7 WWF - Good Energy Projects in Europe																
8 Rapid Impact Assessment Matrix (RES Portugal)				1		1	1	1					1			1
9 Guidance on EIA (EIA Review Checklist - Section 4)			1	1		1	1	1					1	1		1
10 Environmental Impact Assessment - Czech Republic	1	1				1	1	1			1		1	1		1
11 Selection criteria OP Austria	1					1	1				1					1
12 Selection criteria OP Germany																
13 Selection criteria OP Czech Republic	1															
14 Programme scorecard Netherlands		1	1			1	1									1
15 Sustainable Energy Development Indicator (SEDI) - LEI	1		1			1	1		1		1					1
16 MCDA - Electricity Systems - Germany			1								1		1	1		1
17 Multicriteria Sustainability Assessment of Residential Buildings - Slovenia																
18 Comparative Sustainability Assessment (Hirschberg)			1								1	1	1	1		1
19 Sustainability of Urban Infrastructures - COST C8	1					1	1		1					1		
20 Mackenzie Gas Project - Sustainability Assessment Criteria	1	1	1			1	1	1					1	1		
<b>Score</b>	<b>8</b>	<b>6</b>	<b>11</b>	<b>3</b>	<b>12</b>	<b>10</b>	<b>8</b>	<b>4</b>	<b>5</b>	<b>8</b>	<b>5</b>	<b>12</b>	<b>8</b>	<b>1</b>	<b>2</b>	<b>8</b>

## Overview of sustainability assessment criteria

Source	Economic										
	Financial (or micro-economic) feasibility	Macro-economic feasibility	Cost efficiency	Secured financing	Chance of success	In accordance with good management practise	Application of best practices, to reduce emissions	Monitoring system in place	added value of the project	employment creation	Strategic vision, LT impact
Testing Framework for Sustainable Biomass (Cramer Report)								1			
1 IDB Biofuels											
2 Sustainability Scorecard RSB Principles & Criteria for Sustainable Biofuel Production											
3 FAIRBiotrade project											1
4 Sustainability Criteria for Bioenergy Systems - Expert Survey	1	1					1		1		1
5 Environmental Assessment Spain											
6 WWF - Good Energy Projects in Europe											
7 Rapid Impact Assessment Matrix (RES Portugal)				1							
8 Guidance on EIA (EIA Review Checklist - Section 4)											
9 Environmental Impact Assessment - Czech Republic											
10 Selection criteria OP Austria											
11 Selection criteria OP Germany	1				1		1			1	1
12 Selection criteria OP Czech Republic	1			1		1					1
13 Programme scorecard Netherlands				1		1					1
14 Sustainable Energy Development Indicator (SEDI) - LEI				1							1
15 MCDA - Electricity Systems - Germany				1							1
16 Multicriteria Sustainability Assessment of Residential Buildings - Slovenia											
17 Comparative Sustainability Assessment (Hirschberg)				1							1
18 Sustainability of Urban Infrastructures - COST C8				1			1				1
19 Mackenzie Gas Project - Sustainability Assessment Criteria		1									1
20 Score	3	2	7	1	2	3	1	1	1	9	3

Source	Social														
	Health issues (mortality and morbidity)	Safety issues (e.g. accident rates)	Influence on food security	Influence on food prices	Social well-being	Effects on the distribution of wealth	Local income generation	Education component /capacity building / awareness raising	conservation of (cultural) heritage	Human and labour rights	Influence on working conditions	Equal opportunities	Participation of local stakeholders	Improving quality of building stock	Reducing poverty
Testing Framework for															
1 Sustainable Biomass (Cramer Report)				1	1	1		1				1			
IDB Biofuels															
2 Sustainability Scorecard				1				1	1		1				
RSB Principles &															
3 Criteria for Sustainable Biofuel Production			1	1				1			1		1		
4 FAIRBiotrade project		1		1				1	1		1				
5 Sustainability Criteria for Bioenergy Systems - Expert Survey				1		1					1		1	1	
6 Environmental Assessment Spain															
7 WWF - Good Energy Projects in Europe								1	1						
8 Rapid Impact Assessment Matrix (RES Portugal)										1					
9 Guidance on EIA (EIA Review Checklist - Section 4)		1													
10 Environmental Impact Assessment - Czech Republic															
11 Selection criteria OP Austria													1		
12 Selection criteria OP Germany													1		
13 Selection criteria OP Czech Republic															
14 Programme scorecard Netherlands		1													
15 Sustainable Energy Development Indicator (SEDI) - LEI		1	1												
16 MCDA - Electricity Systems - Germany		1	1												
Multicriteria Sustainability Assessment of Residential Buildings -															
17 Slovenia															
18 Comparative Sustainability Assessment (Hirschberg)		1	1												
19 Sustainability of Urban Infrastructures - COST C8		1	1						1					1	
20 Mackenzie Gas Project - Sustainability Assessment Criteria		1		1		1	1		1				1	1	
<b>Score</b>	<b>8</b>	<b>5</b>	<b>6</b>	<b>1</b>	<b>3</b>	<b>1</b>	<b>5</b>	<b>5</b>	<b>1</b>	<b>4</b>	<b>1</b>	<b>5</b>	<b>3</b>	<b>0</b>	<b>0</b>

Source	Specific energy related										Other		Building criteria									
	Minimum energy efficiency of the technology	Preferential use of RES	Use of waste heat	Reduction in the use of non-RES	Use of new technologies	Average Load Factor	Peak load response	Impact on energy prices	Security of supply	compliance with laws and regulations	Preference for SMEs	Environmental impact of building materials	Indoor comfort	Architectural functionality and flexibility	Recognition of architectural design	Structural efficiency (safety and economy)	Service life costs for maintenance and repair	Operational costs (energy efficiency)	env. impacts of energy flow (building EE and RES use)			
Testing Framework for																						
1 Sustainable Biomass (Cramer Report)										1												
IDB Biofuels																						
2 Sustainability Scorecard										1												
RSB Principles &																						
3 Criteria for Sustainable Biofuel Production										1												
4 FAIRBiotrade project																						
5 Sustainability Criteria for Bioenergy Systems - Expert Survey										1												
6 Environmental Assessment Spain					1																	
7 WWF - Good Energy Projects in Europe	1	1								1												
8 Rapid Impact Assessment Matrix (RES Portugal)																						
9 Guidance on EIA (EIA Review Checklist - Section 4)																						
10 Environmental Impact Assessment - Czech Republic																						
11 Selection criteria OP Austria			1								1											
12 Selection criteria OP Germany																						
13 Selection criteria OP Czech Republic	1			1							1											
14 Programme scorecard Netherlands																						
15 Sustainable Energy Development Indicator (SEDI) - LEI									1	1												
16 MCDA - Electricity Systems - Germany							1	1	1													
Multicriteria Sustainability Assessment of Residential Buildings - Slovenia												1	1	1	1	1	1	1	1	1		
17 Comparative Sustainability Assessment (Hirschberg)																						
18 Sustainability of Urban Infrastructures - COST C8																						
19 Mackenzie Gas Project - Sustainability Assessment Criteria										1	1											
Score	2	2	1	1	0	1	1	2	3	4	2		1	1	1	1	1	1	1	1		