

GREEN BONDS QUESTIONNAIRE

INVESTMENT SCREENING

This is a checklist to see if investments are in line with green bonds standards

GENERAL DATA

Name of client/applicant (company):

Address:

Phone:

Email:

Description of activities of the company:

INVESTMENT DATA

Name of investment:

Purpose of investment - environmental objectives: (select maximum three)

Investment description:						
Currency of investment	AMD					
Value of investment:	EUR		AMD	-		
Financing from project owner	EUR		AMD	-		
Financing from bank	EUR		AMD	-		
Financing from other sources:	EUR		AMD	-	Name of source	
	EUR		AMD	-	Name of source	
	EUR		AMD	-	Name of source	
Share of bank financing in the total value of the investment:			#DIV/0!			

Expected date of investment start:	
Expected date of investment completion:	
Form of financing:	
New investment/financing green projects	
Nature of what is being financed:	
Physical assets	
Type of investment/sector:	
Energy efficiency in existing buildings - renovation	
Energy efficiency in new buildings	
Renewable energy sources - solar photovoltaic installations	
Renewable energy sources - solar water heating installations	
Renewable energy sources - bioenergy	
Renewable energy sources - geothermal energy	
Renewable energy sources - small hydro power plants	
Renewable energy sources - wind	
Transport - electric vehicles	
Industry - efficient processes and reduction of CO2 emissions	
Water distribution and storage	
Water treatment	
Sustainable agriculture	
Sustainable land use	
Forestry - sustainable forestry management	
Waste - re-use of materials	
Waste - sustainable waste management	

Results**Does this investment meet requirements for green bonds standards? YES/NO****Environmental objectives**

A. Climate change mitigation

E. Pollution prevention and control

Existing buildings

Compliance with green bonds standards	Does this investment meet requirements for green bonds standards? YES/NO	YES
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Objective	Question/criteria	Answer	
Reduction of use of fossil fuel	Does this investment reduce use of fossil fuels?	Yes/No	Yes
	Does this investment reduce installed capacity by more than 20%?	Yes/No	Yes
Reduction of GHG emissions	Does this investment reduce GHG emissions by more than 30% vs. baseline?	Yes/No	Yes
Reduction of energy consumption	Does this investment include efficient envelope?	Yes/No	Yes
	Does this investment include use of efficient heating or cooling system?	Yes/No	Yes

	Does this investment include use of efficient appliances/equipment? (*optional)	Yes/No	No
	Does this investment include use of efficient lighting? (*optional)	Yes/No	No
	Does this investment reduce energy consumption by more than 20%?	Yes/No	Yes
	Does this investment meet national requirements for energy efficiency in buildings?	Yes/No	Yes
Use of renewable energy sources	Does this investment include use of renewable energy sources by more than 20% in the energy consumption? (biomass, biofuel, geothermal energy, solar energy)	Yes/No	Yes
Potential for climate change adaptation	Does this investment have potential for improvement of adaptation on climate change? (example: green roof, green walls etc.) (*optional)	Yes/No	No

GHG savings calculation

Base case		
	Unit	Value
Total floor area	m2	3000
Base case fuel for heating	N/A	Natural gas
Base case energy consumption for heating	MWh/year	450

Base case energy consumption for heating per m2	kWh/m2/year	150
GHG emissions for heating per MWh	tonnes CO2eq/MWh	0.2020
GHG emissions for heating per year	tonnes CO2eq/year	90.88
Base case energy consumption for cooling	MWh/year	90
Base case energy consumption for cooling per m2	kWh/m2/year	30
GHG emissions for cooling per MWh	tonnes CO2eq/MWh	0.2010
GHG emissions for cooling per year	tonnes CO2eq/year	18.09
Base case energy consumption for lighting	MWh/year	18
Base case energy consumption for lighting per m2	kWh/m2/year	6
GHG emissions for lighting per MWh	tonnes CO2eq/MWh	0.2010
GHG emissions for lighting per year	tonnes CO2eq/year	3.62
Energy consumption per year	MWh/year	558
Specific energy consumption per m2	kWh/m2/year	186
GHG emissions per year	tonnes CO2eq/year	112.59

Proposed case		
Total floor area	m2	3000
Proposed case fuel for heating	N/A	Natural gas
Percentage of replaced doors and windows	%	70
Energy savings for heating and cooling by replacing windows and doors	%	7.00%
Percentage of wall insulation improved	%	80.00%
Energy savings for heating and cooling by improving wall insulation	%	19.20%
Percentage of roof insulation improved	%	50.00%
Energy savings for heating and cooling by improving roof insulation	%	5.00%

Percentage of floor insulation improved	%	60.00%
Energy savings for heating and cooling by improving floor insulation	%	2.40%
Percentage of heating installations improved	%	90.00%
Energy savings for heating by improving heating installations	%	10.80%
Percentage of lighting system modernised	%	50.0%
Energy savings by using efficient lighting system	%	40.00%
Energy consumption for heating	MWh/year	250.2
Energy consumption for heating per m2	kWh/m2/year	83.4
GHG emissions for heating per MWh	tonnes CO2eq/MWh	0.2020
GHG emissions for heating per year	tonnes CO2eq/year	50.53
Energy consumption for cooling	MWh/year	59.76
Energy consumption for cooling per m2	kWh/m2/year	19.92
GHG emissions for cooling per MWh	tonnes CO2eq/MWh	0.2010
GHG emissions for cooling per year	tonnes CO2eq/year	12.01
Energy consumption for lighting	MWh/year	10.8
Energy consumption for lighting per m2	kWh/m2/year	3.6
GHG emissions for lighting per MWh	tonnes CO2eq/MWh	0.2010
GHG emissions for lighting per year	tonnes CO2eq/year	2.17
Energy consumption per year	kWh/year	320.76
Energy consumption per year per m2	kWh/m2/year	0.10692
Reduction in energy consumption for heating	kWh/year	199.8
Reduction in energy consumption for cooling	kWh/year	30.24
Reduction in energy consumption for lighting	kWh/year	7.2
Reduction in final energy consumption	kWh/year	237.24
Reduction in final energy consumption/m2	kWh/m2/year	0.07908
GHG emissions per year	tonnes CO2eq/year	64.71
GHG emissions savings per year	tonnes CO2eq/year	47.88
Lifetime of investments	Years	15

GHG emissions over lifetime of investments	tonnes CO2eq	718.2
Percentage of GHG savings per year	%	42.52

GHG emissions per MWh	tonnes CO2eq/MWh
Natural gas	0.2020
Electricity**	0.2010
Wood	0.4032
Coal***	0.3539

**https://www.irena.org/IRENADocuments/Statistical_Profiles/Eurasia/Armenia_Eurasia_RE_SP.pdf

***Coal=Anthracite

**** applicable if the investment does not have its own energy saving data / estimates

if the bank has its own data for the investment, it is used instead of the data in the table below:

Intervention	% of savings
Wall insulation	24.0%
Roof insulation	10.0%
Floor insulation	4.0%
Replacement of windows and doors	10.0%
Installation of the modern heating system	12.0%
Total	120.0%

Intervention in lighting system	% of savings
Maximum reduction of energy consumption	80.0%

Environmental objectives

- A. Climate change mitigation
- E. Pollution prevention and control

New buildings

Compliance with green bonds standards	Does this investment meet requirements for green bonds standards? YES/NO	YES
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Objective	Question/criteria	Answer	
Reduction of use of fossil fuel	Does this investment not include the use of coal and liquid fossil fuels?	Yes/No	Yes
Reduction of GHG emissions	Does this investment provide significant reduction of GHG emissions compared to BAU scenario?	Yes/No	Yes
Reduction of energy consumption	Does this investment include efficient envelope?	Yes/No	Yes
	Does this investment include use of efficient heating/cooling system?	Yes/No	Yes
	Does this investment include use of efficient appliances/equipment?	Yes/No	Yes
	Does this investment include use of efficient lighting?	Yes/No	Yes

	Does this investment provide energy consumption that is at least equivalent to energy class A?	Yes/No	Yes
Use of renewable energy sources	Does this investment include use of renewable energy sources by more than 20% in the energy consumption? (biomass, biofuel, geothermal energy, solar energy)	Yes/No	Yes
Potential for climate change adaptation	Does this investment have potential improvement of adaptation on climate change? (example: green roof, green walls etc.) (*optional)	Yes/No	No

GHG savings calculation

Base case (BAU scenario - building with average energy consumption in Armenia)		
	Unit	Value
Total floor area	m2	3000
Base case fuel for heating	N/A	Natural gas
Base case energy consumption for heating	MWh/year	450
Base case energy consumption for heating per m2	kWh/m2/year	150
GHG emissions for heating per MWh	tonnes CO2eq/MWh	0.2020
GHG emissions for heating per year	tonnes CO2eq/year	90.88
Base case energy consumption for cooling	MWh/year	90
Base case energy consumption for cooling per m2	kWh/m2/year	30
GHG emissions for cooling per MWh	tonnes CO2eq/MWh	0.2010
GHG emissions for cooling per year	tonnes CO2eq/year	18.09
Base case energy consumption for lighting	MWh/year	18
Base case energy consumption for lighting per m2	kWh/m2/year	6

GHG emissions for lighting per MWh	tonnes CO2eq/MWh	0.2010
GHG emissions for lighting per year	tonnes CO2eq/year	3.62
Energy consumption per year	MWh/year	558
Specific energy consumption per m2	kWh/m2/year	186
GHG emissions per year	tonnes CO2eq/year	112.59

Proposed case (comparison with building with average energy consumption in Armenia)		
Total floor area	m2	3000
Proposed case fuel for heating	N/A	Natural gas
Energy consumption for heating per m2	kWh/m2/year	50
Energy consumption for heating	MWh/year	150.00
GHG emissions for heating per MWh	tonnes CO2eq/MWh	0.2020
GHG emissions for heating per year	tonnes CO2eq/year	30.29
Energy consumption for cooling per m2	kWh/m2/year	20
Energy consumption for cooling	MWh/year	60.00
GHG emissions for cooling per MWh	tonnes CO2eq/MWh	0.2010
GHG emissions for cooling per year	tonnes CO2eq/year	12.06
Energy consumption for lighting per m2	kWh/m2/year	3
Energy consumption for lighting	MWh/year	9.00
GHG emissions for lighting per MWh	tonnes CO2eq/MWh	0.2010
GHG emissions for lighting per year	tonnes CO2eq/year	1.81
Energy consumption per year	kWh/year	219.00
Energy consumption per year per m2	kWh/m2/year	0.073
Reduction in energy consumption for heating	kWh/year	300.00
Reduction in energy consumption for cooling	kWh/year	30
Reduction in energy consumption for lighting	kWh/year	9

Reduction in final energy consumption	kWh/year	339
Reduction in final energy consumption/m2	kWh/m2/year	0.113
GHG emissions per year	tonnes CO2eq/year	44.16
GHG emissions savings per year	tonnes CO2eq/year	68.43
Lifetime of investments	Years	15
GHG emissions over lifetime of investments	tonnes CO2eq	1026.4
Percentage of GHG savings per year	%	60.78

GHG emissions per MWh	tonnes CO2eq/MWh
Natural gas	0.2020
Electricity**	0.2010
Wood	0.0000
Coal***	0.3510

**https://www.irena.org/IRENADocuments/Statistical_Profiles/Eurasia/Armenia_Eurasia_RE_SP.pdf

***Coal=Anthracite

Environmental objectives

- A. Climate change mitigation
- E. Pollution prevention and control

Transport - electric vehicles - passenger cars and commercial vehicles

Compliance with green bonds standards	Does this investment meet requirements for green bonds standards? YES/NO	YES
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Objective	Question/criteria	Answer	
Reduction of use of fossil fuel	Does this investment increase share of renewable energy sources in the energy consumption in Armenia?	Yes/No	Yes
	Does this investment support reduction of use of fossil fuels?	Yes/No	Yes
Reduction of GHG emissions	Does this emission reduce total GHG emissions in Armenia?	Yes/No	Yes
	For electric vehicles, is their CO2 emission = 0 gCO2/p-km? * For hybrid and fuel cell vehicles, is their CO2 emission <75 gCO2/p-km?	Yes/No	Yes
Potential for climate change adaptation	Does this investment have potential for improvement of adaptation on climate change? (*optional)	Yes/No	No
Existence of necessary infrastructure	Is there an adequate infrastructure for charging electric vehicles?	Yes/No	Yes
Impact on environment	Is this investment environmentally friendly? (no significant negative impact on soil etc.)	Yes/No	Yes

* For electric vehicles, 0 gCO2 per p-km will be threshold from 2025, in 2020 the target was <50 gCO2 per p-km

Impact on reduction of GHG emissions		
Number of procured electric vehicles	#	100
Grid emission factor for Armenia**	tonnes CO2eq/MWh	0.2010
Km driven per year per vehicle	km/year	15,000
Base case (BAU) - diesel vehicle		
Fuel use per 100 km	liters/100 km	7.5
Fuel used	liters/year	1125.0
Energy per liter of diesel fuel***	MWh/liter	0.0107
Final energy used	MWh	12.04
Conversion factor - final energy / primary energy****	#	1.1
Primary energy used	MWh	10.94
GHG emissions per MWh*****	tCO2/MWh	0.2668
GHG emissions per vehicle	tCO2/vehicle	2.92
GHG emissions per year	tonnes CO2eq/year	292
Energy efficiency case - electric vehicle/car		
Fuel use per 100 km*****	MWh/km	0.015
Fuel used	MWh	2.250
Final energy used	MWh	2.250
Conversion factor - final energy / primary energy	#	0.5
Primary energy used	MWh	4.5
Diesel fuel savings	MWh/vehicle	10.94
GHG emissions per MWh	tCO2/MWh	0.2010
GHG emissions per vehicle	tCO2/vehicle	0.5
Energy saved per vehicle	MWh/vehicle	6.4
GHG emissions reduced per vehicle	tCO2/vehicle	14.5
Total energy saved	MWh	644.3
GHG emissions reduced per year	tonnes CO2eq/year	1,450
Lifetime of investments	Years	10
GHG emissions over lifetime of investments	tonnes CO2eq	2,919

- ** https://www.irena.org/IRENADocuments/Statistical_Profiles/Eurasia/Armenia_Eurasia_RE_SP.pdf
- *** International Gas Union
- **** Assumption
- ***** GEF template
- ***** Assumption

Environmental objectives

- A. Climate change mitigation
- E. Pollution prevention and control

Solar photovoltaics

Compliance with green bonds standards	Does this investment meet requirements for green bonds standards? YES/NO	YES
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Objective	Question/criteria	Answer	
Reduction of use of fossil fuel	Does this investment increase share of renewable energy sources in the electricity/energy generation in Armenia?	Yes/No	Yes
	Does this investment support reduction of use of fossil fuels?	Yes/No	Yes
	Does this investment provide minimum of 85 % electricity generated from solar energy in this facility?	Yes/No	Yes

Reduction of GHG emissions	Does this emission reduce total GHG emissions in total electricity production in Armenia?	Yes/No	Yes
	Is the volume of investment / designed installed capacity or designed annual production of electricity from solar energy large enough for the circumstances in Armenia?	Yes/No	Yes
Potential for climate change adaptation	Does this investment have potential for improvement of adaptation on climate change? (*optional)	Yes/No	No
Existence of necessary infrastructure	Will the investment be supported with fully dedicated transmission infrastructure, grid connections and other supporting infrastructure for solar power plants?	Yes/No	Yes
Impact on environment	Is this investment environmentally friendly? (no significant negative impact on soil etc.)	Yes/No	Yes

Impact on reduction of GHG emissions		
Installed capacity in solar photovoltaics	MW	5
Designed annual generation of electricity from solar energy	MWh/year	10,000.00
Grid emission factor for Armenia*	tonnes CO2eq/MWh	0.2010
Average GHG emissions from solar photovoltaics**	tonnes CO2eq/MWh	0.0250
GHG emissions per year avoided	tonnes CO2eq/year	1,760
Lifetime of investments	Years	25
GHG emissions over lifetime of investments	tonnes CO2eq	44,000

* https://www.irena.org/IRENADocuments/Statistical_Profiles/Eurasia/Armenia_Eurasia_RE_SP.pdf

** <https://www.un.org/en/chronicle/article/promise-solar-energy-low-carbon-energy-strategy-21st-century>

Environmental objectives

- A. Climate change mitigation
- E. Pollution prevention and control

Solar water heating

Compliance with green bonds standards	Does this investment meet requirements for green bonds standards? YES/NO	YES
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Objective	Question/criteria	Answer	
Reduction of use of fossil fuel	Does this investment increase share of renewable energy sources in the electricity/energy generation in Armenia?	Yes/No	Yes
	Does this investment support reduction of use of fossil fuels?	Yes/No	Yes
	Does this investment ensure that solar energy meets at least 30% of the annual heating needs of the facilities / buildings for which it is intended?	Yes/No	Yes
Reduction of GHG emissions	Does this emission reduce total GHG emissions in total heat production in Armenia?	Yes/No	Yes

	Is the volume of investment / designed installed capacity or designed annual production of heat from solar energy large enough for the circumstances in Armenia?	Yes/No	Yes
Potential for climate change adaptation	Does this investment have potential for improvement of adaptation on climate change? (*optional)	Yes/No	No
Impact on environment	Is this investment environmentally friendly? (no significant negative impact on soil etc.)	Yes/No	Yes

Impact on reduction of GHG emissions		
Installed capacity in solar photovoltaics	MW	2
Designed annual generation of heat from solar energy	MWh/year	4,000.00
Grid emission factor for Armenia*	tonnes CO ₂ eq/MWh	0.2010
Average GHG emissions from solar**	tonnes CO ₂ eq/MWh	0.0200
GHG emissions per year avoided	tonnes CO ₂ eq/year	724
Lifetime of investments	Years	20
GHG emissions over lifetime of investments	tonnes CO ₂ eq	14,480

* https://www.irena.org/IRENADocuments/Statistical_Profiles/Eurasia/Armenia_Eurasia_RE_SP.pdf

** <https://researchbriefings.files.parliament.uk/documents/POST-PN-0523/POST-PN-0523.pdf>

Environmental objectives

- A. Climate change mitigation
- E. Pollution prevention and control

Wind farms

Compliance with green bonds standards	Does this investment meet requirements for green bonds standards? YES/NO	YES
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Objective	Question/criteria	Answer	
		Yes/No	Yes
Reduction of use of fossil fuel	Does this investment belong to one or more of the following activities: 1) The development, construction and operation of wind farms; 2) Operational production or manufacturing facilities wholly dedicated to wind energy development; 3) Wholly dedicated transmission infrastructure for wind farms?	Yes/No	Yes
	Does this investment increase share of renewable energy sources in the electricity/energy generation in Armenia?	Yes/No	Yes
	Does this investment support reduction of use of fossil fuels?	Yes/No	Yes
Reduction of GHG emissions	Does this emission reduce total GHG emissions in total electricity production in Armenia?	Yes/No	Yes
	Is the volume of investment / designed installed capacity or designed annual production of electricity from wind large enough for the circumstances in Armenia?	Yes/No	Yes

Potential for climate change adaptation	Does this investment have potential for improvement of adaptation on climate change? (*optional)	Yes/No	No
Impact on environment	Is this investment environmentally friendly? (no significant negative impact on wild birds, soil, etc.)	Yes/No	Yes

Impact on reduction of GHG emissions		
Installed capacity in wind farms	MW	10
Designed annual generation of electricity from wind	MWh/year	20,000.00
Grid emission factor for Armenia*	tonnes CO2eq/MWh	0.2010
Average GHG emissions from wind farms**	tonnes CO2eq/MWh	0.0110
GHG emissions per year avoided	tonnes CO2eq/year	3,800
Lifetime of investments	Years	20
GHG emissions over lifetime of investments	tonnes CO2eq	76,000

* https://www.irena.org/IRENADocuments/Statistical_Profiles/Eurasia/Armenia_Eurasia_RE_SP.pdf

[https://www.forbes.com/sites/christopherhelman/2021/04/28/how-green-is-wind-power-really-a-new-report-tallies-up-the-carbon-cost-of-](https://www.forbes.com/sites/christopherhelman/2021/04/28/how-green-is-wind-power-really-a-new-report-tallies-up-the-carbon-cost-of-renewables/?sh=6ae8ce4573cd)

** [renewables/?sh=6ae8ce4573cd](https://www.forbes.com/sites/christopherhelman/2021/04/28/how-green-is-wind-power-really-a-new-report-tallies-up-the-carbon-cost-of-renewables/?sh=6ae8ce4573cd)

Environmental objectives

- A. Climate change mitigation
- E. Pollution prevention and control

Small hydro power plants

Compliance with green bonds standards	Does this investment meet requirements for green bonds standards? YES/NO	YES
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Objective	Question/criteria	Answer	
Reduction of use of fossil fuel	Does this investment support reduction of use of fossil fuels?	Yes/No	Yes
	Does this investment increase share of renewable energy sources in the electricity/energy generation in Armenia?	Yes/No	Yes
	Does this investment relate to a small hydropower installations with nominal capacity less than 20 MW and in case of reservoirs power density more than 4 W/m ² ?	Yes/No	Yes
Reduction of GHG emissions	Is the GHG emissions intensity < 50 g CO ₂ e/kWh?	Yes/No	Yes
	Is the power density > 10 W/m ² ?	Yes/No	Yes
Potential for climate change adaptation	Does this investment have potential for improvement of adaptation on climate change? (*optional)	Yes/No	No

Impact on environment	Is this investment environmentally friendly? (no significant negative impact on water, soil, biodiversity etc.)	Yes/No	Yes
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Impact on reduction of GHG emissions		
Installed capacity in small hydro power plant (HPP)	MW	5
Designed annual generation of electricity from small HPP	MWh/year	10,000.00
Grid emission factor for Armenia*	tonnes CO ₂ eq/MWh	0.2010
Average GHG emissions from HPPs**	tonnes CO ₂ eq/MWh	0.0240
GHG emissions per year avoided	tonnes CO ₂ eq/year	1,770
Lifetime of investments	Years	40
GHG emissions over lifetime of investments	tonnes CO ₂ eq	70,800

* https://www.irena.org/IRENADocuments/Statistical_Profiles/Eurasia/Armenia_Eurasia_RE_SP.pdf

** <https://www.hydropower.org/factsheets/greenhouse-gas-emissions>