

Explanatory note for filling Annex A8 “Climate proofing assessment”

In order, to fill in correctly Annex A8. “Climate proofing assessment” the following explanatory note will give you more detailed instructions which parts of your technical design or work design are relevant and contain the necessary information.

You must fill in Annex A8. “Climate proofing assessment” for each construction/infrastructure site included in your project proposal!!!

First step “Energy efficiency” assessment process

Assessment element	<i>Phase 1 (screening)</i>						
	Reducing energy consumption						
Energy efficiency assessment' of the investment	Yes, with 5-10%	Yes, with 10-15%	Yes, with 15-30%	Yes, with more than 30%	No	Not applicable	If, your answer is “NO” or “N/a” please explain why

Chose one of the options from the dropdown menu on the left of this table!

How to estimate the annual consumption of primary energy?

The total (integrated) energy performance of a given building includes the annual energy consumption for heating, cooling, ventilation, hot water for domestic needs, lighting and energy-consuming appliances, referred to one square meter of the total air conditioned area of the building (Aclim.,m2). The integrated energy characteristic of the building "specific annual consumption of primary energy (kWh/m2yr.) is certified by the energy characteristics certificate, (if you have previous energy survey of the building or passport of the building) regulated by a model for new and a model for existing buildings. In case you don't have energy survey of the building or passport of the building, the specialist who will prepare “Energy efficiency” part of the work/technical

design must include overall conclusion of the estimated annual consumption of primary energy which the infrastructure will obtain after the project is completed.

Please keep in mind when you are preparing your project that according to the Ordinance No. RD-02-20-3 of 9.11.2022 on the technical requirements for the energy characteristics of buildings, the energy efficiency requirements for buildings in Bulgaria are as follows:

1. All new buildings of the relevant category are designed with close to zero energy consumption according to the national definition defined in the Energy Efficiency Act. The requirement will take effect from 01.01.2024.
2. Existing buildings of the relevant category, which are occupied by public bodies, must have a primary energy consumption at least in accordance with class "B".
3. All existing buildings of the relevant category, which are not occupied by public bodies, must have a primary energy consumption of at least class "B".

For the first part of the declaration use data from technical/work design plan of the infrastructure or ask energy efficiency specialist to evaluate your investment.

Second step 'Carbon Footprint assessment' of the investment

Carbon footprint assessment' of the investment	Yes	No	No effect on the CO ₂ emissions	If, your answer is "NO" or "N/a" please explain why
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Chose one of the options from the dropdown menu on the left of this table!

For this step use data from technical/ work design and Bill of Quantities

The greenhouse gases included in the EIB carbon footprint methodology include the seven gases listed in the UNFCCC Kyoto Protocol), namely: carbon dioxide (CO₂); methane (CH₄); nitrous oxide (N₂O); hydrofluorocarbons (HFCs); perfluorocarbons (PFCs); sulphur hexafluoride (SF₆); and nitrogen trifluoride (NF₃). The greenhouse gas emission quantification process converts all emissions into tonnes of carbon dioxide called CO₂ (equivalent) using Global Warming Potentials (GWP) consistency with the climate targets for 2030 and 2050 and The Paris Agreement aims 'Holding the increase in the global average temperature to well below 2 °C above pre-industrial

levels and to pursue efforts to limit the temperature increase to 1,5 °C above pre-industrial levels.

According to national legislation all partners must follow approved procedures for certification and compliance of the construction products.

Bulgarian legislation:

- Law on technical requirements for products
- National Standardization Law
- Ordinance RD-02-20-1 of 02/05/2015 on the conditions and procedure for placing construction products in the constructions of the Republic of Bulgaria (The Ordinance)
- Order No. RD-02-14-1329 of 3.12.2015 of the Minister of Regional Development and Public Works to determine Bulgarian national requirements for the use of construction products in construction in connection with their intended use or uses, promulgated in State Gazette. no. 98 of December 15, 2015;
- Order No. RD-02-14-643/22.08.2016 of the Minister of Regional Development and Public Works to approve procedures for certification of the compliance of construction products with the national requirements for the use of construction products in constructions in connection with their intended use or uses defined by Order No. RD-02-14-1329 of 3.12.2015 of the Minister of Regional Development and Public Works (promulgated SG No. 98 of 2015);

If the project infrastructure includes Green Infrastructure elements (e.g., green roofs, urban trees, green belts) that will reduce CO₂ footprint of the investment and benefit both - heating and cooling in urban environment, then you must check then you must check “Yes” in the declaration. Also there is a link between energy and Green Infrastructure, i.e., carbon sequestration and biofuel production, come with low costs and high benefits, as the photosynthesis process powered by the sun is free. Both have the benefit of mitigating climate change by reducing CO₂ concentrations (carbon sequestration) or reducing the use of fossil fuels (biofuels).

If your investment is following and complying with all national and European standards for construction product without any additional measure included in your project, then you must check **“No effect on the CO₂ emissions” in the declaration.**

Third step “Climate variables and hazards” of the infrastructure assessment process

Climate variables and hazards												
	On site - assets, construction, building - risk level			Water - risk level, supply pipelines, reservoirs, waste water treatment			Product or services			Transport links or transport services		
Flood	High	Medium	Low	High	Medium	Low	High	Medium	Low	High	Medium	Low
Heat/Forest fire	High	Medium	Low	High	Medium	Low	High	Medium	Low	High	Medium	Low
Drought	High	Medium	Low	High	Medium	Low	High	Medium	Low	High	Medium	Low

Chose one of the options from the dropdown menu!!!

Climate change adaptation measures for infrastructure projects focus on ensuring a suitable level of resilience to the impacts of climate change, which includes acute events such as more intense floods, cloudbursts, droughts, heatwaves, wildfires, storms and landslides and hurricanes, as well as chronic events such as projected sea-level rise and changes in average precipitation, soil moisture and air humidity.

This stage is more related to the project context, i.e. the proposed project and its objectives, including all ancillary activities needed to support the project's development and operation. An impact of climate change on any of the project activities or components may undermine the success of the project. It is essential to understand the overall importance and functionality of the project itself and its part in the overall context/system and to assess how essential this infrastructure is.

Note that the timescale for the climate variables and hazards assessment should correspond to the intended lifespan of the investment being financed under the project.

Floods

This part must be analyzed in the context of 3-4 relevant element depending on the type of the infrastructure and regional specifics.

Check if your investment is in the area of high level of flood danger. Bulgarian partner/s can obtain information from one of the directorates for river basin management under the Ministry of Environment and Waters:

- Danube Region with Pleven center - covering the water catchment areas of the Iskar, Erma, Nishava, Ogosta and West of Ogosta, Vit, Osam, Yantra, Rusenski Lom and Danubian Dobrudjan rivers;
- West Aegean region (BDB) with Blagoevgrad center - for the catchment areas of the Mesta, Struma and Dospat rivers. <https://wabd.bg/content/en/>

Maps of the flood zones and danger level are published on the web sites of the respected directorates for river basin management.

For partners from North Macedonia:

Hydrometeorological Service (UHMR) performs monitoring and provides rainfall, river level, and meteorological data. Supports flood forecasting. at the national level: <https://uhmr.gov.mk/>

Few more thinks to consider during flood analysis such as:

- Will it change the capacity of existing flood plains for natural flood management?
- Will it alter the water retention capacity in the watershed?
- Are embankments stable enough to withstand flooding?
- Will the project be a risk from raising levels of near-surface ground water?
- Will it put at risk water supply pipelines, reservoirs, waste water treatment facilities etc.
- Will it put at risk local production or services supply, e.g. blocking access?
- Will it disrupt transport connections, increase traffic flow on main roads?

If the infrastructure will not affect current conditions or will have a zero effect on current conditions mark “low” in the table.

Heat/Forest fire

Different geographical locations can be exposed to different climate hazards. It is useful to understand how the exposure of different geographic areas will change as a result of changing climate hazards, as illustrated in the list below:

For instance: — areas where people depend on natural resources for income/livelihood — coastal areas, islands and offshore locations are particularly exposed to increasing storm surge heights, wave heights, coastal flooding and erosion; — areas with low and falling seasonal precipitation are often more exposed to increasing risks of drought, subsidence and wildfire; — areas with high and increasing temperature are often more at risk of heatwaves; — areas with increased seasonal precipitation (possibly combined with more rapid snowmelt and cloudbursts) are often more exposed to flash floods and erosion; — areas containing both tangible and intangible cultural heritage.

Every country has a local institution which is monitoring weather and makes short and long term predictions, also making present and future models based on data.

For Bulgarian partner/s information is available at <https://www.meteo.bg/bg> - National institute of Meteorology and Hydrology.

For partners from North Macedonia: Information can be found with Ministry of Agriculture, Forestry and Water Economy (MAFWE), per the 2015 Forest Law including Macedonian Forest Fire Information System (MAKFFIS).

On EU level, the European Forest Fire Information System (EFFIS) was created through cooperative effort of the countries and the EC Services, and is open to all European countries. All data and services provided by Joint Research Center can be found at <https://effis.jrc.ec.europa.eu/applications/data-and-services>

What must be consider during evaluation of this component?

- Will the proposed project restrain air circulation or reduce open spaces?
- Will the proposed project be endangered by forest fire?
- Will it absorb or generate heat?
- Will it emit volatile organic compounds (VOCs) and nitrogen oxides (NOx) and
- contribute to tropospheric ozone formation during sunny and warm days?
- Can it be affected by heatwaves?
- Will it increase energy and water demand for cooling?
- Can the materials used during construction withstand higher temperatures (or
- will they experience, for example, material fatigue or surface degradation)?

- Will it put at risk local production or services supply, e.g. area is not accessible?
- Will it disrupt transport connections, increase traffic flow on main roads?

If the infrastructure will not affect current conditions or will have a zero effect on current conditions mark “low” in the table.

Drought

Direct economic impacts of drought affect industries including agriculture, recreation, energy, tourism, timber, fisheries, and others that rely heavily on water. Indirect economic impacts of drought can be just as severe and damaging as direct impacts. Indirect impacts include job losses, business failures, lost investments, economic uncertainty, and changed development and consumption patterns. Drought often correlates with large wildfire events and changes to soil that increase cyclical flooding and/or result in land subsidence. Severe droughts can result in shortages of water supplies, with widespread social and economic consequences. Drought-induced water scarcity and lack in water supply affect further sectors and critical infrastructures. A lack in water will negatively affect the electricity production and services.

Due to the different types of drought, drought monitoring is based on the analysis of a series of drought indicators, representing different components of the hydrological cycle (e.g. precipitation, soil moisture, reservoir levels, river flow, groundwater levels) or impacts (e.g. vegetation water stress). Usually indicators represent statistical anomalies of the current situation with respect to the long-term climatology at a given location and period of time. As such they are a measure of the probabilistic severity of a given event.

In order to ease the interpretation and to provide information for project impact evaluation, each candidate must check the area where the intended infrastructure will be build and compare data from various sources in order to determine the effect of the project to local agricultural sector and local ecosystem.

For Bulgarian partner/s information on current drought conditions in the country can be found on <http://gis.mrrb.government.bg/>,

<http://nationalsoils.com/%D0%BA%D0%B0%D1%80%D1%82%D0%B8/> and some report published on the website of the Ministry of Environment and Waters

In Serbia, the main organization responsible for drought monitoring and early warning is the Republic Hydrometeorological Service (RHMZ). They are responsible for issuing meteorological and hydrological information and warnings, including drought warnings, before, during, and after a drought event. Additionally, the Drought Management Centre for South East Europe (DMCSEE) plays a role in drought monitoring and resilience in the region, including Serbia.

Further information can be provided by European Drought Observatory (e.g., precipitation measurements, satellite measurements, modelled soil moisture content), and can be downloaded from <https://edo.jrc.ec.europa.eu/edov2/php/index.php?id=1000> or <https://edo.jrc.ec.europa.eu/gdo/php/index.php?id=2112>

What must be consider during evaluation of this component?

- Will the proposed project increase water demand?
- Will it adversely affect the aquifers?
- Is the proposed project vulnerable to low river flows or higher water temperatures?
- Will it worsen water pollution - especially during periods of drought with reduced dilution rates, increased temperatures and turbidity?
- Will it change the vulnerability of landscapes or woodlands to wild fires?
- Is the proposed project located in an area vulnerable to wildfires?
- Can the materials used during construction withstand higher temperatures?

If the infrastructure will not affect current conditions or will have a zero effect on current conditions mark “low” in the table.

Summarized result of the first three step must be displaced at this table:

EXPOSURE ANALYSIS			
Current climate	High	Medium	Low
Future climate	High	Medium	Low
Current + Future	High	Medium	Low
<p>The output of the exposure analysis is based on the summarized results of the previous table. The ranking must be done with consideration of the relevant climate variables and hazards for the selected location, investment type of the project, and current and future climate features of the area.</p>			

A score of 'high', 'medium' or 'low' should be given for each theme and climate hazard and subsequently the result in the Exposure analysis section must correlate with previous findings.

This result put you project on "medium" as overall result: the climate hazard may have a slight impact on assets and processes, inputs, outputs and transport links

You don't need to check "medium" in the "EXPOSURE ANALYSIS" section because your result will be automatically displayed by the formulas in the Annex.

EXPOSURE ANALYSIS				VULNERABILITY ANALYSIS		
	High	Medium	Low	High	Medium	Low
Current climate						
Future climate						
Current + Future						

You don't need to check “medium” in the “VULNERABILITY ANALYSIS” section because your result will be automatically displayed by the formulas in the Annex.

If your score at “EXPOSURE ANALYSIS” section or VULNERABILITY ANALYSIS” section is "medium" or "high", you must proceed with **Phase 2 of the Annex A8 - Sheet 2 and prepare detail risk assessment and adaptation plan up to 30 pages.**

Fourth step “Risk assessment and adaptation plan”

Prepare risk assessment and adaptation plan using following options:

- Identify options responding to the risks (use e.g expert workshops, meetings, evaluations,...)
- Adaptation may involve a mix of responses, e.g. financial resources, work power etc.
- training, capacity building, monitoring, ...
- use of best practices, standards, ...
- nature-based solutions, ...
- engineering solutions, technical design, ...
- risk management, insurance

The appraisal of adaptation options should give due regard to the specific circumstances and availability of data. In some cases, a quick expert judgement may suffice whereas other cases may warrant a detailed cost-benefit analysis. It may be relevant to consider the robustness of various adaptation options vis-a-vis climate change uncertainties.

Integrate relevant climate resilience measures into the technical project design and management options. Develop implementation plan, finance plan, plan for monitoring and response, plan for regular review of the assumptions and the climate vulnerability and risk assessment, and so on. The vulnerability and risk assessment and adaptation planning is aiming to reduce the remaining climate risks to an acceptable level.

Full assessment must be done by following the **Technical guidance on the climate proofing of infrastructure in the period 2021-2027 (2021/C 373/01)**.

[Commission Notice — Technical guidance on the climate proofing of infrastructure in the period 2021-2027 \(europa.eu\)](#)