

4.12 Climate change mitigation and resilience

Principle: The project’s greenhouse gas (GHG) emissions are consistent with low carbon power generation, the project is resilient to the effects of climate change, and contributes to wider adaptation to climate change.

Scope: The estimation and management of the project’s GHG emissions, analysis and management of the risks of climate change for the project, and the project’s role in climate change adaptation.

Requirements:

Criteria	Minimum requirements (good practice)	Advanced requirements (best practice)
Assessment	<p>Preparation Stage:</p> <p><i>For climate mitigation:</i> power density has been calculated; if power density is below 5 W/m², net GHG emissions (gCO₂e) of electricity generation have been estimated and independently-verified; if power density is below 5 W/m² and estimated emissions are above 100 gCO₂e/kWh, a site-specific assessment of GHG emissions has been undertaken; and an assessment of the project’s fit with national and/or regional policies and plans on mitigation has been undertaken.</p> <p><i>For climate resilience:</i> an assessment of the project’s resilience to climate change has been undertaken, which incorporates an assessment of plausible climate change at the project site, identifies a range of resulting climatological and hydrological conditions at the project site, and applies these conditions in a documented risk assessment or stress test that encompasses dam safety, other infrastructural resilience, environmental and social risks, and power generation availability; and an assessment of the project’s potential adaptation services and fit with national and/or regional policies and plans for adaptation has been undertaken.</p> <p>Implementation Stage:</p> <p><i>For climate mitigation:</i> power density has been calculated; if power density is below 5 W/m², net GHG emissions (gCO₂e) of electricity generation have been estimated and independently-verified; if power density is below 5 W/m² and estimated emissions are above 100 gCO₂e/kWh, a site-specific assessment of GHG emissions has been undertaken.</p> <p><i>For climate resilience:</i> an assessment of the project’s resilience to climate change has been undertaken, which incorporates an assessment of plausible climate change at the project site, identifies a range of resulting climatological and hydrological conditions at the project site, and applies these conditions in a documented risk assessment or stress test that encompasses dam safety, other infrastructural resilience, environmental and social risks, and power generation availability.</p>	<p>Preparation Stage:</p> <p><i>For climate mitigation:</i> if a site-specific assessment is required, it incorporates a broad range of scenarios, uncertainties and risks.</p> <p><i>For climate resilience:</i> assessment of resilience incorporates sensitivity analysis and project-specific hydrological modelling using recognised climate models.</p> <p>Implementation Stage:</p> <p><i>For climate mitigation:</i> in addition, if a site-specific assessment is required, it incorporates a broad range of scenarios, uncertainties and risks.</p> <p><i>For climate resilience:</i> in addition, assessment of resilience incorporates sensitivity analysis, and project-specific hydrological modelling using recognised climate models; and an assessment of the project’s potential adaptation services has been undertaken.</p> <p>Operation Stage:</p> <p><i>For climate mitigation:</i> in addition, if a site-specific assessment is required, it incorporates a broad range of scenarios, uncertainties and risks.</p> <p><i>For climate resilience:</i> in addition, assessment of resilience incorporates sensitivity analysis, project-specific hydrological modelling using recognised climate models, and the project’s opportunities to provide adaptation services are considered on an ongoing basis.</p>

Operation Stage:

For climate mitigation: power density has been calculated; if power density is below 5 W/m², estimates of net GHG emissions (gCO₂e) of electricity generation are calculated and independently- verified, and periodically updated; if power density is below 5 W/m² and estimated emissions are above 100 gCO₂e/kWh, a site-specific assessment of GHG emissions is undertaken and periodically updated.

For climate resilience: an assessment of the project's resilience to climate change is undertaken and periodically updated; this assessment of project resilience incorporates an assessment of plausible climate change, identifies a range of resulting climatological and hydrological conditions at the project site, and applies these conditions in a documented risk assessment or stress test that encompasses dam safety, other infrastructural resilience, environmental and social risks, and power generation availability. .

Management

Preparation Stage:

For climate mitigation: if GHG emissions estimates assume design and management measures, there are plans to put these measures in place.

For climate resilience: the project design is based on plausible climate change scenarios; and structural and operational measures are planned for design, implementation and operation phases to avoid or reduce the identified climate risks.

Implementation Stage:

If GHG emissions estimates assume design and management measures relevant to the implementation stage, these measures are in place; measures relevant to the implementation stage are in place to avoid or reduce the identified climate risks.

Operation Stage:

For climate mitigation: if GHG emissions estimates assume management measures, these measures are in place.

For climate resilience: measures are in place to avoid or reduce identified climate risks.

Preparation Stage:

For climate mitigation: design and management measures have been developed for implementation and operation phases of the project to respond to risks and opportunities including offsetting emissions; plans have been developed to monitor parameters used in GHG emissions estimates or to monitor GHG stocks.

For climate resilience: resilience measures take account of a broad range of risks and inter-relationships, and processes are in place to respond to unanticipated climate change; and plans have been developed to provide adaptation services if necessary.

Implementation Stage:

For climate mitigation: design and management measures relevant to the implementation stage are in place to respond to risks and opportunities including offsetting emissions; plans are in place to monitor parameters used in GHG emissions estimates or to monitor GHG stocks.

For climate resilience: resilience measures relevant to the implementation stage take account of a broad range of risks and inter-relationships; and plans are in place to provide adaptation services if necessary.

Operation Stage:

For climate mitigation: management measures are in place to respond to risks and opportunities including offsetting emissions; plans are in place to monitor parameters used in GHG emissions estimates or to monitor GHG stocks.

		<p><i>For climate resilience:</i> measures take account of a broad range of risks and inter-relationships, and processes are in place to respond to unanticipated climate change; and plans are in place to provide adaptation services if necessary.</p>
<p>Conformance/ Compliance</p>	<p>Implementation Stage and Operation Stage:</p> <p>Processes and objectives relating to climate change mitigation and resilience have been and are on track to be met with no major non-compliances or non-conformances, and any mitigation-related and resilience-related commitments have been or are on track to be met.</p>	<p>Implementation Stage and Operation Stage:</p> <p>There are no non-compliances or non-conformances.</p>
<p>Outcomes</p>	<p>Preparation Stage:</p> <p><i>For climate mitigation:</i> the project’s GHG emissions are demonstrated to be consistent with low carbon power generation, and the fit of the project with national and regional policies and plans for mitigation can be demonstrated.</p> <p><i>For climate resilience:</i> plans will deliver a project that is resilient to climate change under a range of scenarios; and the fit of the project with national and regional policies and plans for adaptation can be demonstrated.</p> <p>Implementation Stage:</p> <p><i>For climate mitigation:</i> the project’s GHG emissions are demonstrated to be consistent with low carbon power generation.</p> <p><i>For climate resilience:</i> plans will deliver a project that is resilient to climate change under a range of scenarios.</p> <p>Operation Stage:</p> <p><i>For climate mitigation:</i> the project’s GHG emissions are demonstrated to be consistent with low carbon power generation.</p> <p><i>For climate resilience:</i> findings of the climate change assessment indicate that the project is resilient to climate change.</p>	<p>Preparation Stage:</p> <p><i>For climate mitigation:</i> in addition, project net emissions are minimised or project operations facilitate system emissions reductions.</p> <p><i>For climate resilience:</i> in addition, the project is resilient under a broad range of scenarios; and the project will contribute to climate change adaptation at local, regional or national levels.</p> <p>Implementation Stage:</p> <p><i>For climate mitigation:</i> in addition, project net emissions are minimised or project operations facilitate system emissions reductions.</p> <p><i>For climate resilience:</i> in addition, the project is resilient under a broad range of scenarios; and the project will contribute to climate change adaptation at local, regional or national levels.</p> <p>Operation Stage:</p> <p><i>For climate mitigation:</i> project net emissions are minimised or project operations facilitate system emissions reductions.</p> <p><i>For climate resilience:</i> the project is resilient under a broad range of scenarios; and the project will contribute to climate change adaptation at a local, regional or national levels</p>