Climate and Disaster Risk Screening - Screening Guidance Note
Energy Global Practice

This Sector Screening Guidance Note provides an end-to-end roadmap of the climate and disaster risk screening process.

Climate and disaster risk screening applies to:

- All IDA operations
- All IBRD operations starting July 1, 2017

Why screen for climate and disaster risk?

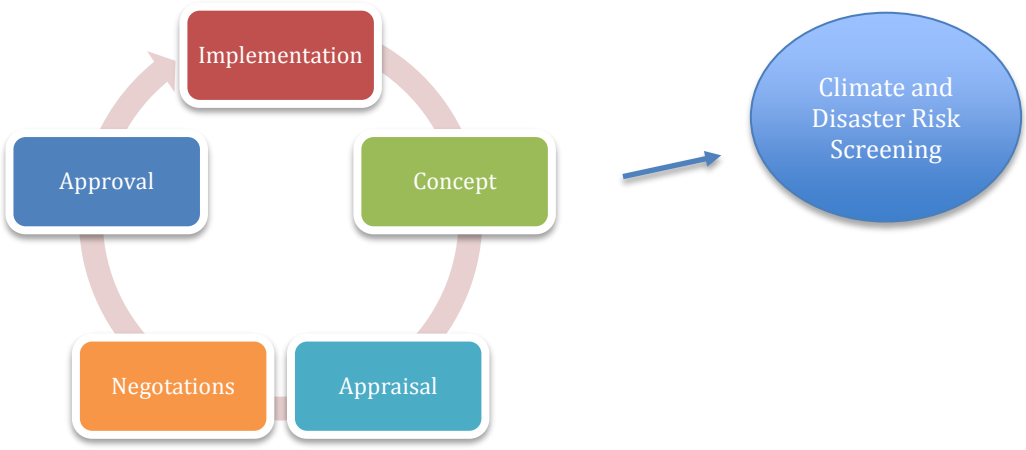
- Meeting the corporate climate commitment (WBG Climate Change Action Plan (CCAP) commits to increasing the climate related share of the portfolio to 28% by 2020)
- Complying with the screening requirement (IDA-17 policy commitment to screen operations since July 1, 2014; commitment will continue under IDA-18; screening requirement extended to IBRD operations starting July 1,2017 as per CCAP commitment)

What is climate and disaster risk screening?

- A **proactive approach to managing short- and long-term climate and disaster risks** with the final aim of integrating appropriate resilience measures in development policies, programs and projects.

When to screen operations?

Climate and disaster screening is carried out at an **early concept stage** of the project cycle.



What information is required for screening?

- An initial understanding of project components and location
- Some knowledge of the project's country context including the agriculture sector context and the political, social and economic context
- No specialized knowledge of climate change and disasters is required

Where to get screening support?

- Visit the Country Adaptation Profiles and Climate Change Knowledge Portal (CCKP) for information on climate and disaster risks
- Watch the training videos for screening and the CCKP

- Follow an e-learning course
- Join a face to face training session
- Contact the Climate Help Desk at climatescreeninghelpdesk@worldbankgroup.org

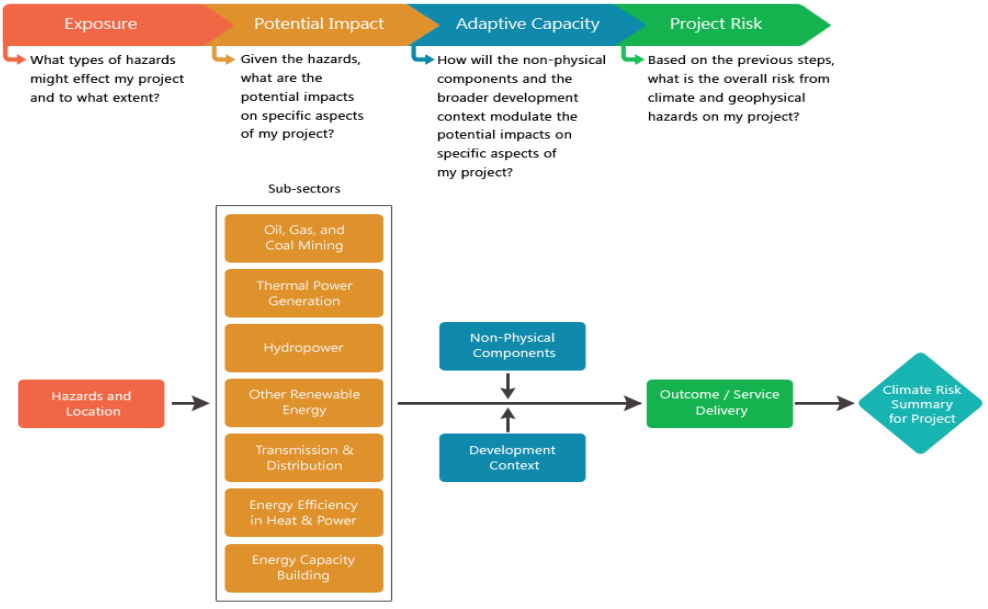
What screening tools are available?

- Two screening tools are available: one **Rapid Screening Assessment** and one **In-Depth Screening Assessment**
- The tools can be used for all WBG lending and financing instruments
- **Note**: These tools provide high-level screening at an early stage of project and/or program development. They **do not** provide a detailed risk analysis, nor do they suggest specific options for increasing the project's resilience. They are intended to help determine the need for further studies, consultation and/or dialogue in the course of project and/or program design.

Tool	Description	Completion Time	Outputs
Rapid Screening Assessment	• Provides a lightweight, rapid assessment of current and future climate and disaster risks. • A good option for users who already have knowledge on the climate and disaster risks that may impact their project/program.	Around 30 minutes	Downloadable summary report of selected risk ratings to be included in project and/or program documents
In-Depth Screening Assessment	• Provides a more in-depth assessment of current and future climate and disaster risks. • A good option for users who may need additional guidance on the climate and disaster risks that may impact their project/program.	Around 2 hours	Downloadable detailed project risk report to be included in project and/or program documents

What are key steps to screen for climate and disaster risks using the WBG screening tools?

The screening tools follow four main steps: Exposure> Impacts> Adaptive Capacity>Risks to the project outcome/service delivery.



STEP 1 - EXPOSURE OF PROJECT LOCATION

- This step assesses the current and future exposure of the project location to relevant climate and geophysical hazards
- This is based on climate information drawing on global, quality controlled data sets from the Climate Change Knowledge Portal
- Understanding the trends of hazards is important as they act individually and collectively on project components.

Relevant climate and geophysical hazards	Guiding questions for energy projects
Temperature	• Is annual and monthly temperature (i.e. seasonality) projected to change? • Is the frequency, intensity and duration of extreme temperatures projected to change? • Is the average annual basin temperature projected to change? • Is potential evapotranspiration projected to change?
Extreme precipitation and flooding	• Are annual and monthly (i.e. seasonality) precipitation patterns projected to change? • Is the frequency, intensity and duration of extreme precipitation projected to change? • Is runoff projected to change in the basin? • Is the annual base flow projected to change in the basin? • Is storage (basin yield) projected to change in the basin? • Is the annual high flow projected to change in the basin?
Droughts	• Is the frequency, intensity and duration of droughts projected to change? • Is the annual low flow projected to change in the basin?
Strong Winds	• Is the project location exposed to winds from tropical cyclones, such as hurricanes or typhoons?
Sea level rise	• Is local sea level projected to change by the end of the project lifetime?
Storm surge	• Does the project location include areas that have experienced storm surge in the past?
Geophysical hazards (earthquakes, tsunami, volcanoes, etc.)	• Have there been historical earthquakes? • Is the project located below a dam or levee that could be damaged by flood? • Is the project located in a tsunami zone area? • Is the project located near an active volcano? • Has the location of the project ever experienced landslides or wildfires in the past?

- **Note**: in this stage you are only identifying and rating the hazards that may affect your project location as a whole, not rating their impact on your project infrastructure and assets.

STAGE 2 – IMPACTS ON YOUR PROJECT'S PHYSICAL INFRASTRUCTURE AND ASSETS

- This step assesses the current and future impacts of identified climate and geophysical hazards on the project's physical infrastructure and assets as currently designed under relevant subsectors.
- Understanding where risks may exist within one or multiple components and identifying where further work may be required to reduce or manage these risks can help inform the process of dialogue, consultation and analysis during project design.

Subsectors	Potential impacts of climate and geophysical hazards on subsectors
Oil, Gas & Coal Mining	• Floods and storm surge may cause physical damage to extraction and processing facilities and disrupt operations • Droughts may affect the extraction and processing of fossil fuel resources as these are water-intensive
Thermal Power Generation	• The efficiency of thermal power generation may be reduced by higher air temperatures • Changes in precipitation patterns and drought may lead to reduced availability of cooling water
Hydropower	• Hydropower plants are highly sensitive to climate-induced changes in water levels which may be caused by changes in temperatures and rainfall
Other Renewable	• Extreme events may damage all the infrastructure associated with renewables • Generation capacity for certain renewables (solar, wind) is highly dependent on weather conditions

Energy (solar, wind, etc.)	
Transmission & Distribution	• Transmission and distribution infrastructure may be damaged by heavy rainfall and flooding. • Tsunamis may reduce the ability to conduct project activities or restrict access to energy services within the run-up areas
Energy Efficiency in Heat & Power	• Higher temperatures may increase the demand for energy and reduce the benefits of investments in energy efficiency activities

- **Note**: If your project includes soft components only (no physical infrastructure and/or assets), then you can skip this stage and move on to Step 3 – Modulating effect of the Project's Adaptive Capacity.

STEP 3: MODULATING EFFECT OF THE PROJECT'S ADAPTIVE CAPACITY

- This step assesses how potential impacts on key components/subsectors due to exposure to hazards is modulated by the project's soft components and broader development context
- The right kind of soft components can increase preparedness and long-term resilience and reduce risk

Soft components	Modulating effect of adaptive capacity
Soft components: Energy laws, Regulations, Policy Analysis and development, Feasibility, Design Studies, Institutional Strengthening, Training and Knowledge Exchange, Strategic Energy System Planning, data gathering, monitoring and Information Management Systems, Operations support, Capacity building, Technical assistance and Outreach	• Planning for redundancy and options that could accommodate disruptions in service due to natural disasters and changing climatic conditions. • Operational changes, such as increased maintenance, that could reduce the vulnerability of infrastructure to climate variability and extremes. • Capacity building that increases the institutional and technical ability to plan for and respond to climate-change impacts.
Development context: Energy sector	• Policies to promote less centralized energy systems may reduce the ripple effects of extreme weather events • Policies and programs that create incentives for using climate-resilient or energy-efficient technologies may help overcome existing market barriers
Social, economic and political factors: Access to technology, Prices (food and energy), Financial resources, Conflict, Political instability, Legal enforcement, Population growth, Urbanization, Land ownership issues, Land and soil quality, Nutrition, Education, Gender	• Population and economic growth may significantly and rapidly increase demand for energy, putting additional stress on the energy system • Legal enforcement of proper building codes and zoning regulations may reduce the vulnerability of energy infrastructure to extreme weather events

- This step also takes into account particularly vulnerable groups including **women, migrants and displaced populations**.

Women, Migrants and displaced populations	Adaptive capacity elements that help alleviate risk
Soft components	• Investments in complementary services (such as business development services, credit and agricultural extension) that can help women take advantage of investment in energy access, through e.g., productive use applications in mini-grid and off-grid projects. • Support to development of women's energy enterprises (including in solar lanterns and other technologies) using tested retail distribution methodologies focused on women's technology and pricing preferences • Gender-responsive pricing and affordability in energy operations (for example, targeting subsidies for connection fees to female-headed households). • Expanding coverage of clean cookstove technologies in those countries with poor energy access, so as to reduce pressure on biomass, reduce indoor air pollution that disproportionately affected women and children; and reducing women's time poverty and pressures on household budgets,

	through reduced need for fuelwood collection and for purchase of charcoal, and improved stove efficiency • Long-term planning and labor force development for women's increased formal sector employment in the renewable energy industry through support to girls' STEM education, and energy industry apprenticeships
Broader development context	• Increasing women's access to renewable energy will reduce women's time poverty, and improve economic opportunities • Tariff-setting or targeting of energy subsidies offer an opportunity to increase energy access, particularly for female-headed households • Introducing clean cookstoves can reduce indoor air pollution, as well as household expenditure on biomass sources of fuel, and reduce refugee women's vulnerability to gender-based violence when collecting fuel wood

- Annex 1 provides additional information on climate and disaster risk to women.

STEP 4: RISK TO PROJECT OUTCOME/SERVICE DELIVERY

- This step assesses the level of risk to the outcome/service delivery that the project is aiming to provide
- Both screening tools will provide guidance on next steps to take and on how to use your risk assessment based on the level of risk identified for your project

The table below provides some general guidance based on risk ratings for project outcome/service delivery:

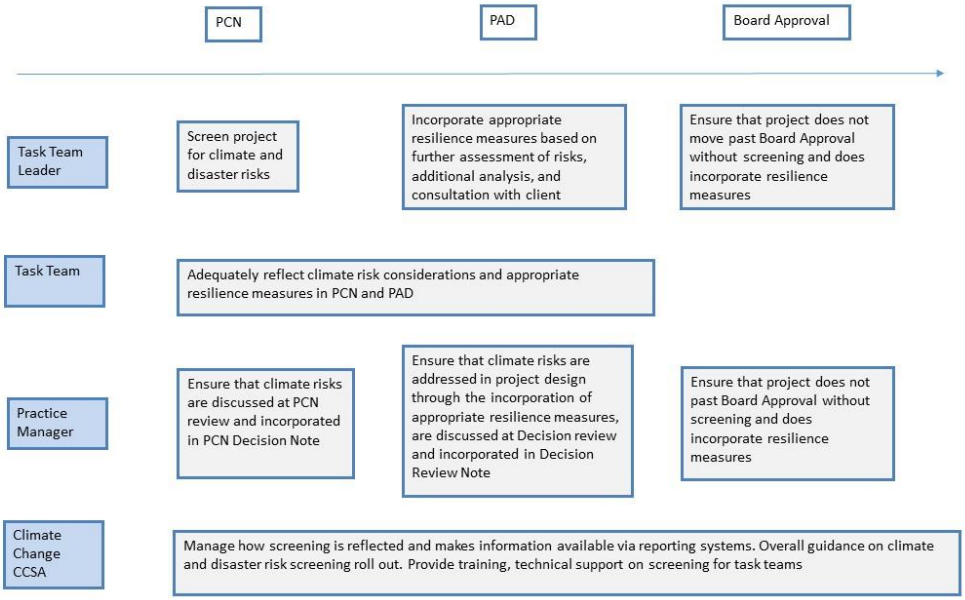
HIGH RISK	• You are strongly encouraged to conduct a more detailed risk assessment and to explore measures to manage or reduce those risks.
MODERATE RISK	• For areas that your screening has identified as at *Moderate Risk*, you are encouraged to build on the screening through additional studies, consultation, and dialogue. This initial screening may be supplemented with a more detailed risk assessment to better understand the nature of the risk to the project
LOW RISK	• If your screening has made you confident that climate and geophysical hazards pose *low risk* to the project, continue with project development. However, keep in mind that this is a high-level risk screening at an early stage of project development. Therefore, you are encouraged to monitor the level of climate and geophysical risks to the project as it is developed and implemented. You may also consider gathering additional information to increase your level of confidence in your rating
NO RISK	• If your screening has made you confident that climate and geophysical hazards pose *no risk* to the project, continue with project development. However, keep in mind that this is a high-level risk screening at an early stage of project development. Therefore, you are encouraged to monitor the level of climate and geophysical risks to the project as it is developed and implemented.
INSUFFICIENT UNDERSTANDING	• Gather more information to improve your understanding of climate and geophysical hazards and their relationship to your project

- Annex 2 lists some climate risk management measures for typical energy projects for your consideration.

Who does what and when?

Roles and Responsibilities

- The figure below depicts clear roles and responsibilities for the TTL, task team, relevant Manager, and Climate Change CCSA at key points in the project cycle, as it relates to screening.



Task teams should do the following:

Project concept stage	Project preparation stage
• Identify the climate change and disaster risks that could potentially impact project outcomes. • Determine, based on available knowledge, the level of risk to project outcomes. • Discuss screening results at the project concept note review meeting and record decision on potential level of risk to project outcomes in the review minutes.	• Demonstrate how the project components can be better designed. As appropriate, understand how to integrate resilience measures into project design. • Discuss key climate and disaster risks and resilience considerations at the PAD review meeting and record decisions in the decision meeting minutes.

How to Reflect Screening in Project Documents?

- Summarize potential climate and disaster risks in the 'Introduction and Context" and the "Overall Risk and Explanation" sections of the PCN document.
- Where risks exist, identify potential resilience-enhancing measures in appropriate sections.
- If risks and resilience-enhancing measures have not been identified at PCN stage, these must be considered by appraisal stage and reflected in the appropriate sections of the PAD.

Additional Resources

Climate Change Impacts on Energy Systems:

- *U.S. Department of Energy's U.S. Energy Sector Vulnerabilities to Climate Change and Extreme Weather examines current and potential future impacts of climate change on the U.S. energy sector. It identifies activities underway to address these challenges and discusses potential opportunities to enhance the climate resilience of U.S. energy system.*
- *The IPCC Working Group III's Special Report on Renewable Energy Sources and Climate Change Mitigation includes discussion on the potential impact of climate change on renewable energy resources.*
- *Addressing Climate Change-Driven Increased Hydrological Variability in Environmental Assessments for Hydropower Projects – scoping study details the context of hydrological variability, a changing climate and hydropower/reservoir operation*
- *Addressing Climate Vulnerability for Power System Resilience and Energy Security by USAID Global Climate Change Office and its Resources to Advance LEDS Implementation (RALI) Project, explains how climate change affects hydropower and other power generation infrastructure and resources using a four step approach: assess climate risks and vulnerabilities; identify, evaluate, and prioritize options to address climate risks; integrate climate change into project implementation, power planning, operations and maintenance; and monitor, evaluate, and adjust plans over time.*

Information on Climate Change Impacts on Energy Systems and Potential Adaptation Strategies:

- *The World Bank's Climate Impacts on Energy Systems: Key Issues for Energy Sector Adaptation provides an overview of how the energy sector might be impacted by climate change and what options exist to address these impacts.*
- *Chapter 10: Key Economic Sectors and Services of Working Group II's contribution to the IPCC's Fifth Assessment Report includes discussion of climate change impacts and adaptation options for the energy sector.*
- *Asian Development Bank's Climate Risk and Adaptation in the Electric Power Sector discusses the exposure and vulnerability of the energy sector to climate change. It identifies adaptation options available to each source of energy generation as well as for the distribution and end use of electrical energy.*

Other screening tools/manuals:

- *African Development Bank (AfDB): Booklet on Climate Screening and the Adaptation and Review Evaluation Procedures (AREP): is a manual representing a set of decision-making tools and guides that enable the AfDB to screen projects in vulnerable sectors for climate change risks and identify appropriate adaptation measures to reduce vulnerability. It covers the Agriculture, Water, Energy and Transport sector.*
- *Think Hazard!, is a web-based tool enabling non-specialists to consider the impacts of disasters on new development projects. Users can quickly and robustly assess the level of river flood, earthquake, drought, cyclone, coastal flood, tsunami, volcano, and landslide hazard within their project area to assist with project planning and design.*

- *The Climate Finance Impact Tool, made by Japan International Cooperation Agency (JICA), is designed to screen for risks in the early stages of project development. It is designed for offline use in under two hours.*
- *The Caribbean Climate Online Risk and Adaptation Tool (CCORAL) guides users to identify whether an activity is likely to be influenced by climate change. The tool is focused on the Caribbean region. It may be completed in under two hours.*
- *CRiSTAL (Community-based Risk Screening Tool – Adaptation and Livelihoods) is based on a participatory, local-scale approach to prioritize climate risks. Tool versions are available for Food Security and Forests.*
- *The UK Climate Impacts Programme Business Areas Climate Assessment Tool (BACLIAT) is a workshop-based process designed to help users consider the potential impacts of future climate change on business areas.*
- *The U.S. Department of Agriculture's Forest Service Climate Project Screening Tool is a process-oriented tool designed to help land managers integrate climate change considerations into project planning. The tool may be completed in under two hours.*
- *The National Wildlife Federation's Scanning the Conservation Horizon: A Guide to Climate Change Vulnerability Assessment is a guide for natural resource managers for assessing key components of vulnerability, focusing on species, habitats, or ecosystems.*
- *USAID Climate Risk Screening and Management Tool: this tool is guiding users through the process of assessing and addressing climate-related risks.*
- *Climate, Environment and Disaster Risk Guidance (CEDRIG) developed by the Swiss Agency for Development and Cooperation, is a tool designed to systematically integrate climate, environment and disaster risk reduction into development cooperation and humanitarian aid in order to enhance the overall resilience of systems and communities.*

Climate change and migration:

- *Environmental Change and Human Mobility: Reducing Vulnerability & Increasing Resilience is a policy brief by the KNOWMAD Thematic Working Group on Environmental Change and Migration summarizes major findings and policy implications of papers commissioned to examine vulnerability and resilience, with particular focus on developing countries.*
- *The IDMC's Global Internal Displacement Database is an interactive platform designed for policy makers, NGOs, researchers, journalists and the general public for data and analysis on internal displacement.*
- *IOM's Environmental Migration Portal / Country Profiles*

Help Desks:

- ***The Climate Screening Help Desk can be reached at climatescreeninghelpdesk@worldbankgroup.org.*** *The Help Desk can provide support in the following areas:*
  - *IT assistance: Support with IT problems and glitches in the WB screening tools.*
  - *Assistance with risk screening: Assistance with the use of the tools for risk screening; guidance on use of the Climate Change Knowledge Portal (CCKP); links to World Bank regional or sector experts to obtain additional information to help screen for risks to your projects and additional information on in-person trainings.*

- *Climate and disaster risk management: Guidance on how to address climate and disaster risks beyond completing the risk screening tools (e.g., incorporating climate and disaster risks into feasibility studies, terms of reference, consultations, and project design).*

Trust Funds:

- *Global Facility for Disaster Reduction and Recovery (GFDRR) – Just in time Resilience Grants*
- *Adaptation Fund*
- *BioCarbonFund Initiative for Sustainable Forest Landscapes (ISFL)*
- *Carbon Partnership Facility (CPF)*
- *Climate Investment Funds and the Pilot Program for Climate Resilience (PPCR)*
- *Forest Carbon Partnership Facility (FCPF)*
- *Global Environment Facility (GEF)*
- *Green Climate Fund (GCF)*
- *Korea Green Growth Partnership*
- *Least Developed Countries Fund*
- *Program on Forests (PROFOR)*
- *Transformative Carbon Asset Facility (TCAF)*

Annex 1 – Climate and Natural Hazard Impacts on Gender in the Energy Sector

Overview and key considerations: Women and men face different vulnerabilities and risks from climate change, and have varied opportunities and resources upon which to draw in their adaptation strategies. Due to gender and social exclusion, women often face barriers in benefitting from opportunities of green growth, and in taking best advantage of new resources, leadership opportunities, and assets created through climate investments. Gender-responsive climate programming requires an understanding of the roles and responsibilities of women and men in diverse sectors and country contexts, along with their rights and entitlements to relevant resources, assets and networks that aid in reducing vulnerability to the impacts of climate change.

A number of gender gaps lie at the heart of the gender and climate challenge. These include: i) the difference in women and men's mortality rates in extreme events (stemming in part from gendered norms around mobility, skills, and other factors); ii) women's particular vulnerability in the context of climate-induced migration (including furtherance of tenure insecurity; potential for gender-based violence; loss of social networks and place-specific livelihood skills, such as specialization in particular forms of agriculture or livestock management); iii. women's disproportionate vulnerability to climate-induced shocks at the household level (especially important in regions facing multiple hazards or increasing frequency of extreme events), due to reliance on natural resource-based livelihoods (as compared to male movement into the non-farm economy and services employment); iv) increased risk of women using negative coping strategies, due to prevailing gender norms, and the gender division of labor around household reproductive and care activities.

Energy sector, gender and exposure to climate change

A major cause of greenhouse gas (GHG) emissions that lead to climate change is the burning of fossil fuels, such as oil, gas, and coal for electricity generation. An additional, though less significant cause is global deforestation that reduces forest cover in the world which had previously served as important carbon "sinks". Thus climate mitigation actions that aim to reduce global GHG emissions levels are centered primarily in energy (i.e., shifting energy sources to renewables e.g., solar, wind, geothermal, and hydropower, and improving energy efficiency in the built environment and in urban transport), as well as in the forest sector. Energy sector activities falling under climate mitigation can interact with gender in the following ways.

- Climate mitigation investments can offer expanded employment opportunities for women, as follows (e.g., temporary construction employment; regular energy utility employment; own-account enterprise development). Are targets being set up to help women transition to new renewable energy jobs that may not be "gender-typed" locally?
- Are provisions being made to support productive use applications of new renewable energy generation, especially in off-grids and mini-grids, through business development and enterprise finance support?
- Expanded energy access can reduce women's time poverty, improve health status due to reductions in time spent collecting firewood, or using 'dirty' fuels. Is this being tracked through evaluative studies?

Energy sector, gender impacts from climate change

- Is there an energy transition underway to low-carbon technologies? Does it offer scope for women's expanded employment, especially, in high-value service sector jobs? What training or development of school-to-work industry pipelines (e.g., internships) is required?
- Does the project foresee impacts of expansion of girls' educational attainment from household electrification and have impact monitoring systems been set up to track this?

ONLINE DATA SOURCES ON GENDER

- **World Bank:** Gender Equality Data and Statistics. This gender data portal is a one-stop shop for gender information, catering to a wide range of users and providing data from a variety of sources. The portal has indicators related to five dimensions of gender equality: economic structures and access to resources; education; health and related services; public life and decision-making; and human rights of women and girl children.
- **FAO:** Gender and Land Rights Database. This portal highlights the major political, legal, and cultural factors that influence women's ability to claim their land rights throughout the world. It includes 84 country profiles, land tenure statistics disaggregated by gender, and a Legislation Assessment Tool for gender-equitable land tenure.
- **FAO:** Agri-gender Statistics Toolkit. This toolkit supports increased collection and analysis of sex-disaggregated agricultural data. It includes a compilation of gender-sensitive questions, questionnaire components, and tables. The database is structured around nine items related to agriculture: agricultural population and households; access to productive resources; production and productivity; destination of agricultural produce; labor and time use; income and expenditures; membership in agricultural or farmer organizations; and food security poverty indicators.
- **World Economic Forum**: Annual Global Gender Gap Report**.** The Global Gender Gap Index 2015 ranks 145 economies according to how well they are leveraging their female talent pool, based on economic, educational, health-based, and political indicators.
- **World Bank:** Women, Business and the Law. *Getting to Equal* measures legal and regulatory barriers to women's entrepreneurship and employment in 173 economies. It provides quantitative measures of laws and regulations that affect women's economic opportunities in seven areas: accessing institutions, using property, getting a job, providing incentives to work, going to court, building credit, and protecting women from violence.
- **UNDP:** International Human Development Indicators. The Human Development Report Office releases five indices each year: the Human Development Index (HDI), the Inequality-Adjusted Human Development Index, the Gender Development Index (GDI), the Gender Inequality Index (GII), and the Multidimensional Poverty Index (MPI).
- **UN Statistics:** The World's Women. This portal highlights differences in the status of women and men in eight areas: population and families; health; education; work; power and decision making; violence against women; environment; and poverty.

Annex 2 – Types of Climate Risk Management Measures for Typical Energy Projects

OBJECTIVE	EXAMPLES
Accommodate/ Manage	• Develop redundant structures or services that can be relied upon if structures fail • Plan back-up power systems for treatment and pumping facilities • Increase inspection frequency to ensure structures are enduring climate change pressures • For transmission and distribution where higher winds are expected, adopting higher design standards for distribution poles; in the case of increased temperatures, putting in place of more effective cooling systems for substations and transformers • Setting up rapid emergency repair teams to repair damaged facilities quickly
Protect/ Harden	• Upgrade existing cooling systems for thermal power • Designing facilities to be waterproofed where increased flooding is expected • Add reinforcements to walls and roofs • Build dikes to contain flooding • Incorporate structural improvements to transmission • For existing hydro infrastructure, operational changes to optimize reservoir management and improve energy output by adapting to changes in rainfall or river flow patterns • For hydropower, restored and better-managed upstream land, including afforestation to reduce floods, erosions and mudslides for a better protection of existing infrastructure • Increase drainage of energy facilities • Employ more robust specifications allowing structures to withstand more extreme conditions (such as higher wind or water velocity) • Design turbines and structures better able to handle increased wind speed and gusts
Retreat/ Relocate	• Integrate sea level rise projections and storm surge in coastal siting • Relocate or refit extremely vulnerable existing infrastructure • For hydropower, where water flows changes are expected, consider diverting upstream tributaries, building new storage reservoirs and installing turbines better suited to expected conditions • For transmission & distribution, specifying redundancy in control systems, multiple T&D routes, relocation and underground distribution for protection against adverse conditions may be considered.
Build information collection and management systems	• Strengthen climate information systems, building on existing regional and national networks • For hydropower, strengthen hydrologic forecasting and coordinate power planning and operations with other water-use projects • For electricity end-use, putting in place mandatory minimum energy performance standards for buildings, manufacturing facilities and energy-intensive appliances • Build capacity of national governments to harmonize data across regions • Putting in place more robust operational and maintenance procedures
Strengthen policies, planning and systems	• Integrate climate change and disaster management planning • Improve coordination of policies and programs across government agencies to address the additional pressures imposed by climate change • Foster integrated resource management with agriculture and water • Put in place policies and enforceable regulations to improve energy security, decentralized local planning and generation • Improve forecasting of demand changes and supply-demand with climate change • Improved land-use planning so future power infrastructure is in less vulnerable areas

Sources: ADB Guidelines to Climate-Proofing Investments in the Energy Sector