Guidelines to Develop Energy Resiliency in APEC Off-grid Areas

COP 22.MARRAKECH.NOVEMBER 2016

CEBU DECLARATION

2015 APEC Energy Ministerial Meeting

> We affirm the importance of energy resiliency in promoting energy security and sustainable development and providing access to the people. This includes in particular, the ability and quality of energy infrastructure to withstand extreme natural and man-made disasters, to recover and return to normal conditions in a timely and efficient manner and to build back better.

Background

07/2015

Philippines Initiates Energy Resiliency Workshop Project

The Philippines through its DOE, as co-chair of ERTF with the US, proposed to the APEC Secretariat to co-fund a project that will bring together APEC member economies to develop guidelines for energy resiliency

Asia-Pacific Economic Cooperation

09/2015

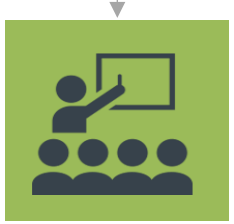
Cebu Declaration 2015

APEC energy ministers stated in their Cebu Declaration of 2015 that "A priority goal in developing a resilient APEC community will be to provide energy access to our people, including in remote communities. "

01/2016

APEC forms the Energy Resiliency Task Force

APEC formed and mobilized its Energy Resiliency Task Force (ERTF) to find, promote, and implement strategies to develop energy resiliency in all sectors of the 21 member economies



06/2016

Energy Resiliency Workshop

The Workshop on Improving Energy Resiliency in Off-grid Areas in APEC Member Economies was held on June 15-17, 2016 in Boracay Island, Aklan, Philippines

Drafting of the Guidelines

The Guidelines is drafted from the workshop proceedings then circulated among APEC member economies for comments and further inputs.

Energy Resiliency Workshop

The workshop , held in Boracay island, Philippines, facilitated the sharing of lessons learned, best practices, and country perspectives in improving energy resiliency.

The program also included a site visit to the Nabas wind farm and an off-grid solar charging station for electric tricycles in Boracay island.

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Objective of the Guidelines

The guidelines, rather than being linear and prescriptive, is geared **towards appropriate solutions, practical application**, and interfacing. Thus, it is recommended that a specific member economy start with its own situation and needs when using the guidelines and from there generate appropriate solutions.

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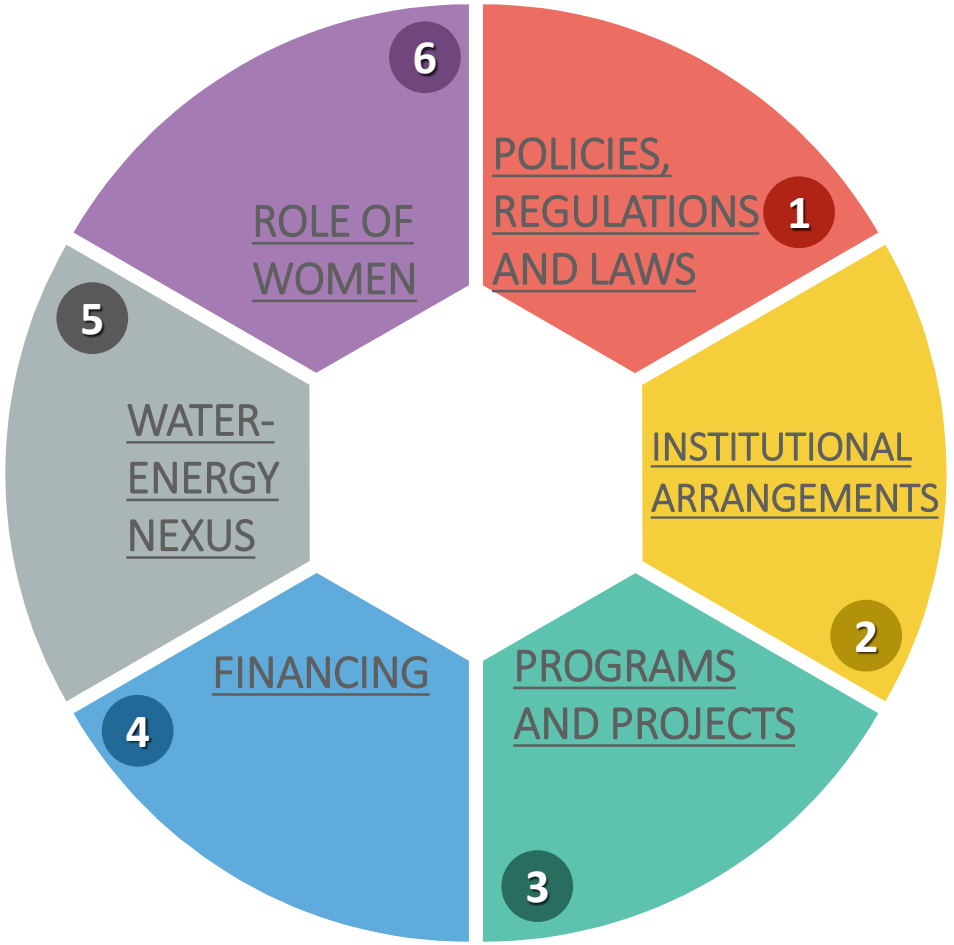
Content of the Guidelines

The guidelines discusses **enabling mechanisms** on the following components of improving off-grid energy resiliency as well as presents **case studies** of experiences of APEC member economies.



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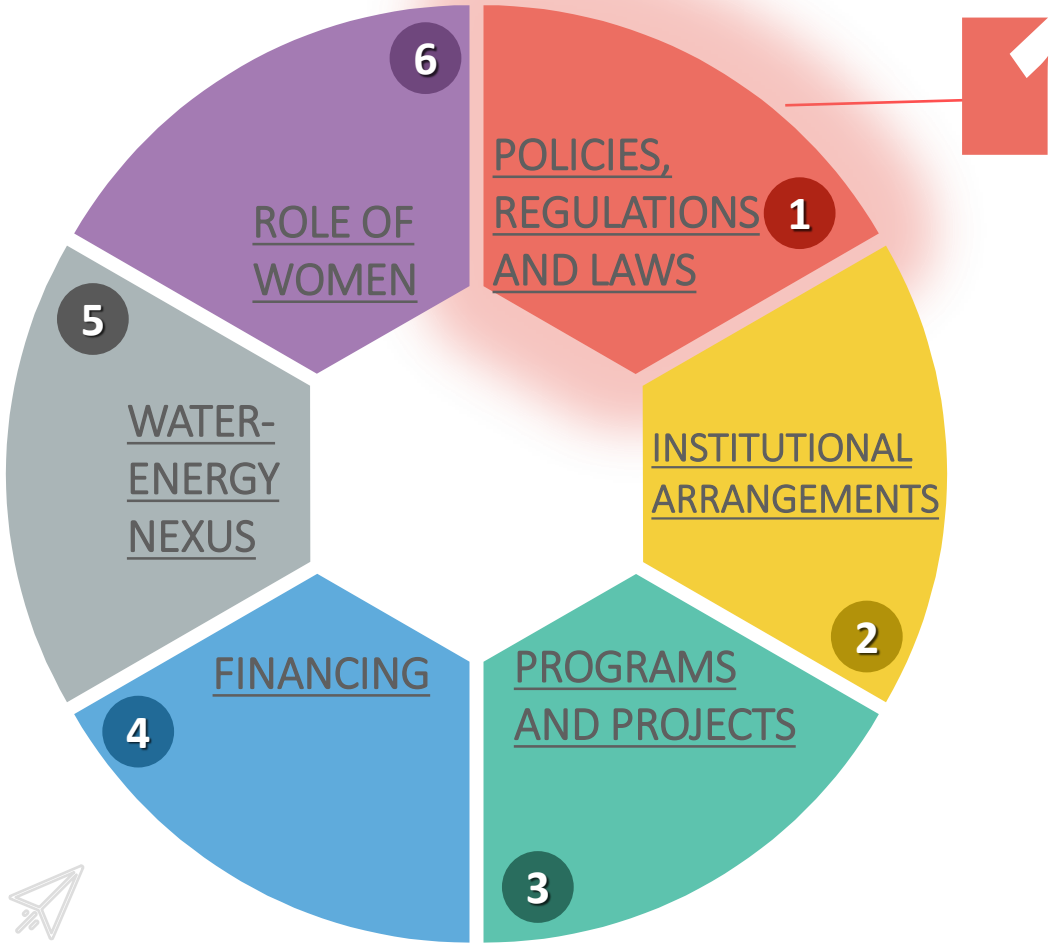

- Recognize climate change impacts in national and sectoral plans and policies
- Conduct an inventory and assessment of existing policies
- Assess national and local vulnerability to climate change impact
- Formulate local ordinances and initiate local action
- Formulate and enforce higher design standards

Assess national and local vulnerability to climate change impact

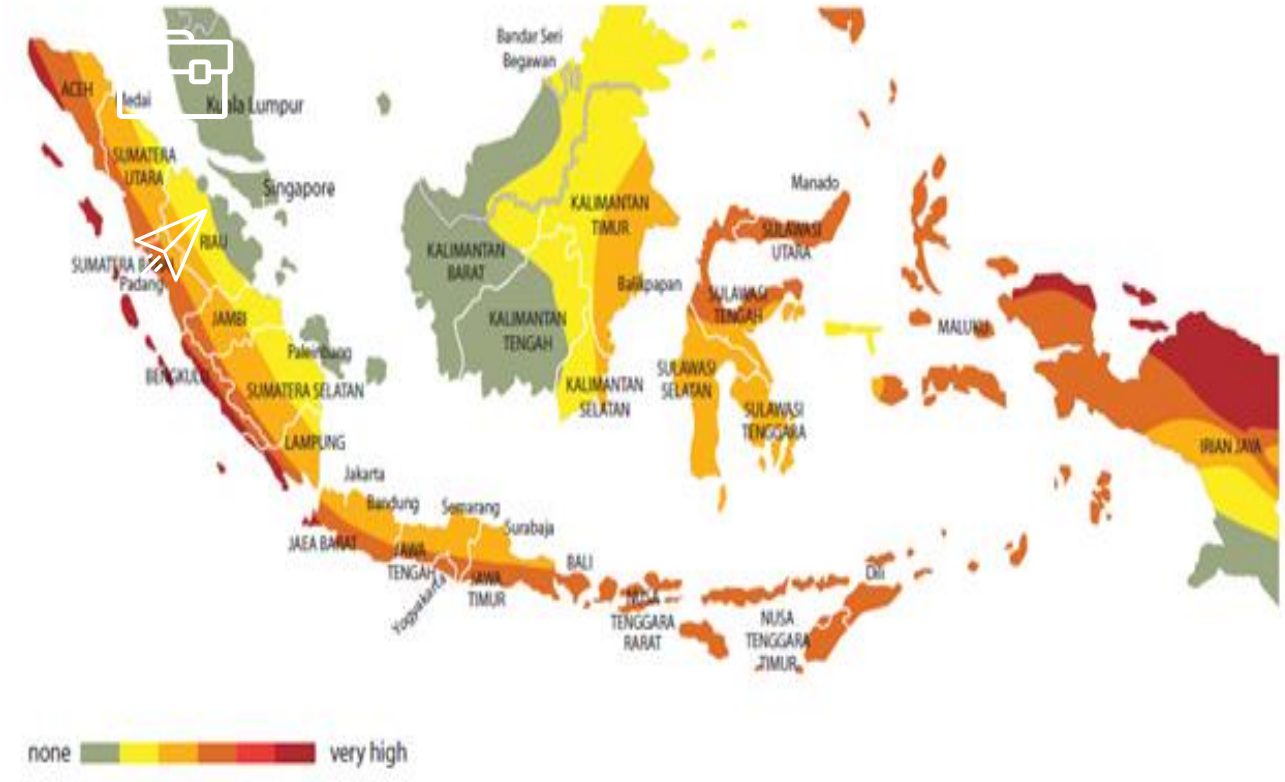

Figure 4. Indonesian National Hazard Map

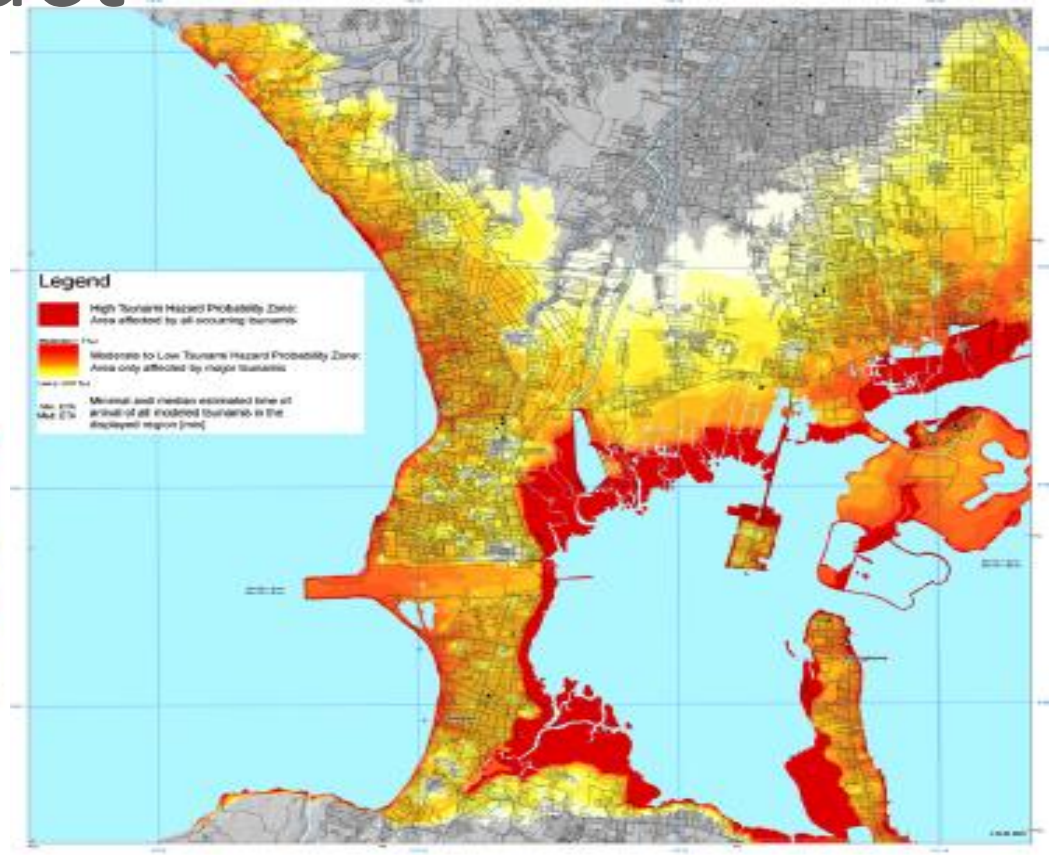

Figure 5. Bali Hazard Map

Case Study - Law on Environmental Protection of Viet Nam

Viet Nam's Law on Environmental Protection (LEP) requires Strategic Environmental Assessment (SEA) of regional and sectoral plans.

This case study looks at the SEA of the Quang Nam province hydropower plan and the climate change impacts considered such as increased rainfall intensity and variability; increases in size of extreme flood flows; sea-level rise; increases in temperature and higher evapotranspiration.

Conclusions from the SEA provided vital information namely: (1) that the pace and scale of the proposed hydropower development was at an unsustainable level (2) the need to incorporate climate change parameters in design and management is explicitly mentioned.

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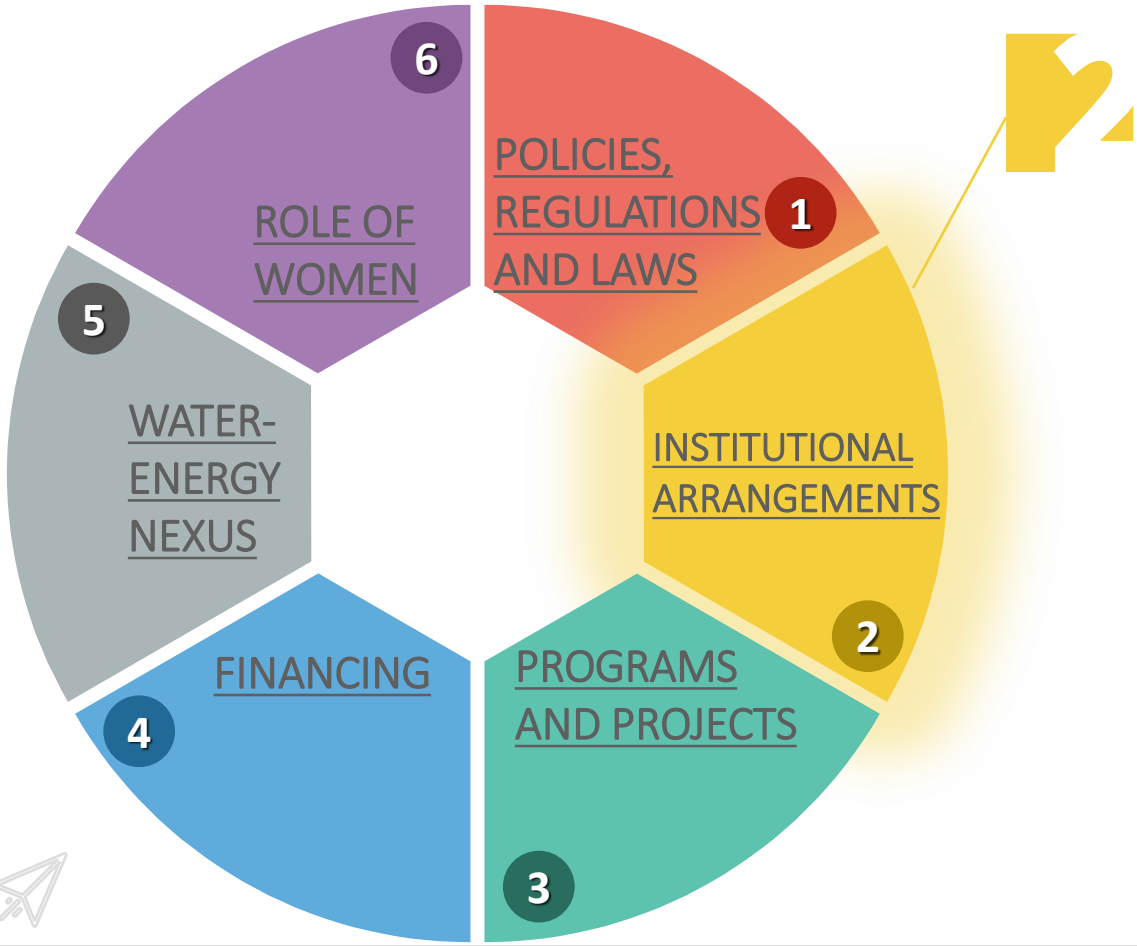

Institutional arrangements for improving energy resiliency require strengthening concerned government and private agencies, their cooperation as well as empowering and mobilizing local communities.

The following recommendations are included in this section:

- Review existing institutional arrangements and coordination
- Strengthen cooperation among national and sectoral government institutions
- Empower and mobilize local communities

Case Study - Australia's Critical Infrastructure ResiliencE (CIR) Strategy

The resilience of Australia's critical infrastructure has been enhanced by the collective work of the States and Territories, the Commonwealth Government and the owners and operators of critical infrastructure.

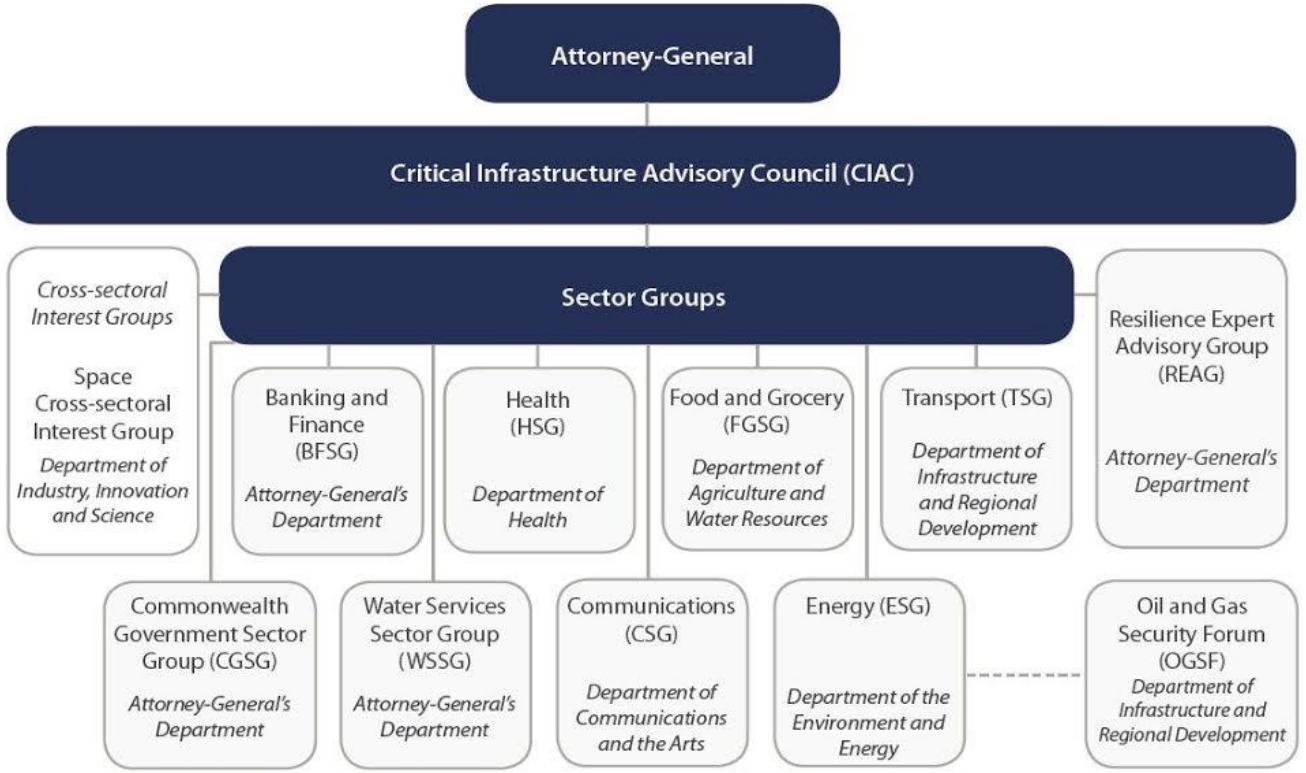

Figure 7. The Australian Government's Trusted Information Sharing Network for Critical Infrastructure Resilience.

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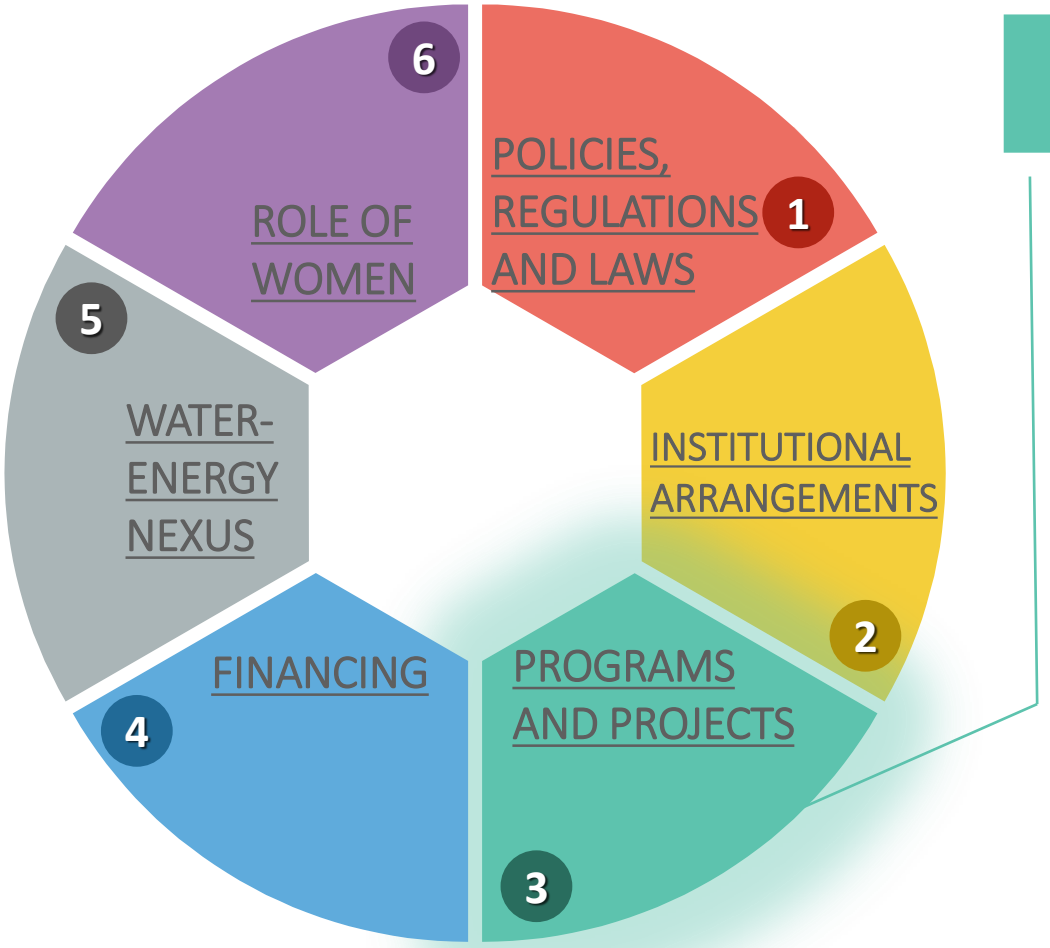

This section contains the following measures in streamlining resiliency in energy programs and projects:

- Localize climate-energy models and hazard map
- Map energy facilities, resources, and other critical structure
- Prepare energy contingency plans
- Integrate resilience in existing and new energy facilities
- Ensure the social and productive application of local energy facilities

SELECTED CLIMATE RESILIENCY PLANNING AND MAPPING TOOLS

The section includes a list of tools available to enhance resiliency of energy projects and links to these tools:

- Knowledge management in energy resiliency measures: GEF's Adaptation Learning Mechanism - UNDP and USAID
- International Institute for Sustainable Development: Community-based Risk Screening Tool—Adaptation and Livelihoods (CRiSTAL).
- World Bank: Climate Change Knowledge portal including ADAPT tool. Science-based Risk Analysis: U.S. Climate Resilient Toolkit
- Visualize Climate Data in Maps and Graphs: Climate Explorer
- Intergovernmental Panel on Climate Change (IPCC) Task Group on Data and Scenario Support for Impact and Climate Assessment: Opportunities and Risks of Climate Change and Disasters

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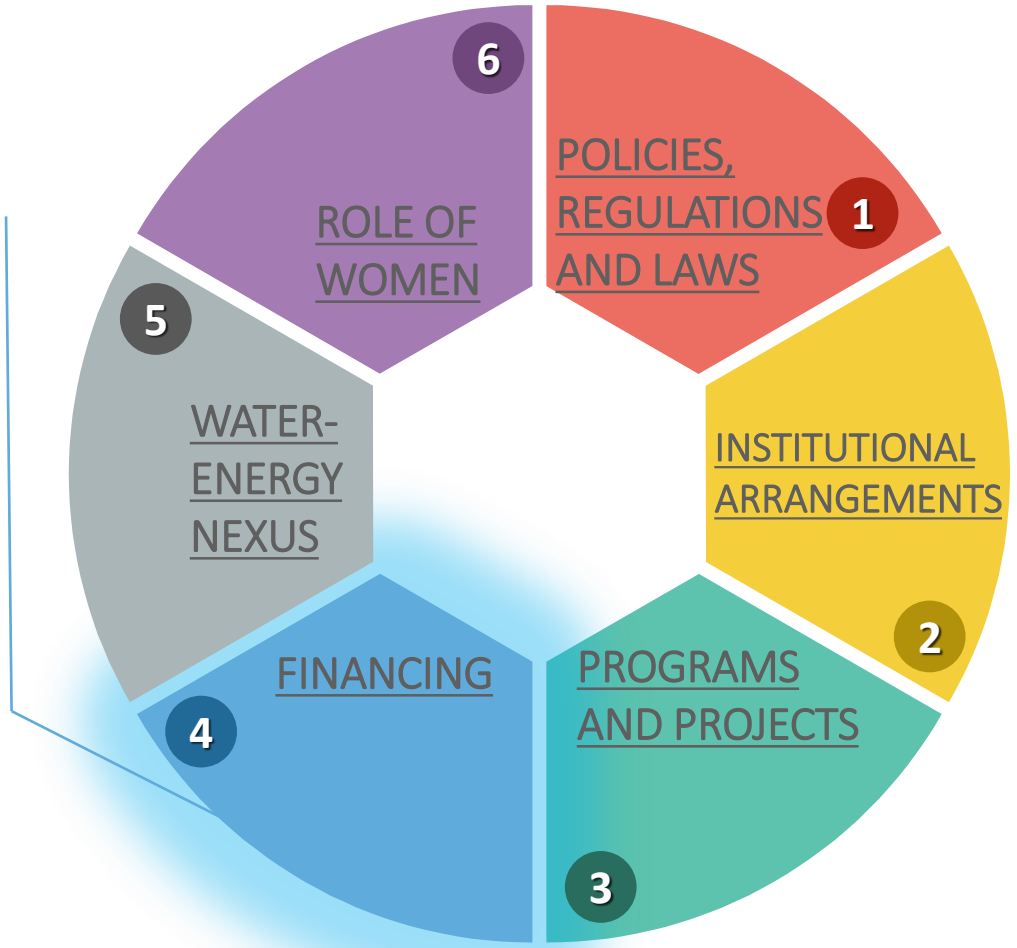
There are various climate funds that can be drawn from in implementing energy resiliency measures. Practical pointers included in this section are:

- Assess the financing needs of a specific energy facility
- Search for the appropriate financing product or modality
- Comply with financing requirements



List of Multilateral and Bilateral Climate Funds

Fund Name	Website
The Adaptation Fund	http://www.adaptation-fund.org/
The Least Developed Countries Fund	http://www.thegef.org/gef/LDCF
The Special Climate Change Fund	http://www.thegef.org/gef/SCCF
Pilot Program for Climate Resiliency	http://www.climateinvestmentfunds.org/cif/ppcr
The Global Climate Change Alliance	http://www.gcca.eu/
Nordic Development Fund	http://www.ndf.fi/
International Climate Initiative	http://www.international-climate-initiative.com/
International Climate Fund	https://www.gov.uk
The Green Climate Fund	http://news.gcfund.org/

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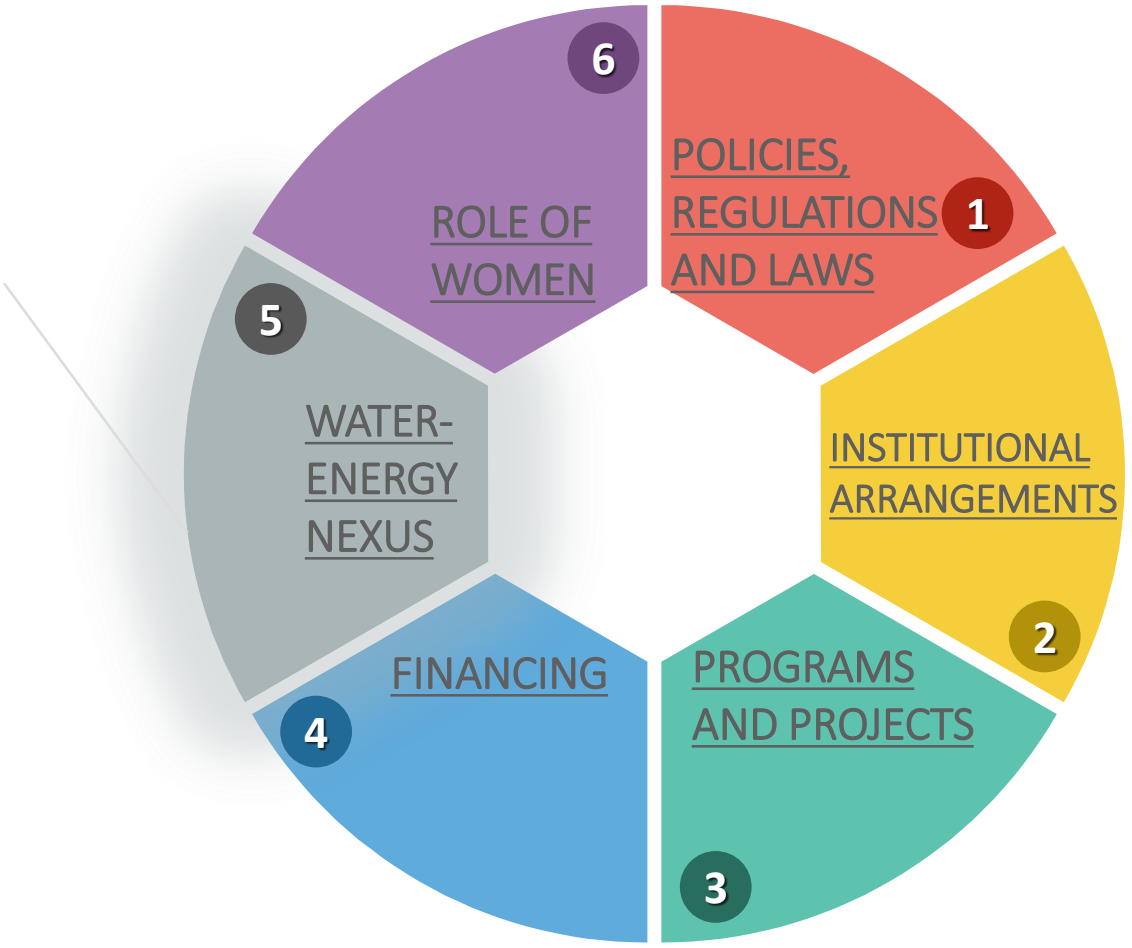
- Balancing water and energy use in off-grid areas is essential to making energy facilities resilient and sustainable.
  - Conduct an inventory of water use
  - Identify water and energy use intersections
  - Define strategies to balance water and energy use



Water Evaluation and Planning System

Water Evaluation and Planning System (WEAP), developed by the Stockholm Environment Institute's (SEI) U.S. Center, is a software tool that takes an integrated approach to water resources planning and can be linked to energy models.

WEAP models the demand side of the equation --water use patterns, equipment efficiencies, re-use, prices, hydropower energy demand, and allocation—and the supply side --streamflow, groundwater, reservoirs and water transfers – to assist the planner and policy-maker in examining alternative water development and management strategies.

This case study looks at how WEAP is used to explore issues and trade-offs of desalination in California, an issue common in island communities.

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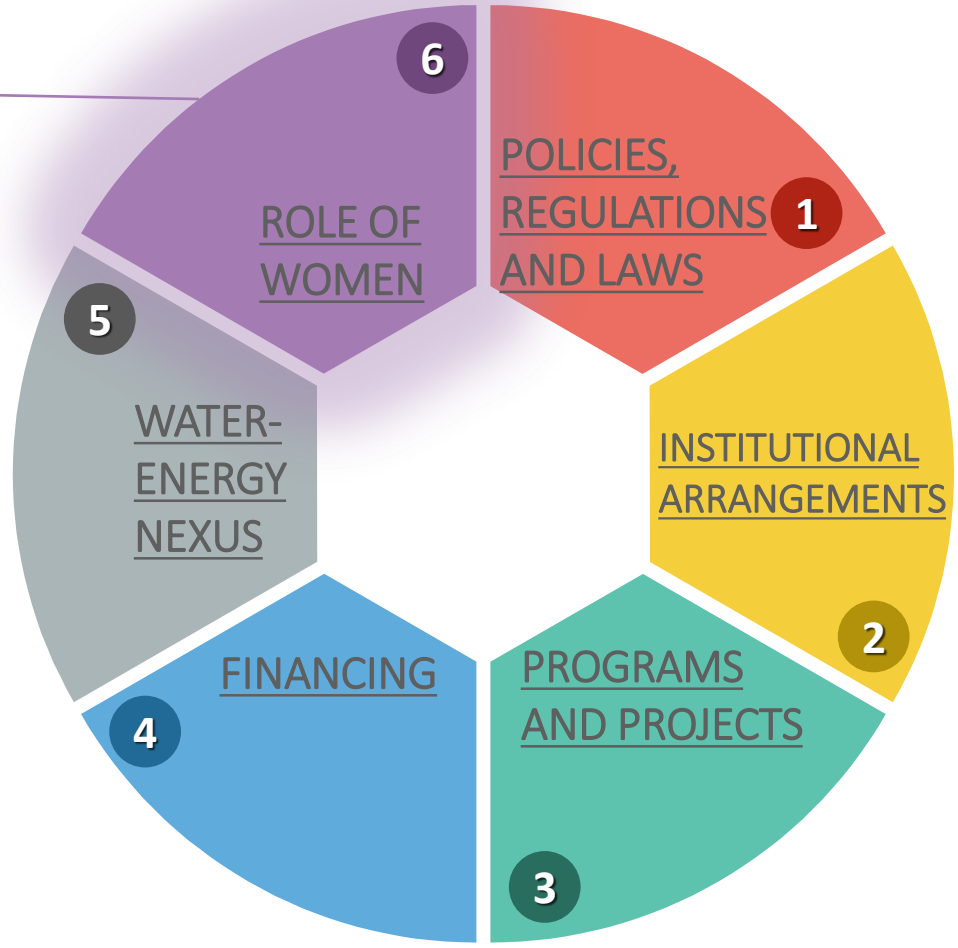
Women, especially in developing countries and off-grid areas, are often more exposed to the impacts of climate change. Women are also the ones who lead efforts in initiatives on developing resilience at the community level.

- Recognize energy-related issues that affect women
- Conduct pre-project design gender analysis
- Conduct gender analysis for energy resiliency related actions



Case Study - Undertaking Gender-Sensitive Vulnerability Assessments

A good practice in engaging communities including women in improving off-grid energy resiliency is a participatory vulnerability assessment of energy resources and use. This involves deduction of availability of energy resources to the community and use of energy by women and men.

For example, villages where solar household systems (SHS) are common and women and men are capable of dismounting them to protect them from rising winds are more resilient to an extreme event than villages where only men can dismount the systems.

Asia-Pacific
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Thank You and Mabuhay!