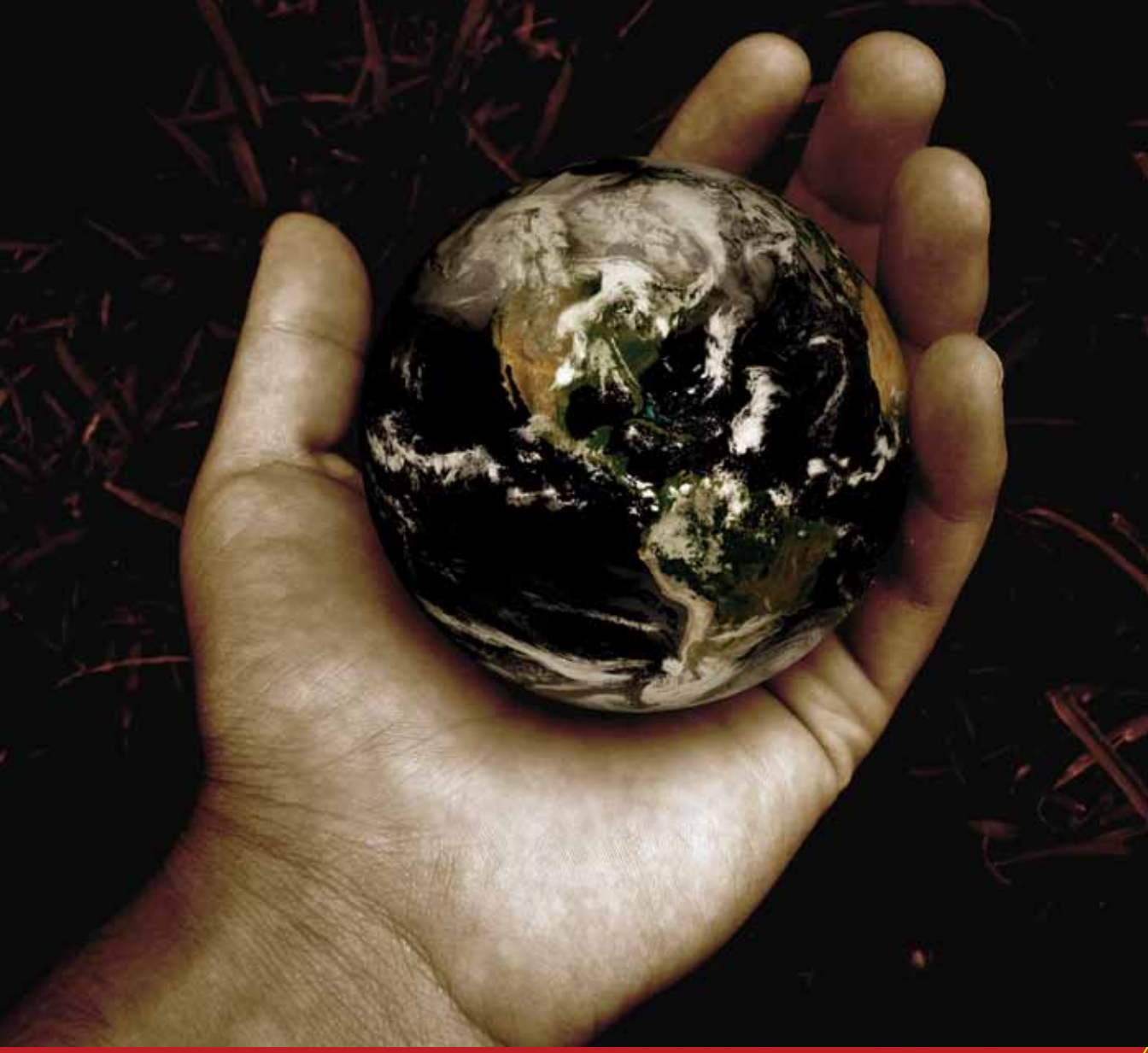


HEAT | Hands-On Energy Adaptation Toolkit

ESMAP HEAT

HEAT TOOLKIT | Overview

WHAT | HEAT is an online resource that is designed to lead you through an assessment of climate vulnerabilities and adaptation options in your country's energy sector and raise awareness among key stakeholders.

HOW | HEAT provides an interactive, step-by-step guide, as well as an analytical framework and support tools, to help policymakers consult with stakeholder groups to scope out climate risks and vulnerabilities. It then provides guidance on developing and selecting among options to manage, monitor, and evaluate these risks.

WHO | Delivering the assessment successfully involves engaging senior decision makers and technical experts in the energy sector. HEAT provides guidance on how to complete the assessment process and explains the skills and expertise required in the team leading the assessment—the Assignment Management Team. To ensure credibility when engaging stakeholders at various stages, the Assignment Management Team should include experts with knowledge of the country's energy sector, energy asset performance, the effects of climatic and hydrological conditions on energy services, expertise in cost-benefit analysis, and skills in delivering participatory assessments.

WHY | HEAT identifies key direct risks to energy supply and demand, and options for managing these risks. It also identifies additional research needed to better understand the implications of extreme climatic events for the energy sector as well as potential indirect impacts—for example, possible adaptation actions in the agriculture sector may affect energy supply.

Assessing Climate Change Risks to a Country's Energy System

Many countries are increasingly vulnerable to changes in seasonal weather patterns, weather variability, and extreme events—e.g., droughts, floods, heat waves—that can affect the production and supply of energy and affect seasonal energy demand. We must explore these vulnerabilities given the major contribution of energy to economic development and the long life span of energy infrastructure.

HEAT, a Hands-on Energy Adaptation Toolkit, is designed to help countries carry out a stakeholder–based, semiquantified risk assessment of climate vulnerabilities and adaptation options for the entire energy supply-use chain. It can help address questions such as that posed in Albania, "How can Albania best manage its future security of energy supply in the face of a changing climate?"

HEAT can help raise awareness among key stakeholders—in government, private sector, academia, and civil society—of climate change risks and initiate dialogue on energy sector adaptation.

HEAT works. It documents the lessons, experiences, and processes followed in implementing assessments in Albania and Uzbekistan.

A step-by-step resource guide is available online at:

http://esmap.org/esmap/HEAT

Engage and Inform Stakeholders

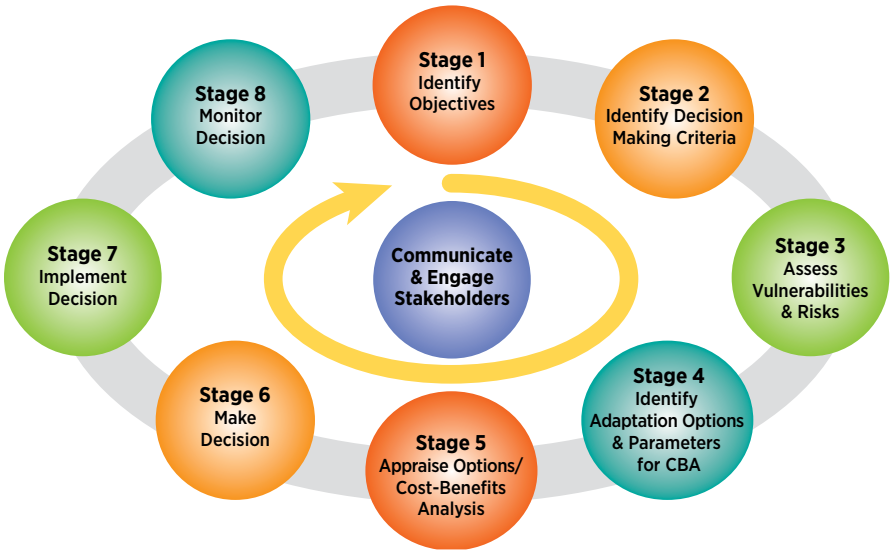
HEAT's climate vulnerability assessment framework puts stakeholders–ministries, regulators, research institutes and academia, private sector operators, civil society, and NGOs involved in energy and climate change, or in related issues such as water and agriculture –at the heart of the decision-making process. It helps:

- Promote greater awareness and deeper understanding among key stakeholders of energy sector vulnerabilities, risks, and adaptation options
- Identify issues with a cross-sector or regional dimensions that require broader engagement
- Clarify areas requiring additional research and in-depth analyses

It is essential to have the support of a local 'champion', who is a senior decision-maker who initiates the assessment process and facilitates the dialogue with other stakeholders, ensuring that they are fully engaged and supportive.

Support Discourse on Energy and Climate Adaptation | 8 Stages, 2 Workshops

HEAT draws on experience and published guidance from the United Kingdom's Climate Impacts Programme (UKCIP) and the Australian Commonwealth Scientific and Research Organization's (CSIRO) work for the Australian Greenhouse Office—*Climate Change Impacts and Risk Management: A Guide for Government and Business,* as well as existing research and literature. It builds on country-led national communications to the United Nations Framework Convention on Climate Change (UNFCCC).



HEAT provides a climate assessment framework based around 8 stages that work with stakeholders on an iterative basis to define their objectives and success criteria, and maintain their involvement throughout the stages of climate vulnerability assessment, risk assessment, and risk management (adaptation planning):

Stage 1 | **Identify Objectives**—What is the energy sector aiming to achieve? How can the country ensure that it delivers successfully on energy security objectives in the face of climate change? What opportunities arise from climate change for the energ y sector?

Stage 2 | **Identify Decision-Making Criteria**—Develop criteria to assess risks and adaptation options, considering critical thresholds and sensitivities, legislation, costs, etc.

Stage 3 | **Assess Vulnerabilities and Risks**—Undertake tiered vulnerability and risk assessments, drawing on the latest climate change trends and future projections

Stage 4 | **Identify Adaptation Options and Parameters for Cost Benefit Analysis (CBA)**—Identify risk management (adaptation) options, including no-regrets and low regret options, win-win options, and flexible options (adaptive management). Agree on CBA objectives and parameters

Stage 5 | **Appraise Options and Conduct Cost Benefit Analysis**—Assess the financial, social, and environmental costs and benefits of each adaptation option. Evaluate risk management options against decision-making criteria (Stage 2)

RESULTS | Pilot Climate Vulnerability, Risk, and Adaptation Assessments in the Europe & Central Asia Region (2009–10)

Albania is over 90% dependent on hydropower and faces significant challenges in maintaining energy security due to weather variability that reduces power supply by around 50% in a dry year compared to a wet year. Projected climate change could further reduce power supply by an average of 20% by 2050. The climate vulnerability, risk, and adaptation assessment helped energy stakeholders identify near-term priorities to support climate smart development—better weather/climate forecasting and information; attention to adaptation deficits (energy losses, water losses, and energy efficiency); integration of climate considerations into new investments; and rehabilitation of existing assets—and energy planning.

In contrast to Albania, Uzbekistan's energy sector is rich in fossil fuel-based resources (oil, gas, and coal). The gas export industry is strong and thermal power plants (TPPs) mostly run on natural gas. The power supply industry is looking to improve efficiency, reduce losses, and liberalize the market. Significant expansion of renewable resources—hydropower, wind, and solar—is envisaged to diversify supplies. A significant reduction in water resources is projected to 2050 amid a growing demand for water (by the population, for economic development). This pending water crisis is compounded by water scarcity in arid/semi-arid regions, raising regional concerns about shared water and energy resources. Both hydropower facilities and TPPs can be considerably affected by water shortages. Water crises are principal barriers to energy security for Uzbekistan.

Stage 6 | Make Decision—Bring information together, undertake final checks. Is there enough information to design and implement adaptation measures?

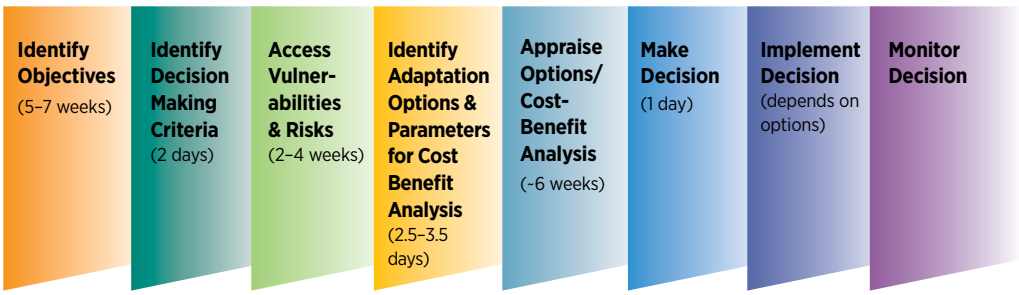
Stage 7 | Implement Decision—Implement adaptation measures according to established timetable

Stage 8 | Monitor Decision—Monitor climate impacts on the energy sector, the performance of adaptation measures, and new scientific information on climate change and its impacts

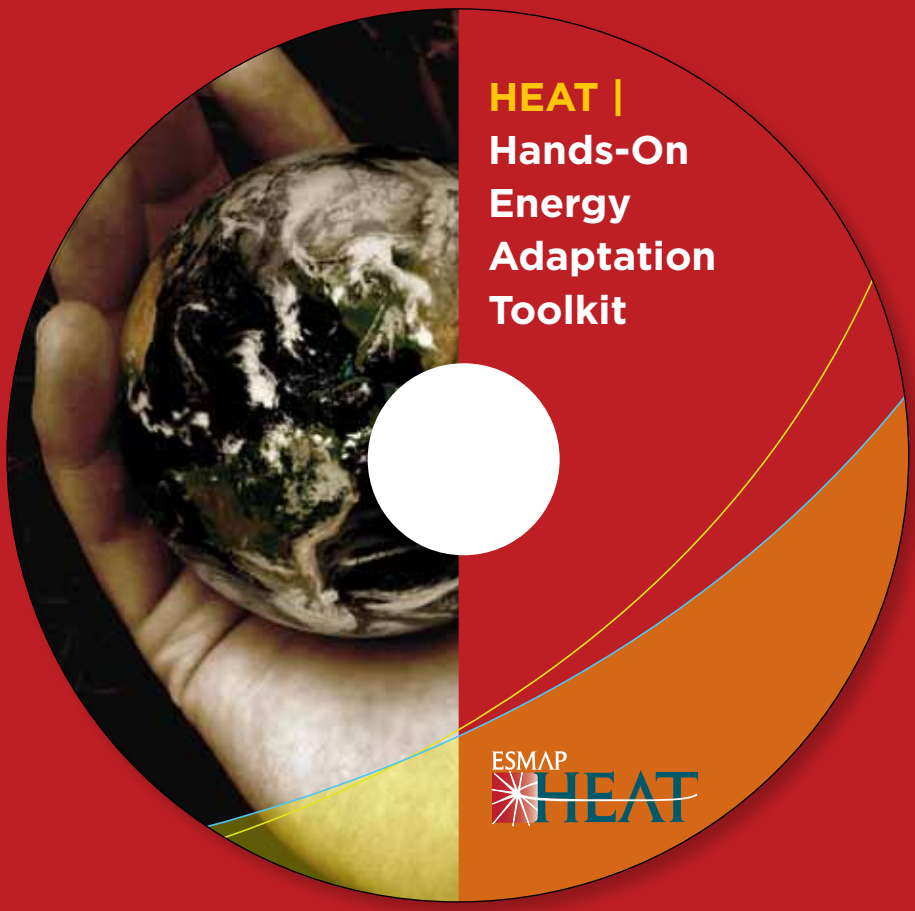
At each stage, the toolkit provides practical guidance on:

- Who's involved in undertaking the work at that stage
- Timing to schedule and complete the work
- Key questions that will be answered at each stage
- Tools to help with the assessment
- Guidance on what should be done at each stage
- Outputs of each stage
- Practical examples of how the process was undertaken in Albania (2009) and Uzbekistan (2010).

The assessment is delivered through 2 key workshops with stakeholders and a series of related meetings: ***Workshop 1:*** *Climate Risks & Vulnerabilities* and ***Workshop 2:*** *Climate Risk Management & Cost-Benefit Analysis.* Overall the process to conduct and document the assessment process (Stages 1–5) typically spans 5–8 months to allow time for meaningful engagement and dialogue. Time for implementation and monitoring depends on the suite of adaptation measures selected. Based on experience in conducting an assessment in Albania (2009) and Uzbekistan (2010), Stages 1–5 cost about US$200,000, using international experts as part of the Assignment Management Team.



HEAT Provides a Framework to Develop an Adaptation Plan with Key Stakeholders by Providing Guidance, Tools, and Practical Examples at Each Stage of the Process.



RESOURCES

Online toolkit: http://www.esmap.org/esmap/heat

Hear from stakeholders in Albania:
http://streaming3.worldbank.org/asxgen/ext/media/AlbaniaLONGeng2.wmv

Link to Albania Report:
http://web.worldbank.org/external/default/main?sortDesc=DOCDT&theSitePK=301412&cntry=82664&piPK=51189446&pagePK=51187344&menuPK=301440

Link to Knowledge Briefs on the World Bank's Europe and Central Asia Region:
http://www.worldbank.org/eca

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The Energy Sector Management Assistance Program (ESMAP) is a global knowledge and technical assistance program administered by the World Bank that assists low- and middle-income countries to increase know how and institutional capacity to achieve environmentally sustainable energy solutions for poverty reduction and economic growth.

For more information on HEAT: Hands-on Energy Adaptation Toolkit or about ESMAP's climate change work, please visit us at www.esmap.org or write to us at:

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