UNIDO EVALUATION GROUP

Terminal Evaluation Report

GLOBAL ENERGY ASSESSMENT

Developing Policy Tools for Jointly Reducing Energy Poverty and Greenhouse Gas Emissions

(GEF ID 3928 – UNIDO ID 103025 and 103026)

UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

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Independent Terminal Evaluation

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Abbreviations and acronyms

GEA	Global Energy Assessment
GEF	Global Environment Facility
IIASA	International Institute for Applied Systems Analysis
SEFA	Sustainable Energy for All
UNIDO	United Nations Industrial Development Organization
UNDP	United Nations Development Programme

Glossary of evaluation related terms

Term	Definition
Baseline	The situation, prior to an intervention, against which progress can be measured.
Conclusions	Conclusions point out the factors of success and failure of the evaluated intervention, with special attention paid to the intended and unintended results and impacts, and more generally to any other strength or weakness. A conclusion draws on data collection and analyses undertaken, through a transparent chain of arguments.
Effect	Intended or unintended change due directly to an intervention.
Effectiveness	The extent to which the development intervention's objectives were achieved, or are expected to be achieved, taking into account their relative importance.
Efficiency	A measure of how economically inputs (through activities) are converted into outputs.
Impact	Positive and negative, primary and secondary long-term effects produced by a development intervention, directly or indirectly, intended or unintended.
Indicator	Quantitative or qualitative factor or variable that provides a simple and reliable means to measure achievement, to reflect the changes connected to an intervention, or to help assess the performance of a development actor.
Lessons learned	Generalizations based on evaluation experiences with projects, programmes, or policies that abstract from the specific circumstances to broader situations. Frequently, lessons highlight strengths or weaknesses in preparation, design, and implementation that affect performance, outcome, and impact.
Outcomes	The likely or achieved short-term and medium-term effects of an intervention's outputs. Related terms: result, outputs, impacts, effect.
Outputs	The products, capital goods and services that result from a development intervention; may also include changes resulting from the intervention that is relevant to the achievement of outcomes.
Recommendations	Proposals aimed at enhancing the effectiveness, quality, or efficiency of a development intervention; at redesigning the objectives; and/or at the reallocation of resources. Recommendations are linked to conclusions.
Relevance	The extent to which the objectives of a development intervention are consistent with beneficiaries' requirements, country needs, global priorities and partner and donors' policies. Note: Retrospectively, the question of relevance often becomes a question as to whether the objectives of an intervention or its design are still appropriate given changed circumstances.
Results	The output, outcome or impact) of a development intervention. Related terms: outcome, effect, impacts.
Sustainability	The continuation of benefits from a development intervention after major development assistance has been completed. The probability of continued long-term benefits. The resilience to risk of the net benefit flows over time.

Executive summary

The Global Energy Assessment Context

After more than five years of work, the Global Energy Assessment is now completed. The final product, a manuscript of more than 1800 pages was delivered to the publisher, Cambridge University Press, in March 2012. The report was formally launched at a session of Rio+20 where heads of state and government were present. The Global Energy Assessment is the most comprehensive treatment of the energy sector consisting of a collection and analysis of the most up to date peer-reviewed literature on the various topics covered by the report in its four clusters of topics.

The four clusters of the GEA include: a review of the major energy challenges of the 21st century; an assessment of the energy technologies that are available to address these challenges; a review of the options and pathways through which potential solutions may be achieved; and a portfolio of policy recommendations and other measures to help make the urgently needed energy transformation possible. In sum, it is an assessment of how energy can offer possible solutions to global challenges.

The overall message of the report is that, as currently configured, energy systems will need to be radically transformed. If not, energy, despite being a potential solution to the many challenges faced, will constitute a major hindrance and in some cases a major detriment to the efforts by many to address these global challenges. These challenges include: poverty eradication, global and national security, climate change, health, and the environment in general.

The GEA is not the usual energy sector report. Instead, it is an assessment that takes a deep look at all aspects of economic and social activity where energy is essential. It examines whether and how energy is delivering or not on the objectives behind these activities. This thorough and comprehensive analysis was undertaken by some 500 analysts from many countries in every region of the world.

The Global Energy Assessment includes contributions from specialists in a range of disciplines, industry groups, and policy areas in defining a new global energy policy agenda, one that is capable of transforming the way society thinks about, uses and delivers energy. The GEA will facilitate equitable and sustainable energy for all, in particular the two billion people who currently lack access to clean, modern energy.

Coordinated by the International Institute for Applied Systems Analysis (IIASA), the GEA is led by some of the world's leading energy experts, in research, academia, business, industry, and policy, from all regions of the world. The GEA

is the first ever fully integrated energy assessment analyzing energy challenges, opportunities and strategies, for developing, emerging and industrialized economies. It is supported by government and non-governmental organizations, the United Nations System, and the private sector.

The GEF/UNIDO Project

The project covered by this evaluation was conceived by UNIDO and IIASA in August 2009 to disseminate tools generated by the GEA process. The project was approved by the GEF CEO in October 2009 and was planned to be completed by May 2011.

The GEF/UNIDO project was designed to support the development of policy options and analytical tools aimed at informed decision-making to support scaling-up of low carbon energy technologies, achievement of reductions in greenhouse gas emissions, and the reduction of energy poverty. Based on a survey of workshop participants and discussions with policy makers, the evaluation found that the objectives and the desired outcomes were achieved. A number of follow-up activities are identified to make use of the project deliverables.

The GEF support was provided for the following 3 components:

- Policy tools for improving energy access;
- Technical analysis for improving energy access;
- Interactions with policy makers in developing countries.

The primary purpose of the GEF resource allocation was to disseminate the results of the GEA. This was accomplished through the production of the web-based tools, the four co-authored documents, and the conduct of the dissemination workshops. These products developed with GEF resources would not have been produced within the GEA project and they add significant value to the GEA outreach process.

The GEF grant specifically supported production of two substantive reports on modern energy access and transformative energy pathways, two web-based energy analysis tools, including a database and user manuals, and the conduct of one sub-regional and two national workshops. In addition, the GEF support contributed to the writing of four chapters of the Global Energy Assessment.

Delays in the preparation of the GEA, upon which the project was based, resulted in the project being completed in June 2012. This was done at no additional cost to the GEF and with no loss of quality in the deliverables.

The Main Findings under the GEF/UNIDO Project

The evaluation found several areas for building on the results of the project and continuing the work produced by the GEA. The GEA has done the heavy lifting, and there is scope to build on the momentum. Principal work areas for follow-up are identified within the following categories which are detailed in the recommendations section of this evaluation report. They are:

- Capacity building for policy makers and energy practitioners;
- Preparation of Policy Briefs and Thematic White Papers;
- Creation of regional centers of excellence; and
- Collaboration with other global initiatives, such as Sustainable Energy for All.

The project objectives were achieved with high quality deliverables that will be useful to GEF and UNIDO programme managers to guide the design of new projects. The intention to develop policy options to inform decision makers and support their actions to adopt low-carbon energy technologies while reducing energy poverty was met. The analytical web-based tools developed to guide these decisions were well received in stakeholder workshops.

The documents on modern energy access and transformative pathways are particularly relevant in the global arena where social inequality and energy poverty are regularly discussed. These topics have become the daily subsistence of the mainstream media, and so this project is particularly timely. The use of short documents like these two cited examples will be a good way to get the high quality, peer reviewed material developed within the GEA process out into the public domain where it can have significant development impact.

Main Recommendations

The GEA report is a significant treatment of the global energy sector. It was subject to a rigorous and independent analysis and review. The heavy lifting has been done, and the material is available for wide-scale dissemination. However, the sheer volume of technical information requires that this information is processed in a way that is more accessible to non-technical policymakers. Furthermore, the production of Policy Briefs and Thematic White Papers are two means of getting the benefits to policy makers for the creation of programmes for the end users. There is ample opportunity to do this work in partnership with developing country institutions with support of UNIDO and GEF.

Key recommendations for UNIDO, the GEF and other development partners are:

1) Continue building capacities. There is significant need to develop capacity building initiatives to make the material accessible to a wider audience by training practitioners in the design and delivery of energy initiatives. Dissemination of the results has begun with the three policymaker workshop undertaken in 2012, but

further work is required. This is within the scope of UNIDO activities and can be undertaken by UNIDO and its development partners.

2) Facilitate the use of web based tools. The workshop participants expressed a need for back-stopping support in the use of the web-based energy access tools. Setting up a chat room at IIASA would be an effective means to accomplish this task.

3) Formulate technical cooperation projects. UNIDO played a seriously significant role in the design and execution of this initiative. It is important to catalyze on this experience and develop programmes to serve the Member States in energy use for industrial development, access, and low-carbon solutions for eradicating energy poverty. UNIDO is well placed to develop partnerships with UN-Energy, the GEF, World Bank, bilateral donors and the private sector to further address the sustainable energy agenda.

4) Promote further dialogue and dissemination of GEA results

1.

Introduction

The main purpose of the project evaluation is to determine the impact and sustainability of the project outputs. The outcome of the GEF supported project is to create a better understanding among decision makers of key technologies, technology transfer issues, policy instrument choices, and other major sustainable development issues. The evaluation re-examines the relevance of the project objectives and its design. It also determines the effectiveness and efficiency of project execution. Finally, recommendations for dissemination of project deliverables and their wider applicability are proposed.

1.1 Evaluation Methodology

The Evaluation was undertaken during September/December 2012. It included interviews at UNIDO and IIASA and surveys of workshop participants and experts. The GEF and members of the GEA Council were also consulted. The list of persons consulted is in Annex 1. The evaluation was conducted by Dr. Andrew Yager, Consultant, Oslo, Norway. He received significant mission support from colleagues in the UNIDO office in Vienna and the IIASA office in Laxenburg. The evaluator had full access to all project related data and information at UNIDO and IIASA. The first step in the evaluation was to assemble and review the relevant project documentation. This included the project deliverables, and background information such as policies and strategies of the UN and GEF to assess project relevance.

A five day field visit to Vienna was undertaken to meet with the UNIDO Evaluation Group, and conduct interviews with the key stakeholders at UNIDO and IIASA.A survey was prepared and sent to the participants of the three workshops supported by the project to obtain feedback on the utility of the project deliverables in their national/regional energy activities.

In addition, interviews were conducted with the GEF CC team, members of the GEA Council, and energy experts.

1.2 Questions to be addressed

The key question to be addressed by the evaluation is whether the project has successfully created decision making tools to assist energy policy makers in assessing their needs. These tools could assist GEF recipient countries in identifying their national priorities in the field of energy.

2.

Project background

The Global Energy Assessment (GEA) is a multi-year and multi-stakeholder activity that aims to help decision makers address the challenges of providing energy services for sustainable development throughout the world. The GEF project under evaluation uses the GEA as a knowledge platform upon which to develop specific analytical tools to assist decision makers. Specifically, the GEF project was meant to support the development of policy options and analytical tools aimed at informed decision-making to support scaling-up of low carbon energy technologies, achievement of reductions in greenhouse gas emissions, and the reduction of energy poverty. The evaluation found that the objectives and the desired outcomes were achieved. Moreover, a number of follow-up activities are identified to make use of the project deliverables. The GEF support was provided for the following 3 components:

- Policy tools for improving energy access;
- Technical analysis for improving energy access;
- Interactions with policy makers in developing countries.

The following Table presents the main outputs of the project.

Table 1: Outputs of the GEF project

Outcomes by Project Component[1]	Indicators
Component 1: Policy tools for improving energy access **Outcome:** Dissemination of the analytical tools generated by the GEA project **Outputs:** Web-based and computer-based quantitative tools	1.1 GEA Scenario work and database allowing decision makers to view scenario outcomes for key energy variables 1.2 Interactive PC-based scenario analysis tool designed to allow policy makers to rank their priorities

[1] The outputs listed are in line with the final work plan agreed by the GEF secretariat, UNIDO and IIASA in June of 2011, and differ slightly from the original outputs planned at the project conceptual stage in 2009, presented in Annex 4

Component 2: Technical analysis for improving energy access **Outcome:** Providing a better understanding of key outcomes of the GEA (technology, TT, policy instruments) to serve future GEF programming **Outputs:** Chapters on energy access of the major analytical report of the GEA GEA policy tools for energy access, based on analysis of the GEA scenarios database	2.1 Specific chapters on energy access of the major analytical report of the GEA 2.2 Energy access tool 2.3 Recommendations on policies for energy access set within larger policy portfolios and written outputs for dissemination of GEA results 2.4 Obtaining feedback and providing guidance on the changes in energy systems needed to simultaneously attend to the challenges of the 21st Century
Component 3: Interactions with policy makers in developing countries **Outcome:** Establish a dialogue to disseminate policy tools and GEA activities **Outputs:** Chapter on policy portfolios of the major analytical report; written products for dissemination at workshops	3.1 Recommendations on policies for energy access set within larger policy portfolios and written outputs for dissemination of GEA results 3.2 Obtaining feedback and providing guidance in three stakeholder workshops.

The GEF grant specifically supported production of two substantive reports on modern energy access and transformative energy pathways, two web-based energy analysis tools, including a database and user manuals, and the conduct of one sub-regional and two national workshops. In addition, the GEF support contributed to the writing of four chapters of the Global Energy Assessment.

A principal objective of the GEF support is to provide tools for Member States to make informed decisions that favorably impact global environmental issues while achieving their national development objectives. Hence the tools developed from the GEA would be consistent with GHG methodologies and would be presented in a manner that facilitates the decision process for policy makers. The GEA provides a holistic approach to energy while focusing squarely on expanding energy access to the poor within the next two decades. This GEF supported project comes at a pivotal time in the current global effort to eradicate energy poverty. It contributes directly to the global initiative of the UN Secretary General to provide Sustainable Energy for All (SEFA) by the year 2030. It is also noteworthy that the UN General Assembly recently approved a new Resolution declaring 2014-2024 as the Decade of Sustainable Energy for All.

The development impact of the GEF support is of paramount importance. A measure of success is the relevance of the decision making tools prepared for energy policy makers in meeting their needs. A further measure of success is the relevance of the outputs for UNIDO country programming. The evaluation illustrates that the GEF project has clearly fulfilled these objectives.

The Global Energy Assessment report makes clear that major changes in current global trends are required if future energy systems are to be affordable, safe, secure, and environmentally sound. The report points to a need for a sustained and comprehensive strategy to help resolve the following important global challenges:

- Providing affordable energy services for the well-being of 7 billion people today and the 9 billion people projected by 2050;
- Improving living conditions and enhancing economic opportunities, particularly for the 3 billion people who cook with solid fuels today and the 1.4 billion people without access to electricity;
- Increasing energy security for all nations, regions, and communities;
- Reducing global energy systems related greenhouse gas emissions to limit global warming to less than 2℃ above pre-ind ustrial levels;
- Reducing indoor and outdoor air pollution from fuel combustion and its impacts on human health; and
- Reducing the adverse effects and ancillary risks associated with some energy systems to safe and acceptable levels.

The GEA assessed a broad range of resources, technologies and policy options and identified a number of 'pathways' through which energy systems could be transformed to simultaneously address all of the above challenges. The GEF project built on the key findings of the Global Energy Assessment. The transformative pathways document entitled "The Next Energy Transition" recognized that energy systems can be transformed to support a sustainable future and that an effective transformation would require immediate action. Addressing the above challenges would require the development of policies and institutional mechanisms as explored and suggested in the Pathways document. Dozens of technological choices are examined and compared for their applicability and cost-effectiveness in meeting the global challenges. Based on the assessment, it is clear that low-carbon energy pathways are achievable.

The deliverable entitled "Access to Modern Energy" also addressed some of the principal challenges that were examined by the GEA. The assessment specifically analyses options for meeting the demand for electricity, for clean modern cooking fuels and for mechanical power to eradicate energy poverty. These options are explored in the context of the UN initiative on providing Sustainable Energy for All (SEFA) by the year 2030. The web-based Energy-Multi Criteria Analysis Tool (ENE-MCA) developed within the GEF supported project provides guidance on making choices for integrated energy system design. The tool enables decision makers and policy analysts to assess the social benefits of varying the impact of energy system priorities. By using this tool, policy makers can compare options within varying investment and regulatory frameworks. The project summary sheet is presented in the following Table.

Table 2: Project Information Summary

General Information	Project Title	Cooperation with global energy assessment on the development of industrial sector energy end-use module / global energy assessment: developing policy tools for jointly reducing energy poverty and greenhouse gas emissions
	GEF ID	3928
	UNIDO ID	GFGLO10004
	Region	GLOBAL
	GEF Focal Area(s)	Climate Change
	Agency(ies)	UNIDO
	Project Partners	International Institute for Applied Systems Analysis (IIASA)
	Project Size (FSP, MSP, EA)	MSP
Milestone Dates	Project CEO Endorsement/Approval Date	21 October 2009
	Project Implementation Start Date	23 March 2010
	Original Expected Implementation End Date	1 May 2011
	Revised Expected Implementation End Date (if any)	22 November 2011
	Actual Implementation End Date	30 June 2012
Funding	GEF Grant (USD)	1,000,000
	GEF PPG (USD) (if any)	None
	Total GEF Grant Disbursements to date (USD)	1,000,000
	Co-financing (USD) at CEO Endorsement	4,107,000
	Materialized Co-financing at Project Completion (USD)	3,988,191 **(discrepancy due to USD/EURO conversion rate fluctuations)
Evaluations	Mid-term Review Date	None required
	Terminal Evaluation Date	30 November 2012
	Tracking Tool Date	30 June 2012

At the time of CEO endorsement, the GEF support was intended to contribute about 20% of the total cost of preparing the GEA estimated to be USD 5,107,000 including the GEF contribution of USD 1 million. By the time the GEA was published in June 2012, the total cost had reached USD 8.216 million. This included a contribution from IIASA in cash and in-kind of approximately USD 3.1 million. Hence, the USD 1 million GEF grant had provided 12% of the final GEA production cost. Details of the project co-financing are provided in the following Table.

Table 3: Project Co-Financing (all amounts are USD)

Sources of co-financing	Name of co-financer	Type of co-financing	Amount confirmed at CEO endorsement /approval	Actual amount materialized at closing
Bilateral Agency	Austrian Development Agency	Grant	1,088,000	922,190
National government	Italian Ministry of Environment and Territory	Grant	1,259,000	130,000
National government	Swedish Research council for Environment, Agriculture & Spatial Planning (FORMAS) & Swedish Energy Agency	Grant		619,463
National government	US Environment Protection Agency	Grant		117,000
National government	US Department of Energy	Grant		482,258
National government	Research Council of Norway	Grant		82,121
National government	Deutsche Gesellschaft fur Internationale Zusamm. (GIZ)	Grant		141,937
Private sector	Petrobras	Grant	313,000	122,912
Private sector	First Solar Inc	Grant		138,988
Other multilateral agencies	World Energy Council (WEC)	Grant		13,000
Civil Society	UN Foundation	Grant	400000	49,041
Civil Society	Climate Works foundation	Grant		349,214
Multilateral agencies	UNIDO	Grant	500,000	500,000
Multilateral agencies	UNDP	Grant	89,000	30,537
Multilateral agencies	UNEP	Grant	60,000	50,700
Multilateral agencies	WB/ESMAP	Grant	398,000	238,830
		TOTAL	4,107,000	3,988,191

2.1 Context of the GEA and the GEF/UNIDO Project

The Global Energy Assessment was conceived and adopted by the International Institute for Applied Systems Analysis (IIASA) governing council in November 2005. The first meeting of the GEA Organizing Committee was held in December 2005. The process evolved during the next year until the GEA was formally launched in early 2007 as a major contribution to the global policy agenda on energy and climate change. The multi-year, multi-stakeholder initiative was designed to help decision makers address the challenges of providing sustainable energy services for global development. More than 300 authors and 200 reviewers contributed to the assessment.

In August 2009, a project to disseminate the tools generated by the GEA process was presented by UNIDO and IIASA to the GEF for funding. The GEF CEO approved the project which envisioned development of specific tools, reports and technical analysis to be produced during an implementation period from October 2009 to May 2011.

In January 2011, the GEF convened a meeting in Washington, D.C. to review progress made under the GEF project. The meeting was chaired by the GEF CC Team Leader and attended by the UNIDO and IIASA GEA teams. Both project teams made detailed presentations on the status of activities, strategic approaches and deliverables under the GEF project followed by a thorough discussion. A number of useful comments and suggestions were made by the GEF CC team and later incorporated in the document. A tentative roadmap for completion of the project activities was discussed and agreed.

In April 2011, IIASA sent UNIDO a request seeking a no-cost project extension to December 2011. This request was prompted by delays in the GEA report finalization which had repercussions on the implementation of key activities under the GEF funded project. A full revision of the project plan was conducted during May and June 2011, resulting in the preparation of a revised work plan.

A further extension was granted to enable a series of three workshops to be conducted for the purpose of disseminating the project deliverables. Activities under the GEF project were essentially completed with the final workshop in June 2012.

2.2 Cooperating Partner

IIASA is an independent institute and part of an international network of scientific institutions working together to study global change. IIASA's goal is to provide objective and usable information on economic, environmental, and social issues for the benefit of the public, scientists, and national and international organizations. IIASA is sponsored by a consortium of scientific organizations in

18 countries; it has member organizations in Africa, Asia, Europe and North America.

IIASA has been involved in the areas of energy and climate change issues for some time and has built up a considerable standing in these areas. In reflection of IIASA's expertise and experience in these areas, the Global Energy Assessment (GEA) was initiated by IIASA with the support of the following organizations:

- Austrian Development Cooperation
- Brazilian Ministry of Mines and Energy
- International Energy Agency
- International Energy Initiative
- Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning
- UNDP
- UNEP
- World Bank
- World Energy Council

UNIDO also financially supported the GEA as the other organizations listed above are doing, directly and by funding specific experts and activities that are in line with UNIDO's global role in the industrial energy sector.

Beyond the issue of UNIDO's energy related standing and exposure, which was greatly enhanced by actively participating in the GEA, the GEA also provided UNIDO with an opportunity to collaborate on in-depth research into a range of different aspects concerning industrial energy use. This in itself will continue to be highly beneficial to UNIDO's technical and scientific capacity and in its development assistance programming.

3.

Project assessment

3.1 Design of the GEF/UNIDO Project

3.1.1 Technical design

The GEA will become an important report as it brings significant benefits to the scientific community, to policy-makers and to the international developmental community. The report defines the status of the global energy sector and its challenges. It will also therefore contribute to defining the response of the U.N. system and other bi-lateral and multi-lateral donors in the areas of energy and climate change.

It is within this context that UNIDO and IIASA prepared the GEF supported project to utilize the Global Energy Assessment (GEA) as a knowledge platform to develop policy tools for jointly reducing poverty and greenhouse gas emissions. The project successfully prepared policy options and analytical tools aimed at informed decision-making to support scaling-up of low carbon energy technologies, achievement of reductions in greenhouse gas emissions and the reduction of energy poverty. The outcome of the GEF supported project has contributed to the creation of a better understanding among decisions makers of key technologies, technology transfer issues, policy instrument choices and major sustainable development issues. A summary of the GEF Concept Note, denoted Project Identification Form is presented in Annex 4.

The GEF project specifically uses scenarios and analysis obtained from the GEA to provide policy makers with tools for decision making. Two interactive PC-based tools were developed. A scenario analysis tool was designed to allow policy makers to rank their priorities for different policy objectives and to see in real time the future implications for the global energy system in terms of technology deployment, funding requirements, GHG emissions, air pollution and health impacts, and energy security. In addition, an energy access policy tool was created to model different energy access policies (including subsidies and microfinance) and their costs and benefits.

The Global Energy Assessment is an up to date compilation of peer-reviewed energy analyses and scenarios. It consists of 25 chapters arranged in 4 clusters: i) a review of the major current challenges; ii) an assessment of the technologies available to address these challenges; iii) a review of the options and pathways to solutions; and iv) a portfolio of policy recommendations to achieve the energy transformation. In essence, the GEA assesses how energy is either contributing to global problems or offering possible solutions.

The project supported activities within 3 of these 4 GEA clusters, by contributing to drafting of material in Chapter 2 (Energy, Poverty and Development), Chapter 17 (Energy Pathways for Sustainable Development), Chapter 19 (Energy Access for Development), and Chapter 23 (Policies for Energy Access). Hence, as detailed in these four chapters, the focus of the GEF support is clearly on the eradication of extreme poverty through the provision of sustainable modern energy services.

Two deliverables were prepared based on these specific GEA chapters. They are:

- The Next Energy Transition: Transformative Pathways, Choices and Opportunities;
- Access to Modern Energy: Assessment and Outlook for Developing and Emerging Regions.

Three workshops contributed to the dissemination of the knowledge products developed under the project.

Specific details and the evaluation of these deliverables are provided in the following sub-sections.

3.1.2 Implementation design

The arrangements for the managerial structure of the project were laid out in the project document. The project team was lead by a UNIDO project manager and was executed by IIASA. IIASA had also been responsible for the secretariat of the GEA which coordinated the efforts of over 500 lead authors, convening authors and technical reviewers.

3.1.3 Monitoring and evaluation design

The GEF CEO Endorsement Form (GEF CEO EF) indicates that the UNIDO staff would be directly involved in the technical component of the project, particularly the industrial energy efficiency knowledge module. No direct project management funds were allocated from the GEF grant, as IIASA was coordinating the overall initiative.

All contracts given to IIASA were monitored following the UNIDO standard procurement rules and regulations.

3.2 Relevance

3.2.1 Relevance to Target Groups

Comments made during the workshops and feedback received from the participants provided significant input regarding the relevance of the project.

In the Cape Verde regional workshop, the participants indicated that the Energy Multi-Criteria Analysis Tool (ENE-MCA) was particularly useful, pointing to the treatment of trade-offs and synergies between different national objectives which are often context-dependent and may vary considerably across countries. The flexibility of the tools, permitting users to select policy preferences, was greatly appreciated; and participants felt that this facilitated better understanding the consequences of prioritization of multiple objectives.

The presentations emphasized the importance of efficiency and renewable technologies for Africa. The biggest challenge will be to mobilize the necessary resources, given the relatively high capital intensity of these options. It was thus recommended that future research in this area should more strongly focus on policy mechanisms that would incentivize foreign direct investment. This is in addition to domestic financial resources which will most likely be insufficient for the successful transformation of the Sub-Saharan Africa energy system. The conclusions with respect to integrated policy approaches under multiple energy objectives will be critical to achieve these goals in a most cost effective way, which is of particular importance for Africa.

Further discussions with African policy makers asserted the relevance of the project for policy formulation and further noted the challenge regarding implementation. Capacity building is needed to assist with policy formulation and especially for energy programme design and implementation.

It was also noted that the tools developed under the project would be beneficial in bridging the gap between energy planners and policy makers. The tools are also useful in developing the regulatory framework for national and regional energy network expansions.

In the New Delhi workshop, the participants expressed interest in the application of the policy tools and analysis presented by the project. In particular, there was interest in doing further work to apply the tools on a national scale by incorporating additional objectives and focusing on pathways and policies rather than outcomes. The participants felt that the tools were important for stimulating policy makers to ask the right questions and to visualize synergies and tradeoffs and wider impacts and implications of specific policy choices. Some feedback and suggestions were also made to link the two tools and incorporate access as an additional objective in the multi-criteria decision tool (ENE-MCA). Suggestions were also made to improve the energy access tool (ENACT) to include more energy option and supply technologies, such as decentralized off-grid electrification and improved stove technologies for cooking. In addition, it was

suggested that it would be interesting to look at the welfare impacts of policies across different cross-sections of the population in more detail.

The presentations highlighted the importance of complementarity between the regional and global scale analysis carried out at IIASA and the more local context specific research and studies being carried out by TERI and other national research organizations. Significant discussion on the investments and financing needed to achieve sustainable energy transitions also took place. The participants felt that greater transparency with regards to cost elements and assumptions regarding investment estimations was desirable and further work on potential sources of financing might be useful. It was also felt that the production of shorter targeted documents like the energy access and transformative pathways documents is an effective means of disseminating the knowledge and information.

At the national workshop in Yerevan, Armenia, the participants indicated appreciation for the policy tools and analysis presented and noted the potential to help them with their national energy planning. The participants indicated that the tools were important for stimulating policy-makers to ask the right questions and to think of synergies and trade - offs and the wider implications of specific policy choices. The greatest discussion during the workshop took place following the presentations of the local experts. It was felt that the workshop helped to initiate these discussions and provided an important forum for national stakeholders to learn about national energy and environmental policy and voice their views and concerns. The presentations highlighted the importance of and complementarity between regional and global scale analysis carried out at IIASA and the more local context specific research and studies being carried out in Armenia.

3.2.2 Relevance to International Development

In addition, key international stakeholders were also interviewed during the evaluation to determine the relevance of the project for supporting national, regional and global energy sector activities.

Several interviewees supported the assertion that the project design was adequate for policy development. There was agreement that the project would contribute to creating a better understanding among decision makers of key technologies, technology transfer issues, policy instrument choices and major sustainable development issues. This was particularly noted for renewable energy and energy efficiency applications.

The question of policy implementation was beyond the scope of the current project. Whereas the project developed policy frameworks to address poverty and climate change issues, each country/region would need to develop its individual implementation plan and seek further funding to address their local development needs. Capacity building would be an important aspect of the implementation; whereas government commitment for policy development would

be essential, it was felt that national energy utilities and the private sector would be needed to ensure sustainable implementation of the policy measures.

The current activities within the 2012 Year of Sustainable Energy for All provide an important framework for implementation of the outputs from this project; and the newly announced United Nations Decade of Sustainable Energy for All 2014-2024 ensures the relevance of the project into the longer term. There is hence significant scope for continued support from GEF and its development partners.

It is significant that the UN resolution on the SEFA Decade “calls upon Member States to galvanize efforts to make universal access to sustainable modern energy services a priority, as such services contribute to poverty eradication, improve the quality of life, reduce inequality, save lives, improve health and help to provide for basic human needs, as well as curb environmental risks, including those associated with climate change, and stresses that these services are essential to social inclusion and gender equality”. This is consistent with the intention of the GEF project and confirms the project is thus central to the global sustainable development agenda in the coming decade.

In addition, the GEA secretariat has created a Dissemination Advisory Committee. This committee is seeking ways to provide effective outreach to developing countries to achieve development objectives consistent with SEFA and other global initiatives relevant to the GEF. In Africa, the outreach is targeted to the African Union, ECOWAS, SADC, and other regional inter-governmental organizations. Outreach through global networks (i.a. GNESD, GFSE, REN21) is also an effective development approach.

The current work at the World Bank (with the International Energy Agency) to create a baseline and score card for national SEFA activities is relevant to the web-based scenarios and transformative pathways developed under the GEF project. It can be useful to have an independently funded GEA secretariat to coordinate scenario development and implementation.

3.2.3 Relevance to UNIDO Programming

The project responds well to the UNIDO Programme and Budgets for 2012-2013.

Within its Environment and Energy Programme, UNIDO promotes resource efficient and cleaner production, renewable energy for industrial applications, water and waste management, and other related improvements. In addition to the environmental benefits, the UNIDO Programme increases industrial productivity, encourages the creation of new and higher value industries, allows greater access to global markets and ultimately reduces poverty by creating economic growth and employment in sectors that support environmental improvements and resource efficiency. The strategic objectives of the GEF are reinforced in the UNIDO Programme by decoupling the consumption of natural resources and the

release of greenhouse gas emissions from economic growth while also mitigating the negative effects of climate change and pollution.

The project is also relevant within the UNIDO Programme on Poverty Reduction through Productive Activities. The programme addresses economic growth challenges by supporting capacity building initiatives in agribusiness and rural entrepreneurship development, as well as women and youth in productive activities.

UNIDO internal approval committees assessed the project design document for its technical scope and its quality, during the design phase that took place between May of 2009 and February of 2010. UNIDO's Quality Assurance Group (QAG) assessed both the GEF PIF and the GEF CEO Endorsement document and made recommendations to improve the design, by narrowing the scope, aligning the project to the main GEA effort, as well as clarifying the roles of the different partners involved.

The overall message of the GEA report is that global energy systems need to be radically transformed. The report makes the case that energy, despite being a potential solution to many global challenges, may constitute a major hindrance and be detrimental to efforts made by many to address these global challenges.

The UNIDO Business Plan of 1997 established technical cooperation (TC) and global forum (GF) activities as the two main dimensions of the UNIDO mission. The interaction between these complementary functions is well laid out in the UNIDO Strategic Research Project on Combating Marginalization and Poverty through Industrial Development (COMPID) which has been under implementation since 2009. The GF is defined under the UNIDO Corporate Strategy by its dual function to generate and disseminate knowledge while initiating and conducting global debate to influence the development agenda.

The project fits soundly within this paradigm. Whereas, the development of tools and methodologies utilized for technical assistance projects is explicitly excluded from the GF per se, their development is appropriate where they contribute to the global development dialogue as in the knowledge platform developed through the GEA and promoted by the GEF project. It is this bridging aspect between GF and TC that is a central element for strategic research in UNIDO.

Since UNIDO in-house research capacities are limited, COMPID calls for strategic research to be carried out in partnership with renowned research organizations (such as IIASA). UNIDO would be involved in the design and dissemination phases whereas the actual research would be outsourced to the research partners. The COMPID also calls for the necessary financial resources to be raised jointly, as was the case in the project.

3.2.4 Relevance to GEF Strategies and Strategic Programs

The project responds to the GEF-4 Climate Change Focal Area Strategy, including strategic programs CC-SP1 through CC-SP5. The analysis provides insights on new and alternative energy supply and end-use technologies that will be relevant to the assessment of potential GEF projects. With respect to CC-SP1 (Promoting Energy Efficiency in Residential and Commercial Buildings) and CC-SP2 (Promoting Energy Efficiency in the Industrial Sector), the GEA examines the technology and other issues associated with providing energy services from final energy carriers in the following steps: 1) Assess the status of cost, thermodynamic efficiency, technical capabilities, and applications of currently available and next-generation energy efficiency/end-use technologies; 2) Provide forward-looking assessments of relevant technology innovations, potentials and buy-down possibilities; 3) Seek rigorous benefit-cost (life-cycle based) analysis of energy services and technologies (incorporating their impact on social conditions, especially poverty and the situation of women, the impact on the local, regional and global environment, broader economic benefits, subsidies); 4) Define potential economic benefits associated with energy end-use options, e.g., improved technologies, market development, increased manufacturing capacity, trade opportunities; 5) Assess potential opportunities, barriers and associated benefits of technological leapfrogging by developing countries; and 6) Evaluate lessons learned from pilot projects including those by multilateral donors such as GEF. The analytical insights provided by the project illuminate possible combinations of resources and technologies that will contribute toward global environmental benefits through decarbonization (lower GHG emissions per unit of economic output) of the global energy system. In addition, the project creates a policy environment that is enabling of climate mitigation measures.

With respect to CC-SP3 (Promoting Market Approaches for Renewable Energy), the GEA examines the role of public policy in achieving a renewable electricity system. The GEA explores issues of governance related to the specific ways in which governments can regulate markets across a continuum of policy instruments ranging from command-and-control regulations (technology-focused versus firm- or plant-focused), to financial incentives/disincentives and market oriented regulation, to voluntary mechanisms. In addition, the project conducts analysis aimed at illuminating the current and potential competitiveness of renewable electricity systems, including an assessment of the cost, efficiency, technical capabilities, and possible applications of technologies, both currently available and next-generation, as well as the potential for lower emissions of pollutants and GHGs.

With respect to CC-SP4 (Promoting Sustainable Energy Production from Biomass), the GEA considers energy crops from the standpoint of land-use requirements, competition of land for other uses (food, fiber), and global environmental benefits, including through lowered GHG emissions, on a life-cycle basis. The GEA synthesizes life-cycle based benefit-cost analysis of biomass resources, technologies and systems, incorporating their impact on social, environmental (local, regional and global) and economic factors such as investment and subsidies. Policies for biomass-intensive energy systems are also evaluated in the GEA.

With respect to CC-SP5 (Promoting Sustainable Innovative Systems for Urban Transport), the GEA considers urban transport options, differentiating between infrastructure-intensive versus "orgware"-intensive, for example, between light rail/metro versus rapid transit bus systems versus parking/congestion charges for car mobility. The GEA analyzes options with respect to their ease of implementation, acceptability, energy use, and capital requirements. This analysis is set within a comprehensive overview of urban energy use and of the specifics of urban energy demand and supply. Global and regional coverage of the chapter will be complemented by case studies of selected cities including a basic energy profile and summarizing positive experiences in sustainable urban design, energy demand, transportation management, and energy supply systems integration.

In general, these findings will contribute to the knowledge base for future GEF decision making. The project provides data that will help GEF establish decision criteria for future project selection. For example, by assessing the cost, efficiency, technical capabilities, and possible applications of technologies, both currently available and next - generation, the project clarifies which technologies are best suited to GEF interventions and elucidates what are some of the barriers to deployment of new energy technologies. In addition, the GEA highlights effective policies and programs with valuable lessons-learned that will be of interest to GEF. These and other insights comprise a useful take on what tools are currently available for sustainable development in energy.

3.3 Effectiveness

The GEF support was provided for three project components: i) policy tools for improving energy access; ii) technical analysis of options for improving energy access; and iii) interactions with policy makers in developing countries through workshops. Based on an assessment of the products developed by the project, it is evident that the GEF project objectives were achieved.

3.3.1 Energy Modeling and Transformative Pathways

The Global Energy Assessment explored several possible transformation pathways of the future global Energy System with the overarching aim of assessing the technological feasibility as well as the economic implications of meeting a range of sustainable objectives simultaneously. As such, it aims at the integration across objectives, and thus goes beyond earlier assessments of the future energy system that have mostly focused on either specific topics or single objectives. Through its modeling work undertaken through the last few years, the team assessed technical measures, policies, and related costs and benefits for meeting the following objectives:

- Providing universal access to affordable clean cooking fuel and electricity for the poor;
- Limiting the air pollution and health damages from energy;
- Improving energy security throughout the world; and
- Limiting climate change.

The main outcome was to show that it is technically possible to achieve improved energy access, air quality, and energy security simultaneously while avoiding dangerous climate change. In fact, a number of alternative combinations of resources, technologies, and policies are found capable of attaining these objectives. From a large ensemble of possible transformations, three distinct groups of pathways (GEA-supply, GEA-mix, and GEA-efficiency) were identified and analyzed. Within each group one pathway was selected as illustrative in order to represent alternative evolutions of the energy system toward sustainable development.

The modeling work showed that achieving all objectives simultaneously remains an extremely ambitious task. Although a successful transformation is found to be technically possible, it will require the rapid introduction of policies and fundamental political changes toward concerted and coordinated efforts to integrate global concerns, such as climate change, into local and national policy priorities (such as health, energy access, and energy and security).

The work shows that this transition can be achieved from different levels of energy demand as well as through alternative combinations of resources. An in-depth modeling sensitivity analysis showed, however, that efficiency

improvements throughout the energy system are the most important options to achieve the transformation towards a more sustainable energy future.

The modeling work of GEA shows that the transformation of the energy system would require dedicated efforts to increase global energy related investments to between US$1.7 trillion and US$2.2 trillion annually, compared with about US$1.3 trillion in annual investments today. Out of this total, about US$300 to US$550 billion efficiency related investments are required on the demand-side. Investments into energy correspond to a small fraction (about 2%) of global gross domestic product.

The modeling work and pathways developed illustrate the importance of holistic and integrated approaches, leading to substantial economic co-benefits in the case that all objectives are met simultaneously. Achieving societal near-term pollution reduction and health objectives is greatly furthered by climate change mitigation, and similarly, stringent climate policy can help further the energy security goals of individual countries. The simultaneous achievement of climate change mitigation, energy security, and air pollution control comes at a significantly reduced total energy cost when the multiple economic benefits are properly accounted.

The modeling work shows that the transformation toward sustainable objectives offers multiple benefits that cannot be assigned monetary values at a detailed level, but are nevertheless important to account for. The following are some important non-pecuniary benefits of the transformation.

- Universal access to electricity and clean cooking energy increases the productivity of the poorest and thus contributes to overall well-being and more equitable economic growth. In addition, such access results in significant health benefits of more than 24 billion DALYs saved in 2030.
- Pollution control policies consistent with WHO air quality guidelines result in health benefits on the order of 20 million DALYs saved in 2030.
- Limiting climate change to less than 2 degrees Celsius compared with pre-industrial times reduces the risks of a number of different types of climate impacts, summarized by five main reasons of concern, namely: the risk to unique or threatened systems; the risk of more frequent episodes of extreme weather events; an equitable distribution of impacts (given that some regions, countries, and populations may face greater harm from climate change); large aggregate damages; and the risk of large-scale discontinuities.
- Rapid decarbonization and thus stronger reliance on efficiency improvements and low-carbon energy (e.g. renewable) may create job opportunities, thus providing additional economic benefits.

In summary, the analysis done through the modeling work of the GEA, provided valuable insights of what is possible and what it takes to make these possible pathways a reality. The GEF supported work, therefore, was extremely influential in the overall GEA report and its findings. Under this GEF contract, a synthesis of

this work and its results is provided in a report entitled “The Next Energy Transition: Transformative Pathways, Choices and Opportunities”.

3.3.2 Policies for Energy Access

In addition to the modeling work described above, three chapters provided the basis for a review of the progress to date, past policies and programs, and the development of future scenarios related to modern energy access. Providing universal access to modern energy is one of the most urgent but also difficult challenges of our time. Developing solutions to this challenge is one of the aims of the work of GEA and its analysis.

Under the project, a synthesis of this work is provided in a report with the title “Access to Modern Energy Access: Assessment and Outlook for Developing and Emerging Regions”. The overarching objective of this report is to provide guidance on how to facilitate the achievement of universal access to clean-combusting cooking fuels and stoves, and rural electrification by 2030. This work is complemented by two inter-active web-based tools, which have been developed in support of this study.

Through the work undertaken under this rubric, the GEA offers some insights on achieving universal access by 2030 as follows:

- Improving energy access to modern cooking fuels has the potential to avert between 0.6 million and 1.8 million premature deaths, on average, every year until 2030, including between 0.4 and 0.6 million deaths per year of children below the age of five in sub-Saharan Africa, South Asia, and Pacific.
- From a technical and economic perspective, providing almost universal access to electricity and modern cooking fuels is achievable by 2030. This will require investments of US$36-41 billion annually until 2030, which is approximately 3 percent of total energy infrastructural investments. At the high end of this estimate, about half will need to be spent on electricity access and rest in improving access to modern cooking fuels.
- This goal may have a negligible or even negative impact on greenhouse gas (GHG) emissions. This is due to the potential to replace inefficient biomass use with modern cooking fuels and kerosene for lighting with electricity. Current technologies that use traditional biomass are associated with significant emissions of GHG and aerosols due to incomplete combustion.
- Supporting policies that provide a combination of subsidies and microfinance are likely to be most successful and cost-effective in achieving universal access. In addition, government-supported investments toward energy access will need to be considerably ramped up, and targeted to rural and remote areas and poor urban communities. Increasing private sector involvement will also be crucial to reach the level of scale-up in access efforts required over the next decades.

The report lists the many challenges to achieving universal access (e.g. mobilizing $40 billion in financing and putting in place the institutions to appropriately invest these finances), among which are: the fact that one in five people in the world still lives without access to any electricity and 40% still depends on solid fuels such as unprocessed biomass, coal, charcoal, for cooking and space heating, and the fact that in the absence of new policies by 2030 about 2.4 billion in Sub-Saharan Africa, South Asia and the Pacific will still be relying on solid fuels in their home, and over 800 million would still lack electricity.

The report also lists some of the success factors in energy access expansion, among which are the following:

- Strong supporting government role;
- Integration of energy access and other development policies;
- Responsive, accountable institutions with local involvement;
- Innovative, solution-specific financing mechanisms, and
- Institutional support and capacity building.

3.3.3 Policy tools for improving energy access

Two web-based analytical tools were developed: 1) the IIASA Energy Access Tool (Energy-ENACT); and 2) the IIASA Energy-Multi Criteria Analysis Tool (ENE-MCA) including the GEA Scenario Database. Energy-ENACT permits the assessment of alternative future policy scenarios including estimation of investment needs and impacts at global and regional levels. The primary utility of Energy-ENACT is to provide advice to policy makers while visualizing costs and benefits that each policy or combination of policies offers. By allowing a large number of alternate energy access futures to be compared within a common framework, analysts and decision makers are able to gain a quick understanding of how alternate policies can shape the future of energy access in dramatically different ways in terms of funding requirements, effectiveness, demand implications, greenhouse gas emissions, air pollution and health impacts.

Energy-ENACT is a user friendly tool that gives users from diverse backgrounds and with varied interests a web-based platform to assess the effects of a subset of energy access policies by selecting different choices via an easy to use interface. This multiple policy approach to energy access policy is important because the impacts on energy access objectives cannot be easily compared without detailed information on the effect they have on different groups of populations.

The GEA scenario database aims at documenting results and assumptions of the GEA transformation pathways. The database serves as a central data-repository for the dissemination of GEA scenario information. The pathways in this database underpin the majority of the work in GEA Chapter 17 and users should refer to that text for a discussion of the results.

A User Manual for Energy-ENACT provides guidance for navigating the web-based scenario analysis tool in an interactive manner. This output of the GEF supported project will be helpful to decision makers and policy specialists for visualizing costs and benefits of specific policy choices and their impacts.

In addition, IIASA also developed the Energy-Multi Criteria Analysis Policy Tool (ENE-MCA). This tool is designed to assist national policy makers in their strategic policy planning processes. The tool extends work undertaken by the GEA and, as such, is built on the extensive set of global energy and environmental scenarios that have been generated as part of the GEA report.

As GEA concludes, the energy challenges facing society are as varied as they are great, and in charting a path toward a truly sustainable energy future, a number of different objectives will need to be fulfilled. These include:

- Avoiding dangerous climate change;
- Achieving near-universal access to modern energy;
- Improving energy security;
- Reducing air and water pollution and the consequent impacts on human health and ecosystems;
- Minimizing ancillary risks;
- Maintaining the affordability and reliability of energy supplies for healthy socio-economic growth.

Simultaneously achieving each of these important targets is a major challenge for all societies, current and future. However, it is already quite evident that not all stakeholders (governments, private industry, and individual consumers) prioritize the multiple objectives in exactly the same way or to the same degree of importance. In fact, more often than not, the objectives seem to be competing for attention.

The primary aims of the ENE-MCA Tool are to add some analytical rigor and objectivity to the often subjective discussion surrounding the concept of energy sustainability and to do this in such a way that the specific needs and priorities of the decision maker are considered. Due to the enormous synergies and to a lesser extent, trade-offs between the various sustainability objectives, the tool takes a broad, systems approach. By allowing a large number of alternate energy-environment-economic futures to be compared within a common framework, analysts and decision makers are able to gain a quick understanding of how alternate worldviews can shape the future of the global energy system in dramatically different ways, in terms of technology deployment, funding requirements, greenhouse gas emissions and climate change, air pollution and health impacts, and energy security.

3.3.4 Dissemination Workshops

Three workshops were held to present the tools developed under the project. Due to budget and time constraints, it was determined to limit the number of workshops and that they are geographically diverse. The target audiences included policy makers ranging from LDCs to emerging economies thus envisioning contrasting energy policies and social realities. The workshop locations also considered areas where UNIDO has development activities.

The first workshop took place in Praia, Cape Verde, in April 2012 and assembled a group of 60 government officials, policy makers and experts from the ECOWAS Region. This workshop was combined with the Regional ECREEE Workshop on Training for National Renewable Energy Policy and Incentive Schemes. The web-based energy access tools (Energy-ENACT and ENE-MCA) were presented and discussed with the participants. The tools consider multiple energy sustainability objectives (security of energy supply, climate change mitigation, and air pollution reduction) as well as policy scenarios that achieve universal access to modern energy by 2030. The transformative pathways scenario document developed under the project was also presented. The use of the tools was also illustrated in carrying out assessments of policy choices for access to modern energy services by 2030 which is a goal of the SE4All initiative.

The second workshop was held in New Delhi, India, in May 2012 and included approximately 40 national and international participants.

The third workshop was held in Yerevan, Armenia, in June 2012 and included approximately 60 national and international participants.

A survey of the workshop participants was conducted to evaluate the relevance of deliverables produced by the project. The following Table indicates the responder ratings for each of the survey questions. The survey was completed by 25 persons: 11 from the Cape Verde workshop, 13 from Armenia, and one from New Delhi. The results are presented in the aggregate. There were small differences by region but not significant enough to make noticeable differences in the resulting messages.

The first set of questions was meant to assess increased capacity of the participants as a result of the workshops. The respondents indicated significant agreement that they improved their capability to understand energy issues and make more informed decisions. Their capacity to formulate policy and assess investment decisions was also improved. Though a less marked improvement, the respondents also indicated increased knowledge of energy technology applications.

With respect to the specific interactive tools developed under the project, the workshop participants found them to be relevant or very relevant for assessing energy access investments. The tools were less relevant for assessing health

impacts of energy sources. However, they found the tools to be especially relevant for determining GHG emission impacts and for assessing the social and economic benefits of improved energy access.

A senior policy maker noted that this type of workshop generally serves the purpose of information dissemination and stimulating thought processes; and that the workshops were successful for that purpose. It was also noted that smaller technical oriented workshops would be more effective for specific training. Participants also noted that the workshops targeted energy policy makers but not the end users. It was suggested that a series of training activities aimed at end users would be an effective means of disseminating the information and achieving desirable energy saving impacts. It was also suggested that practical training at energy using facilities would be an effective means of demonstrating the theory. Finally, participants pointed to the value of case studies for illustrating the impact of the policy tools.

3.3.5 Survey of Workshop Participants

1) Please rate the following statements based on your experience.

Table 4a: Survey of Workshop Participants

	Not able to assess	Disagree	Agree	Fully Agree	Agree or Fully Agree
The training improved your understanding of the energy issues		2	16	7	92 %
You feel more able now to make informed energy decisions		2	20	3	92 %
Your capacity to assess and defend investment decisions improved	1	3	16	5	84 %
Your ability to formulate energy policies has increased	2	2	18	3	83 %
Your ability to formulate environmental policies has increased	2	2	16	5	83 %
Your knowledge of energy technology applications has increased	3	2	14	6	80 %

2) During the workshop two interactive PC-based tools were presented. Please rate your assessment of the usefulness of these tools in the following applications.

Table 4b: Survey of Workshop Participants

	Not able to assess	Less relevant	Relevant	Very relevant	Relevant or Very Relevant
Investments needed to increase access to modern energy	1	3	16	3	83 %
Affordability of cleaner modern energy sources and stoves	2	1	19	1	87 %
Health impacts of different energy sources	2	5	14	2	70 %
Greenhouse gas emission impacts	1		15	7	96 %
Social and economic benefits of improved energy access		1	15	7	96 %

3.3.6 Access to Modern Energy

The document on access to modern energy makes clear the importance of innovative financing and external financial support for the success of energy access programs. These are the strengths of the GEF. Further the potential for achieving both energy access expansion and GEF environmental objectives is significant. The synergy is particularly strong with modern cooking and heating services in poor countries. Liquid and gaseous fuel supply for solar cookers and water heaters can reduce deforestation by displacing biomass based stoves. The carbon impact of using LPG in place of biomass is negligible. And new bio-ethanol technologies have an even more favorable carbon balance.

With regards to electrification, there is potential with GEF support to mitigate adverse environmental impacts. Providing electricity to meet growing demands for livelihoods and raising living standards would entail increases in greenhouse gas emissions since all developing economies rely on fossil fuel based generation. The extent of this increase is uncertain due in large part to the uncertainty in how much energy demand both income growth and the provision of access would generate. Furthermore in regions with electricity access but insufficient supply the extent of latent demand is also not well known. However, GEF support could mitigate this carbon impact, for instance, with support for renewable-based generation, distributed micro credits in place of great extensions to remote areas, or more efficient power distribution systems.

The environmental impacts of scaling-up the provision of mechanical power in rural areas also depends on the technologies and strategies deployed. Electricity-based mechanical power would have the impact of related electrification policies. Small-scale and micro-enterprises within developing countries depend on electricity and thermal sources. The provision of efficient energy conversion technologies such as efficient motors and boilers could mitigate the carbon impacts of providing electricity-based mechanical power. Several alternative forms of mechanical power which do not depend on electricity access (e.g. treadle pumps) could be suitable for the remote and poor populations who cannot afford electricity.

A universal challenge when addressing programmes and policies for energy access is the need for institutional capacity to support the deployment of new technologies in remote rural regions and to provide innovative financing mechanisms to make these technologies affordable at a commercial scale.

Since many of the neediest developing countries do not have national plans in place or have not set goals for universal access, GEF support could incentivize policy-makers to develop such plans and goals. GEF support could also enable the creation of new institutions at the local and regional levels that could support technology deployment. Institutions for measuring and monitoring progress in achieving energy access goals as well as the environmental sustainability of various access initiatives may also have to be put in place. Implicit in the GEF-5 Strategy is the priority placed on mainstreaming GEF activities into national policies, and supporting national programmes such as off-grid renewable-based electricity generation.

Renewable sources of energy stand at the center of global efforts to induce a paradigm shift towards green economies, poverty eradication and ultimately sustainable development. Record investments are being made in some countries to propel innovation, development and commercialization of renewable energy technologies. Nonetheless, much more cooperation and action is needed to substantially increase the contribution of these technologies to the global energy system. Additional coordinated global energy strategies need to be adopted, in conjunction with consistent and stable national policies, to bring down the cost of renewable energy technologies, including off-grid systems, for use by the poorest segments of the population living in rural areas.

With GEF support, coordinated global energy strategies could be designed to benefit developing countries and in particular the population still using traditional biomass and without access to electricity. The strategy needs to be defined taking into consideration three major factors: (1) about 85 per cent of the people without access to modern energy services live in rural areas; (2) most rural areas are isolated and require decentralized systems; and (3) almost all rural off-grid renewable energy technologies are still too expensive.

The strategies could include four major objectives: (1) to develop systems and products specifically designed to address the needs of the poorest segment of

the population; (2) to reduce the cost of rural off-grid technologies to levels that could compete with conventional energy options; (3) to implement innovative financial mechanisms that will facilitate acquiring the systems by the target population; and (4) to support capacity building and technical cooperation programmes that would allow creation of stable markets for new and renewable energy in developing regions particularly in rural areas.

Furthermore financial instruments such as micro-finance initiatives and other innovative mechanisms will be necessary at the national level so that these technologies remain below a threshold and can be afforded by the people with the lowest incomes. These mechanisms supported by an international global strategy will allow the development of stable and coherent markets of these technologies for the long-run.

3.4 Efficiency

The primary purpose of the GEF resource allocation was to disseminate the results of the GEA. This was accomplished through the production of the web-based tools, the four co-authored documents, and the conduct of the dissemination workshops. These products developed with GEF resources would not have been produced within the GEA project and they add significant value to the GEA outreach process.

It is noteworthy that the GEF support added value to the GEA dissemination process by providing an integrated view of all issues touching upon energy and in developing win-win solutions that jointly deliver economic development and poverty alleviation together with global environmental benefits deriving from the deployment of advanced energy technologies.

The GEF support for the development of policy options and analytical tools was an effective use of GEF resources. This body of work effectively made the entire GEA accessible to the global community. It is noteworthy that the GEF contribution of USD 1.0m enabled GEF to be a significant partner in the entire GEA initiative that cost more than USD 8.2m.

Project funds were spent in the following way, as reported in the GEF PIR final report:

GEF Funds: UNIDO issued a contract to IIASA on the full amount of the GEF contribution of USD 1,000,000 to undertake tasks to achieve the outputs under the 3 planned components under the GEF project.

The main expenditure is in-line with the allocation of funds foreseen in the GEF CEO Endorsement Form for the project.

Co financing from UNIDO: was disbursed in the following manner[2]:

- Provided contracts to IIASA for USD 400,000 to support the development of the main scientific GEA process.
- Organized three contracts to partner organizations for the logistics and the recruitment of national experts for the workshops: USD 45,000.
- Contracted an external evaluation expert: USD 20,000.
- Travel costs, sundries, etc: USD 35,000.

The rest of the co-financing contributions described in the table presented in section 2 were managed by IIASA for the main GEA project.

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The delays in the production of the GEA did cause delays in the GEF Project, which also resulted in the reformulation of the GEF project work plan. Nonetheless, the GEF project objective was met with the no-cost extensions. The UNIDO response to the delays was timely and satisfactory.

3.4.1 Fund allocation efficiency

As described in the CEO EF, the cost effectiveness of this project could not be assessed in a quantitative fashion. The GEA objective was to address multiple global challenges simultaneously, a goal that could not be reached by multiple independent studies. In that sense, it can be regarded as cost effective by providing the benefits of undertaking several research initiatives with a single data set and coordination.

3.5 Assessment of Sustainability of Project Outcomes

The web-based tools developed with the GEF support (Energy-ENACT and ENE-MCA) have been presented at national and regional workshops with positive response from participants as indicated in the survey results.

The GEF CEO Endorsement Form highlighted possible financial and social risks. The financial risk identified insufficient funding for the GEA as a concern. Nonetheless, sufficient funding was obtained to complete the GEA so that it provided a suitable platform for the successful implementation of the GEF project.

[2] Data reported in GEF PIR 2012

Regarding social risks, there are indications that the GEA is being widely used. One measure is the number of downloads of GEA outputs and the purchase of the GEA report. In particular, the joint IIASA, UNIDO, GEF publication entitled Access to Modern Energy is a central document in the implementation of the Sustainable Energy for All initiative. The recently adopted General Assembly Resolution on the Decade of Sustainable Energy for All 2014-2024 will utilize the project outputs and thus ensure the longevity of the products of this GEF project.

The launch of the GEA at Rio+20 ensured a high profile dissemination of the document. The event was attended by high level representatives of many countries including Government Ministers and at least one Deputy Prime Minister.

The Global Energy Assessment is the first comprehensive energy assessment which covers the multiple challenges facing global energy systems. The focus of the Assessment on synergies and multiple benefits shows that a global energy transformation which meets multiple energy objectives is achievable. The transparency and accessibility of data (through the GEA database and multi-criteria tool) are invaluable to supporting and facilitating a global energy transformation.

The GEF project supported activities aimed at applying the knowledge from GEA to the regional and national levels where implementation will happen. In the near-term (months–1 year) the GEA findings are being disseminated and the report is being made available to as wide of an audience as possible; then medium-term (1–4 years) spin-offs will make the information accessible and transparent for national and regional policy-makers while also providing opportunities for developing tools to support national policy-makers in designing energy road-maps and for tracking national and global progress towards the SE4All goals.

These dissemination activities are being undertaken by IIASA and other contributors to the GEA. The GEA Dissemination Advisory Committee also provides outreach and ensures sustainability of the outcomes emanating from the GEA. While GEF project funds are not directly related to the dissemination activities, the outreach is the result of co-funding.

3.5.1 Near-term dissemination (present–1 year)

The near-term priority is to disseminate *GEA* widely. The assessment is relevant to public and private stakeholders including: national and international policy-makers; international aid programmes and the development community; investors and managers in the private sector (particularly in the energy industry); NGOs; advocates for the environment and the bottom billion; and energy researchers and university students in general. Reaching these different audiences involves a multi-pronged approach:

- Make the volume widely available (which is already underway):

    - The publisher has printed 6,000 copies. Authors, IIASA and other organizations are encouraged advertise widely to their networks.
    - The Summary Document is available on PDF and can be downloaded for free. It is anticipated that the entire GEA report will soon be available for free download and it has been recommended to also make a low-resolution copy available for download so that developing countries can access it easily.
    - IIASA is preparing to make the GEA report widely available on USB drives with included tailor-made slide packages for specific audiences.

- Organize GEA events with authors to present the GEA findings to policy-makers and private sector representatives. A number of regional and national "launches" are already scheduled and/or in preparation including:

    - A Dutch GEA launch in September 2012
    - A West Africa launch in November 2012
    - A press event at the Chatham House in London in Nov-Dec 2012
    - Policy briefing for EU policy-makers in Nov-Dec 2012
    - A Norwegian GEA forum for the Energy Minister in December 2012
    - U.S. West coast launch in February 2013
    - Boston launch with AAAS in February 2013

- Conduct briefings of public and private decision makers and the media at different levels: from local to international.
- Publicize the scientific advances in GEA and its findings in policy papers and scientific articles. (This work is already underway with, for example the publication of the multi-criteria energy analysis in *Nature Climate Change*; the presentation of a policy brief at *Planet under Pressure*; the German WBGU report; the UN AGECC report; and the SE4All Task Force 2 report.)

3.5.2 Medium-term spin-offs (1–4 years)

It is envisioned that, in the medium-term, *GEA* results will be translated into nationally, regionally or thematic-relevant white-papers, action plans and policy briefs. These would contribute to: (1) the global and regional results become nationally-relevant and (2) highlight local case-studies and human interest stories which will focus attention on success stories. This work would be organized around regions and countries (e.g. a Chinese energy assessment) and themes (e.g. eliminating extreme poverty through energy access). At the same time, the regional/national work will build regional networks of experts of the GEA writing

team, the broader GEA community, and key decision-makers. This will build upon the successful regional workshops that were held in Cape Verde, New Delhi, and Armenia under this GEF supported project. These networks would be leveraged to share expertise and stories and to write policy briefs.

Writing shorter and more accessible versions of key chapters of the GEA is also a priority area where GEF and its development partners can make use of the wealth of knowledge already assembled in the GEA. This has been done already for chapter 17 on the GEA transformation pathways; and the energy access issue dealt with in chapters 2, 20 and 23. Chapter 4 on health is in the works and being published in a specialized journal of WHO on energy and health. In addition, the case studies generated by Chapter 24 on technologies are being published by Cambridge University Press as a separate book. Other shorter versions of key chapters are also being planned. The GEA Dissemination Advisory Committee is an important collaborating entity in this regard.

The policy tools developed in GEA (including the GEA database, energy access tool, and the multiple criteria analysis tool) facilitate a first step towards identifying the necessary measures, their costs and benefits on a regional and global level. Next steps will involve translating the work to the local/national level for the development of national implementation roadmaps taking into account salient differences at the national and sub-national level. A comprehensive national assessment based on GEA methodologies would also improve comparability of presently planned and legislated efforts with what would be needed to achieve the overall sustainability objectives, and thus allow for medium to long-term planning of energy-related projects that are comparable across countries and take into account local barriers and opportunities.

Within this vein of work there is a potential to integrate the immense global and regional expertise which was developed in GEA with local and national knowledge on physical resources, capacities, and priorities. Given the high interest expressed by many for more tools, a concept paper is currently being prepared as a contribution to SE4All for work which will complement the World Bank global tracking project on the three goals of the initiative. This tool will be used by policy makers at the national level to zoom in on performance indicators in their own countries and assess where progress is being made. The tool can be used to fine-tune the interventions for a more effective impact. In sum, it is a tool that will help track progress towards the SE4All goals and facilitate the development of a framework which incorporates the feedbacks between national actions and global trends.

This work is being developed during the coming year and will be useful in the duration of the SE4ALL initiative to 2030. This tool will not only have practical off the shelf application but also contribute to enriching the data and information of countries around the developing world. The project will have enormous potential for capacity building.

3.6 Project coordination and management

There were two key challenges which arose during the project implementation. These were: a) delays in the production of the GEA report; and b) the resignation of a senior manager of the GEA team. This section describes the circumstances and how they were managed.

3.6.1 Delays in GEA Production

In January 2011, the GEF convened a meeting in Washington DC to review the progress made under the GEA project. This meeting was chaired by the GEF CC Team Leader and attended by the UNIDO and IIASA GEA teams. Both project teams made detailed presentations on the present status of activities, strategic approaches and deliverables under the GEF project, which was followed by a thorough discussion. A number of useful comments and suggestions were made by the GEF CC team and later incorporated in the project document. Finally, a tentative roadmap for completion of the project activities was discussed and agreed.

In April 2011, IIASA sent UNIDO a request seeking project extension to December 2011, since the delays in the overall GEA report finalization were having repercussions in the implementation of the key activities under the GEF funded project. From May to June of 2011 a full revision of the project planning was conducted and a revised work plan was established.

3.6.2 Resignation of GEA Executive Committee Co-chair

Thomas Johansson resigned as a GEA co-Chair in September 2011. Following an extraordinary meeting followed by consultative meetings of the GEA Council, the concerns raised by Thomas Johansson were addressed, in particular those related to ensuring integrity and credibility of the GEA. Mr Johansson resumed his position as GEA Co-Chair in November 2011. The GEA Council maintained a strict progress control over the GEA process throughout this period. While the resignation had a minor impact on the timing of the release of the GEA report, it did not have a negative impact on the achievement of results. In fact, persons interviewed during the evaluation suggested that the report quality had improved as a result of the even closer scrutiny of the content.

The GEF CEO requested UNIDO to stop disbursement and report on the concerns raised, to provide a delivery plan, to conduct an evaluation and audit of the project. UNIDO provided evidence and responded to the entire request. The GEF Secretariat allowed the resumption of Disbursements in December 2011.

3.6.3 Implementation of Monitoring and Evaluation

Following the revision of the project scope, a task-based work plan was defined with concrete outputs and a timeline. The UNIDO Project Manager (PM) tracked progress towards the achievement of the milestones set in the work plan, and notified the GEF of any deviations. The PM monitored the progress of the main GEA process, trying to anticipate the repercussions that a delay in that process could affect the GEF project work plan, while keeping track of the main project goals. The PM ensured that transparent communications between stakeholders were made periodically. While both key challenges caused time delays, neither caused additional cost to the project.

Table 5: Project performance rating

Project performance ratings		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
Attainment of Project Objectives and Results		S
Relevance and design	Responds to GEF Strategic Objectives. Relevant to UNIDO Programme and core competencies. Founded on GEA body of work (incl. 500 authors and reviewers globally). Consistent with internationally agreed mandates (i.a. SEFA, Rio+20, UNFCCC)	HS
Effectiveness	All planned tasks were completed. Scenario tools were produced; introduced to policy-makers in workshops. Four GEA chapters were written. Targeted manuscripts on modern energy access and transformative pathways were published.	S
Efficiency	The project effectively leveraged the GEA to produce GEF relevant outputs at least cost. Project delays were well managed by UNIDO. The granting of no-cost extensions did not affect cost effectiveness.	HS
Sustainability of Project Outcomes		
Financial	Global energy investments will continue to increase; the project provides policy guidance to ensure the judicious use of clean modern energy choices.	HS
Socio Political	Full cost accounting of resource use in the models will enable sound decision making for sustained benefits.	HS
Institutional framework and governance		
Environmental		
Monitoring and Evaluation		
M&E design	Monitoring of IIASA delivery was achieved in line with UNIDO standard monitoring	HS

Project performance ratings		
	procedures for institutional contracts.	
M&E implementation plan	Monitoring of IIASA delivery was achieved in line with UNIDO standard monitoring procedures for institutional contracts.	HS
M&E budgeting & funding	Sufficient funding from GEF and UNIDO resources.	HS
UNIDO Specific Ratings		
Quality at entry		
Implementation approach		
UNIDO supervision and backstopping	UNIDO provided all the human and financial resources required to assure no shortcomings in the achievement of the project objectives.	HS
Overall Rating		S

4.

Conclusions, recommendations & lessons learned

4.1 Conclusions

All those involved in this project should be pleased with the results. They include the authors of the reports and the management at IIASA, the UNIDO management team, and the GEF CC team. The project objectives were achieved with high quality deliverables.

The intention to develop policy options to inform decision makers and support their actions to adopt low-carbon energy technologies while reducing energy poverty was met. The analytical tools developed to guide these decisions were well received in stakeholder workshops.

The documents on modern energy access and transformative pathways are particularly relevant in the global arena where social inequality and energy poverty are regularly addressed. These topics have become the daily subsistence of the mainstream media, and so this project is particularly timely. The use of short documents like these two cited examples will be a good way to get the high quality, peer reviewed material developed within the GEA process out into the public domain where it can have significant development impact.

The outputs of this project will be useful to GEF and UNIDO program managers in the design of future initiatives.

The GEA provided UNIDO with an opportunity to collaborate on in-depth research into a range of different aspect concerning industrial energy use. This will be beneficial to UNIDO's technical and scientific capacity and its development assistance programming.

Unavoidable time delays were imposed on the project, not caused by it. These were well managed by the project team without compromising quality of the outputs and at no cost to the GEF.

4.2 Recommendations

The GEA report is a significant treatment of the global energy sector. It was subject to a rigorous and independent analysis and review. The heavy lifting has been done, and the material is available for wide-scale dissemination. However, the sheer volume of technical information requires that this information is

processed in a way that is more accessible to non-technical policymakers. Furthermore, the production of Policy Briefs and Thematic White Papers are two means of getting the benefits to policy makers for the creation of programmes for the end users. There is ample opportunity to do this work in partnership with developing country institutions with support of UNIDO and GEF.

The GEA report includes a policymaker and a technical summary, but there is scope to draw out many complementary studies and publications. The modern energy access document and the transformative pathways document are two examples of what can be achieved.

Following, are some specific recommended task and activities that can be supported by UNIDO, the GEF and other development partners:

1) Continue building capacities. There is significant need to develop capacity building initiatives to make the material accessible to a wider audience by training practitioners in the design and delivery of energy initiatives. Dissemination of the results has begun with the three policymaker workshop undertaken in 2012, but further work is required. This is within the scope of UNIDO activities and can be undertaken by UNIDO and its development partners.

2) Facilitate the use of web based tools. The workshop participants expressed a need for back-stopping support in the use of the web-based energy access tools. Setting up a chat room at IIASA would be an effective means to accomplish this task.

3) Formulate technical cooperation projects. UNIDO played a seriously significant role in the design and execution of this initiative. It is important to catalyze on this experience and develop programmes to serve the Member States in energy use for industrial development, access, and low-carbon solutions for eradicating energy poverty. UNIDO is well placed to develop partnerships with UN-Energy, the GEF, World Bank, bilateral donors and the private sector to further address the sustainable energy agenda.

5) Promote further dialogue and dissemination of GEA results

a) One key avenue for delivery of the GEA is through the planned SEFA Country studies. Both national and regional dialogues are a good way to get the results into the public domain. In addition, UNIDO should liaise with SEFA to ensure inclusion of GEA results in SEFA country studies. The newly agreed Decade on Sustainable Energy for All 2014-2024 also provides a longer-term framework.

b) The strengthening and eventual creation of new Regional Networks of Excellence is an effective way to build on the momentum. Many regional and global networks already exist in this domain (e.g. GNESD, GFSE, REN21). There will be scope to develop new networks as a consequence of the

heightened awareness of the links between energy, poverty and climate change.

c) The global network of energy centers also provides an important avenue to further develop accessible solutions for expanding the use of clean modern energy solutions. The IIASA collaboration with the German Advisory Council on Climate Change (WBGU) is a good example, among many. UNIDO can support institutional strengthening activities in developing countries to engage more successfully in partnerships that create sustainable energy solutions.

4.3 Lessons Learned

The key lessons identified in the project, which are useful for the design of similar future initiatives, are:

- Technical: Addressing multiple issues simultaneously provides as a way of identifying the linkages between the issues, and it generates economies of scale in funding the research of multiple topics, as described in section 3.c.
- Stakeholder Engagement: While liaising with multiple stakeholders is a complex process which strengthens the quality of the scientific products, differences in opinions should not compromise the quality of the outputs as described in section 3.f. Also, communicating openly to all parties facilitates stakeholder management. While the situation that arose in this project execution (of a key technical stakeholder pulling out) is uncommon, it demonstrates that engagement is a key factor for project success.
- Project Management: Aligning the work plan to the changing realities in a project requires consensus building and flexibility.

Annex 1: Terms of Reference

Independent Terminal Evaluation of the UNIDO Project: Global Energy Assessment: Developing Policy Tools for Jointly Reducing Energy Poverty and Greenhouse Gas Emissions

(Project Number: XP/GLO/09/002)
June 2012

I. Project Background and overview

The Global Energy Assessment (GEA) is a multi-year and multi-stakeholder activity that aims to help decision makers address the challenges of providing energy services for sustainable development throughout the world. The GEA has brought together approximately 200 analysts world-wide to contribute independent, scientifically based, integrated, policy-relevant analysis of current and emerging energy issues and options.)

This project uses the GEA as a knowledge platform and develops specific analytical tools aimed at informing decision-makers on the scaling-up of low carbon energy technologies, achievement of reductions in greenhouse gas emissions, and the reduction of energy poverty. The outcome of the project is to create a better understanding among decision makers of key technologies, technology transfer issues, policy instrument choice and major sustainable development issues

a) The Global Energy Assessment

In January 2007, International Institute for Applied Systems Analysis (IIASA) and a host of international partners launched the Global Energy Assessment (GEA), a major initiative seeking to redefine the global energy policy agenda. This multi-year and multi-stakeholder activity aims to help decision makers address the challenges of providing energy services for sustainable development throughout the world.

The GEA aims to go beyond existing authoritative studies on energy issues by presenting a comprehensive and integrated analysis of energy challenges, opportunities and strategies, for developing, industrialized and emerging economies. Moreover, the GEA has been produced by independent scientific and technical experts—subject to rigorous reviews and independent of partisan interference.

The GEA challenges conventional thinking on energy policy by identifying integrated solutions for confronting existing and emerging energy issues, such as:

- The need to sustain affordable, available energy services as a precursor to healthy economic growth;
- The requirement for continued, secure supplies of energy;
- The challenge of achieving equity and ensuring that we meet the needs of the two billion or so people who currently lack access to affordable modern forms of energy;
- The need to address climate change mitigation in a timely fashion;
- To adequately resolve the many other environmental challenges posed by energy production, transport, processing and use, including

indoor and urban air pollution, the “Asian Brown Cloud” phenomenon and acidification; and

- The need to contain ancillary risks posed by operating energy systems, such as ensuring security and peace through addressing nuclear proliferation, nuclear waste security, and reducing the potential for acts of terrorism.

The GEA shall provide a strong technical and scientific basis for decision-making by evaluating the range of social, economic, development, technological, environmental, security and other issues linked to energy.

The impact of the GEA will be maximized by targeting the needs of a range of stakeholders and by providing: policy-relevant analysis and capacity-enhancing guidance to national governments and intergovernmental organizations; decision-support material to the business and investment sector; and analysis relevant to academic institutions.

The governance of the Assessment is led by the GEA Council. The Council is increasing engagement with stakeholders and defining the policy context and scientific challenges.

The GEA will be released in the first quarter of 2012.

b) The Developing Policy Tools for Jointly Reducing Energy Poverty and Greenhouse Gas Emissions (GEF project ID 3928)

In August 2009, a project to disseminate the tools generated by the GEA process was presented by UNIDO as implementing agency and IIASA as executing agency to the GEF (Global Energy Assessment: Developing Policy Tools for Jointly Reducing Energy Poverty and Greenhouse Gas Emissions) for funding. The GEF CEO approved the project which envisioned development of specific tools, reports and technical analysis along with an implementation period from October 2009 to April 2011.

The project has Global scope and the GEF Secretariat has a coordinating role. The project is a categorized as a Medium-Scale project by the GEF (funding is less than 1 million U$S), so particular mentoring, repotting and evaluation requirements may apply.

In January 2011, the GEF convened a meeting in Washington DC to review the progress made under the GEA project. This meeting was chaired by the GEF CC team Leader and attended by the UNIDO and IIASA GEA teams. Both project teams made detailed presentations on the present status of activities, strategic approaches and deliverables under the GEF project, which was followed by a thorough discussion. A number of useful comments and suggestions were made

by the GEF CC team at later incorporated in the document. Finally, a tentative roadmap for completion of the project activities was discussed and agreed.

In April 2011, IIASA sent UNIDO a request seeking project extension to December of 2011, since the delays in the overall GEF report finalization have had repercussions in the implementation of the key activities under the GEF funded project.

Consultation meeting were held in May and June of 2011 to discuss and reshape the project scope due to the delays, define in detail the content of deliverables and agree on a workplan.

A request for extension was granted by the GEF in July 2011 to extend the project until December 2011.

Additional delays war encountered as a consequence of the resignation of a Co-chair of the GEA. This resulted in a delay I the final release of the Assessment to 2012.

UNIDO and IIASA have followed the work plan and planned to complete all activities by June 2012.

c) Project objectives

The objective of the project is the development of policy options and analytical tools aimed at informed decision-making to support the scaling-up of low carbon energy technologies, achievement of reductions in greenhouse gas emissions, and the reduction of energy poverty.

The project specifically uses the scenarios and analysis obtained from the GEA to provide policymakers with

1) Analytical reports on energy pathways for sustainable development, energy access for development and policies for energy access

2) Interactive PC-based tools, with the following characteristics;

- Scenario analysis tool: designed to allow policy makers to rank their priorities for different policy objectives and see in real time the future implications for the global energy system, in terms of technology deployment, funding requirements, GHG emissions, air pollution and health impacts, and energy security.
- Energy access policy tool: model different energy access policies (subsidies and microfinance/grants) and their costs and benefits.

II. Objectives and scope of the evaluation

The purpose of the mid-term evaluation is to enable the GEF, UNIDO and other stakeholders and donors to:

(a) Verify prospects for development impact and sustainability, providing an analysis of the attainment of global environmental objectives, project objectives, delivery and completion of project outputs/activities, and outcomes/impacts based on indicators. The assessment includes re-examination of the relevance of the objectives and other elements of project design according to the project evaluation parameters defined in section IV of these ToRs.

(b) Enhance project relevance, effectiveness, efficiency and sustainability by proposing a set of recommendations with a view to ongoing and future activities.

(c) Draw lessons of wider applicability for the dissemination of the findings experience gained in this project in other projects/countries.

The key question of the evaluation is whether the project has successfully created decision making tools to assist energy policymakers in assessing their needs[3].

III. Methodology

The evaluation will follow UNIDO and GEF evaluation guidelines and policies. It will be carried out as an independent in-depth evaluation using a participatory approach whereby the UNIDO staff associated with the projects is kept informed and regularly consulted throughout the evaluation. The evaluation team leader will liaise with the UNIDO Evaluation Group (EVA) on any logistic and/or methodological issues to properly conduct the review.

The methodology will be based on the following:

1. A desk review of project documents including, but not limited to:
   (a) The original project document, monitoring reports (such as progress and financial reports to UNIDO and GEF Annual Project Implementation Review report), output reports (case studies, action plans, sub-regional strategies, etc.) and relevant correspondence.
   (b) Notes from the relevant UNIDO Approval committees.
   (c) Project deliverables (reports, policy tools and their manuals, dissemination materials).

[3] In the GEF 5 cycle recipient countries can undertake on a voluntary basis a GEF National Portfolio Formulation Exercises. These will serve as a priority setting tool for countries and as a guide for GEF Agencies as they assist recipient countries. The tools could assist GEF recipient countries in identifying their national priorities in the field of Energy.

2. The evaluation team will use available models of (or reconstruct if necessary) theory of change for the different types of intervention (enabling, capacity, investment, demonstration). The validity of the theory of change will be examined through specific questions in interviews and possibly through a survey of stakeholders.

3. Counterfactual information: In those cases where baseline information for relevant indicators is not available the evaluation team will aim at establishing a proxy-baseline through recall and secondary information.

4. Interviews with project management and technical support including and staff associated with the project's financial administration and procurement if necessary.

5. Interviews with project partners, in particular the project executing agency, the International Institute for Applied Systems Analysis (IIASA).

6. Telephone interviews with intended users for the project outputs, such as the GEF Secretariat Climate Change team, and other stakeholders involved with this project. The evaluator shall determine whether to seek additional information and opinions from representatives of any donor agencies or other organizations.

7. Other interviews, surveys or document reviews as deemed necessary by the evaluator and/or UNIDO EVA.

IV. Project Evaluation Parameters

The ***ratings for the parameters described in the following sub-sections A to E will be presented in the form of a table*** with each of the categories rated separately and with **brief justifications for the rating** based on the findings of the main analysis. An overall rating for the project should also be given. The rating system to be applied is specified in Annex 5.

A. Project relevance and design

Relevance to international development and environmental agendas and agreements.

Relevance to target groups: relevance of the project's objectives, outcomes and outputs to the different target groups of the interventions (e.g. GEF Secretariat and energy policymakers, etc.).

Relevance to the GEF and UNIDO: In retrospect, were the project's outcomes consistent with the focal areas (climate change) and GEF 5 six strategic objectives[4]?

Were they in line with the UNIDO mandate, objectives and outcomes defined in the Programme & Budget and core competencies?

Is the project's design adequate to address the problems at hand?

Was a participatory project identification process applied and was it instrumental in selecting problem areas and counterparts?

Does the project have a clear thematically focused development objective, the attainment of which can be determined by a set of verifiable indicators?

Was the project formulated based on the logical framework approach?

B. Effectiveness: attainment of objectives and planned results (progress to date)

Assessment of project outcomes should be a priority:

- What outputs and outcomes has the project achieved so far (both qualitative and quantitative results)? Has the project generated any results that could lead to changes of the assisted institutions? Have there been any unplanned effects?
- Are the actual project outcomes commensurate with the original or modified project objectives? If the original or modified expected results are merely outputs/inputs, the evaluators should assess if there were any real outcomes of the project and, if there were, determine whether these are commensurate with realistic expectations from such projects.
- To what extent have the expected outputs and outcomes been achieved or are likely to be achieved? How do the stakeholders perceive their quality?
- Identify the potential longer-term impacts or at least indicate the steps taken to assess these (see also below "monitoring of long term changes"). Wherever possible, evaluators should indicate how findings on impacts will be reported to the GEF in future.
- Catalytic or replication effects: the evaluation will describe any catalytic or replication effect of the project. If no effects are identified, the evaluation

[4] [4] The climate change mitigation strategy for GEF-5 objectives are (1) demonstration, deployment and transfer of low-carbon technologies; (2) market transformation for energy efficiency in the industry and the building sector; (3) investment in renewable energy technologies; (4) energy efficient, low-carbon transport an urban systems; (5) conservation and enhancement of carbon stocks through sustainable management of land use and forestry; and (6) enabling activities and capacity building.

will describe the catalytic or replication actions that the project carried out. No ratings are requested for the project's catalytic role.

C. Efficiency

Was the project cost effective? Was the project the least cost option? Was project implementation delayed, and, if it was, did that affect cost effectiveness? Wherever possible, the evaluator should also compare the costs incurred and the time taken to achieve outcomes with that for similar projects.

Have the donor, UNIDO and Government/counterpart inputs been provided as planned and were adequate to meet requirements? Was the quality of UNIDO inputs and services as planned and timely?

D. Assessment of sustainability of project outcomes

Sustainability is understood as the likelihood of continued benefits after the GEF project ends. Given the uncertainties involved, it may be difficult to have a realistic a priori assessment of sustainability of outcomes. Therefore, assessment of sustainability of outcomes will give special attention to analysis of the risks that are likely to affect the persistence of project outcomes. This assessment should explain how the risks to project outcomes will affect continuation of benefits after the GEF project ends. It will include both exogenous and endogenous risks. The following four dimensions or aspects of risks to sustainability will be addressed:

a. **Financial risks.** Are there any financial risks that may jeopardize sustainability of project outcomes? What is the likelihood of financial and economic resources not being available once GEF assistance ends? (Such resources can be from multiple sources, such as the public and private sectors or income-generating activities; these can also include trends that indicate the likelihood that, in future, there will be adequate financial resources for sustaining project outcomes.).
b. **Sociopolitical risks.** Are there any social or political risks that may jeopardize sustainability of project outcomes? What is the risk that the level of stakeholder ownership (including ownership by governments and other key stakeholders) will be insufficient to allow for the project outcomes/benefits to be sustained? Do the various key stakeholders see that it is in their interest that project benefits continue to flow? Is there sufficient public/stakeholder awareness in support of the project's long-term objectives?
c. **Institutional framework and governance risks.** Do the legal frameworks, policies, and governance structures and processes within which the project operates pose risks that may jeopardize sustainability of project benefits? Are requisite systems for accountability and transparency, and required technical know-how, in place?
d. **Environmental risks.** Are there any environmental risks that may jeopardize sustainability of project outcomes? The evaluation should

assess whether certain activities will pose a threat to the sustainability of the project outcomes. For example, construction of a dam in a protected area could inundate a sizable area and thereby neutralize the biodiversity-related gains made by the project.

Risk identified in the GEF CEO Endorsement Form

a. Financial risks. Insufficient funding of the GEA platform in which the GEF project is to be situated;

b. Social risk: low uptake of the GEA recommendations.

E. Assessment of monitoring and evaluation systems and project management

- **M&E design.** Does the project have a sound M&E plan to monitor results and track progress towards achieving project objectives? The Evaluation will assess whether the project met the minimum requirements for the application of the Project M&E plan (see Annex 4).
- **M&E implementation.** The evaluation should verify that an M&E system was in place and facilitated timely tracking of progress toward project objectives by collecting information on chosen indicators continually throughout the project implementation period; annual project reports were complete and accurate, with well-justified ratings; the information provided by the M&E system was used during the project to improve performance and to adapt to changing needs; and projects had an M&E system in place with proper training for parties responsible for M&E activities to ensure that data will continue to be collected and used after project closure.
- **Budgeting and Funding for M&E activities.** In addition to incorporating information on funding for M&E while assessing M&E design, the evaluators will determine whether M&E was sufficiently budgeted for at the project planning stage and whether M&E was funded adequately and in a timely manner during implementation, **considering that the project is classified as a Medium Scale project by the GEF.**
- **Project management.** Were the management and overall coordination mechanisms efficient and effective? Did each partner have specific roles and responsibilities from the beginning? Did each partner fulfill its role and responsibilities (e.g. providing strategic support, monitoring and reviewing performance, allocating funds, providing technical support, following up agreed/corrective actions…)? Were the UNIDO based management, coordination, quality control and technical inputs efficient, timely and effective (problems identified timely and accurately; quality support provided timely and effectively; right staffing levels, continuity, skill mix …)

- **Implementation approach.** Is the implementation approach chosen different from other implementation approaches applied by UNIDO and other agencies?

F. Assessment of processes affecting attainment of project results

The evaluation will consider, but need not be limited to, the following issues that may have affected project implementation and attainment of project results:

a. **Preparation and readiness.** Were the project's objectives and components clear, practicable, and feasible within its time frame? Were the capacities of the executing institution(s) and its counterparts properly considered when the project was designed? Were lessons from other relevant projects properly incorporated in the project design? Were the partnership arrangements properly identified and roles and responsibilities negotiated prior to project approval? Were counterpart resources (funding, staff, and facilities), enabling legislation, and adequate project management arrangements in place at project entry?

b. **Stakeholder involvement.** Did the project involve the relevant stakeholders through information sharing and consultation and by seeking their participation in project design, implementation, and M&E? For example, did the project implement appropriate outreach and public awareness campaigns? Did the project consult with and make use of the skills, experience, and knowledge of the appropriate government entities, nongovernmental organizations, community groups, private sector entities, local governments, and academic institutions in the design, implementation, and evaluation of project activities? Were perspectives of those who would be affected by project decisions, those who could affect the outcomes, and those who could contribute information or other resources to the process taken into account while taking decisions? Were the relevant vulnerable groups and powerful supporters and opponents of the processes properly involved?

c. **Financial planning.** Did the project have the appropriate financial controls, including reporting and planning, that allowed management to make informed decisions regarding the budget and allowed for timely flow of funds? Was there due diligence in the management of funds and financial audits? Did promised co financing materialize?

d. **UNIDO supervision and backstopping.** Did UNIDO staff identify problems in a timely fashion and accurately estimate their seriousness? Did UNIDO staff provide quality support and advice to the project, approve modifications in time, and restructure the project when needed? Did UNIDO provide the right staffing levels, continuity, skill mix, and frequency of field visits for the project?

e. **Co-financing and project outcomes and sustainability.** If there was a difference in the level of expected co-financing and the co-financing actually realized, what were the reasons for the variance? Did the extent of materialization of co-financing affect project outcomes and/or sustainability, and, if so, in what ways and through what causal linkages?

f. **Delays and project outcomes and sustainability.** If there were delays in project implementation and completion, what were the reasons? Did the delays affect project outcomes and/or sustainability, and, if so, in what ways and through what causal linkages?

g. **Processes and procedures, including human resources issues.** In how far did procedures and processes affect implementation and results? Are there any critical processes that need to be revised?

V. Evaluation Team and Timing

The evaluation will be undertaken by one independent international evaluator recruited for this specific assignment by UNIDO based in Vienna.

UNIDO evaluation group will be responsible for the quality control of the evaluation process and report. It will provide inputs regarding findings, lessons learned and recommendations from other UNIDO evaluations, ensuring that the evaluation report is useful for UNIDO in terms of organizational learning (recommendations and lessons learned) and its compliance with UNIDO evaluation policy and these terms of reference.

The evaluator will be able to provide information relevant for follow-up studies, including evaluation verification on request to the GEF partnership up to three years after completion of the evaluation.

The tasks of the evaluator are specified in the job description attached to these terms of reference.

The evaluator must not have been directly involved in the design and/or implementation of the programme/projects.

Timing

The evaluation is scheduled to take place in the period May to June 2012. The final evaluation report will be submitted 2 weeks after the draft report is submitted.

VI. Reporting

Inception report

This Terms of Reference provides some information on the evaluation methodology but this should not be regarded as exhaustive. After reviewing the project documentation and initial interviews with project manager(s) the International Evaluation Consultant will prepare a short inception report that will operationalizing the TOR relating the evaluation questions to information on what type of and how the evidence will be collected (methodology). It will be discussed with and approved by the responsible UNIDO Evaluation Officer. The Inception Report will focus on the following elements: preliminary project theory model(s);

elaboration of evaluation methodology including quantitative and qualitative approaches through an evaluation framework ("evaluation matrix"); and a reporting timetable[5].

Evaluation report format and review procedures

The evaluation report should be brief, to the point and easy to understand. It must explain; the purpose of the evaluation, exactly what was evaluated and the methods used. The report must highlight any methodological limitations, identify key concerns and present evidence-based findings, consequent conclusions, recommendations and lessons. The report should provide information on when the evaluation took place, the places visited, who was involved and be presented in a way that makes the information accessible and comprehensible. The report should include an executive summary that encapsulates the essence of the information contained in the report to facilitate dissemination and distillation of lessons.

Evidence, findings, conclusions and recommendations should be presented in a complete and balanced manner. The evaluation report shall be written in English and follow the outline given in annex 1.

The evaluation report shall follow the structure given in annex 1. The reporting language will be English.

Review of the Draft Report

Draft reports submitted to UNIDO Evaluation Group are shared with the corresponding Programme or Project Officer for initial review and consultation. They may provide feedback on any errors of fact and may highlight the significance of such errors in any conclusions. The consultation also seeks agreement on the findings and recommendations. The evaluators will take the comments into consideration in preparing the final version of the report.

Quality Assessment of the Evaluation Report

All UNIDO evaluations are subject to quality assessments by UNIDO Evaluation Group. These apply evaluation quality assessment criteria and are used as a tool for providing structured feedback. The quality of the evaluation report will be assessed and rated against the criteria set forth in the Checklist on evaluation report quality (annex 2).

The draft report will be delivered to UNIDO EVA and circulated to UNIDO staff associated with the project. Any comments or responses to the draft report will be sent to UNIDO EVA for collation and onward transmission to the evaluation team leader; he/she will be advised of any necessary revisions.

[5] The evaluator will be provided with a Guide on how to prepare an evaluation inception report prepared by the UNIDO Evaluation Group.

Annex A: Outline of an in-depth project evaluation report

I. Executive summary

- Must provide a synopsis of the storyline which includes the main evaluation findings and recommendations;
- Must present strengths and weaknesses of the project;
- Must be self-explanatory and should be 3-4 pages in length.

I. Evaluation objectives, methodology and process

- Information on the evaluation: why, when, by whom, etc.;
- Scope and objectives of the evaluation, main questions to be addressed;
- Information sources and availability of information;
- Methodological remarks, limitations encountered and validity of the findings.

II. Project background

- Brief context: an overview of the economy, the environment, institutional development, demographic and other data of relevance to the project;
- Sector-specific issues of concern to the project[6] and important developments during the project implementation period;
- Project summary:
  - Fact sheet of the project: including project objectives and structure, donors and counterparts, project timing and duration, project costs and co-financing;
  - Brief description including history and previous cooperation;
  - Project implementation arrangements and implementation modalities, institutions involved, major changes to project implementation;
  - Positioning of the UNIDO project (other related initiatives);
  - Counterpart organization(s).

[6] Explicit and implicit assumptions in the logical framework of the project can provide insights into key-issues of concern (e.g. relevant legislation, enforcement capacities, government initiatives, etc.)

III. Project assessment

This is the key chapter of the report and should address all evaluation criteria and questions outlined in the TOR (see section III Evaluation Criteria and Questions). Assessment must be based on factual evidence collected and analyzed from different sources. The evaluators' assessment can be broken into the following sections:

A. Design
B. Relevance
C. Effectiveness
D. Efficiency
E. Sustainability
F. Project coordination and management

At the end of this chapter, an overall project achievement rating should be developed as required in Annex 2. The overall rating table required by the GEF should be presented here.

IV. Conclusions, Recommendations and Lessons Learnt

This chapter can be divided into three sections:

A. Conclusions

This section should include a storyline of the main evaluation conclusions related to the project's achievements and shortfalls. It is important to avoid providing a summary based on each and every evaluation criterion. The main conclusions should be cross-referenced to relevant sections of the evaluation report.

B. Recommendations

This section should be succinct and contain few key recommendations. They should:

- Be based on evaluation findings;
- Realistic and feasible within a project context;
- Indicate institution(s) responsible for implementation (addressed to a specific officer, group or entity who can act on it) and have a proposed timeline for implementation if possible;
- Be commensurate with the available capacities of project team and partners;
- Take resource requirements into account.

Recommendations should be structured by addressees:

- UNIDO
- Counterpart Organizations
- Donor

C. Lessons Learned

- Lessons learned must be of wider applicability beyond the evaluated project but must be based on findings and conclusions of the evaluation;
- For each lessons the context from which they are derived should be briefly stated.

Annexes should include the evaluation TOR, list of interviewees, documents reviewed, a summary of project identification and financial data, and other detailed quantitative information. Dissident views or management responses to the evaluation findings may later be appended in an annex.

Annex B: Checklist on evaluation report quality

Report quality criteria		UNIDO Evaluation Group Assessment notes	Rating
A.	Did the report present an assessment of relevant outcomes and achievement of project objectives?		
B.	Were the report consistent and the evidence complete and convincing?		
C.	Did the report present a sound assessment of sustainability of outcomes or did it explain why this is not (yet) possible?		
D.	Did the evidence presented support the lessons and recommendations?		
E.	Did the report include the actual project costs (total and per activity)?		
F.	Quality of the lessons: Were lessons readily applicable in other contexts? Did they suggest prescriptive action?		
G.	Quality of the recommendations: Did recommendations specify the actions necessary to correct existing conditions or improve operations ('who?' 'what?' 'where?' 'when?)'. Can they be implemented?		
H.	Was the report well written? (Clear language and correct grammar)		
I.	Were all evaluation aspects specified in the TOR adequately addressed?		
J.	Was the report delivered in a timely manner?		

Rating system for quality of evaluation reports

A number rating 1-6 is used for each criterion:
Highly Satisfactory =6,
Satisfactory = 5,
Moderately Satisfactory = 4,
Moderately Unsatisfactory = 3,
Unsatisfactory = 2,
Highly Unsatisfactory = 1,
and unable to assess = 0.

Annex C: GEF Minimum requirements for M&E[7] (GEF Monitoring and Evaluation policy 2010) for MSP projects

Minimum Requirement 1: Project Design of M&E

All projects will include a concrete and fully budgeted monitoring and evaluation plan by the time of work program entry for full-sized projects and CEO approval for medium-sized projects. This monitoring and evaluation plan will contain as a minimum:

- SMART[8] indicators for project implementation, or, if no indicators are identified, an alternative plan for monitoring that will deliver reliable and valid information to management;
- SMART indicators for results (outcomes and, if applicable, impacts), and, where appropriate, indicators identified at the corporate level;
- Baseline for the project, with a description of the problem to be addressed, with indicator data, or, if major baseline indicators are not identified, an alternative plan for addressing this within one year of implementation;
- Identification of reviews and evaluations that will be undertaken, such as mid-term reviews or evaluations of activities; and
- Organizational set-up and budgets for monitoring and evaluation.

Minimum Requirement 2: Application of Project M&E

Project monitoring and supervision will include implementation of the M&E plan, comprising:

- SMART indicators for implementation are actively used, or if not, a reasonable explanation is provided;
- SMART indicators for results are actively used, or if not, a reasonable explanation is provided;
- The baseline for the project is fully established and data compiled to review progress reviews, and evaluations are undertaken as planned; and
- The organizational set-up for M&E is operational and budgets are spent as planned.

[7] www.thegef.org »Home » Evaluation Documents » policy.
[8] Specific, Measurable, Achievable and Attributable, Relevant and Realistic, and Time-Boundly, Timely, Trackable and Targeted.

Annex D: Overall Ratings Table

Criterion	Evaluator's Summary Comments	Evaluator's Rating
Attainment of project objectives and results (overall rating) **Sub criteria (below)**		
Effectiveness		
Relevance		
Efficiency		
Sustainability of Project outcomes (overall rating) Sub criteria (below)		
Financial		
Socio Political		
Institutional framework and governance		
Ecological		
Monitoring and Evaluation (overall rating) Sub criteria (below)		
M&E Design		
M&E Plan Implementation (use for adaptive management)		
Budgeting and Funding for M&E activities		
UNIDO specific ratings		
Quality at entry		
implementation approach		
UNIDO Supervision and backstopping		
Overall Rating		

Rating of project objectives and results

- Highly Satisfactory (HS): The project had no shortcomings in the achievement of its objectives, in terms of relevance, effectiveness or efficiency.
- Satisfactory (S): The project had minor shortcomings in the achievement of its objectives, in terms of relevance, effectiveness or efficiency.
- Moderately Satisfactory (MS): The project had moderate shortcomings in the achievement of its objectives, in terms of relevance, effectiveness or efficiency.
- Moderately Unsatisfactory (MU): The project had significant shortcomings in the achievement of its objectives, in terms of relevance, effectiveness or efficiency.
- Unsatisfactory (U) The project had major shortcomings in the achievement of its objectives, in terms of relevance, effectiveness or efficiency.
- Highly Unsatisfactory (HU): The project had severe shortcomings in the achievement of its objectives, in terms of relevance, effectiveness or efficiency.

Please note: Relevance and effectiveness will be considered as critical criteria. The overall rating of the project for achievement of objectives and results may not be higher than the lowest rating on either of these two criteria. Thus, to have an overall satisfactory rating for outcomes a project must have at least satisfactory ratings on both relevance and effectiveness.

Ratings on sustainability

Sustainability will be understood as the probability of continued long-term outcomes and impacts after the GEF project funding ends. The evaluation will identify and assess the key conditions or factors that are likely to contribute or undermine the persistence of benefits beyond project completion. Some of these factors might be outcomes of the project, i.e. stronger institutional capacities, legal frameworks, socio-economic incentives /or public awareness. Other factors will include contextual circumstances or developments that are not outcomes of the project but that are relevant to the sustainability of outcomes.

Rating system for sustainability sub-criteria

On each of the dimensions of sustainability of the project outcomes will be rated as follows.

- Likely (L): There are no risks affecting this dimension of sustainability.
- Moderately Likely (ML). There are moderate risks that affect this dimension of sustainability.
- Moderately Unlikely (MU): There are significant risks that affect this dimension of sustainability.
- Unlikely (U): There are severe risks that affect this dimension of sustainability.

All the risk dimensions of sustainability are critical. Therefore, overall rating for sustainability will not be higher than the rating of the dimension with lowest ratings. For example, if a project has an Unlikely rating in either of the dimensions then its overall rating cannot be higher than Unlikely, regardless of whether higher ratings in other dimensions of sustainability produce a higher average.

Ratings of project M&E

Monitoring is a continuing function that uses systematic collection of data on specified indicators to provide management and the main stakeholders of an ongoing project with indications of the extent of progress and achievement of objectives and progress in the use of allocated funds. Evaluation is the systematic and objective assessment of an on-going or completed project, its design, implementation and results. Project evaluation may involve the definition of appropriate standards, the examination of performance against those standards, and an assessment of actual and expected results.

The Project monitoring and evaluation system will be rated on 'M&E Design', 'M&E Plan Implementation' and 'Budgeting and Funding for M&E activities' as follows:

- Highly Satisfactory (HS): There were no shortcomings in the project M&E system.
- Satisfactory(S): There were minor shortcomings in the project M&E system.
- Moderately Satisfactory (MS): There were moderate shortcomings in the project M&E system.
- Moderately Unsatisfactory (MU): There were significant shortcomings in the project M&E system.
- Unsatisfactory (U): There were major shortcomings in the project M&E system.
- Highly Unsatisfactory (HU): The Project had no M&E system.

"M&E plan implementation" will be considered a critical parameter for the overall assessment of the M&E system. The overall rating for the M&E systems will not be higher than the rating on "M&E plan implementation.

All other ratings will be on the GEF six point scale.

HS	= Highly Satisfactory	Excellent
S	= Satisfactory	Well above average
MS	= Moderately Satisfactory	Average
MU	= Moderately Unsatisfactory	Below Average
U	= Unsatisfactory	Poor
HU	= Highly Unsatisfactory	Very poor (Appalling)

Annex E: Required Project Identification and Financial Data

The evaluation report should provide information on project identification, time frame, actual expenditures, and co financing in the following format, which is modeled after the project identification form (PIF).

I. Project Identification

GEF Project ID: *[Assigned by the GEF Secretariat at pipeline entry.]*
GEF Agency Project ID:
Countries:
Project Title: *[As per the project appraisal document submitted to the GEF.]*
GEF Agency (or Agencies):

II. Dates

Milestone	Expected Date	Actual Date
CEO Endorsement/Approval		
Agency Approval date		
Implementation start		
Midterm evaluation		
Project completion		
Terminal evaluation completion		
Project closing		

Expected dates are as per the expectations at the point of CEO endorsement/approval.

III. Project Framework

Project Component	Activity Type	GEF Financing (in $)		Co-financing (in $)	
		Approved	Actual	Promised	Actual
1.					
2.					
3.					
4.					
5. Project Management					
Total					

Activity types are investment, technical assistance, or scientific and technical analysis. Promised co-financing refers to the amount indicated at the point of CEO endorsement/approval.

IV. Co financing

		Project preparation		Project implementation		Total	
Source of co financing	Type	Expected	Actual	Expected	Actual	Expected	Actual
Host gov't contribution							
GEF Agency (ies)							
Bilateral aid agency (ies)							
Multilateral agency (ies)							
Private sector							
NGO							
Other							
Total co financing							

Expected amounts are those submitted by the GEF Agencies in the original project appraisal document. Co-financing types are grant, soft loan, hard loan, guarantee, in kind, or cash.

Annex F: Job Description

Post title	International Evaluation Consultant
Duration	20 work days spread over 2 months
Started date	21 July 2012
Duty station	Home based, Vienna and Laxenburg (Austria)

Duties

The consultant will evaluate the projects according to the Terms of Reference. S/he will be responsible for preparing the draft and final evaluation report, according to the standards of the UNIDO Evaluation Group. S/he will perform the following tasks:

Main duties	Duration/ location	Deliverables
Review project documentation and relevant background information (policies and strategies, UN strategies and general economic data…); determine key data to collect and prepare key instruments (questionnaires, logic models…) to collect these data through interviews and/or surveys	3 days Home based	List of detailed evaluation questions to be clarified; questionnaires/ interview guide; logic models; list of key data to collect
Briefing with the UNIDO Evaluation Group, project managers and other key stakeholders at HQ	1 day home based (telephone interviews)	Interview notes, detailed evaluation schedule and list of stakeholders to interview during the field missions
Prepare inception report and discuss with UNIDO EVA	1 day	inception report
Conduct interviews	5 days Vienna and Laxenburg (Austria)	
Present overall findings and recommendations to the stakeholders at UNIDO	2 days Vienna	Presentation slides
Prepare the evaluation report according to TOR and template provided by UNIDO EVA	5 days Home based	2 Draft evaluation report
Revise the draft project evaluation	2 days	Final evaluation report

Main duties	Duration/ location	Deliverables
reports based on comments from UNIDO Evaluation Group and stakeholders and edit the language and form of the final version according to UNIDO standards	Home based	
TOTAL	**20 days**	

Qualifications and skills

General

Master degree in engineering, economics, international policy or development studies o or other related discipline
Full command of Microsoft Office software package (Word, Excel, Power Point and Project)

Language: English

Professional

At least 15 years of working experience in the field of energy policy and/or, policy research

Specific:

- Knowledge and experience in the field of evaluation of development projects;
- Experience in GEF projects and knowledge of UNIDO activities an asset.

Absence of Conflict of Interest

According to UNIDO rules, the consultant must not have been involved in the design and/or implementation, supervision and coordination of and/or have benefited from the programme/project (or theme) under evaluation. The consultant will be requested to sign a declaration that none of the above situations exists and that the consultants will not seek assignments with the manager/s in charge of the project before the completion of her/his contract with the Evaluation Group.

Note: The TOR requests that the TOR be annexed to the evaluation report. However, the Terms of Reference for this assignment are 19 pages in length. They are available separately.

Annex 2 List of persons consulted

Name	Job title/Position in company/organization	Name of company/organization
Nebojsa Nakicenovic	GEA Director	IIASA
Luis Gomez-Echeverri	GEA Associate Director	IIASA
Keywan Riahi	Technical lead for GEF project and convening lead author	IIASA
Shonali Pachauri	Senior Evaluation Officer	IIASA
Volker Krey	Lead author	IIASA
David McCollum	Research scholar	IIASA
Patricia Wager	GEA project secretary	IIASA
Johannes Dobinger	Evaluation Team	UNIDO
Pradeep Monga	Energy and Climate Change Director	UNIDO
Bettina Schreck	Industrial Development Officer	UNIDO
Marinela Lukic	Project Assistant	UNIDO
Marina Ploutakhina	Industrial Energy Efficiency Unit Chief	UNIDO
Martin Lugmayr	Industrial Development Officer	UNIDO
Ming Yang	Sr. Climate Change Specialist	GEF Secretariat
Daniel Bouille	Argentina, convening lead author	Experts & GEA Council Members
Suani Coelho	Convening lead author	Experts & GEA Council Members, Brazil
Reid Detchon	GEA Council Member	Experts & GEA Council Members, USA
Isaac Ennison	Senior research scientist	Experts & GEA Council Members,Ghana
Irene Giner-Reichl	GEA Council Member	GEA Council, Austria,
Talba Imamuddeen	Special advisor	Min. of Power, Nigeria
Leena Srivastava	GEA Review Editor	India

Annex 3: List of documents reviewed

Access to Modern Energy: Assessment and Outlook for Developing and Emerging Regions

Communications between UNIDO, GEF, IIASA and GEA

GEA Progress reports , (31 October 2010, November 2010, 22 December 2010)

GEF Project Information Form (PIF)

GEF CEO Endorsement Form

IIASA Completion Report, (June 20120

The Global Energy Assessment report, (selected chapters)

The IIASA Energy-Multi Criteria Analysis Tool (ENE-MCA), User Manual

The IIASA Energy Access Tool (Energy-ENACT), User Manual

The Next Energy Transition: Transformative Pathways, Choices and Opportunities

UNIDO Programme and Budgets 2012-2013

UNIDO's Quality Assurance Group minutes ,(12 June 2009 and 19 February 2010)

UNIDO Progress reports, (30 June 2011, 31 May 2012)

UNIDO Annual PIR. (10 September 201)

UNIDO Project Completion Report (Final PIR), (18 October 2012)

Workshop report for Praia, Cape Verde

Workshop report for New Delhi, India

Workshop report for Yerevan, Armenia

Annex 4: Summary of project identification form

The GEF PIF lays the basis for the project design and provides the key logical framework information in part 1.The objetctives, outcomes (components) and outputs are presented in Table A, which is transcribed below. The table also provides a budgetary breakdown per outcome and financing source, as well as the percentages covered by each source.

Project Objective: Development of policy options and analytical tools aimed at informed decision making to support the scaling –up of low carbon energy technologies, achievement of reductions in greenhouse gas emissions, and the reductions of energy poverty.								
Project Components	**Indicate whether Investment, TA, or STA[2]**	**Expected Outcomes**	**Expected Outputs**	**GEF Financing[1]**	**Co-Financing[1]**			**Total ($)** c=a+ b
				($) a	**%**	**($) b**	**%**	
1. Improving access policy tools.	STA	1.1. Analytical tools generated by GEA are known to and used by decision makers in most LDCs and by foreign aid agencies in developed countries; 1.2. Use of GEA results in the forging of multi – lateral environmental agreements (e.g., UNFCCC).	Web – based and computer – based quantitative tools, translated into major LDC languages and supported by workshops.	312,500	50	312,500	50	625,000
2.	STA	2.1. Better understanding by decision makers of key technologies, technology transfer issues, policy instrument choice and major sustainable development issues; 2.2.Increased welfare of people in LDCs; and 2.3. Future GEF programming considers GEA outcome.	Chapters on energy access of the major analytical report of the GEA, translated into major LDC languages.	312,500	50	312,500	50	650,000
3. Interactions with Policy makers in developing countries.	STA/TA	3.1. Improved understanding among decision makers of policies and market instruments that are enabling sustainable energy systems; 3.2.Increased investment by industry and governments in sustainable solutions for LDCs; and 3.3. Measurable reduction of energy poverty: better access to modern energy by the poor.	Chapter on policy portfolios of the major analytical report; written products for dissemination, translated into major LDC languages.	375,000	50	375,000		750,000
4. Other GEA activities.	STA/TA	Development of 23 other knowledge modules.				3,107,000		3,107,000
Total Project Costs				1,000.000		4,107,000		5,107,000