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Benefits of Increased Energy Efficiency:

- Low-cost and rapid implementation
 - Energy efficiency can be a dramatically cheaper and faster option than financing and constructing new power generation, transmission and distribution facilities. Energy efficiency can also temper growth in electricity demand and make better use of existing generation capacity.
- Direct impact on jobs and businesses
 - Energy efficiency creates jobs and generates investment in local businesses by stimulating demand for local products, materials, and services.
- Zero-emission solution to meeting energy needs
 - Energy efficiency reduces the need for additional power generation, making efficiency the “cleanest fuel” in the clean energy arsenal.



ENERGY EFFICIENCY OPPORTUNITY STUDY

INTRODUCTION

High variability between local end-use markets in different countries and regions make it challenging to determine which energy efficiency activities will be successful at a large scale. Factors, such as the cost of technology, the availability of energy performance information for customers, and the presence of a skilled workforce to install and maintain equipment influence whether a particular program will save energy, be cost-effective, and shift the market toward more energy efficient practices.

In order to position USAID and its partners to quickly and effectively scale up energy efficiency around the world, ICF developed and tested a methodology to evaluate market readiness for energy efficiency programs, and identify the most effective investments to reduce energy demand. ICF developed and implemented the Energy Efficiency Opportunity Study to provide a framework to: (1) assess the ability of a particular market to support programs (e.g., through policies), and (2) identify near-term activities with a strong chance of cost-effectively advancing efficiency.

From May 2016 to March 2017 the Opportunity Study Team deployed across seven reference locations, representing varying levels of past efficiency deployment, in order to identify the potential for appropriate energy efficiency technology policies and programs. The Opportunity Study evaluated the basic technical and economic potential of a host of energy efficiency interventions while taking into account political and administrative feasibility and distributional factors, and considering the likelihood of bringing programs to scale. Opportunity Study results quantitatively highlight which programs can deliver the greatest energy savings at the lowest cost per unit of energy reduced. These findings suggest considerable savings opportunities in each reference location.

Framework Overview

I. Select reference locations

- The Opportunity Study assessed seven locations: (1) South Africa, (2) Mozambique, (3) El Salvador, (4) Mexico, (5) Kazakhstan, (6) Andhra Pradesh, India and (7) Telangana, India. Each national-level study (locations 1 through 5) focused on urban centers as representative of the greatest opportunities to scale up energy efficiency. The India sub-national studies (locations 6 and 7) also focused on urban centers to identify the best opportunities within each respective state, and considered both national and state-level policies as well as other market readiness characteristics.



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The *Opportunity Assessment Tool* was used to identify a total of 139,326,000 MVWh of achievable energy savings across the seven activity locations.

2. Assess energy efficiency building blocks

Building Blocks for scaling up energy efficiency were developed and used to assess “market readiness”. The Opportunity Assessment Tool (see below) was expanded to incorporate assessment of the building blocks and provide users with insight into market strengths and weaknesses for supporting energy efficiency. Building Blocks are:

1. Skilled Workforce
2. Financing Support
3. Public Awareness
4. Regulatory Mechanisms
5. Smart Incentives
6. Technology Development

- The building block assessment accomplished two objectives: 1) it provided insight into the current market state thereby helping to assess the likelihood of the successful implementation of an efficiency program; and, 2) it highlights where programmatic support should be focused to enable future efficiency activities—particularly those that were found to be cost effective, but not likely to succeed during implementation.

3. Update Opportunity Assessment Tool/add country

- The ICF team encoded the analytical framework in a software tool: the *USAID Opportunity Assessment Tool*, designed with a user-friendly interface to record information and identify energy efficiency programs with the highest potential and likelihood of success. The tool is designed for USAID and local stakeholders implementing programs in developing countries. Users can select their country and proceed through steps to determine country-specific energy efficiency program recommendations. The assessment includes scoring the country-specific indicators for each program under consideration and evaluating the building blocks for energy efficiency through a customized set of questions. For the reference locations in the study, the ICF team used the tool to identify the “top 10” energy efficiency policies and programs likely to be the best investments, under current market conditions, based on a combination of the size of their market impact/ability to scale, energy savings, GHG emission reductions, cost, and ease of implementation.

Project Accomplishments/Key Findings

- Energy efficiency has the potential to offset the need for substantial levels of electricity capacity and generation. Program impact estimates can be highly persuasive in efforts to incorporate energy efficiency into comprehensive power sector planning. To illustrate, the table below summarizes the potential impact of implementing the “Top 10” energy efficiency opportunities identified in each of the countries in the Study. These opportunities represent programs that have been assessed to be cost-effective and likely to successfully scale up energy efficiency. In these seven locations, the **study identified a total of 139,326,000 MWh of achievable energy savings.**



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Scaling energy efficiency activity requires (1) strengthening market readiness, and (2) making cost-effective strategic investments with the greatest market share.

Energy and GHG Emission Potential Impact Summary

Study Location	Results for the Identified “Top 10” Energy Efficiency Opportunities		
	Energy Savings (MWh)	Percent of Total Electricity Consumption	Greenhouse Gas (GHG) Emissions Reduction (million tons)
El Salvador	1,783,000	32	0.94
Mozambique	244,000	9	0.19
Kazakhstan	28,881,000	30	25
Andhra Pradesh, India	30,932,000	41	28
Telangana, India	33,257,000	42	30
South Africa	14,693,000	8	15
Mexico	29,536,000	12	17.5

Recommendations for Replication and Adding New Reference Locations

- Investigate data availability.
 - Data quality and availability is a critical factor in applying the principals of the Energy Efficiency Opportunity Study and Assessment Tool. Non-availability of data, especially in developing countries, has the potential to limit and reduce utilization of the tool. To identify opportunities for energy efficiency improvements in a specific country, the tool must include data in the following areas:
 - Sector-wise energy consumption and forecasts
 - End-use energy consumption percentages for each identified sector
 - Baseline end-use and efficiency data
 - Costs and savings for incremental measures, full measures, and measure life (i.e., the expected length of time for a measure to deliver savings).
- Conduct strategic planning for demand-side management as an initial building block for scaling up energy efficiency.
 - Cost-effective opportunities to lower energy demand through energy efficiency should be carefully analyzed and incorporated into large scale power sector planning.
 - Strategic planning, using the Opportunity Assessment Tool, allows stakeholders to focus resources on investments likely to have the most significant impacts on energy demand.
- Use the Energy Efficiency Building Blocks to develop activities that address current barriers to implementing energy efficiency programs.