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Central Asian Energy Efficiency Support Program (CAEESP)

Final Report

Submitted by ICF International

February 2014

This document was prepared for the United States Agency for International Development (USAID) by ICF International under Cooperative Agreement No. 00176-LA-11-00003, Leader with Associate Cooperative Agreement AID-OAA-L-11-0000.

The contents are not the responsibility of USAID and do not necessarily reflect the views of the United States Government.

Central Asian Energy Efficiency Support Program (CAEESP)

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ACRONYMS

ACF	Asian Credit Fund
ADB	Asian Development Bank
AO	Agreement Officer
AOTR	Agreement Officer's Technical Representative
CAEESP	Central Asian Energy Efficiency Support Program
CAR	Central Asian Republics
CAREC	Central Asia Regional Environmental Center
DOE	US Department of Energy
DSM	Demand Side Management
EAAK	Energy Auditor's Association of Kazakhstan
EBRD	European Bank for Reconstruction and Development
EE	Energy Efficiency
EnMS	Energy Management System
EPC	Energy performance Contract
ESCAP	UN Economic and Social Commission for Asia and the Pacific
ESCO	Energy Services Company
FY	Fiscal Year
GHG	Greenhouse Gas
GoKZ	Government of Kazakhstan
IFI	International Financial Institution
KCCMP	Kazakhstan Climate Change Mitigation Program
KEE	KazEnergoExpertize
KTR	Kazakhstan Technical Regulation Committee
LED	Low Emissions Development
MINT	Ministry of Industry and New Technologies
O&M	Operations and Maintenance
PMEP	Performance Monitoring and Evaluation Plan
SK	Samruk Kazyna Group
STTA	Short-term Technical Assistance
UNDP	United Nations Development Program
UNECE	United Nations Economic Commission for Europe
UNIDO	United Nations Industrial Development Organization
US	United States
USAID	US Agency for International Development
USG	US Government

I. EXECUTIVE SUMMARY

Kazakhstan ranks high among the world's top GHG emitters, with highly carbon intensive power and industrial sectors. Its industrial sector, comprising over 2,000 registered entities, consumes more than 70% of the country's electricity. The Ministry of Industry and New Technologies (MINT) revised and led the passage of Kazakhstan's *Law on Energy Savings and Increasing of Energy Efficiency (LES)* in January 2012, laying out major policy measures to reduce energy use in Kazakhstan, focusing particularly on energy efficiency (EE) at major industrial sites. USAID/CAR has been assisting Kazakhstan in its drive toward a greener economy, and as part of its technical assistance program, awarded the *Central Asia Energy Efficiency Support Program (CAEESP)* to ICF International in September 2011, under Cooperative Agreement No. AID-OAA-L-11-00003. The 2-year, \$1.89 million project sought to lower the barriers to EE improvements in Central Asia, particularly Kazakhstan. From 2011-2013, CAEESP worked to improve the enabling environment for EE in Kazakhstan, providing capacity building to the Government of Kazakhstan (GoKZ) to help with the rollout of the LES and to the regulated industries with awareness and tools for compliance with the LES. The CAEESP's assistance included policy analysis, awareness raising, international energy management best practices, and regional information dissemination. This report summarizes the activities and results of the program, as well as measures of program progress and implementation elements (obstacles, budget expenditures, and project personnel).

CAEESP Activities and Results. The CAEESP team of U.S., regional, and Kazakh energy management and EE experts designed a methodical but flexible approach to the CAEESP, engaging a diverse set of stakeholders at the national, municipal, and facility levels. These stakeholders included regulatory bodies such as KazEnergyExpertize (KEE), the Committee of State Energy Supervision and Control (CSESC), and the Kazakhstan Technical Regulation Committee (KTRM) of MINT on LES implementation; industrial regulated entities such as the Samruk Kazyna Group on compliance and awareness; and academic institutions and associations on training and curriculum development. The CAEESP approach was informed by stakeholder consultations and assessments conducted under **Task 1 - Initial Assessment and Prioritization**, where the initial CAEESP Inception Report outlined key stakeholder roles, responsibilities, and priorities.

Key CAEESP activities over the two years included an early stakeholder roundtable to introduce the goals of the CAEESP and an in-depth analysis of the LES itself, where the team identified potential key implementation challenges and gaps to be addressed during LES operationalization. These included issues such as lack of industry awareness and understanding of LES requirements, incentives for energy savings, and capacity for enforcement and compliance. CAEESP's regulatory analysis of the LES and the team's recommendations were presented in a report to MINT in 2012. Recognizing the heavy emphasis on the industrial sector in the LES, with requirements for industry energy audits, energy management systems (EnMS), and ISO 50001 certification, the CAEESP's **Task 2 - Stakeholder Awareness and Training in EE Approaches and Technologies** work program focused on training and awareness raising on these issues for both the GoKZ and the regulated industries, combining workshops and trainings with on-site visits and deep-dive demonstrations. CAEESP provided training series on

ISO 50001 and energy auditing to a cross section of government and industry members to help build capacity and share best practices. To further industry awareness of EE and energy savings at the commercial retail level, the CAEESP team organized industrial sector outreach events on best energy management practices and prepared a report to MINT on EE consumer product labeling, providing recommendations for program design based on successful programs such as the USEPA's Energy STAR program.

Under **Task 3 - EE Project Development and Financing Facilitation**, the CAEESP team placed emphasis on identifying EE improvement projects within energy-intensive end-users in Kazakhstan. CAEESP worked with individual industries as well as central, regional, and local authorities to identify CAEESP capacity building opportunities at the facility and project levels. CAEESP's support included assistance with energy audits, process optimization, and feasibility studies of improvement opportunities to facilitate investment or financing. CAEESP worked closely with several major industrial entities, including *KazPhosphate*, *Kazchrome*, *ALES (Almaty Power Plants)*, *KazakhMys* and *KazTransMorFlot*, to conduct on-site ISO 50001 gap analyses, securing cooperation from senior officials within the companies and instilling technical and management best practices on energy management. At the municipal levels, CAEESP supported a number of akimats such as Almaty Akimat and Ekibastuz and Aksu in Pavlodar Oblast, to help meet the LES requirements that municipalities develop Energy Action Plans. On financing, CAEESP consulted with project financiers such as the European Bank for Reconstruction and Development (EBRD) to better understand the context, opportunities, and risks associated with EE financing. CAEESP also worked with the Asian Credit Fund (ACF) to help ACF loan officers evaluate EE loans.

Under **Task 4 - Support for Private Sector EE Service Providers**, CAEESP aimed to build the foundation for the development of energy services by introducing companies to potential benefits of energy performance contracts and potential ESCO types of services. CAEESP conducted preliminary training work with Samruk Energo and worked with CHP-2 Power Plant in Almaty as the target of the consultancy for ISO and EnMS services. CAEESP also provided advisory support to the Institute of Nuclear Physics, the sole organization in Kazakhstan providing energy audit services for the nuclear industry (mining, processing and production).

Although focused on Kazakhstan, CAEESP also included regional activities on information dissemination of lessons learned, international tools, and best practices. Under **Task 5 - Regional Analysis and Recommendations in EE**, the CAEESP team participated in a number of regional events in Central Asia to discuss CAEESP progress and results and also invited participants from Central Asian countries to participate in several of CAEESP's training workshops. A key partnership was established with the Central Asia Regional Environment Center (CAREC), engaging in information dissemination on municipal EE via the regional Covenant of Mayors and in the creation of a Central Asia Energy Efficiency Learning Portal (CAEELP). CAEELP is also funded by USAID and builds off the tools, training, and best practices from CAEESP's work in Kazakhstan.

CAEESP's variety of activities on policy analysis, awareness and training, and on-site demonstrations helped build a foundation and provided tools to both the GoKZ and the regulated community to further the long-term implementation of the LES in Kazakhstan. The CAEESP also helped to inform subsequent larger programs on EE and energy management in

Kazakhstan, such as the USAID Kazakhstan Climate Change Mitigation Program (KCCMP) begun in late 2013. Though accomplishing all of the planned activities, the CAEESP team recognized the limited timeframe, scope, and budget of the project and in turn worked with USAID/CAR to develop some early concepts for potential follow-on projects, as presented in **Annex A** of this report. A more detailed description of Annex A concepts was presented to USAID/CAR in 2013.

2. INTRODUCTION

This Final Report for the CAEESP, a deliverable under ICF International's Cooperative Agreement No. 00176-LA-11-00003, provides a summary of the program context, major activities, accomplishments, challenges encountered, performance indicators, and coordination efforts conducted in accordance with the following five Tasks of the project:

- Task 1 - Initial Assessment and Prioritization
- Task 2 - Stakeholder Awareness and Training in EE Approaches and Technologies
- Task 3 - Energy Efficiency Project Development and Financing Facilitation
- Task 4 - Support for Private Sector Energy Efficiency Service Providers
- Task 5 - Regional Analysis and Recommendations in Energy Efficiency

ICF established a project office in Almaty from 2011-2013 to implement CAEESP, led first by the Chief of Party Keith Little, and then by Mary Worzala, who replaced him in 2012. Program administration, staffing, and budget issues are also summarized in this report.

Background and Policy Context. Kazakhstan is a major global contributor of GHG emissions, particularly in its power and industrial sectors. Electricity consumption is focused in a relatively small set of end-users – more than 35% of all generated electricity in the country is consumed by 15 large industrial enterprises – and EE programs in the power sector and these large industrial end-users can offer significant emission reductions. In its drive to become a greener economy, Kazakhstan has issued a variety of energy, climate change, and environmental laws, regulations, policies, and strategies over the past decade. Kazakhstan's *Law on Energy Savings and Energy Efficiency (LES)* was updated and passed in January 2012, laying out a number of measures designed to reduce energy use in Kazakhstan. The LES particularly focuses on the industrial and business sectors, with some provisions for residential use. Among the key elements of the LES are the following:

- Starting in 2013, all members of the state energy registry (SER) that consume more than 1,500 tons of fuel equivalent per year are required to report energy consumption to the GoKZ.
- Under Article 16, entities under the SER, with the exception of government offices, must undergo a mandatory energy audit at least once every 5 years and be certified in ISO 50001 (energy management systems or EnMS)). Energy audits must be conducted by a certified energy auditor.

- From the audits, the regulated entities must develop energy reduction plans that will achieve the potential identified in the audit, with a goal of achieving the highest EE figures.
- Each municipality must have an EE action plan prepared by 2013 that will be reviewed and approved by the national government.
- LES Governing Structure: Several bodies have Administrator authorities under the law: (1) the State Committee on Energy Control (SERC) is responsible for enforcement and compliance with the law (including auditor accreditation and oversight); (2) KazEnergExpertise (KEE) will maintain the national energy registry; and (3) MINT is responsible for energy policy issues.

Capacity Building Needs and Compliance Gaps for the LES. Implementation of and compliance with the LES present potentially significant challenges for central and regional governing authority, service providers, technical/education institutes, and the industrial sector itself. Although the LES lays out the general legislative framework, additional regulations and provisions are needed to ensure the law can be effectively implemented. Currently there are no clear economic penalties for non-compliance (i.e., for not implementing energy saving technologies and measures). Article 17 of the law introduces the concept of incentives and state support for modernizing state institutions, but details on the types of incentives or the budget resources available for energy efficiency efforts in state institutions were not specified. Significant capacity is needed with KEE, MINT, and others to administer the LES. In particular, the Administrator will need to manage the state energy registry, including the collection and storage of data and reports; management of the energy audit certification process; creation of a sustainable system for ISO 50001 certification; and development of tools, guidance, and information to support companies as they work to meet their energy reduction targets. The challenges for the industrial sector include:

- Lack of clarity and understanding on the detailed requirements of the LES. The LES only provides an overall framework on energy saving and energy efficiency, but further regulatory details and compliance guidance are still being developed to help operationalize the law.
- Ambitious timeframe for EnMS rollout. The national legislation set out a deadline for regulated companies to have an internationally-recognized EnMS certification in place, but supporting regulations and guidance are lagging. As a result, the allowable timeframe for industry to carry out implementation plans has been significantly compressed, especially given that EnMS implementation is a relatively new and detailed process.
- Lack of industry understanding of ISO 50001. ISO 50001 is a fairly new standard in Kazakhstan, particularly relative to ISO 9001 and ISO 14001. This standard requires a strong understanding of both technical and management systems for energy. Service providers and regulators are still developing guidance and capacity building to support the regulated industrial sector. ISO 50001 provides an overall framework for EnMS but the implementation details need to be tailored to each industrial sector and each facility.
- Lagging incentives for implementation of EnMS. Energy prices are low in comparison with international tariffs, thereby presenting a very limited economic incentive for effective

implementation of EnMS. The LES mentions incentives, but development of incentives is lagging behind the penalty system for noncompliance, which focuses on penalizing rather than incentivizing the industry. This approach results in a negative reaction and attitude from industry towards forced compliance (i.e., doing the bare minimum to meet requirements) rather than focusing on effective improvement of energy performance.

USAID's CAEESP – Building a Foundation to Support the LES. With this context in Kazakhstan, USAID's Central Asian Energy Efficiency Support Program (CAEESP), a two-year, \$1.9M project based in Almaty, was awarded to ICF International to assist Kazakhstan in reducing greenhouse gas (GHG) intensity and emissions by stimulating investments in energy efficiency technologies and projects. It also focused on building capacity of the GoKZ to operationalize the LES and the regulated entities in Kazakhstan to comply with its requirements. The CAEESP sought to establish an early foundation of technical assistance and best practice tools to address key elements of the LES and to sustain the results of the project by helping to inform the larger follow-on USAID KCCMP project to CAEESP. Lessons learned, tools, and best practices are now available to be replicated into other Central Asian countries through CAEESP partners such as the Central Asia Regional Environmental Center (CAREC) and the Asian Credit Fund (ACF).

3. CAEESP ACTIVITIES AND RESULTS

This section summarizes the CAEESP program activities, findings, and results from 2011-2013 under CAEESP and includes some recommendations for potential further interventions relative to the CAEESP objectives and Tasks.

The CAEESP was designed and awarded to ICF International prior to the passage of the LES, with specific objectives to: (1) raise stakeholder awareness of EE as means to the achievement of Kazakhstan's GHG emissions reductions targets; (2) build private sector capacity in developing and implementing EE projects; (3) increase private sector investment in EE measures, especially through public-private partnership (PPP); and (4) stimulate interests within the banking sector in developing lending products targeted at EE investments. The CAEESP's work program was developed and continually adjusted accordingly with USAID to align with ongoing needs and interests of the GoKZ and industrial entities after the enactment of the LES. Program objectives were expected to be achieved through five key Tasks of the project, as follows:

- Task 1 - Initial Assessment and Prioritization
- Task 2 - Stakeholder Awareness and Training in EE Approaches and Technologies
- Task 3 - Energy Efficiency Project Development and Financing Facilitation
- Task 4 - Support for Private Sector Energy Efficiency Service Providers
- Task 5 - Regional Analysis and Recommendations in Energy Efficiency

CAEESP's technical assistance and capacity building activities were targeted across the spectrum of energy stakeholders including:

- I. National GoKZ institutions such as MINT and KEE on LES policy, enforcement, and operationalization;

2. Municipal (akimat) authorities regarding implementation of the LES and energy savings measures;
3. Industrial facilities and other regulated entities regarding LES compliance; and
4. Retail businesses, academic institutions, and community organizations on awareness of EE and energy management issues.

Technical assistance was also complemented by efforts to inform industry and decision-makers about opportunities for project financing through small-scale programs under the ACF or by leveraging experience under EBRD and the Asian Development Bank (ADB) on larger scale energy finance. This integrated approach allowed CAEESP to establish an early platform that cut across a number of key elements of the LES and its early operationalization from both the enforcement and compliance perspectives.

Activities and results for each of the five tasks are described in sections 3.1 through 3.5 below.

3.1 Task I - Initial Assessment and Quick Start Prioritization

Task I Activities

To inform the CAEESP and to further develop the detailed work plan, the program began during Year I by assessing opportunities both in Kazakhstan and the region to create an enabling framework that focused the project’s work over the two year timeframe and beyond. While much of the work under Task I was completed during the early period of Year I, ICF continually evaluated the CAEESP approach in order to be current with the progress and priorities in Kazakhstan and the region, ensuring that the program was responsive and reflected the relevant needs of stakeholders, both governmental and non-governmental. The CAEESP team consulted and engaged a wide array of stakeholders during both years of the program. These included educational institutions, GoKZ agencies, industry members, international financial institutes (IFIs), non-governmental organizations and other potential project partners. The following table provides a snapshot of stakeholders consulted during Task I.

<p>Kazakhstan Agencies and Institutes</p> <ul style="list-style-type: none"> • Ministry of Industry and New Technology (MINT), Energy Efficiency Unit, Astana • Ministry of Environmental Protection, Kyoto Protocol Department, Astana • Kazakh Ecology and Climate Research Institute • State Agency for Construction and Utilities <p>Universities/Academia</p> <ul style="list-style-type: none"> • Al-Farabi Kazakh National University • Nazarbayev University • Eurasian Innovative University • Kyrgyzstan Power Engineering University <p>Non-Governmental Organizations</p> <ul style="list-style-type: none"> • Eurasia Foundation of Central Asia 	<p>International Organizations</p> <ul style="list-style-type: none"> • UNDP/GEF Project "Promotion of Energy Efficient lighting in Kazakhstan," Almaty • UNDP Project “Removing Barriers to Energy Efficiency In Municipal Heat And Hot Water Supply”, Astana • UNDP “Energy efficiency in Buildings, ” Astana • Delegation of the EU to Kazakhstan • Asian Credit Fund LLC • EBRD’s Kazakhstan Sustainable Energy Financing Facility” (KAZSEFF) • American Chamber of Commerce/Kazakhstan <p>Industries/Private Sector</p> <ul style="list-style-type: none"> • KazakhMys • KazPhosphate
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<ul style="list-style-type: none"> • Central Asia Regional Environmental Center (CAREC) • Kazakh Electro-energeticheskaya Associatsia (Kazakh Energy Association–KASEC), Astana 	<ul style="list-style-type: none"> • KazChrome • Almaty Power Station (ALES) • Azimut Energy Services (AES), Astana • EnergoAuditKazakhstan (EAK), Semipalatinsk
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Task I Results and Recommendations

Task I Results. While Task I was completed with the submission of the Inception/Task I Report deliverable early in Year I of the program, CAEESP maintained continued contact with its key stakeholders to stay abreast of developments in the energy sector. Continued engagement with the cross-section of stakeholders resulted in more tailored and responsive interventions in the CAEESP work program, such as training workshops, site gap analysis and demonstrations, and other assistance activities, as well as contributing to larger participation in CAEESP events. Priorities, needs, gaps, and recommendations from the Task I consultations allowed the CAEESP team to identify potential partners and priority focal areas for the program, which were: (1) industrial sector compliance; (2) municipal planning support; (3) retail/business awareness on product labeling; (4) policy support of MINT and other GoKZ agencies on LES administration and regulatory development; (5) academic/educational research, knowledge management, and curriculum development on EE, energy audits, and energy management; (6) public awareness campaigns and information dissemination support from NGOs; and (7) financing and resource leveraging from donors and the financial sector.

The CAEESP achieved a significant level of commitment and engagement from many of the stakeholders identified during Task I implementation, such as MINT, KEE, KazPhosphate, KazChrome, ACF, ALES, Al-Farabi Kazakh National University, and the CAREC. Their participation in CAEESP activities was critical to the success of the project and in the sustainability of the program interventions. As a result of CAEESP, several of these partners are better positioned to also participate in the follow up USAID program, the KCCMP, having had training and other technical assistance support from CAEESP. The CAREC in particular became a key regional partner for the program, where it is also serving as the Central Asian platform for capturing knowledge and information under CAEESP and disseminating it regionally in Central Asia through its network of offices and programs in the region. The CAREC is currently working with ICF on a related energy efficiency knowledge management portal, also funded by USAID (the Central Asia Energy Efficiency Learning Portal, or CAEELP).

Task I Findings and Recommendations. The findings from the stakeholder consultations and prioritization efforts under Task I were delineated in the CAEESP’s Project Inception Report and helped inform the direction of the project for the remainder of the two years of the program. Capacity building needs and gaps relative to the LES were also summarized earlier in this Final Report and, combined with stakeholder interests under Task I, helped the CAEESP team adjust the activities for the CAEESP to reconcile with some planned activities prior to the award of the program to ICF. From the onset, many large industrial companies in Kazakhstan had a strong interest in ISO 50001 to help fulfill the requirements of the LES and help them be

more competitive on the global market, thus CAEESP focused more attention and resources to larger industrial needs on EnMS and ISO 50001, given the CAEESP team's in-depth experience in industrial EnMS and expertise in ISO 50001 requirements.

In addition, to help the GoKZ and industrial entities respectively enforce and comply with Article 16 of the LES, which requires that entities under the SER (with the exception of government offices) undergo a mandatory energy audit at least once every 5 years, the CAEESP team expanded and adapted trainings on energy audits, targeting large industrial energy-consumers and other relevant organizations. Findings under **Task 1** resulted in more emphasis and resources devoted to awareness and ISO 50001 and EnMS issues, and in turn reducing the extent of engagement in project finance and EE project development under **Task 3** and support for the fostering of Energy Services Companies (ESCOs) under **Task 4**. To sustain and build upon the stakeholder assessment and prioritization efforts under Task 1, CAEESP recommends that future activities be implemented to strengthen "communities of practice (CoP)" on EE and energy savings in Kazakhstan, particularly with respect to enforcement and compliance with the LES. The extensive list of CAEESP stakeholders and consultations with them can serve as a basis for establishing this CoP, where academia, industries, and GoKZ representatives can have a forum or platform to share information, priorities, and progress regarding LES implementation and compliance.

Annex A of this report includes some early recommendations to USAID developed during the CAEESP on potential short term assistance projects to support some of these issues, including establishing Industrial Working Groups and conducting further outreach events to industry regarding compliance and potential public-private partnerships on EE and energy savings. The *Central Asia Energy Efficiency learning Portal (CAEELP)* proposed on the Annex A list has been funded and is underway, developing an electronic platform for information sharing on EE and energy savings in the region and seeking to connect energy stakeholders from academia, government, industry, NGOs, and citizens. The CAEELP scope is focused on the creation of the portal and early stakeholder engagement, but additional support to the implementing entity, the CAREC, is recommended to further the CoP objectives and approach. This stakeholder platform will enable a robust and continual mechanism for ensuring current priorities and progress on EE and energy savings in Kazakhstan and regionally, as begun under task 1 of the CAEESP.

3.2 Task 2 – Stakeholder Awareness Raising and Training in EE Approaches and Technologies

Despite ongoing and recent efforts promoting EE in Kazakhstan, the industrial, public and commercial sectors continue to have a very low level of awareness regarding EE opportunities in the country. Task 2 of CAEESP relies on ICF's experiences and tools to raise awareness of EE approaches and technologies among the target sectors within Kazakhstan and the broader Central Asian region. In order to maximize impact and contain costs, the awareness-raising and training activities were often implemented in collaboration with other government, private and donor-sponsored initiatives. With some parallel training and educational efforts occurring in Kazakhstan, CAEESP sometimes assumed a clearinghouse and coordinator role. As part of the

CAEESP's training development and monitoring and evaluation process, the CAEESP team identified and screened when possible potential participants from a cross section of industry, commercial, public and academic stakeholders to select the most relevant attendees; maintained detailed training participation lists; and tracked post-training evaluation and potential for future engagement.

CAEESP's classroom training courses were often supplemented by on-site training where facility managers were able to receive hands-on experience in low-cost energy efficiency retrofits and practices. The EnMS and energy audit trainings were particularly important to Tasks 3 and 4, helping to identify criteria and opportunities for bankable projects and to establish a professional auditor community.

Task 2 Activities

Task 2 essentially represented the core efforts of the CAEESP, where stakeholder awareness and furthering stakeholder support and buy-in to CAEESP objectives were important areas of focus in both years of the CAEESP. The CAEESP team continued to strengthen its institutional relationships began under Task 1 with such regulatory bodies as KEE and the Kazakhstan Technical Regulation Committee (KTRM) of MINT and organized joint planning and implementation activities. Through CAEESP's established working relationship with public and private stakeholders in Kazakhstan, the CAEESP team developed and conducted a tailored and responsive CAEESP work program that included a series of training events (workshops, conferences, presentations, etc.) focusing on the key subjects of energy audits, ISO 50001 and Energy Management Systems (EnMS), in line with the requirements of the LES.

Participants of events organized by the CAEESP (including participants from other Central Asian countries) included governmental and non-governmental delegates who had responsibilities and interests in administering and implementing EE policies and measures (including in response to LES requirements). The CAEESP awareness, education, and training efforts under **Task 2** also coordinated with and leveraged opportunities to participate in other trainings and events in Kazakhstan in the energy sector.



Dr. Trofimov of CAEESP presenting analysis of the Kazakhstan EE law and importance of EE to the representatives of several Ministries. Astana, May 2012.

EE Policy and Regulatory Support. An evaluation of the 'Law on Energy Savings and Energy Efficiency (LES)' was completed by CAEESP's local energy expert, Dr. German Trofimov, and the findings were presented to MINT in 2012. CAEESP's report also addressed implementation steps relating to the LES and helped KEE and MINT to develop their action plan for implementation. As a follow-up to a request by the State Committee on Energy Control (SCEC), CAEESP conducted further research to support regulatory development under the LES, specifically pertaining to the energy audit certification process.

Municipal EE Support. To help address requirements in the LES for municipalities to have Municipal Energy Action Plans (MEAPs), the CAEESP team targeted selected akimats (Almaty Akimat) and two in Pavlodar Oblast to help with the development of their MEAPs. These municipal support activities helped to serve as models for other municipalities and were done in coordination with the Covenant of Mayors (CoM) program. CAEESP completed a review of a Almaty MEAP, which covered only residential and municipal buildings, providing recommendations to improve the plan. In Pavlodar, CAEESP supported two municipalities, Aksu and Ekibastuz, conducting training and seminars on topics such as “energy assessments in the municipal sector,” and engaging with local authorities to raise awareness of EE and energy savings opportunities. The CAEESP team worked on the development of the municipal road map for energy management, which described a clear sequence of targeted actions in the legal, technical, financial and economic areas to reduce energy consumption. The road map sought to show the sequence of measures to be taken by the akimat and is the first step to implement energy management in the municipal sector. It was initially tested at a CAEESP training in Aksu and submitted to USAID for review in late 2013.

Tailored Energy Audit, EnMS and ISO 50001 Training. CAEESP organized a series of sessions on energy audits and ISO 50001 over the two years of the project to address key requirements in the LES on energy management and audits, working closely with the Energy Auditor’s Association of Kazakhstan (EEAK) and selected GoKZ and industry partners. Participants were introduced to best practices on energy audits, energy resources management, elements of the ISO-50001 standard, and EnMS planning and implementation. CAEESP presenters described the structure and mechanisms needed to support effective energy management and continuous EE improvements.

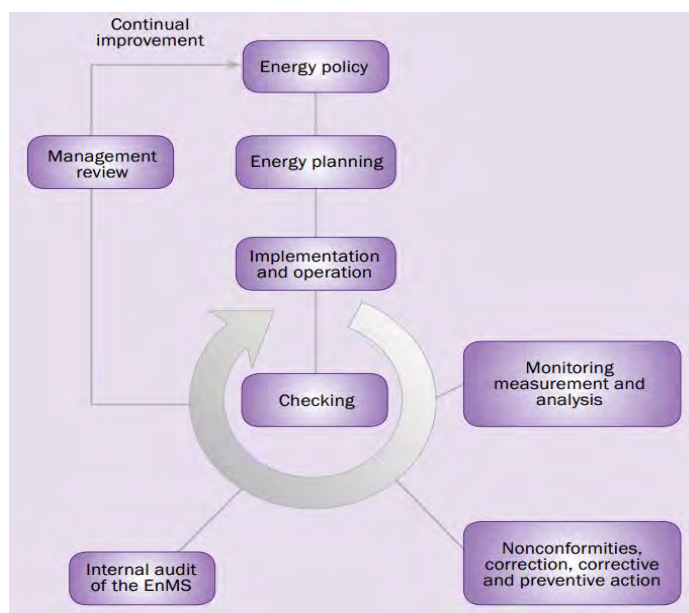


Figure 1 Energy Management System Model

Raising Awareness through EE Labeling and Products. CAEESP built upon ICF’s extensive experience with USEPA’s ENERGY STAR program on public awareness and EE product labeling to help support a better understanding of and compliance with Article 12 of the LES, which states that “technical documentation of all electric energy-consuming devices marketed in Kazakhstan shall provide information on the energy efficiency of the device.” In March 2012, CAEESP staff briefed MINT, KTRM, KEE, and other energy efficiency stakeholders in Kazakhstan on the organization and operations of the US ENERGY STAR program, introducing key elements of ENERGY STAR that have made it a success and identifying those that can be adapted into the labeling program in Kazakhstan, both at the early stages of development and after full implementation. As a result of the briefing, the CAEESP team prepared and submitted

a report to MINT outlining potential areas of interventions on EE product labeling and EE awareness raising within the commercial retail sector. The team followed up the report with targeted training at three major electronics retail stores: 'TekhnoDom' (TechHouse), 'Planeta Elektroniki' (Planet of Electronics), and 'Sulpak'.

Industrial Outreach Events and Other Awareness Raising Activities: Under Task 2, the CAEESP team organized an industrial sector outreach event in 2013 to present case studies from the EnMS work. Representatives from MINT, SCEC, and KEE provided updates on the LES implementation to representatives from industry, associations, universities, municipal governments, and donor organizations. Linkages to other industry events were also promoted by CAEESP. CAEESP continually collaborated with other organizations when possible to promote EE and energy savings, such as collaborating with KAVEIK on its launch of an energy publication in late 2013. CAEESP program staff prepared suggestions for articles on energy efficiency and energy technology. These include articles on updates to implementation of the energy efficiency law, a comparative analysis of the ISO 50001 gap analysis completed under CAEESP, and a road map for municipal energy efficiency programs.

Furthering Sustainability through an EE Learning Portal. As part of the CAEESP strategy to sustain the awareness and knowledge management efforts, ICF and the CAEESP team were able to leverage additional funding from USAID/HQ for a complementary "Central Asia Energy Efficiency Learning Portal (CAEELP)," to be housed within a key CAEESP partner, the CAREC. The purpose of this portal is to create a community of practice for EE professionals in the Central Asian region, and to provide a common platform to share successes, failures, and technologies on EE and energy savings, building on the platform partly created by CAEESP. The CAEELP is underway at this writing, and will be available to the public in early 2014. While the content will be user-uploaded, efforts to date by the ICF and CAREC teams include aggressive outreach to local and regional stakeholders, including universities, equipment manufacturers and suppliers, auditing associations, and government agencies participating in this community of practice. The CAEELP is designed to disseminate EE knowledge, technologies, and experiences throughout the Central Asian region, and will maximize impact and distribution of CAEESP tools and reports developed during the two years of the program. CAREC's regional mandate and presence serves as an excellent platform for knowledge sharing and regional collaboration.

Task 2 Results and Recommendations

Task 2 Results. The approach and expected results of this task stem directly from best practices and lessons learned from the U.S. and other international experiences. The CAEESP provided a platform for information sharing, constructive discussion, and capacity building on topics such as enforcement and compliance issues relative to the LES, incentives for energy savings, and financing of EE and energy savings projects. During workshops and trainings, CAEESP staff were able to assess views of the regulated communities regarding a variety of issues, such as the status of energy auditor certification and the requirements under the LES. Industry representatives had a forum to express, for example, their frustration with the slow pace of energy auditor certification, which impacted their ability to comply with the requirements of the LES. These discussions resulted in the CAEESP's efforts to prepare a survey of industry regarding the LES and challenges to compliance. The CAEESP survey then

informed the project's recommendations to MINT and KEE on how industry can be supported by the GoKZ to meet the requirements of the LES.

Successful awareness raising and training was partly measured by the corresponding follow-up actions from participants to apply tools and knowledge acquired from CAEESP trainings. For example, following the CAEESP team's workshop on EE product labeling for the second electronics/white goods store chain (*Tekhnodom*) in January 2013, Teknodom confirmed that it planned to integrate parts of the presentation into its salesperson-consultant training and that it will focus more attention on EE and energy savings measures in its own training programs.

The CAEESP helped establish a foundation for increased EE awareness for the GoKZ, the regulated industrial and business communities, and household energy consumers in Kazakhstan. The increased awareness across the spectrum of stakeholders – with continued reinforcement post-CAEESP under the KCCMP, the CAEELP, and other programs – is intended to result in more industry understanding of incentives for energy savings and EE, application of EnMS and sound energy practices, and increasing use of energy efficient products. This deeper understanding will lead to energy savings.

Task 2 Findings and Recommendations. CAEESP's awareness and training activities under Task 2, as described above, identified more needs and gaps in the regulated community's: (1) understanding of the newly revised LES and its requirements; (2) lack of readiness to comply in accordance with the timelines proposed under the LES; (3) experience with ISO 50001 and energy audits; and (4) perception of minimal incentives for implementation of EnMS. From the GoKZ's perspective, the CAEESP team also identified additional capacity building and technical support needed to translate the provisions of the LES into a workable and enforceable regulatory framework, accompanied by requisite guidance and outreach to industry and municipalities to aid with regulatory compliance. GoKZ staff themselves could benefit further from training on technical areas such as EnMS and ISO50001. The CAEESP Team recommended that the bridge between enforcement from the GoKZ (e.g., MINT, CSEC, KEE) and compliance by industry should be strengthened to ensure an effective rollout of the LES and the continued promotion of EE and energy savings activities in Kazakhstan.

The CAEESP team also found that despite general lack of awareness and experience, there were some organizations and industrial firms that were knowledgeable and experienced with sound EE and energy savings practices (described further under Task 3 activities and results). Moreover, through the universities engaged in CAEESP and organizations such as the EAAK, the CAEESP Team identified opportunities to further engage local resources in future training and energy services to support the LES implementation.

While the CAEESP was able to engage in a diverse set of awareness and training activities under Task 2, the limited size of the program and period of performance did not allow for in-depth interventions on a number of technical training topics, nor was the project able to engage very deeply across the entire spectrum of regulated industries, municipalities, and business sectors. Instead, CAEESP focused on supporting (a) larger, energy intensive industries, selecting several to conduct deeper dive assessments, and (b) three key municipalities (Almaty, Aksu, and Ekibastuz). The CAEESP's approach provided a platform, methodologies, tools, training

materials, and case studies to build upon for further expansion within Kazakhstan and regionally in Central Asia.

The CAEESP team recommends continued capacity building and awareness raising initiatives to promote EE and energy savings, including targeting households and financial institutions, by building on some of the models and examples under CAEESP. The CAREC's early start on EE knowledge management with the USAID-funded CAEELP and the new USAID-supported KCCMP are two ongoing efforts that are following up on to the work under Task 2.

Annex A includes further recommendations for potential projects to (a) build industry partnerships and networks, (b) establish university-based industrial assessment centers, (c) develop industry and technical guidance documents, and (d) conduct other awareness and training activities.

3.3 Task 3 - Energy Efficiency Project Development and Financing

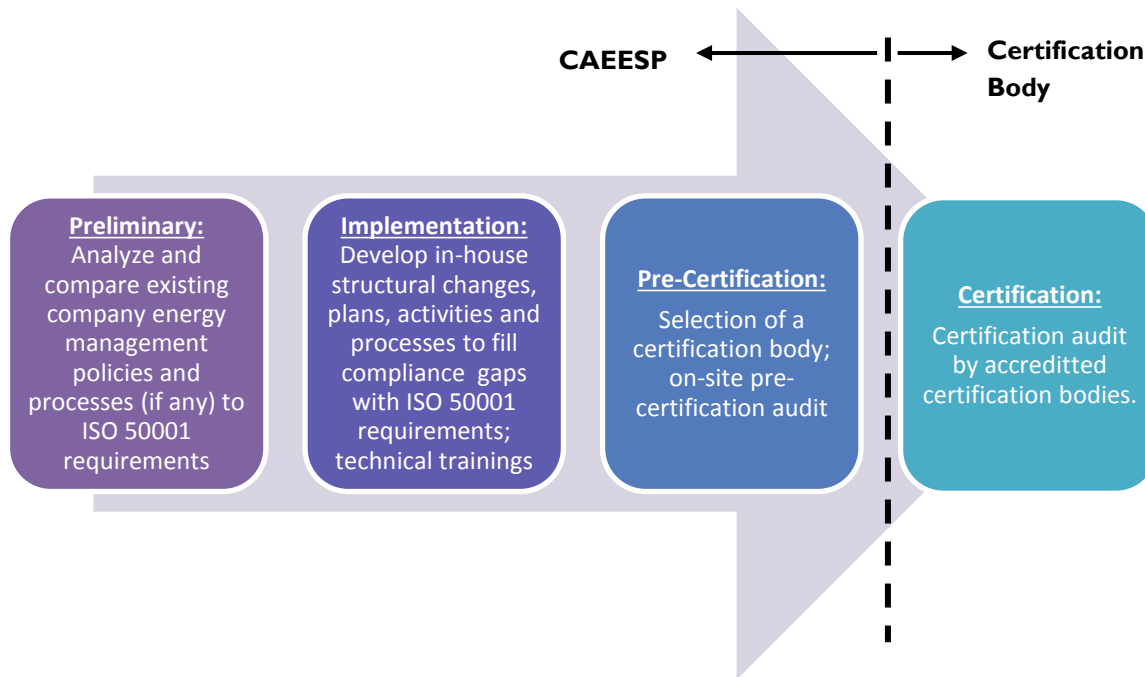
Task 3 Activities

The CAEESP emphasized identifying EE projects within energy-intensive sectors (e.g., industry, municipal buildings, large scale residential blocks, single enterprise townships). CAEESP worked with individual industries as well as central, regional, and local authorities (GoK, Akimats, municipalities) in identifying such project opportunities. These projects were mainly geared towards implementation of EnMS in compliance with the LES and ISO 50001. Project development activities included energy audits, process optimization, and feasibility studies of improvement opportunities to facilitate individual investment or external financing. The CAEESP team particularly targeted energy-intensive, larger industries for its technical assistance interventions, supporting selected large industrial companies in implementing an effective EnMS, prioritizing energy performance improvement; setting compliance with the LES was a secondary goal. The timeframe established in the LES for the SER formation and its mandate for industry's EnMS compliance coincided with part of the CAEESP project timeline, enabling the CAEESP to further support the implementation of the LES.

Industrial Support Activities. At the project or facility levels, the CAEESP team worked directly with selected industrial companies on energy management systems and ISO 50001 analysis, instilling sound technical and management energy practices at targeted facilities where possible. In Year 1, for example, ICF partnered with the US Department of Energy (USDOE) and its Oak Ridge National Laboratory, which had secured several agreements or expressions of interest from industrial clients (including KazPhosphate, KazChrome, KazakhMys, ALES [Almaty Power Plants], and KazTransMorFlot) to engage in facility ISO 50001 gap analyses.

For the on-site industrial support activities, the CAEESP team followed an approach of analyzing the existing position of each targeted company and adapting tailored support that would prove most useful to each. Such a focus on effectiveness ensures that each company receives appropriate assistance and progresses towards implementing an effective EnMS in compliance with ISO 50001 requirements and the LES.

The figure below provides an overview of support provided by CAEESP under the three steps prior to ISO 50001 certification: (1) preliminary analysis of existing policies and processes relative to ISO 50001 requirements; (2) implementation of trainings and development of facility process improvements and management measures to work toward ISO 50001 compliance and EnMS development; and (3) pre-certification audits and selection of certification bodies.



At each facility, the CAEESP team analyzed the level of EnMS preparedness of each company with regard to compliance to ISO 50001 requirements, focusing in particular on the existing programs in place for monitoring and recording energy data, whether energy-related roles have been assigned to staff, whether incentives for EE improvement exist, and whether management pays attention to the energy performance of facilities.

On-site ISO 50001 gap analysis. For Kazakhmys, Kazphosphate, and ALES, the CAEESP team conducted an on-site gap analysis, and then built capacity of the companies to conduct future analyses or train others on the methodology. The on-site gap analysis was aimed at supporting the companies to: (1) understand how their existing EnMS complies with ISO 50001 requirements; (2) identify gaps of their EnMS to ISO 50001 requirements; and (3) address the identified gaps. Overall, the information was gathered through interviews with management and staff, as well as limited documentation review. Where applicable, the CAEESP assessment team of experts applied assumptions based on an understanding of the plant’s existing EnMS flow, sequence, linkage, combination, interactions, and communication between each existing element. Interviews were generally conducted using interpreters, and documentation reviews were based on ad-hoc translations from the interpreter. Thus, the accuracy of collected data was limited by the translation accuracy. In order to assess the compliance of the documents and surveyed facilities of each company to ISO 50001 requirements, a scoring technique was developed and applied, accompanied by associated guidelines. According to ISO 50001

requirements, each analysis finding was assigned a scoring indicator between 0 - 1.0, with discrete increments of 0.25 within the score range, based on the following criteria:

- A score within the range 0.75 – 1.0 was given to an indicator that meets EnMS criteria. This score indicates a clearly-structured and well-defined program that substantially meets all or most EnMS requirements, where required activities and tasks are fully or substantially implemented.
- A score within the range 0.25 – 0.75 was given to an indicator when a program already exists, but it either does not substantially meet EnMS requirements in one or more areas, or it has not been implemented. Thus, the score suggests significant gaps in compliance.
- A score within the range 0 – 0.25 was given to an indicator that needs substantial improvement to meet EnMS criteria. The score suggests that the program either does not exist, or does not meet the main EnMS requirements in more than one area, i.e. it is significantly deficient or not implemented. The report of findings includes suggestions for improvement of the EnMS development and implementation process, taking into account realistic and feasible activities.

Using this scoring method, the indicators for each ISO 50001 requirement that were assessed by the experts using collected data and site visit observations, were summed up to determine an average % score. The results of the scoring and the average were reflected in the assessment report, which was later distributed to key management representatives at the company.

The CAEESP team provided EnMS support to three of largest natural resources companies in the country – Kazakhmys, Kazphosphate, and Kazchrome. CAEESP activities at these three companies are summarized below:

Cooperation with KazPhosphate: Representatives from the various mining and processing facilities – including plant managers, energy managers, and quality control staff – participated in the CAEESP ISO 50001 workshop. Presentations on ISO 50001 and industrial energy management were made by CAEESP staff, and KazPhosphate selected the Taraz plant as the site for the gap analysis. The gap analysis was conducted in November and the gap analysis report submitted to KazPhosphate for review. In addition, the auditing team conducted the gap assessment audit on-site at KazPhosphate's Novodzhambul Phosphoric Plant to assess the key gaps in its existing EnMS to the requirements of ISO 50001. Audit findings indicate that KazPhosphate already has a well-established, implemented, and maintained EnMS operating since the plant was setup in the 1970s. KazPhosphate's top management is very engaged on the plant's EnMS along with a strong, competent team of energy management representatives throughout the plant and frequent detailed reports on energy performance, backed by good energy data records. The current EnMS is not set up to ensure continual performance improvement, however. KazPhosphate indicated that they completed their review of the report and concurred with its findings.

Cooperation with KazChrome: In December 2012, KazChrome invited over 60 participants from seven of its plants to participate in a CAEESP workshop to kick off the ISO 50001 gap analysis. The meeting took place at the KazChrome headquarters building in Aktobe, with

participants from the plants on remote video connection. An ISO 50001 pre-certification audit with KazChrome was completed during the second quarter of FY 2013 and the CAEESP team was impressed with KazChrome's readiness for the ISO 50001 certification. KazChrome is in the process of having all of its sites certified and had gathered the documentation for the pre-certification audit. CAEESP reviewed general documentation and specific documents for one of the sites near Aktobe. The KazChrome pre-certification audit report was completed, translated, and submitted to KazChrome and USAID for review. Subsequent discussions with KazChrome indicated satisfaction with the report and progress toward ISO 50001 certification. Its ISO certification consultant and KazChrome planned to complete the certification by the end of 2013.

Cooperation with KazakhMys: At the EAAK's energy audit training for KazakhMys in September 2012, the Chief of the Energy Saving Department expressed interest in having CAEESP work with the company on a gap analysis for ISO 50001, specifically with the company's operations in the Ust-Talovka village where they have copper-zinc ore mining and processing facilities. KazakhMys also provides heat and hot water to the town. The CAEESP kick-off meeting with KazakhMys in February 2013 included over 70 energy managers and plant managers from all of KazakhMys's mining and processing plants. The CAEESP team subsequently completed the gap analysis in late February 2013 and KazakhMys expressed interest in follow-up technical support to assist them in establishing an energy management system at their Ust-Talovka plants. The gap analysis report for KazakhMys was completed and a set of action steps was developed for potential support by CAEESP. KazakhMys indicated that they would appreciate additional assistance to develop their energy action plans. However, due to the timing of CAEESP and KazakhMys's inability to clearly articulate areas of potential assistance, no further work was designed before the end of CAEESP.

Municipal Project Development Support Activities. To help with LES requirements for municipal energy action plan development, the CAEESP team cooperated directly with selected individual akimats in the development of their Energy Action Plans, particularly in Almaty and Pavlodar. In addition to assisting with energy action plans at the municipal levels, under Task 3, the CAEESP team conducted training and capacity building activities to help akimats in Pavlodar to better able develop and address EE project development and finance issues. In January 2013, the Pavlodar akimat sought CAEESP training support on energy audit and energy management for municipal building energy managers. The training is in support of the energy action plan for the oblast and fulfills a specific training need that was identified in the plan. A two-day energy management and energy audit seminar, "Energy Assessment in the Municipal Sector", was designed to meet the specific needs of municipal energy managers.

CAEESP teamed with the EAAK to also clarify legislative requirements pertaining to energy audits. CAEESP provided trainings in June 2013 in Ekibastuz and Aksu in the Pavlodar Oblast for municipal energy management and energy efficiency technologies. The training covered energy management for the municipal sector and included a walk-through audit for two selected schools. The training was attended by more than 60 people and comprised participants from the akimat, housing, health and education sectors, as well as one representative from the Eurasian Innovative University in Pavlodar. The training program

included municipal energy management, EE measures, and the development of a municipal energy road map.

EE Financing Facilitation Activities. The CAEESP focused more on the technical assistance training and awareness on EnMS, ISO50001, and energy audit issues, but was also able to implement several activities on EE financing that were delineated in the original scope for Task 3.

Assessment of EE Financing Context in Kazakhstan. During the initial phases of project implementation, CAEESP consulted with representatives of several multilateral banks, including ADB, the International Finance Corporation (IFC), and the EBRD, to review the local project financing context in terms of its challenges and opportunities for EE financing. Securing investment for EE projects in Kazakhstan is a challenging problem, and the investigations conducted by the CAEESP team revealed that organizations engaged in this effort, such as the EBRD, have during the recent years struggled in this task. The EBRD's Kazseff facility, for example, was designed and executed expressly with the aim of funding EE project investment. It had available a fund of Euro 75 million working through national banks, but ultimately struggled to secure new projects in middle sized or smaller firms. Risk reduction required some creativity in an investment climate where the costs can easily outweigh the financial gains, and in a relatively tight capital market where competing commercial projects are more financially attractive than EE investment opportunities.

The CAEESP team continued to gather information of financing context and opportunities by participating in national and regional events organized by the United Nations Economic Commission for Europe (UNECE), the UN Economic and Social Commission for Asia and the Pacific (ESCAP), the UN Development Program (UNDP), which shared international experiences and approaches to EE financing and investments. In April 2013, CAEESP worked with UNECE and ESCAP to co-sponsor an EE financing workshop in April 2013 in Kazakhstan entitled "International Training Course on Business Planning for Energy Efficiency Projects," where case studies of policy reforms to promote EE investments were shared and recommendations for adoption of similar approaches to other country contexts were discussed. The CAEESP team also participated in UNECE's Third International Forum on Energy for Sustainable Development, held in Kyrgyzstan in September 2012, with the theme of "Capacity building for EE and access to cleaner energy in Central Asia and neighboring regions." Financing of EE and low emissions projects was a key part of the program agenda for the Forum and the CAEESP team captured information of lessons learned and resources on financing and investment issues as part of the knowledge sharing and management efforts of the CAEESP.

Building EE Capacity of ACF Loan Officers. In addition to assessment and information gathering on EE financing and investments, the CAEESP team proactively worked to assist with actual financing for EE improvement projects. In 2012, CAEESP partnered with ACF to help homeowners identify and evaluate EE investment opportunities and improve access to financing for those projects. CAEESP organized a 3-day training program that included the development of a methodology and scorecard for ACF loan officers to use in evaluating energy efficiency loans. The scorecard evaluated common measures such as insulating doors and windows, heating supply options, lighting, solar hot water, and wall insulation. Habitat for Humanity

International, a U.S.-based non-profit organization, participated in the training to share its practical experience from Tajikistan on monitoring small construction projects in rural areas. CAEESP provided a scorecard mechanism for loan officers; this was designed to be quick and simple because the transaction cost associated with these loans (typically <\$2,000 USD) must be small. The objectives of the training were to:

- Introduce participants to the concept of housing poverty and housing finance
- Increase participants' knowledge in housing loan product features and processes.
- Build field staff capacity to provide construction technical assistance to their clients.



Training for loan officers from the Asian Credit Fund on energy efficiency for rural households. Almaty, August 2012.



Training follow-up site visit, to Shelek village, by CAEESP expert and Asian Credit Fund loan officers.

CAEESP and ACF also developed joint promotional materials, such as brochures, “how-to” videos, and case studies of energy efficient households to further promote EE and energy savings at the household levels.

Task 3 Results and Recommendations

Task 3 Results. The variety of industrial, municipal, and financing facilitation support activities under Task 3 resulted in an increase in the capacity of targeted stakeholders to examine the potential impacts of the national LES on local level EE and energy savings opportunities at the site/plant and project levels. Training and onsite demonstration activities instilled best practices and hands-on, real-time process improvements and facility performance enhancement approaches, thereby building the capacity of company authorities and plant managers to better develop EE and energy savings projects. Reviews of the CAEESP trainings and capacity building interventions were very positive from the industry participants, and built momentum for technical and management best practices on energy management systems.

At the municipal level, CAEESP combined support for Municipal Energy Action Plan (MEAP) development and reviews with technical training and workshops that targeted specific types of site-level technical issues, such as how to conduct walk-through energy audits at selected schools. As a result of CAEESP support, stakeholders at the municipal levels are better able to

develop practical and local energy action plans that take into account project level EE and energy savings opportunities.

Complementing this technical support for energy action plans with CAEESP's financing facilitation work with the ACF provided additional tools for small-scale project financing of EE initiatives. An achievement of the CAEESP-ACF collaboration was that ACF loan officers now have necessary skills to assist their rural clients with incorporating energy efficient measures into their loan applications and to promote energy efficiency loans throughout ACF's 21 loan offices in Kazakhstan.

Task 3 Findings and Recommendations. Task 3's financing facilitation, municipal EE support, industrial sector support for ISO 50001 certification, and on-site EnMS gap analysis identified varying levels of awareness and expertise, commitments to energy management, readiness for ISO certification, and opportunities for EE financing. Nevertheless, the CAEESP recognizes the limitations in the reach of the CAEESP team's Task 3 interventions, where for resource and schedule reasons the program had to focus on a few selected facilities, municipalities (Almaty and Pavlodar), and financing facilitation schemes (rural households with the ACF).

ISO 50001 Certification: For the facilities examined by CAEESP, the team noted that they were at varying steps on the path to ISO 50001 certification, with most having established some basic systems, policies and procedures for energy management at their facilities. Some of the companies were found to have made greater strides, specifically with respect to having elements of ISO 50001 already developed within their facility process and procedures. The CAEESP team's approach tailored assistance and advice to the specific needs of each company to help them progress to the next stage towards certification. CAEESP trainings and capacity building efforts on EnMS and ISO 50001 can be easily adapted to a broader selection of industries and enterprise sizes in Kazakhstan and the Central Asian Region. Through CAEESP, excellent case studies have been established and may be integrated into future training workshops and capacity building efforts as practical examples.

The CAEESP team recommends an expansion of the work begun by CAEESP to other industry sectors as well as to target medium and smaller businesses that consume significant energy. Accordingly, efforts should be made to help industry work towards moving beyond compliance, where emphasis is also placed on incentives for energy management and voluntary support for EnMS and ISO 50001 certification, particularly for industries that might be exempt from these regulatory requirements. Annex A includes related recommendations for potential follow-on activities to CAEESP on energy management trainings.

Municipal Project Development Support: CAEESP's focus on municipal capacity building in Almaty and Pavlodar identified a great need for further local, municipal level capacity building on energy and EE action planning, local policy development, and technical aspects of EE program design and implementation. Municipal/Akimat staff need to understand the technical aspects of EE, EnMS, EE investments and finance, social outreach, tariff issues, and other topics in order to develop and implement LES-required sustainable Energy Action Plans for their respective akimats.

Annex A includes recommendations for follow on work to: (1) develop a more strategic and comprehensive approach to municipal clean energy action planning with a shift to low emissions development and/or (2) a green buildings public-private partnership program to provide technical assistance in best practice and best available technology to develop an “Eco-office” in Astana. Future programs may collaborate with the EU’s Covenant of Mayors (CoM) program and leverage expertise and lessons learned from the CoM to expand capacity building efforts to other municipalities in Kazakhstan and other Central Asian Republics.

EE Financing Facilitation: This aspect of Task 3 was not fully addressed under CAEESP, as deep-dive EE and climate financing initiatives at the national and regional levels would require larger program and budgetary resources, as revealed by consultations with multilateral banks (ADB, IFC, and EBRD, as discussed earlier under Task 3 under the heading “Assessment of EE Financing Context in Kazakhstan”). CAEESP recommends that additional program resources be brought to Kazakhstan to focus technical assistance on a variety of EE and energy financing and investment issues, building on the previous work of EBRD, ADB, the EU’s CoM, and CAEESP’s information gathering and loan support work with ACF. A robust capacity assistance program could include interventions on identifying and improving access to international climate financing, support for the development of bankable EE projects, and assistance with project cost/benefit analysis, to start. To explore options for stimulating investment into private and public sector EE projects, follow-on programs can, for example, assess the industrial/commercial sector with the aim of finding prospective investment projects, and examine the feasibility of creating a model approach for Demand Side Management (DSM) at the municipal level.

On-site ISO 50001 Gap Analysis: **Table I** below presents an overview of the findings and recommendations from CAEESP’s onsite gap analysis of specific firms under Task 3. The gap analysis approach can be adapted or replicated at other industrial sites as part of potential follow-on donor programs or as part of local or regional governmental or industry efforts. For more in-depth technical assistance, future programs might be able to work more deeply to analyze and advise on industry process improvement opportunities and develop EE and energy savings projects for financing.

Table I Summary of main findings at each company

Organization	Positive Notes	Constraints	Conclusions & Recommendations
Kazakhmys	<ul style="list-style-type: none"> The head office in Astana has a large department dedicated to EnMS, tracking frequent changes in corporate structure Strong commitment and focus on improving existing EnMS Engaged external consultants on pilot project with EnMS at one facility 	<ul style="list-style-type: none"> Company restructurings may hinder EnMS implementation The plan of EnMS integration into the company's structure is not established Highest level of management needs more EnMS awareness Shortage of EnMS staff to cover all departments 	<ul style="list-style-type: none"> Top management at the corporate level needs to understand the EnMS implementation strategy More dedicated resources needed to achieve overhaul of EnMS Energy costs comprise a minute percentage of overall expenses, leading to lower interest in EnMS
Kazphosphate	<ul style="list-style-type: none"> Maintain a functioning 40-year-old internal EnMS standard, many elements of which already comply with ISO 50001 Very cohesive corporate structure, with top management involved in EnMS and related operations 	<ul style="list-style-type: none"> Substantial financial constraints cause scarcity of necessary EnMS personnel Exceptionally old facilities using aging and failing equipment Energy costs are subsidized by the government, with a requested increase to compete in the global market 	<ul style="list-style-type: none"> Need to develop large and small-scale dedicated investment strategies to align with long-term objectives for company modernization and to focus on 'low-hanging fruit' for improving energy efficiency, respectively
Kazchrome	<ul style="list-style-type: none"> Well-organized EnMS implementation structure and strong commitments from top management Well-developed plan to achieve ISO 50001 certification for 4 plants in the company's ferroalloys department 	<ul style="list-style-type: none"> Risk of overcomplicating the maintenance of ISO 50001 certification when applying procedures specific to ISO 9001 and ISO 14001, which may lead to inefficient use of resources 	<ul style="list-style-type: none"> Kazchrome implemented CAEESP's recommendations and later achieved ISO 50001 certification, noting that the support came at a crucial time and fixed important gaps in the company's EnMS
ALES	<ul style="list-style-type: none"> Well-functioning existing EnMS that already addresses many ISO 50001 requirements Parent company commits financial resources to develop EnMS and key personnel is knowledgeable in EnMS Well-maintained CHP plants operate in good condition 	<ul style="list-style-type: none"> Weak inter-department communications within ALES corporate structure Not proactive in implementing EnMS improvements and wait for parent company's decision Does not make use of internal knowledge, preferring consultants 	<ul style="list-style-type: none"> Top management needs more EnMS understanding to develop a top-down plan Improve communication and integration between departments to use internal staff experienced with ISO 9001 and ISO 14001 on implementing ISO 50001

3.4 Task 4 - Support for Private Sector Energy Efficiency Service Providers

Task 4 Activities

Under CAEESP, ICF originally aimed to build the foundation for the development of ESCO-related business by training companies on how they can benefit from EPC and ESCO services, educating loan/equity providers on how they can profitably invest in ESCOs backed by EPCs, and developing a pipeline of energy efficiency projects, which can be implemented under the EPC/ESCO model. However, with the current limited and still fledgling state of ESCOs in Kazakhstan, the CAEESP team revised the scope of Task 4 to emphasize the continued development and outreach on the types of services that would be useful for EE service providers to provide – such as energy audit training and certification support, EnMS gap analysis, and regulatory compliance support – rather than specifically working to improve the environment for the creation of ESCOs.

The CAEESP team partnered with existing organizations such as the Energy Audit Association in Kazakhstan (EAAK) and other private companies to transfer knowledge and conduct joint training and capacity building activities. The EAAK collaborated with CAEESP on several training workshops and seminars, providing presentations on energy audit principles and regulatory context in Kazakhstan. In 2012, CAEESP worked with *Samruk Energo* to develop joint training and EnMS capacity building activities, targeting the CHP-2 plant (part of the broader ALES Power Plant group) in Almaty as the target for an EnMS consultancy. The CAEESP team conducted a workshop for ALES on Kazakhstan's energy policy and the energy efficiency law, EnMS, and the ISO 50001 standard. The CAEESP/Samruk Energo team then conducted an ISO 50001 gap analysis at one of the combined heat and power (CHP) stations. The final ALES gap analysis report was submitted to ALES in September 2013.

Task 4 Results and Recommendations

The revised scope of Task 4 de-emphasized the original intent to identify and train a cadre of professionals in the principals of Energy Performance Contracting (EPC) and third party 'ESCO' financing, as the basis for building an ESCO sector in Kazakhstan when market conditions improve, thus the achievements with regard to the original metric did not occur. The CAEESP team proposes that follow-on projects such as KCCMP might consider addressing this objective, which would typically involve a mixture of legal, financial, and technical training, along with examination of models from other countries, where trainees might be able to design an ESCO model suitable for use in Kazakhstan, including the development of necessary legal documentation and financing assessment tools. Instead, under Task 4, the CAEESP achieved success in working with existing organizations such as the EAAK, Samruk Energo power group, plant managers, and other industrial entities to enhance their knowledge and expertise on EnMS, ISO 50001, and energy audits, and their own abilities to further train or provide energy services to other stakeholders.

3.5 Task 5 – Regional Analysis and Recommendations

Kazakhstan is arguably the Central Asian leader in the area of energy market reforms and is likely to be the first country to implement the regulation enabling market-based EE

mechanisms. While funding for CAEESP is primarily focused on interventions in Kazakhstan, the CAEESP team recognized the regional intent of the project and sought opportunities for engagement in other Central Asian countries, particularly through sharing of the CAEESP experience in Kazakhstan and understanding the respective contexts in Uzbekistan, Turkmenistan, Tajikistan, and Kyrgyzstan. CAEESP team participated in conferences and workshops outside of Kazakhstan and invited local and USAID participants from other Central Asian countries accordingly.

Task 5 Activities

All of the training and outreach activities included invitations to selected regional ministries, universities, and other stakeholders who could benefit from (and in some cases replicate and carry on) the training. CAEESP participated in a regional energy efficiency forum and events in 2012 and 2013 sponsored by UNECE and UNESCAP. In September 2012, CAEESP participated in the International Energy Efficiency Forum in Kyrgyzstan, sponsored by the UNECE, which attracted participants from all five of the Central Asian countries as well as other countries in Eastern Europe, Russia, India, and China. The Forum provided a good opportunity for CAEESP to meet others working in EE throughout the region, establish cooperative relationships for regional activities, and to raise awareness of the CAEESP's objectives and plans. CAEESP also invited representatives from Central Asian countries to each of the energy audit and ISO training events held in Astana during Year 1. Meetings were held to coordinate CAEESP's work with other agencies implementing programs in the Central Asia region, such as the CAREC and various IFIs. CAEESP also participated in the Covenant of Mayors kick-off event in Bishkek, Kyrgyzstan, on December 2012, providing updates on CAEESP activities, such as the collaboration with the ACF, and on municipal energy efficiency opportunities. Outreach and discussions were also held by CAEESP staff with the USAID Turkmenistan and Uzbekistan missions for potential expansion of CAEESP activities, but funding constraints limited further interventions in those countries.

The CAREC as a regional platform for CAEESP. CAEESP established a strong collaborative partnership with CAREC on a variety of activities in Kazakhstan and regionally, leveraging its technical and regional mandates and presence. Collaborative activities included municipal EE planning via the Covenant of Mayors' initiatives and exploring collaboration on energy auditing and EE training in Tajikistan and Uzbekistan in support of CAREC's work in developing Nationally Appropriate Mitigation Action (NAMA) Plans in the region. Specifically, CAEESP cooperated with CAREC on the design of energy auditing and energy efficiency training for Uzbekistan and Kyrgyzstan. In both countries, the focus of the training was on boilers, with the training content designed jointly by CAEESP and another contractor on the CAREC consortium. The ongoing Central Asia Energy Efficiency Learning Portal (CAEELP) project continues to complement the regional scope of CAEESP, involving heavily the CAREC country offices to engage with stakeholders in each country to participate in the Knowledge Portal. While not a direct CAEESP activity, it utilizes the lessons learned from CAEESP and disseminates the materials and reports more widely throughout the region through the web platform.

Task 5 Results and Recommendations

While regionalization of program activities was not the major focus of the CAEESP, as project resources were directed more to Kazakhstan (particularly after the passage of the LES in January 2012), the CAEESP team did achieve success in disseminating the CAEESP

experience in Kazakhstan to some regional stakeholders, including USAID and its partners in Kyrgyzstan, Uzbekistan, and Turkmenistan. The strong partnership between CAEESP and the CAREC, where the CAREC is leading the management of the CAEELP and stakeholder outreach efforts, provides a sound platform for regional information dissemination of EE best practices and lessons learned from the CAEESP experience. With country offices in each of the Central Asian countries, the CAREC can serve as an effective entry point for potential expansion of the CAEESP into other countries in the region. With additional funding support, the approach of CAEESP of tackling policy, technical, and financing issues can be adapted to other Central Asian countries, beginning with more in-depth EE opportunities assessments and strong stakeholder consultations to inform proposed work programs in each country. Energy efficiency benchmarking initiatives can also be designed to capture broader, regional data.

3.6 Significance of CAEESP for Energy Efficiency Processes Development in Central Asia

Summing up the activities and results across the five tasks, and their implications for extending the work across Central Asia, Kazakhstan's proactive approach to legal and policy reforms to address energy efficiency and energy savings through its newly revised law (LES), combined with its various national green growth strategies and policies, can serve as a possible model for other Central Asian countries. Lessons learned and applicable tools and resources stemming from Kazakhstan's roll out of the LES can be captured and adapted to the specific contexts in these countries. Although the level of GHG emissions and sources of emissions from industrial and other sectors vary among the countries, as well as the legal and policy frameworks, the general CAEESP approach to capacity building on EE and energy savings in Kazakhstan, focused on policy analysis, EnMS, ISO 50001, education, and knowledge management, are cross-cutting and may be adapted to other countries in the region. A robust CAEESP approach in Turkmenistan or Tajikistan, for example, could have similarly positive impacts on raising awareness of EE and energy savings opportunities, improving legislative developments, furthering EE investments and finance, and building capacity of both the governments and the regulated communities to better understand key aspects of EE and energy management best practices. This approach could in turn have potentially significant impacts on the EE process development in the Central Asian Republics.

4. MONITORING AND EVALUATION

The CAEESP Performance Monitoring and Evaluation Plan (PMEP) was prepared and submitted to USAID/CAR in November 2011. The table below provides the targets and final achievements over Year 1 and Year 2.

Final – Performance Indicators Targets and Achieved

Project Level Outcome: GHG intensity of energy sector in Kazakhstan is reduced by stimulating investments in energy efficiency		
Indicator	Program Targets	Achieved
Indicator P1: Quantity of greenhouse gas emission, measured in metric tons of CO ₂ equivalent reduced as a result of USG Assistance	No target set ¹	N/A
Indicator P2: Energy and materials saving due to improved practices as percentage of overall country's consumption	No target set ²	NA
Expected	Intermediate	Results (IR)/
Task Level Intermediate Results (IR) – Indicators, Targets, Milestones		
IR 1: Raised stakeholders' awareness of the importance of, and opportunities for, energy efficiency as a means of reducing end-user costs and GHG emissions (Task 2)		
Indicator	Program Targets	Achieved
Indicator 1.1: Number of awareness/outreach activity/events held	12	23
Indicator 1.2: Number of institutional stakeholders, firms, and industry targeted by awareness campaigns	130	233
Indicator 1.3: Number of people covered by awareness campaigns	1050	978
IR 2: Commercial banking sector is interested in developing lending products targeted at energy-efficiency investments (Task 2)		
Indicator	Program Targets	Achieved
Indicator 2.1: Number of awareness/orientation/education activity implemented targeting financial sector	4	5
Indicator 2.2: Number of financial institutions represented in project sponsored activities (including Asian Credit Fund)	6	10
IR 3: Increased private sector investment in energy efficiency measures (Task 3)		
Indicator	Program Targets	Achieved
Indicator 3.1.a: Number of small scale energy efficiency walk-through audits completed	5	0
Indicator 3.1.b³: Number of energy efficiency action plans leveraged	7	44
Indicator 3.2: Amount of public and private funding leveraged for energy efficiency investments	No target set ⁴	\$726,073
IR 4: Increased private sector capacity in developing and implementing energy efficiency projects (Task 4)		
Indicator	Program Targets	Achieved
Indicator 4.1: No. of people receiving USG supported training in energy auditing, ESCO and EPC practices; low-cost measures; voluntary energy efficiency policies, strategies and techniques (gender target –at least 30% of trainee will be women)	60	307 (48% - women)

¹ Per the *GCC Indicator Handbook*, the value of this indicator (i.e. emissions reduced) is zero since quantifying the activities poses a significant challenge (e.g., capacity building activities)

² Similar to above

³ Indicator 3.1.b has been added in Year 2.

⁴ Per the *GCC Indicator Handbook*, the indicator baseline is zero and only newly leveraged investment that is attributable to USG-supported efforts should be counted.

Indicator 4.2: Number of companies with increased capacity to develop and implement energy efficiency projects (gender target –at least 30% of trainee will be women)	10	7
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5. OBSTACLES DURING IMPLEMENTATION

The CAEESP encountered a number of challenges during the project implementation that sometimes hindered timely project delivery and required adjustments to planned activities. Challenges included administrative (pace of legal registration and local operational issues in Kazakhstan), staffing (staffing changes in Almaty project office), and confidentiality issues, described below. Nevertheless, most of these obstacles were overcome and CAEESP was able to achieve the key objectives of the program and laid a good foundation for follow-on interventions.

Administrative Issues

During the first quarter of the project, typical start-up obstacles were encountered, including working within the complex legal structure of Kazakhstan as a firm newly registered in the country beginning a new project. The pace of acquiring legal support and addressing legal requirements for local staffing and registration hampered immediate, quick operational start-up but it did not significantly affect the early Task I assessment and stakeholder outreach efforts. The project team was able to meet a variety of stakeholders and conducted three visits to Kazakhstan during the quarter.

During the team’s initial visit to Kazakhstan from October 17-28, 2011, meetings were held with senior-level Chokin Institute representatives who demonstrated interest in providing office space for the project and build stronger ties with the ICF team to engage the Institute’s staff members in project training activities. A draft Letter of Agreement was prepared for review by both parties (ICF and Chokin) and negotiations continued through November during a second ICF team visit to Almaty on a variety of issues. Additional terms and conditions posed by the Institute subsequently surfaced for the office space, including financial and equipment transfer requirements. The ICF team ultimately deemed some of the terms and conditions for the office space co-location within the Chokin Institute unacceptable for the project during a final round of meetings in December. Moreover, the team had some concerns that a strong commitment and affiliation with Chokin so early in the project’s stakeholder consultation and analysis process could potentially undermine the project’s perception of objectivity within Kazakhstan. The team however continued its relationship with the Institute, recognizing its reputation and expertise in Kazakhstan on energy efficiency, but communicated with the Institute that it sought project office space elsewhere.

Logistical and legal requirements presented unusual difficulties for registering an office in Kazakhstan. Registration required responding to a set of demands in strict sequence. The first act was to establish an office, which then triggered other parts of the sequence. Losing the Eurasia Foundation office premises on the day the lease was due to have been signed cost the project significant lost time and considerably set the registration process back. However, another office location was secured shortly thereafter and the registration process was completed. Once the project’s registration was finalized, project activities

picked up significantly, and were supported by more robust administrative infrastructure in-country.

Staffing Adjustments

CAEESP's approved CoP Evgeniy Nadezhdin began the project and traveled to Kazakhstan in October during the initial mobilization mission with ICF, but he was not able to fulfill his requirements under the project and had to be replaced. This contributed to additional project delays as the ICF team had to recruit and seek approval for a replacement candidate. Mr. Nadezhdin was replaced by Dr. Keith Little. Dr. Little was approved by USAID/CAR and began his assignment on December 5, 2011. Due to issues with Dr. Little, ICF replaced him with Mary Worzala, who began her role as COP in August 2012, and remained in Almaty through August 2013. Under Ms. Worzala's leadership, the project accomplished all of its key objectives, despite the initial challenges of identifying a COP with the appropriate (and rare) combination of technical, institutional, and management capabilities needed to direct the project.

Confidentiality

Working with the industrial sector, the CAEESP team found that many companies were not willing to reveal their current EE management activities due to business confidentiality reasons. In particular, Kazchrome was resistant to allow CAEESP's experts in their factories for energy audits. Following some exchange with the company, a non-disclosure agreement was sent from CAEESP to Kazchrome, which was then reviewed by the company's legal department. One of Kazchrome's main concerns was protection of sensitive information regarding the company's operations. Following several iterations of discussions between the CAEESP team and Kazchrome's legal departments, Kazchrome finally agreed to proceed without a non-disclosure agreement.

6. BUDGET AND EXPENDITURES

As of the end of the CAEESP program, expenditures were as follows:

Budget Category	Total Expended	Total Budget	Remaining
Personnel			
Other Direct Costs (ODCs)			
Subtotal Direct Costs			
Indirect Costs			
Total USAID			
Cost Share			
Total Program			

The difference between initial budget figures and final costs for Personnel and Other Direct Costs is due to the shift of the majority of technical labor during Year 2 from ICF staff labor to ICF consultant labor, due to the closure of the ICF/Moscow office. The remaining funds will be used to fully bill ICF's CY 2012 indirect rates on 2012 actual costs upon approval of ICF's rates from its cognizant auditing agency.

7. PROJECT PERSONNEL

During the first year, the CAEESP team underwent some changes to keep up with the needs of the program; however these changes did not significantly affect the pace of the program implementation. As noted above in Section 6, the Chief of Party position underwent some changes, as Keith Little, who assumed the role after the original CoP Evgeniy Nadezhdin was unable to mobilize to Kazakhstan, was himself replaced with Mary Worzala in August 2012. Additional local staff support was recruited during the first year. Short-term technical assistance (STTA) support included some changes from the composition in the original proposal. As of end of Year 2, the core project team consisted of the following:

Name	Position	Location
Mary Worzala	Chief of Party (CoP)	ICF - Almaty
Nadezhda Trubova	Operations Manager	ICF - Almaty
Daniyar Buxukbaev	Technical EE Expert	ICF-Almaty
German Trofimov	Senior EE Consultant	ICF- Almaty
Vitaliy Bekker	Senior Industrial EE Expert	ICF- Moscow
Andrei Dodonov	Senior Municipal EE Expert	ICF-Moscow
Yeen Chan	EnMS Expert	ICF-London
Bizhan Zhumagali	Energy Labeling Expert	ICF-London

Overall program management and operations support was provided by the ICF International's headquarters office in Fairfax, Virginia by Hoai Huynh, the Project Director, and by Daniel Cullop, Project Manager. Mr. Huynh was also the Deputy Chief of Party (DCOP) for the overall Energy Efficiency and Clean Development Program (EECDP), a Leader with Associates Award (LWA) under which CAEESP is implemented. Specialized short-term technical assistance was also provided periodically by ICF's Michaela Martin, Vice President for Industrial Energy Efficiency, and Mark Allington, Vice President, ICF Consulting London.

ANNEX A: RECOMMENDATIONS FOR FOLLOW-ON ACTIVITIES

Activity #	Activity Name	Summary Description	Target/Partner	Timeframe
1.0 Expansion of Industrial Sector Activity				
1.1	Energy Management Trainings	Develop a series of trainings (in person and online) based on ISO 50001	Medium and small industries	6-9 months
1.2	Industrial Partnerships and Development of Toolkits	Establish Industrial Working Groups to promote best practices within sectors; develop toolkits based on case study and sector feedback	Medium and small industries	12-24 months
1.3	Industrial Sector Benchmarking	Conduct benchmarking analysis for selected industries to identify greatest opportunities for energy and resource efficiency	Large and medium industry	12-18 months
1.4	Energy Guide: Improving Energy Efficiency in a Focus Industry	Develop an energy guide for specific industries to highlight best technologies and practices	TBD – one industry	6-12 months
1.5	Industrial Energy Partner Meetings and Networking	Promote industrial sector knowledge sharing and networking through regular in-person meetings and sectoral webinars	Medium and small industry	12-18 months
2.0 Municipal and Buildings Sector				
2.1	Municipal Sector Strategies for Low Emissions Development	Develop a more strategic and comprehensive approach to municipal clean energy action planning with a shift to low emissions development	Almaty, Pavlodar and/or Taraz akimat	6-9 months
2.2	Green Buildings Public-Private Partnership	Provide technical assistance in best practice and best available technology to develop an “Eco-office” in Astana	Kazakh Center for Public-Private Partnerships	12-18 months
3.0 Targeted Capacity-Building Initiatives				
3.1	University-based Industrial Assessment Centers	Establish Industrial Assessment Centers at one or two universities in Kazakhstan to train energy engineers in industry audits and develop an industrial database	ORNL, DOE, Kazakh universities	18-24 months
3.2	Higher Education Initiative for the Energy Sector	Work with one or two universities to develop a strong energy management curriculum and to provide intern and practical experience for university students	Kazakh universities; Ministry of Higher Education; energy sector stakeholders	18-24 months
4.0 GHG Emissions Tracking and Outreach				

4.1	Energy and Emissions Tracking Tool	Adapt the ICF Energy Tracking Tool developed for Energy Star for Kazakhstan	EPA, selected industries in Kazakhstan	6-12 months
4.2	Emissions Trading Outreach and Education	Develop a set of workshops with stakeholders on the requirements for establishing and emissions trading system	MINT, Ministry of Environment, large industrial clients, Ministry of Finance	3-6 months
5.0 Regional Activity				
5.1	Central Asian Energy Efficiency Learning Portal	Develop an on-line learning portal and energy efficiency equipment database	MINT, KEE, equipment suppliers, municipalities, universities	12 months
5.2	Low Emissions Development Strategies Capacity Building	Assist country partners to design and implement well-structured low-emissions development strategies through analytic tools, training and scenario-building	Host government policy-makers, universities and scientific research organizations	12-24 months