



## UNDP Project Document

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### **Energy-Efficient Design and Construction of Residential Buildings**

#### Brief description

The Republic of Kazakhstan (RK) has the seventh-most carbon-intensive economy in the world, emitting about 1200 tonnes of CO<sub>2</sub> equivalent per million dollars of economic output, as compared with a world average of about 500 tCO<sub>2</sub>e/mln\$. Its energy sector generates about 80 percent of total emissions, out of which about 90 percent comes from power and heat generation. Buildings, primarily residential, account for 13.5 percent of power and 24 percent of heat demand; the residential sector is the third-leading energy consumer in the country, after the energy and manufacturing sectors. Official projections and policy priorities call for rapid growth in the residential sector, which accounts for 97% of new buildings.

The goal of this project is to decrease GHG emissions from new residential buildings by transforming practices and markets in the building sector of Kazakhstan towards more energy-efficient design and construction. The proposed project will include four components, each targeting specific barriers and stakeholders: 1. development and enforcement of energy-efficient codes, standards, and labels for buildings; 2. expanded production and certification of energy-efficient building materials and products; 3. education and outreach to promote energy-efficient building design and technology; and 4. Demonstration projects on energy-efficient building design and construction.

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## List of acronyms

CENef	Center for Energy Efficiency
DOE	United States Department of Energy
EBRD	European Bank for Reconstruction and Development
EE	Energy efficiency
ESIB	Energy Saving Initiative in the Building Sector in the Eastern European and Central Asian countries
EU	European Union
FSP	Full-Sized Project
GASK	State Architectural and Construction Oversight Agency (from Russian <b>Госархстройконтроль</b> )
GEF —	Global Environment Facility
GHG	Greenhouse gas
HVAC	Heating, ventilation, and air conditioning
IMT	Institute for Market Transformation
KazGASA	Kazakhstan State Architectural and Construction Academy (from Russian <b>Казахская Государственная Архитектурно-Строительная Академия</b> )
PIF	Project Information Form
PIU	Project Implementation Unit
RCU	Regional Coordinating Unit
RK	Republic of Kazakhstan
SNiP	Building Code and Regulations (from Russian <b>Строительные Нормы и Правила</b> )
SNRK	Building Code of the Republic of Kazakhstan (from Russian <b>Строительные Нормы Республики Казахстан</b> )
TOR	Terms of Reference
UNDP	United Nations Development Programme
U.S. EPA	United States Environmental Protection Agency

# I. Proposal narrative

## 1. Situation analysis

The Republic of Kazakhstan (RK) has the seventh-most carbon-intensive economy in the world, emitting about 1200 tonnes of CO<sub>2</sub> equivalent per million dollars of economic output (more than 150 MtCO<sub>2</sub>e/yr in all), as compared with a world average of about 500 tCO<sub>2</sub>e/mln\$.<sup>1</sup> Its energy sector generates about 80 percent of total emissions, out of which about 90 percent comes from power and heat generation.<sup>2</sup> Buildings, primarily residential, account for 13.5 percent of power and 24 percent of heat demand; the residential sector is the third-leading energy consumer in the country, after the energy and manufacturing sectors.

As of 2009, Kazakhstan's existing residential building stock comprises approximately 160 million square meters, the large majority of which is aging, inefficient buildings constructed in the Soviet era. On average, buildings in Kazakhstan consume two to three times more energy per unit of floor area than buildings in northern countries of western Europe. Most existing residential stock consists of multifamily buildings connected to district heating from boiler houses or cogeneration stations. Coal is used for more than 80 percent of district heating in Kazakhstan; gas (13 percent) is the next most important primary fuel, used especially in the central and southern regions of the country. More than half of the GHG emissions from residential energy use in Kazakhstan arise from space heating. Domestic hot water and electricity each account for approximately one-fifth of residential-sector emissions, with cooking and other uses making up the remaining share. Coal also accounts for about 85 percent of the country's electricity generation.

Over much of the past decade, a booming economy and aggressive government housing-development policy led to rapid acceleration of new housing construction rates in Kazakhstan. On average, introduction of new housing grew by 15-20 percent per year between 2000 and 2007. Despite the brisk pace of construction, however, population growth, increasing affluence, and the rapid expansion of Kazakhstan's capital Astana caused housing demand to outpace supply by far.

Starting in 2007, the rate of new residential construction finally began to slow, as the global financial crisis spread to Kazakhstan. In 2008, investment in residential construction fell about nine percent from levels of 2007. New residential construction in 2008 stood at about 6.8 million square meters, or about 15 percent less than stated in government plans. The slowdown has continued in 2009.

Meanwhile, government social-welfare targets for housing (18 square meters per person) are still far from being met; therefore expansion of housing remains an urgent priority of the country. As of October 2009, official targets call for residential construction to grow again, with a total of 34 million square meters of new housing, or 280,000 apartment units, to be introduced in the next five years (see Table 1 below). About 90 percent of new housing will be financed out of the federal budget and implemented by regional administrations.

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1 Source: Climate Analysis Indicators Tool (CAIT) Version 6.0. Washington, DC: World Resources Institute, 2009 (2005 data).

2 National GHG Inventory 2004. Ministry of Environmental Protection of Kazakhstan: 2006

**Table 1.**

**Yearly construction of new residential buildings in Kazakhstan**  
(thousand m<sup>2</sup>, projected\*)

2010	2011	2012	2013	2014
6,200	6,500	6,800	7,100	7,400

\*as per the draft State Programme for Improvement of Architectural, Planning, and Construction Activity and Development of Production of Construction Materials in the Republic of Kazakhstan 2010-2014

The expected growth of housing construction will mean increased residential energy demand and associated emissions. According to official projections,<sup>3</sup> the share of buildings in total final energy consumption in Kazakhstan will double by 2016.

### **Legislative and policy context**

Energy efficiency is gaining status as a national strategic priority in Kazakhstan, reflected most prominently in mandates recently voiced by President Nursultan Nazarbayev and Prime Minister Karim Massimov.<sup>4</sup> Various government agencies deal in some way with energy efficiency. For the residential building sector, the two with the greatest responsibilities are the Agency for Construction and Residential-Communal Affairs and the Committee for State Energy Oversight.

The Agency for Construction and Residential-Communal Affairs, which is the primary executing partner of this UNDP/GEF project, oversees government activity in residential construction, urban planning, code enforcement, utility services, and support of research, development, and production of construction materials. Formerly a part of the RK Ministry of Industry and Trade under the name Committee for Construction and Residential-Communal Affairs, the Agency became a self-standing government entity with a new name reflecting its increased status in summer 2009.

The Agency's plans regarding new residential construction for the next five years are embodied in a comprehensive draft document entitled "The State Programme for Improvement of Architectural, Planning, and Construction Activity and Development of Production of Construction Materials in the Republic of Kazakhstan 2010-2014" (hereinafter called simply the State Programme for Construction). In addition to setting the targets shown in Table 1 for new-construction volume, the State Programme for Construction contains a variety of specific provisions to promote financing and construction of residential buildings. Notably, however, the State Programme deals only tangentially with energy efficiency.

The Committee for State Energy Oversight is the only agency in the RK federal government specifically devoted to energy efficiency. Its mandate is to monitor energy consumption in various sectors of the economy, mostly in large facilities such as power plants and factories, and to identify opportunities for increased efficiency. The Committee also plays a major role in the development and adoption of various mandatory regulations, standards, and legislation on energy efficiency. Up until March 2010, it was part of the RK Ministry of Energy and Mineral Resources; now, with that

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<sup>3</sup> Ministry of Energy and Mineral Resources of Kazakhstan

<sup>4</sup> See, for example, Massimov's address at the 2008 KazEnergy forum (<http://ru.government.kz/site/news/main/2008/09/11>).

Ministry's dissolution, it is expected that the Committee will be come part of the new Ministry of Industry and New Technologies.

The 1997 RK law "On Energy Saving" lays out some general objectives and agency responsibilities for energy efficiency, but does not set forth specific actions or targets. In 2009, after more than a year of gathering stakeholder input, the Committee drafted a new version of this law. As of January 2010, the law is in the hands of a Parliamentary Working Group, which includes seven elected legislators, representatives of government agencies, private companies, and others.

Like the Committee's work in general, the new energy-saving law focuses on larger energy-sector and industrial facilities, devoting only modest focus to the residential building sector. This lack of emphasis on residential buildings arises in part from a practical sense that the greatest savings are most conveniently available at the largest facilities, but also from an institutional split of responsibilities with the Agency for Construction and Residential-Communal Affairs. The UNDP project-development team, at the invitation of the Committee and its consultants, recommended the addition of major new building-sector provisions in the draft law, but these recommendations have not been included in the current draft of the law, as of January 2010.

In sum, government mandates and institutions provide a promising framework for increased energy efficiency in the RK residential buildings sector. At present, however, agency efforts are a bit disjointed, with the main construction agency placing relatively low priority on energy efficiency and the main energy-efficiency agency placing relatively low priority on residential buildings. There is considerable potential for synergy among these agency efforts, with the proposed UNDP project serving an important bridging role.

## **Barriers**

Increasing the efficiency of energy use could significantly curtail GHG emissions from the residential sector in Kazakhstan. Well-placed policymakers and other stakeholders in Kazakhstan recognize the importance and potential of energy efficiency (EE) in buildings, from both environmental and economic perspectives. But the existing institutions and markets of Kazakhstan will not achieve needed energy-efficiency improvements on their own. Targeted program activity is needed to overcome various barriers:

- **Policy and regulatory barriers**, including divided agency mandates, obsolescent requirements, ineffective enforcement of energy codes and general construction regulations, and insufficient support for energy efficiency in the government's capital budget for construction;
- **Technical and market barriers**, including insufficient market availability and competitiveness of energy-efficient building materials and products;
- **Information barriers**, including lack of familiarity among building professionals with best practices and advanced technology, and inability of the general public to distinguish the energy performance of buildings and building products.

## **2. Strategy**

### **Project rationale, objectives, and modality**

The proposed full-sized project will address the above-stated barriers and achieve cost-effective energy savings within the context of existing national programs and legislation on energy efficiency, construction, and housing policy. Proposed activities will target several overarching objectives.

- **Improving compliance with existing building energy codes**
- **Promoting energy performance beyond existing code requirements**
- **Providing enhanced information to manufacturers, building designers, and the general public**
- **Transforming practices and markets for building design and construction**

Space heating will be the major focus of this project, as it accounts for the most energy use and associated emissions in the residential sector by far, as well as the greatest potential for effective program intervention. Opportunities to achieve energy savings in lighting and domestic hot water will also be addressed where possible.

In promoting energy efficiency in buildings, the project is directly consistent with GEF Strategic Objective CC-1 (promotion of energy-efficient technologies and practices in appliances and buildings). GEF support will be delivered in the form of technical assistance, which is considered the most suitable modality for grant delivery given the nature of barriers and the proposed interventions.

### **Project components**

The proposed project will include four components, each targeting specific barriers and stakeholders. See the Strategic Results Framework for a full listing of intended project outcomes, and outputs, and indicators.

#### **1. Improved enforcement and implementation of mandatory building codes and rating system**

Kazakhstan adopted a new mandatory thermal-performance code for buildings in 2004 (SNRK 2.04-21-2004 Energy Consumption and Thermal Performance of Buildings). This code regulates energy consumption for space heating in new and renovated buildings. Analysis of typical building types indicates that on average, code-compliant buildings consume 40 percent less energy than buildings built before the code took effect — a level only slightly less stringent than code-stipulated energy consumption in western Europe.

Code adoption was a major step forward, but already, in the words of one RK specialist, its requirements are "becoming outdated." National and international experts estimate existing potential for widespread implementation of buildings that consume 15 percent less energy on average for heating and ventilation than required by the current code.

The Agency for Construction and Residential-Communal Affairs is currently reviewing and revising the 2004 thermal code, with completion expected by the end of 2009. Although it would be much more ideal for this timetable to be pushed later, in order for the UNDP/GEF project to offer direct assistance, it

appears that the schedule is firm. Therefore, the UNDP project-development team is contributing general suggestions for this code in 2009, and will work with the Agency on further enhancements and implementation support during the project period. It is not clear to what extent, if at all, the revised code will reflect greater stringency than the 2004 version.

Implementation in reality even of the current code has been uncertain so far. According to four building designers from institutes in Astana and Almaty, as well as a senior Agency official, compliance is essentially universal at the design stage in Kazakhstan. But the UNDP project team's review of several building design submittals from regions around Kazakhstan reveals clear cases of non-compliant building design. Exact percentages of noncompliance are not certain.

Furthermore, even if designs do comply with code requirements, the absence of a comprehensive system for tracking real energy performance makes it impossible to state whether real consumption matches the result on paper. Anecdotally, officials and private-sector stakeholders indicate that actual building performance probably does fall far short of code-compliant design. They note various barriers to effective code enforcement after the design stage. These include:

- **The absence of a strong top-down government mandate** that energy codes must be observed in actual construction practice.
- **Lack of complete clarity even among the agencies themselves about respective energy-code enforcement responsibilities** of the Agency for Construction and Residential-Communal Affairs and the Committee for State Energy Oversight.
- **Lack of an established process and administrative responsibilities for issuing sanctions** for code violations. At present, the process focuses only on removal of the violation.
- **Prevailing practice among contractors of making change orders to building designs.**
- **Occasional deficiencies in the internal process of "authorial oversight,"** in which a representative of the building design team monitors actual construction to ensure consistency with design. This process can work well, but various problems may emerge, including pressure on authorial oversight agents to accept change orders; lack of job security for authorial oversight agents, as they may be removed at will by the contractor; the relatively minor share of authorial oversight as a proportion of overall design budgets; and inconsistent application of building commissioning (that is, the practice of comprehensive checking and adjusting building systems, especially HVAC and controls, for correct and optimally energy-efficient performance). These various problems could be remedied by greater integration and mutual support among authorial oversight, technical oversight conducted by the owner, and state inspection.
- **Deficiencies in the official process of inspection and approval,** which is carried out almost entirely by local or regional agencies of the State Architectural and Construction Oversight service (known universally by its Russian initials as GASK). Problems include the lack of state inspection on site, with review only of paperwork submitted by the authorial oversight agent; conflict of interest when regional governments are themselves erecting new buildings; insufficient pay for inspectors, creating flight of qualified individuals to the private sector, as well as incentives for corruption; and insufficient training.

The code mandates the use of a documentation system called the "Energy Passport," which shows key design parameters, calculated energy consumption for heating, and code compliance for new and renovated buildings. Beyond these uses, the RK code also discusses the use of the Energy Passport as the basis for a rating and labeling system for both new and existing buildings, intended to enable market stakeholders to recognize and value energy efficiency in buildings, and to create a basis for financial incentives and sanctions. So far, however, the rating and labeling dimension of the Energy Passport exists only on a recommendatory basis in Kazakhstan.

Since 2002, Kazakhstan has had a building code on lighting efficiency (SNiP 2.04-05-2002 Natural and Artificial Lighting). As in most other countries, requirements for the residential sector are limited. The RK code stipulates that stairwell lighting in residential buildings three stories and taller must have automated controls (either timers, or sensors detecting light, motion, or sound). It also recommends, but does not mandate, gas-discharge lighting within living spaces.

The first project component addresses regulatory approaches to energy efficiency, focusing on enhanced code enforcement, strengthened code requirements, and implementation of a mandatory building energy performance rating system. Planned action areas include:

- 1.1. **Support for government mandates** (legislation and/or executive decree) on energy efficiency in residential buildings, including mandatory compliance and enforcement of building energy codes. UNDP staff and consultants will continue their roles, begun during the project preparatory phase, in helping to shape national legislation and state programmes in relevant areas.
- 1.2. **Support for restructuring and strengthening of code-enforcement institutions.** This subcomponent will include clarification of respective agency roles, recommendations on possible expansion of pay scales for authorial oversight agents, and elaboration of detailed policies and procedures for federal oversight of the regional enforcement process. (Increased federal oversight of regional inspection offices is already a prominent stated priority of the State Programme for Construction.) This project area will also deliver enhanced training for GASK inspectors, focusing on code requirements and energy efficiency.

The subcomponent will also seek revision of the enforcement process itself, with an emphasis on verification on site both by state inspectors and by agents providing authorial oversight and commissioning. This work would establish a checklist of on-site inspection tasks, including selective use of thermographic imaging, where applicable. (Thermography is mentioned in the 2004 thermal code, but is not treated as a required part of the inspection process.) Expanded inspection and commissioning processes would feed information into a planned national system of Energy Passport record-keeping, thus providing the first comprehensive nationwide source of verified data on code compliance and building energy consumption. See subcomponent 1.6.

Subject to the availability of suitable participants from RK institutions, this subcomponent may also be linked to the international study tour (subcomponent 3.5).

- 1.3. **Development of new voluntary standards for EE and "green buildings."** This project subcomponent will seek to develop and promote standards for energy performance beyond minimum requirements of existing codes. Such standards could be applied by private developers seeking market distinction; regional governments seeking environmental and life-cycle economic benefits from their own residential buildings; and federal projects, including completely new "satellite cities" under preliminary planning by the Agency for Construction and Residential-Communal Affairs. Subject to formal verification, buildings meeting these standards could receive some designation analogous to the U.S. EPA's Energy Star label or LEED (Leadership in Energy and Environmental Design) certification. Government agencies could grant administrative priority status to buildings meeting the standards, including expedited or enhanced utility connections as well as approval of bids for government housing projects.

The new standards will draw from recommendatory provisions of existing RK codes, analogous codes and standards worldwide, and the findings of the demonstration projects of Component 4. The new standards would include integrated requirements for lighting, HVAC, and thermal envelopes, which are currently treated in separate RK codes. Energy performance targets would reflect increased stringency in all areas; ideally, the implementation of such standards, and accompanying transformative effects in markets and design practice, would facilitate the concurrent or subsequent revision of code requirements themselves (see subcomponent 1.4). Standards could also extend beyond energy end-use efficiency to include embodied energy and resource sustainability of materials and components.

- 1.4. **Development of new code requirements.** This subcomponent will include enhancement of the 2004 thermal-performance code (or the new version expected by the end of 2009) and the possible revision of the 2002 lighting code.<sup>5</sup> Action steps would include the following: review of building designs, materials, and technologies in Kazakhstan, with assessment of both common practices and best practices; drafting of revised methodologies, enforcement procedures, and/or performance requirements, including discussion and justification of assumed materials and technologies; overall review of potential for integration and streamlining of codes now published as separate documents; presentation of the draft revisions and solicitation of comments; finalization and adoption of revised requirements; training for enforcement agents and building designers about how to implement the new requirements.
- 1.5. **Development and implementation of a building energy performance rating system.** Work in this area would build upon existing mandates of the Committee for State Energy Oversight to document, monitor, and improve the nation's energy-consuming facilities, as well as the code-related responsibilities of the Agency for Construction and Residential-Communal Affairs. Activity under this subcomponent will draw extensively from analogous efforts to create building labeling systems in the European Union and the United States.

Action steps would include roundtable meetings among government officials and private-sector stakeholders on the goals and framework for such a program, with participation from EU and/or North American experts in rating systems (possibly in conjunction with the study tour described in subcomponent 3.5); identification of the sphere of applicability in which to apply an Energy Passport rating and labeling program on a pilot basis (for new or existing buildings, or both; for residential or public buildings, or both; etc.); creation of a technical working group, involving both public and private-sector representatives and an international consultant, on defining rating methodologies and thresholds for categories; elaboration of a system of rewards and/or penalties for various ratings (starting with letter grades themselves, and possibly expanding to variable tariffs, taxes, fees, and/or state financing of initial construction); research on applicability of energy performance ratings to expanded financing from mortgage lenders or energy service companies; organization of an implementing agency; and promotion of the system via public presentations, print media, and electronic media.

- 1.6. **Development and implementation of a system for monitoring and accounting of energy use and GHG emissions from buildings.** At present, national statistics on building energy consumption are compiled based on data from centralized energy suppliers. There exists no widespread or methodologically standard system for collecting data on energy consumption in individual buildings.

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<sup>5</sup> UNDP is developing a new GEF project to promote energy-efficient lighting in Kazakhstan. Work toward revision of the lighting code will be coordinated between the two projects, wherever applicable.

A data-management system based on Energy Passports could fill this void. Energy Passports, held electronically in national databanks, would ideally contain design data, calculated energy consumption, field measurements of energy consumption where available, inspection and permit records, and the building's rating. The ultimate goal would be a fully electronic state register of Energy Passports, usable not only simply as a record of ratings, but also as a key source of methodologically uniform data for monitoring and evaluation, and even possible eventual use as a basis for assignment of tradeable emissions-reduction credits.

For both subcomponents 1.5 and 1.6, the technical and institutional challenges of establishing the enhanced Energy Passport system will be formidable. Implementation will likely proceed first on a pilot regional basis before establishment of a national system.

## **2. Production and certification of energy-efficient building materials and components**

Demand for housing in Kazakhstan has, in turn, stimulated demand for building materials, components, and equipment. The marketplace offers a wide variety of such products, including energy-efficient ones, which are commonly available (often via import), but usually more expensive than competing goods.

The State Programme for Construction for 2010-2014 places high priority on capital expansion of domestic production capacity for building materials — particularly cement and glass — with the goal of expanding the national market share of domestic construction materials from about 50 percent at present to 80 percent by the end of the programme. Energy efficiency is not a present focus of this policy initiative. In accordance with preliminary plans stated in the Project Information Form (PIF), UNDP has considered how energy efficiency could fit into this area. We have concluded that direct investment in expanded domestic production of energy-efficient products in Kazakhstan would not necessarily lead to greater efficiency of buildings, nor even expanded availability or lower prices for such products. (Anecdotally, both official and nongovernmental experts note that building components produced at new domestic facilities are actually much more expensive than imported goods, because of issues of raw material availability and transport.)

Therefore UNDP and the Agency for Construction and Residential-Communal Affairs have focused this component on technical issues of standards and certification of building materials and products, rather than capital investment and expansion of manufacturing capacity.

The Agency and other RK government institutions have developed myriad standards for various products, including construction materials and components. But, as the Chairman of the Agency himself has noted, these standards do not include specifications of energy-efficient building materials and products. The Chairman says that manufacturers have noted their desire for such specifications, which would help lift technical barriers to market entry, ensure product quality, and possibly reduce costs.

Certification of compliance with state standards are required for some construction products in Kazakhstan. Therefore enhanced certification would follow naturally from updates and expansion of standards for energy-efficient building products. Such enhancement should include both technical verification procedures and development of consumer labels showing information for non-experts to use in comparing technical features, energy use, and costs associated with given products. Special designations and/or physical labels could be granted to particularly efficient products.

This component will include the following action steps:

- 2.1. **Technical assessment of energy-efficient building materials and components** in Kazakhstan. The purpose of this assessment would be to identify those materials and components for which technology transfer, enhanced standards, certification, and labeling would be most useful. (Of all the building elements that we have examined during project preparation, windows appear to be the most conducive to the activities outlined above, not only because of their significant effect on energy end use, but also because of multiple examples of mature window labeling programs in Europe and North America.)
- 2.2. **Development of official technical standards** for one or more chosen materials and/or components. These standards would draw upon international best practices as well as prevailing production conditions in Kazakhstan. Such standards would be intended primarily to help guide domestic production, but could also apply to imported goods.
- 2.3. **Development of certification procedures** for chosen materials and/or components. This subcomponent would follow directly from the technical standards of subcomponent 2.2.
- 2.4. **Development and application of a consumer labeling system** for chosen materials and/or components. The scope of the labeling system should depend on market conditions. The system will be applied and tested on voluntary basis within the first three years of project implementation. Based on the results of the pilot voluntary stage, recommendations for a mandatory labeling system will be developed and submitted for adoption by the end of the project.

### **3. Education and outreach to promote energy-efficient building design and technology**

Certain institutions of higher education in Kazakhstan, including the Kazakhstan State Architecture and Construction Academy, the Almaty Institute of Energy and Communication, Eurasian State University, offer programs in thermal energy studies, awarding approximately 218 bachelor's degrees and 43 master's degrees annually. Curricula include instruction in energy efficiency and energy conservation in heat supply, energy auditing, energy research, and advanced technology in centralized and automated energy efficiency. Architecture curricula contain substantial instruction in design of thermal performance of building envelopes.

All the same, various national experts note the potential for enhancement of higher education on energy efficiency and renewable energy in buildings, particularly with regard to economic, environmental, and social aspects. Furthermore, instruction on energy efficiency and renewables for contractors (both supervisors and working staff who install various building components) and the general public is essentially absent in Kazakhstan.

This project component is intended to overcome informational barriers to energy efficiency among building professionals in Kazakhstan. The main national partner for this work will be the Kazakhstan State Architecture and Construction Academy (hereinafter referred to by its Russian abbreviated name, KazGASA), which is the country's leading educational institution on construction, with activities in undergraduate and graduate education, as well as continuing education for professionals. The private company Saint-Gobain Construction Products LLP Kazakhstan will also participate actively in the UNDP/GEF project in synergy with Saint-Gobain's extensive existing efforts in delivering training and promoting best practices in passive house design.

Action areas include:

- 3.1. **Development and delivery of course content** on integrated building design, international best practices, and the economic, environmental, and social significance of energy efficiency and renewable energy. The project's main collaborator will be KazGASA. This subcomponent will include college and graduate-level instruction, as well as continuing-education training. Where applicable, courses and individual lectures or seminars could be made available to non-specialist students. Enhanced training content may also be developed in conjunction with Saint-Gobain's training workshops, approximately 100 of which the firm delivered in Kazakhstan in 2009 alone.
- 3.2. **Organization of a competition on energy-efficient building design.** This subcomponent is based on a highly successful activity in a past UNDP/GEF project to promote energy efficiency in residential buildings in the Czech Republic, as well as similar contests organized by Saint-Gobain in 2008-2010. As currently envisioned, this contest would invite submittals from both current students and practicing professionals, perhaps in two separate categories. Project staff, consultants, and/or various national partners would issue general specifications such as building type and size, and would serve as judges. If successful, the contest could be handed over to institutional partners such as the Agency, educational institutions, or Saint-Gobain for them to organize in future years.
- 3.3. **Training support for developers and building owners** on the economic advantages of energy efficiency, including discussion of international best practices, case studies, national programs such as the Energy Passport rating system, and marketing strategies for promoting energy performance as a selling point with potential buyers and renters. This training would be a major element of consumer outreach planned for the new national center described in section 4.3 below. Delivery of this training could also be offered in collaboration with Saint-Gobain. Workshops would be offered annually starting in the second project year, covering at least three regions of Kazakhstan by the end of the project period.
- 3.4. **Training for construction workers and supervisors** on correct installation of windows, insulation, wall panels, roofs, floors, heat points and controls, and other building elements that affect energy performance. Training would be offered annually starting in the second project year, covering at least three regions of Kazakhstan by the end of the project period.

All proposed training in subcomponents 3.3 and 3.4 will be delivered via existing institutions, including possibly accredited institutions of higher learning, as well as proposed business/technology centers planned by the RK Ministry of Industry and Trade. Such centers are also a focus of Component 4 (see below).

- 3.5. **International study tour** on best practices in building design, construction, operations, and policy. The project will arrange a tour in a suitable region (possibly Europe, North America, or Australia) for up to seven RK specialists and/or officials. The tour will ideally include numerous site visits and technical review of building designs and technology, as well as meetings with counterpart agency representatives. Selection of participants, destinations, and agenda will be based significantly on potential to support other project components, including code enforcement, rating systems, and demonstration projects.

#### **4. Development and demonstration of energy-efficient building design**

The final project component involves energy-efficiency demonstration projects in real buildings, with the goal of overcoming barriers of insufficient information and unfamiliarity with energy-efficient design and technology in Kazakhstan. The project team will focus these efforts in three areas:

- design and construction of two energy-efficient residential buildings;
- design of prototype buildings for potential widespread use around the country;
- design and construction of the building for a national center for training and business development for energy efficiency.

4.1. **Design and construction of two energy-efficient residential buildings.** As originally envisioned in the PIF, the proposed full-sized project will support the design, construction, and monitoring of two actual residential buildings, with an emphasis on incremental energy-efficiency enhancements beyond baseline practices.

This subcomponent will involve at least two, and possibly up to three publicly-financed buildings, to be planned and built by regional administrations (akimats), with funding from the federal budget. The akimats will bear financial and management responsibility for project management, building design, materials, construction, and building operation. GEF funding will support expert consultation on building design, incremental costs of chosen energy-efficient materials and components, and activities in monitoring and evaluation.

During the project preparatory period, UNDP invited akimats from around Kazakhstan to submit proposals for demonstration buildings, including preliminary site and design information, as well as financing plans. This solicitation yielded substantive expressions of interest from numerous regions. From among these, UNDP has received formal commitments, including co-financing pledges, from the oblast administrations of Karaganda, West Kazakhstan, and Mangystau the oblast administrations of Karaganda, West Kazakhstan, and Mangystau. Several other akimats, which have proposed work on candidate buildings in Kokshetau, Almaty, Taldykorgan, and Petropavlovsk, continue to have interest in principle, but have temporarily withdrawn their candidacies because of uncertainty about federal budget availability for new buildings in 2010 and beyond. To hedge against the risk of sudden unavailability of cofinancing or other problems, the project has left open the possibility of which regions will be final partners for these projects. Final selection of building projects and institutional partners will occur within the inception phase of project implementation, based on various criteria, especially security of co-financing, as well as potential for energy savings and replication. In this context, and in consideration also of the constraints of the UNDP/GEF budget, the addition of a third demonstration project will be considered.<sup>6</sup>

It is anticipated that the demonstration project in Karaganda will involve a very large residential building complex consisting of seven sections, each nine stories tall. The demonstration project in West Kazakhstan and/or Mangystau would be a typical five-story building. During the project preparatory stage, design options for both of these building types were considered. This preliminary assessment indicates that the demonstration projects would include integrated energy-efficient design of mechanical systems (heating and ventilation), the building envelope, lighting, and hot water. Likely measures will include automated thermostatic heat-delivery controls in buildings; user-controlled heat delivery controls in individual apartments; heat recovery; controlled ventilation; enhanced wall insulation; advanced windows; energy-efficient lamps; and passive solar design, where applicable. Analysis by national and international experts indicates that such measures, taken together, should yield energy savings of more than 50 percent beyond what the new buildings might consume without GEF involvement, with simple payback times of about 9.5 years at current energy prices. Faster payback would apply if energy tariffs increase as expected during the project period.

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<sup>6</sup> For more detail on these issues in the context of project risk and associated mitigation strategies, see page 17.

Aside from the direct benefits of energy savings in the buildings themselves, we expect that the demonstration projects would generate numerous indirect benefits, including replication in other buildings; general advancement of design, construction, and commissioning practice; and publicity for energy efficiency among real-estate investors and the general public. A major factor in the selection of final building designs and institutional partners will be their suitability for effective replication efforts.

The demonstration projects should also help to define possibilities for raising federal cost ceilings for state-funded building projects, contingent upon achievement of given levels of energy efficiency. The Agency for Construction and Residential-Communal Affairs has established a ceiling of about 60,000 tenge, or about \$400, per square meter for budgeted projects. Builders and regional officials state that this ceiling is a major constraint on building designs, effectively ruling out many energy-efficient measures and causing market inertia favoring conventional materials and components.

Akimats routinely seek to expand their construction budgets via private investment or allocations of the region's or city's own budget funds to construction projects. In exchange for such additional funds, private or public investors receive ownership or development rights to units, buildings, or land. This arrangement adds some flexibility, but still places much greater priority on cost reduction, on the one hand, or luxurious amenities that make for high margins and quick sale, on the other. Therefore energy efficiency still languishes, constrained by the federal budget, with no compensating incentives.

The federal government pays not only for its share of construction, but also for the entire cost of utility infrastructure serving new buildings. Therefore, the government has a significant financial incentive to reduce heating and electricity loads in new buildings. Of course, the government of Kazakhstan also has an interest in promoting societal benefits of resource conservation and pollution prevention. In documenting the costs, operating savings, reduced infrastructure costs, and environmental benefits of incremental energy-efficiency measures, the demonstration projects will provide substantive justification for raising the cost ceiling for qualifying buildings.

- 4.2. **Design of prototype buildings.** The use of standard prototype designs is widespread in Kazakhstan, especially with state-financed residential buildings. Generally, these designs reflect the high priority of minimizing costs, with only negligible attention to energy efficiency. This subcomponent will apply national and international expertise to development of new prototype building designs embodying best practices in energy efficiency. The ultimate goal would be for these designs to replace less-efficient building designs as models for new construction around the country.

The head of the Department of New Construction Technologies at the Agency for Construction and Residential-Communal Affairs has suggested that work on new, energy-efficient prototypes focus on five-story and nine-story buildings with brick walls, as these building types are prevalent in Kazakhstan's existing markets. Possible measures and design innovations to increase energy efficiency could include redesign of wall spaces to allow for increased insulation, where applicable; possible use of external insulation; advanced windows; advanced heating system controls; controlled ventilation; and passive solar design, including enhanced consideration of orientation and thermal mass.

Two prototype building designs will be completed by the third project year. The project team will assist not only in technical aspects of design, but also in dissemination and monitoring of the use of the new prototypes.

- 4.3. **Design of the building for a national center on energy efficiency.** The Center for Innovative Technologies of the RK Ministry of Industry and New Technologies is planning to build a new business-and-technology complex in Astana specifically devoted to promoting energy efficiency in buildings. UNDP/GEF's municipal heating project is already assisting in the development of this new institution's business plan, which will include training, consultation, and demonstration of materials, components, and devices for saving energy. The Ministry is planning for the Astana center to be the first of four similar institutions around the country.

The Department envisions the building itself as a model of highly energy-efficient design. Though this center is not itself a residential building, it presents an unusual opportunity to implement the most advanced energy-efficient design approaches and technologies in the country, including passive solar design, which would be applicable to both residential and public buildings. Unlike public residential buildings, which are built in a context of tight financial and institutional constraints, this new center has secure funding and a priority mandate to showcase energy efficiency, both in its operations and in the building itself.

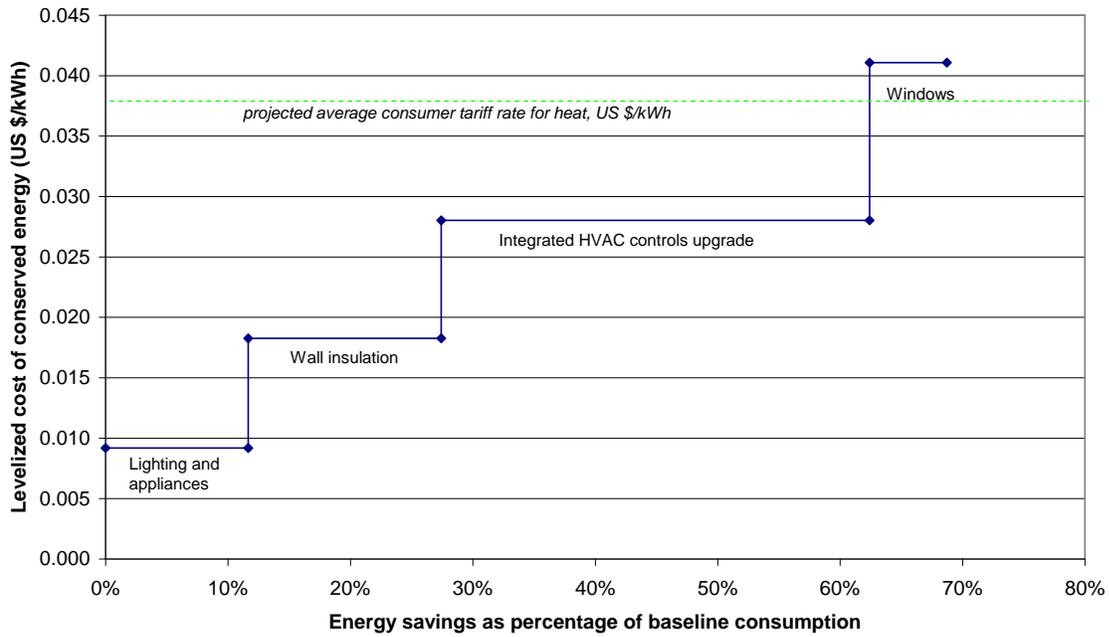
In the UNDP/GEF project, this subcomponent will include participation in the design of the building of the Astana center, as well as subsequent commissioning and monitoring. Modest GEF funding will be used for these limited purposes only; the Ministry has committed to cover the costs of construction, including energy-efficient materials and components, on its own. If successful, the building for this first business/technology complex on energy efficiency could serve as a prototype for the next three centers.

### **Cost-effectiveness**

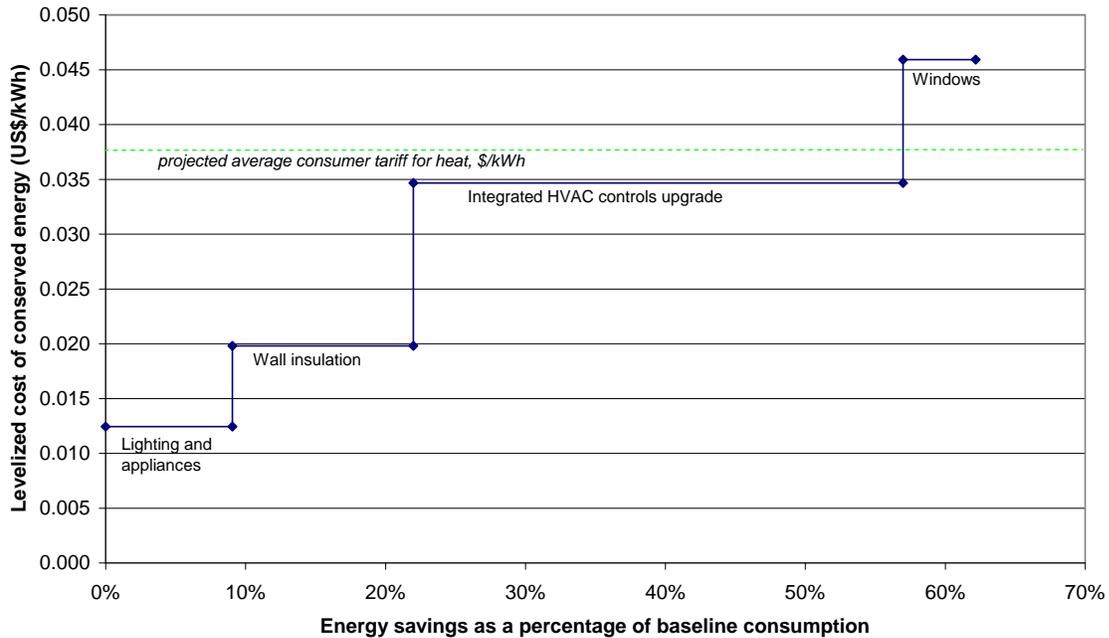
The proposed project offers extremely cost-effective means to achieve global environmental benefits. This cost-effectiveness stems largely from its emphasis on high-leverage policy vehicles — mandatory national building codes — which apply to all new building stock, at high projected volumes. Other project approaches further enhance cost-effectiveness, including targeting well-defined, influential constituencies (inspectors and building designers); sharing a significant portion of total costs with national and regional partners in both government and the private sector; and emphasis on replication of lessons learned in demonstration projects. Project activities embody both supply-side and demand-side approaches noted with favor in the document *Cost-Effectiveness Analysis in GEF Projects*, including development of minimum standards; technical assistance; and education of consumers and professionals.

The proposed demonstration projects will involve measures selected for maximally cost-effective energy savings. Figures 1 and 2 show supply curves for conserved energy for the two projects, based on current material and equipment prices in Kazakhstan, as well as projected energy savings. The green dashed line on each of these figures represents forecasted tariff rates for heat energy, based on conservative assumptions. (These tariffs are now artificially low because of government price support; targets set by the RK state antimonopoly agency call for tariff increases to levels much higher than shown here, but it is uncertain whether such increases will be politically possible.) Note that the cost of combined measures fall mostly below the consumer price for heat. Only the addition of energy-efficient windows pushes the levelized cost of conserved energy above heat costs. Increases in heat tariffs and/or reductions in window prices (see Component 2) would keep the total cost of conserved energy below the cost of heat.

**Figure 1. Supply curve of conserved energy for proposed demonstration project in Karaganda**



**Figure 2. Supply curve of conserved energy for proposed demonstration project (5-story building)**



Note: Forecasted electricity tariffs for both regions are estimated at more than \$0.06/kWh during the project period.

Our most conservative scenario envisions that by the end of the project period (2015), the project will result in about 3 million tonnes of indirect avoided CO<sub>2</sub> emissions from buildings; at the GEF financing amount of \$4.5685 million, the cost of avoided emissions is about approximately \$1.50 per tonne. As effects accumulate over 25-year lifetimes of these buildings (only buildings built from 2010 through 2015), this conservative scenario projects savings of 22 million tonnes, or approximately \$0.21 per tonne. These figures fall far below the relative costs of most GHG-reduction programs worldwide, as well as prices in world carbon-trading markets.<sup>7</sup> Estimated figures for the project's costs of avoided emissions drop still further with the inclusion of new buildings from after 2015, or with the consideration of more optimistic scenarios.

### **Coordination with related initiatives**

The UNDP/GEF project "Removing Barriers to Energy Efficiency in Municipal Heat and Hot Water Supply" (Atlas Project ID: 00051578) seeks to increase the efficiency of district heating in Kazakhstan, through a variety of technical and policy approaches. The proposed project and the existing district heating project complement each other closely and naturally, with little direct overlap but much potential synergy.

On a technical level, it is useful to think of the proposed project as focusing on the building itself, while the district heating project focuses on heating systems, with their initial boundary at the centralized heat plant, through municipal distribution networks, ending at the heat point in the basement of the building. Notably, the district heating project directly addresses tariff policy for heating; therefore the proposed project does not seek to work in this area, despite the clear relevance of energy pricing as a barrier to energy efficiency in buildings themselves. The district heating project is also working on increasing efficiency of domestic hot water supply and weatherization of existing buildings, thus obviating the need for the proposed new project to work in these areas.

The main areas of synergy between the two projects would include work on national policy and legislation, including the law "On Energy Saving"; demonstration projects, especially in integrated building design (that is, designing the building envelope and HVAC systems together, for optimal energy savings and cost reduction); education and outreach, including joint partnerships with business/technology centers for energy efficiency; and measurement and evaluation, especially in the establishment of baselines.

Lighting is a minor aspect of this proposed residential-buildings project, but it is the central focus of a new UNDP/GEF project, whose Project Initiation Form was submitted in November 2009. As currently envisioned, the lighting project will include both policy reform and market-stimulation components, spanning both the public and residential building sectors. Cooperation between the lighting project and this proposed project on residential buildings may include work on revision of the 2002 lighting code, as well as introduction of international best practices on daylighting.

In addition to the municipal heating project, the proposed new full-sized project will share experiences and best practices with other related UNDP/GEF projects on energy efficiency in buildings in several countries of Central Asia and the former USSR, including Russia, Uzbekistan, Kyrgyzstan, Turkmenistan, and Armenia. Already UNDP staff and consultants from the various countries have been in regular contact, directly and via Google Group, sharing information on matters large and small (for example, criteria for lighting-efficiency standards; recruitment and selection criteria for partner entities for demonstration projects; identification of possible international consultants; definition of indicators of project success; etc.).

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<sup>7</sup> Incremental costs of energy-efficient technology incurred by investors (including the federal RK budget) are not considered in the figures presented in this section.

The proposed full-sized project builds upon previous work conducted by the Institute for Market Transformation (IMT), an American nongovernmental organization, on energy efficiency in the RK building sector. This work, funded by the U.S. Environmental Protection Agency and the Renewable Energy and Energy Efficiency Partnership, focused on delivery of a model code that was used as the basis for the 2004 thermal code. IMT also arranged two study tours of the United States for the RK official responsible for technical regulations within the Agency (at that time, called the Committee) for Construction and Residential-Communal Affairs. The Moscow-based Center for Energy Efficiency (CENEf) and Research Institute for Building Physics provided major technical consultation on code development. Both IMT and CENEf are serving on the project development team for the proposed new full-sized project.

In October 2009, representatives of the United States Department of Energy (DOE) had meetings, facilitated by UNDP, with the Agency for Construction and Residential-Communal Affairs, as well as the Committee for State Energy Oversight, in Astana. DOE offered technical assistance to both agencies on energy efficiency and renewable energy in buildings, directly within the context of this proposed full-sized UNDP/GEF project. Such assistance will cover issues of rating system implementation; standards and certification for windows and/or other relevant technologies; and/or other best practices in energy efficiency and renewable energy in buildings.

In the spring and summer of 2009, a contractor for the European Union (EU) developed draft Terms of Reference (TOR) for a project entitled the "Energy Saving Initiative in the Building Sector in the Eastern European and Central Asian countries" (ESIB). ESIB has arisen within the framework of INOGATE, which is an international cooperative program on energy issues, with membership among EU members, Turkey, Moldova, Belarus, Ukraine, Armenia, Azerbaijan, Georgia, and the Central Asian countries, including Kazakhstan. The initial internal draft ESIB TOR was developed with direct consultation between the EU consultant and UNDP staff and contractors in Kazakhstan. After the EU project is assigned to a contractor, UNDP and the EU will continue discussions on how to ensure synergy between their projects.

In 2009, the European Bank for Reconstruction and Development (EBRD) has been providing assistance to the Committee for State Energy Oversight in drafting the new national energy-efficiency law. The UNDP project team has already offered recommendations on the law, at the invitation of the key EBRD team member, as well as the Committee itself. To the extent that development of this law continues into the proposed project period, the project team will continue to work with EBRD and the Committee to ensure that the law provides strong mandates and well-defined directions for implementing energy efficiency in the building sector.

EBRD has also been developing a new project to assist the government in demolition of old residential buildings and replacing them with new energy-efficient buildings. EBRD also intends to develop model design practices for housing for groups needing special social services (the disabled, the elderly, etc.). An EBRD representative has expressed interest in using prototype building designs developed under this proposed UNDP/GEF full-sized project (see Component 4) for these new buildings.

## **Risks**

Table 2 shows the most significant risks to project implementation, with a brief discussion of mitigation strategies.

**Table 2.**  
**Project risks and mitigation**

Risk	Assessment	Mitigation
Low energy prices suppress implementation of energy efficiency in buildings	Low	Energy codes ensure minimum energy efficiency even when end-use energy prices are low. UNDP/GEF project on district heating is already working directly on tariff reform for home heating. Some increases in energy tariffs are expected during the project period.
Political will for energy codes and other energy-efficiency programs is insufficient	Low/ Medium	Key government agencies, including the Agency for Construction and Residential-Communal Affairs and the Committee for State Energy Oversight, have stated their commitment to energy efficiency and their general support for the code advances and programs proposed for this project. Still, adoption and enforcement of mandatory regulations and programs always carries some controversy. In particular, Agency partners and national experts have voiced their uncertainty about whether it will be politically possible to strengthen the 2004 thermal code during the project period. Stakeholder engagement, as well as clear analysis of cost-effectiveness and feasibility, will be necessary to ensure the legitimacy and political acceptability of new proposed code requirements and related programs.
Institutional capacity to implement expanded code enforcement and rating system is insufficient	Medium	Expanded code enforcement and rating-system implementation would create great volumes of new work, probably beyond the capacity of government agencies at existing staff levels. Synergies with existing processes and agency mandates (such as the Committee for State Energy Oversight's existing work on auditing and registering energy-consuming facilities) will be tapped wherever possible. Development of sustainable fee-based financing mechanisms for new enforcement and rating initiatives will be a major priority of the project. Introduction of rating systems may be pursued first in selected regions.
Global economic crisis complicates or shuts off financing for construction projects (new residential buildings)	Medium	Privately-funded construction is languishing in Kazakhstan because of the global financial crisis. Public funding is more stable. For Component 4, the owners of demonstration buildings will be regional government agencies, which receive their construction funds from the federal government. Co-financing for the demonstration projects is therefore largely contingent upon the passage of a State Programme for Construction for 2010.  Consideration of multiple demonstration project partners provides some assurance that this project component will move ahead even if one or more demonstration buildings encounters financial or other difficulty. Final decisions on demonstration projects will be made in 2010, based primarily on stability of essential co-funding. At least one akimat states that financing is already available even without the State Programme.

### 3. Strategic Results Framework

Project strategy	Objectively Verifiable Indicators				
Goal	Increase energy efficiency in new and renovated residential buildings in Kazakhstan, thereby reducing greenhouse gas emissions				
	Indicators	Baseline	Target	Means of Verification	Important Assumptions
<b>Project Objectives</b> Increase energy efficiency in new and renovated residential buildings  Reduce GHG emissions associated with residential energy use	Average thermal energy consumption for space heating in new and renovated buildings	Average thermal energy consumption for space heating: 140 kJ/m <sup>2</sup> .°C.day for existing building stock, and 100 kJ/m <sup>2</sup> .°C.day for new and renovated buildings complying with the current code	Average thermal energy consumption for space heating reduced to 85 kJ/m <sup>2</sup> .°C.day for new and renovated buildings	Mandatory code requirements for thermal performance; national statistics; quantitative evaluation conducted by project, including selective review and analysis of building designs, as well as selective verification of actual construction and operating performance.	Construction volumes are taken from official national projections 2010 through 2014; volume in 2015 follows the same linear trend projected for 2010-2014.  Savings shown here are only from thermal energy consumption for heating, the main focus of the project. (Other end uses fall into separate existing projects, and/or have a much smaller share of residential energy consumption than heating.) If the project does achieve any reductions in non-heating end uses, project results would be magnified, but probably not by a large proportion.
	CO <sub>2</sub> emissions from energy use in new and renovated buildings	25.5 million tonnes of CO <sub>2</sub> emitted during 2010-2105 by buildings newly built or renovated during this period  186 million tonnes of CO <sub>2</sub> emitted from energy use in these buildings over a 25-year lifetime  Continuation of this consumption trend past project period	22.5 million tonnes of CO <sub>2</sub> emitted during 2010-2015 by buildings newly built or renovated during this period (3 million tonnes less than baseline)  164 million tonnes of CO <sub>2</sub> emitted from energy use in these buildings over a 25-year lifetime (22 million tonnes less than baseline)  Continuation of this trend of reduced consumption past project period, with magnified cumulative effects		
<b>OUTCOME 1:</b> Improved enforcement and implementation of mandatory building energy codes and rating system  <b>Output 1.1</b> Streamlined and strengthened building energy code enforcement leads to universal	Rates of compliance with applicable energy codes	Baseline compliance rate has not been formally documented; various national experts state that noncompliance is widespread at the	Increasing observance of existing codes, up to universal compliance  Documentation and statistical verification of universal compliance by new buildings,	Rates of code compliance, documented in official withholding and issuance of permits, and supported by selective	Current code compliance procedures are deficient; enhanced procedures and training will close loopholes and improve compliance

compliance with existing codes		construction stage	starting in 2012, with whole-building energy consumption targets of 2004 thermal-performance code, supported by field inspection and measurements as well as design data.	review of building plans and field verification of construction and actual performance	Selective field verification is representative of national trends
<b>Output 1.2</b> New voluntary national and/or regional standards for energy efficiency and "green buildings" lead to implementation of EE beyond existing code requirements	Adoption and implementation of standards, with verification procedure  Energy performance of buildings complying with these standards  Number of buildings complying with these standards	No voluntary standards for energy performance beyond existing code requirements exist in Kazakhstan.	Officially-recognized "green-building" standard embodying super-efficient energy performance across various end uses  Implementation of this standard on a voluntary basis by private developers and/or regional governments by the end of the fourth project year	Published standards  Records from implementing agencies of buildings certified to comply with standards	A meaningful proportion of owners, designers, and contractors will want to employ these standards
<b>Output 1.3</b> Adopted revisions to national building energy codes and associated official documents lead to more effective implementation and incremental savings	Adoption and implementation of new mandatory requirements  New required levels of energy performance	Existing national thermal-performance code, adopted in 2004, sets maximum allowed energy consumption for heating between 135 and 72 kJ/m <sup>2</sup> .°C.day for new and renovated buildings, depending on building height (estimated average of 100 kJ/m <sup>2</sup> .°C.day). This code is less stringent than progressive codes in Europe. Revisions are planned by the end of 2009, but it is not clear to what extent required consumption levels will be reduced, if at all.	Implementation of new mandatory thermal-performance requirements in national code, reducing allowed energy consumption for heating by 15 percent, to an estimated average of 85 kJ/m <sup>2</sup> .°C.day.	Published code requirements	Government agencies will have collective political will to adopt and implement more stringent requirements, despite probable objections from some stakeholders, based on perceptions of increased initial compliance costs. This assumption carries considerable uncertainty. See discussion of project risks above.
<b>Output 1.4</b> Rating and labeling system for EE in buildings provides clear information to	Adoption of rating and labeling system  Creation of incentives	Energy Passport rating system for buildings is established only on a recommendatory basis by the 2004 code. In	Energy Passport rating and labeling system established and applied widely to new and existing buildings, first in selected regions and ultimately expanding to a	Publication of rating and labeling system procedures, including associated incentives	Implementing agencies can sufficiently staff and effectively apply rating and labeling system

market stakeholders, as well as a technical basis for financial incentives, leading to increased market demand for efficient buildings	<p>Number and fraction of buildings rated and labeled</p> <p>Number and size of incentive awards</p> <p>Recognition of system by real-estate stakeholders</p>	practice, this rating system and associated building labels are not being applied.	mandatory nationwide basis.	<p>Records from implementing agencies of ratings and labels applied to buildings</p> <p>Records from implementing agencies of delivered incentives</p> <p>Interviews and survey on public recognition of labeling system</p>	Government agencies have sufficient political will to adopt incentives
<b>Output 1.5</b> GHG monitoring and accounting system supports effective program evaluation and helps shape future national priorities for energy efficiency in buildings	<p>Creation and official adoption of GHG monitoring and accounting procedures</p> <p>Number of regions and buildings participating in this new system</p>	Aggregated energy consumption in buildings can be extrapolated from centralized energy supply statistics, but there exists no methodologically uniform system for compiling data on energy use by individual buildings, nor on the effects of energy efficiency measures	Official procedures for universal GHG monitoring and accounting in buildings is developed and applied, first regionally and then nationally, based on the Energy Passport system.	Records from public agencies	Implementing agencies can sufficiently staff and effectively apply GHG monitoring system
<b>OUTCOME 2:</b> Expansion of markets for energy-efficient products					
<b>Output 2.1</b> Technical guidance to producers of energy-efficient building materials and products leads to lower costs, higher quality and performance, and wider availability	<p>Establishment of product standards</p> <p>Cost, quality, performance, and availability of products for which standards are established</p>	Product standards for energy-efficient building components are deficient or absent.	Standards promulgated for selected building product(s)	<p>Published standards</p> <p>Records from companies and implementing agencies on products manufactured in accordance with these standards</p>	Manufacturers will deem it cost-effective to change existing production as necessary to conform with standards
<b>Output 2.2</b> Certification and labeling with regard	Establishment of product certification and labeling	Certification and labeling of products for energy performance is deficient	Certification and labeling established based on new standards and/or other enhanced procedures	Published procedures on certification and labeling	Implementing agency has sufficient staffing and equipment to carry out

to energy performance leads to greater consumer understanding and demand for efficient materials and/or products	Public recognition of label and response to given information	or absent.	Energy-efficiency labels widely applied to selected products	Records from implementing agency on application of labels to products  Interviews and survey on public recognition of labeling system	certification and labeling
<b>OUTCOME 3:</b> Education and outreach to promote energy-efficient building design and technology  <b>Output 3.1</b> Enhanced training enables building designers to apply international best practices in energy-efficient building design (including integrated building design) and technology	Ability of architects and engineers to design energy-efficient buildings, applying best practices and technology  Number of buildings built embodying practices and technology introduced via enhanced instruction	Architects and engineers have high technical capabilities and receive some training on energy efficiency, but lack key information on international best practices, as well as social, economic, and environmental benefits	Enhanced course material on energy efficiency included as a standard part of building-design curricula, delivered to at least 350 building design professionals by the end of the project  International study tour completed for 5 to 7 participants	Course listings, curricula, and participant rosters from courses  Follow-up interviews and written feedback	Institutes of higher learning are willing to devote staff time for implementing revised curricula  Architects and engineers choose to participate in courses in expected numbers
<b>Output 3.2</b> Competitions motivate building designers to pursue energy-efficient design, and raise collective expertise	Ability of architects and engineers to design energy-efficient buildings, applying best practices and technology  Number of participants and building designs	Motivation to pursue energy-efficient building design is largely driven by market demand. There are no contests or other mechanisms within the design community to stimulate such motivation.	At least two competitions during the project period on energy-efficient building design, attracting 50 participants.	Participant rosters and submitted designs	Architects and engineers choose to participate in expected numbers
<b>Output 3.3</b> Workshops prompt	Recognition by owners and	Owners and developers have little interest in	Workshops delivered annually starting in the second project year,	Course listings and participant rosters	Owners and developers choose to participate in expected

building owners and developers to pursue energy efficiency and effectively market energy performance to buyers and renters	developers of the value of energy efficiency in buildings  Number of workshops and participants	pursuing energy efficiency, instead placing greatest emphasis on appearance, amenity, and cost reduction	covering at least three regions by the end of the project period	Follow-up interviews	numbers
<b>Output 3.4</b> Training enables contractors and construction workers to correctly install energy-efficient building materials and components	Ability of contractors and construction workers to correctly install energy-efficient building materials and components	Training for builders on energy-efficient materials and components is absent, except for sporadic offerings by private companies on their own products	Training delivered to builders annually starting in second year of project, covering at least three regions by the end of the project period	Course listings and participant rosters  Follow-up interviews	Contractors and construction workers choose to participate in courses, and understand the content sufficiently to apply it in their work
<b>OUTCOME 4:</b> Development and demonstration of energy-efficient building design  <b>Output 4.1</b> Best practices in energy-efficient building design (including integrated building design) and technology cost-effectively demonstrated in two residential buildings	Construction of buildings embodying best practices in energy-efficient building design	New residential buildings in Kazakhstan do not embody international best practices or technology	New energy-efficient residential buildings in two regions, built in the third and fourth years of the project. Energy performance and cost-effectiveness documented in both buildings by end of project.	Official records of code compliance, with associated energy-related documentation; field verification of presence and performance of built features; metering of actual energy consumption, normalized based on weather data; comparison with corresponding data, where available, from buildings without energy-efficient additions, but with otherwise analogous design (control group)	Public funding for planned residential buildings is made available according to budget plans.

<p><b>Output 4.2</b>  Prototype and demonstration building designs serve as models for replication, leading to further energy savings and transformation of design/construction practice</p>	<p>Planning, design, and construction of buildings based on energy-efficient model building designs</p>	<p>Standard building designs are efficient only to the minimum extent required by code, and do not embody international best practices.</p>	<p>Prototype information disseminated to design institutes, regional administrations, and federal Agency for Construction and Residential-Communal Affairs</p> <p>Plans, including budgets and initial building designs, established for 20 buildings based on prototypes and demonstration projects.</p>	<p>Documentation from implementing agencies and partners</p>	<p>Demonstration projects completed on schedule</p> <p>Relevant designs are cost-effective, energy-efficient, and applicable to other buildings</p>
<p><b>Output 4.3</b>  Cost analysis establishes basis for correcting state-stipulated cost ceilings for qualifying EE government-funded buildings</p>	<p>Reassessment and revision of state-stipulated cost ceilings for construction for qualifying EE government-funded buildings</p>	<p>Existing cost ceiling is about \$400 per m<sup>2</sup> of new government-funded housing. There are no exceptions to this ceiling. It is difficult or impossible to design EE buildings under this cost ceiling.</p>	<p>Formal recommendations on raising cost ceiling issued to Agency for Construction and Residential-Communal Affairs and regional administrations</p> <p>Cost ceiling raised, effectively creating a major mechanism for government financing of energy-efficient residential construction</p>	<p>Documentation from implementing agencies and partners</p> <p>Official published policies</p>	<p>Government agencies have sufficient political will and budget flexibility to adopt raised cost ceiling</p>

#### 4. Total budget and workplan

<b>Award ID:</b>	00059795	Project ID(s):	00074950
<b>Award Title:</b>	Energy-Efficient Design and Construction of Residential Buildings		
<b>Business Unit:</b>	KAZ10		
<b>Project Title:</b>	Energy-Efficient Design and Construction of Residential Buildings		
<b>PIMS no.</b>	4133		
<b>Implementing Partner (Executing Agency)</b>	UNDP		

GEF Outcome/Atlas Activity	Responsible Party/ Implementing Agent	Fund ID	Donor Name	Atlas Budgetary Account Code	ATLAS Budget Description	Amount Year 1 (USD)	Amount Year 2 (USD)	Amount Year 3 (USD)	Amount Year 4 (USD)	Amount Year 5 (USD)	Total (USD)	See Budget Note:
<b>OUTCOME 1:</b> Improved enforcement and implementation of mandatory building energy codes and rating system	<b>UNDP</b>	<b>62000</b>	<b>GEF</b>	71400	Project specialist (technical staff)	28,080	28,080	28,080	28,080	28,080	140,400	1
				71200	International consultants	134,000	131,000	119,000	116,000	116,000	616,000	2, 3
				71300	Local consultants	51,750	53,438	50,062	44,437	46,688	246,375	3, 4
				72100	Contractual services	17,250	17,812	16,688	14,813	15,562	82,125	5
				71600	Travel	31,100	48,700	34,100	25,400	28,400	167,700	6,7
				75700	Workshops	3,500	2,500	2,500	2,500	2,500	13,500	8,9
				74200	Communications and publications (web, print, etc.)	0	0	3,000	3,000	3,000	9,000	10
					<b>sub-total GEF</b>	<b>265,680</b>	<b>281,530</b>	<b>253,430</b>	<b>234,230</b>	<b>240,230</b>	<b>1,275,100</b>	
	<b>Total Outcome 1</b>	<b>265,680</b>	<b>281,530</b>	<b>253,430</b>	<b>234,230</b>	<b>240,230</b>	<b>1,275,100</b>					
<b>OUTCOME 2:</b> Expansion of markets for energy-efficient products	<b>UNDP</b>	<b>62000</b>	<b>GEF</b>	71400	Project specialist (technical staff)	3,600	3,600	3,600	3,600	3,600	18,000	1
				71200	International consultants	18,000	36,000	30,750	0	3,000	87,750	11
				71300	Local consultants	14,625	18,000	21,937	21,375	7,875	83,812	12
				72100	Contractual services	4,875	6,000	7,313	7,125	2,625	27,938	5, 12
				71600	Travel	6,700	6,700	6,700	1,000	1,000	22,100	6, 13
				75700	Workshops	500	0	0	0	0	500	8
				74200	Communications and publications (web, print, etc.)	0	0	10,000	10,000	10,000	30,000	10
					<b>sub-total GEF</b>	<b>48,300</b>	<b>70,300</b>	<b>80,300</b>	<b>43,100</b>	<b>28,100</b>	<b>270,100</b>	
	<b>Total Outcome 2</b>	<b>48,300</b>	<b>70,300</b>	<b>80,300</b>	<b>43,100</b>	<b>28,100</b>	<b>270,100</b>					
<b>OUTCOME 3:</b>	<b>UNDP</b>	<b>62000</b>	<b>GEF</b>	71400	Project specialist (technical staff)	3,600	3,600	3,600	3,600	3,600	18,000	14

Education and outreach to promote energy-efficient building design and technology				71200	International consultants	18,000	27,000	12,750	9,000	6,750	73,500	15
				71300	Local consultants	13,500	9,562	10,125	9,563	10,125	52,875	16
				72100	Contractual services	4,500	3,188	3,375	3,187	3,375	17,625	5, 16
				71600	Travel	6,700	30,000	6,700	6,700	6,700	56,800	6, 17
				75700	Workshops	2,200	1,700	1,700	1,700	1,700	9,000	8, 18
				74200	Communications and publications (web, print, etc.)	3,000	3,000	3,000	3,000	3,000	3,000	10
					<b>sub-total GEF</b>	<b>51,500</b>	<b>78,050</b>	<b>41,250</b>	<b>36,750</b>	<b>35,250</b>	<b>242,800</b>	
					<b>Total Outcome 3</b>	<b>51,500</b>	<b>78,050</b>	<b>41,250</b>	<b>36,750</b>	<b>35,250</b>	<b>242,800</b>	
<b>OUTCOME 4:</b> Development and demonstration of energy-efficient building design	<b>Party 1</b>	<b>62000</b>	<b>GEF</b>	71400	Project specialist (technical staff)	33,840	33,840	33,840	33,840	33,840	169,200	14
				71200	International consultants	123,000	132,000	119,000	33,000	18,000	425,000	19
				71300	Local consultants	25,688	28,875	30,188	16,875	2,062	103,688	20
				72100	Contractual services	77,062	86,625	90,562	50,625	6,188	311,062	5, 20
				71600	Travel	33,700	33,700	42,400	12,000	15,000	136,800	6
				72200	Equipment	0	1,248,390	0	0	0	1,248,390	21
				75700	Workshops	1,000	0	0	4,080	4,080	9,160	8
					<b>sub-total GEF</b>	<b>294,290</b>	<b>1,563,430</b>	<b>315,990</b>	<b>150,420</b>	<b>79,170</b>	<b>2,403,300</b>	
	<b>Total Outcome 4</b>	<b>294,290</b>	<b>1,563,430</b>	<b>315,990</b>	<b>150,420</b>	<b>79,170</b>	<b>2,403,300</b>					
<b>PROJECT MANAGEMENT UNIT</b>  (This is not to appear as an Outcome in the Results Framework and should not exceed 10% of project budget)	<b>Party 1</b>	<b>62000</b>	<b>GEF</b>	71400	Project Manager	37,440	37,440	37,440	37,440	37,440	187,200	22
				71400	Project Assistant	20,800	20,800	20,800	20,800	20,800	104,000	22
				72100	Contractual services	5,000	5,000	5,000	5,000	5,000	25,000	23
				71200	International consultants	0	0	16,500	0	16,500	33,000	24
				72200	Equipment	16,000	0	0	0	0	16,000	25
				71600	Travel	700	700	700	700	700	3,500	6
				72500	Office Supplies	1,200	1,200	1,200	1,200	1,200	6,000	
				74500	Board meetings	500	500	500	500	500	2,500	
				<b>sub-total GEF</b>	<b>81,640</b>	<b>65,640</b>	<b>82,140</b>	<b>65,640</b>	<b>82,140</b>	<b>377,200</b>		
			<b>UNDP</b>	71300	Local consultants	0	0	5,000	0	5,000	10,000	26
				71600	Travel	2,500	2,500	2,500	2,500	2,500	12,500	27
				72500	Office Supplies	0	0	0	0	0	0	
				74500	Board meetings	500	500	500	500	500	2,500	
				<b>sub-total</b>	<b>3,000</b>	<b>3,000</b>	<b>8,000</b>	<b>3,000</b>	<b>8,000</b>	<b>25,000</b>		
	<b>Total Management</b>	<b>84,640</b>	<b>68,640</b>	<b>90,140</b>	<b>68,640</b>	<b>90,140</b>	<b>402,200</b>					
<b>PROJECT TOTAL</b>						<b>744,410</b>	<b>2,061,950</b>	<b>781,110</b>	<b>533,140</b>	<b>472,890</b>	<b>4,593,500</b>	

1. One full-time staff member will coordinate technical activity on building codes and rating systems (Outcome 1 -- 89% time) and expansion of markets for energy-efficient building products via standards, certification, and labeling (Outcome 2 -- 11% time).

2. International consultants working on Outcome 1 will include a bilingual project technical advisor (8 weeks/yr); code enforcement specialist (8 weeks in first year, 4 weeks/yr in following years); code development specialist (13 weeks/yr); energy performance certification and rating specialist (8 weeks/yr); integrated "green building" standards specialist (12 weeks in years 1 and 2, 10 weeks in years 3 and 4, and 6 weeks in year 5); and an organizer for the international study tour (3 weeks in year 2 -- 5 additional weeks from this same consultant will be covered under Outcome 3), plus a share of evaluation (see note 3 below). Some positions may overlap. Some international consultants may be from CIS countries, possibly with lower weekly rates than consultants from Europe, North America, or other regions.
3. Consultant effort for Midterm and Final Evaluations, as well as other monitoring and evaluation (M&E), is mostly covered under project management. A share of consultant effort on M&E is shown under technical assistance components, as follows: Midterm Evaluation (year 3) -- 2.5 weeks international and 4 weeks local; Final Evaluation (year 5) -- 6.25 weeks international and 25 weeks local. Outcome 1 and especially Outcome 4 will require the most technical effort from M&E.
4. Local specialists on building codes and rating systems will include a code enforcement specialist (20 weeks/yr in years 1 and 2, 15 weeks/yr in following years); code development specialist (26 weeks/yr); energy performance certification and rating specialist (26 weeks/yr in years 1-3, 20 weeks/yr in following years); and integrated "green building" standards (20 weeks in years 1 and 2, 15 weeks/yr in following years), plus a share of evaluation (see note 3 above). Some positions may overlap. Some positions will be covered via contracted services (hiring of companies) rather than direct hiring of individual consultants (see note 5 below).
5. Local specialists will be hired either as individual consultants or via companies (contracted services). This budget estimates that 75 percent of costs for local specialists will be covered via individual consultancies and 25 percent via contracted services for Outcomes 1, 2, and 3. For Outcome 4, the ratio is reversed, with an estimated 25 percent of costs for local specialists to be covered via individual consultancies, and 75 percent via contracted services.
6. Travel for most international consultants and study tour participants is estimated at \$5,700 per trip. Travel originating in other CIS countries is estimated at \$2000 per trip. Except where noted, travel for project staff and local consultants within Kazakhstan is estimated at \$1000 per trip, on average. Trips by project staff and national consultants within Kazakhstan are estimated at
7. International travel for Outcome 1 will include 3 trips/yr originating outside the CIS in years 1-3, and 2 such trips/yr in following years. We estimate one international consultant trip per year originating within the CIS for this project outcome. Twelve trips will be made per year by project staff and national consultants within Kazakhstan. Finally, this line includes 3 international person-trips to be made by participants in the study tour.
8. Each technical assistance component (outcome) will bear a portion of the cost of the project inception workshop in Year 1, in the following amounts: \$1000 from Outcomes 1 and 4, and \$500 from Outcomes 2 and 3.
9. Costs for annual workshops on code enforcement are estimated at \$2500/year.
10. Communications and publications under technical assistance components includes development and production of building energy labels (Outcome 1); development and printing of product standards (Outcome 2); development and production of product labels (Outcome 2); printing of curricular materials (Outcome 3); and miscellaneous other items in various media.
11. International consultant work on Outcome 2 will include technical assessment in year 1 (6 weeks), and work on product standards and labeling (12 weeks in year 2, 10 weeks in year 3), as well as a small share of M&E (see note 3 above).
12. Work by local consultants and contracted companies on Outcome 2 will include technical assessment in year 1 (26 weeks), work on product standards and labeling (32 weeks in year 2, 38 weeks/yr in years 3 and 4, and 10 weeks in year 5), as well as a small share of M&E (see note 3 above).
13. International travel for Outcome 2 will include 1 trip/yr originating outside the CIS in years 1-3, and 1 trip/yr over the entire project period by project staff and/or national consultants within Kazakhstan.
14. One full-time staff member will coordinate technical activity on education and outreach (Outcome 3 -- 10% time) and demonstration projects (90% time).
15. International consultant work on Outcome 3 will include development and delivery of enhanced energy-efficiency curricula (4 weeks in year 1, 2 weeks in years 2 and 3, 1 week in year 4); judging of the energy-efficient building design contest (2 weeks in each project year); organization of the international study tour (5 weeks in year 2 -- shared with Outcome 1); and a small share of M&E.
16. Work by local consultants and contracted companies on Outcome 3 will include development and delivery of enhanced energy-efficiency curricula (18 weeks in year 1, 10 weeks/yr in following years); organization and judging of the energy-efficient building design contest (6 weeks in year 1, 5 weeks/yr in following years); and a small share of M&E, focused primarily on surveys of students (see note 3 above).
17. Travel in support of Outcome 3 will include 1 international consultant trip per year originating outside the CIS in years 1 and 2; 1 local consultant trip per year throughout the project period; and four international person-trips for participants in the study tour.
18. Work on Outcome 3 will include seminars and other instruction on energy efficiency, for various stakeholders. We estimate an annual cost of \$1700 for rental of equipment and space, and/or other direct expenses associated with these classes. This amount represents a part of the expected cost of these events; other costs will be covered via cost-sharing by project collaborators.
19. International consultants working on Outcome 4 will include a bilingual project technical advisor (3 weeks/yr in years 1-3); integrated building design specialist (10 weeks/yr in years 1-3, 5 weeks/yr in following years); building envelope specialist (10 weeks/yr in years 1-3); passive solar specialist (8 weeks/yr in years 1-3); heating system design specialist (20 weeks in years 1 and 2, 6 weeks in year 3); and a building commissioning specialist (3 weeks in year 2, 7 weeks in year 3, 6 weeks in year 4), plus a share of evaluation (see note 3 above). Some positions may overlap. Some international consultants may be from CIS countries, possibly with lower weekly rates than consultants from Europe, North America, or other regions.
20. Local specialists working on Outcome 4 will include a chief architect (39 weeks/yr in years 1-3, 20 weeks in year 4); staff architect (26 weeks/yr in years 1-3, 10 weeks in year 4); chief engineer (39 weeks/yr in years 1-3, 20 weeks in year 4); staff engineer (26 weeks/yr in years 1-3, 10 weeks in year 4); a building commissioning specialist (3 weeks in year 1, 20 weeks/yr in years 2-4), plus a share of evaluation (see note 3 above). Some positions may overlap. Most positions will be covered via contracted services (hiring of companies) rather than direct hiring of individual consultants (see note 5).

21. This line includes incremental costs for energy-efficient technology and materials to be used in the demonstration buildings (insulation, windows, controls, et al.) for at least 23,000 m<sup>2</sup> or maximum 55 US\$/m<sup>2</sup> of incremental GEF financing.
22. The project manager and project assistant are both full-time positions.
23. A firm will be hired annually via contract to conduct a financial audit.
24. This item includes services associated with preparation of Midterm and Final Evaluations.
25. This item includes workstations for the Project Manager, Project Assistant, and two full-time technical staff, plus other equipment needed by other project personnel.
26. UNDP will contribute \$5,000 toward the costs of the Midterm Evaluation, and the same amount for the Final Evaluation.
27. UNDP will contribute \$2,500 per year toward travel in support of M&E by staff or consultants.

**Summary of Funds:<sup>1</sup>**

	Amount	Amount	Amount	Amount	Amount	<b>Total</b>
	Year 1	Year 2	Year 3	Year 4	Year 5	
<b>GEF</b>	741,410	2,058,950	773,110	530,140	464,890	<b>4,568,500</b>
<b>UNDP</b>	3,000	3,000	8,000	3,000	8,000	<b>25,000</b>
<b>Agency for Construction and Residential-Communal Affairs<sup>2</sup></b>	2,585,034	2,585,034	2,585,034	2,585,034	2,585,034	<b>12,925,170</b>
<b>Karaganda Oblast Administration</b>	2,173,470	2,173,470	2,173,469	2,173,469	0	<b>8,693,878</b>
<b>West Kazakhstan Oblast Administration<sup>3</sup></b>	1,700,680	0	0	0	0	<b>1,700,680</b>
<b>Center for Innovative Technologies and New Materials</b>	1,530,612	0	0	0	0	<b>1,530,612</b>
<b>Kazakhstan State Architecture and Construction Academy (KazGASA)<sup>4</sup></b>	600,000	600,000	600,000	600,000	600,000	<b>3,000,000</b>
<b>U.S. Department of Energy (DOE)<sup>5</sup></b>	20,000	0	0	0	0	<b>20,000</b>
<b>TOTAL</b>	<b>9,354,206</b>	<b>7,420,454</b>	<b>6,139,613</b>	<b>5,891,643</b>	<b>3,657,924</b>	<b>32,463,840</b>

1. Support pledged in Kazakh tenge (KZT) is shown here at a rate of 147 KZT per US dollar.
2. Some support from the Agency for Construction and Residential-Communal Affairs will be delivered via the Residential-Communal Affairs Reform Center. Support letters from both the Agency and the Reform Center accompany this document, but associated funds are shown only once in the above table. The support letter from the Agency also cites a figure of 48 billion KZT (~US \$320 million) for renovation and repair of housing and utility services. That figure is not included in this table.
3. The support letter from the West Kazakhstan Oblast cites a figure of 250 million KZT for the construction of one five-story residential building as a demonstration project. That figure is included here in year 1. The support letter also cites an overall projection of 8.5 billion tenge for total spending by the regional government on housing between 2010 and 2015. This latter sum is not included in the table, but should still be noted as a meaningful expression of support for future replication efforts. The Mangystau Oblast has submitted a similar letter, also attached to this document, expressing general support and citing an overall regional-government projection of construction spending at 1.2 billion KZT between 2010 and 2015. Although this letter too is notable as a sign of support for implementation and replication, the overall Mangystau spending projection is not included in this table.
4. The support letter from KazGASA cites a figure of \$5,000,000 in co-financing. Among much other activity that is squarely within the framework of this UNDP/GEF project, the letter also mentions construction of a kindergarten, which, as a public building, is outside the project scope. We make a conservative (high) estimate of allocations for the kindergarten project at US \$2 million, which is excluded from this table.
5. The accompanying support letter does not cite a dollar amount, but the specific figure cited here has been provided separately by the DOE project manager via electronic mail correspondence, which is available upon request

## 5. Management arrangements

The project will be executed following established UNDP national execution (NEX) procedures. The Executing Agency/Implementing Partner will be the Agency for Construction and Residential-Communal Affairs (hereinafter, the Agency). The Executing Agency/Implementing Partner will appoint a National Project Director and will hire with GEF funding a Project Manager and an administrative/financial assistant. A summary of the roles and responsibilities of the National Project Director, the Project Manager, and the Administrative and Financial Assistant are provided below.

The National Project Director will be a high-level government official primarily responsible for overall implementation of the Project. This responsibility includes representing and supporting project objectives at high decisionmaking levels within the Government of Kazakhstan. The National Project Director also takes the primary responsibility for representing the Project to co-financiers, as well as for ensuring that the required government support to reach the milestones of the Project is available.

The *Project Implementation Unit (PIU)* will consist of a Project Manager and a Project Assistant to be hired for the full duration of the project and will be based in Astana, Kazakhstan. The Project Manager will be responsible for day-to-day management of all project activities; communication and coordination with the Agency and the Project Board; supervision of consultants; timely handling of disbursements and audits. The Project Assistant will be responsible for secretarial and administrative tasks. In addition, the PIU will include two full-time Project Specialists handling technical and management issues for specific components. All project staff will be recruited according to standard UNDP rules and regulations, based on pre-agreed Terms of Reference and selection processes. A representative of the Agency will be consulted, as a member of the recruitment panel. Please see the project organizational map below. The Project Manager will assume overall responsibility for the successful implementation of project activities and the achievement of planned project outputs. S/he will work closely with the national and international experts hired under the project, as well as the Project Assistant, and will report to the National Project Director and to the UNDP Country Office. The Administrative and Financial Assistant will provide assistance to the Project Manager in the implementation of day-to-day project activities. S/he is responsible for all administrative (contractual, organizational and logistical) and accounting (disbursements, record-keeping, cash management) matters related to the project.

The Executing Agency/Implementing Partner will establish a Project Board (PB) to give advice and guide project implementation. This will be chaired by the National Project Director. The PB will consist of representatives of all key stakeholders and will ensure the inclusion of industries' interests. The participants will include but not limited to: Ministry of Environmental Protection, Agency for Construction and Residential-Communal Affairs, and Ministry of Industry and New Technologies. Ministry of Environmental Protection will represent the interests of Senior Beneficiary. UNDP CO will play the role of Senior Supplier—being a GEF Implementing Agency represented in the country. Project assurance will be ensured by GEF OFP, UNDP CO together with the UNDP GEF RCU. The PB will monitor the project's implementation, provide guidance and advice, and facilitate communication, cooperation, and coordination among stakeholders and other project partners. At the initial stage of project implementation, the PB may, if deemed advantageous, wish to meet more frequently to build common understanding and to ensure that the project is initiated properly. Further details on the PB are provided in the monitoring and evaluation section of the document.

The project will hire short-term national and international experts for specific project assignments for indicative scope of the assignment of key experts/ consultants). Project activities will be contracted out on a competitive basis through tenders.

The project will be implemented in close coordination and collaboration with all relevant government institutions, regional authorities, industries and NGOs, as well as with other related relevant projects in the region. The UNDP-CO will be an active partner in the project's implementation. It will support implementation by maintaining the project budget and project expenditures, contracting project personnel, experts and subcontractors, undertaking procurement, and providing other assistance upon request of the National Executing Agency. The UNDP-CO will also monitor the project's implementation and achievement of the project outcomes and outputs, and will ensure the proper use of UNDP/GEF funds. Financial transactions, reporting and auditing will be carried out in compliance with national regulations and established UNDP rules and procedures for national project execution.

In order to accord proper acknowledgement to GEF for providing funding, a GEF logo will appear on all relevant GEF project publications, including, among others, project hardware purchased with GEF funds. Any citation on

publications regarding this project will also accord proper acknowledgment to GEF. The UNDP logo will be more prominent (and separated from the GEF logo if possible), as UN visibility is important for security purposes.

Table 5 enumerates all the anticipated responsibilities of these three main project partners.

Table 5. Activity categories and tasks for national partners

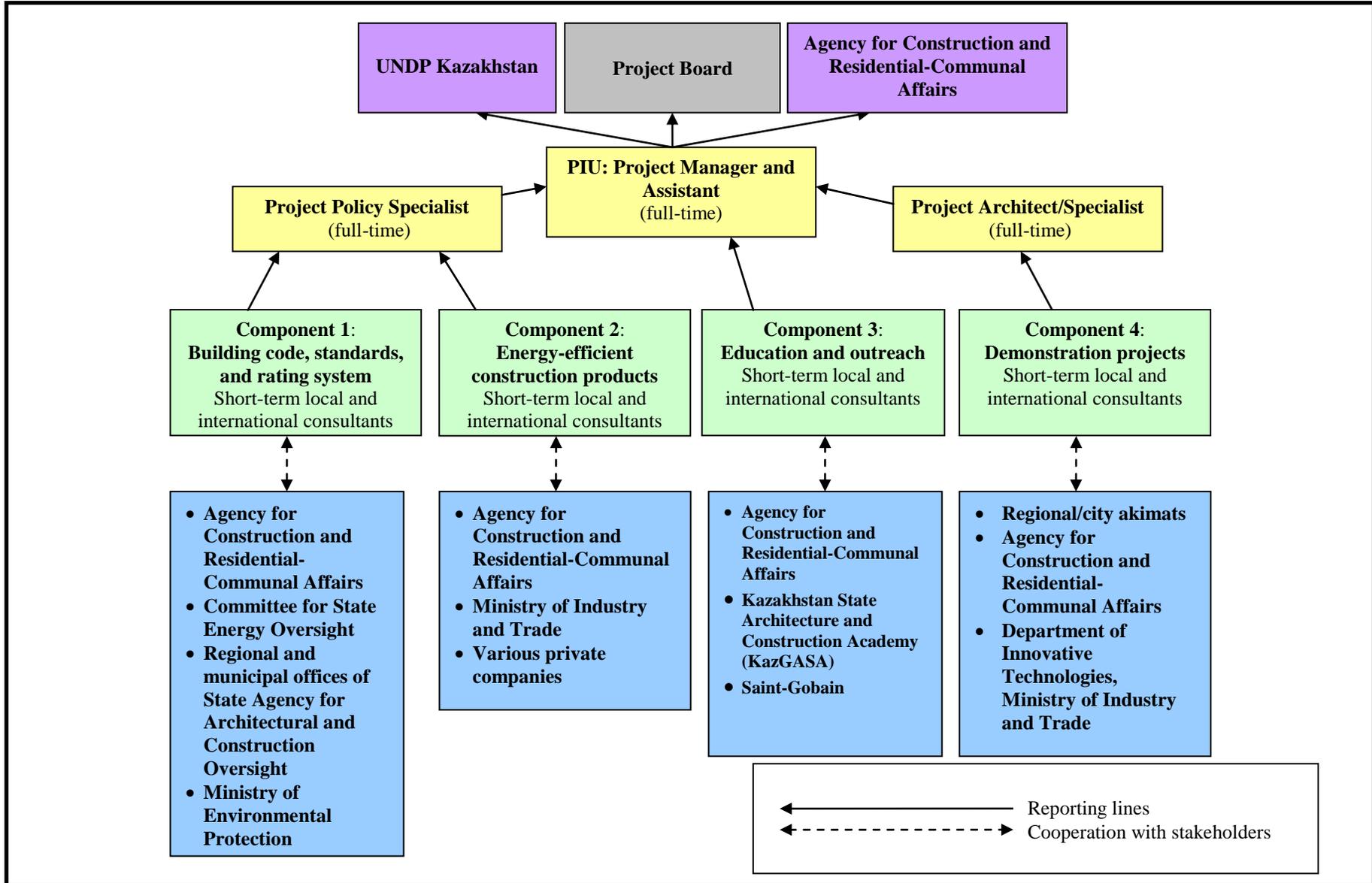
Activity/ Component	Partner agency / institution		
	Agency for Construction and Residential-Communal Affairs* (national implementing partner)	Committee for State Energy Oversight	Selected regional administrations
<b>Management and coordination</b>	<ul style="list-style-type: none"> <li>- Overall project management, coordinated with Project Implementation Unit</li> <li>- Participation in Project Board</li> <li>- Coordination with stakeholders, plus team of national and international consultants</li> </ul>	<ul style="list-style-type: none"> <li>- Participation in Project Board</li> </ul>	<ul style="list-style-type: none"> <li>- Participation in Project Board</li> </ul>
<p><b>Component 1 (Codes, standards, and rating system)</b></p> <p><i>1.1 Government mandate for code compliance</i></p> <p><i>1.2 Code enforcement</i></p> <p><i>1.3 Advanced building standards</i></p> <p><i>1.4 New code requirements</i></p> <p><i>1.5 Rating system (Energy Passports)</i></p>	<ul style="list-style-type: none"> <li>- Development of relevant laws and state program on energy efficiency in buildings (Chair, Deputy Chair, and staff)</li> <li>- Development and implementation of new policies, procedures, and training for code enforcement (federal State Architectural-Construction Oversight [GASK] under supervision of Deputy Chair)</li> <li>- Drafting of new standards and code requirements (Department of Technical Codes and Standards and New Construction Technology, under supervision of Deputy Chair)</li> <li>- Development of technical methodology for rating system. (Department of Technical Codes and Standards and New Construction Technology, under supervision of Deputy Chair).</li> <li>- Development of incentives associated with rating system, including possible tax advantages and/or raising of cost ceilings for state-funded buildings (Deputy Chair, Department of Residential-Communal Affairs, and others.)</li> <li>- Implementation of rating system in conjunction with regional administrations (GASK, other departments to be determined)</li> <li>- CO2 monitoring system (Ministry of Environmental Protection)</li> </ul>	<ul style="list-style-type: none"> <li>- Development of laws and state program on energy efficiency in buildings (Chair, Deputy Chair, and staff)</li> <li>- Development of technical methodology for rating system (staff).</li> <li>- Development of incentives associated with rating system</li> <li>- Implementation of rating system in conjunction with national audit program</li> </ul>	<ul style="list-style-type: none"> <li>- Development and implementation of new policies, procedures, and training for code enforcement (regional GASK)</li> </ul>
<b>Component 2 (Energy-</b>	<ul style="list-style-type: none"> <li>- Development of standards and certification for energy-efficient windows or other chosen</li> </ul>		

<i>efficient building materials and products)</i>	building materials or components (Department of Technical Codes and Standards and New Construction Technology, under supervision of Deputy Chair)		
<i>Component 3 (Education and outreach)</i>	- Participation in the development and delivery of courses and classes on energy efficiency for building designers and contractors (various departments)		
<i>Component 4 (Demonstration projects)</i>	<ul style="list-style-type: none"> <li>- Provision of funds to regional agencies for new residential building projects, as budgeted under State Programme (Department of Residential-Communal Affairs)</li> <li>- Participation in technical development of prototype building designs for demonstration projects (Department of Technical Codes and Standards and New Construction Technology)</li> <li>- Participation in the dissemination of design prototypes and principles developed in the demonstration projects (Department of Technical Codes and Standards and New Construction Technology)</li> </ul>		<ul style="list-style-type: none"> <li>- Development, implementation, and overall management of two demonstration projects involving actual construction</li> <li>- Replication of demonstration project approaches and technology in other buildings</li> </ul>

\* The Agency is now a self-standing entity separate from the Ministry of Industry and Trade, which was noted as the national implementing partner in the PIF. Note that a portion of the cofinancing committed by the Agency will be delivered via the Kazakhstan Residential-Communal Affairs Reform Center, a private company funded by the Agency.

Figure 3 presents an organizational map of relationships and responsibilities for all institutions with notable roles in the project.

Figure 3. Project organizational map



## 6. Monitoring and evaluation (M&E) plan

Monitoring and evaluation (M&E) of the project will follow the UNDP Program Manual and GEF M&E procedures, and will be conducted by the project team and the UNDP Country Office in Kazakhstan with support from the UNDP/GEF Regional Coordination Unit in Bratislava. The Project Results Framework in Annex A defines indicators for project implementation, including baselines, targets, and means of verification, all of which will form the basis for the project's M&E plan. The Project Results Framework will also serve as the foundation of detailed annual work plans.

### General project review and reporting

Several mechanisms, applied with varying frequency, will track, document, and evaluate project progress. The full-time Project Manager and Project Specialists will handle day-to-day monitoring and management of project activity, in the context of the Project Results Framework and annual work plans. The UNDP country office and UNDP/GEF Regional Coordinating Unit will provide regular guidance, support, and assistance in ad-hoc troubleshooting. Project staff will report formally to the Project Board in face-to-face meetings at least once per year. Staff will also prepare written quarterly progress reports to the UNDP country office and UNDP/GEF Regional Coordinating Unit.

The project team will organize a *Project Inception Workshop* within two months of the beginning of the project period, after the hiring of staff and key consultants. At this two-day meeting, the entire project team, including national partners, will discuss in detail the plans and intended outcomes of the project, and agree upon a first-year work plan based on the Project Results Framework. Expectations, roles, specific assignments, and reporting procedures will be set forth for all project members (for consultants, in accordance with their Terms of Reference). The inception workshop will result in an Inception Report, including the written annual first-year work plan and team member assignments, to be submitted to GEF within four weeks after the workshop is completed.

Annual work plans will be prepared not only for the first project year, of course, but also for each subsequent year. As for the first year, these plans will define all assignments and expected results for the project team, based on the Project Results Framework.

Once per year, project staff will prepare and circulate *Project Implementation Reviews* and *Annual Project Reports*, at least two weeks before the Project Board meets. These reports will summarize project activity, outputs, and outcomes in the context of the annual work plan for the year being completed. The reports will also discuss any delays or other problems with implementation, and propose remedies for the project as it moves into the next years of work. Both project narratives and financial summaries will be included.

A *Midterm Evaluation* will be carried out in the middle of the third project year (projected December 2012). This evaluation will be carried out by a contractor who has not participated on project implementation. The evaluation will assess progress toward targeted outcomes and will recommend changes in course as needed. Recommendations will contribute directly to subsequent annual work plans.

Another independent evaluation will be carried out at the close of the project. The *Final Evaluation* will be conducted in accordance with standard UNDP and GEF guidance. It will discuss project results in the context of original project plans and indicators, as well as the Mid-term Evaluation. This evaluation will contain a section in which project staff can respond to the evaluator's comments.

The UNDP country office will identify contractors and define specific Terms of Reference for both the Mid-term and Final Evaluations.

In addition to the independent Final Evaluation, the M&E plan calls for a *Project Terminal Report* at the end of the project period. Project staff will compose this report, which will enumerate all project activities, outputs, and outcomes. This report will address areas in which project results fell short of plans, with a discussion of reasons for unmet expectations. The terminal report will also present both positive and negative lessons learned, as well as recommendations for future activity to sustain, build upon, and replicate project results in Kazakhstan and other countries.

## Financial audit

Annual financial audits of UNDP will be conducted in accordance with UNDP procedures. The Government of the Republic of Kazakhstan and regional administrations participating in the demonstration projects will provide the Resident Representative of UNDP Kazakhstan with certified periodic financial statements, and an annual audit of financial statements relating to the status of UNDP and GEF funds, according to the established procedures set out in the Programming and Finance manuals. The annual audit will be conducted by the legally recognized auditor of the Government, or by a commercial auditor engaged by the Government.

## Evaluation of specific components: indicators, methods, and limitations

The indicators enumerated in the Strategic Results Framework encompass a range of quantitative and qualitative factors, each with its own particular means of verification:

- *statistical and technical data*, including total residential energy consumption and average consumption per unit of floor area;
- *objective but quantitatively elusive indices* such as code compliance rates and transformation of market practices; and
- *objective facts* such as the passage of regulations and delivery of educational courses;
- *qualitative assessments*, such as consumer opinions and interest in energy efficiency.

For quantitative evaluation of energy consumption in buildings, the M&E plan will rely foremost on national statistics for construction volumes and sectoral energy consumption. National code requirements will provide a basis for estimation of energy consumption by new buildings, and for comparison against baseline consumption by existing buildings complying with earlier codes.

Actual building energy performance may not always match with design projections on paper, leading to energy use beyond code-stipulated limits even in buildings deemed in compliance. Recognizing this possibility, the project M&E team will work with official agencies to conduct selective verification of building designs, actual construction, and operating performance. Such verification work will be conducted in conjunction with existing program efforts in enhanced code enforcement and building energy rating and labeling, with the number, location, and types of buildings subject to verification to be determined during the project. Data from these verification procedures could be used both in cross-checking quantitative assessments of energy consumption and in estimating compliance rates.

The demonstration projects in component 4 will have their own especially rigorous technical process of M&E, including compilation of official records of code compliance, with associated energy-related documentation; field verification of presence and performance of built features; and metering of actual energy consumption, normalized based on weather data. Where possible, data from the demonstration buildings will be compared against corresponding data from a control sample of buildings without energy-efficient additions, but with otherwise analogous design. A team of national and international consultants will work specifically on the verification elements of the demonstration projects, apart from design and implementation.

Finally, for evaluation of the effectiveness of public information programs (including building labeling, product labeling, and training), the project calls for targeted opinion research among relevant building-industry stakeholders. This research will be carried out by in-country agencies qualified in social research.

## Budget and timetable

The table below summarizes key planned M&E activities.

Type of M&E activity	Responsible Parties	Budget US\$ <i>Excluding project staff time</i>	Time frame
<b>I. Quality control by project management</b>			
Inception Workshop	<ul style="list-style-type: none"> <li>▪ Project manager</li> <li>▪ UNDP country office</li> <li>▪ UNDP/GEF Regional Coordinating Unit (RCU)</li> </ul>	3,000	Within first two months of project startup
Visits to field sites	<ul style="list-style-type: none"> <li>▪ UNDP country office</li> <li>▪ UNDP/GEF RCU</li> <li>▪ Government representatives</li> </ul>	16,000 (3,500 from GEF, 12,500 from UNDP)	Yearly
<b>II. Project reporting</b>			
Inception Report	<ul style="list-style-type: none"> <li>▪ Project manager</li> <li>▪ UNDP country office</li> <li>▪ International consultant</li> </ul>	None	Within three weeks of Inception Workshop
Periodic status reports	<ul style="list-style-type: none"> <li>▪ Project manager</li> </ul>	None	Quarterly
Annual Project Reports and Project Implementation Reviews	<ul style="list-style-type: none"> <li>▪ Project manager</li> <li>▪ UNDP country office</li> <li>▪ UNDP/GEF RCU</li> </ul>	None	Annually
Mid-term Evaluation	<ul style="list-style-type: none"> <li>▪ Project manager</li> <li>▪ UNDP country office</li> <li>▪ UNDP/GEF Regional Coordinating Unit</li> <li>▪ National and international consultants (evaluation team)</li> </ul>	36,000 (33,000 from GEF, 3,000 from UNDP)	At the midpoint of project implementation (beginning to middle of third year).
Final Evaluation	<ul style="list-style-type: none"> <li>▪ Project manager,</li> <li>▪ UNDP country office, UNDP/GEF RCU</li> <li>▪ National and international consultants (evaluation team)</li> </ul>	36,000 (33,000 from GEF, 3,000 from UNDP)	At the end of project implementation
Project Terminal Report	<ul style="list-style-type: none"> <li>▪ Project manager</li> <li>▪ UNDP country office</li> <li>▪ External Consultant</li> </ul>	None	At least one month before the end of the project
Financial audits	<ul style="list-style-type: none"> <li>▪ UNDP country office</li> <li>▪ Project manager</li> </ul>	25,000 (average 5,000 per year*)	Yearly
<b>III. Evaluation of energy savings, avoided emissions, and other project results</b>			
Compilation and analysis of national statistics	<ul style="list-style-type: none"> <li>▪ National consultants</li> </ul>	3,000	
Field verification of building energy performance	<ul style="list-style-type: none"> <li>▪ Government agencies</li> <li>▪ National consultants</li> <li>▪ International consultants</li> <li>▪ Project architect/specialist</li> </ul>	10,500	Throughout project (inspection and documentation of at least six to ten buildings per year)
M&E of demonstration projects	<ul style="list-style-type: none"> <li>▪ National consultants</li> <li>▪ International consultants</li> <li>▪ Regional administrations</li> </ul>	28,500	
Opinion research	<ul style="list-style-type: none"> <li>▪ National consultants</li> </ul>	10,500	
<b>TOTAL INDICATIVE COST</b> <i>Excluding project staff time, UNDP staff and travel expenses.</i>		168,500	

## 7. Legal context

This Project Document shall be the instrument referred to as such in Article I of the Standard Basic Assistance Agreement between the Government of Kazakhstan and the United Nations Development Programme, signed by the parties on 4 October 1994. The host country implementing agency shall, for the purpose of the Standard Basic Assistance Agreement, refer to the government co-operating agency described in that Agreement.

The UNDP Resident Representative in Astana, Kazakhstan is authorized to effect in writing the following types of revision to this Project Document, provided that he/she has verified the agreement thereto by the UNDP-GEF Unit and is assured that the other signatories to the Project Document have no objection to the proposed changes:

- a) Revision of, or addition to, any of the annexes to the Project Document;
- b) Revisions which do not involve significant changes in the immediate objectives, outputs or activities of the project, but are caused by the rearrangement of the inputs already agreed to or by cost increases due to inflation;
- c) Mandatory annual revisions which re-phase the delivery of agreed project inputs or increased expert or other costs due to inflation or take into account agency expenditure flexibility; and
- d) Inclusion of additional annexes and attachments only as set out here in this Project Document.

## ANNEXES

## Project staff and consultants (with Terms of Reference for key staff)

<i>Position Titles</i>	<i>\$/ person week*</i>	<i>Estimated person weeks**</i>	<i>Tasks to be performed</i>
<b>For Project Management</b>			
<i>Local</i>			
Project manager (PM)	720	260	<ul style="list-style-type: none"> <li>• Responsibility for overall project management, including technical, administrative, and financial aspects, as well as monitoring and evaluation</li> <li>• Drafting of Terms of Reference (TOR) for all consultants</li> <li>• Supervision of Project Specialist (Policy) and Project Specialist (Technical)</li> <li>• Hiring and supervision of consultants, with the assistance of the two Project Specialists</li> <li>• Coordination with UN Country Office, national implementing agency, and other partners</li> <li>• Leadership of meetings and workshops</li> <li>• Preparation of reports and timely posting of information to project website</li> </ul>
Project assistant	360	260	<ul style="list-style-type: none"> <li>• Assistance to PM in general program operations, including communication, logistics, reporting and record-keeping, and selected technical activity</li> </ul>
<b>For Technical Assistance</b>			
<i>Local</i>			
Project policy specialist	720	220	Day-to-day leadership and coordination of all activities under Components 1 and 2, under the supervision of the Project Manager. Oversight and support of consultants. Development and advocacy of policies, regulations, and programs planned under these components.
Project technical specialist	720	260	Day-to-day leadership and coordination of all activities under Components 3 and 4, under the supervision of the Project Manager. Oversight and support of consultants. Direct participation in all technical aspects of prototype building development and demonstration projects, as well as technical education and outreach.
Building code enforcement specialist	750	85	Development and implementation of training and operational enhancements to support more effective building energy code enforcement, in conjunction with national implementing agency.
Green building standards specialist	750	85	Development and implementation of integrated "green" building standards. Elaboration of technical criteria, rules, and implementation procedures.
Building energy code and performance certification	750	248	Development and implementation of energy code enhancements and building energy certification

specialist			system, including methodological and programmatic aspects. Analysis of proposed measures, calculation methods, and certification rules. Stakeholder outreach and advocacy. Dissemination via print publications, online media, and presentations.
Construction materials production & labeling specialist	750	106	Technology assessment of energy-efficient building materials in Kazakhstan, including best opportunities for technology transfer and new production standards. Development and promotion of technical standards, based on needs identified in assessment, in collaboration with relevant agencies.
Building design education and outreach specialist	750	24	Development and delivery of advanced curricula on energy-efficient building design, installation of energy-efficient building features, and/or economic advantages of energy efficiency
Environmental studies curriculum developer	750	20	Development and delivery of advanced curricula on social, economic, and environmental benefits of energy efficiency.
Chief architect	750	137	Supervision and direct participation in technical development of prototype buildings and demonstration projects, including preparation of drawings and blueprints, selection of building materials and components, and analysis of building energy use
Architect	750	88	Technical development of prototype buildings and demonstration projects, including preparation of drawings and blueprints, selection of building materials and components, and analysis of building energy use
Chief engineer	750	137	Supervision and direct participation in technical development of heating and ventilation systems for prototype buildings and demonstration projects, including system design and equipment selection
Engineer	750	88	Technical development of heating and ventilation systems for prototype buildings and demonstration projects, including system design and equipment selection
Project engineer (commissioning agent)	750	63	Planning and implementation of systematic optimization of HVAC and other building systems for maximally energy-efficient performance before and during occupancy, including checking, maintenance, and establishment of control settings
Measurement and evaluation specialist (surveys)	750	8	Surveys of participants in training organized by the project. Analysis and reporting of survey results.
Measurement and evaluation specialist (technical)	750	65	Compilation and analysis of energy savings and avoided emissions from all project components
<i>International</i>			
Project Technical Advisor	3,000	47	<ul style="list-style-type: none"> <li>• Technical advice to PM and Project Specialists on project planning, implementation, and integration, especially with Components 1 and 4</li> </ul>

			<ul style="list-style-type: none"> <li>• Participation in development of consultant TOR</li> <li>• Coordination of technical discussions at project Inception Workshop</li> <li>• Position to be filled by a bilingual (English and Russian) specialist with expertise in both RK and international energy-efficiency practices in the building sector</li> <li>• Assistance to management team and consultants with technical aspects of monitoring and evaluation</li> </ul>
Building code enforcement specialist	3,000	24	Technical advice on international best practices in building code enforcement, delivered via direct training and written materials
Green building standards specialist	3,000	39	Technical advice on international best practices in "green" building standards (integrated standards on energy efficiency and environmental sustainability)
Building thermal performance specialist	2,000 <sup>8</sup>	89	<ul style="list-style-type: none"> <li>• Technical advice on thermal performance standards and code requirements for buildings</li> <li>• Participation in design of prototype buildings and demonstration projects</li> </ul>
Energy performance certification specialist	3,000	64	Technical advice on international best practices in energy performance certification and labeling, for both whole buildings and components such as windows
Integrated building design expert	3,000	59	<ul style="list-style-type: none"> <li>• Technical advice on international best practices in energy-efficient integrated building design</li> <li>• Participation in development of prototype buildings and demonstration projects</li> <li>• Development of advanced educational curricula</li> <li>• Judging of annual design contest</li> </ul>
Passive solar design specialist	3,000	21	Technical advice on international best practices in passive solar building design, for use in prototype buildings and demonstration projects
Heating system design specialist	2,000	46	Technical advice on design of energy-efficient heating systems (hydronic, connected to district heating), for use in prototype buildings and demonstration projects
Building commissioning specialist	3,000	18	Technical advice on building commissioning (checking and optimization of building systems, especially controls, for energy-efficient performance)
Organizer of international study tour	3,000	8	Organization of logistics and substantive training for international study tour, including advance preparation, the tour itself, and follow-up reporting

<sup>8</sup> Weekly rates for consultants from Russia will fall between those of local consultants and other international consultants.

## 8. Part III: Terms of Reference for key project staff and main subcontracts

### PROJECT MANAGEMENT COMMITTEE

#### Status and Functions

1. The Project Management Committee (PMC) is a main coordinating body, which coordinates the implementation arrangements of the project referring to the objectives and the outcomes, reflected in the project document and in accordance with UNDP rules and regulations;
2. The main functions of the PMC are:
  - The general monitoring and control of the correctness to fulfill the project activities
  - Regulation of the current project activity with regard to the changing external environment
  - Approval of the changes, that are contributed in the project document, that arise due to the unexpected reasons after the careful analysis and discussion of the ways to solve problems
3. Members of the PMC work on a voluntary unpaid basis. The reimbursement of the travel expenses of Members PMC work is on a voluntary no-charge basis. Compensation of expenses for business trips, connected with the activities within the framework of the project is carried out upon submission of all confirming documents, according to procedures and standards of UNDP;
4. Members of the PMC have no right to participate in the realization of the project. Members of the PMC do not have the right to receive monetary compensation as experts or advisers in the project. Otherwise the Member will be obliged to leave from the PMC structure;
5. The PMC Structure is formed as agreed between UNDP and the involved national structures and, whenever possible, includes representatives of all interested parties for substantial and financial participation in coordination of the execution of the project;
6. PMC as body, as well as its individual members does not represent neither UNDP, nor GEF.

#### PMC Structure

1. The PMC structure should be as stable as possible for the complete duration of the realization of the project in order to adequately carry out both the supervision and co-ordination of performance of the project;
2. The mandatory PMC structure includes the following representatives: National Project Director from the government, equal representation from executive and supervising agencies, UNDP representatives and the representative from other donors if available,
3. The final list of PMC members must be reflected in the project documents but can be modified through official correspondence or following the report of a meeting.
4. UNDP along with supervising executive partners is responsible for any modification regarding the PMC structure;

#### Sessions

1. PMC sessions are held according to the working plan which includes a tentative schedule of the authorized sessions in accordance to signed project document. In case of a need for a convocation of an extraordinary PMC session, all representatives PMC should be notified in writing 14 days prior to prospective date of session;
2. The manager of the project is obliged to distribute all materials concerning the themes of the session to all PMC members, at least for 5 working days prior to any sessions with the purpose of maximizing effective participation of all participants and receptions of fruitful and substantial discussion. In turn, PMC members are obliged to familiarize themselves attentively with the submitted documents in order to be completely informed and competent on the themes of discussion of next PMC session;

3. PMC members should be present at all sessions. In the event where a situation would be interfering with the participation of a PMC member in the next session, the manager of the project must be notified 3 days prior to the session;
4. PMC sessions are to be held with a minimum attendance of 2/3 from PMC structure;
5. In a case where PMC partner's representative would not be present for 2 consecutive sessions, the member, following a PMC decision, would be removed from the structure of the committee;
6. During PMC sessions, PMC representatives must appoint a member who will be chairing the session. The basic function of the Chairman is the maintenance of the democratic character of the discussions and the achievement of a consensus in an operating time for the next and-or emergency PMC sessions;
7. The presence of independent observers with the right of a deliberative vote to PMC sessions is possible. The nomination of the observer should be at least 5 working days prior to the session and be coordinated with UNDP and supervising and partner agencies. No other accompanying persons can participate in executive PMC decisions.

#### Decision-making

1. PMC Decisions must be reached on the basis of a consensus;
2. PMC must appoint a session secretary among the employees from the designated personnel
3. All decisions are fixed by the session reports which must be signed by all participants of session and kept in the office of the project;
4. Copies of decisions in Russian and English languages must be distributed within 3 days to the corresponding PMC members involved in the performance of sessions and acceptance of decisions.

#### The conflict of interests

1. Representatives PMC are obliged to provide impartiality in the decision-making process reached by consensus, to exclude questions of personal character, the conflicts of interests, and possible external influences;
2. In the case of potential conflicts of interests between PMC representatives and the bearer of the application, the PMC member is obliged to notify PMC beforehand of the development of the situation and, under PMC decision, the member might not participate to the discussion of the concrete project, or will continue work in a usual mode.

#### The order of modification of the present rules

1. The duties of PMC representatives are defined by the present document, the project document and the working plan.
2. Changes and additions in key rules of work of PMC representatives to be coordinated during PMC sessions and affirmed by a common decision of the session.

## **National Project Director**

Duties and responsibilities.

- Represent the Government of Kazakhstan as the person responsible for the Removing Barriers to Energy Efficiency in Municipal Heat and Hot Water Supply implementation from the government side.
- Supervise implementation of the Removing Barriers to Energy Efficiency in Municipal Heat and Hot Water Supply project during the entire period, assuring that work is carried out in accordance with the Project Proposal.
- Ensure all required authority to the Project Manager required for successful project implementation.
- Ensure presentation of all project expenses to authorized officials, in accordance with operational principles of national implementation.
- Assure coordination between project activities and other governmental activities, as well as incentives related to the project.

**Provide other types of support to assure successful implementation of the project and further activities, including the sustainability and dissemination of the results.**

## Terms of Reference

<b>Position:</b>	<b>National Project Manager</b>
<b>Project:</b>	<b>Energy Efficient Design and Construction of Residential Buildings</b>
<b>Type of Contract:</b>	<b>Service</b>
<b>Place of Work:</b>	<b>Astana, Kazakhstan</b>
<b>Period:</b>	<b>September 2010 through December 2015</b>

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### Brief description

The Project Manager (PM) will be responsible for the daily management of all project activity at the national level. The PM will head the work of the Project Implementation Group, providing supervision of all consultants, contracted companies, and technical and administrative staff. The PM will work under the general oversight of the National Project Director and the Project Board, with supervision from the project coordinator at UNDP. All work conducted by the PM and the entire Project Implementation Group will be coordinated with the Agency for Construction and Residential-Communal Affairs, which is the national implementing agency for the project from the Republic of Kazakhstan.

This is a full-time position. The PM is responsible for the following:

- Effective project planning and implementation, with participation of all interested parties, in accordance with the project document
- Preparation, tracking, and implementation of annual work plans for the project
- Organization and management of the work of the Project Implementation Group
- Development of Terms of Reference and contracts for national and international consultants
- Provision of effective interaction with relevant state agencies, scientific institutions, NGOs and other interested parties
- Development of relations with other relevant GEF programs or other regional programs on energy efficiency and/or buildings;
- Dissemination of information of project activity and results to project partners and the general public (including the creation and updating of project web page)
- Supervision of internal processes for quality control, including creation of logs of risks, problems and quality indicators of project activity, monitoring and maintaining these logs, and making necessary changes
- Provision of progress reports on project implementation in accordance with the project document
- Delivery of needed information to independent outside project evaluators
- Regular reporting and communication with the Project Board and UNDP about project status, including problems
- Control of spending of project funds on intended purposes in accordance with the approved budget of each project outcome
- Monitoring and coordination of the delivery of co-financing as stipulated in the project document.

The overall goal for the PM's work is the successful implementation of the project in accordance with the goals, work plan and budget set forth in the project document, including the following specific outputs:

- Procedural reform and training in support of enhanced enforcement of existing building energy codes
- Voluntary standards for energy performance and "green buildings"
- Review and recommendations on revision of mandatory building energy codes

- Development and implementation of a rating and labeling scheme for energy performance of residential buildings
- Development of system for monitoring and accounting of energy use and associated greenhouse gas emissions from residential buildings
- Technical assessment of energy-efficient building materials and products in Kazakhstan, noting areas of particular need for technology transfer, product standards, and certification/labeling
- Development of product standards, certification, and labeling for chosen products
- Development and delivery of enhanced educational curricula on energy efficiency in buildings, for building designers, contractors, and owners
- Contests on energy-efficient building design
- Implementation of at least two demonstration projects embodying best practices in energy-efficient building design, construction, and operations
- Reporting and dissemination of demonstration project results, lessons learned, and opportunities for further activity

### **Required qualifications**

- Higher education (specialist designation, bachelor's degree, or equivalent, as granted by a university or institute) in a field related to energy efficiency in buildings (architecture, thermal engineering, energy, economics, and/or policy, etc.)
- Technical knowledge and work experience of not less than 5 years in energy efficiency, housing policy, building design, and/or construction
- Experience in strategic planning and project management
- Experience in supervision of employees and consultants
- Excellent abilities to motivate and supervise a diverse team
- Excellent computer skills
- Familiarity with the structure and strategic priorities of UNDP and GEF projects is preferable
- Fluency in written and oral Russian and English
- Knowledge of Kazakh is preferable

**Position:** Project Assistant  
**Project:** Energy Efficient Design and Construction of Residential Buildings  
**Type of Contract:** Service  
**Place of Work:** Astana, Kazakhstan  
**Period:** September 2010 through December 2015

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### **Brief description**

The Project Assistant (PA) will provide administrative and other support for the Project Manager (PM) and other project staff and consultants.

This is a full-time position, under the direct supervision of the PM. The PA's duties will include:

- Administrative activity and logistics in support of the project
- General administration of the project office
- Business correspondence, telephone calls, and other communication related to the project
- Maintenance of business and financial documentation, according to requirements of the UNDP and donor organizations
- Preparation of internal reports and recording of meetings
- Organizing and executing meetings and workshops
- Assistance to project manager in preparation of financial and other reports

### **Required qualifications**

- Work experience and skills in office administration
- Ability to work effectively under pressure
- Perfect computer skills
- Fluency in English and Russian; knowledge of Kazakh is desirable

**Position:** Policy Specialist / Task Manager  
**Project:** Energy Efficient Design and Construction of Residential Buildings  
**Type of Contract:** Service  
**Place of Work:** Astana, Kazakhstan  
**Period:** September 2010 through December 2015

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### **Brief description**

The Policy Specialist (PS) will oversee the technical and policy implementation of Outcomes 1 and 2 (Components 1 and 2), as articulated in the project document. These project components include the following activities:

- Review and recommendations on revision of mandatory building energy codes
- Development and implementation of a rating and labeling scheme for energy performance of residential buildings
- Development of system for monitoring and accounting of energy use and associated greenhouse gas emissions from residential buildings
- Technical assessment of energy-efficient building materials and products in Kazakhstan, noting areas of particular need for technology transfer, product standards, and certification/labeling
- Development of product standards, certification, and labeling for chosen products

This is a full-time position, under the direct supervision of the Project Manager (PM). The PS is responsible for the following:

- Development of annual work plans in conjunction with the PM
- Work in conjunction with the PM in developing Terms of Reference and hiring national and international consultants in the given project areas
- Supervision and support of consultants
- Research and analysis on prevailing conditions and practices in the residential building sector, and potential for enhancing energy efficiency via the planned components
- Written policy recommendations on regulations, enforcement, rating systems, and certification systems
- Organization and implementation of seminars and meetings
- Timely and complete fulfillment of project tasks in accordance with annual work plans and the project document

### **Required qualifications**

- Higher education (specialist designation, bachelor's degree, or equivalent, as granted by a university or institute) in a field related to energy efficiency in buildings (architecture, thermal engineering, energy, economics, and/or policy, etc.)
- Technical knowledge and work experience of not less than 3 years in energy efficiency, housing policy, building design, and/or construction
- Familiarity with building energy regulations and the institutional processes of development and implementation of these regulations
- Familiarity with prevailing building design and construction practices, as well as markets for building materials and components, in Kazakhstan
- Excellent computer skills

- Fluency in Russian
- Knowledge of English and Kazakh are preferable

**Position:** Technical Specialist / Task Manager  
**Project:** Energy Efficient Design and Construction of Residential Buildings  
**Type of Contract:** Service  
**Place of Work:** Astana, Kazakhstan  
**Period:** September 2010 through December 2015

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### **Brief description**

The Technical Specialist (TS) will oversee the technical implementation of Outcomes 3 and 4 (Components 3 and 4), as articulated in the project document. These project components include the following activities:

- Development and delivery of enhanced educational curricula on energy efficiency in buildings, for building designers, contractors, and owners
- Contests on energy-efficient building design
- Implementation of at least two demonstration projects embodying best practices in energy-efficient building design, construction, and operations
- Reporting and dissemination of demonstration project results, lessons learned, and opportunities for further activity

This is a full-time position, under the direct supervision of the Project Manager (PM). The TS is responsible for the following:

- Development of annual work plans in conjunction with the PM and project partners
- Work in conjunction with the PM in developing Terms of Reference and hiring national and international consultants in the given project areas
- Supervision and support of consultants
- Development of relations with project partners, including educational institutions and regional administrations
- In conjunction with regional administrations and other partners, ensuring the timely fulfillment of schedules for demonstration-project building design, construction, and commissioning
- Ensuring delivery and integration of technical recommendations on energy-efficient building design, materials, and components
- Pricing and procurement of energy-efficient building materials and components in accordance with the project budget and all applicable rules and procedures
- Organization and implementation of seminars and meetings
- Supervision of project evaluation for the given components
- Dissemination of project results via publications, print and electronic media
- Timely and complete fulfillment of project tasks in accordance with annual work plans and the project document

### **Required qualifications**

- Higher education (specialist designation, bachelor's degree, or equivalent, as granted by a university or institute) in a field related to energy efficiency in buildings (architecture, thermal engineering, energy, etc.)
- Technical knowledge and work experience of not less than 5 years in energy-efficient building design and/or construction

- Familiarity with building energy regulations and the institutional processes of development and implementation of these regulations
- Familiarity with higher education and continuing education for building professionals in Kazakhstan
- Familiarity with prevailing building design and construction practices, as well as markets for building materials and components, in Kazakhstan
- Excellent computer skills
- Fluency in Russian
- Knowledge of English and Kazakh are preferable

**SIGNATURE PAGE**

UNDAF Outcome(s)/Indicator(s): Environmental Sustainability

Expected Outcome(s)/Indicator (s): Outcome 2. The Government, industries and civil society take steps to adapt to climate change and mitigate it’s impact through energy efficiency measures and climate change adaptation policies.

Expected Output(s)/Indicator(s): Outcome 2.3 The Government and energy consumers are better equipped with knowledge, policies and pilot cases on renewable energy market regulations, and energy efficiency measures in sectors with high CO2 emission level.

Implementing partner: Agency for Construction and Residential-Communal Affairs of the Republic of Kazakhstan.

Other Partners: UNDP-Kazakhstan, Ministry of Industry and New technologies, Akimats of Karaganda, Mangystau and Western Kazakhstan oblast.

Programme Period:	2009-2015
Programme Component:	Environmental sustainability
Atlas Award ID:	00059795
Project ID:	00074950
PIMS #	4133
Project duration:	60 months
Management Arrangements	NEX

Total resources required	4,568,500
Total allocated resources:	32,463,840
Allocated resources in cash:	
• GEF	4,568,500
• UNDP	25,000
Parallel co-financing:	
• Government	24,850,340
In-kind contribution:	
• Other	3,020,000

Agreed by Agency for construction and housing:

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Date/Month/Year

Agreed by Ministry of Environment Protection:

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Date/Month/Year

Agreed by UNDP:

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Date/Month/Year