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Energy Efficiency Investments in Public Facilities

Developing a Pilot Mechanism for Russia and Chelyabinsk Region

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January 2012



Pacific Northwest
NATIONAL LABORATORY

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Executive Summary

Russian public sector buildings tend to be very inefficient, which creates vast opportunities for savings. In the past, there were few incentives to save energy as any savings immediately resulted in a reduced energy budget for the owner. New legislation and regulations have changed that. Russian public buildings must reduce energy consumption by 15% by 2014; they can also now more easily attract energy service companies to help implement improvements. However, given Russia's limited experience with energy performance contracts (EPCs), a pilot project can help test the mechanism in practice at a manageable scale and facilitate smooth implementation of large-scale energy efficiency improvements.

The U.S. Department of Energy cooperates with Russia on energy issues, including energy efficiency within the framework of the U.S.-Russia Bilateral Presidential Commission. Both sides selected energy efficiency in the public sector as a top priority for energy efficiency cooperation. Following meetings with several regions, Chelyabinsk Region was selected for this pilot because of the region's progressive steps in designing and implementing an energy efficiency program and its openness and commitment to investors. The mechanism and options described here are designed based on the specific situation in Chelyabinsk Region, but also drawing heavily from the federal regulatory requirements. Section 2 of this report provides information on potential opportunities for the pilot project in Chelyabinsk Region.

To implement improvements, the Russian legislation enables public entities to enter into EPCs and to conduct a public tender for projects. While this current system takes advantage of the best international practices in financing energy efficiency projects, the regulations are still evolving. Based on consultations with large, experienced ESCOs such as Honeywell, we believe the current regulations have many positive aspects, but some of the provisions may dampen the market. This report overviews the latest developments in the Russian legislation related to energy efficiency in the public sector, describes the major challenges the regulations pose, and proposes solutions for overcoming these challenges. Specifically, sections 5 and 6 of this report goes over the obstacles posed by one-stage tendering, lack of municipal credit ratings, requirements for direct ESCO financing of project and the Russian government's preference for shared savings contracts. To the extent possible, the report also provides practical options for addressing these issues in a pilot project.

Finally, this report contains several appendices, including information on Russian building energy certificates and sample contracts.

The hope is that this information will make the Russian energy efficiency market more approachable and help attract much needed investment to speed up the implementation of energy efficiency projects in Russia.

1. Background and Introduction

U.S. President Obama and Russian President Medvedev launched a Bilateral Presidential Commission in 2009 to serve as an umbrella for cooperation on a range of issues, including energy. The U.S. Department of Energy (DOE) and Russian Ministry of Energy lead the Working Group on Energy, and both sides have made energy efficiency an important priority. Given the relevance and importance of energy efficiency in public buildings, this topic forms an important thrust of the jointly-led cooperation. The Russian Energy Agency (REA) and Pacific Northwest National Laboratory (PNNL) have been asked to serve as coordinators of this work. DOE leads a government-wide effort called the Federal Energy Management Program that helps federal agencies and facility managers meet aggressive goals to improve energy efficiency. In the 2009 Law on Energy Efficiency, the Russian Government also launched a program on systematic energy efficiency improvements in public buildings and facilities. Thus, this topic provides much common ground. We are very thankful for the support of the Department of Energy, in particular the Office of Energy Efficiency and Renewable Energy and the Office of Policy and International Affairs, as well as the energy and effort of the Russian Government in pursuing this topic and project.

PNNL and REA began by jointly selecting an approach, focusing on a pilot project to develop a mechanism for energy efficiency in public buildings, and information exchange on the topic. In March 2011, they selected Chelyabinsk Region for the pilot based on the region's motivation to improve efficiency, diligent efforts since the 2009 law was adopted, and its experience on regional support of energy efficiency. In Chelyabinsk, several partners are playing a key role. These include the Ministry of Construction, Infrastructure and Road Maintenance; Energoberezhniye (a local company specializing in energy efficiency analyses); and two municipalities, Yuzhnouralsk and Satka. In addition, PNNL has been in close contact with other stakeholders, including U.S. ESCOs, international banks and government agencies in Russia. Honeywell's advice, insights and interest in the project have proven particularly useful, ensuring that the planning takes into account real-world constraints and business models that ESCOs use. The European Bank for Reconstruction and Development (EBRD) has also shared much information on legal issues with the project team; PNNL, Honeywell and REA have been able to comment on many of these draft legal or regulatory documents, including a draft methodology on establishing baseline energy use and a draft model ESCO contract.

1.1. Overview of energy efficiency in Russian public facilities

Russia has tremendous potential for energy efficiency, both because of its climate and its high energy intensity. Russian buildings are particularly energy intensive, when heat losses due to inefficient design are combined with the long heating season. It is estimated that energy efficiency investments in buildings could save up to 69 Mtoe per year, or 690 million GCal (World Bank, 2008).

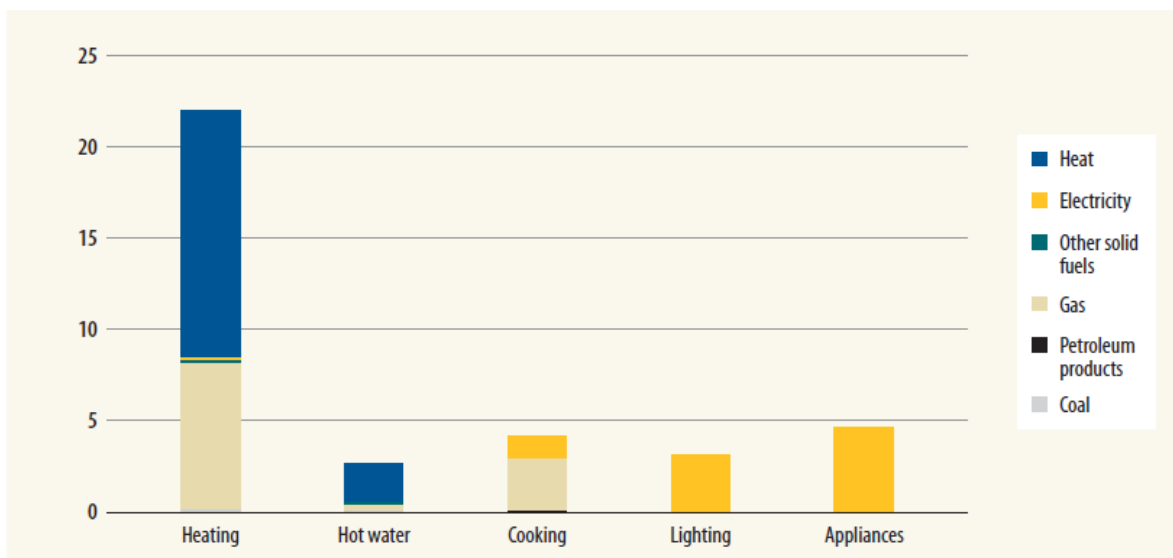
Russian President Medvedev has launched a series of major policy reforms to promote broad improvements in Russia's energy efficiency. Following this initiative, in December 2009, the Russian Duma adopted a Law on Energy Efficiency, which provides concrete measures and requirements to

improve the efficiency of Russian public buildings and facilities¹. Russia is now creating a national program to improve energy efficiency in all public buildings and facilities, including those owned by federal, regional and local entities.

Russian public buildings, responsible for 9% of total end-use energy consumption in Russia, have significant potential to save energy. A World Bank report (2008) estimates the potential for energy efficiency in Russian public buildings to be 15 Mtoe, or 150 million GCal, with federal buildings alone able to save annually 1.2 billion U.S. dollars (USD) (based on 2006 prices).

Approximately 60% of the energy use in public buildings is for space heating (see Figure 1.1). It should be noted that district heating systems in Russia are considered within the federal “budget sphere”, if municipal companies operate them, which is typical. In addition, district heating accounts for over 30% of energy consumed in Russia.

Figure 1.1. Energy End-use in the Public Sector in Russia, 2005 (Mtoe)



Source: CENEF for the World Bank.

While there are many opportunities for improved energy efficiency in Russia, we highlight several potential opportunities for a pilot project in Chelyabinsk Region. This region has made some of the most advanced steps towards its energy efficiency program and has indicated a strong willingness to consider various options to attract ESCOs and investors. Thus, in the next section we provide information on potential energy efficiency investments in Chelyabinsk Region.

¹ This document uses the term “public” to describe buildings and facilities owned by what are known as “budget sphere” organizations in Russia, in other words, those owned by federal, regional, or municipal governments or organizations. This includes buildings like town halls, schools, and hospitals, as well as municipally-owned district heating systems.

2. Overview of Investment Opportunities in Chelyabinsk Region

2.1. Overview of public buildings and the district heating in Chelyabinsk Region

The Russian region of Chelyabinsk has limited local energy production, importing 100% of needed natural gas from other Russian regions. Up to 35% of electricity is purchased on wholesale markets. Thus, energy efficiency is among the top regional priorities. Per the requirements of the federal law, the Chelyabinsk Regional energy efficiency program emphasizes reducing energy consumption in public facilities by 15% by 2015 through equipping all public facilities with metering devices, conducting energy audits and compiling energy certificates (“passports”) as well as engaging in public-private partnerships to attract financing.

With average winter temperature around -15° C, most of the energy in Chelyabinsk Region is consumed as heat and electricity. Total heat energy, including hot water, consumed in Chelyabinsk Region in 2008 was 44 million GCal. Annual heat energy consumption in public facilities was 2.3 million GCal, or 5.2% of the total heat consumption in the region. Heat losses in the district heating network were over 3.2 million GCal, or 7.3% of the total heat consumption.

Heat supply for most residential and public buildings in Chelyabinsk Region comes from 821 boilers, 580 of which are under municipal ownership. Of these boilers, 75% (or 617) operate on natural gas, 21% (173 boilers) operate on solid fuels, such as coal and wood, while 4% (31 boilers) use liquid fuel.

In terms of electricity, the total consumption in 2008 was 36 billion kWh. The biggest users of electricity are industry (55%), utilities (10%), residential (9%), transportation (8.5%), and agricultural production (1.2%). Losses from the electricity network were 3 billion kWh, or 8.4% of the total consumption.

Chelyabinsk Region has approximately 4,800 public buildings owned by the regional or municipal governments. These include over 1,200 kindergartens, over 1,000 secondary schools and more than 500 public health facilities. In total, they consume 3.3 billion Russian rubles (RUR) worth of energy, or 104 million USD² (see Table 2.1).

Table 2.1. Energy and Utility Consumption by Public Facilities in Chelyabinsk Region, 2009

Type of Energy	Total Used/Units		Cost, in Thousand Russian Rubles (RUR)	Cost, in Thousand U.S. Dollars (USD)
Electricity	475,310	Thousand kWh	868,508	27,358
Heat	2,356,858	GCal	1,958,776	61,701
Natural gas	9,164	Thousand m ³	24,240	764
Coal	19,264	Tons	41,098	1,295
Wood	10,517	m ² (dense)	9,954	314
Diesel	346	Tons	6,647	209
Hot water	1,127	Thousand m ³	31,283	985
Water supply	14,834	Thousand m ³	188,152	5,927
Sewage	15,785	Thousand m ³	170,894	5,383
TOTAL			3,299,551	103,936

² Unless a specific year is indicated, the conversion rate used in this paper is the average for the year of 2011 (1 RUR = \$0.034 USD). Otherwise, it is average for the given year. Conversion rates are taken from www.oanda.com.

The subsections below describe potential sites for the pilot project in two municipalities³: Satka and Yuzhnouralsk. The opportunities in Satka include a small district heating system, public buildings and street lighting, while those in Yuzhnouralsk focus on public buildings and street lighting. Because lighting is typically such a cost-effective opportunity, we also include sample economic analysis from a proposed lighting project at a hospital in Zlatoust, a separate municipality located near Satka.

2.2. Investment opportunities in Satka

Satka is a municipality made up of several towns and villages; it is located 190 km to the southwest of Chelyabinsk on the Big Satka River. The municipality has a population of 86,025; about half of the population lives in Satka town proper, while 5,600 people live in Mezhevoye, site of the proposed district heating project.

Satka has 126 municipal buildings and facilities, among which there are 2 institutions of higher education, facilities for pre-school and school education, libraries, clubs, sports and physical education facilities, public health organizations, and administrative buildings.

Energy consumption in public facilities in Satka in 2010 included (Baranovskiy, 2011):

- Heat – 46,790 GCal,
- Electricity – 10,299,800 kWh,
- Water consumption – 441,000 m³,
- Natural Gas – 347,000 m³,
- Coal – 90 tons,
- Diesel fuel – 17.6 tons, and
- Wood – 232.4 m³.

2.2.1. District heating opportunities in the Mezhevoye District of Satka Municipality

Mezhevoye has one boiler house that supplies heat and hot water to the district's buildings (SenRi, Inc., 2011). The district heating network, water supply network and boiler house are operated by a limited liability company called KONiS. Servicing of heating and hot water systems beyond the building thresholds is the responsibility of the limited liability company Zhilservis.

The boiler and distribution networks have the following characteristics:

- Installed heating capacity – 12 GCal/hour,
- Actual heating capacity – 10.7 GCal/hour,
- Main fuel source – natural gas, reserve fuel – diesel,
- Heating system is of the closed-loop, double-circuit type, and
- Hot water system consists of 2 pipes with recirculation.

³ Chelyabinsk Region has two types of municipalities: municipal districts (“okruga”) and municipal sub-regions (“rayony”). While municipal districts usually comprise larger towns and are smaller in area, municipal sub-regions have more rural population and are more spread out. For simplicity, we refer to these two sub-divisions as municipalities. Municipalities also have smaller sub-divisions, which we refer to as districts.

Over time, the capacity of the boiler house has declined so today the actual capacity is about 2 GCal/hour less than the design capacity. As a result, the boiler house works operates at near its full capacity.

Before 2010, the tariff on heating varied between 853 RUR/GCal (35 USD/GCal) and 1,186 RUR/GCal (48 USD/GCal), depending on the group of users. In 2010, the tariff was combined and comprised 980 RUR/GCal (32 USD/GCal), and in 2011 it was 1,112 RUR/ GCal (38 USD/GCal). The cost of generating and transporting heat (mostly due to fuel costs) was 729 RUR/GCal (30 USD/GCal) in 2008, 985 RUR/GCal (32 USD/GCal) in 2010 and 1,084 RUR/GCal (37 USD/GCal) in 2011.

The length of the district heating network (counting both the supply and return pipes) is 10.22 km. Most of the distribution pipes are located underground. The pipes were put in between 1959 and 2002. The wear rate is estimated to be 95%. As a result, there were 8 bursts in 2008, 10 bursts in 2009 and 12 bursts in 2011.

Heat losses through piping insulation are 1.24 higher than the established norm. Reliability of the network is low. At the same time, it is expected that the need for heating and hot water will increase by 5.9 GCal/hour by 2025 due to new construction.

Therefore, the government of Mezhevoye District would like to upgrade its district heating system. Two options were proposed to achieve this goal (SenRi, Inc., 2011):

- Option One: To increase the capacity of the existing boiler house with expansion of services and installation of modular boilers (and related facilities) for heat supply to a new neighborhood in town, or
- Option Two: To upgrade the existing boiler house and increase the heat energy capacity by installing a separate set of modular boilers or installing a natural gas-driven reciprocating CHP unit or a natural-gas fired, turbine-driven CHP unit, as well as constructing a modular boiler house for heat supply to the new development in town.

The first option envisions expansion and upgrade of the existing boiler house from 10.66 GCal/hour to 13.31 GCal/hour as well as installing a new, automated modular boiler house with a capacity of 7.5 GCal/hour. The second option also includes upgrade of the existing boiler house, and also envisions construction of mini-CHP station on the territory of the existing boiler house. The calculations below assume installation of three CHP units (reciprocating or gas turbine) with electric power capacity of each unit of 330 kW and heat capacity of 361 kW. Cost savings are based on reduced fuel and maintenance costs after the modernization.

Table 2.2. Capital Investments in Mezhevoye District Heating under Option One

Recommended Measures	Capital Investments, Thousand RUR (<i>Thousand USD</i>)			Expected Cost Savings, Thousand RUR (<i>Thousand USD</i>) per Year	Simple Payback Time, Years
	2015	2020	2025		
1. Reconstruction of the central boiler house					
1.1. Replacement of natural gas burners on 7 boilers	3,450 (117)	0	0	603 (21)	5.7

1.2. Installation of an additional group of circulation pumps on the first circuit of hot water delivery	87 (3)	0	0	174 (6)	0.5
1.3. Transitioning of boilers to use the natural draft	155 (5)	0	0	656 (22)	0.2
1.4. Transitioning of the first circuit to operate at 110/80° C, and the second circuit to operate at 95/70° C	0	0	0	0	-
1.5. Installation of an additional water heating boiler with heat capacity of 1.5 MW	1,100 (37)	0	0	0	-
2. Replacing the heat transmission network	48,144 (1,637)	0	0	3,177 (108)	15.2
Total	52,936 (1,800)	0	0	4,610 (157)	-
3. Construction of a sectional water heating boiler in a new neighborhood	19,200 (653)	0	0	-	-
4. Construction of new heat lines in new neighborhoods	11,526 (392)	6,917 (235)	4,610 (157)	-	-
Total	30,726 (1,045)	6,917 (235)	4,610 (157)	-	-
TOTAL expenses under this option		95,188 (3,236)		-	-

Source: SenRi, Inc., 2011.

Option Two involves the same activities as option one, except that instead of installing an additional water heating boiler, this option proposes to construct a mini-CHP with electric capacity of 1 MW. This construction is estimated at 21 million RUR, or 714,000 USD, while the annual savings from more efficient heat generation and distribution are 4 million RUR, or 136,000 USD. Thus, the Mezhevoye report calculates that the new CHP has an estimated a simple payback of 5.2 years (considering fuel and maintenance savings, but not factoring in the cost of capital). However, if other benefits are considered, such as reduction in expenses on electricity for water treatment, water pumping and other district heating system needs, the simple payback time for the mini-CHP station could be lowered to 2.5-3 years.

An ESCO would want to assess and potentially revise these options before offering a guarantee. In order to work on district heating in Mezhevoye District, an interested ESCO would need to obtain approvals from the head of Satka Municipality as well as from the municipal company operating the district heating system (the firm KONiS).

2.2.2. Potential municipal facilities in Satka for upgrade in the pilot project

Table 2.3 provides basic information on the municipally owned buildings and facilities in Satka (Baranovskiy, 2011). To approximate the size and potential impact of an energy performance contract, PNNL analyzed information about the public buildings in Satka. When combined, public facilities in Satka are budgeted to consume 46,790 GCal of heat per year and 39,405 MWh of electricity per year, and hot water consumption is also not insignificant.

Table 2.3. Satka Municipal Building Energy Use and Cost in 2011

Government Owner	Number of Facilities	Elec. Limit, Thous. kWh	Estimated Electricity Budget, USD	Heat Energy Limit, GCal	Estimated Heat Budget, USD	Hot Water Limit, m ³	Est. Hot Water Budget, USD	TOTAL Budget
Bakalskoye	3	101	6,262	1,726	65,257	343	221	71,740
Sulenskoye District	3	16	986	36	1,357	0	0	2,344
Mezhevoye	3	51	3,139	562	21,244	9	6	24,389
Satka Admin. of Culture	7	104	6,437	963	36,394	547	353	43,184
Satka Admin. of Youth Affairs	2	7	439	77	2,896	136	87	3,422
Satka Municipal Administration	8	348	21,548	1,075	40,640	633	408	62,597
Ailinskoye	3	79	4,895	569	21,520	0	0	26,416
Dept. of Internal Affairs of Satka	4	117	7,277	300	11,341	145	94	18,712
Berdyaushskoye District	4	32	1,984	498	18,837	0	0	20,822
Satka Municipal Administration of Education	69	4,876	302,318	27,412	1,036,385	62,847	40,536	1,379,240
Satka Admin. of Phys. Ed., Sports and Tourism	4	486	30,158	1,367	51,665	3,442	2,220	84,043
Romansvkoye District	1	22	1,353	0	0	0	0	1,353
Satka Admin. of Health	5	2,249	139,429	10,408	393,522	36,847	23,766	556,717
Satka District	10	208	12,875	1,798	67,975	412	266	81,116
TOTAL	126	8,695	539,102	46,790	1,769,035	105,361	67,958	2,376,095

To estimate the scale of potential energy savings for Satka public facilities, as well as the scale of potential investment required to achieve the energy savings through an energy performance contract, PNNL used the data included in Table 2.3. The results of the analysis are summarized in Table 2.4. Annual energy and water costs for Satka public facilities total just over 2 million USD, as shown in Table

2.3. The Russian legislation requires a 15% reduction by 2014 and additional savings by 2020, thus potential savings are estimated to be 356,414 USD as summarized in Table 2.4, Column C.

Based on experience with other buildings in Russia, basic efficiency measures can usually save over 25% of the energy consumed. Assuming a net combined simple payback of 7 years, which PNNL also believes is very reasonable for Satka, the required investment cost can be estimated as 7 times the annual savings estimate, or around 2.5 million USD, as summarized in Table 2.4, Column D. If the projected energy savings estimate is increased to 20% with the same 7-year net simple payback, the associated energy investment becomes around 3.3 million USD, as summarized in Table 2.4, Column E. In a very rough sense, this gives one an idea of the potential scale of the project in Satka public buildings.

Table 2.4. Energy Performance Contract Potential for Satka Public Buildings

Government Owners of Public Buildings in Satka Municipality	Total Estimated Energy and Hot Water Use, USD	Potential Annual Electricity, Heat and Hot Water Savings at 15% Reduction, USD	Potential Return on Investment on a 7-year Project at 15%	Potential Return on Investment on a 7-year Project at 20%
A	B	C	D	E
Bakalskoye District	71,740	10,761	75,327	100,436
Sulennskoye District	2,344	352	2,461	3,281
Mezhevoye District	24,389	3,658	25,609	34,145
Satka Admin. of Culture	43,184	6,478	45,343	60,457
Satka Admin. of Youth Affairs	3,422	513	3,594	4,791
Satka Municipal Administration	62,597	9,390	65,727	87,635
Ailinskoye District	26,416	3,962	27,736	36,982
Dept. of Internal Affairs of Satka	18,712	2,807	19,647	26,196
Berdyashskoye District	20,822	3,123	21,863	29,150
Satka Municipal Administration of Education	1,379,240	206,886	1,448,202	1,930,936
Satka Admin. of Phys. Ed., Sports and Tourism	84,043	12,606	88,245	117,660
Romansvkoye District	1,353	203	1,421	1,894
Satka Admin. of Health	556,717	83,508	584,553	779,404
Satka District	81,116	12,167	85,172	113,563
TOTAL	2,376,095	356,414	2,494,899	3,326,532

A potential investor in all 126 Satka public buildings would need to work with various institutions and districts of Satka Municipality listed in Table 2.4, Column A, as well as with the head of each facility. A suggestion could be to select only the 69 buildings of the Satka Municipal Administration of Education, which has a total estimated budget for energy and water use of 1,379,240 USD (Table 2.4, Column B). PNNL will continue to have discussions with the municipality to streamline approvals of EPCs and project implementation.

2.2.3. Street lighting in Satka

Like most municipalities, Satka and its districts have opportunities to save energy with investments in more efficient street lighting. According to the official data from the Administration of Satka Municipality's Website, this municipality, with a population size of 86,600 people was budgeted to use 3 million kWh of electricity in street lighting in 2011, which costs the local budget an estimated 186,000 USD (based on electricity pricing for Chelyabinsk Region from Table 2.1 of 0.062 USD/ kWh). Out of this, Mezhevoye District consumes about 367,000 kWh annually.

2.3. Investment opportunities in Yuzhnouralsk

Yuzhnouralsk is a town in Chelyabinsk Region, located 89 km south of the regional capital of Chelyabinsk (Baranovskiy, 2011). The town's establishment is related to the construction of Yuzhnouralsk GRES, one of the first electricity stations in the USSR. In 1963, Yuzhnouralsk was registered as town of regional significance. Today, Yuzhnouralsk also includes the village of Letyagino, located 12 km out of Yuzhnouralsk. Thus, the territory of Yuzhnouralsk with the suburb comprises 110 km² with a population of 38,652 as of January 1, 2009. City planners estimate that by 2020 the population of Yuzhnouralsk will be 45,000-50,000 because the town is located on a major highway, and industry there is also seeing increased demand.

The town has 37 municipal buildings, including 6 facilities for higher learning, 1 specialized education facility, 2 professional institutes, several pre-schools and secondary schools, libraries, cultural centers, a local history museum, an art school, facilities for physical activity and sports, and public health facilities.

Table 2.5 provides an overview of the total energy use in Yuzhnouralsk in 2009 (Yuzhnouralsk Municipal Administration, 2011).

Table 2.5. Total Energy Use in Yuzhnouralsk, 2009

Energy Type	Total Use, in Energy Units	Industry	Residential and District Heating	Public Sector
Electricity, thousand kWh	144,704	115,736	21,706	7,235 (5%)
Heat, including district heating and hot water, thousand GCal	732.8	241.8	410.4	80.8 (11%)
Natural gas, thousand m ³	1,400,000	1,100,000	298,800	1,300
Coal, tons	756,847	755,597	1,250	
Black oil, tons	443	443		
Wood, m ³	220		220	
TOTAL, in thousand tons of coal equivalent	2,203,095	1,764,849	420,765	17,264

2.3.1. Potential Facilities for Upgrade in the Pilot Project

Table 2.3 provides basic information on the municipally owned buildings and facilities in Yuzhnouralsk. To get an estimate of approximate size of a potential project to improve the energy efficiency of these facilities, PNNL analyzed information about the public buildings in Yuzhnouralsk. When combined, public facilities in Yuzhnouralsk are budgeted to consume just over 19,000 GCal of heat per year; electricity consumption is also not insignificant. As in Satka, these entities are required to reduce their energy consumption by a minimum of 15% in three years, with additional savings required through 2020. Based on experience with other buildings in Russia, basic efficiency measures can usually save well over 25% of the energy consumed.

Table 2.6. Energy Budget of Central Yuzhnouralsk by Major Facility, 2011

Municipal Facilities	Space, m ²	Heat		Water		Allocated in the Budget, RUR
		Tariff= 1069.53 RUR		Tariff= 18.96 RUR		
		Approved Limit, GCal	Annual	Approved Limit, m ³	Annual	
Administration			809		488,710	813,753
<i>Kindergartens – subtotal</i>			5,095		4,875,554	5,535,453
Kindergarten # 3	1,099		397		965,140	428,995
Kindergarten # 6	1,089		340		800,440	420,306
Kindergarten # 8 "Fairy Tale"	1,722		485		5,044	508,152
Kindergarten # 9 "Sunshine"	1,763		642		1,418,722	760,912
Kindergarten # 12 "Little Oak"	1,579		535		781,975	636,687
Kindergarten # 14 "Little Poplar"	1,200		244		566,674	294,608
Kindergarten # 16 "Little Fir Tree"	1,067		335		296,645	382,516
Kindergarten # 17 "Little Spark"	2,032		520		24,133	472,256
Kindergarten # 19 "Smile"	1,679		543		5,044	588,918
Kindergarten # 20 "Dolphin"	2,450		1,053		11,737	1,042,104
<i>Schools – subtotal</i>			3,380		58,636	3,707,998
School #1	3,221		577		9,496	592,283
School #3	5,652		1,043		21,883	1,234,544
School #4	6,500		1,364			
School #5	1,439		390		10,767	429,629
School #7	7,364		1,370		16,490	1,451,542
<i>Afterschool institutions - subtotal</i>			482		243,713	476,333
Central Afterschool Facility	1,528		374		95,080	350,580
Youth Sports Education Facility	455		107		148,633	125,753
<i>Other institutions – subtotal</i>			744		406,022	616,078
Professional Teaching Facility	3,473		484		363,730	445,147
Center for Education Development	468		170		42,292	87,922
Social-medical-psychological Center for Children	190		90			83,009
Kindergarten #18	2,029		643			502,543
School #6	4,244		770			757,180

<i>Subtotal of the above</i>		11,113	5,583,925	11,595,585
Children's School of Art		737		508,152
Libraries		670	533,907	592,226
Museums		69	9,880	75,649
Palace of Culture		680	131,570	801,633
Cinema "Ekran"		246	3,880	244,634
Central Stadium		275	526,613	346,515
<i>Subtotal of the above</i>		2,677	1,205,850	2,568,808
Yuzhnouralsk Municipal Hospital		4,637	5,146,018	5,217,470
TOTAL		19,236	12,424,503	20,195,615

To estimate the scale of potential energy savings, as well as, the scale of potential investment required to achieve the energy savings through an energy performance contract, PNNL used the data included in Table 2.6 and summarized in Table 2.7. Annual estimated energy and water costs for Yuzhnouralsk are just over 1 million USD, as shown in Table 2.7, Column D. This estimate is based on the known annual limits for heat and water consumption (Table 2.3) and known electricity consumption by public entities (Table 2.5). The limit is based on regional and municipal budgeting for energy. Therefore, the limit on heat and water does not reflect actual consumption, and, in many cases, consumption is known to exceed the limit. Using limit data arrives at a conservative estimate of energy savings. In addition, while detailed data is available on 30 public buildings in Yuzhnouralsk, there are 7 other public buildings on which data is not available. We did not attempt to estimate their heat and water consumption, again to arrive at a more conservative estimate, and thus the actual heat and water consumption and spending might be greater than indicated in Table 2.7.

Using the 15% reduction required by Russian law, potential savings are estimated to be 155,609 USD as summarized in Table 2.7, Column E. Assuming a net combined simple payback of 7 years, which PNNL believes is very reasonable for Yuzhnouralsk based on other projects in Russia, the required investment cost for the region can be estimated as the annual savings times the duration of the contract – 7 years. In other words, the estimated project size is just over 1 million USD, as summarized in Table 2.7, Column F. If the projected energy savings estimate is increased to 20% with the same 7-year net simple payback, the associated energy investment becomes close to 1.5 million USD, as summarized in Table 2.7, Column G. In a very rough sense, this gives one an idea of the potential scale of the project in Yuzhnouralsk.

Table 2.7. Energy Performance Contract Potential for Yuzhnouralsk

Public Buildings in Yuzhnouralsk	Allocated in the Budget for Heat and Water, USD*	Estimated Electricity Expenses, USD**	Total Estimated Energy and Water Use, USD	Potential Annual Electricity, Heat and Water Savings at 15% Reduction, USD	Potential Return on Investment on a 7-year Project at 15% Reduction, USD	Potential Return on Investment on a 7-year Project at 20% Reduction, USD
A	B	C	D	E	F	G
30 municipal facilities in central district	686,651	284,388	971,039	145,656	1,019,591	1,359,454
7 other municipal facilities	Unknown	66,357	At least 66,357	At least 9,954	At least 69,675	At least 92,900
TOTAL	686,651	350,745	1,037,396	155,609	1,089,266	1,452,354

* Conversion rate between RUR and USD was assumed to be 0.034, average for 2011.

** Consumption of electricity by the public sector in Yuzhnouralsk is known from Table 2 (7,235 thousand kWh). It is also known from the official Yuzhnouralsk data that the street lighting portion of this total public consumption is about 2,000 thousand kWh. For this simple analysis, we estimate public building consumption to equal 5,235 thousand kWh annually. The tariff on electricity is known from Yuzhnouralsk official website, where the quoted rate for the population for 2011 is 1.97 RUB/kWh, or 0.067 USD/kWh.

By Russian law, to work with entities in the public sphere, an investor needs to receive approval of implementation plans for energy efficiency measures from the head of the municipality where the project is based and with the head of each municipal entity. Thus, for a project in Yuzhnouralsk involving the 37 municipal facilities listed in Table 2.7, an investor would need to get approvals from the head of Yuzhnouralsk Municipality, as well as from the head of each school, hospital, library, etc. Similarly, verification of implementation of EPCs, such as new installations, is also required by public entities. To address this issue, in Yuzhnouralsk, the municipality has discussed creating a government organization that will sign contracts and provide approvals on behalf of municipal entities.

2.3.2. Street lighting upgrade in Yuzhnouralsk

Official Yuzhnouralsk data estimate that Yuzhnouralsk consumes about 2 million kWh/year of energy for street lighting. The street lighting system there consists of 1,534 street lights and 35 km of electric transmission lines. In 2011, operating it was estimated to cost the municipal and regional budgets 7,624,009 RUR (\$259,216 USD) for electricity and 1,761,086 RUR (59,877 USD) for maintenance.

2.4. Example of lighting project economics in Chelyabinsk Region

Lighting projects are low-hanging opportunities in terms of implementing energy efficient projects in Chelyabinsk Region. Similar to the rest of Russia, outdated lighting technologies are prevalent

in Chelyabinsk Region, resulting in inefficient energy use and a vast energy saving potential. Installing energy saving, cost-efficient technologies can reduce lighting costs by over 50%. The most common lamps used are high-pressure mercury vapor lamps, sodium lamps and some fluorescent lamps.

In terms of street lighting alone, Chelyabinsk Region has about 50,000 lamps, about half of which are inventoried in a Rudea report. The report provides data on half the municipal districts in Chelyabinsk Region, and the street lights covered consume 27 GWh/year, which costs Chelyabinsk Region 54 million RUR, or about 1.8 million USD (Rudea, 2011). Table 2.8 highlights some facts about the street lighting systems in the town of Zlatoust.

Table 2.8. Key Facts on Zlatoust Street Lighting

Number of streetlights (lamps)	Units	5,072
Number of control cabinets	Units	150
Annual energy use	MWh/yr	5,484
Annual cost of electricity	Million RUR	10.97
Annual cost of electricity	Thousand USD	373

Source: Rudea

PNNL’s local partner Energoberezhniye has worked with local companies to develop proposals on improved lighting systems (external and inside buildings) for the regional administration. Provided below is a sample proposal for a project in a hospital in the town of Zlatoust to highlight the potential economics of such projects (Administration of Zlatoust Municipality, 2011).

Investment Project "Energy Efficient LED System" in City Hospital #3, Zlatoust, Russia

This project focuses on three goals:

- Reducing electricity use by lighting systems,
- Lowering maintenance expenses for servicing lighting systems, and
- Changing ineffective incandescent bulbs and mercury fluorescent lamp for ecologically-friendly and energy efficient LED as required by the Russian Federation Law on Energy Efficiency (Law #261-F3).

The plan is to implement this project through an Energy Service Contract. The contract and warranty period would be for 5 years. The first quarter of the contract will involve planning and upgrading the lighting systems. The ESCO would receive payments over two years, starting the second quarter of the project. As a result of this project, the hospital will reduce its lighting bill by close to 70%. These savings will be used to repay the investment. Based on the initial project plans, the project would require an investment of 6,430,550 RUR (218,639USD); the payments to the ESCO would cover this initial cost and provide the ESCO with a return of 2,431,901 RUR (82,685 USD). The regional governments would also provide a loan of 3,998,640 RUR (135,954 USD), which would cover some of the ESCO payments in the first two years, thus speeding up to the repayment (and reducing interest costs).

Over the five years of the ESCO contract, the costs of operating the street lighting system around the hospital would drop by 7,544,550 RUR (256,515 USD). The city would retain 1,114,000 RUR (37,876 USD) of this, once the ESCO and regional government are repaid. Going forward, the city could expect to see savings of 2 million RUR (68,000 USD) per year or more, depending on the electricity prices.

Table 2.9 below summarizes the key technical characteristics of the project.

Table 2.9. Technical Characteristics of Zlatoust Hospital Lighting Project

	Existing Lighting	Proposed Replacement Lighting
Lighting Installations	Incandescent light bulbs, 100 W – 304 units Fluorescent lights LB40, 40 W – 1,636 units Fluorescent lights LB420, 20 W – 12 units	LED lights CC110-112 – 706 units LED lights CC110-212 – 64 units LED lights ExKL – 304 units
Power load	92.89 kW	27.97 kW
Annual cost of lamp replacement	64,380 RUR (2,314 USD)	0 RUR

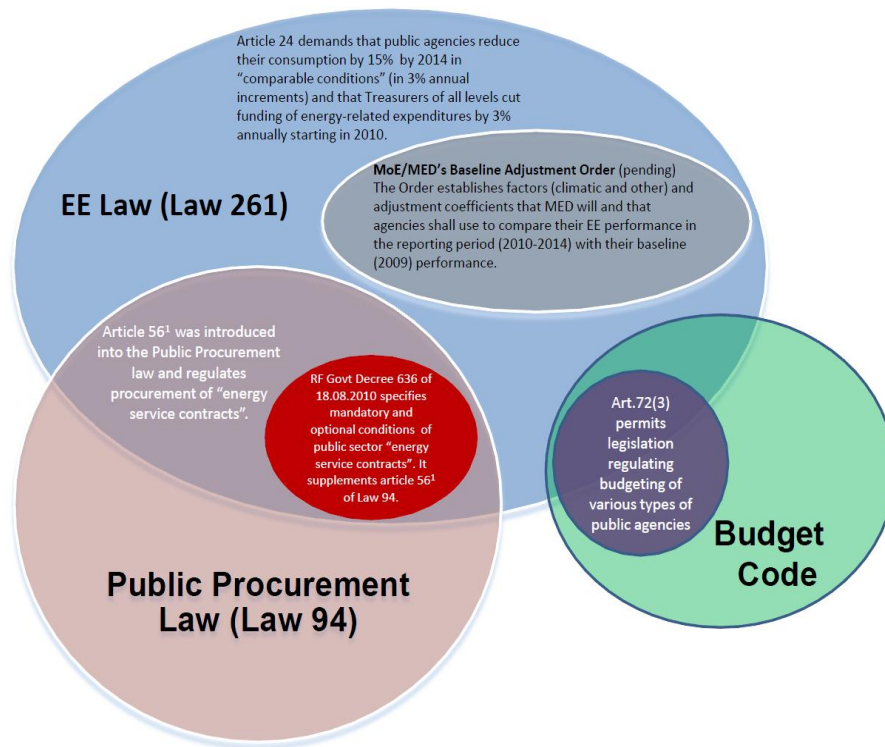
It is also important to note that this is a project for the lighting systems at one hospital in one city. There are several such proposed projects in Zlatoust alone.

3. Russia’s New Legal Framework for Energy Efficiency in Public Buildings

Russia has three main laws that govern EPCs in the public sector: The Law on Energy Efficiency, the Public Procurement Law and the Budget Code. The Law on Energy Efficiency requires comprehensive metering of all public buildings by 2012, an energy audit of each public facility conducted by 2012 and then again every five years, and, most significantly, that all public agencies reduce their energy and water consumption by 15% by 2014 (compared to a baseline with comparable conditions). Energy use above the allowed limit will not be funded through the federal budget. Other important provisions include the fact that public facility owners must conduct energy audits and install meters by 2012. The Public Procurement Law makes EPCs legal within the public procurement system and sets out the basic rules for such procurements. These include the fact that ESCOs must finance the EPCs and that the EPC tenders will take place in a one-stage process. The Budget Code was also amended to allow public agencies to pay for long-term EPCs from savings on their utility bills, a critical step. The Federal Government and the Ministry of Economic Development have also developed a series of regulations and decrees to provide further detail on how the legislation will be applied. For example, Decree 636 (signed by Prime Minister Putin) defines requirements for EPCs and the tendering process. The Ministry has also developed a model contract and a document on how to determine the baseline to compare savings achievements in public buildings.

Figure 3.1 below summarizes the legislative framework.

Figure 3.1. Overview of Russian Legislation and Regulations on Energy Efficiency in the Public Sector



Source: EBRD.

The current Russian legal basis for implementing energy efficiency has many strengths. It requires aggressive improvements in energy efficiency and sets up a system to monitor progress. It also provides a clear legal basis for EPCs in the public sector. However, the system also creates some potential barriers for projects. Sections 5 and 6 of this report discuss challenges as well as potential solutions for using EPCs in Russia. Section 7 outlines an additional approach that Chelyabinsk Region (along with a few other Russian regions) has used to finance upgrades to district heating networks: the tariff agreement.

4. Energy Performance Contracts: A Model for Leveraging Private Investment in Public Sector Efficiency

Like in many other countries, EPCs will be used in Russia to finance a large share of the energy efficiency measures in the public sector. The Russian government has been developing the legal and contractual framework to support this.

EPCs have proven to be a successful and innovative form of achieving energy efficiency investments in the public sector in many countries. EPCs work well because of the energy efficiency performance guarantees that energy service companies (ESCOs) provide; these performance guarantees ensure that the savings are real, which in turn, makes it easier to arrange financing for the projects. ESCOs develop the recommended measures, arrange financing for the projects and install the energy

efficiency measures. ESCOs also monitor the projects over an extended period, ensuring that the measures perform as expected.

One of the biggest advantages of ESCOs is that public sector organizations wishing to implement the upgrades do not have to come up with upfront funding for energy efficiency projects. Even if customers are not able to pay the cost of an EPC project with capital budgets, ESCOs can help secure long-term loans or leases by giving financial guarantees that the planned energy savings will materialize.

In most countries, awarding EPCs in the public sphere requires a competitive process. Such a process may include the following steps⁴:

1. Stage Setting

- Set project goals and develop consensus.
- Conduct informal, educational meetings with ESCOs.
- Ensure compliance with procurement procedure policies, and legal, regulatory and performance contracting statutes.
- Begin discussions with internal staff and, potentially, external financial experts, regarding financing options.

2. Procurement

- Draft procurement documents (Request for Qualifications (RFQ) or Request for Proposals (RFP)).
- Approve and release procurement documents.
- ESCOs submit proposals by specified due date.
- Review and evaluate ESCO bid submissions.
- Interview ESCOs, check references.
- Select winning ESCO(s) and notify all ESCO(s) of final decision.
- If necessary, initiate an RFP process to select the finalist(s).
- If necessary, sign EPC and Project Development Agreement (PDA).

3. Investment Grade Audit/Investment Proposal

- Review project's goals and constraints with the selected ESCO(s).
- Define Scope of Work for the Investment Grade Audit/Investment Proposal.
- ESCO undertakes audit.
- Review and discuss recommendations.

4. Implementation

- Negotiate measures.
- Implement project.

5. Measurement and Verification (and Beyond)

- Client or client's representative to oversee and verify ESCO's measurement and verification (M&V) conclusions.
- Manage the risk of the degradation of resource savings.⁵

⁴ Adapted from: www.presidentsclimatecommitment.org/resources/eebrp/toolkit.

⁵ The steps described above were slightly adapted to a process that has worked well in many countries.

Taking advantage of partnering with an ESCO depends on the ability of entities to enter into a contract, such as an EPC. In Russia, the Ministry for Economic Development is in the process of drafting a model contract to be used at the regional and municipal levels (some flexibility is assumed). A recent draft of this model contract can be found in Appendix II, and the contract is discussed in more details in the following sections. It should also be noted that working with district heating in Russia might also require signing a tariff agreement to ensure that heating prices, normally regulated in Russia, are set in a fair and predictable way to allow for recovery of investment in system upgrades. For a model tariff agreement that has been applied in Chelyabinsk, please see Appendix III.

5. A Pilot Mechanism for High-Quality EPCs in the Russian Public Procurement System

5.1. Overview

Russia has very significant opportunities for improvements in energy efficiency in its public sector, and new regulations that seek to bring ESCOs to help address this issue. This can create some excellent business opportunities; however, getting there requires testing the new legislative framework in practice and ensuring that it will maximize results.

Like in most countries, EPC contracting in the Russian public sector will require a fair procurement process. While the current Russian legal system has many strengths, such as requiring aggressive improvements in energy efficiency, the system also creates some potential barriers for developing projects. This report focuses on the three most significant barriers for investors: an implied tendering process that does not easily allow ESCOs to conduct an investment-grade audit before the tender (i.e., a one-stage tendering process); municipal creditworthiness and the need for regional guarantees; a requirement that ESCOs finance projects (not just arrange third-party financing); and a model contract for shared savings rather than guaranteed savings; as well as a few other smaller, but important issues that also need to be addressed in the pilot. Below, the report describes both why these issues are challenges and how they might be addressed within the current legal framework in a pilot project in Chelyabinsk Region.

5.2. EPC tendering in the Russian public sector

Under the Russian law, tendering for a public-sector energy performance contract is a one-stage process. ESCOs typically find such an approach difficult, and many jurisdictions have found few ESCOs bidding. The reason is that, in an EPC, the ESCO must guarantee the savings and, before an ESCO will take on the associated technical risks, the ESCO needs to conduct a thorough analysis of the facilities to be retrofitted and the potential energy savings measures. This analysis is called an investment-grade audit. ESCOs will rarely use the results of another audit (even a high-quality audit) before providing the savings guarantee. Yet, an investment grade audit costs money; no ESCO would want to spend this money unless they have a reasonable chance of implementing a project. The solution that has worked in many jurisdictions is to have a two-stage tendering process, in which one or several ESCOs are first selected based on their qualifications and the terms of contract that they are willing to offer. In the second stage of the tender, the winning ESCO prepares detailed proposals based on their own investment grade audits.

While the process in Russia involves a single stage, it may be possible to select an ESCO with a strong emphasis on qualifications (up to 20%), and to refine the measures that will be implemented and guaranteed through an investment grade audit after the tender. This approach, if successful, would retain competition, encouraging broader participation in the tender (because of the lower costs of participating), while still ensuring high-quality analysis and planning leading to savings guarantees.

This section will describe the requirements regarding tenders, the criteria by which ESCOs are selected, and how this system might be adapted to meet the needs for fairness and high-quality project preparation.

According to the Russian federal regulations, the government entity (i.e., the client) issuing a tender for an EPC must prepare an RFP that includes the following documentation:

1. Required savings in energy and monetary units,
2. Applicable energy tariffs for calculating monetary savings,
3. Metering data,
4. Term of the contract,
5. Payment schedule,
6. Status of the sanitary standards (temperature, lighting levels), and
7. Fines for both the customer and the client (these are defined in the law).

The Russian legislation also gives the clients the option of including a list of measures in the RFP, and, in this case, these measures must be included in any proposal responding to the RFP. If the tender does not include a list of measures, then the ESCOs should propose measures based on the buildings' energy certificates or equivalent information. The bidders are not required to guarantee specific measures, but they must guarantee the level of energy savings in physical units. Government clients can and typically would require a relatively low savings level (say 15% savings, which in most Russian buildings is significantly below what can be cost-effectively attained). ESCOs not delivering savings to the level promised will have to pay fines for the discrepancy.

Under the federal program for energy efficiency in the public sector, regions and sub-regional entities must prepare inventories of their facilities, as well as energy certificates and energy audits of each facility. Energy certificates include general information on a facility as well as information on its past and projected energy use⁶, while energy audits highlight potential energy efficiency measures and their cost-effectiveness. In Chelyabinsk, public agencies are planning to undertake the required energy audits by April 2012. These documents would likely be included in the RFP to increase ESCO interest in bidding. The quality of energy passports and government-required energy audits varies.

Under the current law, ESCOs have 30 days after the RFP is issued to do a walk-through audit and prepare their bid package. The government client would then review the proposals based on several weighted criteria. The government entity that prepares the RFP can decide on the criteria and their weighting, within certain boundaries. Price must be included as a criterion and up to 3 additional criteria

⁶ For more detailed information on the typical contents of energy certificates (also called "passports"), please see Appendix I.

can also be chosen. The list below describes the boundary requirements for criteria when they are included.

- Price (an obligatory criterion, minimum weight: 35%),
- Company qualifications (maximum weight: 20%),
- Duration of the warranty (maximum weight: 10%),
- Implementation time (minimum weight: 35%). Note that implementation time can either be construction time or the term of the contract; presumably in either case, a shorter period is preferable to the client.

Under the existing regulations, certain terms of the contract, including the duration and guaranteed level of savings, cannot be negotiated after the tender documents are published. While ESCOs would prefer an investment grade audit to guarantee savings, if the required savings level is low enough, it might be possible for ESCOs to accept a guarantee of such a level in the tender and then confirm it.

An important note is that both government clients and ESCOs would see benefits in a two-stage procurement process. Government clients would be able to require a higher level of guaranteed savings, and ESCOs would be able to obtain more work at less risk. This would require a change in regulations that will likely not occur until there is clear and consistent evidence that the current system does not work adequately in Russia.

However, because the current one-stage system will likely lead to low levels of guaranteed savings, ESCOs will likely pick only the most cost-effective measures with high rates of return. Unlike in the United States, Russian regulations do not require ESCOs to declare their profit level in their bids. The profit would be embedded in the savings level and costs. Potentially, this could lead to high profit margins if relatively few ESCOs enter the market.

All this said, the ESCO will still need to conduct an investment grade audit in order to feel comfortable with the measures and to properly plan the work. The approach we suggest is that the government client allow for such an audit after the tender. The cost of the audit would be embedded in the cost of the contract. Based on the results of the investment grade audit, the ESCO would propose a revised list of measures; the ESCO might also propose to guarantee a higher percentage of savings, if necessary, by including additional measures compared to the initial bid and increasing their business volume. The government client and the ESCO would negotiate the final list before implementation. There are risks with this approach, principally that the government client may refuse to renegotiate and that the initial list of measures may prove less economic than initially estimated. Additionally, we recommend that a well-qualified third-party prepare a high-quality energy certificate and conduct a thorough audit of each facility before the RFP for the initial pilot projects so as to encourage ESCO participation.

Another option is that a regional energy efficiency fund (see below) or other potential investor could pre-qualify ESCOs for financing based on rigorous criteria such as experience, financial stability and existing assets. Such an approach could lower financing costs and ensure the qualifying ESCOs that they have a means of financing the projects post-commissioning, which could both allow for more competitive bids. However, ESCOs will still need to feel comfortable with this approach.

Having a well-crafted contract in place would be important for all parties. As mentioned above, the Ministry of Economic Development is finalizing a draft model contract that would seek to balance the risks between clients and ESCOs. The model contract can be useful because it is designed to meet Russian law and to streamline the contracting process for municipalities, but the contract provisions can and will be changed in specific contracts. ESCOs should also carefully review the terms in the specific contracts they would sign. For instance, contracts should have a provision for early cancellation or renegotiation if any of the information the client provided in the RFP is materially different from the actual situation (for example, building usage data or energy consumption data). In addition, it is important to ensure that the contract scope provides enough flexibility to adjust measures, if they are later found impractical or too costly. A clause addressing this could provide flexibility for adjustments after an investment grade audit. A lawyer with experience in Russian procurement law would facilitate the process for ESCOs.

5.3. Municipal creditworthiness and guarantees

Few municipalities in Russia have an established credit rating. Many municipalities are also in debt, primarily because of energy arrears (which also reflects the importance of energy efficiency to these towns). Conducting detailed credit analyses of each municipality and municipal facility owner would be too expensive given the size of the energy efficiency projects. At the same time, financial institutions and investors want to be sure that they will be repaid what is due to them.

Although challenging to obtain, regional guarantees are essential to attract significant private or international financing, and to attract financing at the best terms. The terms of the guarantees should be fairly robust to be attractive and credible, with commitments to cover delinquent payments after a reasonably short period (possibly a few months). This will be one of the more important considerations for the regional government: guarantees will likely have a great ability to stimulate investment because guarantees can help leverage private funds. Many municipalities in Chelyabinsk Region are also interested in regional grants to buy down interest rates, and guarantees may lower interest rates without directly spending regional funds to this end.

5.4. Financing the projects

Under Russia's public procurement law, ESCOs must include financing as part of the services they provide within an EPC. Effectively, this means that ESCOs must accept the financial risk for the project and carry the financing on their own books. In other countries, ESCOs typically arrange third-party financing, but they rarely provide financing directly because this would tap the working capital of ESCOs, and make them take on credit risks that they are not well adapted to assess. The net effect of this requirement will likely be to reduce the number of projects that move forward unless there is some way to involve a financial intermediary. One solution that has worked in Bulgaria is to use a specially created energy savings fund that buys the receivables from the ESCO as soon as the project is commissioned. The box below describes how this has worked in Bulgaria.

Bulgaria's Energetics and Energy Savings Fund (EESF)

The Energetics and Energy Savings Fund SPV (EESF) is special purpose company, supported by EBRD, to finance the energy services business of Enemona AD, a construction and engineering group. EBRD awarded Enemona with a €7 million loan to help purchase the long-term capital it needs to expand its ESCO business in Bulgaria. The proceeds are used to purchase receivables from energy performance contracts carried out by Enemona, the Fund's majority shareholder. Since its establishment in 2006, EESF has purchased receivables under more than 20 Energy Performance Contracts (EPC) with a total value exceeding USD 6 million. In November 2006 EESF SPV issued bonds with a total value of €3 million, all of which have now been repaid. Private Bulgarian banks purchased most of the bonds.

The fund profits and pays for its own activities by discounting the value of the receivables it purchases; effectively this discount becomes the cost of financing. The discount on the receivables has been is between 10 and 15%. The ESCO must price the project at the beginning based on the estimated project implementation costs, the ESCOs profit, and the likely discount (or interest) rate. The ESCO profit is bundled with the costs, as would be the case under Russian law.

Because the fund is closely associated with the ESCO from which it purchases projects, it can coordinate closely with the ESCO in advance regarding municipal risks and pricing. In a fund not tied to a specific ESCO, there would likely need to be a clear mechanism for deciding if the fund would purchase projects in advance, since if ESCOs could not sell their receivables once the project was commissioned, they would likely stop pursuing projects in Chelyabinsk.

The fund minimizes its payment risks by investing in projects in cities with low risk (based both on the municipalities' track record and whether its mayor is from a governing coalition party). Bulgarian law requires an independent appraisal, but the appraisal is cursory, only covering a review of the contract, not an appraisal of the financial risk of the municipality. In addition, the fund has a guarantee from the Bulgarian government which allows the fund to draw payment from a government agency when the municipal payment is 30 days overdue.

The ESCO guarantees savings even after it sells the receivables. If the savings are less than the guaranteed level, the municipality must still pay the same monthly installment, but the ESCO must pay the municipality the difference. Thus the fund does not take on the risk of the savings guarantee.

The fund is managed privately. It has a board of directors with three members (a chair, vice chair and the executive director of the fund). There are only two employees: the executive director and an investment relations director. By law, the fund must hire an accounting/servicing company that prepares financial statements, collects receivables and monitors the portfolio of receivables. Most of the projects have a seven-year term.

The key to the approach in Bulgaria is that the ESCO limits its financial risks by selling the receivables (or future revenue from the project) to a financial institution as soon as the project is commissioned. There are a few options regarding the buyer of the receivables in Russia. One is to establish a specialized fund that would purchase the receivables, as in Bulgaria. The advantage is that there would be a buyer for multiple projects; the fund could also attract financing from various sources.

The main disadvantages of a fund are the time it takes to set it up, the need to estimate the size of the market for the fund in advance (or risk losses) and the need for excellent long-term management by a new entity.

Another short term option is to find a single financial institution willing to buy receivables from a range of projects (say multiple buildings in several cities). The Overseas Private Investment Corporation (OPIC) is willing, in principle, to provide such financing, particularly if it could get a regional guarantee to back municipal financing. OPIC would provide financing either in the form of a direct loan in which the ESCO assigns the receivables to OPIC (if the ESCO is a small company), or investment guarantees (under which a commercial bank would accept the receivables and provide financing). OPIC can finance up to 75% of the project costs, generally, meaning that some portion would still need to be provided from elsewhere (possibly from a commercial bank or a fund). Table 5.1 below summarizes the pluses and minuses of these two approaches.

Table 5.1. Comparison of Options for Selling EPC Receivables

Option	Plus	Minus
Dedicated fund	Designed to handle new projects on an ongoing basis, providing certainty to the market; pool financing from several sources to cover all receivables; may be possible to provide range of additional services (short-term construction loans, energy audits); a regional guarantee could potentially cover all fund projects; creating institutional knowledge	Time to set up; need for independent, professional management which may conflict with policy goals if there is government financing; potential to oversize it; may crowd out other financing options
Single financial institution	Can start relatively quickly; may provide for more transparent pricing and more competition; potentially can also cover political risks	Each deal must be negotiated separately, which may reduce certainty and increase costs if negotiations are lengthy

If a fund is set up, there are several important design considerations: the sources of financing, how the fund will decide whether to invest in particular projects, the management structure and the services the fund will provide.

EBRD is considering setting up one or more such funds in Russia, and EBRD experience in this area would be a large advantage, although the fund would likely not be operational immediately. EBRD can typically finance up to 60-70% of a project, so the remaining financing would need to come from commercial banks, regional authorities or private companies. In Bulgaria, the remaining financing was provided from bonds and from corporate investments of the main shareholder in the fund. The main shareholder was willing to provide financing because it was a real estate investment company that also owned an ESCO, and effectively only this ESCO could benefit from the fund. In Russia, one of the reasons for creating a fund is to provide an alternative form of financing instead of ESCO working capital; thus, ESCOs are not likely to finance the fund. With EBRD involvement, private commercial banks would likely be more willing to get involved through loan syndication.

Regional government financing may also be important to attract other financing and bringing down interest rates/shorten contract terms (which in turn will bring down contract costs). A good

example is the project proposal in Zlatoust. There, because of regional financing, the ESCO would get repaid within two years (with the majority coming in the first year), so the interest payments would be rather small. In the U.S., federal energy service contracts often stretch beyond a decade not because the measures have low cost-effectiveness, but because the interest payment require such long periods to pay back the full initial financing costs. Another way of putting it is that by bringing down financing costs, the region could help ensure that deeper energy efficiency retrofits are implemented because the contract terms will still remain acceptable. It is also important to note that such a fund would differ significantly from former regional funds, such as the Chelyabinsk Energy Savings Fund that was ultimately dismantled. Those funds relied on special regional taxes for financing. Here, the regional funding would likely come from an allocation from an annual budget, in other words, funds that the regional government had allocated to spend on energy efficiency in the public sector. Alternatively, the regional funding could come from a bond issue.

Attracting international or private investment into a fund would require professional fund management. An example of a professional manager might be a commercial bank operating locally or a company such as the one operating the fund in Bulgaria. Professional management would help ensure that the investments (or purchases) are assessed based on their economic and financial merits, including all risks, and not based on policy objectives. The problem with picking projects with political intensions in mind is that this could result in poor performing investments that damage the fund and reduce its ability to invest in new projects. Municipal governments often carry debt and may not be able to repay EPCs even if they see energy costs decline because of the competing needs of other debt servicing. The fund will need to be careful in assessing the towns it chooses to finance; at the same time, regional guarantees (more on this below) will be essential to attract international and private financing. Management structure of the fund is also important. While the fund may have a professional manager, the board overseeing the fund will likely be made up of the investors. In Bulgaria, a streamlined management structure helped reduce costs, but that may be more challenging to agree to if a range of investors participates.

Finally, regarding additional services, there will be a balance between the need to concentrate on a well-defined set of activities to keep costs low versus a desire to provide a broader range of services to ensure that projects do flow. Financing construction costs will likely increase the size of the market, so it would be to the fund's advantage. The ESCOs would need to take on the loans during construction, given the Russian EPC procurement rules; however, the ESCO could be repaid and the receivables transferred to the fund once projects are commissions. Energy audits might also stimulate the market, but they will likely need to be treated with more care for several reasons. First, it is not clear that the fund would be able to increase its revenue much by paying for audits (the financial benefits would flow primarily to the municipalities and the ESCOs). Second, the ESCOs will nonetheless want to conduct their own audits. Thus, funding audits, if it happens, would likely be a temporary solution. If the regional government funds high-quality audits, it may be better served by paying directly for them (or requiring municipalities to do so to access the fund).

There are also other financing options that this report does not delve into as deeply. The World Bank and Gazprombank, for example, are planning to create a facility for ESCO investments, but the facility is still in the initial planning phases. The idea is that the EPCs financed would be implemented by a new Gazprombank ESCO. Two other large Russian commercial banks, Vneshekonombank and

Vneshtorgbank, are also looking at this market actively, particularly from the perspective of a federal mechanism.

5.5. Guaranteed vs. shared savings contract

Currently, the model contract developed by the Russian Ministry for Economic Development mandates a shared savings model. In this model, the energy savings are shared between the two parties in the form of a fixed-percentage split of the savings between the ESCO and the Russian facility owner. Therefore, as annual savings may vary, the annual payment from the Russian facility owner to the ESCO may also change, although they will be a fixed percentage of the annual savings.

The shared savings model is in contrast to the one used in the U.S. and other Western countries, which operates more as a fixed-payment loan. Under the U.S. model in particular, the ESCO is required to provide a guaranteed minimum level of annual savings in a special clause. The guarantee may be equal to the estimated annual savings but is typically less as a result of technical risk and/or confidence levels. Under U.S. regulations, the planned (scheduled) annual payment to the ESCO (or organization that made the loan) must be less than or equal to the guaranteed annual savings. Further, the U.S. government requires an annual audit to validate that the achieved annual savings are equal to or greater than the guaranteed annual savings.

In the U.S. guaranteed-savings model, the annual payment from the facility owner/manager to the loaning organization is a fixed payment structure, much like a bank loan, provided the validated savings are greater than the fixed payment. In the situation where validated annual savings do not exceed the fixed payment, the facility owner is only required to make a payment up to the validated annual savings and the ESCO must pay the remainder of the required annual payment. Further, most if not all, of the savings are used for the loan payments (this pays off the loan faster and minimizes the financing costs). Maximizing the payments to the ESCO allows for maximizing the energy-savings measures that can be implemented within the shortest contract term.

Under a shared savings contract, it is assumed that the client (e.g., a Russian government organization) will retain a percentage of the validated (realized) savings. While this does mean the client gets something as soon as the energy saving measures are fully implemented, it comes at the cost of a longer contract term, which bears some financial, as well as, technical risk. While annual savings may be accurately estimated, basing contractor payments on a percentage of savings (which are likely to be variable) rather than on a fixed payment schedule, results in additional levels of financial risk. The shared savings model forces clients and ESCOs to undertake longer contracts and bear more risks and uncertainties. Greater risks result in a higher financial cost, reducing the ability to economically justify as many energy measures. For this reason, shared savings model is not very popular.

Even though the Ministry of Economic Development's draft model contract is based on a shared savings model, Russian law can accommodate a guaranteed savings contract. Thus, the parties can modify the current model contract to serve as a guaranteed savings contract instead. Appendix IV provides a summary of U.S. Federal Super Energy Service Performance Contract (ESPC), which may help in understanding how a guaranteed savings contract might be drafted. (A Super ESPC contract is a contract awarded to an ESCO that has won the right to be considered for federal energy efficiency projects based on the terms and qualifications it has offered). Most of the specific differences in

contractual language are in how the value of savings and payments are defined; some of the initial contract definitions of terminology also highlight the difference. For example, the sample ESPC defined “Guaranteed Annual Cost Savings” as follows:

The guaranteed annual cost savings are the levels of annual cost savings the contractor is willing to guarantee for a task order (TO) project. The proposed values for these savings appear in Schedule TO-1 (Preliminary Assessment, PA), column (b). After the Investment Grade Audit (IGA), the contractor revises the preliminary assessment and offers the final values in Schedule TO-1 (final), column (b). The guaranteed annual cost savings must exceed the annual contractor payments (Schedule TO-1 (final), column (c)) in each year of the TO post-acceptance performance period. For the first interval (generally 12 months) after Government acceptance of construction, the contractor is paid as if the savings guarantee is being met. The annual energy audit...establishes actual savings. If actual savings fall short of the guarantee, the contractor will pay back the shortfall over the next interval by accepting lower payments.

6. Other Important Issues in Designing a Pilot Mechanism

6.1. Bundling buildings to leverage financing

The time to develop and establish an energy performance contract can be long and involve significant investment on behalf of the energy service company as well as the client. Furthermore, transaction, execution and maintenance costs for energy performance contracts can be high. Transaction costs may include the costs required to develop a response to a client’s request for proposals, identification of energy measures and investment grade audits. Execution costs may include designing energy savings projects, securing project financing, managing risks, preparing for construction and installation (set up costs), as well as bringing the construction team, infrastructure and equipment to the job site. Maintenance costs may include the costs associated with training the operations team on how to operate the new equipment efficiently, training maintenance teams on how to keep the equipment operating efficiently, as well as the annual performance measurement and validation requirements. Because the fixed costs to establish an energy performance contract can be high, an economy of scale is required to achieve an adequate return on investment. For this reason, it is recommended that multiple buildings with multiple energy measures be bundled into a common project scope of work to achieve the large scale required to make energy performance contracting cost effective for both parties.

Even for locations and proposed energy projects with low associated risks, an energy performance contract may need to be bundled into a package of 1-2 million USD in project costs. Assuming a net simple payback of 5 years, this equates to annual savings ranging from 200,000 USD to 400,000 USD per year. Further assuming the savings as a percentage of the total initial energy bill is 15%, this implies the bundle of buildings total energy bill should be on the order of 1.3-2.7 million USD per year. Increased financial, operational or performance risks will further increase the need for bundling. This example illustrates that a single building or a single energy measure will not provide sufficient scale to motivate a response from an energy service company, who seeks a reasonable return on investment.

For this reason, we have asked Yuzhnouralsk and Satka to consider including a range of facilities. Both agree in principle with this concept.

6.2. Balancing risks: government, ESCOs and financial institutions

All projects and contracts have risk, and projects done under energy performance contracts are no exception. ESCO financing is generally the most expensive financing available. ESCOs must use commercial credit or internal corporate funds to finance energy projects. Commercial credit is typically more expensive (higher interest rates) than that available to public agencies. Further, an ESCO's internal corporate fund is both limited and requires rates of return for corporate shareholders. One axiom in business is the relationship between risk and reward. Additional risk premiums may be charged to the project in exchange for the ESCO bearing greater risks associated with the project repayment. The high cost of ESCO financing can impose limitations on the technical scope of the project and may place restrictive conditions on the terms of the energy performance contract. Put simply, the more risk imposed on the ESCO by the client, the more expensive the project will cost the client. This may limit the total amount of energy savings that can be cost-effectively achieved. Conversely, the more risk the client is willing to take on, the less expensive the project will cost the client and more energy savings can be cost-effectively achieved.

It is important that both parties, client and ESCO, identify the potential risks to the project(s). These risks need to be identified within the scope of work, along with the proposed mitigation approach by the responsible party. This risk/responsibility matrix should be documented in the investment grade audit but may also be included as part of the tender.

The following risks are typically identified and addressed in energy performance contracts within the U.S. and Europe:

- Financial:
 - Interest rates,
 - Energy prices,
 - Construction costs,
 - Measurement and verification costs,
 - Non-energy cost savings,
 - Delays, and
 - Major changes in facility.
- Operational:
 - Operating hours,
 - Load,
 - Weather, and
 - User participation.
- Performance:
 - Equipment performance,
 - Operations,
 - Maintenance, and

- Equipment repair and replacement.

6.3. Potential municipal funding cuts for poor performance

Finally, a remaining concern is that the Russian legislation currently envisions reducing the energy budget allocated to public entities by 15% regardless of whether the required energy cost reductions have been achieved. Because of the practical problems with implementation of this provision, the government is reviewing this issue at several levels. This provision, if enforced even sporadically, will provide a strong incentive for government entities to sign EPCs and actively work to save energy. However, the potential budget cut would create a risk for any EPCs guaranteeing less than 15% savings.

7. Tariff Agreements as an Alternative for Financing District Heating Upgrades

Tariff agreements allow for investment in a district heating network by setting the tariff so that the tariff revenue over a fixed period of time pays for the initial investment. The investor owns the boiler house and sells the heat to the network at a fixed tariff. In Chelyabinsk Region, this has meant that the tariff is fixed at the pre-investment level (with indexation for inflation), even when costs are expected to decline because of improvements in efficiency. For example, an old, inefficient coal-fired boiler may be replaced with a modern gas-fired boiler with significantly lower energy and maintenance costs.

The tariff agreements in Chelyabinsk Region usually have a term of about five years; payments in the initial years cover the costs of the investment, and the final two years (typically) are then the profit of the investor. This term is very low compared to other, similar concession agreements used in the Baltic States and elsewhere. There are a few important differences. First, the local and/or regional government pays for part of the cost as a grant (for example, costs of upgrading heat distribution networks, which typically have a long payback period, might be financed by the government directly). Second, the tariff agreements are not agreements to operate the whole network, just the boiler house, so only some capital and operating costs, and risks are included. Third, the boiler houses where these agreements have been applied are typically very inefficient, so the potential energy savings from the improvements are great. Appendix III provides a sample tariff agreement.

Procurement procedures vary depending on the investment arrangements. If the investor builds a new boiler house, the facility is considered private, and the investor does not need to go through normal public procurement rules to be able to build the facility. If instead the investment involves upgrade of an existing facility, the local government must go through a competitive procurement to award a lease to operate the boiler house. Typically, these leases will have a nominal cost associated with them. The investor would then renovate or reconstruct the boiler using its own resources (or third-party financing), and get repaid through the revenue from the heat sold. After the term of the agreement, the tariff can be renegotiated and will likely be based on a cost-plus methodology. The investors may choose to sell the boiler house back to the local government at this point (when profits will be lower).

8. Conclusions

This report provides initial scoping of proposed pilot investment opportunities in energy efficiency in Chelyabinsk Region, including efficiency improvements in public buildings, street lighting and district heating. The pilot opportunities represent a small portion of the total opportunities available in the region. Developing a viable mechanism that will be attractive and profitable for all the institutions involved, including local governments, the regional government, ESCOs and financial institutions is essential to tap these opportunities.

The federal legislation and supporting documents go a long way to make public sector energy efficiency projects feasible. Notably, they allow public entities to retain their energy savings in order to repay EPCs and they explicitly allow EPCs. Chelyabinsk Region itself has many pieces in place to facilitate projects as well, including capable staff, an inventory of public facilities and their energy use, a budget set aside for implementation, and a true desire to make projects go forward.

The pilot mechanism proposed in this report focuses on several key outstanding issues. The report outlines potential facilities for the pilot project. It highlights how the projects might be financed and what pieces will still need to be agreed. Key among these will be support at the regional and municipal levels, the interest of experienced ESCOs to bid on the projects and the willingness of one or more financial institutions to finance the projects. The potential to establish a viable mechanism in Chelyabinsk Region is great, but doing so will require cooperation, compromise and diligent work. This report and U.S-Russian governmental cooperation on this issue more broadly aim to facilitate that process.

APPENDICES

Appendix I. Energy Certificates

Under the Russian Law on Energy Efficiency No. 261, all public entities and publicly owned organizations are required to obtain energy certificates (“passports”), linked to compliance with the government mandate for public agencies to cut energy use by 15% by 2014⁷. The federal government has a standard form for energy certificates. It should be noted that while the form requires much detailed information, the quality of the certificates have varied greatly and thus cannot always be relied upon for informing investments. For instance, metered data going back several years is more common for electricity but not heat. Nonetheless, this information from the energy certificates may help with bidding.

A sample energy certificate for a public school in Chelyabinsk was carried out by PNNL’s partner Energoberezhniye in August of 2011; this particular certificate is 33 pages long, although the length can vary. As required by the federal law, the certificate includes the following information:

- General description of the facility, including (for the past 5 years):
 - Its annual budget,
 - Money paid for energy resources,
 - Volume of energy consumed,
 - Volume of water consumed,
 - Total capacity of the electric appliances (maximum allowed and actual), and
 - Number of staff and/or occupants.
- Information about meters installed for the following utilities:
 - Electricity,
 - Heat,
 - Liquid fuel,
 - Gas, and
 - Water.
- Information about energy use trends for various types of utilities with explanations (for example, “in 2010 more heat was consumed because of school-hosted events”). Data for the past 5 years.
- Information on balances for electric energy and trends. Data for the past 5 years and projections for the next 5.
- Information on balances for heat and trends. Data for the past 5 years and projections for the next 5 (e.g. “heat was used for ventilation and heating”).
- Information on balances for boilers and trends. Data for the past 5 years and projections for the next 5.
- Use of electricity for lighting over the past 5 years:
 - Numbers of lamps of different types in the facility, and
 - Volume of energy used and installed load.

⁷ The baseline year used in Chelyabinsk is 2010.

- Technical characteristics and use of energy by main technical equipment.
- Brief characteristics of the facility:
 - Year built,
 - Materials used for walls, windows and roof, and
 - Heat characteristics for the building, structure and installations during the baseline year (in $W/m^3\ ^\circ C$).
- Information on criteria for energy efficiency:
 - Current energy efficiency program measures, such as gradual installation of energy efficiency light bulbs, monitoring of equipment and replacement of window frames, and
 - Savings from the current measures.
- Description of transmission lines for energy resources and water.
- Information on the length of transmission lines of various voltage characteristics.
- Information about the capacity of the transformers over the past five years (kVA).
- Information about the capacity of installations for reactive power (capacity) of the transformers (kVAR).
- Information on the volume of losses of the energy resources.
- Recommendations to reduce energy losses.
- Energy efficiency potential and evaluation of potential savings in physical units and monetary values, payback period.
- List of energy conservation measures and their effectiveness. E.g. appointing a responsible person for energy efficiency, conducting meetings and outreach, cleaning of lamps, quarterly monitoring, replacement of light bulbs, etc.
- Staff responsible for energy efficiency and their qualifications.

Appendix II. Model Contract Developed by Russian Ministry of Economic Development (without Annexes)

DRAFT STATE CONTRACT

PROJECT CONTACTS

1. DEFINITIONS

CONTRACTUAL OBJECTS

NOTIFICATIONS

2. SUBJECT

BASELINE PERIOD, ENERGY RESOURCES SAVINGS INDICATORS AND SETTLEMENT PERIODS

STANDARDS OF COMFORT AND QUALITY

3. TERM

4. PRICE, SETTLEMENTS AND PAYMENT TERMS

5. DETERMINING ACTUAL SAVINGS AMOUNT

6. IMPLEMENTATION OF ENERGY SAVING MEASURES

REMEDYING EMERGENCIES

7. TITLE FOR THE RESULTS OF WORKS PERFORMED

9. DISPUTE SETTLEMENT PROCEDURE

LAB SELECTION

FORFEITING/CESSION

OBJECT SHUTDOWN

EARLY TERMINATION/CANCELLATION

FORCE MAJEURE

NO WAIVER

SEVERABILITY

MARKETING PERMISSIONS

10. FINAL PROVISIONS

ANNEXES

Moscow _____, 2011

_____, hereinafter referred to as the "Customer", represented by _____ acting on the basis of _____, being one Party hereto, and _____, hereinafter referred to as the "Contractor", represented by _____, acting on the basis of _____, being the other Party hereto, jointly referred to as the "Parties", have entered into this Energy Service Contract (hereinafter referred to as the "Contract"), under which the Contractor shall implement measures aimed at saving energy and increasing energy efficiency of the energy resources detailed below.

PROJECT CONTACTS

The Contractor's authorized representative regarding the subject of this contract is named in Annex XXX. The representative is authorized to represent the Contractor regarding this contract and modifications and amendments of this contract. The power of attorney for the representative is provided for in Annex #. It can be revoked at any time. In

such case the Contractor shall appoint a new authorized representative by amending the power of attorney to be added to this contract in annex xxx.

1. DEFINITIONS

As used in this Contract, the following terms shall have the meanings indicated:

ENERGY BASIS - an indicator reflecting the consumption of each type of energy resource in real terms for consecutive 12 months prior to project implementation that are representative for the energy consumption of the object in which the Contract is concluded.

BASELINE PERIOD - the period of time equal to 365 or 366 days, whichever is relevant, for which the Energy Basis is determined; the year preceding that in which the Contract is concluded.

ENERGY SAVING MEASURES (ESMs) - organizational and technical measures aimed at reducing energy consumption indicators for the facility whilst maintaining the useful effect derived from their application.

ENERGY RESOURCES SAVINGS INDICATOR - the reduction in the consumption of energy resources in real terms whilst maintaining the useful effect derived from their application, this being the consequence of energy saving measures implemented by the Contractor. The saving of energy resources shall be measured by comparing the Adjusted Energy Basis with the amount of energy consumed based on the results of readings of energy meters after the Contractor has implemented the energy saving measures.

ADJUSTED ENERGY BASELINE is such amount of energy that is arrived at by adjusting energy use in the current (i.e. settlement) period to the baseline energy use with the use of formulas in Annex 6 and that takes into account the adjustment factors described in Annex 6.

ADJUSTMENT FACTOR – a factor that influences energy consumption at facilities but is independent of the will of the Contractor therefore requires that an adjustment is made to the baseline energy consumption.

The provisions of this Contract established in respect of the energy resources shall also apply to water pumped, transferred and consumed with the use of central water supply systems.

ESM COMPLETION DATE – Date on which all the ESM equipment is installed by the Contractor and accepted by the Customer. ESM Completion date marks the end of Phase 1.

PHASE 1 is the installation phase and acceptance phase of the contract that starts with contract execution date and ends with ESM completion date. The Contractor bears no energy savings obligations before the Customer during this phase.

PHASE 2 is the performance phase of the Contract. It starts the next day the Phase 1 is ended. The Contractor is bound to deliver proposed energy savings to the Customer during this phase of the Contract.

CONTRACTUAL OBJECTS

These measures and the contract applies to the buildings and real estate listed in annex 3.

NOTIFICATIONS

All notices shall be provided in writing to address and person indicated in Annex #.

2. SUBJECT

2.1. In accordance with this Contract, the Contractor shall implement measures aimed at saving energy and enhancing energy efficiency of energy resources used by the Customer, including the implementation of energy saving measures at the Customer's facilities, whilst the Customer, in its turn, shall pay for the Contractor's services (work) on account of the funds obtained through the implementation of energy saving measures.

The Contractor is free to propose any measures he considers technically and commercially viable and attractive. By proposing measures he takes full commercial and technical risk of these measures achieving the savings he guarantees in this contract. In support of the Contractor different documents on energy consumption (annex 5) and by other parties identified measures (annex 1, energy certificate/passport) were provided. The Contractor has been given the possibility to thoroughly examine the building in order to verify the actual consumption (annex 5) and in order to propose appropriate saving measures (annex xxx).

Measures aimed at achieving energy saving and increasing energy efficiency shall be generated:

on the basis of the energy rating certificate issued following the results of energy inspection and submitted by the Customer to the Contractor prior to signing of this Contract;

by the Customer on the basis of information available about the facility(-ies);

on the basis of the offer contained in the bid of the tender participant to which the Contract is awarded.

The List of measures aimed at achieving energy saving and increasing energy efficiency is given in Annex 1 hereto. The Contractor warrants the Client that these guaranteed savings will be achieved.

The guarantee is subject to the provided building data (annex XXX), which was verified by the Contractor on his own responsibility, will not change.

2.2. This Contract shall not provide for any reimbursement of the Contractor's expenses as tender participant while preparing a bid, auction/open e-auction offer or to response to an RFQ.

BASELINE PERIOD, ENERGY RESOURCES SAVINGS INDICATORS AND SETTLEMENT PERIODS

2.3. The Baseline Year shall be 365 or 366 days from [date] to [date] whichever is relevant

Energy Baseline shall be determined according to the readings of the metering units:

Option 1 (in case data is available on the energy resource consumption volume determined using the energy meter):

- water (hot water supply, cold water supply) - _____ m³;

- heat energy - _____ GCal;

- electric energy - _____ kWh.

- sewage (m³)

energy meter The data on the volume (share of volume) of energy resource consumed by the Customer obtained using the energy meter shall be determined as the volume of consumption taking into account the factors that influence the level of energy resource consumption (changes in operating patterns and (or) functional purpose of energy consuming installations, changes in the number of energy resources consumers, area and volumes of premises, substantial changes in weather conditions, such as average daily outdoor air temperature during the heating season, duration of the heating season energy meter Shall billing data provide information on consumption from day 1 of month # through today 30(31) of month# for a total of 365 [366] days, the data shall be normalized to a 365-day year using the formula below:

$Z = X/Y * 365$ [366], where

X= the amount of energy used in the baseline billing cycle

Y=the length of the baseline billing cycle (ex. 380 days)

365 [366] = the length of each of the project years for which calculation is being made,

Z= normalized billing data

[In order to normalize the weather too, the formula contained in Annex 6 shall be used].

2.4. The Energy Resources Savings Indicator in real terms to be achieved by the Contractor as a result of execution of this Contract shall equal:

- water (hot water supply, cold water supply) - _____ m³;
- sewage (m³)
- heat energy - _____ GCal;
- electric energy - _____ kWh.

Additional savings of an energy resource equaling to the product of the energy resource price (tariff) and positive difference between the amount of savings achieved as a result of execution of this Contract in real terms and the amount of savings in real terms to be achieved by the Contractor in accordance with this Clause hereof, shall be distributed between the Parties in the following ratio:

- _____ % of additional savings shall remain with the Customer;
- _____ % of additional savings shall be included in the amount payable to the Contractor⁸.

2.5. The Energy Resources Savings Indicators in real terms to be achieved by the Contractor for each settlement period through the implementation of Energy Saving Measures hereunder shall equal:

- water (hot water supply, cold water supply) - _____ m³;
- heat energy - _____ GCal;
- electric energy - _____ kWh.

The settlement period shall be one _____ (month, quarter, year etc).

For the settlement period equal to one month (quarter), the monthly (quarterly) energy resources savings indicators in real terms are given in Annex 5 hereto.

The terms of this Contract related to Energy Resources Savings Indicators shall be considered fulfilled if the savings indicators for every type of energy resource are equal to or exceed values given in Paragraph 1 of this Clause and (or) in Annex 5 hereto.

2.6. When making settlements for supply (purchase and sale, transfer) of the energy resource at various prices (tariffs), the cost of an energy resource unit is determined as a weighted average price (tariff) equal to the ratio of the sum of products of volumes of energy resource supply (purchase and sale, transfer) consumed by the customer during at least 6 calendar months preceding the announcement date of the tender for which the calculations of energy resource were made, and prices (tariffs) at which the settlements for the relevant energy resource volumes were made, to the total amount of energy resource supply (purchase and sale, transfer).

The cost of one energy resource unit as of the date of signing hereof equals to:

- water (hot water supply, cold water supply) - _____ RUR/ m³;
- heat energy - _____ RUR/GCal;

⁸ The percent of additional saving payable to the Contractor cannot exceed the fixed percent of saving in monetary terms of the Customer's respective expenses for obtaining the energy resource stipulated hereby.

- electric energy - _____ RUR/kWh.

STANDARDS OF COMFORT AND QUALITY

2.8. In the course of implementation of Energy Saving Measures the Contractor shall take into account the following patterns (conditions) of energy resource usage:

- temperature conditions in the office - _____ °C;
- illumination level at workplace - _____;
- humidity level in the office - _____ %;
- Customer's working hours - _____ .

2.9. The list of the Customer's facilities that fall under the scope of implementation hereof stating the address and technical specifications (area, total structural volume etc) is given in Annex 3.

2.10. The Contractor shall be authorized to engage Subcontractors to perform certain works. Shall the Contractor engage Subcontractors, he shall be held responsible to the Customer in case Subcontracts fail to fulfill or unduly fulfill their obligations.

2.11. All work within the scope of this Contract shall be performed in accordance with the requirements of the existing law of the Russian Federation, regulatory requirements of Construction Standards and Rules of the Russian Federation (SNIP), State Standards of the Russian Federation in the sphere of construction and capital repairs (GOST), regulatory documents of the system (RDS), and technical specifications (TU).

2.12. The Customer shall warrant that prior to the date of signing of this Contract, the owner or the operator of the facility complied with all existing sanitary-hygienic and technical requirements in terms of energy and resource supply regimes, energy consuming installation operation modes and parameters, facility and premises operation patterns and parameters taking into account their functional purpose. [Should the Customer openly state in the tender documentation that the above-mentioned sanitary and hygienic standards and technical requirements are not compiled with at the facilities, the Customer shall add to the core ESMs envisioned/planned additional measures in order to make the equipment and operations modes conformant with said sanitary and hygienic and technical requirements and standards at additional cost to the customer.]

The cost of additional ESMs mentioned above shall be compensated by the Customer by either of the two measures [Only one of the following shall be in the contract]:

1. leave the baseline and the term of the contract intact and pay the Contractor for the additional required measures from funds other than the utility bill budgets. Shall this action make an impact on readings of meters which are used to measure efficiency and performance of core ESMs; the parties shall agree on a procedure for disaggregating energy consumption of the additional from the meter readings on core ESMs. The Customer hereby warrants that it will not claim any damages or compensation for an absolute increase in energy consumption from the facility as whole relative to the baseline period.
2. shall measure 1 be impossible, the Contract term shall be extended for as long as needed to permit the Customer to implement all the required technical measures to bring the operation modes up to standards and a 12-month period shall be allowed for facility-as-a-whole energy use metering before Phase 1 is initiated. Shall this measure be agreed by the parties, the Contractor or the Customer may not request termination of the contract thereupon. By signing this Contract, the Contractor accepts the new/amended payment schedule.

Shall the Customer request that the Contractor ensure that Health and Comfort requirements (e.g. luminance levels and internal temperature) be higher than those requested by the state standards, the Contractor shall be obliged to provide the requested standards of service and comfort at the Customer's expense. In such a case, the Customer's consumption in the reporting period shall be adequately adjusted to the baseline to compensate the Contractor for increased/improved health and comfort standards. Shall the Customer's current Health and Comfort settings be

higher than those requested by the state standards, the Contractor shall be obliged – if so requested by the Customer - to provide equal standards of service and comfort without making any adjustments to the baseline.

The Contractor shall be indemnified for any liability before the Customer in case the standards of comfort (heat) required by this contract cannot be achieved due to the fact that the volume of (heat) energy resource in question supplied by the utility does not meet the volumes specified in the utility contract with the Customer. The Contractor shall immediately notify the Customer about the fact that the volume of (heat) energy resource in question supplied by the utility does not meet the volume specified in the utility contract with the Customer.

Current status of health and comfort operation modes is contained in Annex # subject to acceptance by the Contractor in Acceptance form #. Required state of health and comfort operation modes are contained in Annex #. The Contractor hereby warrants that it verified information about health and comfort standards and indemnifies the Customer from any claims thereupon.

The temperatures in post-Phase 1 period shall be measured by instruments located in representative areas of each type (occupied area, hallways, storage, stairwells, etc.). The Contractor shall install the instruments in the designated areas at its own expense.

3. TERM

3.1. The Contract is concluded for #____years/months and cannot be extended except for duration of force majeure events or events described in Force majeure section, item 3, as well as in paragraphs 2.12.2, 5.4, 6.3(3), 8.13 (iii) and 8.13 (xxi), 9.1, and OS ii). The term includes Phase 1 and 2.

3.2. Dates for both Phase 1 and 2 are listed in Annex #.

3.3. Phase 1 of this Contract shall begin as of the signing of the Contract by both Parties unless measure 2 of Standards of Comfort and Quality section is chosen by the parties (improvement of health standards and subsequent 12-month metering).Phase 1 and 2 deadlines for the completion of works are given in the Work schedule (Annex 4 hereto).

3.4 Extension of Phase 1 is permitted, however this shall not relieve the Contractor from savings obligations under this Contract.

4. PRICE, SETTLEMENTS AND PAYMENT TERMS

4.1. The price hereunder shall be determined as share of savings of the Customer's expenses for the energy resources supplied.

The share of savings payable to the Contractor hereunder shall equal _____ %.

4.2. The settlement hereunder shall be made upon expiry of the settlement period depending on the savings level achieved: upon achieving the energy resources savings indicators determined in accordance with Clause 2.5 hereof or exceeding this level, the Customer shall honor its obligations to pay for the services hereunder in accordance with the Clause below:

Upon achieving the level of energy resources savings for the settlement period determined in accordance with Clause 2.5 hereof, or exceeding this level, the Customer shall pay for the services being the subject of this Energy Service Contract in the amount determined as the product of energy resources saving for the period specified in Clause 2.5 hereof and the cost of an energy resource unit Clause effective for the given settlement period.

No excess savings in any settlement periods will be credited to the Contractor to compensate for deficiency in savings in the any past settlement period. Shall the Customer only have annual billing data, all settlements with the Contractor for the given energy resource shall only be made annually.

All energy savings achieved before the start of Phase 2 will be fully credited to the Customer.

The first payment shall be made on ____ day of the calendar month following the calendar month in which Phase 2 was initiated.

4.4. Upon expiry of the first settlement period the Contractor and the Customer shall sign the Acceptance Certificate provided that the Energy Resources Savings Indicators given in Clause 2.5 hereof have been achieved.

Upon signing the Acceptance Certificate the Contractor shall warrant achieving the Energy Resources Savings Indicators given in Clause 2.5 hereof provided that the established operating patterns are complied with and the Customer does not breach his obligations under Clause 8.7.

The payment to ESCO shall be made only if there are savings.

The first payment to the Contractor may only be made after the Customer accepted all ESMs, i.e. after Phase 1 is ended.

The Customer reserves the right to reject acceptance of Phase 1 until the Contractor has not provided the following:

- Signed Acceptance/Commissioning Certificate/Report (Annex XXX)
- Maintenance procedures and manuals as well as spare parts lists (Annex XXX)
- Training (subject to content requirements contained in Annex XXX)
- As-Built Drawings

4.5. In order to perform the first settlement, the Contractor shall send to the Customer an Acceptance/Commissioning Certificate, a Reconciliation Report on energy meters readings for the settlement period, including the calculation of actual energy resources savings, as well as an invoice for the services provided hereunder, by day ____ of the month following the first settlement period.

4.6. The Customer shall review and sign the relevant certificates or provide in writing the reason(s) for refusal to sign the certificates, within ____ business days following the date of receipt of the Acceptance Certificate / Reconciliation Report.

Should there be any disagreements, the Customer shall sign the Reconciliation Report within 1 business day after such disagreements are settled.

4.7. In order to perform further settlements, the Contractor shall send to the Customer a Reconciliation Report on energy meters readings for the settlement period, including the calculation of the actual energy resources savings, as well as invoice for the services provided hereunder, by the ____ day of the month following the first settlement period.

4.8. The Customer shall review and sign the Reconciliation Report, or provide in writing the reason(s) for refusal to do so, within ____ business days following the date of receipt of the Reconciliation Report. Should there be any disagreements the Customer shall sign the Reconciliation Report within 1 business day after such disagreements are settled.

4.9. Within ____ business days after signing of the Reconciliation Report and the receipt of the invoice, the Customer shall perform settlements with the Contractor by transferring funds to its account (non-cash settlement form).

Within ____ days of each anniversary of the start of the first settlement date, the Contractor shall provide the Customer with an Annual Reconciliation Report that should show the balance of savings achieved and payments to Contractor made and any discrepancies thereof. The Annual Reconciliation report shall provide the Customer with precise information about consumption volumes in each of the calendar months.

5. DETERMINING ACTUAL SAVINGS AMOUNT

5.1. The actual energy resources consumption for the Basis Year shall be determined as the difference between metering units readings registered on (month) _____ 20_____ and 20_____ and stated in the consumed energy resources reports for the relevant years, submitted to _____ and shall equal:

- water (hot and cold water shall be treated separately, as should be sewage) - _____ m³;
- heat energy - _____ GCal;
- electric energy - _____ kWh.

The list of metering units is given in the Annex hereto.

For the settlement period equal to one month (quarter), the monthly (quarterly) Energy Resources Savings Indicators in real terms for the Basis Year are given in Annex 5.

5.2. The term of implementation of Energy Saving Measures is determined in Clause 3 hereof.

5.3. The actual energy resources consumption during the settlement period after the implementation of Energy Saving Measures shall be determined as the difference between metering units readings registered on _____ (date) in the beginning of the settlement period and the end of the settlement period and stated in the relevant consumed energy resources reports.

5.4. Should water, heat and electric energy metering units fail to operate, they should be replaced by the Customer within # business days at the Customer's expense. The Customer shall notify the Contractor in writing within 10 days of any such replacement and shall provide copies of metering units replacement report certified with the Customer's seal. The contract shall be extended for the amount of time that the meters were not operable.

5.5. The actual energy resource savings for the settlement period shall be determined as the difference between the actual volume of the energy resource consumption determined using the energy meters after the implementation of Energy Saving Measures and the basis volume of energy resource consumption for the same period taking into account factors influencing the volume of energy resource consumption (change in operating patterns and (or) functional purpose of energy consuming installations, change in the number of energy resource consumers, area and volumes of premises, change in weather conditions - average daily outdoor air temperature during heating season, duration of heating season, internal temperature in the building), required changes to health and comfort settings.

The Contractor shall establish by setting this out in M&V Annex how each variable will be quantified, i.e. measurements, monitoring, assumptions, manufacturer data, maintenance logs, engineering resources, etc.

Without prejudice to the paragraph above, for the settlement period equal to one month (quarter), the actual energy resource consumption values before and after the implementation of Energy Saving Measures shall be compared with the same months (quarters) of the Basis Year.

5.6. Shall new factors emerge that may influence the volume of energy resources consumption, any Party shall be entitled to suggest to the other Party the procedure of accounting for such factors in Annex 6.

6. IMPLEMENTATION OF ENERGY SAVING MEASURES

6.1. The Contractor shall implement the List of Energy Saving Measures in accordance with Annex 1 hereto.

6.2. The Contractor shall begin the implementation of the List of Energy Saving Measures within _____ calendar days following the signing hereof.

6.3. Should there be need to draft the project documentation for the reconstruction of utility networks, upgrade of equipment etc., the Contractor shall perform such works using its in-house resources or shall engage a Subcontractor provided Clause 2.10 hereof is fulfilled.

That said, the Customer shall assist the Contractor in approval and implementation of those measures from the List that cannot be implemented without the Customer's assistance, for instance: obtaining permissions and approvals of federal and local authorities, obtaining technical specifications from resource providers etc.

Should the Customer fail to timely approve the project documentation, the Contractor's obligations in respect of the saving timelines shall be adjusted accordingly, or the term of the contract extended accordingly.

6.4. The Contractor shall be responsible for quality control during the implementation of the Energy Saving Measures. The Contractor shall inspect and test all works performed in compliance with the requirements hereof.

6.5. The Contractor shall implement the List of Energy Saving Measures within the deadlines given in the Work schedule (Annex № 4 hereto).

Any changes in Work schedule deadlines are permitted only if mutually agreed by the Parties by means of signing a supplementary agreement hereto introducing amendments to the Work schedule. These changes shall in no means relieve the Contractor from the obligation to achieve the volume of savings promised.

6.6. The Customer shall grant the Contractor and its Subcontractors access to the facilities for design, installation, adjustment, inspection, and monitoring of performance of the equipment during XXX hours on xxx days or at any other time as agreed by the Parties.

The Customer shall permit night, weekend and holiday work unless this unduly disturbs its operations and otherwise strive to grant the Contractor reasonable and timely access to the facilities for the purpose of expediting the ESM implementation.

If any utility services must be discontinued temporarily to perform work, such interruptions shall be described by the Contractor in the project installation schedule. The description shall include the utility service affected, the duration of the interruption, its time (date, day of week, time of day, etc.), affected facilities and a justification. The Contractor shall obtain a written approval from the Customer for the schedule of all utility service interruptions and in any event keep them to a minimum. The Customer shall grant the said approval in case installation of the ESM in question without such utility service disconnection is impossible unless the Parties agree on a similar EE savings measure as a replacement.

The Contract shall not include those measures as mandatory that are impossible to implement without discontinuation of a utility service when such a discontinuation is likely to cause significant harm to the business operations of the Customer (in case of a hospital for ex.) unless the Customer will be willing to accept the said damage and liability. The Contractor shall be indemnified for any damage and liability because of said utility interruptions if these were consented to by the Customer who has the full knowledge of the likely repercussions provided such consent was given by the Contractor in writing and contained the date, time and duration of such utility service interruptions. Annex # contains a Utility Interruption Consent Form that shall list all (*inter alia*) likely repercussions of the said utility service interruptions for each of the facilities under the present Contract.

The Customer shall provide and pay for electric power, water and other utilities reasonably required for the installation of ESMs.

The Customer shall keep all the installations in the locked areas and third parties shall not have the right to access the installations without a prior written consent of the Contractor.

The Contractor shall have the right to access the premises periodically on a no-notice basis in order to inspect whether the number of energy consumers (kettles, moveable heaters, etc.) is in line with the number indicated in Annex #. These visits shall by no means interfere with the Customer's business/operations.

The Customer may inspect any of the Contractor's work areas on a no-notice basis during normal working hours.

6.7. The Contractor shall commit to perform the works using its own materials and resources.

While performing the works the Contractor shall use materials, articles, and equipment conforming to the approved and agreed upon technical specifications, design documentation, and public standards.

Upon written approval of the Customer the Contractor may use for the performance of works materials, articles and equipment similar but different from those specified in the agreed design documentation, provided that their technical specifications match or exceed those specified in the agreed design documentation.

All supplied materials, articles and equipment shall be new, in good and proper working condition, shall be commercially recognized equipment, shall be labeled and shall have relevant certificates, technical data sheets, and other documents to confirm their quality. The Contractor shall provide copies of such documents upon Customer's request forthwith. The Contractor shall comply in its work with the requirements of manufacturers' technical manuals and instructions, as well as process flow charts and quality control charts for the materials, goods and equipment.

6.8. The Contractor shall notify the Customer in writing of completion of each measure specified in the List of Energy Saving Measures, as well as of the full implementation of the List of Energy Saving Measures.

The Contractor shall no later than _____ days before the completion of works on the facility notify the Customer in writing on the full implementation of the List of Energy Saving Measures, set the date for the acceptance of works and provide the Completion Report for further operation of the facility.

The Customer shall verify the scope of work performed by the Contractor registered in the provided Report. Should any discrepancies with the provided Reports be revealed, the Customer shall return them to the Contractor to clear the detected discrepancies.

Should any defects be identified in the performed works the Parties shall draw up a Report outlining the scope of the work required. The Contractor shall eliminate all defects using its own resources and at its own expense within the deadline set by the Parties and noted in the Defects Report. The Completion Report shall be signed after the Contractor has eliminated all defects detected during the acceptance.

6.9. All completed works shall be accepted by the Customer. The Contractor shall move on to the next stage of works only after the Customer has accepted the previously completed stages and relevant Reports of inspection of works, critical structures and utility networks have been drawn up.

The Contractor shall no later than _____ business days before the desired date of Acceptance notify the Customer in writing about the need for intermediate acceptance of the works performed or critical structures completed. Should the Customer's representative fail to attend on the set date the procedure of intermediate acceptance of works performed and critical structures completed, the Contractor shall unilaterally issue a Report and consider works to be accepted; in doing so, the Contractor shall not be relieved of the responsibility for the quality of the work performed. In this case, should the Customer request uncovering of works he shall also assume all subsequent costs.

Should the Customer's representative make comments on the quality of works performed in the Works registry, the Contractor shall not deem such works to be completed without the Customer's written permission, except for cases when the Customer's representative fails to attend the acceptance procedure.

In case the works have been closed out without the Customer's confirmation (the Customer's representative has not been informed thereof, or has been informed behind time), the Contractor shall on the Customer's representative request uncover any part of cover-up work that has not been accepted by the Customer's representative and then restore the same and assume all subsequent costs.

The completion of critical structures, cover-up works and systems shall be confirmed by the inspection certificates for structures and cover-up works signed by the Customer and the Contractor. The Customer may reject any procedures or work that might constitute or create a hazard to the facilities, persons or property.

6.10. The Contractor shall provide the Customer with user's guides, operation manuals and recommended spare parts catalogues required for maintenance of modified equipment and performed works.

Within _____ business days after the full implementation of Energy Saving Measures, certified by the Facility handover certificate, the Contractor shall train the Customer's personnel to operate, maintain and repair in case of failures equipment and systems.

6.11. The Contractor shall provide warranty for the quality of works performed in accordance with the List of Energy Saving Measures for _____ years, but no less than the term of this Contract. The quality of works performed shall be appraised by their compliance with the List of Energy Saving Measures, technical specifications, state standards.

The Contractor's warranty shall not cover the cost of supply and installation works for replacement of consumables which reached 90% of their nameplate life cycle (such as light bulbs in non-LED fixtures, air-conditioning filters, and the like). The warranty period shall begin on the date of signing of the Acceptance Report by the Parties.

6.11.2 Should any defects be detected during the warranty period, even if they are found in previously accepted work or equipment, the Contractor shall eliminate them at its own expense within _____ business days after detection, unless another term conditioned upon the scope and nature of the defects to be eliminated has been agreed on by the Parties and specified in the Defects report.

6.11.3 If the Contractor fails to correct faulty, defective or non-conforming work/equipment as provided in this section within ----- days after discovery or notice by the Customer, the Customer may correct such work at the Contractor's expense, including costs incurred due to the removal of faulty, defective or non-conforming work/equipment. The Contractor shall bear the cost of repairing or replacing all work of other companies destroyed or damaged by such removal or replacement.

Should the Contractor be willing to participate in the drafting of the Defects Report, approval of the procedure and deadlines for defects elimination, he shall send its representative no later than _____ business days after the receipt of the Customer's written notification of defects detection.

Should the Contractor refuse to take part in drafting or sign the Defects Report, the Customer shall commission an expert inspection, as a result of which a report on the existence and nature of defects shall be drafted. The findings of such expert inspection shall be binding upon the Parties. Should the Contractor's fault be detected, the Contractor shall bear all costs related to the expert inspection. The expert inspection shall not preclude the right of the Parties to settle the dispute in a commercial court.

Should the damage be caused to the facility during the warranty period due to defects in the Contractor's work hereunder, the Customer shall notify the Contractor of the damage, after which the Parties shall discuss measures related to eliminating the damage, and the Contractor shall eliminate the damage using its own resources or reimburse the Customer for the damage as agreed.

REMEDYING EMERGENCIES

I Remedying contractor-made emergencies

1. A contractor-made emergency is defined as
 - a. Presence of signs of imminent failure of the equipment or installation that might compromise facility operation,
 - b. Any failure or defect of the equipment or installation that endangers the safety or health of the facility occupants,
 - c. any equipment failure or defect that is likely to create adverse impacts on property (e.g. valve leakage).
2. The Customer shall not restrict access of the Contractor to the Customer's facilities should there be need to prevent or remedy any failure or emergency.

3. Should the Customer learn about an emergency situation, it shall notify the Contractor immediately. If the Contractor does not embark on correction the situation immediately or is unresponsive across all channels of communication (phone, text, e-mail) for ___ (hours/days), the Customer may remedy the emergency with its own means and be entitled to charge this expense to the Contractor.
4. The Contractor shall promptly reimburse the Customer for any costs incurred in responding/correcting Contractor-made emergencies. Such reimbursement may include the Customer adjusting the payment schedule or share of savings due to the Contractor, as necessary, to recover such costs.

II Customer-made emergencies

1. A Customer-made emergency is defined as any contingency that can adversely affect energy resource savings indicators (broken window, stolen temperature sensor, pipe leakage).
2. Should the Customer learn about an emergency situation that affects the equipment/work/services or may affect the energy performance of the facility and shall it unreasonably delay informing the Contractor, and shall remediate the situation within ___ (hours/days).
3. Shall the Customer fail to remedy the emergency situation within the period specified in paragraph I (2), the Contractor may remedy the situation with its own means and charge the Customer whether in the form of a correction made to the baseline adjustment calculation or in the form of monetary compensation for the expenses incurred.
4. The Contractor shall also be entitled to compensation by the Customer for the damage to the equipment caused by a delay in Customer's remedying the emergency, which could have been avoided had the emergency been remedied by the Customer with its own means on time provided that the Contractor is able to show the direct causal connection between the delay and the loss.

7. TITLE FOR THE RESULTS OF WORKS PERFORMED

All drawings, reports and materials prepared by the Contractor specifically in performance of this Contract shall become property of the Customer within 30 days of their origination. The drawings of XXX shall be prepared in XXX format. All reports and training materials shall be provided in a printed format. No drawings or materials shall be shown or disclosed by the Customer to third parties without written consent of the Contractor.

7.1. The title to equipment installed by the Contractor at the Customer's site during the performance of measures aimed at energy saving and energy efficiency improvement shall be held by the Contractor within the effective period hereof. Integrated improvements shall be owned by the Customer as of the moment of their creation at the facilities.

7.2. Upon the expiration of the effective period hereof, the title to equipment created or installed at the facilities shall be transferred to state (municipal) ownership without any additional payment. The Contractor shall transfer the said improvements and equipment to the Customer in operational condition under equipment Acceptance Certificate.

7.3. In case of a material breach of the contract by any of the parties and a subsequent early termination by the court, the Customer shall acquire the title to the equipment by way of compensation to the Contractor at value determined by the court, taking into account the expenses incurred by the Contractor for purchase, delivery, installation, and operation thereof, as well as depreciation and debt servicing expenses.

7.4. Upon the expiration of the effective term hereof, the title to savings from all improvements and equipment created or installed at the Customer's facilities shall be transferred to Customer's ownership without any additional payment.

7.5. The Customer shall acquire no ownership interest in any software, formulas, patterns, devices, secret inventions of processes, or copyright, patents and other intellectual and property rights which are or may become used in connection with the project.

7.6. The Contractor shall grant to the Customer a perpetual, irrevocable royalty-free license of any and all software or other intellectual property rights related to equipment installed in Customer's facilities listed in Annex # necessary for the Customer to continue to operate, maintain, and repair the equipment in a manner that will maximize energy consumption reductions beyond expiration of the present Contract.

7.7. The Contractor shall protect, indemnify and hold the Customer harmless against and from any claims and expenses related to alleged patent, trademark or copyright infringements, misappropriation of proprietary rights resulting from actions taken by the Contractor in connection with this Contract.

7.8. The approval of any invention, appliance, process, article, device, material, design, equipment, or method of construction of any kind by the Customer will only be an approval of its adequacy for the work or services, and will not be an approval of the use thereof by the Contractor in violation of any patents or other rights of third persons.

8. RIGHTS AND OBLIGATIONS OF THE PARTIES

8.1. For failure to fulfill or undue fulfillment hereof, the Parties shall be responsible in accordance with the existing law of the Russian Federation and terms hereof.

The Contractor shall be authorized to engage Subcontractors to perform certain works. Shall the Contractor engage Subcontractors, he shall be held fully responsible to the Customer and liable in case Subcontractors fail to fulfill or unduly fulfill their obligations.

8.2. For the Contractor's failure to fulfill the obligations to achieve the share of saving amount within the relevant period as defined hereby, the Contractor shall be subject to penalty calculated as the product of one hundredth of refinancing rate of Central Bank of Russian Federation effective for the penalty payment date and the product of the price (tariff) of the energy resource determined in accordance with Clause 2.6 hereof, and the difference between the amount of energy resource saving in real terms which was to be ensured by the Contractor hereunder during the relevant period and the actual saving amount in real terms achieved as a result of execution hereof during the relevant period, for each day of delay. The Customer may adjust the payment schedule, as necessary, to recover the amount due in the form of fines.

8.3. The Contractor shall be relieved of paying the penalty in case it proves that the delay in the fulfillment of the obligation stated has occurred as a consequence of force majeure or for reasons depending on the Customer.

The Contractor shall be entitled to implement additional ESMs at its own expense and subject to client's approval in order to avoid penalty payments for savings shortfall.

In case the Customer has standing contracts with third parties that it did not disclose in the tender documentation (and the Contractor did not know and could not have known it) and that provide for penalties for any change to energy consumption volume or pattern, the Customer shall bear the full cost of the penalties for violating conditions of such contracts with third-parties. Shall such contracts completely preclude implementation of certain measures, the Customer shall compensate the Contractor for that volume of savings shortage that can be attributed to the aforementioned situation and shall not apply any fines to the Contractor for as long as the said situation persists. The amount of the compensation shall be agreed to by the Contractor or shall be established by any of the independent labs listed in Annex #. The cost of the services of this lab shall be entirely covered by the Customer.

The Customer shall be relieved of its obligations to pay compensation to the Contractor in case implementation of an energy saving measure (ESM) is forbidden by a federal or regional law or by-law provided such regional or federal by-law is not in conflict with the federal legislation.

In case the Customer delays payment to the Contractor, the Customer shall be liable for a fine equal one three-hundredth of refinancing rate of Central Bank of Russian Federation effective for the penalty payment date for each of the days of the delay.

8.4. The Contractor shall be responsible to the Customer for committed deviations from requirements stipulated hereby and by Annexes hereto, as well as for the committed violations of Construction Standards and Rules of the Russian Federation (SNIIP), State Standards of the Russian Federation in the sphere of construction and capital repairs (GOST), regulatory documents of the system (RDS), and technical specifications (TU)

8.5. The Contractor shall be responsible for the quality of the work performed for the whole duration of the warranty period in accordance herewith, for quality of materials, articles, and equipment used in the course of work performance. The Contractor may by no means request that the Customer shall independently pursue rights and remedies against the manufacturer or dealer of the equipment/materials in the event of equipment malfunction, defects in parts, workmanship or performance during the term of the contract.

Only new and not reconditioned equipment or parts maybe used and installed when repair is necessitated by malfunction.

8.6. The Contractor shall carry the risk of the expenses incurred within the framework of this Contract execution being for its own account in case upon expiration of the first settlement period the energy resource saving indicators specified in Clause 2.4. have not been achieved.

8.7. In case the Contractor proves, by way of conducting an independent expert review or executing a bilateral inspection certificate, that the energy resource saving indicators have not been achieved for reasons depending on the Customer, it shall be relieved of the risks of losing its own expenses and shall be compensated for the shortfall of that part of the savings that is due to the Contractor.

The Customer's fault can be proved in the following cases:

- (1) violation of the facilities' operating pattern and operation mode;
- (2) violation of the equipment operation modes, including by third-party contractors other than those hired by the Contractor,
- (3) violation of safety rules;
- (4) failure to fulfill Clause 5.4;
- (5) extension of facilities' area by means of additions to the existing ones;
- (6) change in the purpose of premises and the facility as a whole vs. the one that existed prior to the moment of implementing the Energy Saving Measures plan (including leasing, sub-leasing of its premises after the implementation of the Energy Resources Saving plan);
- (7) connection of additional consumers to both internal and external grid;
- (8) a substantial change in the number of users (staff, students) (over 10% of that existing as of January 1, 20__ (the year of entering into the Energy Service Contract) towards increase thereof;
- (9) complete or partial upgrading and reconstruction of engineering and technical equipment for that with higher energy consumption (for example, replacement of lamps or bulbs with those of higher capacity) etc.
- (10) ordering third-party engineering services from that adversely affect the performance of equipment or fulfillment of obligations on the part of the Contractor.
- (11) failing to force the utility company to bring the level of utility service provision up to the one established in the utility contract.

The violations shall be registered in the Facility Inspection Certificate which shall be signed by representatives of the Contractor and the Customer.

Shall the Customer commit any of the aforementioned acts, it shall compensate the Contractor for all the loss that would not have been sustained had these changes not been made. The size of the compensation shall be either calculated by the Customer and agreed by the Contractor or calculated by the Contractor and agreed by the Customer or calculated by an independent lab referred to in Annex #. Shall the Customer request calculation of the compensation by an independent lab, the choice of the lab shall be made/agreed by the Contractor and the services of the lab shall be paid by the Customer.

8.8. The Customer shall not be relieved from signing the acceptance certificate and payment of the cost of services subject to conditions of Clause 4 hereof in case the energy resource saving indicators specified in Clause 2.5. have not been achieved through the Customer's fault.

8.9. In case the Customer does not achieve the energy resource saving indicators specified in Clause 2.5 hereof within one and more calculation periods (but not within the first one) through the Contractor's fault, the Customer shall be relieved from fulfilling its obligations to pay for the services within this (these) calculation period(s).

Within subsequent periods, subject to the Contractor's successful execution of Clause 2.5 hereof, the Customer shall fulfill its obligations to pay for the services in accordance with Clause 4 hereof.

Upon expiration of the effective term hereof, reconciliation of energy resources consumed for all calculation periods shall be performed, an overall reconciliation statement with the calculation of actual energy resource saving indicators for the whole effective period hereof shall be executed.

If the actual energy resource saving indicators for the whole effective period hereof validity equal to or exceed the energy resource saving indicators specified in Clause 2.4. hereof, the terms hereof in respect of the energy resource saving indicators shall be considered to be fulfilled. The Customer shall fulfill its obligations of payment for the services at the residual value hereof.

If the actual energy resource saving indicators for the whole effective period hereof are less than the energy resource saving indicators specified in Clause 2.4. hereof, the terms hereof in respect of the energy resource saving indicators are considered to be not fulfilled. The Customer shall only fulfill its obligations of payment for the services for the last calculation period, subject to the Contractor's execution of Clause 2.5 hereof.

The residual value hereof cost can be paid subject to the Contractor's execution of Clause 2.5 hereof within the subsequent 1 (one) calculation period, but not more than _____ months.

8.10. Payment of penalty or application of any other form of responsibility shall not relieve the Parties from fulfillment of obligations hereunder.

8.13. The damage caused to a third party as a result of performing the work shall be compensated for by the Contractor, unless it has been proven that this damage was caused through the fault of other persons.

- (i.) The Customer shall purchase at its own cost an insurance certificate and all the floaters needed for the whole facility with all equipment installed against force majeure events defined in Section#.
- (ii.) The Contractor will not demand that the Customer change, terminate or otherwise cancel in the interest of the Contractor any existing contracts with third parties related to the contractual facilities properly disclosed in Annex #. All standing contracts with third-parties are listed in Annex #.
- (iii.) The Customer shall from the beginning until the end of the contract preserve the as-is condition of the building envelope in aspects that may alter the energy performance of the envelope so as not to bestow the Contractor with additional energy savings or deprive it of legitimate savings. Shall such building envelope or other measures affecting the energy savings be necessitated (option: "mandated by a binding decision of the higher authority"), the baseline should be correspondingly adjusted (so as not to bestow additional savings on the Contractor who did not originate them).
- (iv.) The Customer shall be fully in charge for equipment maintenance as required by maintenance manuals and facilities standards.
- (v.) The Contractor cannot demand that facilities maintenance be transferred to the Contractor directly for execution unless at no additional cost to the Customer subject to consent by the Customer.
- (vi.) The Customer cannot request that facilities maintenance as required by equipment maintenance manuals and facilities standards be executed by the Contractor unless for additional compensation subject to a separate contract procured in accordance with the public procurement law provisions.
- (vii.) Neither the Contractor nor the Customer can demand or enforce execution by the Customer or Contractor respectively of any equipment maintenance or building maintenance measures besides those required by equipment maintenance manuals or facilities operations standards.
- (viii.) The Contractor shall prepare a written definition of maintenance requirements and maintenance work procedure and checklist for each installed ECM and provide it to the Customer to comply with. The Contractor shall train the Customer's personnel in the maintenance work procedures.
- (ix.) The Contractor may
 - i) conduct periodic inspections with sufficient frequency to determine Customer's compliance with maintenance procedures,
 - ii) notify the Customer of any noncompliance and
 - iii) request necessary corrective action.

- (x.) The Contractor shall not install any equipment which will require additional personnel to be hired by the Customer for the operation or maintenance of said equipment.
- (xi.) The Customer shall be fully responsible for damage to the equipment that resulted from improper operation of the installed equipment provided the operation staff has received appropriate training as specified in Annex #.
- (xii.) The Customer shall provide sufficient space on the premises for the installation and operation of the Equipment.
- (xiii.) The Customer agrees to exercise due care in its equipment and facilities operation practices. Shall negligence be observed in Customer's operation practices [such as opening windows or doors in cold weather for extended periods of time unrelated to repairs or other works previously agreed with the Contractor], the Contractor shall be entitled for additional baseline adjustment based on its own calculations or – in case the Customer disagrees with these calculations – based on calculations performed by the lab from the list in Annex # with these services being paid by Customer.
- (xiv.) The Customer shall make knowledgeable employees and agents available for consultations and discussions with the Contractor concerning energy usage of the facilities.
- (xv.) The Customer shall be entitled to oversee all works done by the Contractor at any time without obstructing them.
- (xvi.) The Customer hereby warrants that it has not entered into any agreements with other natural or legal persons regarding the provision of energy performance services for the facilities or with regard to servicing any of the energy related equipment located in the facilities.
- (xvii.) Except where expressly required by applicable laws and regulations, the Customer shall not be responsible for monitoring the Contractor's compliance with any laws or regulations.
- (xviii.) Shall the Contractor perform any of the work or other services required by this Contract knowing or having reason to know that the work or such services are contrary to any laws or regulations, it shall compensate the Customer for any claims resulting thereof.
- (xix.) The Contractor shall perform the work under this Contract and install the equipment in such a manner so as not to harm the structural integrity of the facilities or their operating systems, except as specifically described in the tender documents. The Contractor shall repair and restore to its condition immediately any area of damage caused by its work or services under this Contract which has not been so described in the tender documents and approved by the Customer.
- (xx.) Should the Contractor encounter subsurface or latent physical conditions at the site which differ materially from those indicated in the tender documents or from those ordinarily encountered and generally recognized as inherent in work of the character provided for in this Contract, the Contractor shall give written notice to the Customer before any such condition is disturbed or further disturbed. No claim of the Contractor under this provision will be allowed unless it has given the required notice. The Customer shall promptly investigate and, if it is determined that the conditions materially differ from those which Contractor should reasonably have been expected to discover or anticipate, the Customer will approve changes to the requirements for these works or services as may be necessary. If such changed conditions significantly increase or decrease the Contractor's cost, the parties may negotiate a mutually acceptable solution (direct monetary compensation to the Contractor, reduction in percentage of savings due to the Customer, extension of the term of the Contract).
- (xxi.) Any increase in the price of the Contract or compensation due to the Contractor shall in no case amount to more than 10% of the contract value. Shall any increase individually or together with any other increases over the term of the contract exceed said 10%, the Customer shall hire at its own cost and through a separate tendering process a third-party contractor to perform the said part of the work. The Contract term shall be extended accordingly to allow enough time for such work to be performed by the Contractor or any third-party contractors, including those hired by the Customer.
- (xxii.) The Contractor shall timely advise the Customer in writing of all existing equipment and materials to be replaced at the Premises as part of the work and the Customer shall within _____ () days designate in writing to the Contractor the equipment and materials which should not be disposed of off-site by the Contractor. The Contractor shall be responsible for the disposal of all equipment and materials removed or replaced through its performance of the work/service in accordance with all applicable laws and regulations regarding such disposal, except those items designated by the Customer as non-disposable. The cost of disposal, including the cost of disposal of hazardous waste, to be borne by the Contractor.
- (xxiii.) The contractor shall indemnify and hold the Customer harmless for any and all liability, including fees and legal costs, resulting from the contractor's noncompliance or violation of any applicable federal, regional or local laws, regulations or standards regarding environmental protection. In the event that a regulatory agency assesses a monetary fine against the Customer for violations caused by the Contractor's actions or inaction, the Contractor shall immediately reimburse the Customer for the amount of any fine and other related costs.
- (xxiv.) The Contractor shall comply with the instructions of the Customer's designated safety and health personnel to avoid conditions that create a nuisance or which may be hazardous to the health of Customer's personnel and facilities' users.
- (xxv.) The Contractor shall not commit or permit any act which will interfere with the performance of business activities/operations conducted by the Customer or its employees without prior written approval of the Customer.

- (xxvi.) Only materials and equipment intended and necessary for immediate use shall be brought into the buildings. Equipment and unused materials shall be removed from the facilities by the end of each workday. The Customer shall provide if available, without charge, a mutually satisfactory location or locations for the storage and operation of materials and equipment and the performance of the Work. Combustible materials shall be stored in accordance with fire prevention regulations.
- (xxvii.) Termination of this Contract shall release the Contractor from its obligations to provide a performance/energy savings guarantee.
- (xxviii.) Prior to the final payment and the termination of the Contract, the Contractor shall perform a walk-through survey of the facilities covered by this Contract and prepare the following:
- Operating and maintenance recommendations during the remaining life of equipment installed if different from requirements furnished upon installation or if changes in technology or procedures affecting the equipment could extend the useful life of the equipment or increase the conservation efficiency,

 - An overview of new technology or additional conservation measures for the Customer to consider.
- (xxix.) Any IT systems installed shall be interoperable.
- (xxx.) The Contractor shall not be obliged to perform any work if so required by the Customer in the tender documentation or otherwise that violates existing law and regulations.
- (xxxi.) The Contractor shall submit to the Customer in accordance with the Customer's standards as-built drawings of installed EMSs.
- (xxxii.) The Contractor shall provide an electronic version of the Methods for calculating adjusted energy savings (contained in Annex 6 to this Contract) for the Customer's approval.

9. DISPUTE SETTLEMENT PROCEDURE

9.1. All disputes and disagreements that may arise in connection herewith shall be settled by the Parties by way of negotiations observing the pre-court procedure. This procedure may involve referral of the issue to an independent laboratory by a procedure described in Section #. Decision of the experts of that lab shall be final to the parties. The initial cost of the check shall be borne by the Contractor, however, the cost of the audit by the lab shall be later reimbursed by the Customer shall the Customer be found at fault by the lab by means of a direct monetary compensation or extension of the Contract term granted such extension does not violate clause 8 (xxi) of the Contract.

9.2. The claim shall list the violations committed during the execution hereof with a reference to relevant provisions hereof and Annexes hereto, reflect the cost estimate of liability (penalty), as well as measures to be executed by the Party to eliminate the violations.

9.3. The claim shall be subject to review and resolution within 10 (ten) business days following the moment of receipt hereof, unless a different term for review thereof has been stipulated hereby.

9.4 In case an agreement has not been achieved, the dispute shall be settled in the Commercial Court of _____ in accordance with the existing law of the Russian Federation.

9.5 If conflicts between applicable codes and/or standards exist, the Customer shall seek opinion of the applicable authority to determine the appropriate code to follow. Shall the authorities provide conflicting opinions, the Customer shall make the final decision, which shall be mandatory for the Contractor. However, the Contractor shall not bear any responsibility for any legal repercussions of this decision.

LAB SELECTION

1. In case of any disagreements related to baseline adjustment calculations, the Parties may refer the matter to experts from any of the labs listed in the short list of the pre-qualified labs contained in Annex #.
2. In case the Customer disputes calculations of the Contractor, it shall notify the Contractor in writing. Shall the dispute not be resolved within 10 days of such written notice, the Customer is entitled to refer the issue to independent judgment by an engineer from any of the labs listed in Annex # subject to consent to the choice of the engineer/lab by the Contractor.

3. Shall the Contractor disagree with the choice of the lab/engineer, the Contractor may appoint it is own lab/engineer. Shall the Customer disagree with Contractor's choice of the lab/engineer, the parties' chosen engineers shall appoint a mutually acceptable third party engineer.
4. The decision/award of the third engineer shall be final and binding upon the parties and shall be enforceable in any court.

FORFEITING/CESSION

- (1) Forfeiting is allowed, the Contractor can assign its receivables to a third party. Annex # contains a waiver of plea.
- (2) The Contractor shall notify the Customer of the assignment of receivables made. In case the Contractor fails to do that, all payments made to the Contractor (in place of the assignee) shall be deemed as proper execution of the present Contract.
- (3) Assignment of receivables does not relieve the Contractor of its warranty and energy savings obligations for the duration of the contract. Replacement of a Contractor under the present Contract and the procurement legislation is not allowed.

OBJECT SHUTDOWN

In case the subject facility is shut down, the Customer shall either

- i. compensate the Contractor for the cost of equipment installed and installation and related services rendered and related loss if any;
- ii. (in case of a project involving more than 1 facility), provide for a proper adjustment of energy costs baseline of the remaining facilities and a reasonable extension of the contract duration, with the total price of the contract remaining the same.

EARLY TERMINATION/CANCELLATION

TERM1

The contract may only be terminated upon

- a. mutual consent of the parties or
- b. by a court decision in case of a material breach of either of the parties.

TERM2

The Parties agree to limit the circumstances of termination by mutual consent to the following two instances:

- a. A situation when the Contract is terminated before any services - with the only exception of an energy audit - have been rendered by the Contractor including but not limited to a situation when no equipment and installation services have been provided by the Contractor.
- b. A situation when the federal/regional/local legislation establishes acts that deteriorate the financial position of the Contractor so that the Contractor is essentially deprived of what it was entitled to when executing the contract and if the Contract cannot be amended (for legal or other reasons) to compensate for these changed norms and regulations. This clause shall not apply to cases when changes are

made to technical regulations (TBD) or sanitary standards (TBD), or other regulations aimed at protection of the environment or public health.

TERM3

- a. Material breach – among other circumstances commonly treated as such by the civil law – shall mean a situation when the Contractor discovers up to one year after the contract is signed that the physical condition or technical parameters of the facilities or equipment in question differ materially from the condition described in the technical documentation unless such condition could be uncovered during the walk-through audit of the tendering phase.
- b. Shall the contract be terminated because of the material breach instance described above, the Contractor shall be entitled for a compensation for all costs it has born.

FORCE MAJEURE

1. Force majeure conditions are conditions of natural or man-made origin: Acts of God (fire, flood, earthquakes) certified by a letter from particular [TBD] public authority, insurrections or riots, explosion, war, sabotage, subsurface or latent or concealed conditions at the facilities that could not be reasonably foreseen or expected, other conditions not specifically contemplated by the Contract which, by the exercise of reasonable diligence, could not be prevented.
2. In the event of these events occurring, the Parties may prolong the term of this Contract by the period of actual existence of such conditions.
3. Should force majeure conditions occur and obstruct the performance of works within the term of the Contract, the Contractor shall notify the Customer in writing and supply written evidence (confirmations issued by XXX, an authorized emergency response agencies entitled to protect civilians and land [TBD] etc.) within _____ calendar days after the beginning of such force majeure events that obstructed the performance of works within the set deadlines, in order to extend the term of the contract accordingly.
4. If the events persist for more than ---- months, the parties are entitled to terminate the contract notwithstanding provision of TERM2 of Early Termination/Cancellation Section.
5. The Parties shall determine what if any adjustment to the Baseline set forth in Annex # are necessary due to any events described in this Section.
6. Exceptions. Certain risks and uncertainties in connection with the services shall be assumed by the Contractor as a part of this Contract. Thus, the Contractor, except as otherwise definitely specified herein, shall bear all loss or damage for hindrances or delays during the progress of any portion of the work or services and also all loss or damage arising out of the nature of the work to be done, or from inclement weather, or from any unforeseen and unexpected conditions or circumstances encountered in connection with the work or services, and no payment shall be made by the Customer for such loss or damage.

NO WAIVER

Acceptance of a payment by either party hereto shall not be construed as a waiver by such party of any of its rights (including to subsequent claims and corrections) under the present contract.

SEVERABILITY

Should any of the provisions of this Contract be or become invalid, the validity of the remaining provisions of this Contract and its Annexes shall not be affected thereby.

MARKETING PERMISSIONS

The Contractor shall be entitled to publish information about this project as a reference project and use for that purpose the photographs of the contractual objects in pre-and post-reconstructed state provided the Contractor merits personal data protection regulations.

10. FINAL PROVISIONS

10.1. Relations between the Parties that have not been stipulated hereby shall be governed by the existing law of the Russian Federation.

10.2. This Contract has been executed on _____ pages in _____ (____) counterparts having equal legal force, one for each of the Parties.

There shall exist no additional Annexes or Agreements to this Contract.

10.3 Debt Offset between the Parties to the State Contract shall not be allowed.

10.4 In case of the Contractor's liquidation, or an insolvency (bankruptcy) procedure being conducted in respect of the Contractor, the latter shall be obliged to notify the Customer in writing of liquidation or insolvency (bankruptcy) procedure being conducted in its respect within 1 (one) business day following the day of adopting the resolution to commence the liquidation or introduce the insolvency (bankruptcy) procedure, respectively.

10.5. In case the Contractor's operation is suspended subject to the procedure stipulated by the Russian Federation Code on Administrative Offence, the Contractor shall be obliged to notify the Customer in writing of suspension of its operation within 1 (one) business day following the day of adopting the resolution to suspend the Contractor's operation.

10.6. In case of commencing the Contractor's reorganization, the Contractor shall be obliged to notify the Customer in writing of commencement of its reorganization within 1 (one) business day following the day of adopting the resolution to commence reorganization.

10.7. In case of changing the name, change of manager, registered office, and actual location address (postal address), banking details, contact telephone (fax) numbers, and other Contractor's details, the Contractor shall be obliged to notify the Customer in writing of such changes within 1 (one) business day following the day of such change.

10.8 Change of the Contractor shall not be allowed, except for instances when a new Contractor is a successor to the Contractor hereunder due to reorganization of a corporate entity by way of reorganization, merger, or acquisition.

10.9 All letters, including applications, advices, notices, and claims, and other written instruments which the Parties exchange in the course of implementation hereof (hereinafter – the correspondence) can be sent by the Parties to each other by any means of communication subject to presence of a confirmation that the said correspondence has been originated by the Parties hereto.

10.10 All correspondence related to the implementation of the State Contract shall be valid for the Parties hereto in case it has been executed in accordance with the requirements to documents stipulated by the existing state standards.

Place of jurisdiction shall be Russia.

10.11. The state Contract shall have the following annexed hereto and being an integral part hereof:

ANNEXES

Annex 1. List of possible measures aimed at achieving energy saving and increasing energy efficiency of energy resource usage (ESMs)

Annex 2. List of energy meters

Annex 3. Specifications of the facilities

Annex 4. Work performance timetable/Phase 1-Phase 2 timetable

Annex 5. Actual monthly (quarterly) energy resource consumption for the Basis Year. Energy saving indicators (planned).

Annex 6. Procedure for accounting for factors influencing the energy resource consumption volume.

- Annex: Energy certificate/Passport
- M&V activities plan, including analysis of results of measurements, weather normalized regressions, weather data used and source of data:

In the M&V Plan, the Contractor shall establish how each variable will be quantified, i.e. measurements, monitoring, assumptions, manufacturer data, maintenance logs, engineering resources, etc.

The M&V Annex shall contain the following information about baseline adjustment methodology:

1. Parameters monitored
2. Details of equipment monitored, i.e., location, type, model, quantity, etc.
3. Sampling plan, including details of usage groups and sample sizes
4. Duration, frequency, interval, and seasonal or other requirements of measurements
5. Personnel, dates, and times of measurements
6. Proof of Customer's witnessing of measurements (if required)
7. Monitoring equipment used
8. Installation requirements for monitoring equipment (test plug for temperature sensors, etc.)
9. Certification of calibration/calibration procedures followed. Equipment calibration documentation
10. Expected accuracy of measurements/monitoring equipment
11. Quality control procedures used
12. Form of data (.xls, .csv, etc.)
13. Results of measurements shall be contained in an electronic form. If so this file shall also be part of the contract.

This file shall contain

- detailed description or analysis methodology used, of any data manipulation or analysis that was conducted prior to applying savings calculations.
- all assumptions and sources of data, including all stipulated values used in calculations,
- equations and technical details of all calculations made. (Use of appendix and electronic format may be necessary.) Description of data format shall be included (headings, units, etc.).
- details of any baseline or savings adjustments made.
- post-acceptance (post-Phase 1) performance period energy and water rate adjustment factors, if used.
- actual energy and water rates at sites
- verified savings for this energy conservation measure for performance year.

14. Completed data collection forms, if used

15. Description of whether performance criteria have been met, and if not, what issues should be addressed by ESCO and Customer and how.

- Annex with a list of equipment performance requirements and specifications
- Annex with a list of equipment to be installed

- Annex with a list of equipment removed, disposal arrangements
- Annex with a copy of collateral
- Annex listing all training programs that ESCO should provide to client's staff, including their start dates, fees for re-training of new personnel. The training should cover the needs of the client for the after-the-project period too (the needs for self-service). The training shall include both a classroom phase and a field demonstration phase. The course material shall include the operation and maintenance plans and manuals. The training shall take place within ____ days of completion of Phase 1. This requirement is restated in clause 6.10.
- Annex with maintenance schedules and instructions divided into two parts: Customer's and Contractor's responsibilities. This Annex may include the following responsibilities of the Contractor or client:
 - Checking insulation condition of ... monthly/weekly/daily
 - Linkage condition checking (valves/dampers)
 - Control system calibration (yearly/monthly)
 - Check of filter conditions
 - Equipment adjustment
 - Removal of dirt build-up
 - Scheduled part replacement

These can be subdivided into categories of electric equipment, control equipment, valves, etc.

- Annex with commissioning/acceptance and settlement report forms, including billing data collation form
- Annex with spare parts specifications
- Annex with Current status of comfort and service conditions (health and comfort conditions) with a Customer Acceptance Form #
- Annex with state comfort and service regulations/standards
- Annex with Client's requirements to Phase 2 comfort and health status (these standards may provide for different temperatures and lighting levels of occupied and non-occupied areas, hallways, storage areas, stairwells, etc.)
- Annex with a Utility Interruption Consent Form that shall list all (*inter alia*) likely repercussions of the said utility service interruptions for each of the facilities under the Contract
- Annex with notification contact details separately for legal and technical issues (fax, e-mail, mobile number (for text messages))
- Annex with authorized project representatives in the form of a Power of Attorney
- Annex with current and known future capital projects and the premises
- Annex with insurance requirements, incl. for force majeure
- Annex with Phase 1 and 2 durations

- Annex listing all standing contracts with third-parties.
- An electronic version of the methods for calculating adjusted energy savings (contained in Annex 6 to this Contract)
- An electronic file to be filled out with measurement results of the M&V.

Appendix III. Sample Tariff Agreement Used in Chelyabinsk

Long-Term Tariff Agreement No.

Chelyabinsk

(date)

Pursuant to Federal Law No. 261 dated 23 November 2009 *on Energy Saving and Energy Efficiency and Amendment of Relevant Acts of the Russian Federation*, Federal Law No. 210 dated 30 December 2005 *on Basic Tariff Regulation of Public Utilities*, Federal Law No.190 dated 27 July 2010 *on District Heating*, Governmental Decree No.109 dated 26 February 2004 *on Heat and Electricity Pricing Principles in the Russian Federation*, Governmental Decree No.520 dated 14 July 2008 *on Pricing Principles and Tariff, Surcharge and Pricing Cap Regulation of Public Utilities*, and with a view to reducing prices, improving the quality and security of utilities services, creating economic incentives for energy saving and energy efficiency in public utilities organisations, the State Committee Unified Tariff Body of Chelyabinsk Region ("UTF"), of the first part, and Urban District Administration (local government) ("UDA"), of the second part, and Company X (the "Regulated Party"), _____, of the third part, jointly referred to as "Parties", have agreed as follows.

I. Subject of Agreement

1. The Regulated Party will, at its own expense, take appropriate measures to improve the efficiency of district heating in locality X while ensuring the quality and security of district heating service subject to Governmental Decree No. 307 dated 23 May 2006 *on Public Utilities Services for Population*.

Efficiency improvement measures of the district heating system in locality X and their delivery time are set forth in Exhibit 1.

2. The Parties hereby agree that the Regulated Party will sell heat at long-term rates as agreed pursuant to this Agreement.

II. Rights and Obligations of the Regulated Party

3. The Regulated Party undertakes, at its own expense, to build three automated modular heat-only boiler houses that will generate heat for consumers in locality X.

4. Construction of the three automated modular heat-only boiler houses is performed under the Investment Agreement between the Regulated Party and UDA. Financial estimates of the investment project are outlined in Exhibit 2.

5. The Regulated Party will submit quarterly report to UTF and UDA about the status of measures included in the investment project.

6. During the term of this Agreement the Regulated Party will produce heat that will be used by consumers, with the quality of supply complying with applicable legislation of the Russian Federation, at the price (tariff) as agreed pursuant to this Agreement.

7. Any new assets of district heating and other public infrastructure that the Regulated Party builds at its own expense under this Agreement are property of the Regulated Party.

Separable or inseparable improvements of the public infrastructure facilities which are performed by the Regulated Party under this Agreement and relate to municipal or state property are property of respective municipality, in all other cases the ownership is determined subject to applicable laws.

8. The Regulated Party will account separately for its regulated activity under this Agreement.

9. In order to fulfill its commitments, the Regulated Party is entitled to outsource the work, assuming the same responsibility for the end result of work performed by the outsourced labour as for own work.

III. Rights and Obligations of UTF

10. Subject to the terms of this Agreement, the Regulated Party will set a heat tariff in 2012 that corresponds to the 2012 tariff set by UTF for the coal-fired heat-only boiler plant in locality X. The price of heat generated by the coal-fired boiler plant in locality X, applicable at the time of signing hereof, constitutes 1041.60 rubles/GCal without VAT.

11. For subsequent years and until the expiration of the long-term tariff hereunder, the tariff will be validated and calculated by inflating the cost items, which were accepted by UTF for the year preceding the next regulation period, using the inflation indices recommended by the Federal Tariff Service based on the forecasts of social and economic development of the country as approved by the Government of the Russian Federation for respective year.

12. After the long-term tariff expires, the heat tariff will be set for the Regulated Party in accordance with applicable legislation and guidelines that are in place at the time of tariff setting and based on the effect of the boiler house construction project as described in Exhibit 1.

13. In the event the Regulated Party defaults on the terms of this Agreement, UTF has the right to seek termination of the Agreement upon consent of UDA.

IV. Rights and Obligations of UDA

14. UDA will provide guarantees to the Regulated Party for the investment project of automated modular boiler houses in locality X.

15. UDA will oversee the execution of measures by the Regulated Party as set forth in Exhibit 1.

If the Regulated Party breaches terms of this Agreement, UDA will notify UTF thereof.

In the event of default on this Agreement by the Regulated Party, UDA has the right to seek termination of the Agreement upon consent of UTF.

V. Term of Agreement

16. Measures implemented under this Agreement have a payback period of four (4) years and three (3) months starting from the date of commencement of district heating activities by the Regulated Party in locality X.

17. The term of this Agreement is six (6) years and three (3) months starting from the date of commencement of district heating activities by the Regulated Party in locality X.

18. The Agreement takes effect upon its signature and remains valid until 31 December 2019.

19. The payback period set forth in paragraph 16 of this Agreement may be reduced if:

a) actual total cost of construction of the heat-only boiler plant is less than 54.88 million rubles as projected under the Investment Agreement;

b) net heat production is increased by more than 5% from the project's financial estimations (Exhibit 2).

20. In the event the payback period is reduced, the long-term tariff will remain valid during 2 years after the end of the payback period.

VI. Liability

19. The Parties will be held liable for non-performance or improper performance of this Agreement subject to applicable provisions of Russian laws and this Agreement.

20. The Parties recognize that this Agreement is a regional legal act of social partnership that ensures an agreed tariff policy in the Chelyabinsk Region and agree to comply with its terms.

VII. Force Majeure

21. A Party will be held liable for non-performance or improper performance of its obligations hereunder subject to applicable laws of the Russian Federation and provisions of this Agreement, unless it provides evidence that such default was due to circumstances beyond reasonable control of the Party.

For purposes of this Agreement, force majeure circumstance include, in addition to what is set forth by the Civil Code of the Russian Federation, heat regulation decisions adopted by the Russian Government.

22. A Party in default of this Agreement due to circumstances beyond its reasonable control shall:

a) notify in writing the other two Parties about the occurrence of such circumstances within 5 calendar days after such occurrence and provide relevant documentary evidence;

b) notify in writing the other two Parties about the resumption of its obligations under this Agreement.

23. The Parties agree to take all reasonable measures to rectify the effects caused by force majeure circumstance which prevented proper execution of their obligations under this Agreement.

VIII. Modification

24. This Agreement may be amended or modified subject to agreement by the Parties. Modification of the Agreement shall be done in writing.

IX. Termination

25. This Agreement terminates:

a) upon its expiration;

b) upon consent of the Parties;

c) subject to a court ruling ordering premature termination;

d) subject to agreed decision of UTF and UDA in the event of default by the Regulated Party.

X. Disputes

26. The Parties shall undertake to resolve through mutual consultation all disputes and disagreements arising out of or in relation to this Agreement.

27. If the Parties fail to agree on disputes settlement, the disputes shall be finally resolved subject to applicable legislation of the Russian Federation.

XI. Final Provisions

28. This Agreement is executed in three identical counterparts of equal legal force.

29. All appendices and supplements hereto, which are executed together with or after the execution of this Agreement, constitute integral parts of the Agreement. All appendices and supplements hereto shall be executed by respective duly authorized representatives of the Parties.

30. The Parties agree to provide accurate, complete and timely information for execution of this Agreement.

Appendix IV. Excerpt of U.S. Department of Energy’s Sample “General Indefinite Delivery/Indefinite Quantity Super Energy Service Performance Contract”

[We have deleted or condensed sections of this contract that do not appear relevant in jurisdictions outside of the United States. Sections of this document followed by empty brackets indicate deleted sections.]

[We have preserved the original Table of Contents, below.]

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I.2 ORDERING (FAR 52.216-18)(OCT 1995)

I.3 ORDERING LIMITATIONS (FAR 52.216-19)(OCT 1995)

I.4 INDEFINITE QUANTITY (FAR 52.216-22)(OCT 1995)

I.5 NOTIFICATION OF EMPLOYEE RIGHTS CONCERNING PAYMENT OF
UNION DUES OR FEES (FAR 52.222-39)(DEC 2004)

I.6 STATEMENT OF EQUIVALENT RATES FOR FEDERAL HIRES (FAR 52.222-42)(MAY 1989)

I.7 BUY AMERICAN ACT—CONSTRUCTION MATERIALS (FAR 52.225-9) (JAN 2005)

I.8 BUY AMERICAN ACT—CONSTRUCTION MATERIALS UNDER TRADE
AGREEMENTS (FAR 52.225-11)(AUG 2007)

I.9 RIGHTS IN DATA--GENERAL (FAR 52.227-14)(DEC 2007)(AS MODIFIED BY 65
DEAR 952.227-14 - DOE coverage-alternates VI and VII)

I.10 ENERGY POLICY ACT SUBCONTRACTING GOALS AND REPORTING
REQUIREMENTS (DEAR 952.226-72) (JUN 1996)

I.11 UPDATES OF PUBLICLY AVAILABLE INFORMATION REGARDING
RESPONSIBILITY MATTERS (FAR 52.209-9)(JAN 2011)

PART III - LIST OF DOCUMENTS, EXHIBITS AND OTHER ATTACHMENTS

SECTION J - LIST OF ATTACHMENTS

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PART I - THE SCHEDULE

SECTION B - SUPPLIES OR SERVICES AND PRICE/COSTS

B.1 ITEMS BEING ACQUIRED/TOTAL PRICE

The contractor shall provide energy savings performance contract (ESPC) conservation and renewable energy services for Federal facilities. The contractor shall furnish all personnel, facilities, equipment, materials, supplies, and services (except as may be expressly set forth in this master indefinite delivery/indefinite quantity (IDIQ) contract or any task order (TO) against this master IDIQ contract as furnished by the agency) and otherwise do all things necessary for, or incident to, performance of these requirements in accordance with the statement of work

(SOW) provided in Section C of this master IDIQ contract and all TOs issued against this master IDIQ contract.

SECTION C - DESCRIPTION/SPECIFICATIONS/STATEMENT OF WORK

C.1 GENERAL REQUIREMENTS/PROJECT SCOPE

C.1.1 This contract is intended to promote the use of renewable energy technologies, acquire energy and water conservation services, reduce energy and water consumption and/or associated utility costs, and may reduce energy and water-related operations and maintenance costs, as specified in each task order (TO) issued against this master indefinite delivery/indefinite quantity (IDIQ) contract. The contractor shall be responsible for providing all labor, material, and capital to install energy and water conservation projects, renewable energy projects and provide operations and maintenance (O&M) as specified in each TO. The cost of an energy savings performance contract (ESPC) TO project (hereafter referred to as TO project) must be covered by the energy, water, and related cost savings incurred at the Federal facility. The TO project cost savings must be verified and documented annually.

C.1.2 This master IDIQ contract may be used by Federal agencies for all Federal buildings and facilities in accordance with the procedures established in this master IDIQ contract.

C.1.3 Unless otherwise stated, all provisions that follow throughout the remaining sections of this master IDIQ contract may be revised within the overall scope of the contract, as necessary (based on the needs and regulations of the agency), in an agency TO Request for Proposals (RFP).

C.1.4 A DOE-approved project facilitator (PF) is required for the utilization of this master IDIQ contract. A PF must be selected prior to the agency issuing a notice of anticipated requirements. The PF requirement shall not be waived by the agency.

C.2 ENERGY CONSERVATION MEASURE (ECM) TECHNOLOGY CATEGORIES

(TCs)

C.2.1 ECM TCs - This master IDIQ contract and its TOs require the contractor to possess the capability to implement ECMs that reduce energy and water consumption or costs, increase renewable energy use and may reduce energy and water-related O&M costs. ECMs include measures to increase energy efficiency of energy-consuming systems and to reduce water consumption. ECMs also include measures that improve the efficiency of energy production systems that generate electrical and/or thermal energy.

A list of ECM TCs that shall be considered during the development of a TO project is provided in Attachment J-3. This master IDIQ contract may be modified in the future to add ECMs that are not currently authorized but are subsequently authorized.

C.3 FACILITY PERFORMANCE REQUIREMENTS OF ECMs

Installed ECMs shall comply with the standards of service required for facilities as specified in each TO. The standards of service may include acceptable temperature and humidity ranges, allowable setbacks, noise criteria, air quality parameters, lighting levels, and other related factors, as agreed to between the agency and the contractor. At a minimum, where automated controls of lighting or environmental conditions are to be installed, the agency must have the ability to, or direct the contractor to, respond within a specified time to temporarily override the heating, ventilating and air-conditioning (HVAC) and lighting systems.

C.4 MEASUREMENT AND VERIFICATION (M&V) OF ECM PERFORMANCE

C.4.1 Every TO awarded shall include a site-specific M&V plan that specifies the M&V requirements and procedures that shall apply to the TO based on various factors, such as type of ECMs, projected value of energy savings, certainty/uncertainty of savings being achieved, and the intended risk allocation between the agency and the contractor.

C.4.2 The TO M&V plan is the primary vehicle that an agency uses to first document and then to periodically evaluate the performance expectations of the TO project. This document shall be thoroughly understood by the contractor and agency. It shall, in a clearly understandable format, state where and how energy, water and related cost savings are going to occur and how they are to be calculated and verified. If the scope of work does not include the entirety of a site, or all the systems or significant portions within a building, then that situation shall be stated clearly so that the agency and the contractor are aware of what the TO covers and what it does not. Each building and/or space within

a building that will be affected shall be identified, and buildings or portions of buildings that will not be affected shall be identified. The ECMs that generate savings shall be identified, as well as the building systems that they affect. If there are significant energy- or water-using building systems or other energy or water uses within the buildings, which will not be affected by the TO, they shall be identified so that there is clear understanding of the extent to which total energy, water and related costs at the site will be affected. To the extent this information is provided in the investment grade audit (IGA), it will be repeated in the M&V plan.

C.4.3 [...]

C.4.4 The TO M&V plan shall specify the M&V options and methods that will be used for each ECM included in the TO. M&V options and methods proposed for each ECM shall comply with the latest version (in effect at the time of TO award) and the “International Performance Measurement and Verification Protocol (IPMVP).”

C.4.5 M&V Activities - The contractor shall perform the following required M&V activities:

A. Define a site-specific M&V plan for the particular project being installed, once the project has been fully defined and the IGA is completed. This shall occur before the TO is awarded, and the M&V plan will be incorporated into the TO.

B. Define pre-installation baseline including (a) equipment/systems, (b) baseline energy use, (c) system performance factors (e.g., lighting levels, temperature setpoints, time clock settings, etc.), and/or (d) actions to determine baseline energy use, which may include site surveys, short-term or long-term metering, analysis of billing data, and/or engineering calculations. The pre-installation baseline should also identify factors beyond the contractor’s control that influence post-installation energy (e.g., building occupancy, weather, plug load creep, etc.).

Where such factors beyond the contractor’s control potentially exist, the agency and contractor will agree on the formal change control process to adjust the baseline, modify savings calculations or otherwise account for such factors. Where feasible, adjustments to the calculation methodology for savings are to be preferred over changes to the baseline. Such adjustments make it easier to present the actual savings. The definition of all elements of the pre-installation baseline will be agreed upon before the TO is awarded.

C. Define post-installation conditions including (a) equipment/systems, (b) post-installation energy use and/or (c) actions to determine post-installation energy use, which may include site surveys, short-term or long-term metering, analysis of billing data, and/or engineering calculations.

D. Conduct annual M&V activities to verify operation of the installed equipment/systems and calculate the previous year’s energy and water savings, and compare verified and guaranteed savings.

C.4.6 M&V Submittals during TO Development and Post-Award

A. [...]

B. The contractor shall prepare and submit a site-specific M&V plan with its final proposal. This site-specific M&V plan shall include a schedule indicating M&V activities and post-award M&V reporting milestones for each ECM.

C. The contractor shall prepare and submit a post-installation report to the agency.

D. The contractor shall prepare and submit an annual M&V report to the agency, including data and calculations that demonstrate that continued ECM performance achieves the guaranteed annual energy, water, and related cost savings as required by the TO.

C.5 INSTALLATION REQUIREMENTS FOR ECMs

C.5.1 Design and Construction Package

A. The contractor shall prepare and submit a design and construction package to the Federal agency for review and approval prior to starting ECM installation. The design and construction package shall be certified (stamped) by a licensed professional engineer in the state where the work is performed to assure compliance with applicable building codes and Federal agency design standards. The TO will specify site-specific requirements of the design and construction package. Acceptance of the design and construction package by the agency shall not relieve the contractor from responsibility for meeting facility standards of service and guaranteed cost savings.

B. The design and construction package due date will be negotiated between the contractor and the agency, and specified in the TO.

C. The design and construction package shall be prepared and shall include at least the following:

1. **Manufacturer's Data** - For all ECM equipment to be installed, the contractor shall provide the manufacturer's descriptive literature of equipment including drawings, diagrams, performance and characteristic curves, catalog cuts and installation guidelines and warranty considerations.

2. **Design and Construction Specifications** - Unless otherwise specified by the agency, the contractor shall identify and reference design and construction specifications applicable to installed ECMs.

3. **Construction Drawings** - Construction drawings shall be prepared by the contractor, subcontractor, or any lower-tier subcontractor.

4. **Planned Service Interruptions** - If any utility services must be discontinued temporarily to perform work, such interruptions shall be described and indicated on the project installation schedule. The description shall include the length of the interruption, its time (date, day of week, time of day, etc.), and a justification. Required service interruptions shall be scheduled per C.5.6 of the master IDIQ contract.

6. Acquisition of Permits - For any ECM installation requiring permits from regulatory agencies, the contractor shall provide its plan and schedule for acquiring such permits in accordance with agency instructions and requirements.

7. Installation Schedules - The installation schedule shall show the order in which the contractor proposes to perform the work and the dates on which the contractor contemplates starting and completing all major milestones (including acquiring materials, equipment, permits, and inspections). The schedule shall be in the form of a progress chart of suitable scale to indicate the amount of work scheduled for completion by any given date during the installation period.

D. Design documents will require both a preliminary and final review by the agency. Each TO will specify the submittal requirements associated with each review.

C.5.2 Design and Construction Standards

A. A TO issued against this master IDIQ contract will specify design and construction standards applicable to site.

B. No requirement of this contract shall supersede applicable regulations, local codes and/or standards.

C.5.3 ECM Quality Control Inspection Program

A. The contractor shall be responsible for quality control during installation of ECMs. The contractor shall inspect and test all work performed during ECM installation to ensure compliance with the TO's performance requirements. The contractor shall maintain records of inspections and tests, including inspections and tests conducted by or for any non-Federal organization, such as a utility or other regulatory agency. The contractor shall prepare an ECM Quality Control Inspection Plan for review and acceptance by the agency. Any changes to the ECM Quality Control Inspection Plan shall be submitted for review and acceptance to the agency. The ECM Quality Control Inspection Plan shall be prepared and submitted in accordance with the TO reporting requirements.

C.5.4 ECM Commissioning - The contractor shall assure the agency, through the ECM

Commissioning, that the ECMs performance achieves facility and/or process performance requirements as set out in the TO. The ECM Commissioning shall be accomplished through a process of verification and documentation.

A. [...]

B. ECM Commissioning Plan - After the agency reviews and accepts the design and construction package, the contractor shall provide a Commissioning Plan to the agency for acceptance that addresses each ECM with specific steps that will be taken during the commissioning process.

C. ECM Commissioning Report - The contractor shall submit to the agency a Commissioning Report documenting the ECM's affect upon facility performance requirements in accordance with the Commissioning Plan and agency requirements.

C.5.5 Environmental Protection

A. [...]

B. The contractor shall comply with applicable Federal, State and local laws and with the applicable regulations and standards regarding environmental protection.

C.5.6 Service Interruptions - For any planned utility service interruptions, the contractor shall furnish a request to the agency.

C.5.7 As-Built Drawings (Record Drawings) - After completion of installation and prior to Government acceptance of installed ECMs, the contractor shall submit as-built drawings to the agency.

C.6 OPERATION OF ECMs

C.6.1 [...]

C.6.2 When the implementation of an installed ECM results in a change in an existing operations work procedure, the contractor shall prepare a revised written operations work procedure and checklist for written acceptance by the agency. The contractor shall train

Government personnel in the operations work procedures.

C.6.3 The performance of ECM operations may be assumed by the Government through mutual agreement of the contractor and the agency. In such cases the Government will operate the ECM in accordance with the contractor-provided operations work procedures. The contractor shall conduct periodic inspections.

C.7 PREVENTIVE MAINTENANCE OF ECMs

C.7.1 The contractor shall be responsible for preventive maintenance of all installed ECMs.

C.7.2 The contractor shall prepare a written definition of preventive maintenance requirements and preventive maintenance work procedure and checklist for each installed ECM. The contractor shall train Government personnel in the revised preventive maintenance work procedures.

C.7.3 The Government may assume performance of preventive maintenance through mutual agreement of the contractor and the agency. If the Government assumes preventive maintenance work, the equipment shall be maintained in accordance with the preventive maintenance work procedures and checklists provided by the contractor and accepted by the agency. The contractor shall conduct periodic inspections.

C.8 REPAIR OF ECMs

C.8.1 The contractor shall be responsible for the repair of all installed ECMs. Performance of ECM repairs, however, may be assumed by the agency through mutual agreement of the contractor and the agency, as specified in the TO.

C.8.2 [...]

C.8.3 Equipment Failure -If equipment failure or damage is a result of the contractor's failure to perform or negligence in performing repairs, the contractor shall provide repair or replacement at its expense.

C.9 CONTRACTOR MAINTENANCE AND REPAIR RESPONSE TIME

C.9.1 The contractor shall establish a point of contact (name and phone number) for use by the agency in providing response to contractor equipment failures. The point of contact shall be available as specified in the TO throughout the TO's term. Initial telephone response to repair call messages shall be within the timeframe specified in the TO. If a site visit is needed to repair equipment, repair personnel shall arrive on site within the timeframe specified in the TO for nonemergency repairs or within the timeframe specified within the TO for emergency repairs. Although normal contractor access is during the normal work hours specified for the specific site in the TO, the contractor may be granted 24-hour per day access to the buildings for emergency work at the discretion of the agency.

C.9.2 Emergency maintenance and repair work is defined as maintenance or repair necessary to correct an existing or imminent failure to meet the Facility Performance Requirements of ECMs, Section C.3, or any action necessary to protect the safety or health of the facility occupants and prevent adverse impacts on property.

C.9.3 In the event the contractor fails to respond as required in the TO and in the event of emergencies, the agency may incur expenses to perform emergency repairs to contractor-installed equipment as well as agency equipment for which the contractor assumed maintenance and repair responsibilities. The contractor shall indemnify and hold the agency harmless in such cases where the contractor fails to respond appropriately in emergencies. The contractor shall promptly reimburse the agency for any and all costs incurred in responding to such emergencies. Such reimbursement may include the agency adjusting the payment schedule, as necessary, to recover such costs.

C.10 OPERATIONS AND MAINTENANCE (O&M) MANUALS AND TRAINING FOR ECMs

C.10.1 Operations and Maintenance Manuals -The contractor shall furnish O&M manuals and recommended spare parts lists for O&M of the contractor-installed ECMs.

C.10.2 Agency Personnel Training for ECMs -The contractor shall provide a training program for agency personnel and/or agency contractors for each ECM in a project.

C.11 GOVERNMENT PROJECTS

The agency shall notify the contractor when agency projects are to be implemented that may impact the installation or operations of contractor-installed ECMs.

C.12 ENERGY EFFICIENCY AND RENEWABLE ENERGY AND WATER PROJECT FINANCIAL AND TAX INCENTIVES

The contractor shall be responsible for determining the source, value, and availability of any applicable financial and tax incentives for the project.

C.13 AVAILABILITY OF UTILITIES

The agency will furnish water and electric current at existing outlets, as may be required for the installation work to be performed under a TO, at a cost of the usage mutually agreed to by the contractor and the agency.

C.14 GOVERNMENT-FURNISHED PROPERTY AND CONTRACTOR FURNISHED MATERIAL

The contractor shall provide all materials and supplies necessary to perform the work as specified in the TO. Materials and supplies provided shall be of the grade and quality as specified in the TO and be in compliance with any applicable standards.

C.15 CONTRACTOR EMPLOYEES

C.15.1 Upon issuance of a TO under this master IDIQ contract, the contractor shall provide the agency with the name(s) of the responsible supervisory person(s) authorized to act for the contractor.

C.15.2 The contractor shall furnish sufficient personnel to perform all work specified within the TO.

C.16 FIRE PREVENTION [...]

C.17 SALVAGE [...]

C.18 HAZARDOUS MATERIALS [...]

C.19 DISPOSAL OF NONHAZARDOUS WASTE

Nonhazardous debris, rubbish and unusable material resulting from the work shall be removed from agency property and properly disposed or recycled by the contractor.

C.20 SAFETY REQUIREMENTS - All work shall be conducted in a safe manner.

C.21 SECURITY REQUIREMENTS

C.21.1 Passes and Badges -All contractor employees shall obtain employee and vehicle badges and passes, as required by the agency.

C.21.2 [...]

C.21.3 Contractor Access to Buildings -It shall be the contractor's responsibility, through the agency, to obtain access to buildings on the TO project site.

SECTION D – Packaging and Marketing [...]

SECTION E -INSPECTION AND ACCEPTANCE

E.1 [...]

E.2 INSPECTION OF INSTALLED ECMs

Each task order (TO) will include specific inspection criteria pertinent to the TO project. The agency and contractor shall jointly inspect ECMs.

E.3 ACCEPTANCE

E.3.1 Partial Project Acceptance - The agency may agree in writing to accept ECM(s) installed and operational prior to completion of the Implementation Period. If the agency accepts partial project installed ECM(s), it will pay the contractor, prior to full project acceptance, in amounts and frequency specified in Schedule TO-1 (final), column (c). ECM(s) inspection and testing to verify guaranteed cost savings during the remaining Implementation Period will be conducted and documented by the contractor, and submitted to the agency for acceptance, prior to implementation period contractor payments. Implementation Period contractor payments shall reduce the project Total Amount Financed (Principal) (Schedule TO-3) and related debt service payments during the TO post-acceptance performance period.

E.3.2 Full Project Acceptance

A. After installation of all ECMs the agency will notify the contractor in writing of full project acceptance which will constitute the start of the post-acceptance performance period and commencement of

contractor payments. Agency acceptance, for purpose of payment, in accordance with Section G, occurs when the following are completed:

1. Acceptance by the agency of the contractor's post-installation CO report;
2. Acceptance by the agency of contractor's ECM Commissioning CO Report;
3. The project inspection is conducted pursuant to Section E.2; and
4. Submission of additional TO requirements prior to acceptance:
 - a. Operations work procedures
 - b. Preventive maintenance work procedures
 - c. O&M manuals and spare parts lists
 - d. Training
 - e. As Built Drawings (Record Drawings)

B. The agency and contractor shall mutually agree on, and specify in the TO, the anticipated schedule for the contractor report submittals and the duration for agency review for acceptance.

SECTION F – DELIVERIES OR PERFORMANCE

F.1. – F.5. [...]

F.6 DELIVERABLES AND SUBMITTALS

F.6.1 Agency Requirements -The agency deliverables requirements will be specified in each TO.

SECTION G -CONTRACT ADMINISTRATION DATA

G.1 [...]

G.2 TASK ORDER ADMINISTRATION

G.2.1 Administration of task orders (TOs) issued against this master IDIQ contract shall be accomplished by the agency identified in the TO.

G.2.2 TOs awarded against this master IDIQ contract are firm fixed price.

G.3 INVOICING INSTRUCTIONS

The contractor shall submit invoices in accordance with the specific instructions provided in each TO issued against this master IDIQ contract. These instructions will vary by ordering agency, and will include invoice format, invoice contents and any required attachments or enclosures, submission and addressing instructions, etc. required by the TO.

G. 4 INVOICE SUBMITTAL AND PAYMENT SCHEDULE

G.4.1 Payments to the contractor will commence when acceptance by the agency is obtained as required under Section E.

G.4.2 The frequency of payments, including any partial payments, from the agency to the contractor will be as negotiated and specified in the TO. Options of payment frequency include but are not limited to monthly, quarterly, annual in advance (preferably with debt service only in advance and post-acceptance performance period payments in arrears), or annual in arrears.

G.5 PAYMENT TO THE GOVERNMENT FOR GUARANTEED ANNUAL SAVINGS SHORTFALL

G.5.1 If the contractor fails to meet the guaranteed annual savings as verified by the M&V documents, the agency shall adjust the payment schedule.

G.5.2 When the ECM performance level is restored, the agency will adjust the contractor payment schedule accordingly.

SECTION H -SPECIAL CONTRACT REQUIREMENTS

H.1 [...]

H.2 TITLE TO, AND RESPONSIBILITY FOR, CONTRACTOR-INSTALLED EQUIPMENT

Title to all equipment installed by the contractor shall be vested in the Government after acceptance by the Government, and shall not relieve the contractor's responsibility for Energy Conservation Measure (ECM) performance.

H.4 PRELIMINARY ASSESSMENT CONTENT REQUIREMENTS FOR TASK ORDERS

H.4.1 The contractor shall submit a PA to the **Preliminary Assessment (PA)** -Government, which sets out the merits, technical feasibility, level of projected energy savings, economics, and price of the project.

H.5 INVESTMENT GRADE AUDIT CONTENT REQUIREMENTS FOR TASK ORDERS

H.5.1 Following issuance by the agency of the NOI, the selected contractor shall conduct an Investment Grade Audit (IGA) of facilities and energy systems at the project site to substantiate the contractor's ability to achieve the estimated total cost savings.

H.5.2 The IGA shall identify the relevant existing conditions of applicable agency facilities.

H.5.3 For each ECM identified, the contractor shall provide a detailed analysis documenting the proposed annual energy or water savings performance of the ECM.

H.5.4 The contractor shall document the results of the IGA and provide the documentation to the agency in a format agreed to by the agency.

H.6 REQUIREMENTS FOR FINAL PROPOSAL AND FINAL PROPOSAL REVIEW FOR TASK ORDERS

H.6.1 The contractor shall submit a final proposal (FP), consisting of technical and price components as required in the TO RFP.

PART II -CONTRACT CLAUSES [...]

PART III -LIST OF DOCUMENTS, EXHIBITS AND OTHER ATTACHMENTS

SECTION J -LIST OF ATTACHMENTS

[We have deleted attachments from this document that do not appear to

Attachment Title

J-1 ACRONYM LIST

J-2 DEFINITIONS OF APPLICABLE TERMS

J-3 ENERGY SAVINGS PERFORMANCE CONTRACT
TECHNOLOGY CATEGORIES AND ASSOCIATED
ENERGY CONSERVATION MEASURES

J-4 SAMPLE DELIVERABLES FOR TASK ORDERS

J-5 DESCRIPTIONS OF TASK ORDER SCHEDULES AND
PLACEMENT OF PRICING INFORMATION

J-6 TASK ORDER (TO) SCHEDULES:
TO-1 (PA) (Preliminary Assessment (PA)) Proposed
Guaranteed Cost Savings and Contractor
Payments
TO-1 (final) Guaranteed Cost Savings and Contractor
Payments
TO-2 Implementation Price by Energy
Conservation Measure
TO-3 Post-Acceptance Performance Period Cash

Flow

TO-4 Task Order Performance Period First Year

Estimated Annual Cost Savings by Energy

Conservation Measure and Technology

Category

TO-5 Annual Cancellation Ceiling Schedule

J-7 ENERGY SAVINGS PERFORMANCE CONTRACT RISK,
RESPONSIBILITY AND PERFORMANCE MATRIX

J-8 MEASUREMENT AND VERIFICATION PLAN AND
SAVINGS CALCULATION METHODS OUTLINE

J-9 POST-INSTALLATION REPORT OUTLINE

J-10 ANNUAL MEASUREMENT AND VERIFICATION
REPORT OUTLINE

J-11 INVESTOR DEAL SUMMARY TEMPLATE

J-12 STANDARD FINANCE OFFER TEMPLATE

ATTACHMENT J-1

ACRONYM LIST

AFV	Alternative Fueled Vehicle
AIA	American Institute of Architects
ANSI	American National Standards Institute
ARI	Air Conditioning and Refrigeration Institute
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
BAS	Building Automation System
CFM	Cubic feet per minute
CFR	Code of Federal Regulations
CO	Contracting Officer
COR	Contracting Officer's Representative
DEAR	Department of Energy Acquisition Regulation
DOE	Department of Energy
ECM	Energy Conservation Measure
EMCS	Energy Monitoring/Management Control System
EOI	Expression of Interest
ESCO	Energy Services Company
ESPC	Energy Savings Performance Contract
FAR	Federal Acquisition Regulation
FEMP	Federal Energy Management Program
FOCI	Foreign Ownership, Control and Influence
FP	Final Proposal
FPP	Financing Procurement Price

HVAC	Heating, Ventilating and Air-conditioning
IDIQ	Indefinite Delivery/Indefinite Quantity
IDS	Investor Deal Summary
IESNA	Illuminating Engineering Society of North America
IGA	Investment Grade Audit
IPMVP	International Performance Measurement and Verification Protocol
M&V	Measurement and Verification
MACRS	Modified Accelerated Cost Recovery System
NEC	National Electric Code
NEMA	National Electrical Manufacturers Association
NEPA	National Environmental Policy Act
NESC	National Electrical Safety Code
NFPA	National Fire Protection Association
NOI	Notice of Intent (to award task order)
O&M	Operations and Maintenance
ORCA	Online Representations and Certifications Application
OSHA	Occupational Safety and Health Administration
PA	Preliminary Assessment
PCB	Poly-chlorinated
PE	Professional Engineer
PF	Project Facilitator
REC	Renewable Energy Credit
RFP	Request for Proposals
SBPA	Selection Based on Preliminary Assessments Method
SBQ	Selection Based on Qualifications Method

SF	Standard Form
SFO	Standard Financing Offer
SOW	Statement of Work
TC	Technology Category
TO	Task Order
TRC	Tradable Renewable Certificates
UBC	Uniform Building Code
UL	Underwriters Laboratory
UPC	Uniform Plumbing Code

ATTACHMENT J-2

DEFINITIONS OF APPLICABLE TERMS

Added Premium -The added premium is the number of basis points (basis point=1/100 of a percentage point) that, when added to the index rate for a task order project, equals the total Project Interest Rate (a fixed annual percentage). The entity providing the capital to finance a project, which may be the contractor or a third party, can recover financing expenses either in the added premium or as a separate Financing Procurement Price. In most cases, contractors use project financing capital from third party financiers, and the added premium is a pass-through expense from the third party financier. In such cases, the contractor may recover the cost of arranging third-party financing through the Financing Procurement Price in Schedule TO-3.

Adjusted Energy Baseline -An energy baseline that has been adjusted to compensate for factors that would have changed energy consumption in the absence of any energy conservation measures (i.e., factors affecting baseline energy use beyond the contractor's control). Examples of such factors include increases or decreases in conditioned or illuminated space, changes in occupancy or building use, facility renovation, or extremes in weather.

Annual Energy Audit - The term annual energy audit means a procedure including, but not limited to, verification of the achievement of guaranteed energy, water, and related cost savings and energy unit savings, resulting from implementation of energy conservation measures and a determination of whether an adjustment to the energy baseline is justified by conditions beyond the contractor's control. (Also known as Annual Measurement and Verification.)

Applicable Financial Index - The financial index upon which the index rate, the first component of the project interest rate, is based. This term, as used in the contract, applies to any financial index that is available and usable as a basis or floor. This index may be any acceptable market index in effect at the time of a task order award for which it is proposed, to include U.S. Government Treasury, Swap Rate, etc.

Energy Baseline - The amount of energy that would have been consumed annually without implementation of energy conservation measures based on historical metered data, engineering calculations, sub-metering of buildings or energy consuming systems, building load simulation models, statistical regression analysis, or some combination of these methods.

Energy Conservation Measure (ECM) -A measure applied to a Federal building or facility that improves energy efficiency, is life cycle cost effective under 10 CFR Part 436, Subpart A, and involves energy conservation, cogeneration facilities, renewable energy sources, improvements in operation and maintenance efficiencies, or retrofit activities. The term ECM includes renewable energy systems and other measures that result in energy, water, or related cost savings. For purposes of this definition, "improves energy efficiency" is not limited to a more efficient conversion of energy; rather when renewable energy is substituted for conventional energy fuels, resulting in the Government's reduced usage of conventional energy sources, such a substitution constitutes "improved energy efficiency."

Energy Cost Savings - A reduction in the cost of energy, water, and related operation and maintenance expenses from a base cost established through a methodology set forth in an energy savings performance contract (ESPC), utilized in Federal buildings or facilities as a result of: (1) installation of energy conservation measure(s); (2) the lease or purchase of operating equipment, improvements, altered operations and maintenance, or technical services; or (3) the increased efficient use of existing energy sources by cogeneration or heat recovery. Energy cost savings are generally recurring savings - savings that occur year after year; however, one-time energy cost savings may come from energy savings in excess of guaranteed savings, either during the post-acceptance performance period or during the implementation period.

Energy-Related Cost Savings -Energy-related cost savings are generally recurring reductions in expenses (other than energy costs) related to energy-consuming equipment, generally affecting operations, maintenance, renewal, or repair expenses of equipment. One-time energy-related cost savings can result from avoided expenditures of operations and maintenance, repair and replacement, or capital expenditures funds for projects (e.g., equipment replacement) that, because of the energy savings performance contract project, will not be necessary.

Estimated Energy Cost Savings -Estimated energy cost savings are the contractor-estimated energy cost savings in dollars per year for each energy conservation measure (ECM), and equal the estimated energy savings multiplied by the established energy prices in appropriate units. For ECMs with multiple energy type impacts, energy cost savings equals the sum of the products of the energy savings by energy type and established energy prices. The established energy prices are based on the energy tariffs or rate schedules in affect at the time the project is being developed. Since energy cost savings occur each year after ECMs are implemented, they are a recurring cost savings. Estimated energy cost savings by ECM are entered into Schedule TO-4, column (e).

Guaranteed Annual Cost Savings -The guaranteed annual cost savings are the levels of annual cost savings the contractor is willing to guarantee for a task order (TO) project. The proposed values for these savings appear in Schedule TO-1 (PA), column (b). After the IGA, the contractor revises the preliminary assessment and offers the final values in Schedule TO-1 (final), column (b). The guaranteed annual cost savings must exceed the annual contractor payments (Schedule TO-1 (final), column (c)) in each year of the TO post-acceptance performance period. For the first interval (generally 12 months) after Government acceptance of construction, the contractor is paid as if the savings guarantee is being met. The annual energy audit establishes actual savings. If actual savings fall short of the guarantee, the contractor will pay back the shortfall over the next interval by accepting lower payments.

Indefinite Delivery/Indefinite Quantity (IDIQ) Contract - A contract for property or services that does not procure or specify a firm quantity of property or services (other than a minimum and possibly a maximum quantity) and that provides for the issuance of task orders for the delivery of the property and services during the specified ordering period of the contract.

Investment Grade Audit (IGA) - A procedure which may include, but is not limited to, a detailed analysis of the energy cost savings and energy unit savings potential, building conditions, energy consumption, and hours of use or occupancy for a facility, for the purpose of preparing final technical and price proposals.

Post-Installation Measurement and Verification Activities - Post-installation measurement and verification is to ensure that the proper equipment/systems have been installed, are operating correctly and have the potential to generate the predicted savings. Verification methods may include surveys, inspections, and spot or short-term metering. Commissioning of installed equipment and systems is expected. Commissioning assures that the building systems perform interactively in accordance with the design documentation and intent. Commissioning is generally completed by the contractor. In some cases, however, it is contracted out by the Federal agency.

Preliminary Assessment (PA) - A procedure which may include, but is not limited to, an evaluation of energy cost savings and energy unit savings potential, building conditions, energy consuming equipment, and hours of use or occupancy, for the purpose of developing preliminary technical and price proposals prior to issuance of a notice of intent to award a task order project in accordance with the master indefinite delivery/indefinite quantity contract procedures. Although a PA may include a

technical concept and price assessment, it is not a binding offer and does not include the text of a financing agreement.

Recurring Energy-Related Cost Savings -Recurring energy-related cost savings are ongoing or annually recurring reductions in energy-related expenses that are budgeted and allocated annually, such as lowered costs for ongoing maintenance, operations and repair. These must be actual savings, i.e., there must be an associated reduction in money that the Government was currently spending or planning to spend. Operations, maintenance, and repair costs for tasks currently being performed by the Government or by a contractor hired by the Government are energy-related cost savings if the energy savings performance contract (ESPC) contractor assumes the task, reduces the task, or eliminates the task. The Government will determine whether an ESPC contractor-proposed task assumption, reduction, or elimination will be considered recurring energy-related cost savings.

Renewable Energy Credits (RECs) - also known as Tradable Renewable Certificates (TRCs) or Green Tags™ -A market mechanism that represents the environmental benefits associated with generating electricity from renewable energy sources. Rather than functioning as a tax on pollution-causing electricity generators, as traditional carbon emissions trading programs do, RECs function as a nongovernmental subsidy on pollution-free electricity generators.

Walk-Through Survey -A brief inspection of a facility to evaluate the potential for energy, water and related cost savings measures as well as gather information to determine the need for a more detailed audit. The findings of the walk-through survey are documented in the preliminary assessment.

White Tags™ – Also known as Energy Efficiency Certificates – Tradable attributes similar to Renewable Energy Credits or Green Tags™ that represent the value of energy not used (conserved) at facilities. White Tags™ represent the contractual right to claim the environmental and other attributes associated with electricity generated from a renewable energy facility. They may be traded independently of the energy.

ATTACHMENT J-6

TASK ORDER (TO) SCHEDULES

TO-1 (PA) (Preliminary Assessment (PA)) Proposed Guaranteed Cost Savings and Contractor Payments

TO-1 (final) Guaranteed Cost Savings and Contractor Payments

TO-2 Implementation Price by Energy Conservation Measure

TO-3 Post-Acceptance Performance Period Cash Flow

TO-4 Task Order Performance Period First Year Estimated Annual Cost Savings, by Energy Conservation Measure and Technology Category

TO-5 Annual Cancellation Ceiling Schedule

ATTACHMENT J-7

RESPONSIBILITY/DESCRIPTION	CONTRACTOR PROPOSED APPROACH
1. Financial	
<p>a. Interest rates: Neither the contractor nor the agency has significant control over prevailing interest rates. Higher interest rates will increase project cost, financing/project term, or both. The timing of the TO signing may impact the available interest rate and project cost.</p>	
<p>b. Construction costs: The contractor is responsible for determining construction costs and defining a budget. In a fixed-price design/build contract, the agency assumes little responsibility for cost overruns. However, if construction estimates are significantly greater than originally assumed, the contractor may find that the project or measure is no longer viable and drop it before TO award. In any design/build contract, the agency loses some design control. Clarify design standards and the design approval process (including changes) and how costs will be reviewed.</p>	
<p>c. M&V confidence: The agency assumes the responsibility to determine the confidence that it desires to have in the M&V program and energy savings determinations. The desired confidence will be reflected in the resources required for the M&V program, and the ESCO must consider the requirement prior to submittal of the final proposal. Clarify how project savings are being verified (e.g., equipment performance, operational factors, energy use) and the impact on M&V costs.</p>	
<p>d. Energy Related Cost Savings: The agency and the contractor may agree that the project will include savings from <i>recurring</i> and/or <i>one-time</i> costs. This may include one-time savings from avoided expenditures for projects that were appropriated but will no longer be necessary. Including one-time cost savings before the money has been appropriated may involve some risk to the agency. Recurring savings generally result from reduced O&M expenses or</p>	

reduced water consumption. These O&M and water savings must be based on actual spending reductions. Clarify sources of nonenergy cost savings and how they will be verified.	
e. Delays: Both the contractor and the agency can cause delays. Failure to implement a viable project in a timely manner costs the agency in the form of lost savings, and can add cost to the project (e.g., construction interest, re-mobilization). Clarify schedule and how delays will be handled.	
f. Major changes in facility: The agency (or Congress) controls major changes in facility use, including closure. Clarify responsibilities in the event of a premature facility closure, loss of funding, or other major change.	
2. Operational	
a. Operating hours: The agency generally has control over operating hours. Increases and decreases in operating hours can show up as increases or decreases in “savings” depending on the M&V method (e.g., operating hours multiplied by improved efficiency of equipment vs. wholebuilding/ utility bill analysis). Clarify whether operating hours are to be measured or stipulated and what the impact will be if they change. If the operating hours are stipulated, the baseline should be carefully documented and agreed to by both parties.	
b. Load: Equipment loads can change over time. The agency generally has control over hours of operation, conditioned floor area, intensity of use (e.g., changes in occupancy or level of automation). Changes in load can show up as increases or decreases in “savings” depending on the M&V method. Clarify whether equipment loads are to be measured or stipulated and what the impact will be if they change. If the equipment loads are stipulated, the baseline should be carefully documented and agreed to by both parties.	
c. Weather: A number of energy efficiency measures are affected by weather. Neither the contractor nor the agency has control over the weather. Should the agency agree to	

<p>accept risk for weather fluctuations, it shall be contingent upon aggregate payments not exceeding aggregate savings. Clearly specify how weather corrections will be performed.</p>	
<p>d. User participation: Many energy conservation measures require user participation to generate savings (e.g., control settings). The savings can be variable and the contractor may be unwilling to invest in these measures. Clarify what degree of user participation is needed and utilize monitoring and training to mitigate risk. If performance is stipulated, document and review assumptions carefully and consider M&V to confirm the capacity to save (e.g., confirm that the controls are functioning properly).</p>	
<p>3. Performance</p>	
<p>a. Equipment performance: The contractor has control over the selection of equipment and is responsible for its proper installation, commissioning, and performance. The contractor has responsibility to demonstrate that the new improvements meet expected performance levels including specified equipment capacity, standards of service, and efficiency. Clarify who is responsible for initial and long-term performance, how it will be verified, and what will be done if performance does not meet expectations.</p>	
<p>b. Operations: Performance of the day-to-day operations activities is negotiable and can impact performance. However, the contractor bears the ultimate risk regardless of which party performs the activity. Clarify which party will perform equipment operations, the implications of equipment control, how changes in operating procedures will be handled, and how proper operations will be assured.</p>	
<p>c. Preventive Maintenance: Performance of day-to-day maintenance activities is negotiable and can impact performance. However, the contractor bears the ultimate risk regardless of which party performs the activity. Clarify how long-term preventive maintenance will be assured, especially if the party responsible for long-term performance is not responsible for maintenance (e.g., contractor provides maintenance checklist and reporting</p>	

<p>frequency). Clarify who is responsible for performing long-term preventive maintenance to maintain operational performance throughout the contract term. Clarify what will be done if inadequate preventive maintenance impacts performance.</p>	
<p>d. Equipment Repair and Replacement: Performance of day-to-day repair and replacement of contractor-installed equipment is negotiable, however it is often tied to project performance. The contractor bears the ultimate risk regardless of which party performs the activity. Clarify who is responsible for performing replacement of failed components or equipment replacement throughout the term of the contract. Specifically address potential impacts on performance due to equipment failure. Specify expected equipment life and warranties for all installed equipment. Discuss replacement responsibility when equipment life is shorter than the term of the contract.</p>	

NOTE: The column entitled “Contractor Proposed Approach” should be negotiated between the agency and the contractor for each task order and then the word “Proposed” removed from the title.

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