

# ENERGY EFFICIENCY, PATH TO GREEN ECONOMY



# CHALLENGES IN KAZAKHSTAN

## WHY WE NEED ENERGY EFFICIENCY?

- Soviet time buildings in Kazakhstan **lose up to 30% of heat**
- These buildings **consume 200% of what** buildings consume in European countries with similar climate
- Energy grid (KEGOC) is inefficient as it is **loosing about 15% or more (!)** of energy produced
- Upgrade of old equipment and installation of new appliances required
- Perspective annual savings are estimated up to **USD10bln**
- EXPO 2017 - "FUTURE ENERGY": the crucial question: "*How do we ensure safe and sustainable access to energy for all while reducing CO<sub>2</sub> emissions?*"

N.B. [not much analytical data reported since 2017-18. Is our Government loosing interest in energy efficiency?]

### Visit below links:

<http://www.oecd.org/eurasia/countries/Eurasia-Reforming-Kazakhstan-Progress-Challenges-Opport.pdf>

<https://www.youtube.com/watch?v=ekT1h5NQ5Vc>

<https://eenergy.media/>

<https://www.aisger.kz/>

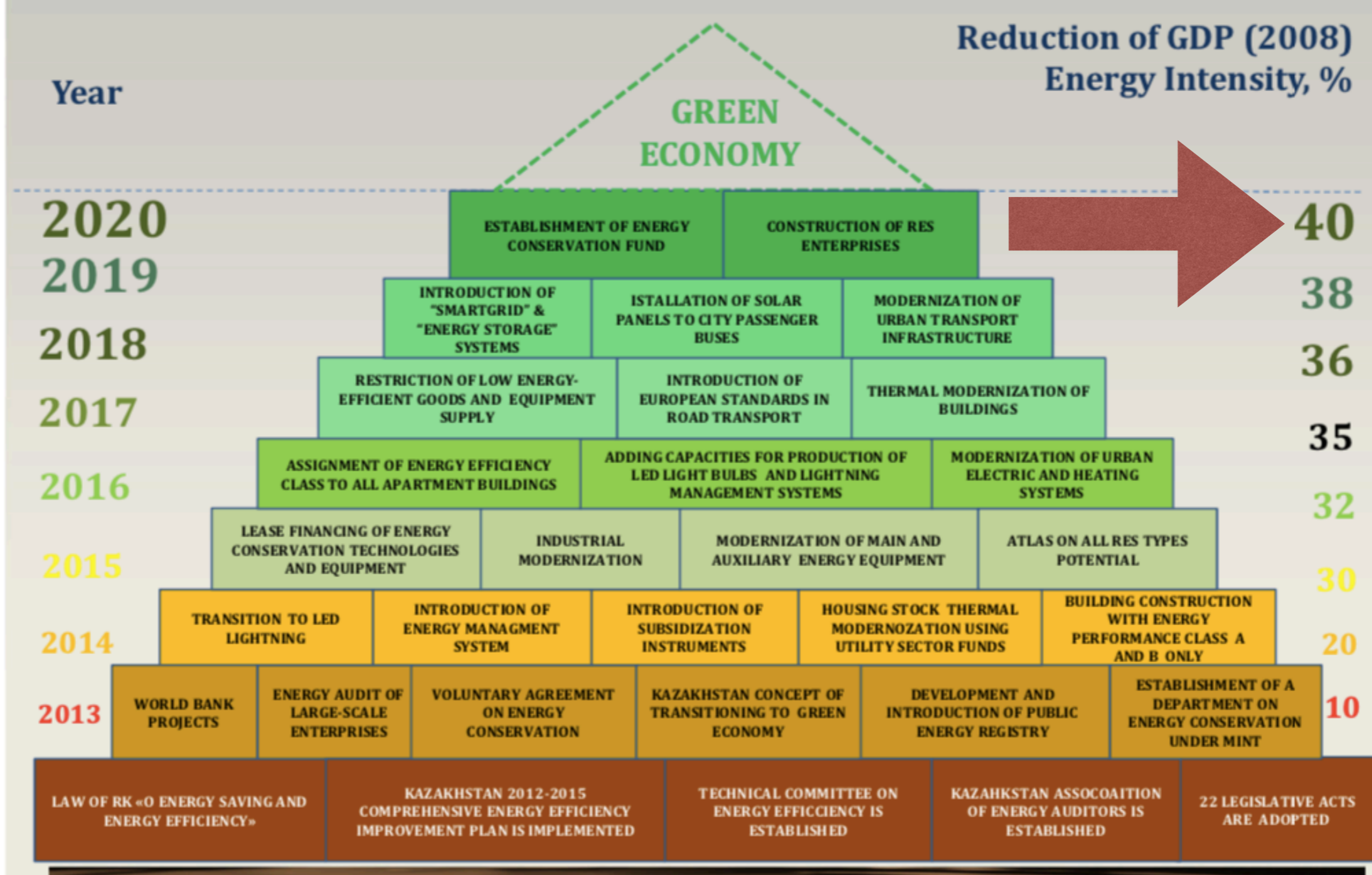
<https://openknowledge.worldbank.org/bitstream/handle/10986/28927/121463-ESM-P130013-PUBLIC-KEEPAlmatyEEPlanNovengfinal.pdf?sequence=1&isAllowed=y>

<https://greenkaz.org/>

# PROGRAMME DOCUMENTS ON ENERGY CONSERVATION AND EFFICIENCY ENHANCEMENT

- I. Law on Energy Conservation and Improvement of Energy Efficiency dated 13 January 2012
- II. Law on Amendments and Additions to Certain Legislative Acts of the Republic of Kazakhstan on Energy Conservation and Improvement of Energy Efficiency dated 13 January 2012
- III. Kazakhstan 2012-2015 Comprehensive Energy Efficiency Improvement Plan dated 29 November 2011
- IV. Energy Efficiency-2020 Program
- V. Concept for Transition to the Green Economy until 2050

# Pyramid: Activities on Energy Efficiency Enhancement and RES Development in Kazakhstan



Current status?

# TARGETS IN ENERGY SAVING

## BEGINNING IN 2010

- Message of the President of the Republic of Kazakhstan to the people of Kazakhstan on January 29, 2010 entitled "New Decade – New Economic Growth – New Opportunities of Kazakhstan"
- State Program on the Accelerated Industrial-Innovative Development of the Republic of Kazakhstan for 2010-2014

### Reduce energy intensity

- by **10%** by 2015
- by **25%** by 2020

### Achieve annual energy saving

- **2,5** % until 2020
- **3,5** % after 2020

### Annual reduction in the energy intensity of the economy

- by **10%** during 2013-2015

In 2012-2013, 22 legislative acts on energy conservation and efficiency improvement were adopted



# ENERGY CONSERVATION STEPS IMPLEMENTED KAZAKHSTAN

1. Public energy registry has been established. Its maintained by National Institute, Kazakhenergoexpertiza JSC. Registry is formed using Japan's energy experience. <https://aisger.kz/>
2. Ban has been imposed on burning of associated and natural gas.
3. International energy management standards are being introduced.
4. Differential tariff for heat consumption subject to heat meter being installed or not has been set up.
5. Ban has been imposed on supply of thermal energy and electricity, as well as gas for newly constructed facilities not equipped with heat meters.
6. Energy consumption standards for industrial enterprises have been set.
7. Phased ban placed on sales and production of incandescent electric lamp (25 Watts or more).

# ENERGY CONSERVATION STEPS IMPLEMENTED KAZAKHSTAN (CONT-D)

8. Energy efficiency requirements for buildings, works and constructions, as well as for transport and, specifically, electric motors have been set. Go TESLA!
9. National concept of transition towards a green economy has been approved.
10. Regional energy conservation plans have been adopted.
11. Energy conservation plans of NWF Samruk-Kazana, MINT, MTK, and MOG have been adopted.
12. 170 technical standards have been established.
13. 11 training centers on energy conservation have been opened, more than 1000 experts have been produced.
14. Kazakh-German Centre for Energy Efficiency has been established.
15. The project supported by World Bank's grant (\$24 bln.). See Slide 11.

## Priorities of the «Energy Efficiency-2020» Program

1	«ENERGY EFFICIENT ENTERPRISE»	<ul style="list-style-type: none"> <li>- Lease financing of energy conservation technologies and equipment</li> <li>- Subsidization of energy audit by 50 %</li> <li>- Subsidization of energy management system implementation by 50 %</li> </ul>	-Increase industrial energy efficiency by <b>30 %</b> in total
2	«ENERGY INNOVATION»	<ul style="list-style-type: none"> <li>- Energy enterprises modernization using foreign investment</li> <li>- RES enterprises construction</li> <li>- Introduction of smartgrid &amp; energy storage systems</li> </ul>	<ul style="list-style-type: none"> <li>- Reduce energy unit cost in electricity production by <b>14 %</b></li> <li>- Reduce powergrid normative losses by <b>5 %</b></li> <li>- Increase RES share in countries' total energy mix by <b>3 %</b></li> </ul>
3	«ENERGY EFFICIENT HOUSING»	<ul style="list-style-type: none"> <li>- Thermal modernization of housing stock using utility sector funds</li> <li>- Modernization of urban electric and heating systems with support of international financial institutions</li> <li>- Introduction of public incentives for energy resources conservation</li> </ul>	<ul style="list-style-type: none"> <li>- Reduce energy intensity per 1 m2 by <b>30 %</b></li> <li>- Reduce normative losses in heating by <b>3,6 %</b></li> </ul>
4	«ENERGY EFFICIENT CONSTRUCTION»	<ul style="list-style-type: none"> <li>- Development of rules, regulations and standards for energy efficient building construction</li> <li>- Construction of an energy efficient block</li> </ul>	-100 % energy-efficient construction in 2015
5	«ENERGY EFFICIENT TRANSPORT»	<ul style="list-style-type: none"> <li>- Marketing incentives for promotion of «hybrid» cars with engine volume of at least 2000 sm<sup>3</sup> by diminishing transport taxes</li> <li>- Modernization of city transport infrastructure (introduction of hybrid transport)</li> </ul>	<ul style="list-style-type: none"> <li>- Reduce fuel consumption by road, railway and air transport by <b>30 %</b></li> <li>- Vehicle fleet renovation in the Republic of Kazakhstan by <b>50 %</b></li> </ul>
6	«ENERGY EFFICIENT PUBLIC SECTOR»	<ul style="list-style-type: none"> <li>- Introduction of energy management systems to local administration of cities and regions</li> <li>- Facilitation of cities' participation in the initiative Covenant of Mayors</li> <li>- Using the subsidies of World Bank for implementation of energy efficiency projects</li> </ul>	-Reduce public sector energy consumption by <b>25 %</b>
7	«ENERGY EFFICIENT LIGHTNING»	<ul style="list-style-type: none"> <li>- Promotion of LED lamps usage</li> <li>- Reconstruction of street lighting</li> <li>- Revision of HS&amp;Rs and SanPiNs, and introduction of new technical regulations</li> </ul>	<ul style="list-style-type: none"> <li>- Cost reduction of electricity used for lightning by <b>60 %</b></li> <li>- <b>100 %</b> use of energy-saving bulbs</li> </ul>
8	«ENERGY EFFICIENT SOCIAL SECTOR»	<ul style="list-style-type: none"> <li>- Establishment of public regulatory body to monitor policy implementation on energy conservation under MINT RK</li> <li>- Organization of round table meetings, conferences and seminars</li> </ul>	<ul style="list-style-type: none"> <li>- Establish 20 training centers for professional retraining and upgrading skills of energy conservation personnel</li> <li>- Raise public awareness on the issues of energy conservation policy implementation in the Republic of Kazakhstan by <b>90 %</b></li> </ul>
9	«ECONOMICAL PAYMENT»	<ul style="list-style-type: none"> <li>- Consumers are required to install heat meters by 2015</li> <li>- Introduction of new metering system standards</li> </ul>	<ul style="list-style-type: none"> <li>- Reduce energy consumption in residential and commercial sectors by <b>20 %</b></li> <li>- <b>100 %</b> coverage of energy payment</li> </ul>

Program aimed 40% (!) energy consumption reduction in 2020 (is that the reason of its cancelling in 2016?)



# 2012-2015 COMPREHENSIVE ENERGY EFFICIENCY IMPROVEMENT PLAN

29 NOVEMBER 2011

list of strictly - defined measures to be taken in the

(a) industry

(b) electricity and heat production

(c) housing and utilities and budgetary sector

World Bank Project. See Slide 11

# 2012-2015 COMPREHENSIVE ENERGY EFFICIENCY IMPROVEMENT PLAN

29 NOVEMBER 2011

No	Direction/Area	Measures
1	Industry	<p>Making a proposal on the possibility of partial reimbursement of the costs of energy audit for the subjects of the SER</p> <p>Organization of internal technical accounting of all types of energy resources by the SER subjects</p> <p>Developing the concept of the draft Law of the Republic of Kazakhstan, providing for the introduction of a tax on electricity consumption for the subjects of SER in the industrial sector within the SER</p>
2	Electricity and heat production	<p>Considering an issue of creating an automated system for monitoring the technical condition of power equipment</p> <p>Developing the concept of the draft Law of the Republic of Kazakhstan, which imposes a ban on the separate production of heat and electricity of projected energy sources without prior assessing the applicability of cogeneration technology</p> <p>Developing the concept of the draft Law of the Republic of Kazakhstan, which imposes a ban on direct gas flaring in steam boilers of gas power plants (replacement of steam boilers with gas turbine heat recovery boilers)</p>
3	Housing and utilities and budgetary sector	<p>Considering an issue of energy audit of typical budget facilities built from 1960 to 1990</p> <p>Making a proposal for the implementation of criteria for energy efficiency and thermal modernization in the overhaul of budgetary organizations</p> <p>Making a proposal on introducing energy managers to the staffing level of regions and Astana and Almaty</p>
4	Intersectoral measures	<p>Introducing the SER</p> <p>Developing a mechanism for financing energy saving projects</p> <p>Considering an issue of subsidizing the cost of small and medium-sized enterprises to conduct energy audits</p> <p>Considering an issue of developing standard energy passports for legal entities operating in the field of industry</p> <p>Considering an issue of development and approval of a unified methodology for calculating indicators in the field of energy saving</p> <p>Considering an issue of financing research and development work in the field of energy saving</p>
5	Pilot projects	<p>Construction of energy efficiency centers</p> <p>Considering an issue of modernization of street lighting in the city of Aksu</p> <p>Considering an issue of installation of automated heat points in all schools in the city of Satpayev</p>

# PROJECT: INCREASE OF ENERGY EFFICIENCY IN KAZAKHSTAN

Stakeholders:

MINISTRY OF INDUSTRY AND INFRASTRUCTURAL DEVELOPMENT  
WORLD BANK

STAGE 1 <http://eeq.kz/comps/view/3>

STAGE 2 <http://eeq.kz/comps/view/2>



<http://eeq.kz/en>

<https://articlekz.com/article/15184>

# MATERIAL RESOURCES



RESOURCE  
EFFICIENCY  
SIMULATION

KAZAKHSTAN

MATERIAL

ENERGY

WATER

SIMULATION

## Energy

In 2015, Kazakhstan had a 21.44% lower energy intensity compared to 2000. This indicates a decrease of energy usage per unit of economic output, implying improvement of resource efficiency over this period. In 2015, Kazakhstan is less resource efficient in terms of energy usage compared to the Asia-Pacific regional average.

**189.23**

Energy Intensity of  
Kazakhstan (Kg of oil  
equivalent per 1000  
dollars GDP (2011 PPP))  
in 2015

**196.00**

Average Energy Intensity  
of North and Central  
Asia (Kg of oil equivalent  
per 1000 dollars GDP  
(2011 PPP)) in 2015

**133.63**

Average Energy Intensity  
of the Asia-Pacific  
region (Kg of oil  
equivalent per 1000  
dollars GDP (2011 PPP))  
in 2015



<https://sdghelpdesk.unescap.org/re/kazakhstan.html>

# CONCEPT FOR TRANSITION TO THE GREEN ECONOMY UNTIL 2050

## 3 MAIN STAGES



Concept is the main strategic policy document is a response to the existing environmental concerns of the country and a **pledge to the Paris Agreement** to deal with G H G emissions mitigation.

The priority of the strategy is establishing a regulatory framework for the development of renewable energy priorities and sustainable clean energy goals, as well as the targets towards energy efficiency and reduction of the energy dependency on fossil fuels.

[https://greenkaz.org/images/for\\_news/pdf/npa/koncepciya-po-perehodu.pdf](https://greenkaz.org/images/for_news/pdf/npa/koncepciya-po-perehodu.pdf)

# CONCEPT FOR TRANSITION TO THE GREEN ECONOMY UNTIL 2050 FOCUS IS DEDICATED TO 6 MAJOR SECTORS

## Kazakhstan's transition to "green economy" strategy (2013- 2050)



### **Kazakhstan's transition to the "Green Economy" in the energy sector has the following targets:**

- Reduction of CO<sub>2</sub> per capita by 25% (2030) and 40% (2050);
- Reduction of energy demand in the energy sector (heat and electricity) by 10% (2030) and 15% (2050);
- Rehabilitation of 45% to 60% of the energy facilities (including energy facilities and industry);
- Share of renewables consists of 30% of generated electricity by 2050;
- Reduction of emissions of SO<sub>2</sub>, NO<sub>x</sub> and PM.

# **LAW ON ENERGY CONSERVATION AND IMPROVEMENT OF ENERGY EFFICIENCY**

DATED 13 JANUARY 2012

## MAIN DIRECTIONS OF STATE'S REGULATION / Article 3

1. technical regulation in energy saving and increase of energy efficiency
2. balancing tariffs for production and consumption of energy
3. stimulating energy saving and increase of energy efficiency including use of equipment and materials;
4. control over efficient use of energy resources
5. propaganda of economic, ecological and social advantages of efficient use of energy resources, raising society's education and awareness
6. securing compliance with relevant legislation

# LAW ON ENERGY CONSERVATION AND IMPROVEMENT OF ENERGY EFFICIENCY

DATED 13 JANUARY 2012

COMPETENCE OF MINISTRY OF INDUSTRY AND INFRASTRUCTURAL DEVELOPMENT (WITH COMMITTEE OF INDUSTRIAL DEVELOPMENT AND INDUSTRIAL SAFETY ("Committee")) / Article 5  
<http://www.gov.kz/memleket/entities/miid/documents/1?lang=ru>

1. implements state policy in the area of energy saving and increase of energy efficiency;
2. conducts within its competence international cooperation in the area of energy saving and increase of energy efficiency;
3. intersectional coordination of state bodies' activities
4. determines process of forming and maintains the State energy register <https://www.aisger.kz/> ;  
[http://kazee.kz/userfiles/ufiles/GEER/perechen\\_subektov\\_gosudarstvennogo\\_energeticheskogo\\_reestra\\_na\\_2019g.\\_kaz.pdf](http://kazee.kz/userfiles/ufiles/GEER/perechen_subektov_gosudarstvennogo_energeticheskogo_reestra_na_2019g._kaz.pdf)
5. state control in in the area of energy saving and increase of energy efficiency;
6. drafting and approval of legal enactments in the area of energy saving and increase of energy efficiency;
7. approval of the list of data measuring systems and technical appliances necessary to conduct activities in the area of energy saving and increase of energy efficiency



# LAW ON ENERGY CONSERVATION AND IMPROVEMENT OF ENERGY EFFICIENCY

DATED 13 JANUARY 2012

COMPETENCE OF MINISTRY OF INDUSTRY AND INFRASTRUCTURAL DEVELOPMENT (WITH COMMITTEE OF INDUSTRIAL DEVELOPMENT AND INDUSTRIAL SAFETY) / Article 5 / cont-d

8. establishes national institute of development in the area of energy saving and increase of energy efficiency (Kazakhenergoexpertiza JSC);
9. sets energy efficiency requirements for buildings/erections, transportation, technological process, equipment, etc;
10. coordinates energy efficiency map
11. publishes list of entities that do not reduce energy consumption annually
12. evaluates energy auditors and maintains its register
13. establishes forms of grading/marking energy efficiency for buildings
14. approves model agreement in the area of energy efficiency
15. determines model forms of energy service agreement
16. etc...

# LAW ON ENERGY CONSERVATION AND IMPROVEMENT OF ENERGY EFFICIENCY

DATED 13 JANUARY 2012

## STATE ENERGY REGISTRY DATA / Article 9

1. Name, address and main types of activities of the entities in State Energy Registry (SER)
2. Volumes of extraction, production, consumption, transfer and losses of energy resources and water in factual and monetary expression during one calendar year;
3. Plan of measures on energy saving and increase of energy efficiency that is developed by each entity upon energy audit
4. Regular report on implementation status of such measures
5. Factual energy consumption on one production unit and (or) expenditure of energy resources for heating of one measurement unit of buildings, erections, etc.
6. Energy audit report
7. Data on presence of energy resources accounting devices

Committee uses SER data for analyses of energy intensity of GDP and efficiency of using energy resources.

# LAW ON ENERGY CONSERVATION AND IMPROVEMENT OF ENERGY EFFICIENCY

DATED 13 JANUARY 2012

## AGREEMENT IN THE AREA OF ENERGY SAVING AND ENERGY EFFICIENCY / Article 18

1. Concluded between the State and SER entity
2. State can be represented by the Committee, akimat of region/ oblast, republican significance city (find out what are these!) and the capital
3. SER Entity must conclude such agreement if its consumption exceeds 100,000 tones of energy resource per annum
4. SER Entity is obliged to reduce energy intensity by **15% in 5 years**

# LAW ON ENERGY CONSERVATION AND IMPROVEMENT OF ENERGY EFFICIENCY

DATED 13 JANUARY 2012

## ENERGY SERVICE AGREEMENT / Article 18-1

1. Between individuals/legal entities and energy service companies
2. State entities must use model energy service agreement  
[https://tengrinews.kz/zakon/pravitelstvo\\_respubliki\\_kazahstan\\_premier\\_ministr\\_rk/promyshlennost/id-V1500011663/](https://tengrinews.kz/zakon/pravitelstvo_respubliki_kazahstan_premier_ministr_rk/promyshlennost/id-V1500011663/)
3. Mandatory content:
  - (a) amount of energy to be saved by energy service company;
  - (b) time necessary to reach energy saving level
  - (c) payment should be made at the expense of monies saved as result of energy saving measures

## **LIST OF KEY LEGISLATION IN KAZAKHSTAN RELEVANT TO THE RENEWABLE HEATING MARKET**

Key legislation examples relevant to the renewable heating and district heating, in general, are listed below:

1. Decree of the President of the Republic of Kazakhstan dated January 16, 2013 No. 466 "On further improvement of the system of government of the Republic of Kazakhstan;
2. Environmental Code;
3. Ecological Code;
4. Water Code;
5. Law "On Supporting the Use of Renewable Energy Sources";
6. Law "On Housing Relations";
7. Law "On Electric Power Industry";
8. Law "On Local government and self-government";
9. Law "On Public-Private Partnership Agreements";
10. Resolution of the Government of the Republic of Kazakhstan of April 30, 2011 No. 473 "On approval of the modernization of housing and communal services by 2020";
11. Order of the Minister of Energy of the Republic of Kazakhstan dated February 20, 2015 No. 118 "On approval of the Rules for determining the tariff for supporting renewable energy sources" (as amended on September 7, 2017);
12. SP RK 4.02-107-2014 "Designing the heat supply of buildings and structures using geothermal energy" (as amended on 04/01/2019);
13. Order of the Minister of Energy of the Republic of Kazakhstan dated March 17, 2015 No. 207 "On approval of the Rules for accounting for the supply of heat energy and coolant" (as amended on 08/11/2016);
14. Resolutions of the Government of the Republic of Kazakhstan "On approval of the consideration, selection, monitoring and evaluation of budget investment projects". Both for the national and regional budgeting.