

Technical workshop: Practical aspects of sustainable energy development in Kyrgyzstan

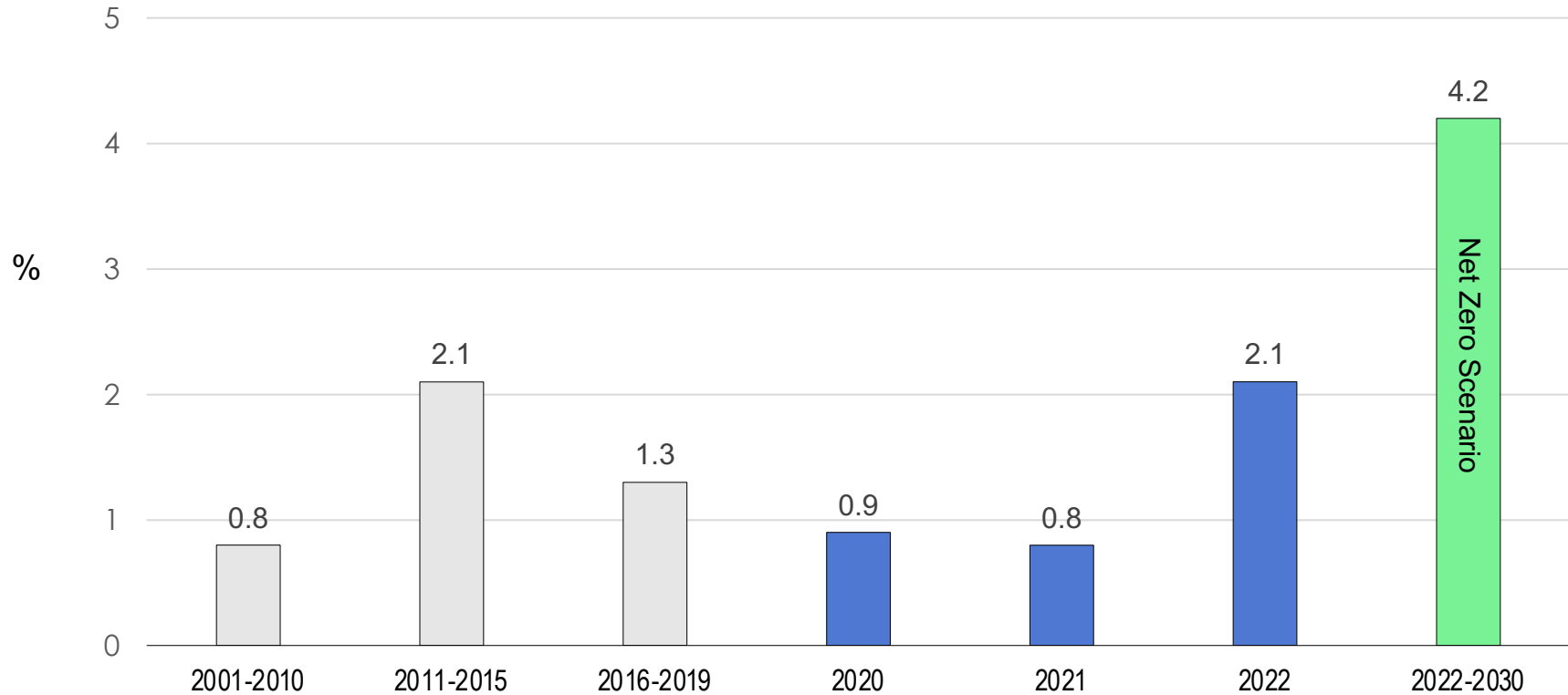
Quality control of energy performance certificates

Bishkek, October 6, 2023

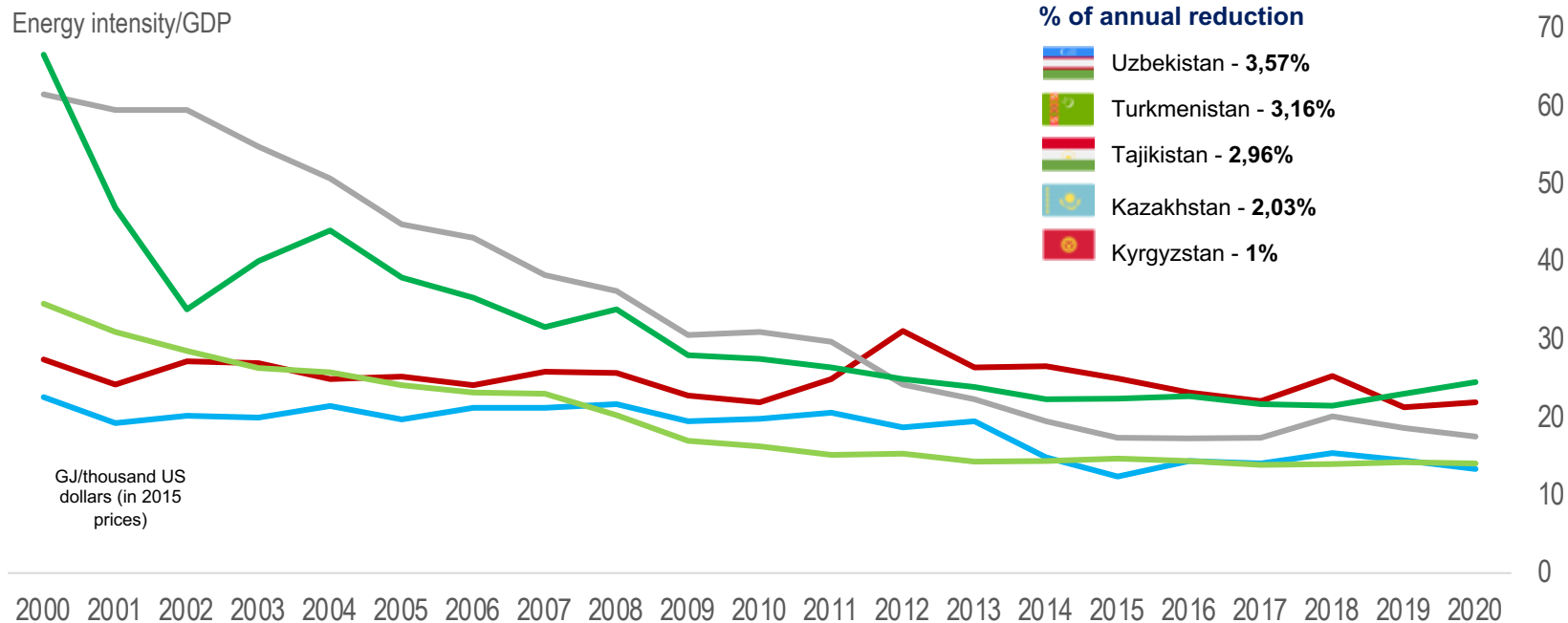
Energy performance certification of buildings in Kazakhstan – evolution and lessons learned

Zhaxylyk Tokayev, energy efficiency expert

Global increase in the level of energy intensity of primary energy, annual change in carbon neutrality scenario, 2000-2030



ENERGY INTENSITY OF GDP IN CENTRAL ASIA COUNTRIES

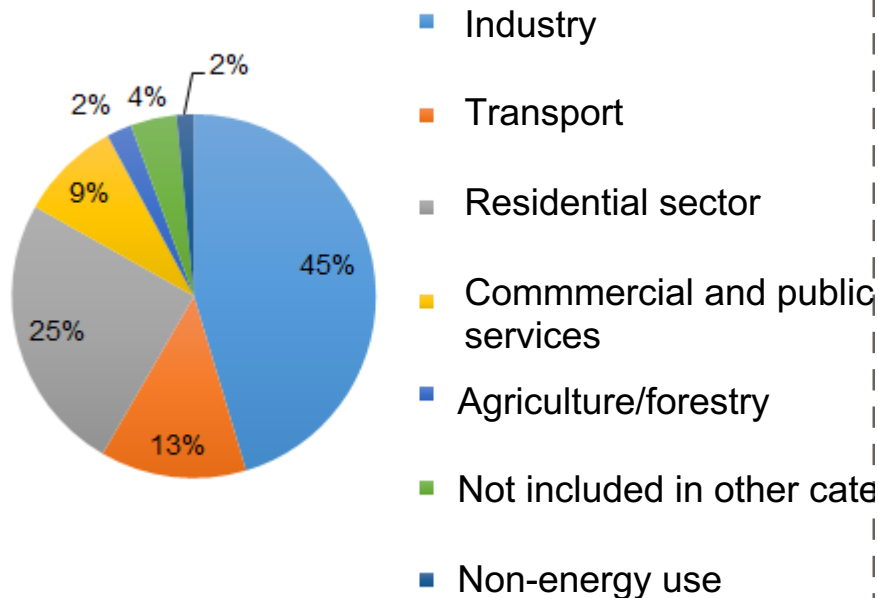


— Казахстан
 — Кыргызстан
 — Узбекистан
 — Таджикистан
 — Туркменистан

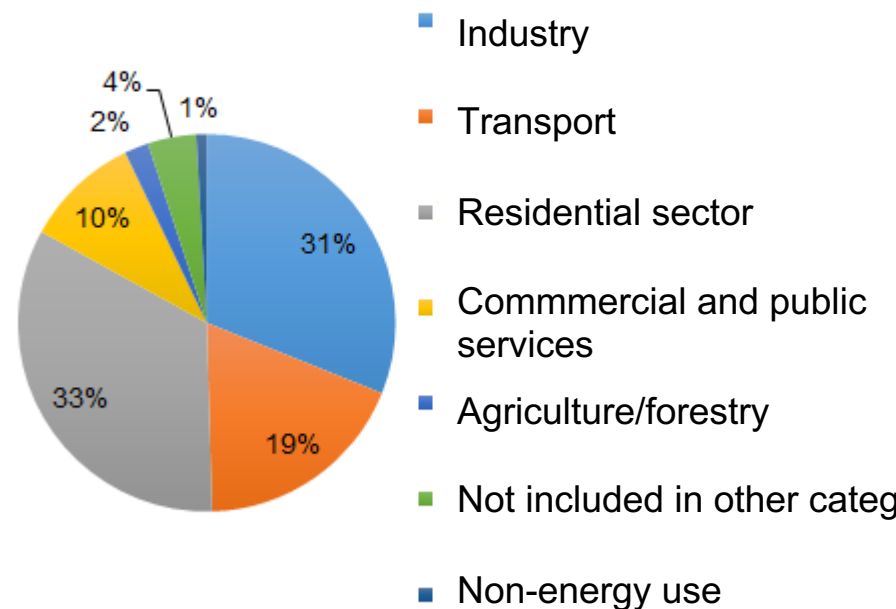
Kazakhstan Kyrgyzstan Uzbekistan Tajikistan Turkmenistan

TOTAL FINAL ENERGY CONSUMPTION IN KAZAKHSTAN

By sector in 2014



By sector in 2020



GOAL AND TASKS OF THE ENERGY SAVING CONCEPT OF KAZAKHSTAN

GOAL

ENERGY INTENSITY OF GDP TO BE REDUCED BY

15%

2021

0,35

t.o.e./thousand US dollars

2029

0,29

t.o.e./thousand US dollars

ENERGY CONSUMPTION PER FLOOR AREA TO BE REDUCED



GJ/m2

by **10%**

of the 2021 level

ENERGY CONSUMPTION PER CAPITA TO BE REDUCED BY



(GJ/m2)

by **5%**

of the 2021 level

KEY ACTIVITIES



UPDATING BUILDING REGULATIONS ON ENERGY SAVING

Commercial and residential sector



THERMAL MODERNIZATION

Residential sector



COMPLIANCE WITH ENERGY CONSUMPTION STANDARDS

Public sector



MONITORING OF PUBLIC PROCUREMENTS FOR COMPLIANCE WITH ENERGY EFFICIENCY REQUIREMENTS



COMPREHENSIVE MONITORING OF THE PUBLIC SECTOR

ENERGY CONSUMPTION STANDARDS FOR PUBLIC INSTITUTIONS

NUMBER OF PUBLIC INSTITUTIONS

11717

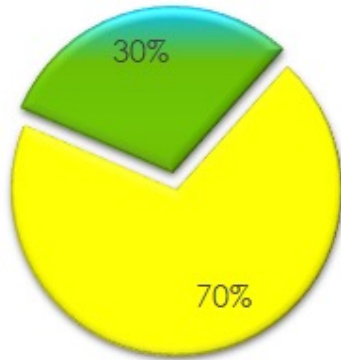


EXCEEDED ENERGY CONSUMPTION STANDARDS

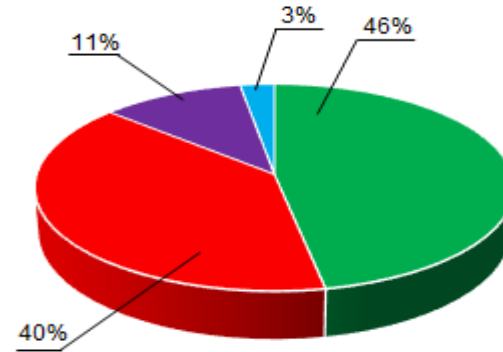
2476

! 21%

In 2022, a standard for monitoring energy consumption standards by public institutions was introduced



■ Central heating ■ Autonomous heating

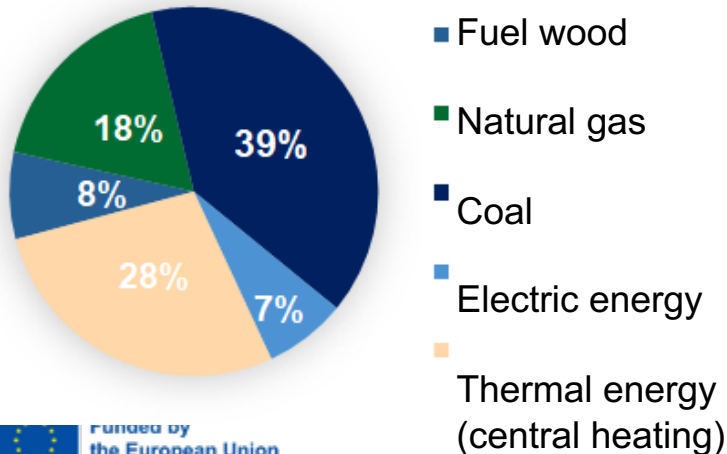


■ Natural gas ■ Coal ■ Electric energy ■ Combination

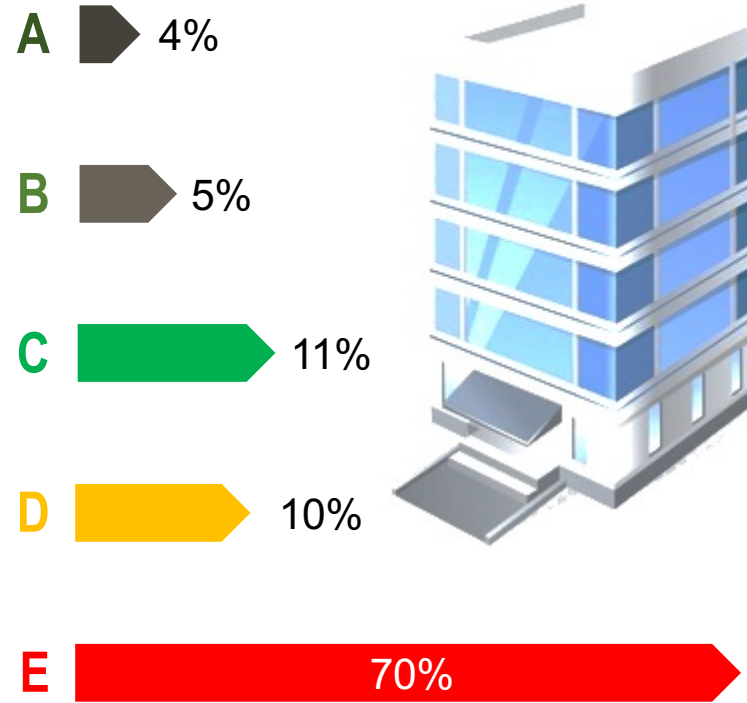
ANALYSIS OF ENERGY EFFICIENCY CLASS OF PUBLIC INSTITUTIONS

 **7 827** Public institutions
analyzed

HEATING TYPES



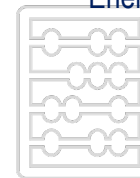
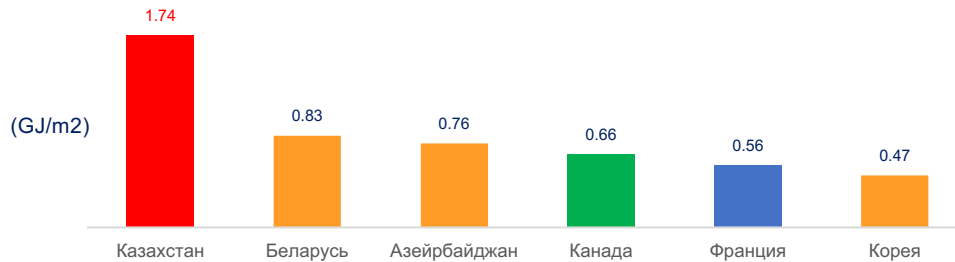
72%
autonomous
heating
systems



ENERGY EFFICIENCY INDICATORS IN HOUSING

	2014	2015	2016	2017	2018	2019	2020	Change (%)
Total energy consumption in housing, thousand toe	9900	10711	9927	10934	11277	15145	13469	36%
Energy consumption in housing, GJ	414 498 686	448 460 322	415 627 350	457 783 589	472 138 207	634 092 450	563 925 647	36%
Energy intensity per capita (GJ/person)	24	26	23	25	26	34	30	25%
Energy intensity per unit area (GJ/m ²)	1.2	1.3	1.2	1.3	1.3	1.7	1.5	23%
Energy intensity per building unit (GJ/building)	181	196	183	199	202	268	236	31%

Low energy efficiency of buildings



Energy intensity per unit area of the housing sector in Kazakhstan is

3 times higher
than the figure for Canada



ENERGY EFFICIENCY LABELING

ENERGY EFFICIENCY LABELING		
ADDRESS YEAR OF CONSTRUCTION TYPE, NUMBER OF FLOORS, HEATED AREA, m ² VOLUME, m ³		
ENERGY EFFICIENCY CLASS	Assigned energy efficiency class	
	Projected	Actual
Maximum efficiency		
Minimal efficiency		
Deviation of the actual value of the energy efficiency indicator for heating and ventilation of the building from the standard value, %		
Actual heat consumption of the facility, kWh/m ²		
Standard heat consumption of the facility, kWh/m ²		
Actual specific value of thermal energy consumption for heating and ventilation of residential and public buildings, W/(m ³ °C)		
Standardized (basic) specific value of thermal energy consumption for heating and ventilation of residential and public buildings during the heating period, according to Order of the Minister of Investment and Development of the Republic of Kazakhstan dated March 31, 2015 No. 406, W/(m ³ °C)		
Issued by		
Date of issuance		



МАРКИРОВКА ЗДАНИЯ ПО ЭНЕРГОЭФФЕКТИВНОСТИ

июнь 2022

ИНФОРМАЦИЯ ПО ЗДАНИЮ

**Нур-Султан, район Есиль,
улица Улы Дала, 16/1**

Ввод в эксплуатацию: 2012 год
Площадь: 1 000 м²

УДЕЛЬНЫЙ РАСХОД ЭНЕРГИИ

150

кВт · ч/м²

CURRENT ENERGY EFFICIENCY LABEL

ENERGY EFFICIENCY LABEL



Energy efficiency class of a building is based on the energy audit conclusion

"Arrow" icon is to be opposite the corresponding letter designation of the energy efficiency class

Month and year when the energy audit conclusion was received

Building address

Year of commissioning

Heated area of the building

B

июнь 2022

BUILDING INFORMATION
Astana, Yesil district, Uly Dala street, 16/1
Year of commissioning: 2012
Area: 1,000 m ²

SPECIFIC ENERGY CONSUMPTION
150
kW*h/m ²



Actual specific consumption of thermal energy for heating and ventilation of the building during the heating period (based on the energy audit conclusion)

ENERGY EFFICIENCY LABELING OF BUILDINGS IN OTHER COUNTRIES

Great Britain



Display Energy Certificate

How efficiently is this building being used?



A Government Dept
12th & 13th Floor
Jubilee House
High Street
Anytown
A1 2CD

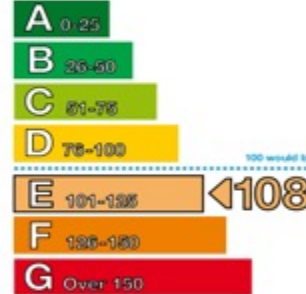
Certificate Reference Number:
1234-1234-1234-1234

This certificate indicates how much energy is being used to operate this building. The operational rating is based on meter readings of all the energy actually used in the building. It is compared to a benchmark that represents performance relative to all buildings of the type. There is more advice on how to interpret this information on the Government's website www.communities.gov.uk/led.

Energy Performance Operational Rating

This tells you how efficiently energy has been used in the building. The numbers do not represent actual units of energy consumed; they represent comparative energy efficiency. 100 would be typical for this kind of building.

More energy efficient



Less energy efficient

Technical information

This tells you technical information about how energy is used in this building. Consumption data based on actual readings.

Main heating fuel: Gas
Building Envelope: Air Conditioned
Total useful floor area (sq ft): 50
Asset Rating: 50

	Heating	Electricity
Annual Energy Use (kWh/m ² /year)	100	100
Special Energy Use (kWh/m ² /year)	100	50
Energy from renewables	0%	20%

Administrative information

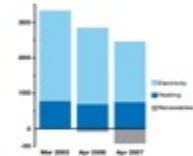
This a Display Energy Certificate as defined in BS027:001 as amended.

Assessment Software: CR1 v1
Property Reference: 9911227794102
Assessor Name: JAMES SMITH
Assessor Number: ABC12345
Accreditation Scheme: ABC Accreditation Ltd
Employer/Trading Name: EnergyMatch Ltd
Employer/Trading Address: 1234 Main St, Birmingham, B2 1AA
Issue Date: 01 Apr 2027
Valid Until: 01 Apr 2028

Related Party Disclosure: EnergyMatch are contracted as energy managers. Recommendations for improving the energy efficiency of the building are contained in Report Reference Number: 1234-1234-1234-1234

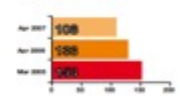
Total CO₂ Emissions

This tells you how much carbon dioxide the building emits. It shows tonnes per year of CO₂.



Previous Operational Ratings

This tells you how efficiently energy has been used in this building over the last three accounting periods.



New York, USA



Building Energy Efficiency Rating

B

75

2018 RATING
B / 75
2017 RATING
C / 64



Building Specifications

DOB Property Address

Year of Compliance: 2019
Borough, Block and Lot: 1-12345-1234
NYC Average: 50

More Information

The 1-100 ENERGY STAR® score compares this building's energy consumption to similar buildings. Buildings with a score of 75 or better are high performers and eligible for ENERGY STAR certification.

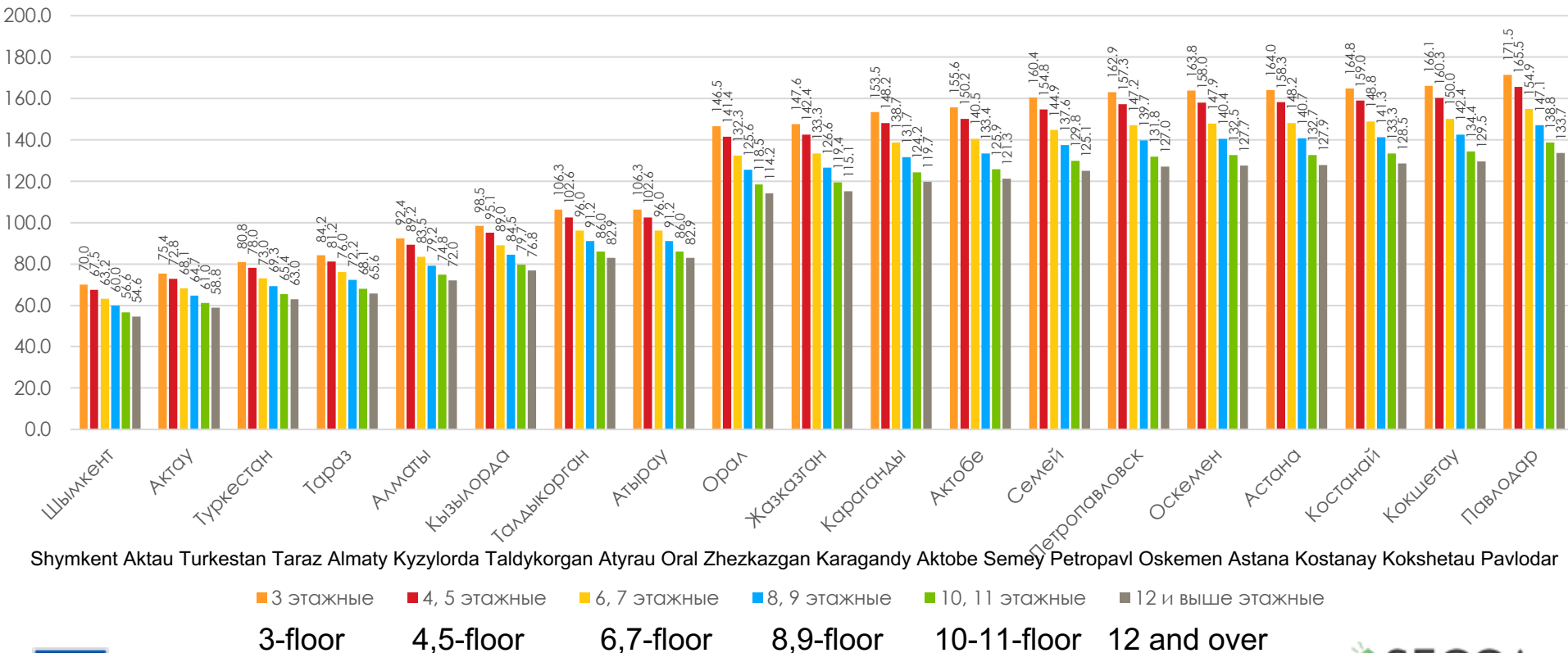
Learn more about Building Energy Ratings.
Find ways to improve. Visit nyc.gov/energyrating



Standardized (basic) specific thermal energy consumption for heating and ventilation of buildings during the heating period, q_{ottr} W/(m³·°C)

Building type	Number of floors							
	1	2	3	4, 5	6, 7	8, 9	10, 11	12 and over
1 Residential multi-apartment buildings, hotels, dormitories	0,455	0,414	0,372	0,359	0,336	0,319	0,301	0,290
2 Public buildings, except those listed in lines 3-6 of the Table	0,487	0,440	0,417	0,371	0,359	0,342	0,324	-
3 Clinics and medical institutions, boarding houses	0,394	0,382	0,371	0,359	0,348	0,336	0,324	-
4 Preschool institutions, hospices	0,521	0,521	0,521	-	-	-	-	-
5 Service buildings, facilities for cultural and leisure activities, technology parks, warehouses	0,266	0,255	0,243	0,232	0,232	-	-	-
6 Administrative buildings (offices)	0,417	0,394	0,382	0,313	0,278	0,255	0,232	0,232

Current requirements for the maximum permitted consumption of thermal energy for heating and ventilation in residential buildings of different floor numbers for different cities of Kazakhstan, kWh/sq.m



Shymkent Aktau Turkestan Taraz Almaty Kyzylorda Taldykorgan Atyrau Oral Zhezkazgan Karagandy Aktobe Semey Petropavl Oskemen Astana Kostanay Kokshetau Pavlodar

■ 3 этажные
 ■ 4, 5 этажные
 ■ 6, 7 этажные
 ■ 8, 9 этажные
 ■ 10, 11 этажные
 ■ 12 и выше этажные
 3-floor 4,5-floor 6,7-floor 8,9-floor 10-11-floor 12 and over

LEGISLATION



On Energy Saving and Energy Efficiency

Law of the Republic of Kazakhstan dated January 13, 2012 No. 541-IV.

- 7) class of energy efficiency of the building, structure, construction - the level of profitability of energy consumption of the building, structure, construction characterizing its energy efficiency at operation stage;
4. The required energy efficiency class shall be specified in the assignment for the development of the construction project (reconstruction, overhaul) and shall be indicated in the technical passport of the constructed and commissioned facility when registering rights to real estate after the completed facility (reconstruction, overhaul) shall be put into operation.
5. Class of energy efficiency of existing buildings, structures, constructions and its review shall be established in the manner determined by the authorized body, following the results of conducting energy audit and shall be stated in a technical passport of a building, structure, construction
6. Energy efficiency labeling of existing buildings, structures and constructions shall be established based on the results of the energy audit and indicated in the conclusion on energy saving and energy efficiency improvement.



On approval of form for energy efficiency labeling of buildings, structures, constructions

Order by the Acting Minister for Investment and Development of the Republic of Kazakhstan dated November 26, 2015 No. 1106.



Rules for determining and revising energy efficiency classes of buildings, structures and constructions

Order by the Minister of Investment and Development of the Republic of Kazakhstan dated March 31, 2015 No. 399.

Rules for determining and revising energy efficiency classes of buildings, structures, and constructions

Old rules

2. The energy efficiency class of a building, structure, and construction is determined:

1) when performing design (design and estimate) documentation for the construction of new or expansion (major repairs, reconstruction) of existing buildings, structures, constructions with an amount of energy resource consumption equivalent to 500 or more tons of standard fuel in one calendar year;

2) when performing design (design and estimate) documentation for the construction of new or expansion (major repairs, reconstruction) of existing buildings, structures, constructions with an amount of energy resource consumption of less than five hundred tons of standard fuel for one calendar year at the initiative of the customer of the design (design and estimate) documentation.

3. The energy efficiency class of existing buildings, structures and constructions is determined based on the results of an energy audit.

New rules

2. The energy efficiency class of a building, structure, and construction is determined:

1) when performing design (design and estimate) documentation for the construction of new or expansion (major repairs, reconstruction) of existing buildings, structures, constructions with an amount of energy resource consumption equivalent to 500 or more tons of standard fuel in one calendar year;

2) when performing design (design and estimate) documentation for the construction of new or expansion (major repairs, reconstruction) of existing buildings, structures, constructions with an amount of energy resource consumption of less than five hundred tons of standard fuel for one calendar year at the initiative of the customer of the design (design and estimate) documentation.

Information about the energy efficiency class of new buildings, structures and constructions or existing buildings, structures and constructions that have undergone expansion (reconstruction, major repairs) is accepted in accordance with the cadastral passport of the constructed and commissioned facility or the certificate of acceptance of the facility into operation and is valid for five years from the moment of their commissioning

3. The energy efficiency class of existing buildings, structures and constructions is determined based on the results of an energy audit.





If you can't measure it, you can't manage it