

*«Fallacious practice of putting
a ban on modernization mini-projects
shall be ruled out» (page 3)*

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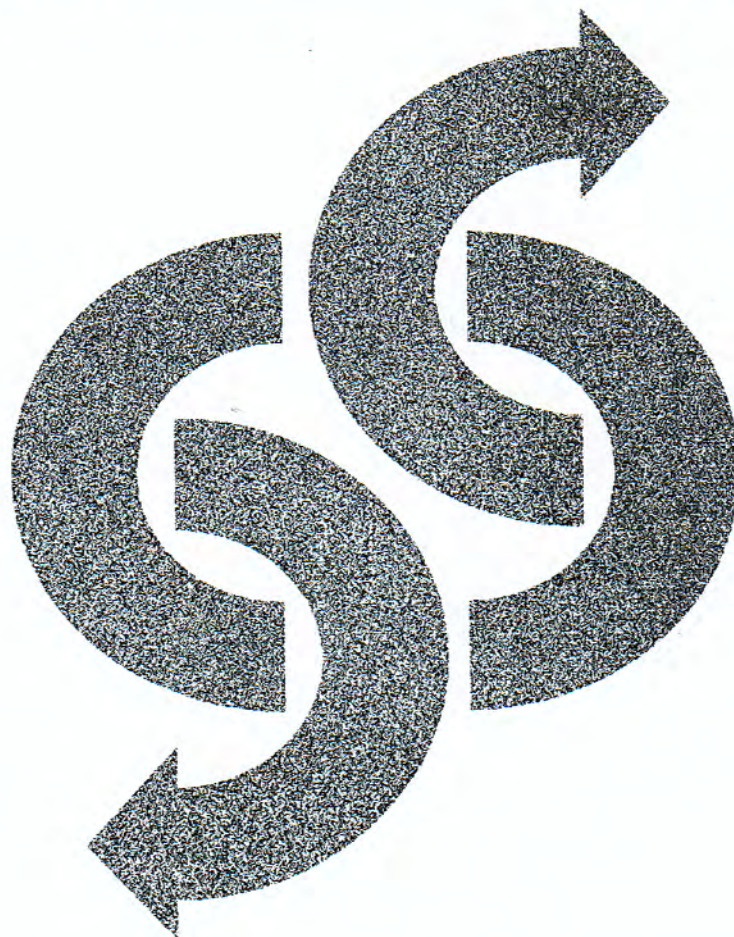
ENERGY EFFICIENCY

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Statistical Data. Reviews

CURRENT STATUS OF LEGAL BASE FOR BUILDINGS ENERGY EFFICIENCY IN RUSSIA

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1. Legal base

The law "On Energy Saving" passed by the State Duma on March 13, 1996, and approved by Council of Federations on March 20, 1996, sets up the fundamental legal base for the development of regulatory documents relating to energy efficiency of buildings.

According to clause 4 of the Law the state energy saving policy is based on the following principles:

- priority of efficient use of energy resources;
- state supervision over rational use of energy resources;
- mandatory account of produced or consumed energy resources by legal entities, as well as account of energy resources consumed by natural persons;
- inclusion of energy efficiency indices in the state standards for equipment, materials, structures, vehicles;
- certification of fuel-, energy-consuming and diagnostic equipment, materials, structures, vehicles, and energy resources;
- harmonizing the interests of consumers, suppliers and producers of energy resources;
- commitment of legal entities – producers and suppliers of energy resources – to the principles of efficient use of the energy resources.

According to clause 5 of the law "On Energy Saving" the state standards for energy-consuming products shall contain indices of their energy efficiency in the order established by the Russian Federation legislation. For mining, production, processing, transportation, storage and consumption of energy resources indices of their effective use, and indices of energy consumption for heating, ventilation, hot water supply and illumination of buildings, other indices of energy consumption by engineering processes in the order established are included in the relevant regulatory and technical documentation.

The requirements for energy consumption prescribed by state standards, technical rules and regulations are mandatory on the entire territory of the Russian Federation.

2. Town-planning regulations and rules

The requirement for town-planning regulations and rules for subjects of the Russian Federation is contained in clause 53 of the Construction Code of the Russian Federation passed by the State Duma on April 8, 1998.

Subjects of the Russian Federation are to develop town-planning regulations and rules effective in the relevant subjects (hereinafter – territorial town-planning regulations and rules) in conformity with federal town-planning regulations and rules, allowance made for natural and climatic, socio-demographic, national and other specific features of the Russian Federation subjects.

The territorial town-planning regulations and rules are to be published and approved by executive authorities of the Russian Federation subjects and are submitted for registration to the federal agency of architecture and town-planning in the order established.

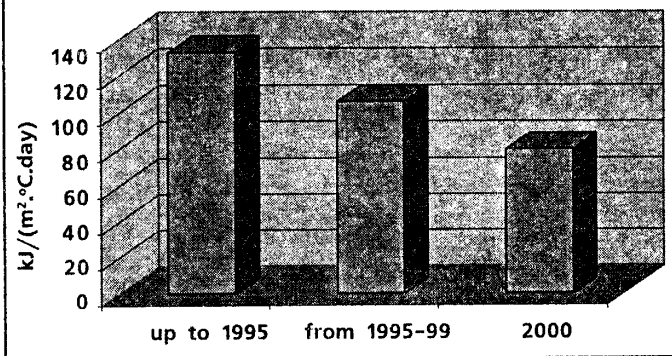
The territorial town-planning regulations and rules, approved by executive authority bodies of the Russian Federation subjects are mandatory for all those engaged in town-planning on the territories of subjects of the Russian Federation.

3. Regulatory documents in construction

Construction Norms and Specifications (SNiP 10-01) are subdivided into:

- Federal regulatory documents, including:
 - Construction Norms and Specifications of the Russian Federation – SNiP;
 - State Standards of the Russian Federation in construction – GOST R;
 - Codes of Rules for Designing and Construction – SP;
- Regulatory documents developed by subjects of the Russian Federation – Territorial Construction Norms (TCN).

Reduction of rated specific energy consumption for heating 6-9 story buildings by years



– The code of rules for designing thermal protection of buildings as a regulatory document has been developed for the first time.

The drawbacks of currently effective SNIp are as follows:

– The outdated prescriptive character of SNIp formulation; the lack of approach oriented to consumer interests;

– The lack of regulatory requirements for energy consumption.

2) Code of Rules SP 23-101 "Designing of Thermal Protection for Buildings "

SP 23-101 is a regulatory document developing and supplementing the obligatory requirements set by SNIp II-3. In the Code of Rules SP 23-101:

– Thermal and energy passport of a building, recording its quality from energy standpoint, data of examination, testing, measurement and the building estimated cost, has been introduced for the first time;

– Algorithm for calculating specific energy consumption for heating of a building has been developed;

– Rules of calculating the reduced heat transfer resistance of the outer walling, including front sides, warm attic and basement ceilings, glass loggias, were elaborated;

– Rules of energy parameters and heat protection control in buildings have been worked out;

– Classification of building materials and methods for ascertaining their design heat conductivity factors have been elaborated.

3.2. Territorial Construction Norms (TCN) for energy efficiency of buildings

By the moment the TCN were developed, approved and officially registered in the RF State Construction Committee for 13 regions of Russia, with more than 40 mln. residents (see Table 1). The TCN act within administrative boundaries of the territories (republic, territory, region, autonomous area, town).

It is advisable to trace the history of the TCN development.

1990 – Development of a draft for SNIp II-3 revising and supplementing, where a new section, "Energy Indices of Buildings" has been proposed for the first time along with the building shape compactness index. The developers are Research Institute of Construction Physics (NIISF) and Central Research Institute of Lodgings Economy and Designing (CNIIEP), etc.

1993 – Development of the first TCN for Moscow "Energy Saving in Buildings" approved by the government of Moscow in 1994. The developers – NIISF, Moscow Research Institute of Heat and Electric Processes (MNIITEP), CENEF and others.

1994 – Development of energy principles under system approach to new norms of building thermal protection and development of energy passport of a building. The developers – NIISF, CENEF in collaboration with NRDC, the USA.

1994 – The first formulation of the new energy principle in the NTO standard "Low Dwelling Houses. General Requirements for Energy Efficiency Assurance", registered by reference number STO BDP-4-94. The developers are CENEF and Standartnauchdom.

1996 – Development of model construction norms for heat shielding of building in the RF regions "Energy Efficiency of Buildings". The developers – CENEF, NIISF in collaboration with NRDC.

1998 – Development of a revised TCN for Moscow "Energy Saving in Buildings", approved by the government of Moscow, for the first time formulating the principle of energy rating and presenting an energy passport of a building. The developers – NIISF, MNIITEP, Energy Saving Agency and others.

2000-2001 – Development and introduction of TCN "Energy Efficiency of Buildings. Energy Consumption and Thermal Protection Standards", approved in 13 regions of the RF and officially registered by the RF State Construction Committee. The developers – NIISF, CENEF with participation of regional specialists.

In the new TCN the aspects important from the standpoint of buildings energy efficiency were reflected:

3.1. Federal regulatory documents

1) SNIp "Construction Heating Engineering"

Main features of SNIp relating to energy efficiency regulation for buildings and structures are as follows:

– Prescriptive character of buildings and structures heat shielding;

– Dependence of the required heat transfer resistance on degree-days for external walling, which has been prescribed for the first time;

– Requirement to reduce specific energy consumption for heating buildings compared with 1995: by 20% in the period up to 1999, by 40% from 2000 (refer to the diagram);

Table 1. TCN introduced

No.	Name of TCN, region	Area of the territory, thou sq. meters	Population, thou persons
1	TCN 23-304-99, Moscow		8625
2	TCN 23-305-99, Saratov region	100	2737
3	TCN 23-306-99, Sakhalin region	87	674
4	TCN 23-307-2000, Ivanovo region	24	1271
5	TCN 23-308-2000, Moscow region	47	6579
6	TCN 23-313-2000, Tyumen region	1435	3174
7	TCN 23-314-2000, Kaliningrad region	15	926
8	TCN 23-316-2000, Tomsk region	317	1080
9	TCN 23-317-2000, Novosibirsk region	178	2745
10	TCN 23-318-2000, Republic of Bashkortostan	144	4073
11	TCN 23-320-2000, Chelyabinsk region	88	3694
12	TCN 23-322-2001, Kostroma region	60	803
13	TCN 23-3XX-2001, Samara region	54	3302

- A new approach to TCN structure according to consumer principle was employed;

- Transfer to the second stage of federal SNiP II-3 was facilitated due to energy consumption rating;

- Standards were set in reference to specific energy consumption for heating the buildings in the heating season, corresponding to the second stage of federal SNiP II-3 and making allowance for energy efficiency of the heat supply system connected to the building;

- Preference was given to buildings connection to decentralized heat supply system;

- New factors, which have not been

previously considered in SNiP II-3, were enabled - influence of architectural, structural and spatial approaches, inside heat release, solar radiation, heating and heat supply systems efficiency;

- Climatic zoning of territories was introduced;

- Energy passports of buildings along with their computer versions were introduced for energy parameters control;

- "Energy Efficiency" section was introduced.

3.3. TCN of Moscow

Let us consider the history and main features of Moscow TCN- TCN 23-304-99 (MGSN 2.01-99) "Energy Saving in Buildings" by way of example (Covers of two publications: standards and a guide to standards, are reproduced below).

1) History of the development

1994 - After introduction of a new type of regulatory document - territorial construction norms - the norms MGSN 2.01-94 "Energy Saving in Buildings" for Moscow were the first to be developed. They envisaged the following norms:

- prescriptive principle of rating;

- requirements for thermal protection of outside walling were increased twofold compared with federal SNiP effective at that time;

- requirements for energy parameters and energy passport of a building were formulated;

- requirements for heat-, water- and electric power supply systems were formulated.

1997 - Energy passport of a building was developed and approved;

1999 - A new revision of TCN for Moscow, MGSN 2.01-99 "Energy Saving in Buildings" was developed and approved. The following aspects have been brought up for the first time:

- consumer principle of TCN structure was realized in line with SNiP 10-014;

- standards of specific energy consumption for heating of buildings were introduced;

- rules of ascertaining thermal protection level by the value of specific energy consumption and rules for calculating energy costs for hot water supply system were elaborated;

- a detailed algorithm of calculating specific energy consumption and its computer version were developed.

2000 - A guide to the MGSN 2.01-99 in reference to building thermal protection designing was elaborated.

2) Main features of the MGSN

When developing the MGSN 2.01-99 some new approaches were employed for the first time:

- A complex index of total specific energy consumption of a building during a heating season, the heating, hot water supply and electric energy costs inclusively, was introduced;

- An algorithm of ascertaining the level of thermal protection relying on specific energy consumption for heating a building was developed;

- Rules of calculating thermal energy for heating during the heating season and loads on the heating and hot water supply systems were elaborated;

- A computer version of energy passport was developed to comply with requirements for energy and heat engineering characteristics and their control in the course of designing.

Table 2 provides the values of required thermal energy specific consumption in heating systems of buildings during a heating season by way of comparison with the level of regulatory requirements in conformity with MGSN of 1994 and 1999.

Table 2. Norms of thermal energy consumption in heating systems, kWh/m²

Types of buildings	Number of stories:							
	1-3		4-5		6-9		10 and more	
	MGSN 2.01-94	MGSN 2.01-99	MGSN 2.01-94	MGSN 2.01-99	MGSN 2.01-94	MGSN 2.01-99	MGSN 2.01-94	MGSN 2.01-99
Dwelling houses	200	160	160	130	140	110	115	95
Educational or medical institutions	205	175	195	165	185	155	-	-
Pre-school institutions	280	245	-	-	-	-	-	-

3) Results of the TCN (MGSN 2.01) introduction in Moscow

The norms set by the MGSN 2.01-99 are observed during construction of all new buildings and dwelling houses under modernization, the construction scope amounting to 3.2 mln. m² annually. Their introduction permitted:

- Improving the level of thermal acceptability in dwelling houses, children's and medical institutions;
- Saving heat in the amount above 1 TWh, or 4% of total heat consumption in the city, in the period of 1996-2000;
- Reducing carbon dioxide emissions to the atmosphere by 120 thousand tons annually in the same period.

3.4. TCN of Sakhalin region

Let us consider another example of the territorial construction norms development and provide characteristic features and result of introduction of the TCN-23-306-99 "Thermal Protection and Energy Consumption in Dwelling and Public Buildings" of Sakhalin region. The TCN major developers are: CENEF, NIISF, Moscow, Institute "Sakhalingrazhdanproekt".

Main features of the Sakhalin TCN are:

- Norms of specific energy consumption were set for a heat source (heat and electric energy generating plant (HEGP), boiler house, individual boiler, etc.;
- Influence of heat supply systems on buildings thermal protection was taken into account;
- A method of mutual settlements of energy supplying companies and heat consumers in the absence of meters was elaborated;
- Requirements were defined for assurance of efficient use of energy in the following systems:
 - a) heat supply to residential microdistricts and buildings,
 - b) cold and hot water supply to buildings,
 - c) electric power supply and electric equipment in buildings.

The fixed norms of specific energy consumption are presented in Table 3.

Table 3. Required specific consumption of thermal energy in heat supply systems (in the source) for heating buildings, kJ/(m²·°C·day) [kJ/(m³·°C·day)]

Types of buildings	Number of stories:			
	1-3	4-5	6-9	10 and more
Dwelling houses	230	190	160	140
Educational and other public houses	[82]	[68]	[57]	-
Polyclinics and other medical institutions, boarding schools	[68]	[63]	[60]	-
Children's pre-school institutions	[75]	-	-	-

Materials of this review can be found in full on CENEF site in Internet at: www.cenef.ru.