USE OF ALTERNATIVE ENERGY SOURCES IN ENGINEERING NETWORKS AND SYSTEMS (in the heating system)

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Abstract: This article focuses on serious problems that have been accumulating over the years, the need to drastically change heat supply systems, the use of alternative fuel and energy sources, in particular solar energy, the gradual transition to local heat and hot water supply systems, and increasing energy efficiency.

Key words: energy, heating, corrosion, local, thermostat, alternative.

Аннотация: В данной статье рассматриваются серьезные проблемы, накапливавшиеся на протяжении многих лет, необходимость кардинального изменения систем теплоснабжения, использование альтернативных источников топлива и энергии, в частности солнечной энергии, постепенный переход на локальные системы теплоснабжения и горячего водоснабжения, повышение энергоэффективности.

Ключевое слова: энергия, отопления, коррозия, локал, термостатик, алтернатив.

Аннотация: Ushbu maqola yillar davomida to'planib kelayotgan jiddiy muammolarga, issiqlik ta'minoti tizimlarini tubdan o'zgartirish zaruratiga, muqobil yoqilg'i va energiya manbalaridan, xususan, quyosh energiyasidan foydalanishga, mahalliy issiqlik va issiq suv ta'minoti tizimlariga bosqichma-bosqich o'tishga va energiya samaradorligini oshirishga bag'ishlangan.

Kalit so'zlar: energiya, isitish, korroziya, mahalliy, termostat, alternativa.

Introduction

Serious problems have accumulated in this area over the years and are currently awaiting their solution. Among them, the most important are the sharp changes in heat supply, the use of alternative fuels and energy sources, in particular solar energy, the gradual transition to local heating and hot water supply systems, the replacement of outdated, fuel-intensive boiler houses with natural gas-saving equipment, the transition to modern energy-efficient equipment, adjustment devices and new technologies in heating, ventilation and air conditioning systems of buildings and structures. 25-30% of the fuel produced in the Republic is consumed in heating and hot water supply systems of buildings.

The main problems of heat supply:

•Large heat losses in heating networks. The reason is poor insulation quality, insulation wetting, rapid failure, etc.;

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• Consumers waste a large amount of heat unnecessarily by pouring cooled water from hot water and heating systems into the sewer;

•Rapid internal and external corrosion of heating networks;

•Moral obsolescence of the nodes connecting heating networks to buildings and poor functioning of the heating system;

•Low level of thermal protection of buildings (in most cases, level 1, i.e., meeting only sanitary and hygienic requirements);

•Inefficient use of local boiler rooms and condensing gas boilers installed in local households;

•Incorrect use of thermostatic control valves when using modern heating devices;

•Low level of use of solar energy;

•Use of old technologies in the construction of heating networks.

Currently, an open heat supply system is used in Uzbekistan, which is the main source of heating and hot water supply for public buildings and multi-apartment housing in large and medium-sized settlements of the country. The advantages of this system are the relative ease and low cost of adjusting heat consumption according to the temperature graph at the heat source.

Disadvantages:

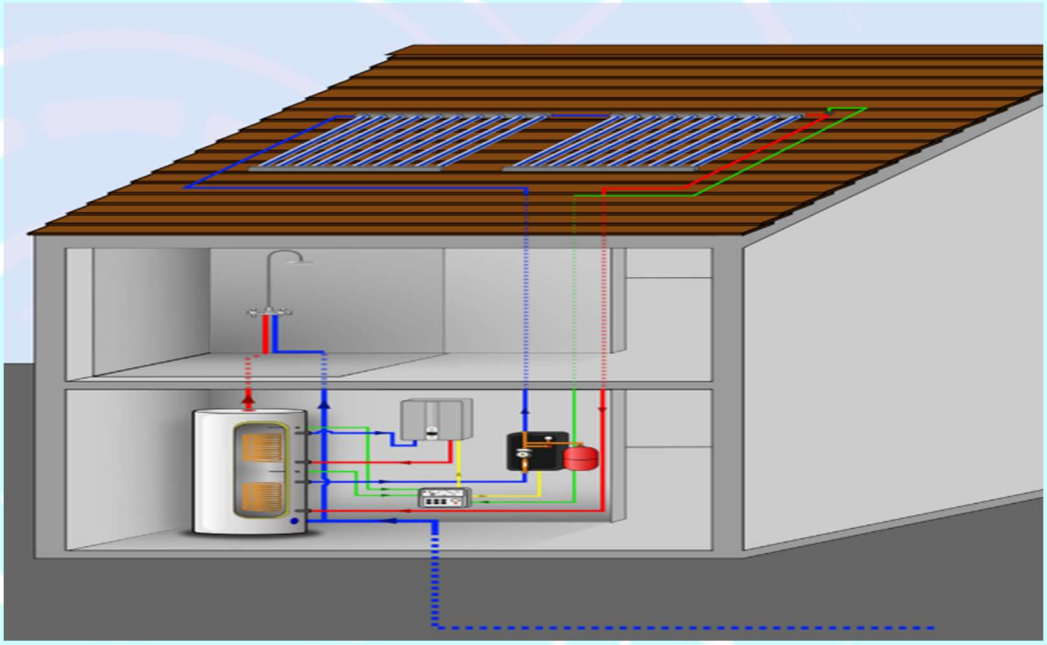
High consumption of supply water due to the withdrawal of water from the network at the heat source for the needs of hot water supply. As a result: it leads to rapid failure of the heat network pipes due to high corrosion.

– the inability to centrally monitor the state of the heat network. Emergency situations are determined by external signs of the route (emergence of the heat carrier to the surface, flooding of wells, etc.), that is, in the event of a large loss of network water.

– the inability to lower the temperature of the heat carrier below 60-65 ° C due to the need to ensure hot water supply needs in the transition period. As a result, “overheating” of buildings occurs during the transition period of the year.

In addition, elevator input nodes are used in the system. These nodes do not allow for prompt adjustment of heat consumption. With an insufficient difference in pressure in the supply and return heat networks, the correct operation of the heating system is not ensured. Typically, this leads to unauthorized intervention by consumers in the input nodes - changing the settings, draining the coolant, etc., which leads to significant losses of the coolant.

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Ways to save heat energy;

- Increasing the level of thermal insulation of buildings;
- Reducing heat loss in heating networks;
- Improving the scheme of connecting buildings to heating networks;
- Efficient use of local boiler rooms;
- Using new heating devices;
- Using thermostatic control valves;
- Using solar energy.

Ways to reduce heat loss in heating networks:

- Transition from open to closed heating networks;
- Use of modern thermal coatings for pipes;
- Reduce unnecessary losses of heat carrier;
- Use of plate heat exchangers instead of the elevator heating scheme.



A closed heat supply system is recommended.

Advantages:

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– increased service life of equipment at the heat supply sources;
– increased service life and reliability of heat pipelines;
– availability of operational control of emergency situations;
– possibility of reducing energy consumption due to automation of consumer input nodes.

Advantages:

– increased service life of equipment at the sources of heat supply;
– increased service life and reliability of heat pipelines;
– availability of operational control of emergency situations;
– possibility of reducing energy consumption due to automation of consumer input nodes.

Disadvantages:

– high cost of heat exchangers for heating and hot water supply at each consumer, the need for simultaneous modernization of equipment of all consumers connected to a single heat source, and the need to ensure qualified service of consumer equipment.

Prospects for the use of renewable energy sources.

№ п/п	Наименование показателей	Генерирующая мощность в 2016 г. (факт)	Прогноз ввода генерирующих мощностей						Доля в структуре генерирующих мощностей, %		Темп роста в 2025 г. к 2016 г. (к году ввода), %*
			2017 г.	2018 г.	2019 г.	2020 г.	2021 г.	2025 г.	2016 г.	2025 г. *	
	Всего	**14 164,0**	**415,0**	**587,7**	**1 159,7**	**2 991,5**	**5 222,5**	**7 401,9**	**100,0**	**100,0**	**135,5**
	в том числе:										
1.	традиционная энергетика	12 370,0	370,0	427,0	802,0	2 409,0	4 218,6	5 406,0	87,3	80,3	124,6

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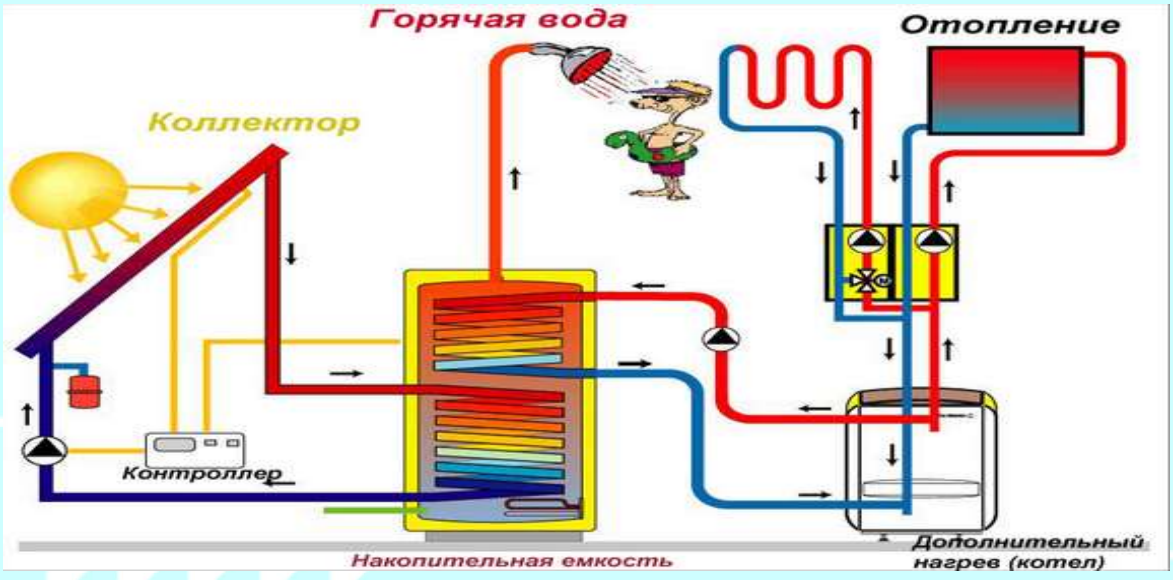
2.	возобновляемые источники энергии	1 794,0	45,0	160,7	357,7	582,5	1 003,9	1 995,9	12,7	19,7	211,3
	их них:										
2.1.	гидроэнергетика	1 793,9	45,0	60,7	157,7	382,5	601,9	1 243,9	12,7	15,8	169,3
2.2.	солнечная энергетика	0,13		100,0	200,0	200,0	300,0	450,0	0,001	2,3	3 462,5 р.
2.3.	ветровая энергетика						102,0	302,0		1,6	3,0р.

The potential of renewablePotensial energy sources:

Types of renewable energy.	**Potential mln t.u.t./yil**		
	In Uzbekiston		In the World
	common	technical	common
Solar energy	76459,5	265,1	$131x10^6$
Wind energy	3,33	0,64	$2x10^6$
Hydro energy	3,43	0,39	$7x10^6$
Biomass energy	13,8	2,92	$0,1x10^6$
Total	76480,0	269,05	$1401x10^6$

A solar power plant installed in the Vodnik district of Tashkent, the capital of Uzbekistan, will save 30% of the natural gas used for water heating each year.

Heat balance of solar collectors for hot water and heating systems.



Geothermal energy in Uzbekistan

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Currently, geothermal energy is developing rapidly in Uzbekistan. Geothermal resources in Uzbekistan are located at depths of 5-6 km, which is 4-6 times more than traditional resources. In the near future, the main consumers of geothermal resources in Uzbekistan will be heat supply and, to a lesser extent, electricity generation. The highest energy potential in Uzbekistan is the heat of dry rocks and large pools of hydrothermal water.

Advantages of geothermal energy:

- Renewable and inexhaustible;
- Does not depend on weather and season;
- Universal (possibility of obtaining heat and electricity);
- Geothermal sources do not pollute the environment, the amount of SO2 released per 1 kW of electricity is 380 g. (for coal, this figure is 1042 g per 1 kWh.)
- Does not create a greenhouse effect;
- GeoES do not take up much space and do not spoil the landscape.

Petrothermal resources, that is, the "dry" heat of rocks, are found in the zones of the Amu Darya, the South Aral Sea, the Kyzylkum deserts, and the Chust-

	Swimming pool	Area, thousand km2	Water temperature in the well, 0C
1	Tashkent	20,0	35-70
2	Fargana	12,0	30-70
3	Qyzylkum	50,0	35-45
4	Zerafshan	8,0-10,0	25-55
5	Kashkadarya	35,0	25-90
6	Dekhnabad	6,0-8,0	30-50
7	Surkhndarya	8,0-10,0	27-70
8	Ustyurt	30,0	27-75

Adrasmon in the Fergana Valley.petrothermal fields include large massifs of granite located at a depth of 4-6 km and heated from 70 to 3000C.

- The total potential of petrothermal resources is 6700,000 million t.e.
- There are several large artesian basins with hydrothermal water in Uzbekistan. The potential of the studied hydrothermal waters is estimated at 170.8 thousand t.e. per year. The greatest potential is in the Bukhara (56.8 thousand t.e.) and Namangan (29.8 thousand t.e.) regions.

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