



Introduction of energy efficient and energy saving technologies into design and construction of buildings

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“Promoting Energy Efficiency in Public Buildings in Uzbekistan” project***

Brief information about project achievements for 2009 - 2014



- **10** key building codes, **5** Guidance Manuals, **3** levels of thermal protection
- Standard methodology on energy inspections and audits of buildings
- Energy Passport of a building
- **3** systems on energy management
- **3** new State Education Standards, **11** educational programs, **8** trainings and modules on energy efficiency in buildings, new specialization “Energy Efficiency”
- **8** pilot buildings, reduction of energy consumption for **38 - 66%**

КУРИЛИШ МЕЪЁРАРИ ВА ҚОНДАЛАРИ

ИСИТИШ
ВЕНТИЛЯЦИЯ
ВА КОНДИЦИЯЛАШ

ҚЎМҚ 2.04.05-97

ОТОПЛЕНИЕ, ВЕНТИЛЯЦИЯ
И КОНДИЦИОНИРОВАНИЕ

РАСМИЙ НАШР
(ЎЗБЕКЧА - РУСЧА)

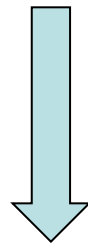
ЎЗБЕКИСТОН РЕСПУБЛИКАСИ ДАВЛАТ
АРХИТЕКТУРА ВА КУРИЛИШ ҚЎМИТАСИ
ТОШКЕНТ 1997



Brief information about project achievements for 2009 - 2014



- **Integrated Building Design Concept (IBD)**
- **Revised designs of 3,4 and 5-rooms rural family houses**
- **Construction of a pilot rural family house**
- **More than 700 specialists trained**
- **National experts and population raised awareness on energy efficiency and its benefits and advantages.**



Concept of the National Energy Efficiency Program drafted based upon project results



Concept of the National Energy Efficiency Program



Duration: 5 years (2015 -2020)

Coordination Agency:

State Committee for Architecture and Construction of the Republic of Uzbekistan

Target areas:

- Public buildings (health and education facilities)
- Residential sector (rural family houses)

Program Goals

Innovative development of construction industry

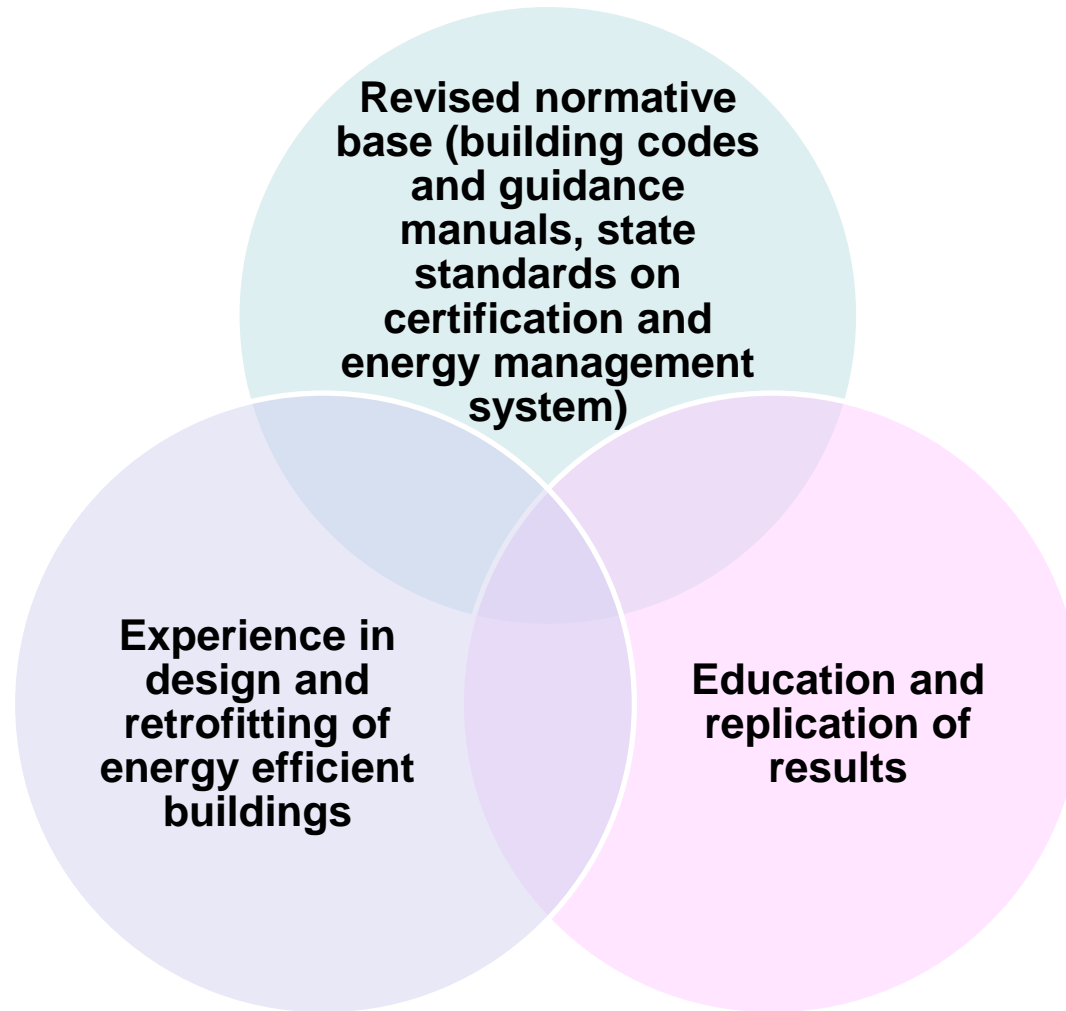
Reduce negative impact of energy complex to environment

Reduce state budget costs and population bills for energy resources

Provide conditions for development of entrepreneurship through using of saved energy

Attract investments to energy efficiency of construction buildings

Baseline



Energy efficiency challenges



Program Goals



- Regulatory
- Institutional
- Training and personnel
- Technological
- Economic
- Social
- Environmental

Baseline - PUBLIC BUILDINGS SECTOR



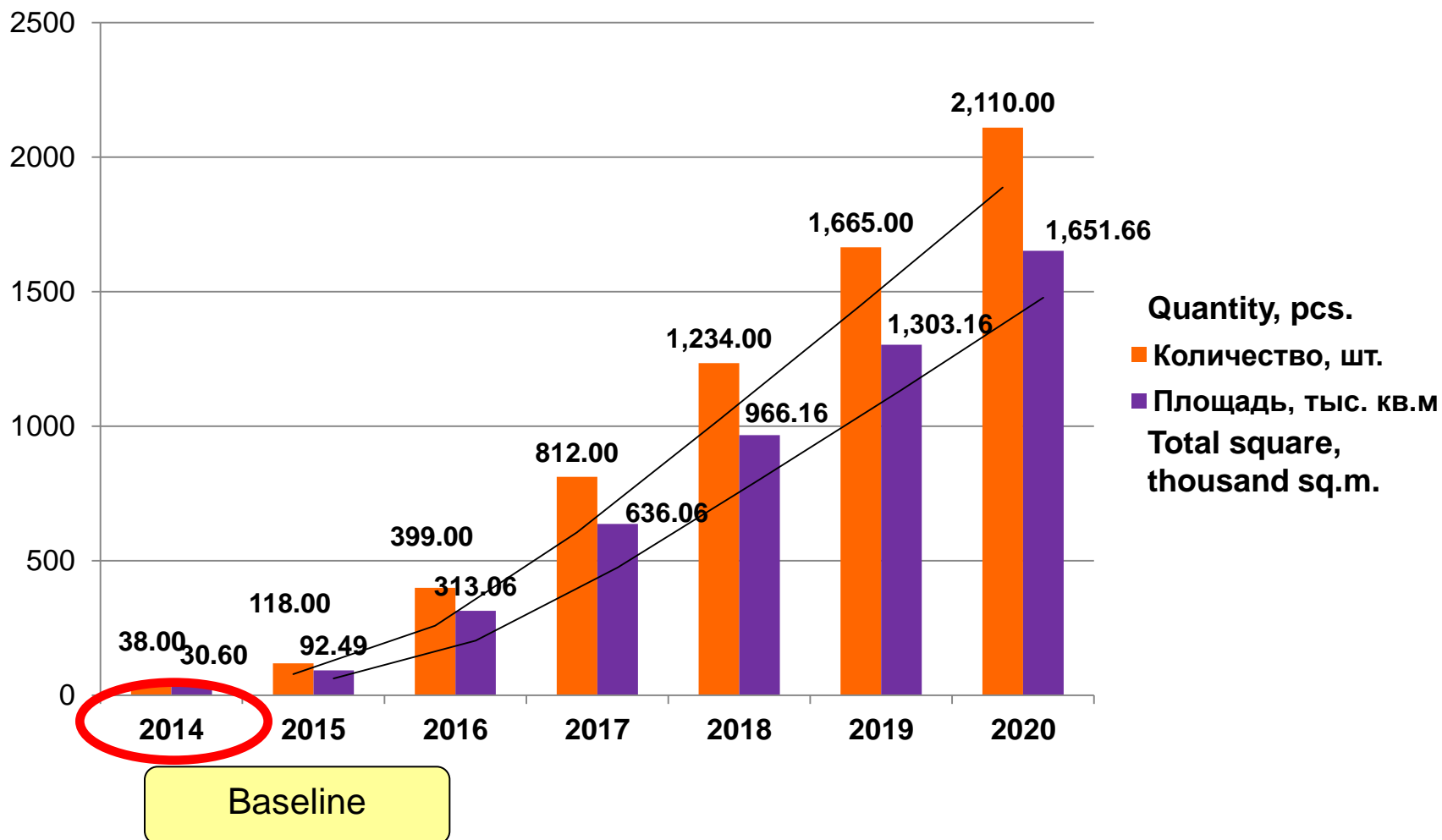
- Resolution of the President of R Uz № ПП-2069 dated 18 November 2013 “On Investment Program of R Uz for 2014”
- Government allocated capital investments of more than **33 trillion soums**, including for construction, retrofitting and capital repair of health and education facilities - more than **949 billion soums (678 buildings)** in 2014



Anticipated commissioning of energy efficient public buildings in 2015 - 2020 (in line with investment programs)

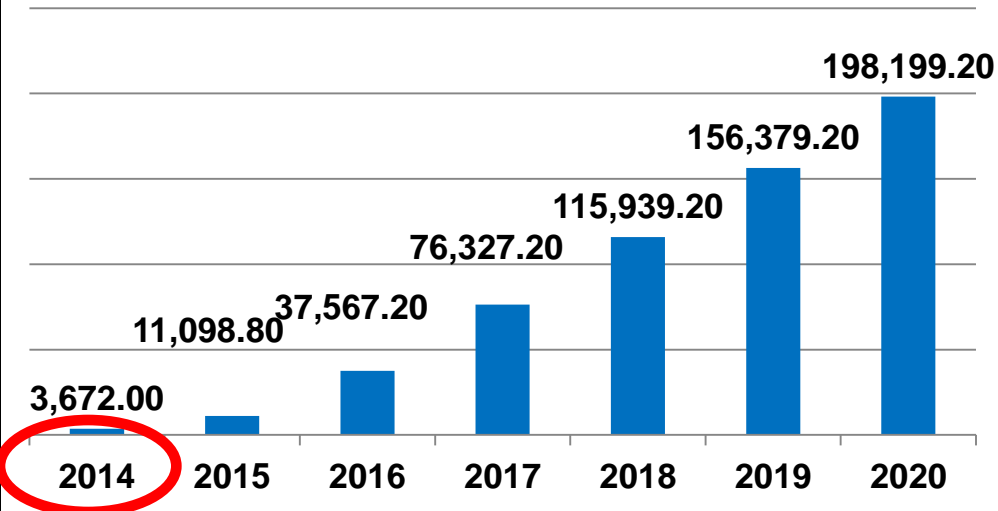


Health and education facilities

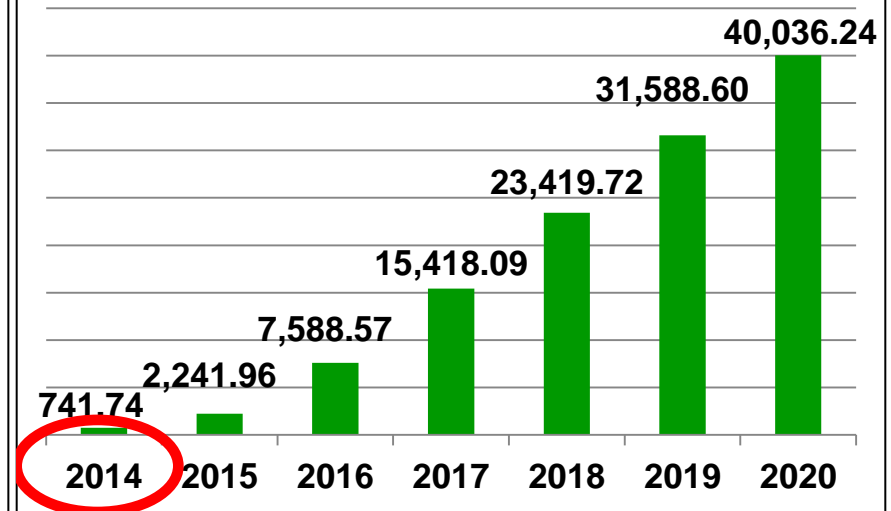


Energy savings and reduction of CO2 emissions in energy efficient health and education facilities in 2015 - 2020

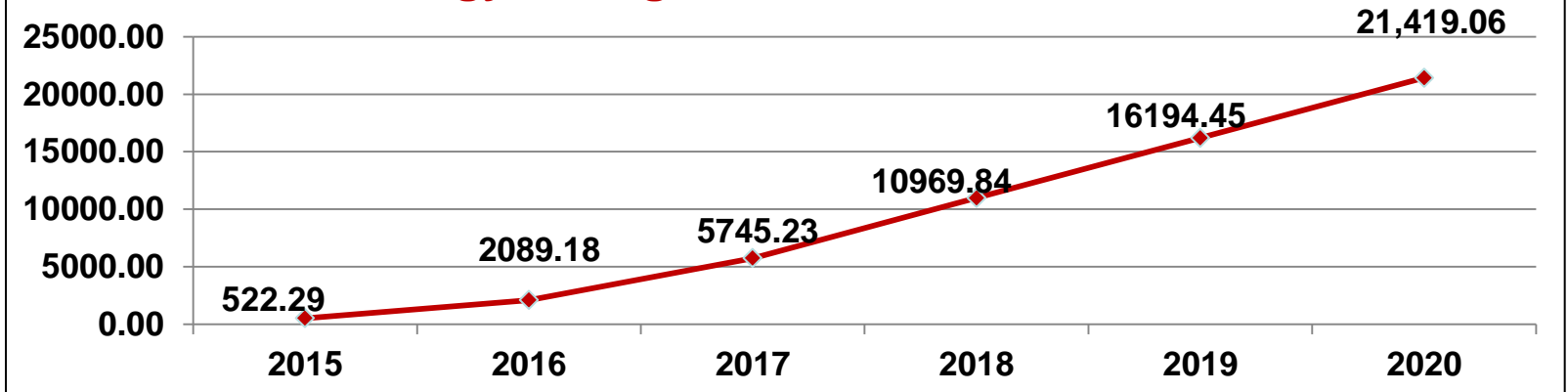
Energy savings in thousand kWt/hour



CO2 emissions reduction, tons



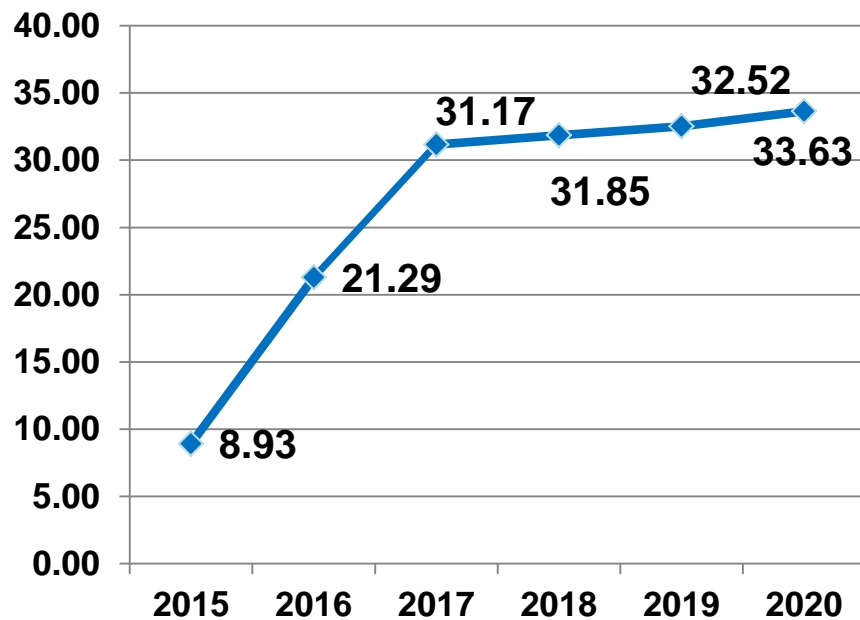
Energy savings in thousand US dollars



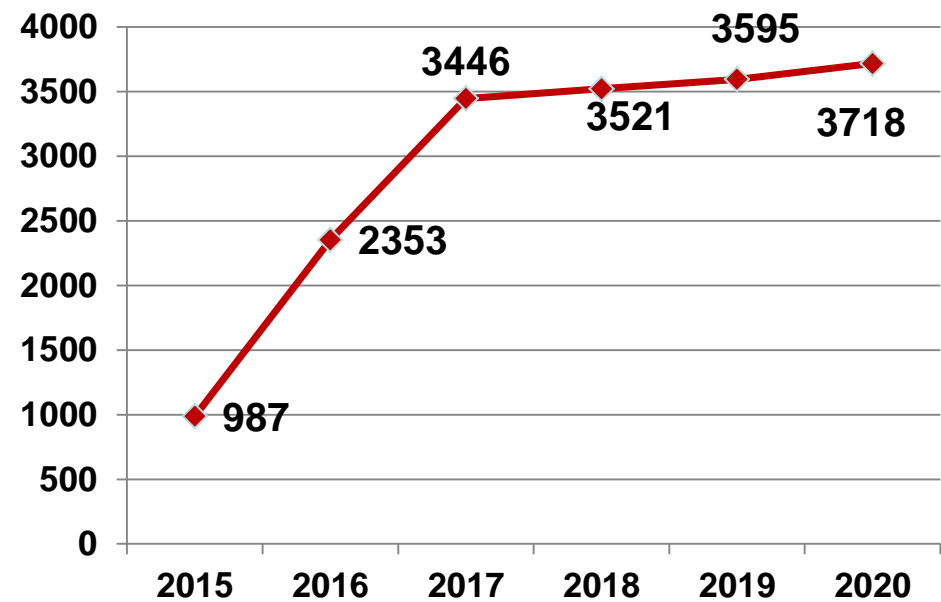
Demand of public buildings in heat isolation materials and their costs in 2015 - 2020



Annual demand in heat isolation materials, **thous.m3**



Annual demand in heat isolation, **thous. US dollars**



- There is annual demand in heat isolation materials of more than **32 thous. m3**
- Pay back period of energy efficient activities is up to **3 years**

Baseline - RURAL FAMILY HOUSES SECTOR

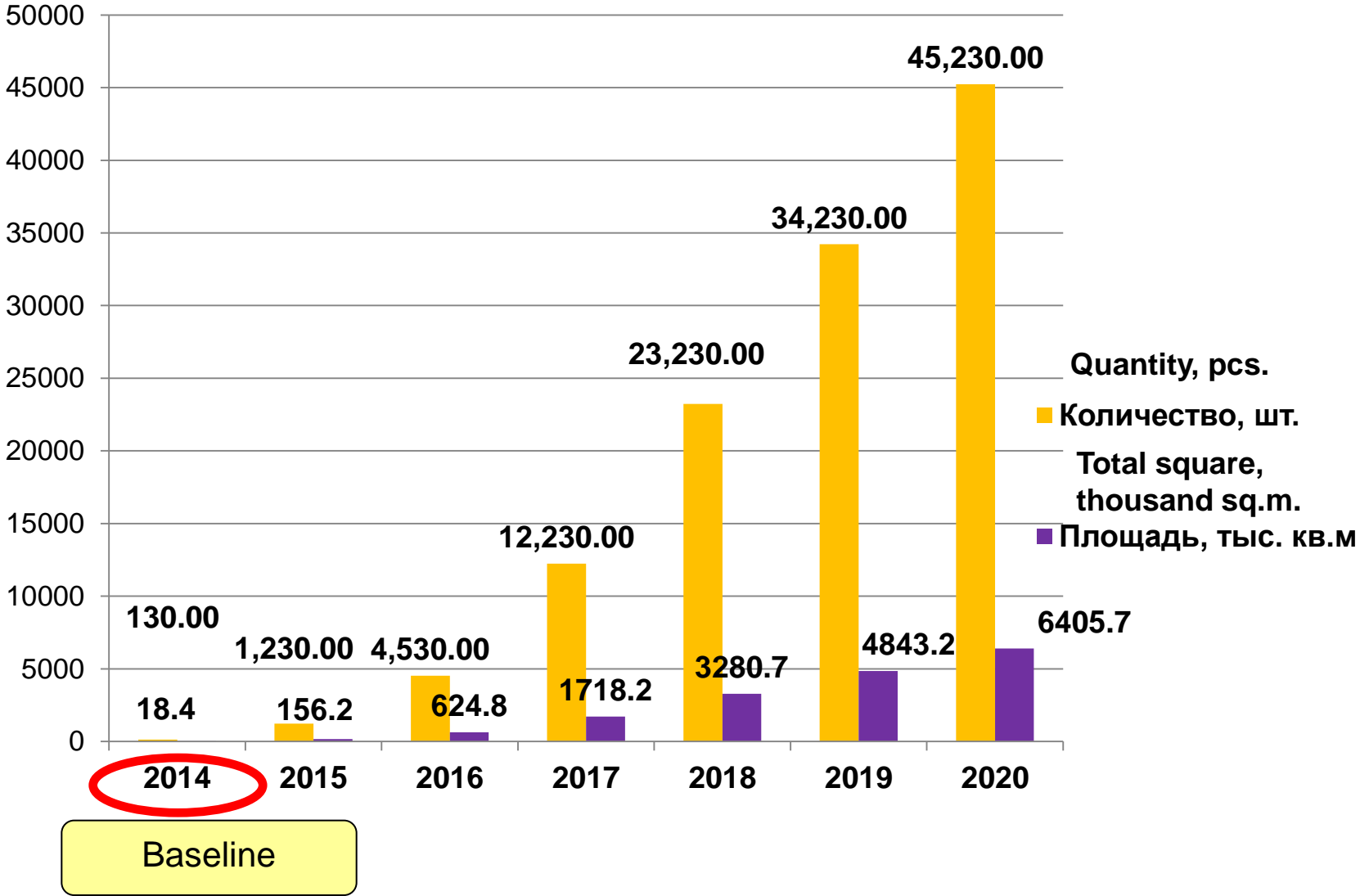


- 2009 - 2015 **State Program on Rural Development** - construction of more than **40 thousand houses** on standard designs (3, 4 and 5-rooms)
- Resolution of the President № ПП-2068 dated 15 November 2013 “**On program of construction of** individual housing on standard designs in rural areas for 2014” - **11 thousand houses** (part of loan capital by **ADB** 100,0 million US dollars)



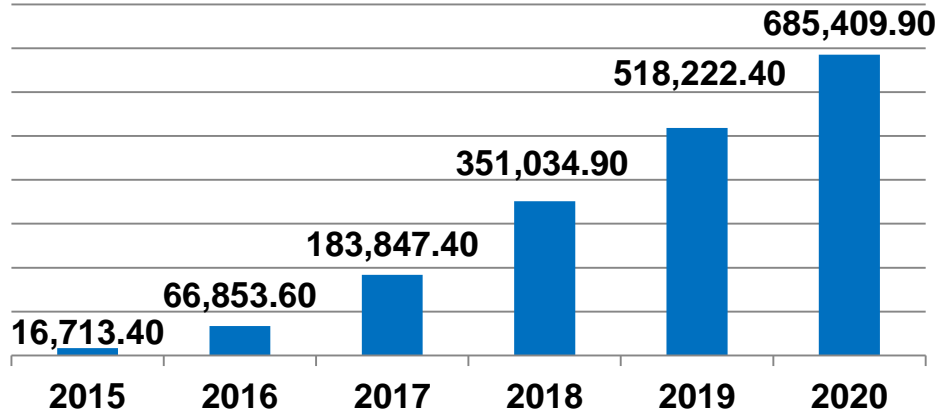
Сводные показатели энергопотребления одноэтажных жилых зданий для сельской местности														
№	Регион	Тип здания	Площадь пола, м ²	Применения энергоэффективных решений	Теплопотери через ограждающих конструкции, кВт					расход тепла для нагрева вентиляционного воздуха, кВт	Бытовые теплопотери в здании, кВт	Расход тепла на отопление и инфльтрацию здания, кВт	Удельные годовые потребления энергии на 1 кв м площади пола, кВт час/м ² в год	
					стен	оконных проемов	наружных дверей	чердачного перекрытия	пол					общие теплопотери
1.	Каракалпакстан	3-х	136,68	до	13556	3701	483	12061	11668	41469	8953	7115	43307	317
			136,68	после	5092	3701	483	4436	5591	19303	8953	7115	21141	155
			136,68	снижение	8464	0	0	7625	6077	22166	0	0	22166	162
		4-х	145,56	до	14117	3649	483	12845	12426	43520	9523	7893	45150	310
			145,56	после	5303	3649	483	4724	5954	20113	9523	7893	21743	149
			145,56	снижение	8814	0	0	8121	6472	23407	0	0	23407	161
		5-ти	181,52	до	15755	4483	483	16018	15496	52235	11879	9759	54355	299
			181,52	после	5918	4483	483	5891	7425	24200	11879	9759	26320	145
			181,52	снижение	9837	0	0	10127	8071	28035	0	0	28035	154
2.	Сурхандарьинская	3-х	136,68	до	6632	1811	371	5900	5708	20422	4377	5095	19704	144
			136,68	после	3521	1811	371	3001	4201	12905	4377	5095	12187	89
			136,68	снижение	3111	0	0	2899	1507	7517	0	0	7517	55
		4-х	145,56	до	6906	1785	371	6283	6079	21424	4665	5652	20437	140
			145,56	после	3667	1785	371	3196	4474	13493	4665	5652	12506	86
			145,56	снижение	3239	0	0	3087	1605	7931	0	0	7931	54
		5-ти	181,52	до	7707	2193	371	7836	7580	25687	5804	6988	24503	135
			181,52	после	4092	2193	371	3985	5579	16220	5804	6988	15036	83
			181,52	снижение	3615	0	0	3851	2001	9467	0	0	9467	52
3.	Ташкентская обл.	3-х	136,68	до	10170	2777	443	9048	8753	31191	6706	6456	31441	230
			136,68	после	4375	2777	443	3853	5065	16513	6706	6456	16763	123
			136,68	снижение	5795	0	0	5195	3688	14678	0	0	14678	107
		4-х	145,56	до	10590	2737	443	9636	9322	32728	7139	7162	32705	225
			145,56	после	4556	2737	443	4103	5394	17233	7139	7162	17210	118
			145,56	снижение	6034	0	0	5533	3928	15495	0	0	15495	106
		5-ти	181,52	до	11819	3363	443	12016	11625	39266	8907	8855	39318	217
			181,52	после	5085	3363	443	5117	6726	20734	8907	8855	20786	115
			181,52	снижение	6735	0	0	6899	4898	18532	0	0	18532	102

Anticipated commissioning of energy efficient rural houses in 2015 - 2020 (in line with investment programs)

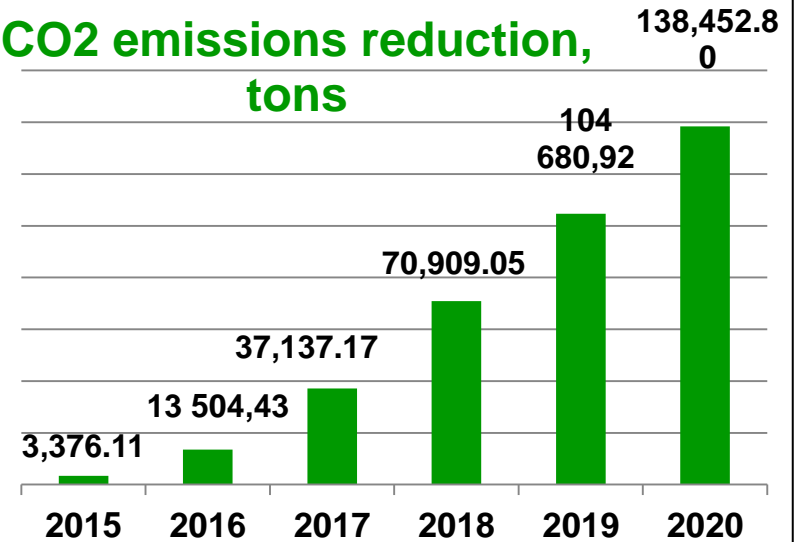


Energy savings and reduction of CO2 emissions in energy efficient rural family houses 2015 - 2020

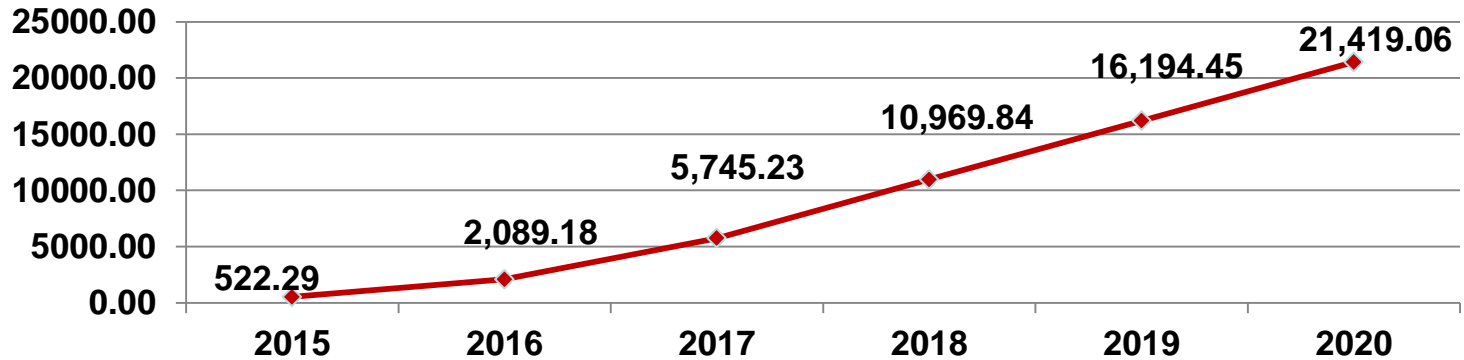
Energy savings in thousand kWt/hour



CO2 emissions reduction, tons

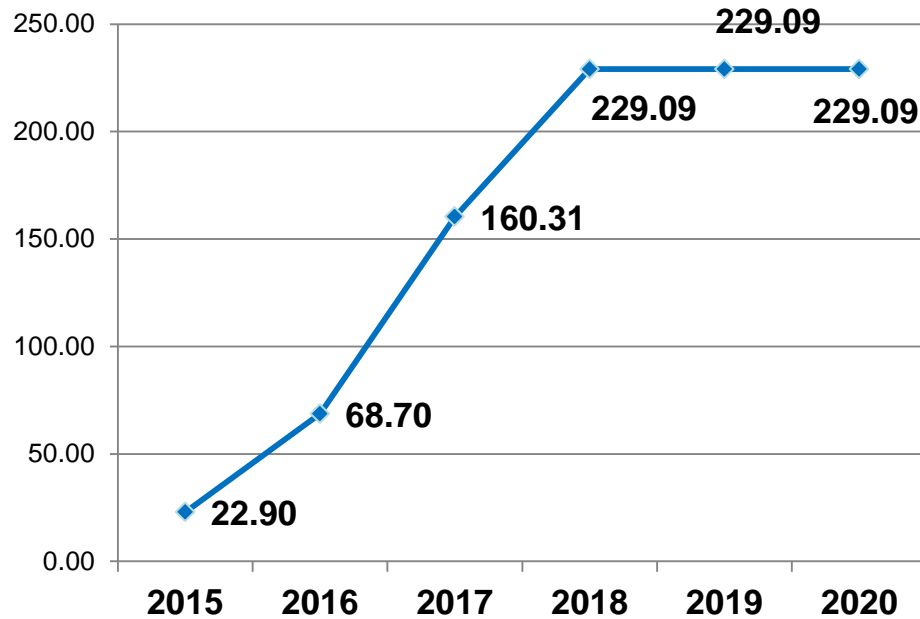


Energy savings in thousand US dollars

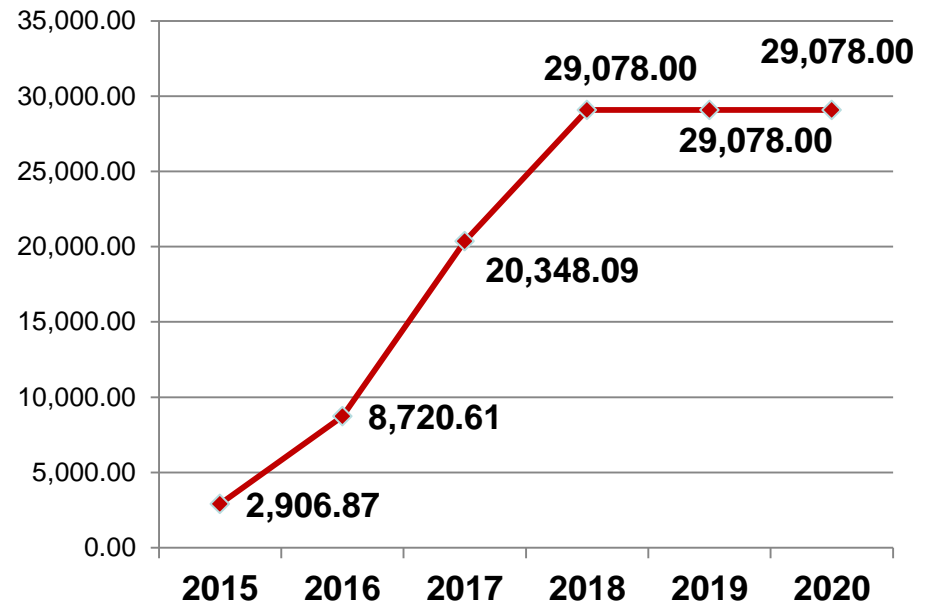


Demand of rural houses in heat isolation materials and their costs in 2015 - 2020

Annual demand in heat isolation materials, thous.m3



Annual demand in heat isolation, thous. US dollars

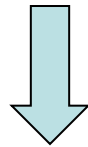


- There is annual demand in heat isolation materials of more than **229 thous. m3**
- Pay back period of energy efficient activities is up to **6 years**

Proposed activities on promoting energy efficiency in construction sector



- Researches, training and design
- Production of heat isolation materials
- Introduction of energy efficient equipment
- Construction
- Monitoring of effectiveness of performed activities

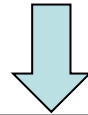


Reducing of specific energy consumption of construction, annual increment of energy resources savings, improving of living standards

Proposed activities on energy efficiency at building maintenance in public sector



- Energy resources consumption rates
- System of incentive measures for energy savings
- Energy audits and passportization, recommendations on promoting energy efficiency
- Energy resources measuring devices and weather control system
- Recuperation fans, efficient ventilation and air conditioning
- Reduce electricity consumption
- Energy efficient equipment in prototype public buildings
- Training for management of budget institutions
- Develop Internet resources on energy efficiency at public buildings
- Monitoring of effectiveness of performed activities



Reduction of budget expenditures through decrease in bills for energy resources

Proposed activities on energy efficiency at building maintenance in residential sector



- Energy audits and passportization, recommendations on promoting energy efficiency
- Phased heating modernization
- Introduce energy efficient technologies
- Introduce energy efficient types of dwelling using renewable energy sources in mass rural housing construction
- Training of high skilled specialists responsible for public utilities
- Monitoring of effectiveness of performed activities

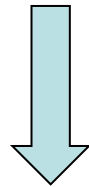


Annual reduction of energy resources consumption in housing and utilities sector, reduction of non-productive expenditures for public utilities, improving of living standards

Proposed activities on energy efficiency for population



- Raising awareness campaigns
- System of incentive measures for energy savings
- Accessibility and encouraging of using energy efficient technologies
- Prevent heat energy losses during maintenance
- Introduction of modern energy consumption measuring devices
- Monitoring of effectiveness of performed activities



Reduction of costs of tenants and owners of residential accommodations through decrease in bills for public utilities, improving of living standards

Measures of state support for promoting energy efficiency



- **Financing and co-financing** of energy efficient construction; researches, development of standard energy efficient buildings, trainings etc.
- **Improving of regulatory basis**
- **Monitoring of energy efficiency** of construction facilities
- **State control** over implementation of plans of promoting energy efficiency and energy savings
- **Tariff incentives** of energy efficiency for producers and consumers
- **Tax and budget incentives** of energy efficient buildings
- **Fund raising**
- **Scientific and practical conferences** on energy efficiency
- **Informational and analytical support**
- **Develop generic solutions** and recommendations on equipping with energy efficient technologies

Thank you!

Rustam Kuchkarov, Team Leader

**Joint project of the State Committee for
Architecture and Construction of Uzbekistan,
United Nations Development Program and Global
Environment Facility “Promoting Energy
Efficiency in Public Buildings in Uzbekistan”**

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