SUBREGION C

Armenia Azerbaijan Belarus Georgia Kazakhstan Kyrgyzstan Republic of Moldova Russian Federation Tajikistan Turkmenistan Ukraine

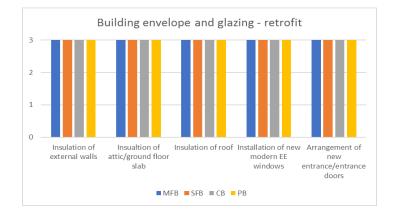
Ukraine Uzbekistan

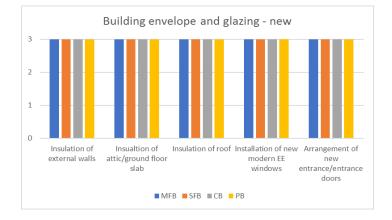


ARMENIA

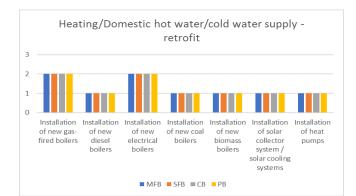
OVERVIEW

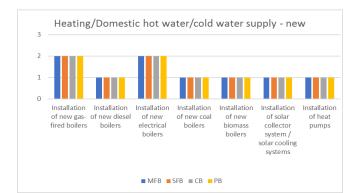
In Armenia the Technical regulation on ES and EE in residential multi-apartment buildings under construction as well as in objects being constructed (reconstructed, repaired) at the expense of state means, passed into effect in 2018. These norms and rules defined e.g. different measures on buildings envelope insulation. Nowadays there are no obligatiory requirements to the energy efficiency of air-conditioning, ventilation and cooling systems, which in turn affect on the application level of these technologies.

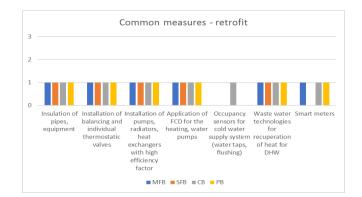


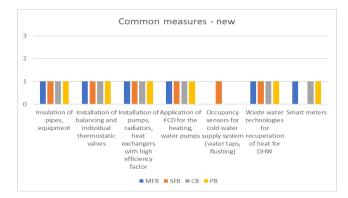


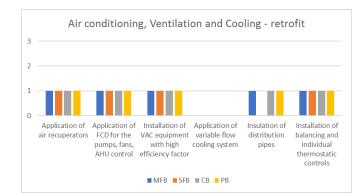
	Armenia									
		Ret	trofit			New co	construction			
	MFB	SFB	CB	PB	MFB	SFB	CB	PB		
3.1Building envelope and glazing										
Insulation of external walls	3	3	3	3	3	3	3	3		
Insualtion of attic/ground floor slab	3	3	3	3	3	3	3	3		
Insulation of roof	3	3	3	3	3	3	3	3		
Installation of new modern EE windows	3	3	3	3	3	3	3	3		
Arrangement of new entrance/entrance doors	3	3	3	3	3	3	3	3		
3.2 Heating/Domestic hot water/cold water su										
3.2.a Improvement of decentralized heating source	rr.,									
Installation of new gas-fired boilers	2	2	2	2	2	2	2	2		
Installation of new diesel/oil boilers	1	1	1	1	1	1	1	1		
Installation of new electrical boilers	2	2	2	2	2	2	2	2		
	1	1	1	1	1	1	1	1		
Installation of new coal boilers Installation of new biomass boilers	1	1	1	1	1	1	1	1		
Installation of new biomass boilers	1	-	-	-	-	1	-	-		
installation of solar collector system / solar cooling systems	1	1	1	1	1	1	1	1		
Installation of heat pumps	1	1	1	1	1	1	1	1		
3.2.b Improvement of centralized heating source	1	-	-	-	-	-	-	1		
Improvement of Centralized Heating Source	1	1	1	1	1	1	1	1		
3.2.c Common measures										
Insulation of pipes, equipment	1	1	1	1	1	1	1	1		
Installation of balancing and individual thermostatic	1	1	1	1	1	1	1	1		
valves	1	1	1	1	1	-	1	1		
Installation of pumps, radiators, heat exchangers with	1	1	1	1	1	1	1	1		
high efficiency factor										
Application of FCD for the heating, water pumps	1	1	1	1	1	1	1	1		
Occupancy sensors for cold water supply system (water taps, autoflush)	0	0	1	0	0	1	0	0		
Waste water technologies for recuperation of heat for										
DHW	1	1	1	1	1	1	1	1		
Smart meters	1	0	1	1	1	0	1	1		
3.3 Air conditioning, Ventilation and Cooling										
Application of air recuperators	1	1	1	1	1	1	1	1		
Application of FCD for the pumps, fans, AHU control	1	1	1	1	1	1	1	1		
Installation of VAC equipment with high efficiency factor	1	1	1	1	1	1	1	1		
Application of variable flow cooling system	0	0	0	0	0	0	0	0		
Insulation of distribution pipes	1	0	1	1	1	0	1	1		
Installation of balancing and individual thermostatic										
controls	1	1	1	1	1	1	1	1		
Solar cooling systems	0	0	0	0	0	0	0	0		
3.4 Appliance										
EE appliance	3	3	3	3	3	3	3	3		
3.5 Lighting										
Installation of new EE lamps (LED/CFL)	2	2	2	2	2	2	2	2		
Occupancy/motion/ambient lighting sensors	1	0	1	1	1	0	1	1		
Exterior lighting control	1	0	1	1	1	0	1	1		
	1	0	1	1	1	0	1	1		

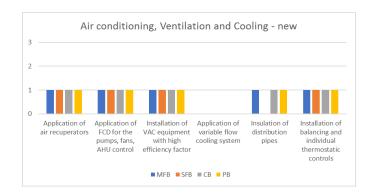


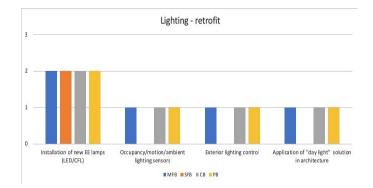


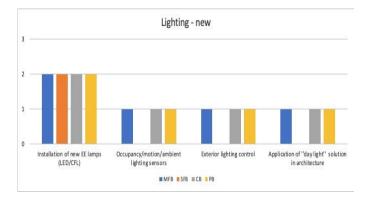










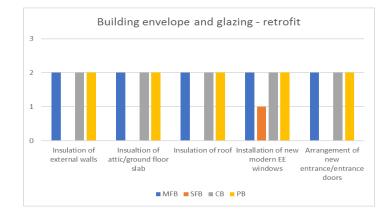




AZERBAIJAN

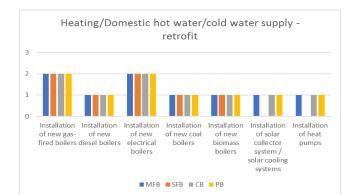
OVERVIEW

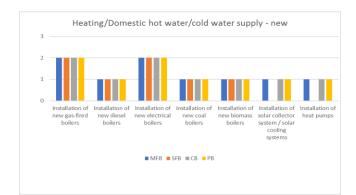
Despite the absence of the clear requirements in the legislation, the complexes of energy efficiency measures, such as buildings envelope insulation and installation of energy saving windows are frequently applied within the new construction and retrofit of the residential and public buildings. At the same time implementation of such technologies, as LED is not widely spread yet. The centralized heat- and hot water supply is also not widely implemented, which leads to the application of various boilers units (mostly gas-fired).

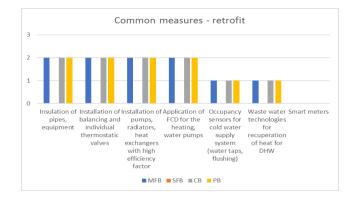


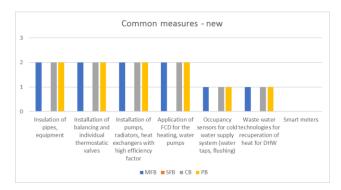


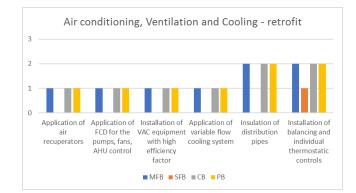
	Azerbaijan									
		Ret	rofit			New cor	struction			
	MFB	SFB	CB	PB	MFB	SFB	CB	PB		
3.1Building envelope and glazing		-				-		-		
Insulation of external walls	2	0	2	2	2	0	2	2		
Insualtion of attic/ground floor slab	2	0	2	2	2	0	2	2		
Insulation of roof	2	0	2	2	2	0	2	2		
Installation of new modern EE windows	2	1	2	2	2	1	2	2		
Arrangement of new entrance/entrance doors	2	0	2	2	2	0	2	2		
3.2 Heating/Domestic hot water/cold water supply										
3.2.a Improvement of decentralized heating source										
Installation of new gas-fired boilers	2	2	2	2	2	2	2	2		
Installation of new diesel/oil boilers	1	1	1	1	1	1	1	1		
Installation of new electrical boilers	2	2	2	2	2	2	2	2		
Installation of new coal boilers	1	1	1	1	1	1	1	1		
Installation of new biomass boilers	1	1	1	1	1	1	1	1		
Installation of solar collector system / solar cooling systems	1	0	1	1	1	0	1	1		
Installation of heat pumps	1	0	1	1	1	0	1	1		
3.2.b Improvement of centralized heating source										
Improvement of Centralized Heating Source	1	0	1	1	1	0	1	1		
3.2.c Common measures										
Insulation of pipes, equipment	2	0	2	2	2	0	2	2		
Installation of balancing and individual thermostatic valves	2	0	2	2	2	0	2	2		
Installation of pumps, radiators, heat exchangers with high	2	0	2	2	2	0	2	2		
efficiency factor										
Application of FCD for the heating, water pumps	2	0	2	2	2	0	2	2		
Occupancy sensors for cold water supply system (water taps, autoflush)	1	0	1	1	1	0	1	1		
Waste water technologies for recuperation of heat for DHW	1	0	1	1	1	0	1	1		
Smart meters	0	0	0	0	0	0	0	0		
3.3 Air conditioning, Ventilation and Cooling										
Application of air recuperators	1	0	1	1	1	0	1	1		
Application of FCD for the pumps, fans, AHU control	1	0	1	1	1	0	1	1		
Installation of VAC equipment with high efficiency factor	1	0	1	1	1	0	1	1		
Application of variable flow cooling system	1	0	1	1	1	0	1	1		
Insulation of distribution pipes	2	0	2	2	2	0	2	2		
Installation of balancing and individual thermostatic controls	2	1	2	2	2	1	2	2		
3.4 Appliance										
EE appliance	2	2	2	2	2	2	2	2		
3.5 Lighting										
Installation of new EE lamps (LED/CFL)	2	1	2	2	2	1	2	2		
Occupancy/motion/ambient lighting sensors	1	0	1	1	1	0	1	1		
Exterior lighting control	1	0	1	1	1	0	1	1		
Application of "day light" solution in architecture	1	0	1	1	1	0	1	1		

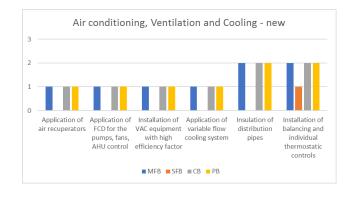




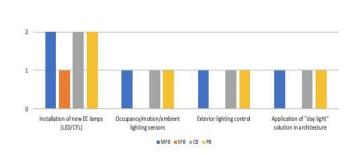


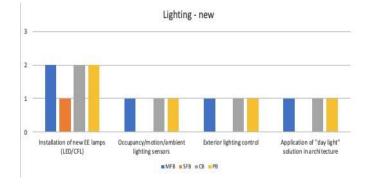






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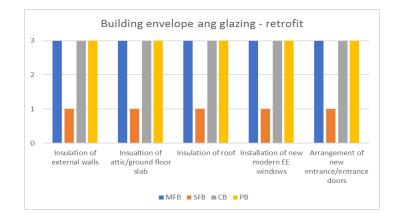


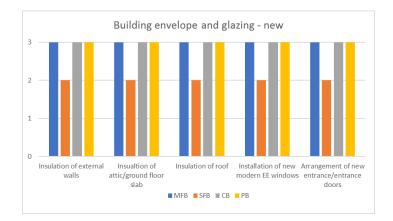


BELARUS

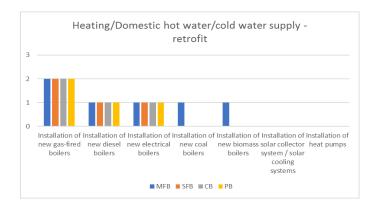
OVERVIEW

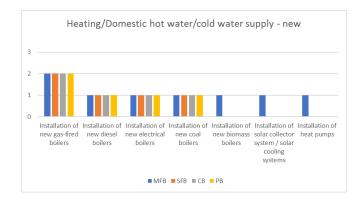
Implementation of the various insulation technologies for buildings envelope while new construction and retrofit is almost across the board in Belarus. The regulatory framework in this field defines the implementation of these technologies both by new construction and capital repairs of the residential and public buildings. However, walls insulation and installation of the modern energy saving windows are being seldom applied by the retrofit of the private single-family buildings.

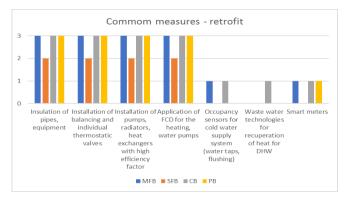


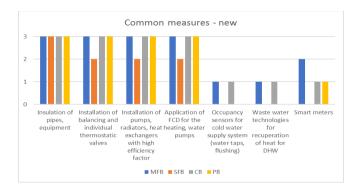


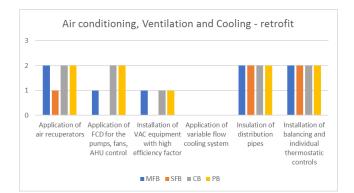
	Belarus									
	Retrofit New construction									
	MFB	SFB	CB	PB	MFB	SFB	CB	PB		
3.1Building envelope and glazing	-									
Insulation of external walls	3	1	3	3	3	2	3	3		
Insualtion of attic/ground floor slab	3	1	3	3	3	2	3	3		
Insulation of roof	3	1	3	3	3	2	3	3		
Installation of new modern EE windows	3	1	3	3	3	2	3	3		
Arrangement of new entrance/entrance doors	3	1	3	3	3	2	3	3		
3.2 Heating/Domestic hot water/cold water supply										
3.2.a Improvement of decentralized heating source	_									
Installation of new gas-fired boilers	2	2	2	2	2	2	2	2		
Installation of new diesel/oil boilers	1	1	1	1	1	1	1	1		
Installation of new electrical boilers	1	1	1	1	1	1	1	1		
Installation of new coal boilers	1	0	0	0	1	1	1	1		
Installation of new biomass boilers	1	0	0	0	1	0	0	0		
Installation of solar collector system / solar cooling systems	0	0	0	0	1	0	0	0		
Installation of heat pumps	0	0	0	0	1	0	0	0		
3.2.b Improvement of centralized heating source										
Improvement of Centralized Heating Source	1	0	1	1	1	0	1	1		
3.2.c Common measures	_									
Insulation of pipes, equipment	3	2	3	3	3	3	3	3		
Installation of balancing and individual thermostatic valves	3	2	3	3	3	2	3	3		
Installation of pumps, radiators, heat exchangers with high	3	2	3	3	3	2	3	3		
efficiency factor										
Application of FCD for the heating, water pumps	3	2	3	3	3	2	3	3		
Occupancy sensors for cold water supply system (water taps, autoflush)	1	0	1	0	1	0	1	0		
Waste water technologies for recuperation of heat for DHW	0	0	1	0	1	0	1	0		
Smart meters	1	0	1	1	2	0	1	1		
3.3 Air conditioning, Ventilation and Cooling										
Application of air recuperators	2	1	2	2	2	0	2	2		
Application of FCD for the pumps, fans, AHU control	1	0	2	2	1	0	1	1		
Installation of VAC equipment with high efficiency factor	1	0	1	1	1	0	1	1		
Application of variable flow cooling system	0	0	0	0	0	0	0	0		
Insulation of distribution pipes	2	2	2	2	2	2	2	2		
Installation of balancing and individual thermostatic controls	2	2	2	2	2	2	2	2		
3.4 Appliance										
EE appliance	3	3	3	3	3	3	3	3		
3.5 Lighting										
Installation of new EE lamps (LED/CFL)	2	2	2	1	2	2	2	1		
Occupancy/motion/ambient lighting sensors	1	0	1	1	1	0	1	1		
Exterior lighting control	2	0	2	2	2	0	2	2		
Application of "day light" solution in architecture	1	0	1	1	1	0	1	1		

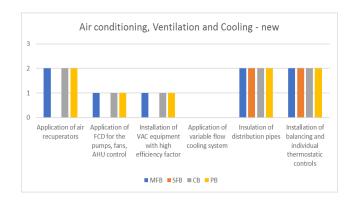


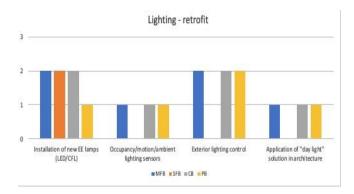


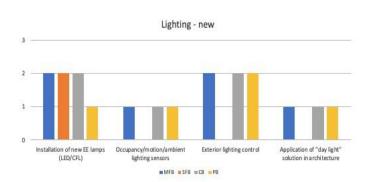


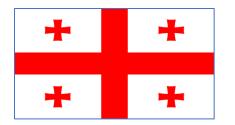








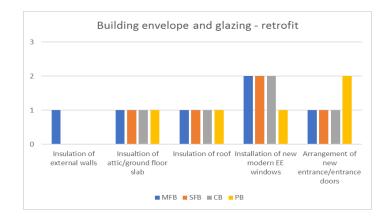


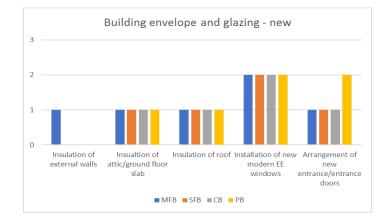




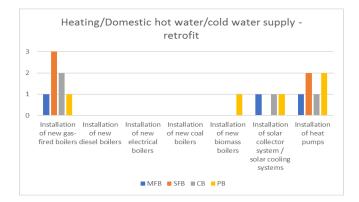
OVERVIEW

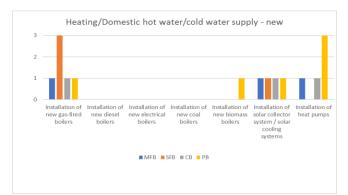
In Georgia there are no regulatory framework, adopted on the national level. There are also no specific requirements to the energy efficient labelling of the household appliances. But despite the facts, mentioned above, installation of LED lamps is obligatory for all commercial and public buildings.

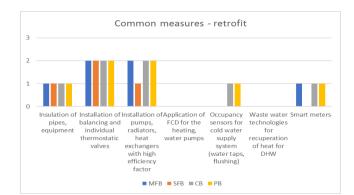


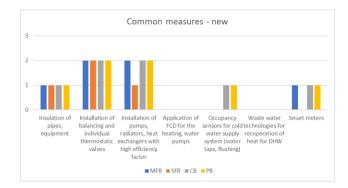


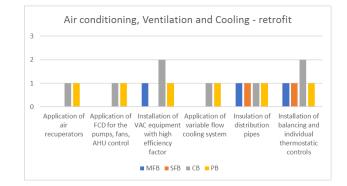
				Geo	orgia			
		Ret	rofit			New con	struction	
	MFB	SFB	CB	PB	MFB	SFB	CB	PB
3.1Building envelope and glazing								
Insulation of external walls	1	0	0	0	1	0	0	0
Insualtion of attic/ground floor slab	1	1	1	1	1	1	1	1
Insulation of roof	1	1	1	1	1	1	1	1
Installation of new modern EE windows	2	2	2	1	2	2	2	2
Arrangement of new entrance/entrance doors	1	1	1	2	1	1	1	2
3.2 Heating/Domestic hot water/cold water supply								
3.2.a Improvement of decentralized heating source								
Installation of new gas-fired boilers	1	3	2	1	1	3	1	1
Installation of new diesel/oil boilers	0	0	0	0	0	0	0	0
Installation of new electrical boilers	0	0	0	0	0	0	0	0
Installation of new coal boilers	0	0	0	0	0	0	0	0
Installation of new biomass boilers	0	0	0	1	0	0	0	1
Installation of solar collector system / solar cooling systems	1	0	1	1	1	1	1	1
Installation of heat pumps	1	2	1	2	1	0	1	3
3.2.b Improvement of centralized heating source								
Improvement of Centralized Heating Source	1	2	2	1	1	2	2	1
3.2.c Common measures								
Insulation of pipes, equipment	1	1	1	1	1	1	1	1
Installation of balancing and individual thermostatic valves	2	2	2	2	2	2	2	2
Installation of pumps, radiators, heat exchangers with high efficiency factor	2	1	2	2	2	1	2	2
Application of FCD for the heating, water pumps	0	0	0	0	0	0	0	0
Occupancy sensors for cold water supply system (water taps, autoflush)	0	0	1	1	0	0	1	1
Waste water technologies for recuperation of heat for DHW	0	0	0	0	0	0	0	0
Smart meters	1	0	1	1	1	0	1	1
3.3 Air conditioning, Ventilation and Cooling								
Application of air recuperators	0	0	1	1	0	0	1	1
Application of FCD for the pumps, fans, AHU control	0	0	1	1	0	0	1	1
Installation of VAC equipment with high efficiency factor	1	0	2	1	1	0	2	1
Application of variable flow cooling system	0	0	1	1	0	0	1	1
Insulation of distribution pipes	1	1	1	1	1	1	1	1
Installation of balancing and individual thermostatic controls	1	1	2	1	1	1	2	1
3.4 Appliance								
EE appliance	2	2	2	2	2	2	2	2
3.5 Lighting								
Installation of new EE lamps (LED/CFL)	2	2	3	3	2	2	3	3
Occupancy/motion/ambient lighting sensors	1	0	2	1	1	0	2	1
Exterior lighting control	1	0	2	2	1	0	2	2
Application of "day light" solution in architecture	0	0	1	1	0	0	1	1

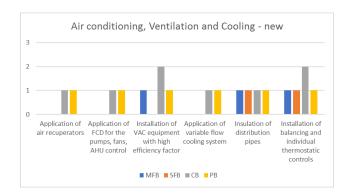


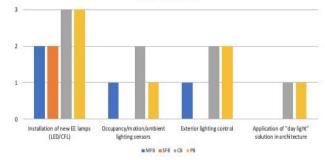


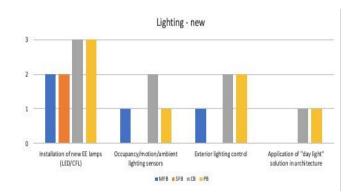










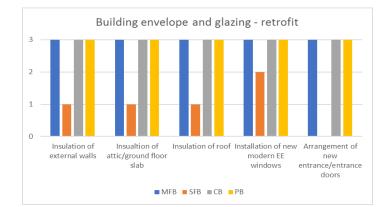




KAZAKHSTAN

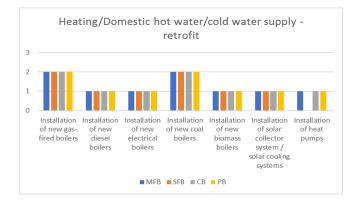
OVERVIEW

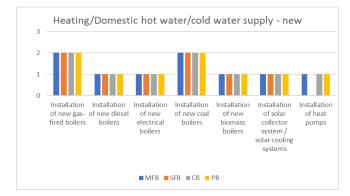
The range of legislative documents, which define the implementation of energy saving technologies for building envelope within the new construction, was adopted on the national level in Kazakhstan. At the same time, modernization of the air-conditioning, ventilation and cooling systems for the premises are not obligatory to follow and, as a result, the energy efficient technologies in this field are not widely implemented.

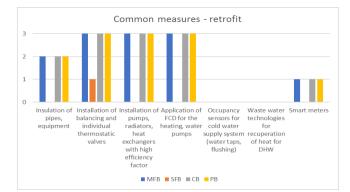


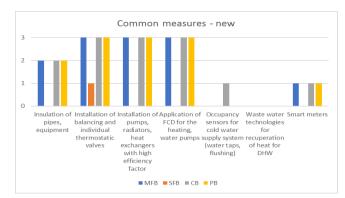


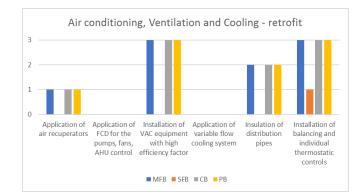
	Kazakhstan									
		Ret	rofit			New cor	struction			
	MFB	SFB	CB	PB	MFB	SFB	CB	PB		
3.1Building envelope and glazing										
Insulation of external walls	3	1	3	3	3	1	3	3		
Insualtion of attic/ground floor slab	3	1	3	3	3	1	3	3		
Insulation of roof	3	1	3	3	3	1	3	3		
Installation of new modern EE windows	3	2	3	3	3	2	3	3		
Arrangement of new entrance/entrance doors	3	0	3	3	3	0	3	3		
3.2 Heating/Domestic hot water/cold water su	vlag									
3.2.a Improvement of decentralized heating source										
Installation of new gas-fired boilers	2	2	2	2	2	2	2	2		
Installation of new diesel/oil boilers	1	1	1	1	1	1	1	1		
Installation of new electrical boilers	1	1	1	1	1	1	1	1		
Installation of new coal boilers	2	2	2	2	2	2	2	2		
Installation of new biomass boilers	1	1	1	1	1	1	1	1		
Installation of solar collector system / solar cooling										
systems	1	1	1	1	1	1	1	1		
Installation of heat pumps	1	0	1	1	1	0	1	1		
3.2.b Improvement of centralized heating source										
Improvement of Centralized Heating Source	3	0	3	3	3	0	3	3		
3.2.c Common measures										
Insulation of pipes, equipment	2	0	2	2	2	0	2	2		
Installation of balancing and individual thermostatic										
valves	3	1	3	3	3	1	3	3		
Installation of pumps, radiators, heat exchangers with										
high efficiency factor	3	0	3	3	3	0	3	3		
Application of FCD for the heating, water pumps	3	0	3	3	3	0	3	3		
Occupancy sensors for cold water supply system (water taps, autoflush)	0	0	0	0	0	0	1	0		
Waste water technologies for recuperation of heat for		0	0			0	-			
DHW	0	0	0	0	0	0	0	0		
Smart meters	1	0	1	1	1	0	1	1		
3.3 Air conditioning, Ventilation and Cooling										
Application of air recuperators	1	0	1	1	1	0	1	1		
Application of FCD for the pumps, fans, AHU control	0	0	0	0	0	0	0	0		
Installation of VAC equipment with high efficiency factor	3	0	3	3	3	0	3	3		
Application of variable flow cooling system	0	0	0	0	0	0	0	0		
Insulation of distribution pipes	2	0	2	2	2	0	2	2		
Installation of balancing and individual thermostatic										
controls	3	1	3	3	3	1	3	3		
Solar cooling systems	0	0	0	0	0	0	0	0		
3.4 Appliance										
EE appliance	3	3	3	3	3	3	3	3		
3.5 Lighting										
Installation of new EE lamps (LED/CFL)	2	1	2	2	2	1	2	2		
Occupancy/motion/ambient lighting sensors	3	1	3	3	3	1	3	3		
Exterior lighting control	0	0	0	0	0	0	0	0		
Application of "day light" solution in architecture	0	0	1	0	0	1	0	0		

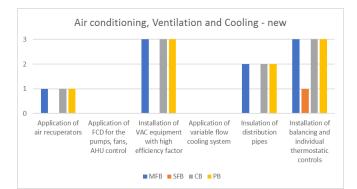


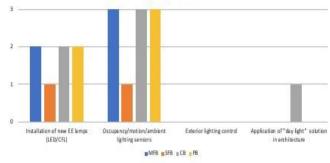




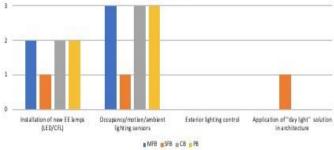










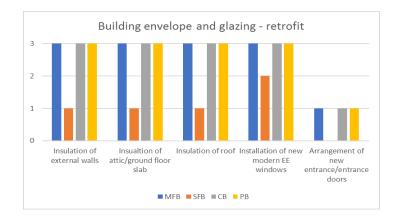




KYRGYZSTAN

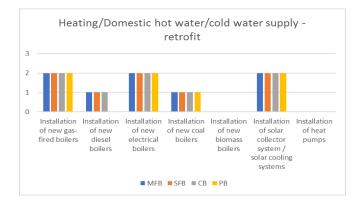
OVERVIEW

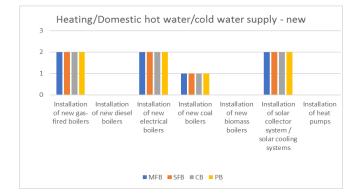
The measures on buildings envelope insulation are obligatory both for new construction and retrofit of the multiapartment residential, public and commercial buildings. However, such technologies, like various floor cooling systems or waste water recuperators haven't found a broad application yet.

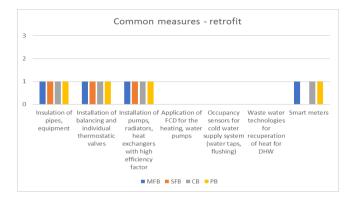


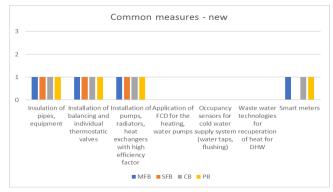


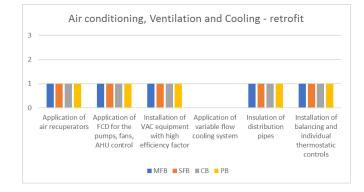
	Kyrgyzstan									
		Ret	rofit			New cor	struction			
	MFB	SFB	CB	PB	MFB	SFB	CB	PB		
3.1Building envelope and glazing										
Insulation of external walls	3	1	3	3	3	2	3	3		
Insualtion of attic/ground floor slab	3	1	3	3	3	2	3	3		
Insulation of roof	3	1	3	3	3	1	3	3		
Installation of new modern EE windows	3	2	3	3	3	2	3	3		
Arrangement of new entrance/entrance doors	1	0	1	1	1	0	1	1		
3.2 Heating/Domestic hot water/cold water sup	oly									
3.2.a Improvement of decentralized heating source										
Installation of new gas-fired boilers	2	2	2	2	2	2	2	2		
Installation of new diesel/oil boilers	1	1	1	0	0	0	0	0		
Installation of new electrical boilers	2	2	2	2	2	2	2	2		
Installation of new coal boilers	1	1	1	1	1	1	1	1		
Installation of new biomass boilers	0	0	0	0	0	0	0	0		
Installation of solar collector system / solar cooling systems	2	2	2	2	2	2	2	2		
Installation of heat pumps	0	0	0	0	0	0	0	0		
3.2.b Improvement of centralized heating source										
Improvement of Centralized Heating Source	1	1	1	1	1	1	1	1		
3.2.c Common measures										
Insulation of pipes, equipment	1	1	1	1	1	1	1	1		
Installation of balancing and individual thermostatic valves	1	1	1	1	1	1	1	1		
Installation of pumps, radiators, heat exchangers with high	1	1	1	1	1	1	1	1		
efficiency factor Application of FCD for the heating, water pumps	0	0	0	0	0	0	0	0		
Occupancy sensors for cold water supply system (water										
taps, autoflush)	0	0	0	0	0	0	0	0		
Waste water technologies for recuperation of heat for DHW	0	0	0	0	0	0	0	0		
Smart meters	1	0	1	1	1	0	1	1		
3.3 Air conditioning, Ventilation and Cooling										
Application of air recuperators	1	1	1	1	1	1	1	1		
Application of FCD for the pumps, fans, AHU control	1	1	1	1	1	1	1	1		
Installation of VAC equipment with high efficiency factor	1	1	1	1	1	1	1	1		
Application of variable flow cooling system	0	0	0	0	0	0	0	0		
Insulation of distribution pipes	1	1	1	1	1	1	1	1		
Installation of balancing and individual thermostatic controls	1	1	1	1	1	1	1	1		
Solar cooling systems	0	0	0	0	0	0	0	0		
3.4 Appliance										
EE appliance	3	3	3	3	3	3	3	3		
3.5 Lighting										
Installation of new EE lamps (LED/CFL)	2	2	2	2	2	2	2	2		
Occupancy/motion/ambient lighting sensors	1	0	1	1	2	0	2	1		
Exterior lighting control	1	0	1	1	1	0	1	1		
Application of "day light" solution in architecture	1	0	1	1	1	0	1	1		

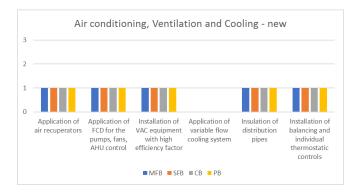


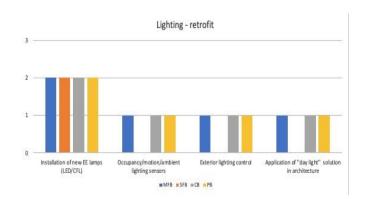


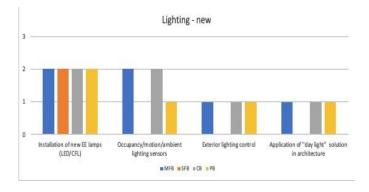










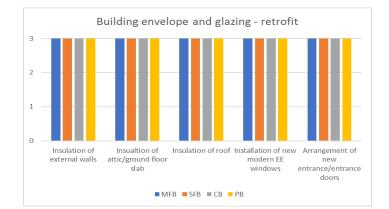


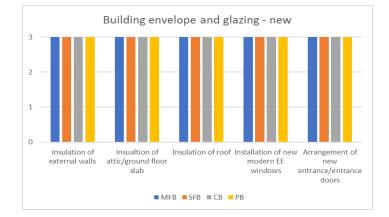


REPUBLIC OF MOLDOVA

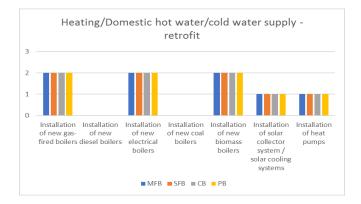
OVERVIEW

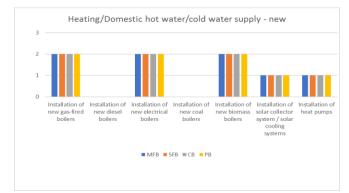
According to the respective Law, application of the different energy saving technologies in new construction and capital repairs of all buildings types is mandatory in the Republic of Moldova since 2014. However, there are no obligatory requirements to the LED technologies implementation, though the customers mostly prefer the modern energy saving lamps.

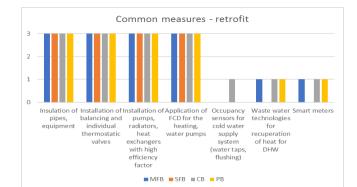


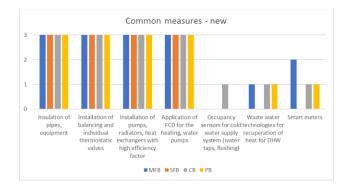


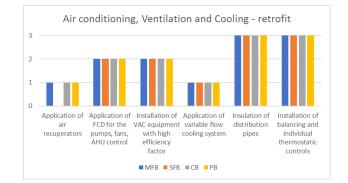
				Republic o	fMoldova			
		Ret	rofit			New cor	struction	
	MFB	SFB	CB	PB	MFB	SFB	CB	PB
3.1Building envelope and glazing								
Insulation of external walls	3	3	3	3	3	3	3	3
Insualtion of attic/ground floor slab	3	3	3	3	3	3	3	3
Insulation of roof	3	3	3	3	3	3	3	3
Installation of new modern EE windows	3	3	3	3	3	3	3	3
Arrangement of new entrance/entrance doors	3	3	3	3	3	3	3	3
3.2 Heating/Domestic hot water/cold water supply								
3.2.a Improvement of decentralized heating source	_							
Installation of new gas-fired boilers	2	2	2	2	2	2	2	2
Installation of new diesel/oil boilers	0	0	0	0	0	0	0	0
Installation of new electrical boilers	2	2	2	2	2	2	2	2
Installation of new coal boilers	0	0	0	0	0	0	0	0
Installation of new biomass boilers	2	2	2	2	2	2	2	2
Installation of solar collector system / solar cooling systems	1	1	1	1	1	1	1	1
Installation of heat pumps	1	1	1	1	1	1	1	1
3.2.b Improvement of centralized heating source					1			
Improvement of Centralized Heating Source	1	0	1	1	1	0	1	1
3.2.c Common measures								
Insulation of pipes, equipment	3	3	3	3	3	3	3	3
Installation of balancing and individual thermostatic valves	3	3	3	3	3	3	3	3
Installation of pumps, radiators, heat exchangers with high	3	3	3	3	3	3	3	3
efficiency factor	э	2	э	2	2	2	2	3
Application of FCD for the heating, water pumps	3	3	3	3	3	3	3	3
Occupancy sensors for cold water supply system (water taps, autoflush)	0	0	1	0	0	0	1	0
Waste water technologies for recuperation of heat for DHW	1	0	1	1	1	0	1	1
Smart meters	1	0	1	1	2	0	1	1
3.3 Air conditioning, Ventilation and Cooling								
Application of air recuperators	1	0	1	1	1	0	1	1
Application of FCD for the pumps, fans, AHU control	2	2	2	2	2	2	2	2
Installation of VAC equipment with high efficiency factor	2	2	2	2	2	2	2	2
Application of variable flow cooling system	1	1	1	1	1	1	1	1
Insulation of distribution pipes	3	3	3	3	3	3	3	3
Installation of balancing and individual thermostatic controls	3	3	3	3	3	3	3	3
3.4 Appliance	-							
EE appliance	3	3	3	3	3	3	3	3
3.5 Lighting								
Installation of new EE lamps (LED/CFL)	2	2	2	2	2	2	2	2
Occupancy/motion/ambient lighting sensors	1	0	1	1	1	0	1	1
Exterior lighting control	1	0	1	1	1	0	1	1
Application of "day light" solution in architecture	1	0	1	1	1	0	1	1

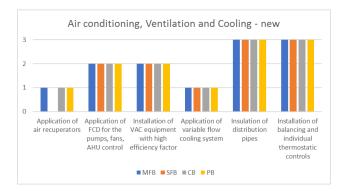




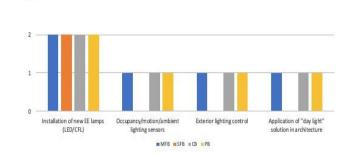


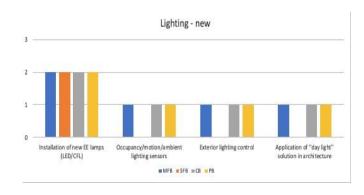






3



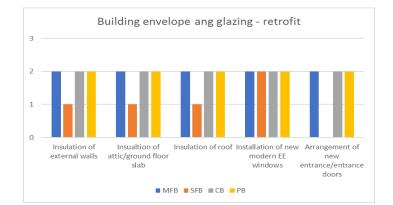


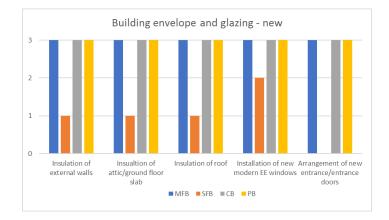


RUSSIAN FEDERATION

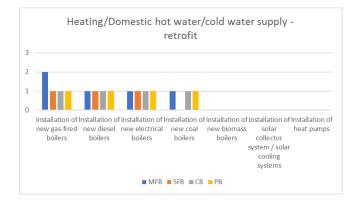
OVERVIEW

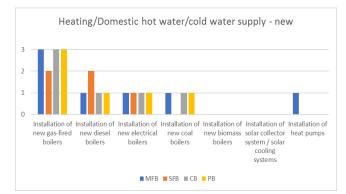
In Russian Federation the requirements to the buildings energy efficiency were adopted on the national level. However, specific requirements to the buildings envelope insulation are obligatory for the new constructed buildings, while the implementation of these technologies is optional. Production and distribution of the filament lamps is prohibited. However, the proper regulatory framework to support LED technologies is still not adopted.

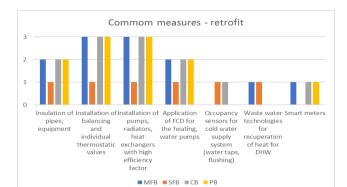


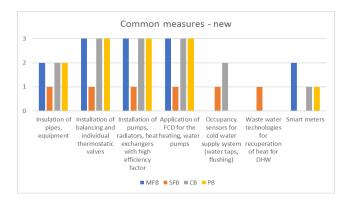


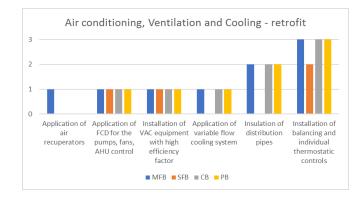
	Russian Federation										
		Ret	rofit			New cor	struction				
	MFB	SFB	CB	PB	MFB	SFB	CB	PB			
3.1Building envelope and glazing											
Insulation of external walls	2	1	2	2	3	1	3	3			
Insualtion of attic/ground floor slab	2	1	2	2	3	1	3	3			
Insulation of roof	2	1	2	2	3	1	3	3			
Installation of new modern EE windows	2	2	2	2	3	2	3	3			
Arrangement of new entrance/entrance doors	2	0	2	2	3	0	3	3			
3.2 Heating/Domestic hot water/cold wa	ter supply										
3.2.a Improvement of decentralized heating so											
Installation of new gas-fired boilers	2	1	1	1	3	2	3	3			
Installation of new diesel/oil boilers	1	1	1	1	1	2	1	1			
Installation of new electrical boilers	1	1	1	1	1	1	1	1			
Installation of new coal boilers	1	0	1	1	1	0	1	1			
Installation of new biomass boilers	0	0	0	0	0	0	0	0			
Installation of solar collector system / solar											
cooling systems	0	0	0	0	0	0	0	0			
Installation of heat pumps	0	0	0	0	1	0	0	0			
3.2.b Improvement of centralized heating sour	ce										
Improvement of Centralized Heating Source	3	0	3	3	3	0	3	3			
3.2.c Common measures											
Insulation of pipes, equipment	2	1	2	2	2	1	2	2			
Installation of balancing and individual											
thermostatic valves	3	1	3	3	3	1	3	3			
Installation of pumps, radiators, heat exchangers	3	1	3	3	3	1	3	3			
with high efficiency factor Application of FCD for the heating, water pumps	2	1	2	2	3	1	3	3			
Occupancy sensors for cold water supply system	2	1	2	2	3	1	3	3			
(water taps, autoflush)	0	1	1	0	0	1	2	0			
Waste water technologies for recuperation of heat											
for DHW	1	1	0	0	0	1	0	0			
Smart meters	1	0	1	1	2	0	1	1			
3.3 Air conditioning, Ventilation and Coc	ling	-		-	-	-	-	-			
Application of air recuperators	1	0	0	0	1	0	0	0			
Application of FCD for the pumps, fans, AHU											
control Installation of VAC equipment with high efficiency	1	1	1	1	3	1	3	3			
factor	1	1	1	1	1	0	1	1			
Application of variable flow cooling system	1	0	1	1	1	0	1	1			
Insulation of distribution pipes	2	0	2	2	2	0	2	2			
Installation of balancing and individual	_		_								
thermostatic controls	3	2	3	3	3	2	2	2			
Solar Cooling Systems	0	0	0	0	0	0	0	0			
3.4 Appliance											
EE appliance	3	3	3	3	3	3	3	3			
3.5 Lighting	5	,	5	,	,	,	,	5			
Installation of new EE lamps (LED/CFL)	2	2	2	2	2	2	2	2			
Occupancy/motion/ambient lighting sensors	1	1	1	1	2	1	2	1			
Exterior lighting control	1	1	1	1	1	1	1	1			
		-	-	-	-	-	-	-			
Application of "day light" solution in architecture	1	1	1	1	1	1	1	1			

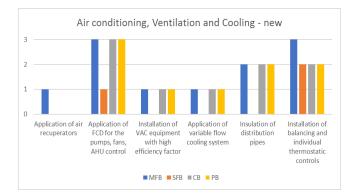


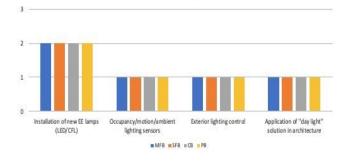


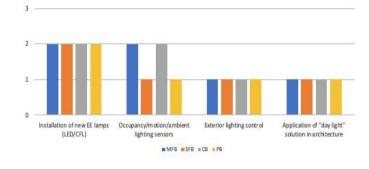












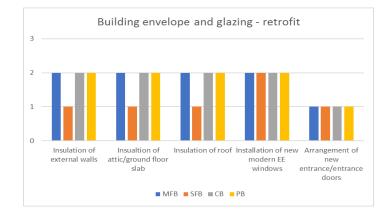
Lighting - new

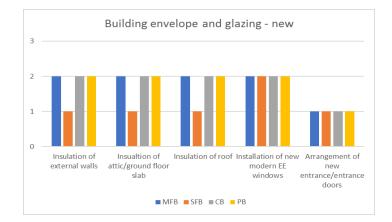


TAJIKISTAN

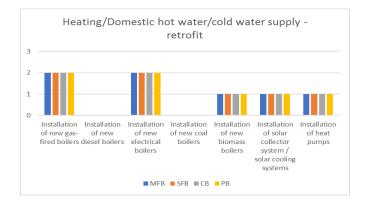
OVERVIEW

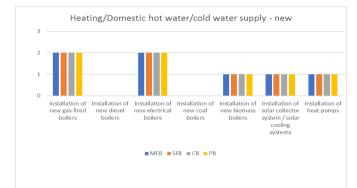
In Tajikistan still operation the norms and rules, inherited from the former USSR, which are not conforming to modern standards of energy efficiency. That is the reason why the technologies of buildings envelope insulation are not so widely applied, especially in the private sector. At the same time there are mandatory requirements to the energy efficiency labelling of the electric appliances.

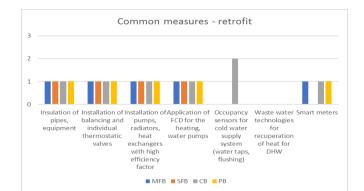


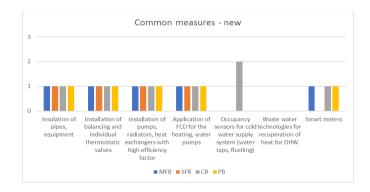


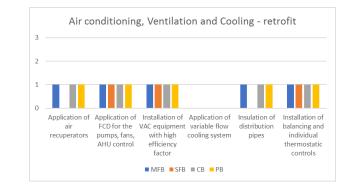
	Tajikistan									
		Ret	rofit			New cor	struction			
	MFB	SFB	CB	PB	MFB	SFB	СВ	PB		
3.1Building envelope and glazing										
Insulation of external walls	2	1	2	2	2	1	2	2		
Insualtion of attic/ground floor slab	2	1	2	2	2	1	2	2		
Insulation of roof	2	1	2	2	2	1	2	2		
Installation of new modern EE windows	2	2	2	2	2	2	2	2		
Arrangement of new entrance/entrance doors	1	1	1	1	1	1	1	1		
3.2 Heating/Domestic hot water/cold water supply										
3.2.a Improvement of decentralized heating source										
Installation of new gas-fired boilers	2	2	2	2	2	2	2	2		
Installation of new diesel/oil boilers	0	0	0	0	0	0	0	0		
Installation of new electrical boilers	2	2	2	2	2	2	2	2		
Installation of new coal boilers	0	0	0	0	0	0	0	0		
Installation of new biomass boilers	1	1	1	1	1	1	1	1		
Installation of solar collector system / solar cooling systems	1	1	1	1	1	1	1	1		
Installation of heat pumps	1	1	1	1	1	1	1	1		
3.2.b Improvement of centralized heating source	_									
Improvement of Centralized Heating Source	1	0	1	1	1	0	1	1		
3.2.c Common measures										
Insulation of pipes, equipment	1	1	1	1	1	1	1	1		
Installation of balancing and individual thermostatic valves	1	1	1	1	1	1	1	1		
Installation of pumps, radiators, heat exchangers with high	1	1	1	1	1	1	1	1		
efficiency factor				-	-			-		
Application of FCD for the heating, water pumps	1	1	1	1	1	1	1	1		
Occupancy sensors for cold water supply system (water taps, autoflush)	0	0	2	0	0	0	2	0		
Waste water technologies for recuperation of heat for DHW	0	0	0	0	0	0	0	0		
Smart meters	1	0	1	1	1	0	1	1		
3.3 Air conditioning, Ventilation and Cooling										
Application of air recuperators	1	0	1	1	1	0	1	1		
Application of FCD for the pumps, fans, AHU control	1	1	1	1	1	1	1	1		
Installation of VAC equipment with high efficiency factor	1	1	1	1	1	1	1	1		
Application of variable flow cooling system	0	0	0	0	0	0	0	0		
Insulation of distribution pipes	1	0	1	1	1	0	1	1		
Installation of balancing and individual thermostatic controls	1	1	1	1	1	1	1	1		
3.4 Appliance										
EE appliance	3	3	3	3	3	3	3	3		
3.5 Lighting										
Installation of new EE lamps (LED/CFL)	2	2	2	2	2	2	2	2		
Occupancy/motion/ambient lighting sensors	1	0	1	1	1	0	1	1		
Exterior lighting control	0	0	0	0	0	0	0	0		
Application of "day light" solution in architecture	0	0	0	0	0	0	0	0		

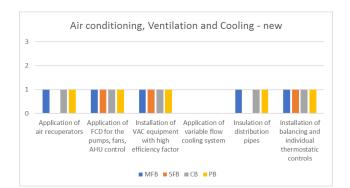


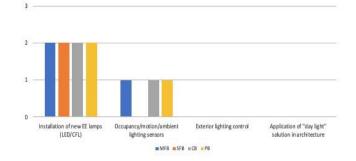


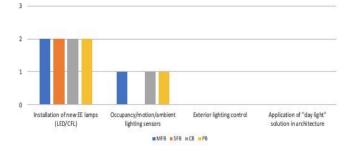












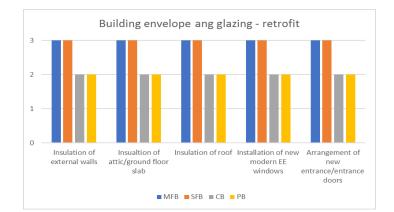
Lighting - new

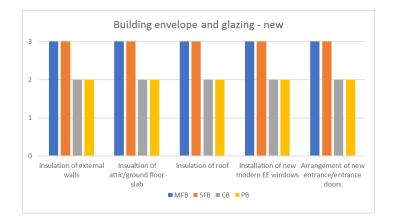


TURKMENISTAN

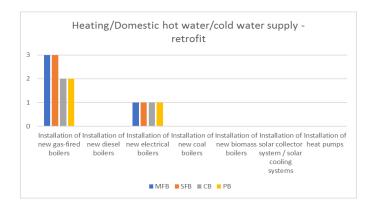
OVERVIEW

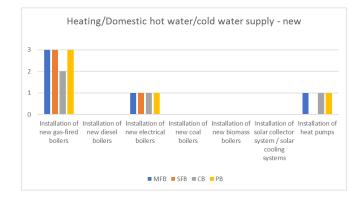
In Turkmenistan the requirements to the energy efficiency of building envelope in the new construction and retrofit, adopted on the national level, are mandatory for both residential (multi-apartment) and single-family buildings. There norms and rules were developed considering the various climatic zones in Turkmenistan. But for the public and commercial buildings these requirements are prescriptive. However, despite the absence of the proper regulatory framework, application of the range of energy efficient technologies is kindly wide-spread. Nowadays there are no specific requirements to the LED technologies application.

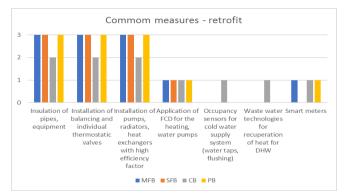


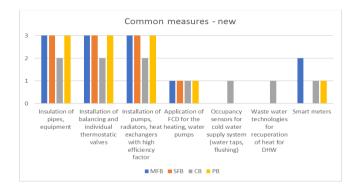


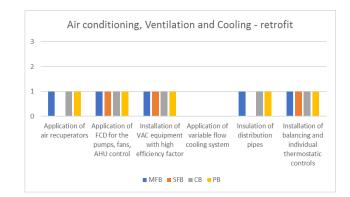
	Turkmenistan									
	Retrofit New construction									
	MFB	SFB	CB	PB	MFB	SFB	CB	PB		
3.1Building envelope and glazing	_									
Insulation of external walls	3	3	2	2	3	3	2	2		
Insualtion of attic/ground floor slab	3	3	2	2	3	3	2	2		
Insulation of roof	3	3	2	2	3	3	2	2		
Installation of new modern EE windows	3	3	2	2	3	3	2	2		
Arrangement of new entrance/entrance doors	3	3	2	2	3	3	2	2		
3.2 Heating/Domestic hot water/cold water supply										
3.2.a Improvement of decentralized heating source										
Installation of new gas-fired boilers	3	3	2	2	3	3	2	3		
Installation of new diesel/oil boilers	0	0	0	0	0	0	0	0		
Installation of new electrical boilers	1	1	1	1	1	1	1	1		
Installation of new coal boilers	0	0	0	0	0	0	0	0		
Installation of new biomass boilers	0	0	0	0	0	0	0	0		
Installation of solar collector system / solar cooling systems	0	0	0	0	0	0	0	0		
Installation of heat pumps	0	0	0	0	1	0	1	1		
3.2.b Improvement of centralized heating source	_									
Improvement of Centralized Heating Source	2	2	1	2	2	2	1	2		
3.2.c Common measures										
Insulation of pipes, equipment	3	3	2	3	3	3	2	3		
Installation of balancing and individual thermostatic valves	3	3	2	3	3	3	2	3		
Installation of pumps, radiators, heat exchangers with high	3	3	2	3	3	3	2	3		
efficiency factor		-		-				-		
Application of FCD for the heating, water pumps	1	1	1	1	1	1	1	1		
Occupancy sensors for cold water supply system (water taps, autoflush)	0	0	1	0	0	0	1	0		
Waste water technologies for recuperation of heat for DHW	0	0	1	0	0	0	1	0		
Smart meters	1	0	1	1	2	0	1	1		
3.3 Air conditioning, Ventilation and Cooling					-					
Application of air recuperators	1	0	1	1	1	0	1	1		
Application of FCD for the pumps, fans, AHU control	1	1	1	1	1	1	1	1		
Installation of VAC equipment with high efficiency factor	1	1	1	1	2	2	2	2		
Application of variable flow cooling system	0	0	0	0	0	0	0	0		
Insulation of distribution pipes	1	0	1	1	2	2	1	2		
Installation of balancing and individual thermostatic controls	1	1	1	1	1	1	1	1		
3.4 Appliance										
EE appliance	2	2	2	2	2	2	2	2		
3.5 Lighting										
Installation of new EE lamps (LED/CFL)	2	1	2	2	2	1	2	2		
Occupancy/motion/ambient lighting sensors	0	0	0	0	0	0	0	0		
Exterior lighting control	0	0	0	0	2	2	1	2		
Application of "day light" solution in architecture	0	0	0	0	0	0	0	0		

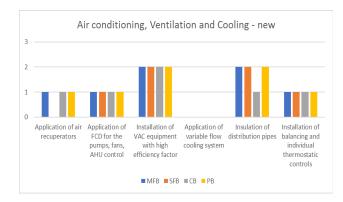


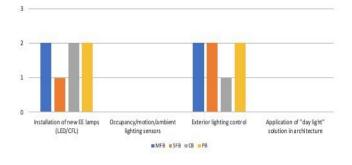












Lighting - new

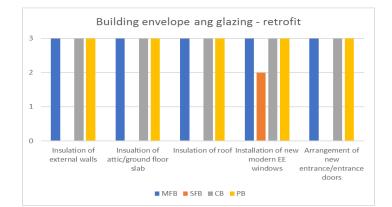
Lighting - retrofit

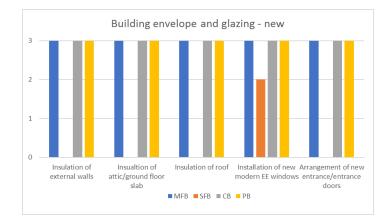


UKRAINE

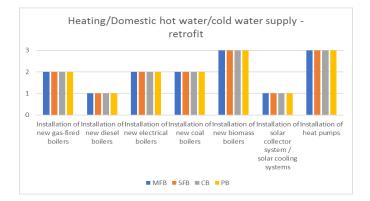
OVERVIEW

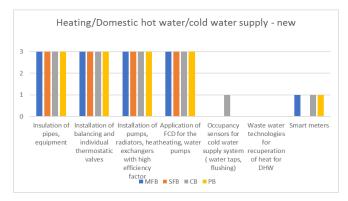
The modern building energy codes extends mostly to the multi-apartment residential buildings, while around 30% of all households is shared of the private sector. Adopted the mandatory labelling of energy efficient household appliances, began the transition to the LED technologies. However, application of the LED lamps is still not adopted on the national level.

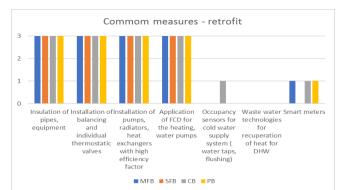


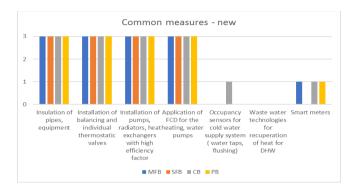


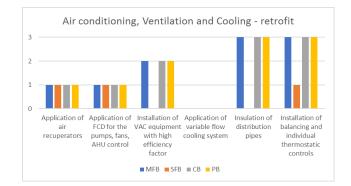
	Ukraine									
		Ret	rofit			New cor	struction			
	MFB	SFB	CB	PB	MFB	SFB	CB	PB		
3.1Building envelope and glazing										
Insulation of external walls	3	0	3	3	3	0	3	3		
Insualtion of attic/ground floor slab	3	0	3	3	3	0	3	3		
Insulation of roof	3	0	3	3	3	0	3	3		
Installation of new modern EE windows	3	2	3	3	3	2	3	3		
Arrangement of new entrance/entrance doors	3	0	3	3	3	0	3	3		
3.2 Heating/Domestic hot water/cold water supply										
3.2.a Improvement of decentralized heating source	_									
Installation of new gas-fired boilers	2	2	2	2	2	2	2	2		
Installation of new diesel/oil boilers	1	1	1	1	1	1	1	1		
Installation of new electrical boilers	2	2	2	2	2	2	2	2		
Installation of new coal boilers	2	2	2	2	2	2	2	2		
Installation of new biomass boilers	3	3	3	3	3	3	3	3		
Installation of solar collector system / solar cooling systems	1	1	1	1	1	1	1	1		
Installation of heat pumps	3	3	3	3	3	3	3	3		
3.2.b Improvement of centralized heating source										
Improvement of Centralized Heating Source	3	0	3	3	3	0	3	3		
3.2.c Common measures										
Insulation of pipes, equipment	3	3	3	3	3	3	3	3		
Installation of balancing and individual thermostatic valves	3	3	3	3	3	3	3	3		
Installation of pumps, radiators, heat exchangers with high	3	3	3	3	3	3	3	3		
efficiency factor							· · ·			
Application of FCD for the heating, water pumps	3	3	3	3	3	3	3	3		
Occupancy sensors for cold water supply system (water taps, autoflush)	0	0	1	0	0	0	1	0		
Waste water technologies for recuperation of heat for DHW	0	0	0	0	0	0	0	0		
Smart meters	1	0	1	1	1	0	1	1		
3.3 Air conditioning, Ventilation and Cooling										
Application of air recuperators	1	1	1	1	1	1	1	1		
Application of FCD for the pumps, fans, AHU control	1	1	1	1	1	1	1	1		
Installation of VAC equipment with high efficiency factor	2	0	2	2	2	0	2	2		
Application of variable flow cooling system	0	0	0	0	0	0	0	0		
Insulation of distribution pipes	3	0	3	3	3	0	3	3		
Installation of balancing and individual thermostatic controls	3	1	3	3	3	1	3	3		
3.4 Appliance										
EE appliance	3	3	3	3	3	3	3	3		
3.5 Lighting										
Installation of new EE lamps (LED/CFL)	2	1	2	2	2	1	2	2		
Occupancy/motion/ambient lighting sensors	1	0	1	1	1	0	1	1		
Exterior lighting control	1	0	1	1	1	0	1	1		
Application of "day light" solution in architecture	1	0	1	1	1	0	1	1		

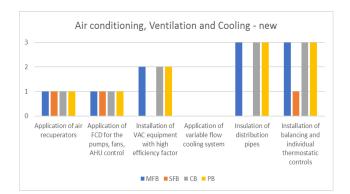


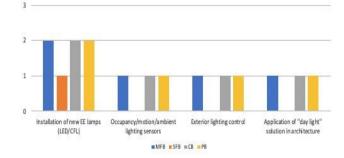


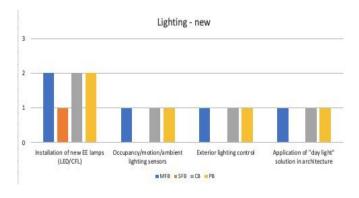










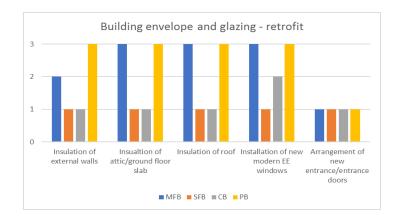




UZBEKISTAN

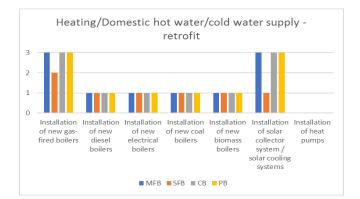
OVERVIEW

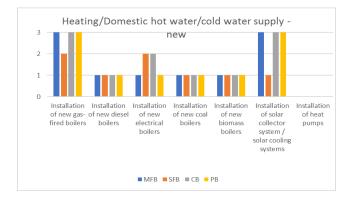
Nowadays the obligatory requirement to the efficiency of buildings envelope are applied in regard of the new construction or retrofit of the multi-apartment residential or public buildings, while the most part of the housing stock in Uzbekistan consists of the private sector (rural housing).

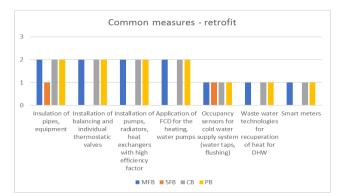


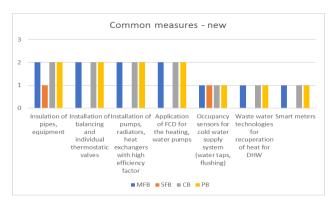


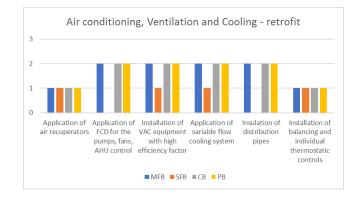
				Uzbe	kistan						
		Ret	rofit			New cor	struction				
	MFB	SFB	CB	PB	MFB	SFB	CB	PB			
3.1Building envelope and glazing											
Insulation of external walls	2	1	1	3	3	1	1	3			
Insualtion of attic/ground floor slab	3	1	1	3	3	1	1	3			
Insulation of roof	3	1	1	3	3	2	2	3			
Installation of new modern EE windows	3	1	2	3	3	2	2	3			
Arrangement of new entrance/entrance doors	1	1	1	1	1	1	1	1			
3.2 Heating/Domestic hot water/cold water supp	bly										
3.2.a Improvement of decentralized heating source											
Installation of new gas-fired boilers	3	2	3	3	3	2	3	3			
Installation of new diesel/oil boilers	1	1	1	1	1	1	1	1			
Installation of new electrical boilers	1	1	1	1	1	2	2	1			
Installation of new coal boilers	1	1	1	1	1	1	1	1			
Installation of new biomass boilers	1	1	1	1	1	1	1	1			
Installation of solar collector system / solar cooling systems	3	1	3	3	3	1	3	3			
Installation of heat pumps	0	0	0	0	0	0	0	0			
3.2.b Improvement of centralized heating source											
Improvement of Centralized Heating Source	1	0	1	1	1	0	1	1			
3.2.c Common measures											
Insulation of pipes, equipment	2	1	2	2	2	1	2	2			
Installation of balancing and individual thermostatic valves	2	0	2	2	2	0	2	2			
Installation of pumps, radiators, heat exchangers with high											
efficiency factor	2	0	2	2	2	0	2	2			
Application of FCD for the heating, water pumps	2	0	2	2	2	0	2	2			
Occupancy sensors for cold water supply system (water											
taps, autoflush)	1	1	1	1	1	1	1	1			
Waste water technologies for recuperation of heat for DHW	1	0	1	1	1	0	1	1			
Smart meters	1	0	1	1	1	0	1	1			
3.3 Air conditioning, Ventilation and Cooling											
Application of air recuperators	1	1	1	1	1	1	1	1			
Application of FCD for the pumps, fans, AHU control	2	0	2	2	2	0	2	2			
Installation of VAC equipment with high efficiency factor	2	1	2	2	2	1	2	2			
Application of variable flow cooling system	2	1	2	2	2	1	2	2			
Insulation of distribution pipes	2	0	2	2	2	0	2	2			
Installation of balancing and individual thermostatic							-				
controls	1	1	1	1	1	1	1	1			
3.4 Appliance											
EE appliance	2	2	3	3	3	3	3	3			
3.5 Lighting											
Installation of new EE lamps (LED/CFL)	2	1	2	3	2	2	2	3			
Occupancy/motion/ambient lighting sensors	1	1	1	1	1	1	2	1			
Exterior lighting control	1	1	1	1	1	1	2	1			
Application of "day light" solution in architecture	0	0	0	0	0	0	2	0			

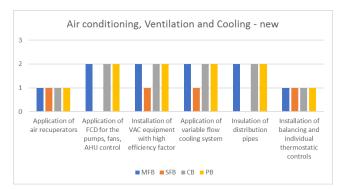


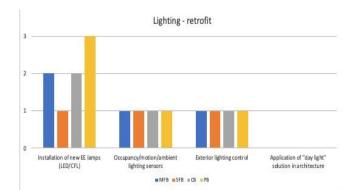


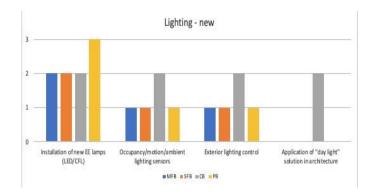














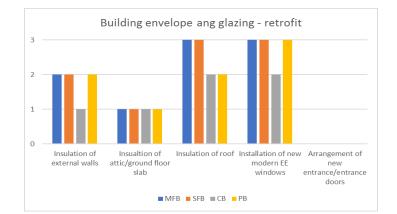
Albania Bosnia and Herzegovina FYR of Macedonia Montenegro Serbia

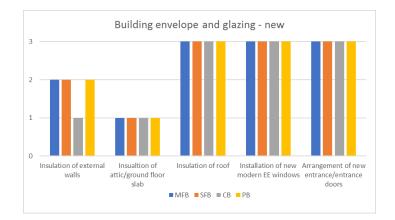


ALBANIA

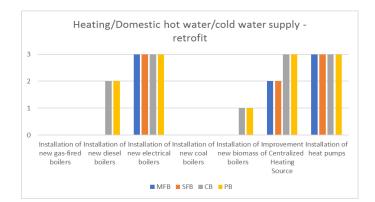
OVERVIEW

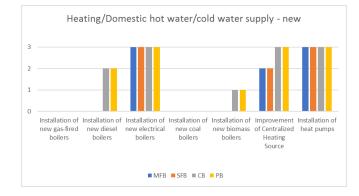
The current legislation in the field of energy efficiency defines the requirements to the roof insulation only, as well as to the installation of energy saving windows in residential and public buildings. Due to the prevalence of the decentralized heat power supply systems, the major part of the considered energy efficiency technologies is not applied. The electric boilers are frequently used for the hot water and heat power supply.

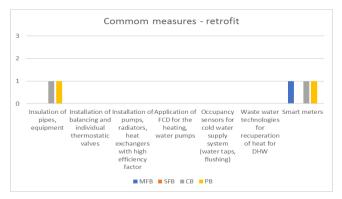


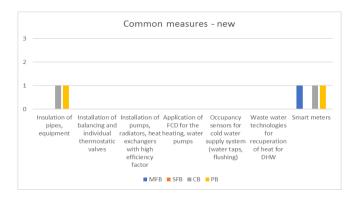


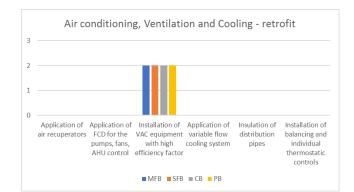
	Albania								
	Retrofit New construction								
	MFB	SFB	CB	PB	MFB	SFB	CB	PB	
3.1Building envelope and glazing	_								
Insulation of external walls	2	2	1	2	2	2	1	2	
Insualtion of attic/ground floor slab	1	1	1	1	1	1	1	1	
Insulation of roof	3	3	2	2	3	3	3	3	
Installation of new modern EE windows	3	3	2	3	3	3	3	3	
Arrangement of new entrance/entrance doors	0	0	0	0	3	3	3	3	
3.2 Heating/Domestic hot water/cold water supply									
3.2.a Improvement of decentralized heating source									
Installation of new gas-fired boilers	0	0	0	0	0	0	0	0	
Installation of new diesel/oil boilers	0	0	2	2	0	0	2	2	
Installation of new electrical boilers	3	3	3	3	3	3	3	3	
Installation of new coal boilers	0	0	0	0	0	0	0	0	
Installation of new biomass boilers	0	0	1	1	0	0	1	1	
Installation of solar collector system / solar cooling systems	2	2	3	3	2	2	3	3	
Installation of heat pumps	3	3	3	3	3	3	3	3	
3.2.b Improvement of centralized heating source									
Improvement of Centralized Heating Source	0	0	0	0	0	0	0	0	
3.2.c Common measures									
Insulation of pipes, equipment	0	0	1	1	0	0	1	1	
Installation of balancing and individual thermostatic valves	0	0	0	0	0	0	0	0	
Installation of pumps, radiators, heat exchangers with high	0	0	0	0	0	0	0	0	
efficiency factor		-				-			
Application of FCD for the heating, water pumps	0	0	0	0	0	0	0	0	
Occupancy sensors for cold water supply system (water taps, autoflush)	0	0	0	0	0	0	0	0	
Waste water technologies for recuperation of heat for DHW	0	0	0	0	0	0	0	0	
Smart meters	1	0	1	1	1	0	1	1	
3.3 Air conditioning, Ventilation and Cooling									
Application of air recuperators	0	0	0	0	0	0	0	0	
Application of FCD for the pumps, fans, AHU control	0	0	0	0	0	0	0	0	
Installation of VAC equipment with high efficiency factor	2	2	2	2	2	2	2	2	
Application of variable flow cooling system	0	0	0	0	0	0	0	0	
Insulation of distribution pipes	0	0	0	0	0	0	0	0	
Installation of balancing and individual thermostatic controls	0	0	0	0	0	0	0	0	
3.4 Appliance									
EE appliance	3	3	3	3	3	3	3	3	
3.5 Lighting									
Installation of new EE lamps (LED/CFL)	2	2	2	2	3	3	3	3	
Occupancy/motion/ambient lighting sensors	1	1	1	1	2	2	2	2	
Exterior lighting control	0	0	0	0	0	0	0	0	
Application of "day light" solution in architecture	0	0	0	0	2	2	2	2	

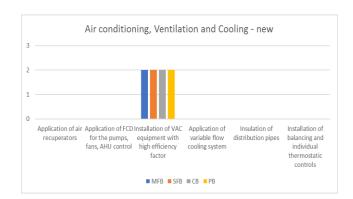


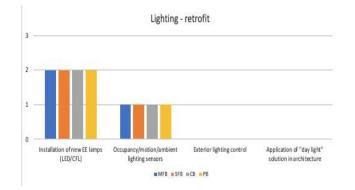


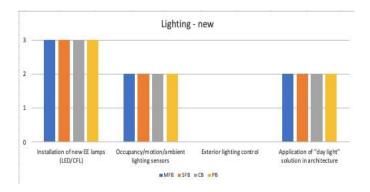










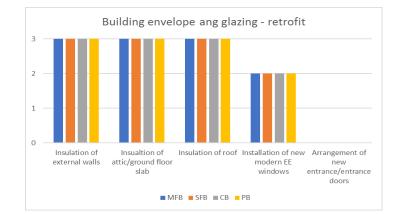


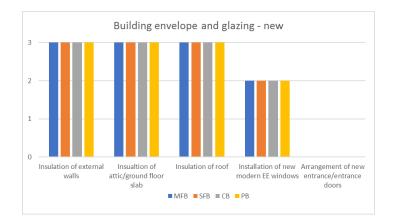


BOSNIA AND HERZEGOVINA

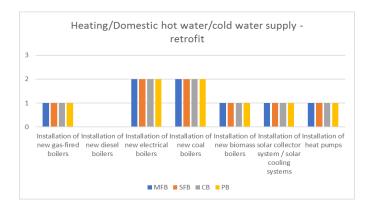
OVERVIEW

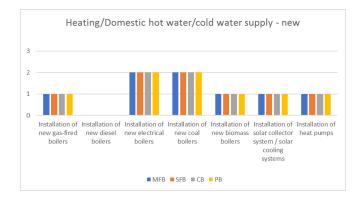
In Bosnia and Herzegovina the legislation in the field of buildings energy efficiency in inextricably linked with the regulatory framework of Serbia, which defines the mandatory requirements to the energy efficiency of buildings envelope in new construction and retrofit of existing buildings. Nowadays on the national level are adopted specific requirements to the EE labelling of appliances, including implementation of LED lighting, which has a significant impact on the presense of such lamps in the buildings and on the streets.



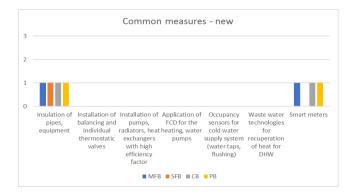


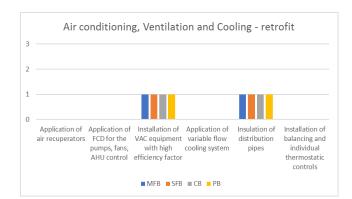
				Bosnia and I	Herzegovina	1		
	Retrofit New construction							
	MFB	SFB	CB	PB	MFB	SFB	CB	PB
3.1Building envelope and glazing							-	_
Insulation of external walls	3	3	3	3	3	3	3	3
Insualtion of attic/ground floor slab	3	3	3	3	3	3	3	3
Insulation of roof	3	3	3	3	3	3	3	3
Installation of new modern EE windows	2	2	2	2	2	2	2	2
Arrangement of new entrance/entrance doors	0	0	0	0	0	0	0	0
3.2 Heating/Domestic hot water/cold water supply								
3.2.a Improvement of decentralized heating source	_							
Installation of new gas-fired boilers	1	1	1	1	1	1	1	1
Installation of new diesel/oil boilers	0	0	0	0	0	0	0	0
Installation of new electrical boilers	2	2	2	2	2	2	2	2
Installation of new coal boilers	2	2	2	2	2	2	2	2
Installation of new biomass boilers	1	1	1	1	1	1	1	1
Installation of solar collector system / solar cooling systems	1	1	1	1	1	1	1	1
Installation of heat pumps	1	1	1	1	1	1	1	1
3.2.b Improvement of centralized heating source	-		_		-			-
Improvement of Centralized Heating Source	0	0	0	0	0	0	0	0
3.2.c Common measures								
Insulation of pipes, equipment	1	1	1	1	1	1	1	1
Installation of balancing and individual thermostatic valves	0	0	0	0	0	0	0	0
Installation of pumps, radiators, heat exchangers with high	0	0	0	0	0	0	0	0
efficiency factor								
Application of FCD for the heating, water pumps	0	0	0	0	0	0	0	0
Occupancy sensors for cold water supply system (water taps, autoflush)	0	0	0	0	0	0	0	0
Waste water technologies for recuperation of heat for DHW	0	0	0	0	0	0	0	0
Smart meters	1	0	1	1	1	0	1	1
3.3 Air conditioning, Ventilation and Cooling								
Application of air recuperators	0	0	0	0	0	0	0	0
Application of FCD for the pumps, fans, AHU control	0	0	0	0	0	0	0	0
Installation of VAC equipment with high efficiency factor	1	1	1	1	1	1	1	1
Application of variable flow cooling system	0	0	0	0	0	0	0	0
Insulation of distribution pipes	1	1	1	1	1	1	1	1
Installation of balancing and individual thermostatic controls	0	0	0	0	0	0	0	0
3.4 Appliance								
EE appliance	2	2	2	2	2	2	2	2
3.5 Lighting								
Installation of new EE lamps (LED/CFL)	2	1	2	2	2	1	2	2
Occupancy/motion/ambient lighting sensors	0	0	0	0	0	0	0	0
Exterior lighting control	0	0	0	0	0	0	0	0
Application of "day light" solution in architecture	0	0	0	0	0	0	0	0

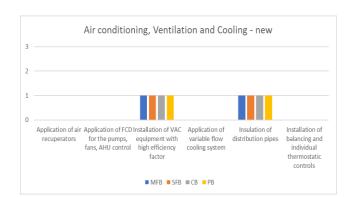


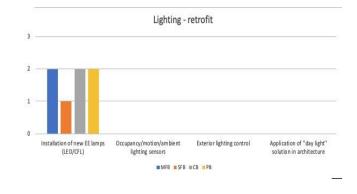


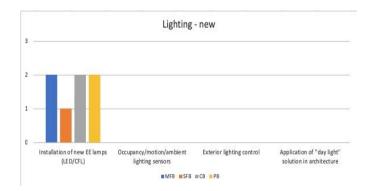
		Co	ommom	measures	- retrofit	t	
3							
2							
1							
~	Insulation of pipes, equipment	Installation of I balancing and individual thermostatic valves	pumps,	Application of FCD for the heating, water pumps	sensors for cold water	technologies for recuperation of heat for	
			MFB	SFB CB	PB		









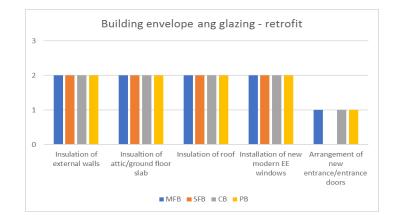




FYR OF MACEDONIA

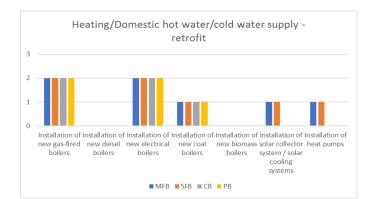
OVERVIEW

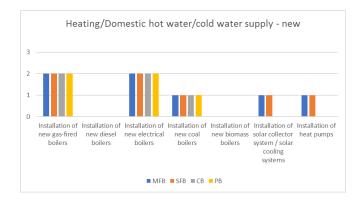
Despite the fact that the requirements to the buildings energy efficiency are still not adopted on the national level, the modern energy saving technologies of building envelope insulation are frequently applied both in new construction and retrofits of existing buildings. In Macedonia, as well as in the whole Balcan region, there is almost no centralized heat supply. Therefore, energy saving measures in the field of modernization of the heat distribution pipes and proper equipment are not applied. For the decentralized systems need are mostly used various gar-fired and electric bioler units, as well as oven heating.





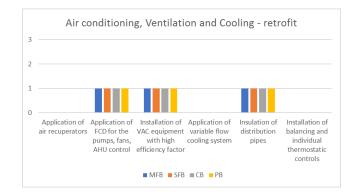
	The former Yugoslav Republic of Macedonia								
	Retrofit				New construction				
	MFB	SFB	CB	PB	MFB	SFB	CB	PB	
3.1Building envelope and glazing	-								
Insulation of external walls	2	2	2	2	2	2	2	2	
Insualtion of attic/ground floor slab	2	2	2	2	2	2	2	2	
Insulation of roof	2	2	2	2	2	2	2	2	
Installation of new modern EE windows	2	2	2	2	2	2	2	2	
Arrangement of new entrance/entrance doors	1	0	1	1	1	0	1	1	
3.2 Heating/Domestic hot water/cold water supply									
3.2.a Improvement of decentralized heating source									
Installation of new gas-fired boilers	2	2	2	2	2	2	2	2	
Installation of new diesel/oil boilers	0	0	0	0	0	0	0	0	
Installation of new electrical boilers	2	2	2	2	2	2	2	2	
Installation of new coal boilers	1	1	1	1	1	1	1	1	
Installation of new biomass boilers	0	0	0	0	0	0	0	0	
Installation of solar collector system / solar cooling systems	1	1	0	0	1	1	0	0	
Installation of heat pumps	1	1	0	0	1	1	0	0	
3.2.b Improvement of centralized heating source									
Improvement of Centralized Heating Source	0	0	0	0	0	0	0	0	
3.2.c Common measures									
Insulation of pipes, equipment	1	1	1	1	1	1	1	1	
Installation of balancing and individual thermostatic valves	0	0	0	0	0	0	0	0	
Installation of pumps, radiators, heat exchangers with high	0	0	0	0	0	0	0	0	
efficiency factor									
Application of FCD for the heating, water pumps	0	0	0	0	0	0	0	0	
Occupancy sensors for cold water supply system (water taps, autoflush)	0	0	0	0	0	0	0	0	
Waste water technologies for recuperation of heat for DHW	0	0	0	0	0	0	0	0	
Smart meters	1	0	1	1	1	0	1	1	
3.3 Air conditioning, Ventilation and Cooling									
Application of air recuperators	0	0	0	0	0	0	0	0	
Application of FCD for the pumps, fans, AHU control	1	1	1	1	1	1	1	1	
Installation of VAC equipment with high efficiency factor	1	1	1	1	1	1	1	1	
Application of variable flow cooling system	0	0	0	0	0	0	0	0	
Insulation of distribution pipes	1	1	1	1	1	1	1	1	
Installation of balancing and individual thermostatic controls	0	0	0	0	0	0	0	0	
3.4 Appliance									
EE appliance	3	3	3	3	3	3	3	3	
3.5 Lighting									
Installation of new EE lamps (LED/CFL)	2	1	2	2	2	1	2	2	
Occupancy/motion/ambient lighting sensors	1	0	1	1	1	0	1	1	
Exterior lighting control	1	0	1	1	1	0	1	1	
Application of "day light" solution in architecture	1	0	1	1	1	0	1	1	

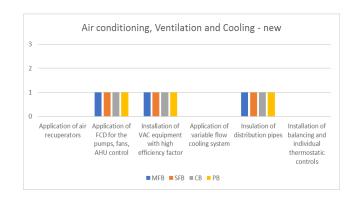


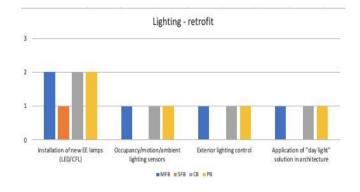


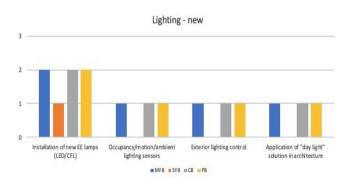
_		Co	mmom	measures	- retrofi	t	
3							
2							
1							
	Insulation of pipes, equipment	Installation of I balancing and individual thermostatic valves	nstallation of pumps, radiators, heat exchangers with high efficiency factor		sensors for cold water	technologies for recuperation of heat for	
			MF8	SFB CB	PB		









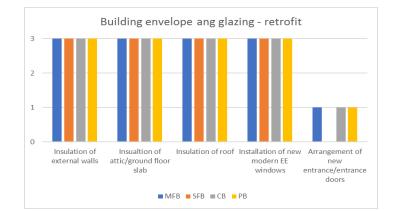




MONTENEGRO

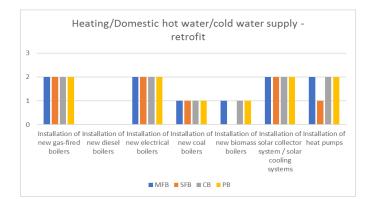
OVERVIEW

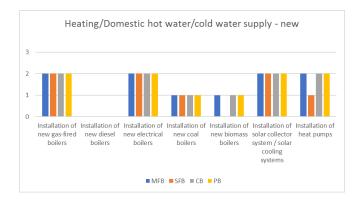
Since 2015 the minimal requirements to the energy efficiency of public and residential buildings entered into force. These legislative documents define the special requirements to the insulation of buildings envelope, as well as installation of the modern energy saving windows etc. However, due to the prevalence of the decentralized heat power supply systems in this country, different measures of the proper systems modernization are frequently applied.

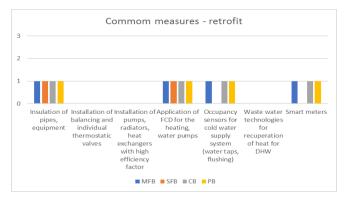


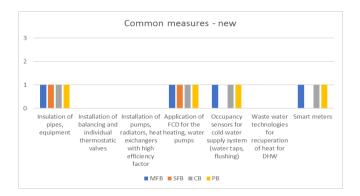


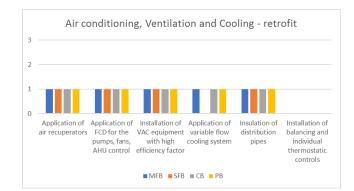
	Montenegro								
	Retrofit				New construction				
	MFB	SFB	CB	PB	MFB	SFB	CB	PB	
3.1Building envelope and glazing									
Insulation of external walls	3	3	3	3	3	3	3	3	
Insualtion of attic/ground floor slab	3	3	3	3	3	3	3	3	
Insulation of roof	3	3	3	3	3	3	3	3	
Installation of new modern EE windows	3	3	3	3	3	3	3	3	
Arrangement of new entrance/entrance doors	1	0	1	1	1	0	1	1	
3.2 Heating/Domestic hot water/cold water supply									
3.2.a Improvement of decentralized heating source									
Installation of new gas-fired boilers	2	2	2	2	2	2	2	2	
Installation of new diesel/oil boilers	0	0	0	0	0	0	0	0	
Installation of new electrical boilers	2	2	2	2	2	2	2	2	
Installation of new coal boilers	1	1	1	1	1	1	1	1	
Installation of new biomass boilers	1	0	1	1	1	0	1	1	
Installation of solar collector system / solar cooling systems	2	2	2	2	2	2	2	2	
Installation of heat pumps	2	1	2	2	2	1	2	2	
3.2.b Improvement of centralized heating source	,	1							
Improvement of Centralized Heating Source	0	0	0	0	0	0	0	0	
3.2.c Common measures	_								
Insulation of pipes, equipment	1	1	1	1	1	1	1	1	
Installation of balancing and individual thermostatic valves	0	0	0	0	0	0	0	0	
Installation of pumps, radiators, heat exchangers with high	0	0	0	0	0	0	0	0	
efficiency factor									
Application of FCD for the heating, water pumps	1	1	1	1	1	1	1	1	
Occupancy sensors for cold water supply system (water taps, autoflush)	1	0	1	1	1	0	1	1	
Waste water technologies for recuperation of heat for DHW	0	0	0	0	0	0	0	0	
Smart meters	1	0	1	1	1	0	1	1	
3.3 Air conditioning, Ventilation and Cooling									
Application of air recuperators	1	1	1	1	1	1	1	1	
Application of FCD for the pumps, fans, AHU control	1	1	1	1	1	1	1	1	
Installation of VAC equipment with high efficiency factor	1	1	1	1	1	1	1	1	
Application of variable flow cooling system	1	0	1	1	1	0	1	1	
Insulation of distribution pipes	1	1	1	1	1	1	1	1	
Installation of balancing and individual thermostatic controls	0	0	0	0	0	0	0	0	
3.4 Appliance									
EE appliance	3	3	3	3	3	3	3	3	
3.5 Lighting									
Installation of new EE lamps (LED/CFL)	2	2	2	2	2	2	2	2	
Occupancy/motion/ambient lighting sensors	1	0	1	1	1	0	1	1	
Exterior lighting control	1	0	1	1	1	0	1	1	
Application of "day light" solution in architecture	1	0	1	1	1	0	1	1	

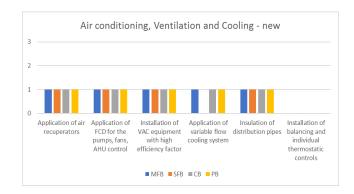


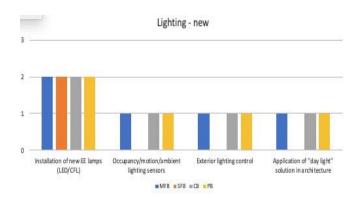












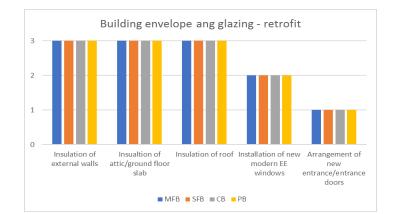
Lighting - retrofit





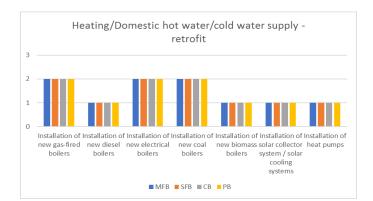
OVERVIEW

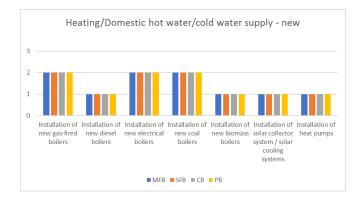
In Serbia action of buildings energy codes extend to all types of buildings from the private sector to municipal public ones. However, due to the lack of centralized heat power supply systems, such technologies like individual heat points with weather control are not applied. For need of decentralized heat power supply the different types of boiler equipment are frequently used.

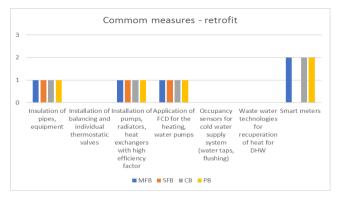




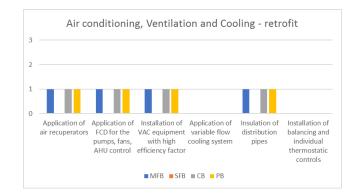
	Serbia								
	Retrofit New construction						struction		
	MFB	SFB	CB	PB	MFB	SFB	CB	PB	
3.1Building envelope and glazing									
Insulation of external walls	3	3	3	3	3	3	3	3	
Insualtion of attic/ground floor slab	3	3	3	3	3	3	3	3	
Insulation of roof	3	3	3	3	3	3	3	3	
Installation of new modern EE windows	2	2	2	2	2	2	2	2	
Arrangement of new entrance/entrance doors	1	1	1	1	1	1	1	1	
3.2 Heating/Domestic hot water/cold water supply									
3.2.a Improvement of decentralized heating source									
Installation of new gas-fired boilers	2	2	2	2	2	2	2	2	
Installation of new diesel/oil boilers	1	1	1	1	1	1	1	1	
Installation of new electrical boilers	2	2	2	2	2	2	2	2	
Installation of new coal boilers	2	2	2	2	2	2	2	2	
Installation of new biomass boilers	1	1	1	1	1	1	1	1	
Installation of solar collector system / solar cooling systems	1	1	1	1	1	1	1	1	
Installation of heat pumps	1	1	1	1	1	1	1	1	
3.2.b Improvement of centralized heating source									
Improvement of Centralized Heating Source	0	0	0	0	0	0	0	0	
3.2.c Common measures									
Insulation of pipes, equipment	1	1	1	1	1	1	1	1	
Installation of balancing and individual thermostatic valves	0	0	0	0	0	0	0	0	
Installation of pumps, radiators, heat exchangers with high	1	1	1	1	1	1	1	1	
efficiency factor									
Application of FCD for the heating, water pumps Occupancy sensors for cold water supply system (water taps,	1	1	1	1	1	1	1	1	
autoflush)	0	0	0	0	0	0	0	0	
Waste water technologies for recuperation of heat for DHW	0	0	0	0	0	0	0	0	
Smart meters	2	0	2	2	2	1	2	2	
3.3 Air conditioning, Ventilation and Cooling									
Application of air recuperators	1	0	1	1	1	0	1	1	
Application of FCD for the pumps, fans, AHU control	1	0	1	1	1	0	1	1	
Installation of VAC equipment with high efficiency factor	1	0	1	1	1	0	1	1	
Application of variable flow cooling system	0	0	0	0	0	0	0	0	
Insulation of distribution pipes	1	0	1	1	1	0	1	1	
Installation of balancing and individual thermostatic controls	0	0	0	0	0	0	0	0	
3.4 Appliance									
EE appliance	3	3	3	3	3	3	3	3	
3.5 Lighting									
Installation of new EE lamps (LED/CFL)	2	2	2	2	2	2	2	2	
Occupancy/motion/ambient lighting sensors	1	0	1	1	1	0	1	1	
Exterior lighting control	1	0	1	1	1	0	1	1	
Application of "day light" solution in architecture	1	0	1	1	1	0	1	1	

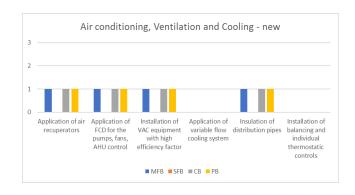


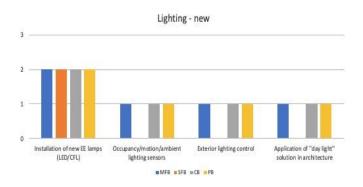












Lighting - retrofit

SUBREGION F

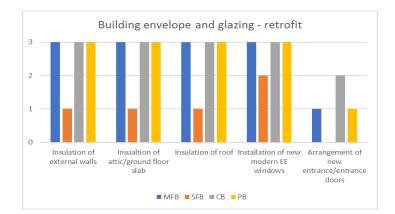
Turkey

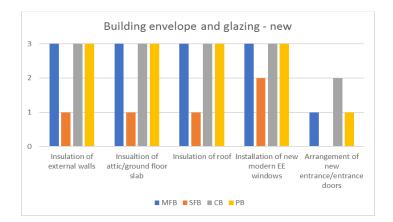


TURKEY

OVERVIEW

In Turkey on the governmental level operate were adopted the building energy codes, which oblige the developers to implement different energy saving technologies within the new construction and retrofit both of multi-apartment residential and municipal buildings. The range of TSN standards are harmonized with some of the EU buildings energy codes. A special attention is paid to the implementation and promotion of energy efficiency labelling of the household appliances.





	Turkey								
		Ret	rofit		New construction				
	MFB	SFB	CB	PB	MFB	SFB	CB	PB	
3.1Building envelope and glazing									
Insulation of external walls	3	1	3	3	3	1	3	3	
Insualtion of attic/ground floor slab	3	1	3	3	3	1	3	3	
Insulation of roof	3	1	3	3	3	1	3	3	
Installation of new modern EE windows	3	2	3	3	3	2	3	3	
Arrangement of new entrance/entrance doors	1	0	2	1	1	0	2	1	
3.2 Heating/Domestic hot water/cold water sup	ply								
3.2.a Improvement of decentralized heating source									
Installation of new gas-fired boilers	2	2	2	2	2	2	2	2	
Installation of new diesel/oil boilers	1	1	1	1	1	1	1	1	
Installation of new electrical boilers	2	2	2	2	2	2	2	2	
Installation of new coal boilers	1	1	1	1	1	1	1	1	
Installation of new biomass boilers	1	1	1	1	1	1	1	1	
Installation of solar collector system / solar cooling systems	2	2	2	2	2	2	2	2	
Installation of heat pumps	0	0	0	0	0	0	0	0	
3.2.b Improvement of centralized heating source									
Improvement of Centralized Heating Source	3	0	3	3	3	0	3	3	
3.2.c Common measures									
Insulation of pipes, equipment	1	0	1	1	1	0	1	1	
Installation of balancing and individual thermostatic valves	3	1	3	3	3	1	3	3	
Installation of pumps, radiators, heat exchangers with high									
efficiency factor	3	0	3	3	3	0	3	3	
Application of FCD for the heating, water pumps	0	0	0	0	0	0	0	0	
Occupancy sensors for cold water supply system (water taps, autoflush)	0	0	2	0	0	0	2	0	
Waste water technologies for recuperation of heat for DHW	0	0	0	0	0	0	0	0	
Smart meters	2	1	1	1	2	1	1	1	
3.3 Air conditioning, Ventilation and Cooling		1	1	1	1	r		1	
Application of air recuperators	2	1	2	2	2	1	2	2	
Application of FCD for the pumps, fans, AHU control	0	0	0	0	0	0	0	0	
Installation of VAC equipment with high efficiency factor	2	1	2	2	2	1	2	2	
Application of variable flow cooling system	3	1	3	3	3	1	3	3	
Insulation of distribution pipes	3	1	3	3	3	1	3	3	
Installation of balancing and individual thermostatic	3	2	3	3	3	2	3	3	
controls	3	2	3	3	3	2	3	3	
3.4 Appliance									
EE appliance	3	3	3	3	3	3	3	3	
3.5 Lighting									
Installation of new EE lamps (LED/CFL)	2	2	2	3	2	2	2	3	
Occupancy/motion/ambient lighting sensors	1	1	1	1	1	1	1	1	
Exterior lighting control	1	1	1	1	1	1	1	1	
Application of "day light" solution in architecture	1	0	1	1	1	0	1	1	

