Webinar on Tariff setting in district heating

April 2021.

ЈАВНО КОМУНАЛНО ПРЕДУЗЕЋЕ
ЗА ПРОИЗВОДЊУ И ДИСТРИБУЦИЈУ ТОПЛОТНЕ ЕНЕРГИЈЕ
ГРАДСКА топлана

Cost reflective district heating tariffs in Niš, Serbia

The city of Niš

- 3rd largest city in Serbia
- Cultural, economic and education centre of south Serbia
- Population **260.237** (whole city), **183.164** (city proper)
- Area **266,77 km²** (urban), **2.729 km²** (metro area)
- The birthplace of former Roman emperor, **Constantin the Great**, founder of Constantinople (now Istanbul)

District Heating Company „Gradska toplana“

- **228** employees at the moment
- **16** boiler houses (7 use natural gas, 8 heavy fuel oil, 1 light fuel oil)
- **277,16 MW** installed capacity
- c-ca **70 km** of distribution network
- **1.094** working substations
- **31.958** customers (29.851 residential and 2.107 commercial)
- **2.132.037 m²** total heated surface
- **3.650** customers temporary disconnected (**210.061 m²**)!!!

Boiler houses overview

Boiler house	fuel type	installed capacity [MW]	installed capacity share [%]
Krivi vir	gas	128,00	46,18%
Jug	gas	60,00	21,65%
Univerzitetski klinički centar	gas	29,70	10,72%
Majakovski	gas	14,00	5,05%
Čair	HFO	10,90	3,93%
Somborska	gas	10,74	3,88%
Prirodno matematički fakultet	HFO	8,01	2,89%
Mokranjčeva	HFO	3,25	1,17%
Knjaževačka	HFO	3,00	1,08%
Ardija	HFO	2,80	1,01%
Ratko Jović	gas	1,90	0,69%
Ledena stena I	HFO	1,50	0,54%
Pantelej	HFO	1,16	0,42%
Mika Antić	LFO	1,20	0,43%
Pasi Poljana	HFO	0,55	0,20%
Ledena stena II	gas	0,45	0,16%
		277,16	**100,00%**
	gas	**244,79**	**88,32%**
	HFO	**31,17**	**11,25%**
	LFO	**1,20**	**0,43%**

Key parameters in CBB transition

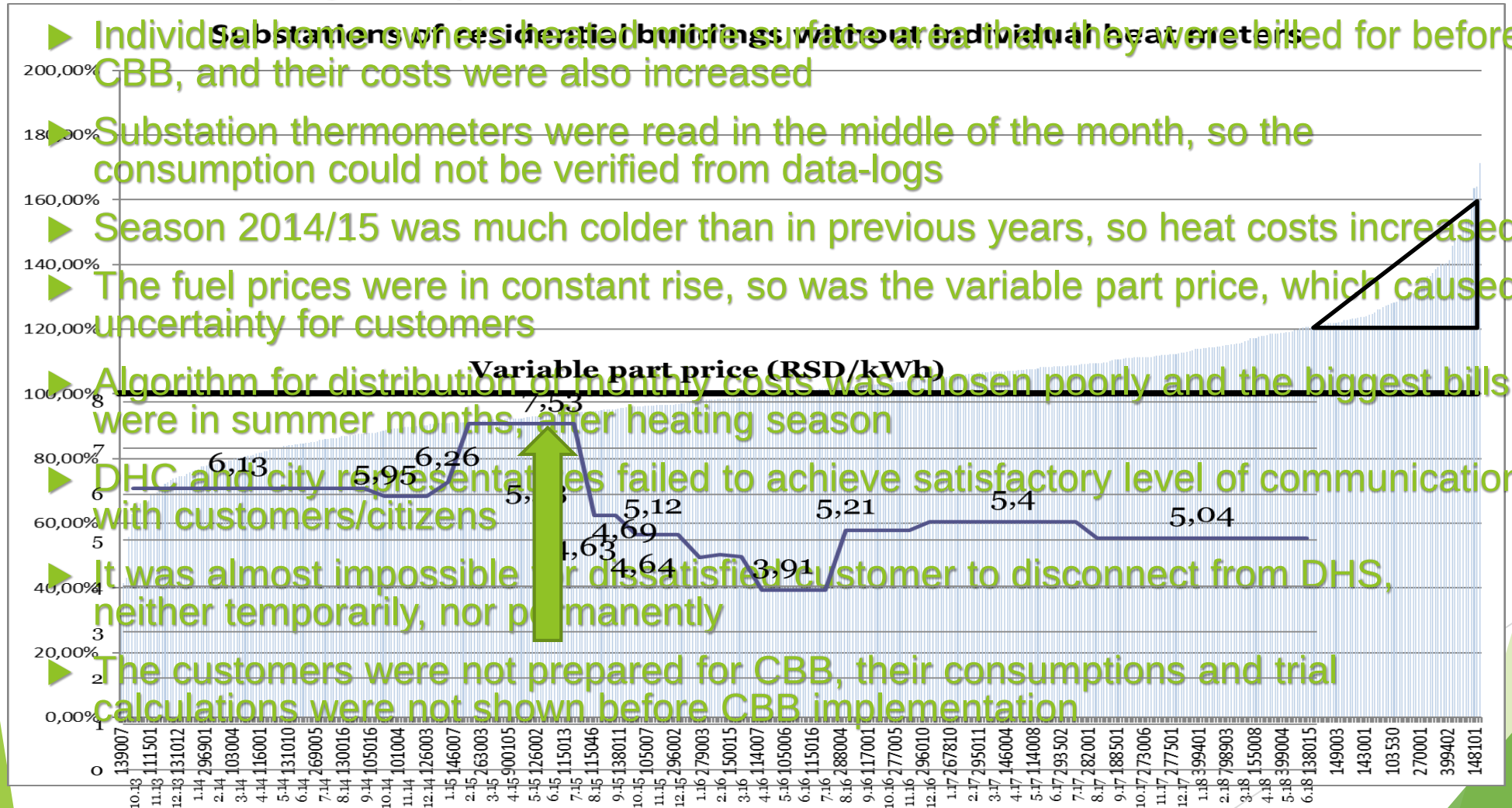
- Local regulations (both at the city level and the DHC level) are in total coordance with state regulations
- In **October 2013**, transition to CBB – 100% customers
- The heat energy cost consists of two parts – **fixed** (per m^2 of heated surface) and **variable** (per kWh of received heat energy)
- At the beginning, we had local methodology for price regulations, but in 2015 new state methodology was introduced, which we follow thoroughly and precisely
- All customers/consumers have the same prices
- In all substations thermometers are installed, and read every month (in the middle of the month, at the beginning of CBB)
- Consumption measured in the substation is devided by heated surface share, unless there are individual heat meters
- **2.206** customers with individual thermometers and **1.064** with heat-cost allocators
- Individual heat-meters are read and maintained by private companies, financed by consumers
- Residential customers, without individual heat meters, are billed for variable part of cost in 12 months, as a rule – different algorithms were applied

Customer dissatisfaction

- Since the introduction of CBB, a lot of customers were dissatisfied and wanted to disconnect from DHS
- Dissatisfaction culminated at the end of 2014/15 season
- There were even demonstrations, organized by civic activists, some of which were homeowner association managers

Main reasons for dissatisfaction

- A significant number of customers live in energy inefficient buildings, and their costs were significatly increased
- Individual home owners heated more surface area than they were billed for before CBB, and their costs were also increased
- Substation thermometers were read in the middle of the month, so the consumption could not be verified from data-logs
- Season 2014/15 was much colder than in previous years, so heat costs increased
- The fuel prices were in constant rise, so was the variable part price, which caused uncertainty for customers
- Algorithm for distribution of monthly costs was chosen poorly and the biggest bills were in summer months, after heating season
- DHC and city representatives failed to achieve satisfactory level of communication with customers/citizens
- It was almost impossible for dissatisfied customer to disconnect from DHS, neither temporarily, nor permanently
- The customers were not prepared for CBB, their consumptions and trial calculations were not shown before CBB implementation



Something had to be done!

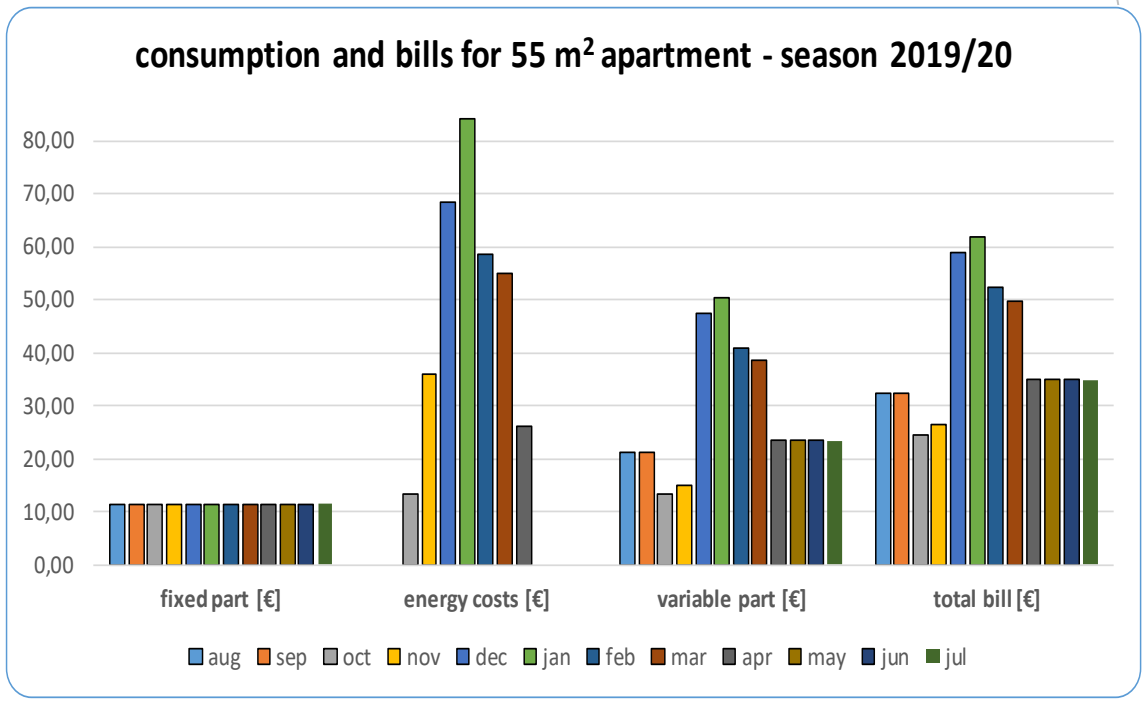
And FAST!!!

Local regulations have been liberalized

- Both temporary and permanent disconnections were made more accesible to customers
- Fixed part price for temporary disconnected customers was cut to 33% of regular price
- Obligations of the DHC to provide the prescribed temperature were made more strict
- Mandatory supply contracts with customers were introduced
- New rulebook for allocation of consumption from a common metering point in the substation was adopted
- Clear and strict regulations for individual metering (thermometers and heat cost allocators at the apartment level) were made
- New algorithm for monthly cost distribution was established

Monthly costs of average 55 m² apartment and new algorithm for billing

season 2019/20	fixed part [€]	specific consump. [kWh/m²]	energy costs [€]	variable part [€]	total bill [€]
aug	11,38			21,12	32,50
sep	11,38			21,12	32,5
oct	11,38	4,29	13,20	13,20	24,58
nov	11,38	11,73	36,11	14,99	26,37
dec	11,38	22,26	68,53	47,41	58,79
jan	11,38	27,32	84,11	50,46	61,84
feb	11,38	19,02	58,55	40,99	52,37
mar	11,38	17,84	54,92	38,44	49,82
apr	11,38	9,22	26,21	23,47	34,85
may	11,38			23,47	34,85
jun	11,38			23,47	34,85
jul	11,38			23,47	34,85
TOTAL:	136,56	111,68	341,63	341,61	478,17
AVERAGE:	11,38	15,95	28,47	28,47	39,85



Citizens were involved in decision making

- City and DHC representatives introduced regular meetings with customer representatives
- Representatives of consumer protection NGO were introduced as full members of DHC's Advisory Board for prycing and DHC's Complaints Commission
- Representative of NGO that led demonstrations is given an „empty chair" in DHC Supervisory Board – the right to be present, argue and suggest, but not to vote
- Citizens are subsidized for heat bills (as for other utility costs) by city, based on their socio-economic vulnerability
- Citizens with average specific consumption over 120% of average are subsidized by DHC, regardless of their income
- Each building was assigned to one of the workers, for better communication and faster problem solving

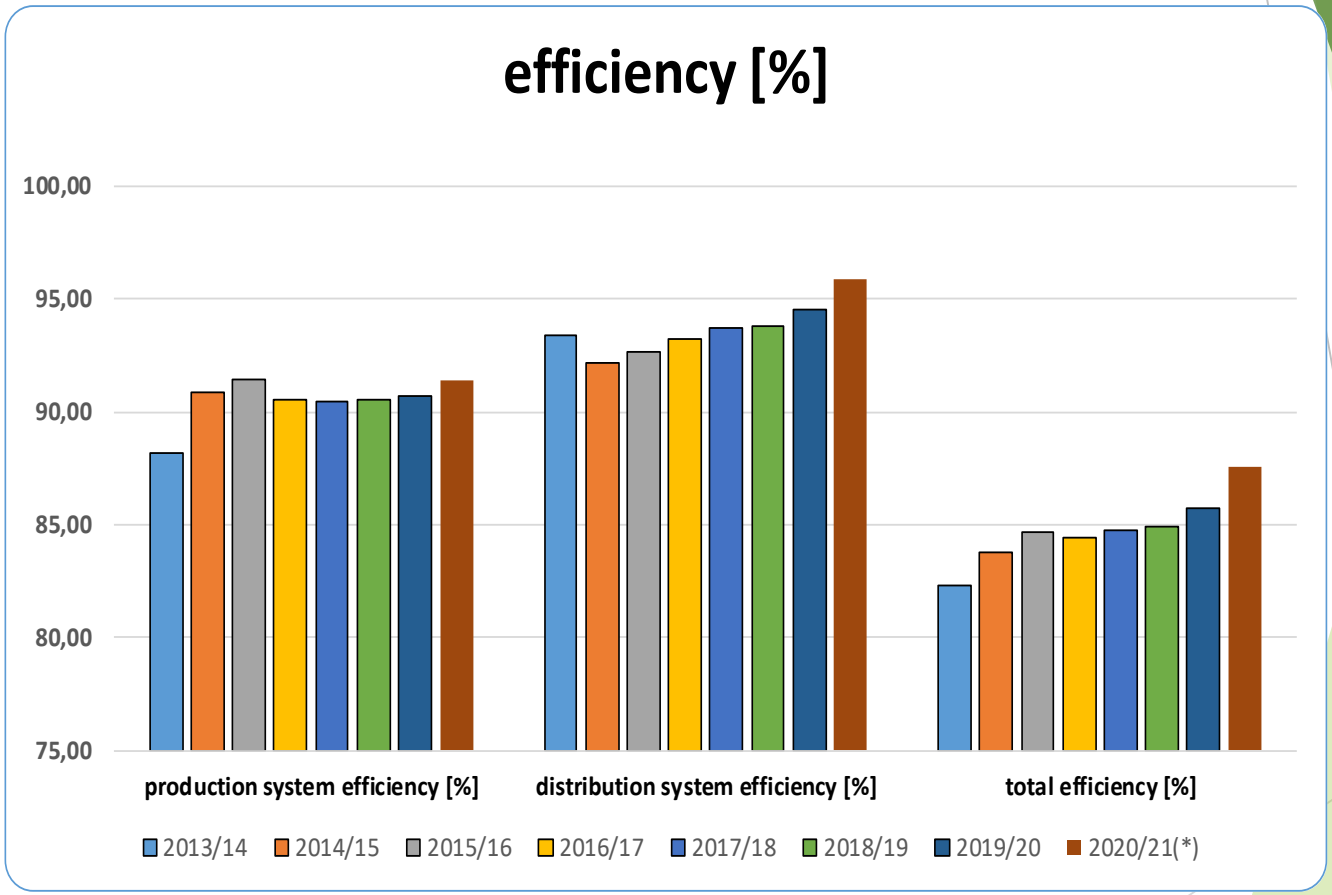
Improving of energy efficiency and cost savings

- DHC managment made an extra effort to cut all unnecessary costs, which influenced fixed part costs at the most
- CBB brought energy efficiency into the focus, both of the production and distribution system
- By prompt interventions on distribution system, water losses were reduced, and even new 302 m deep well began to be used, which further reduced water costs
- Big substations that supply several different buildings, which means a lot of secondary distribution heat losses, were separated
- The plans of changing HFO and LFO and bringing different renewable energy sources (biomass, thermal energy, solar energy) into energy mix were made
- **Customer satisfaction**, together with **energy efficiency**, and **environment protection** became 3 pillars of DHC business model

Production, distribution and overal efficiency

season	production system efficiency [%]	distribution system efficiency [%]	total efficiency [%]
2013/14	88,15	93,37	82,31
2014/15	90,84	92,19	83,75
2015/16	91,42	92,63	84,68
2016/17	90,53	93,26	84,43
2017/18	90,49	93,69	84,78
2018/19	90,52	93,80	84,91
2019/20	90,67	94,57	85,75
2020/21(*)	91,36	95,89	87,61

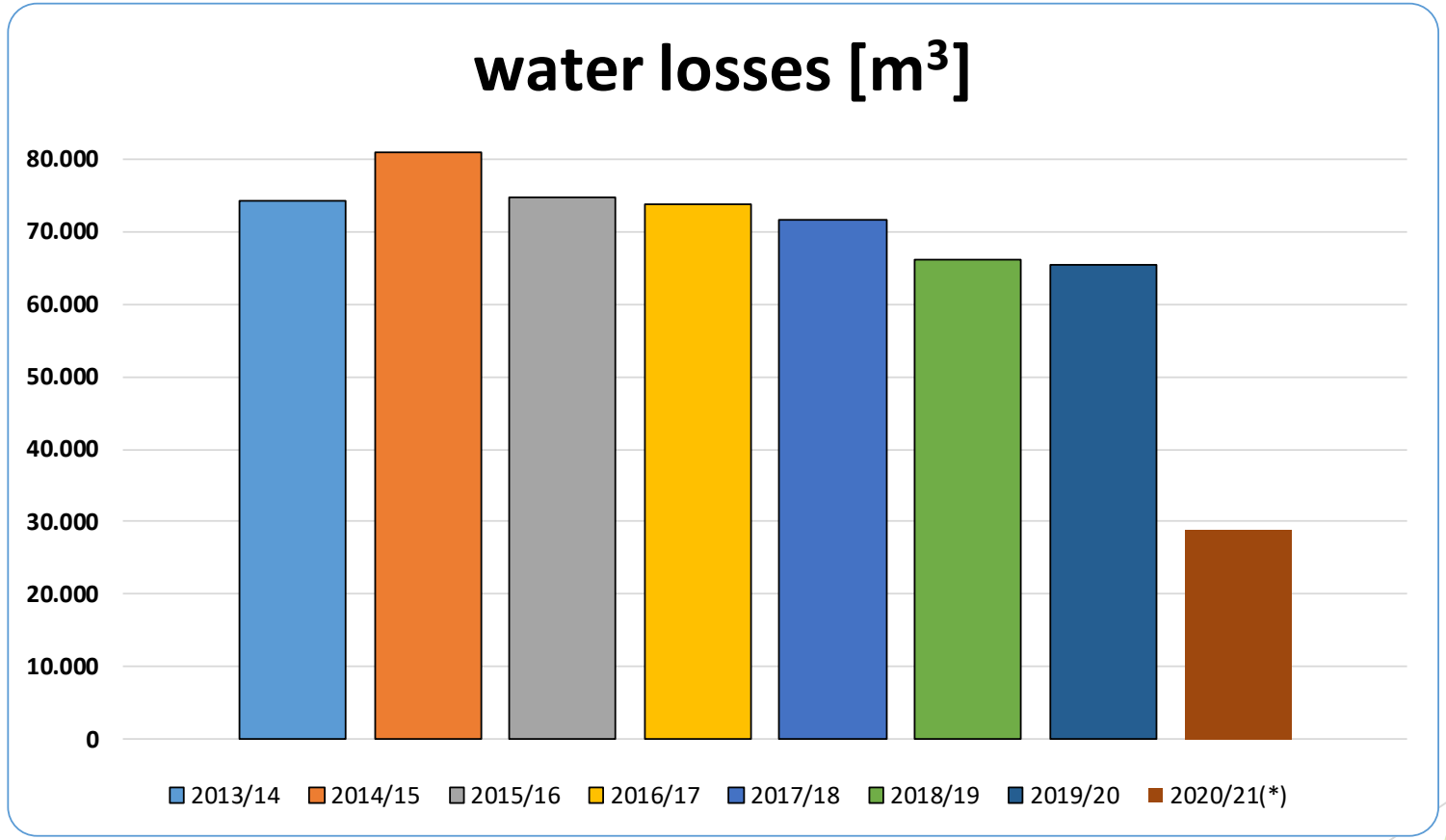
(*) - until march



Distribution system water losses

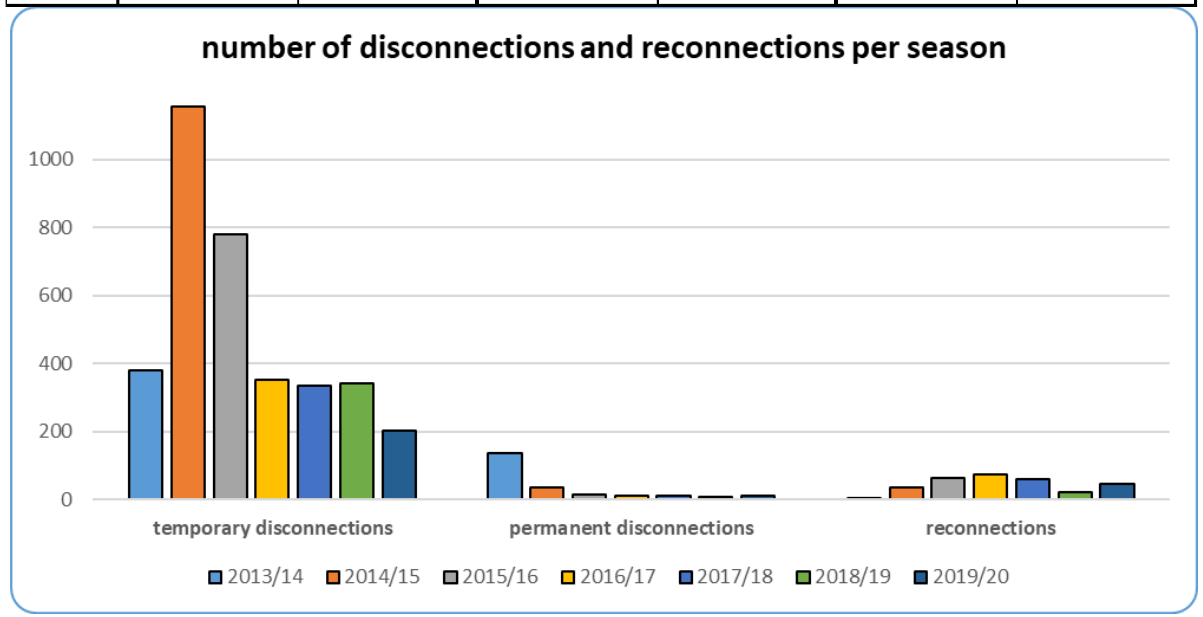
season	water losses [m^3]
2013/14	74.330
2014/15	81.006
2015/16	74.730
2016/17	73.771
2017/18	71.651
2018/19	66.201
2019/20	65.380
2020/21(*)	28.882

(*) - until march



DHS disconnections and reconnections

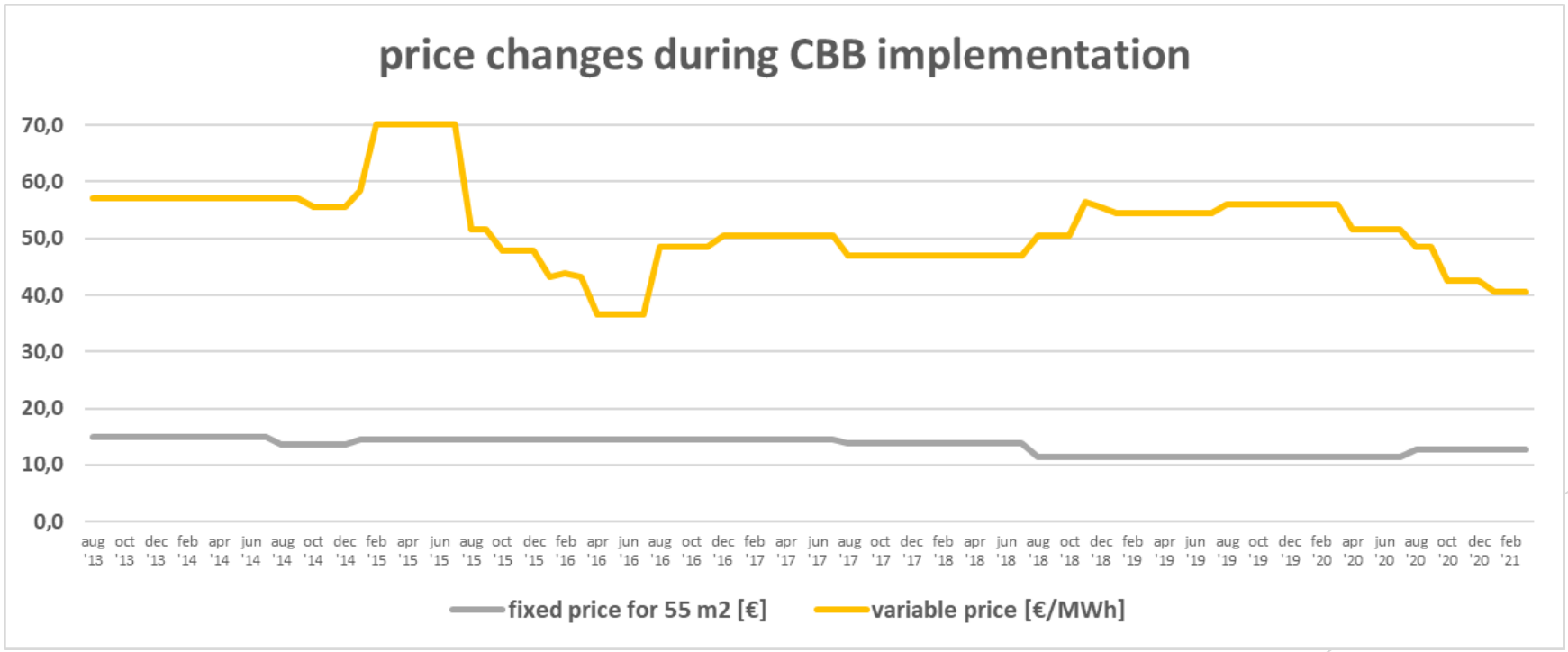
Number and surface of temporary and permanent disconnections and reconnections to DHS						
year	temporary disconnection		permanent disconection		reconnection	
	number of customers	heating area [m^2]	number of customers	heating area [m^2]	number of customers	heating area [m^2]
2014	378	23542,95	137	17305,83	4	1624,18
2015	1156	70565,31	35	4058,7	36	2130,26
2016	778	53068,65	13	1646,54	63	5204,67
2017	352	21857,69	10	1089,76	72	3769,98
2018	333	20722,07	11	1009,52	60	6603,46
2019	342	20307,67	6	2588,42	22	1850,11
2020	203	12340,5	10	1731,26	46	3036,87



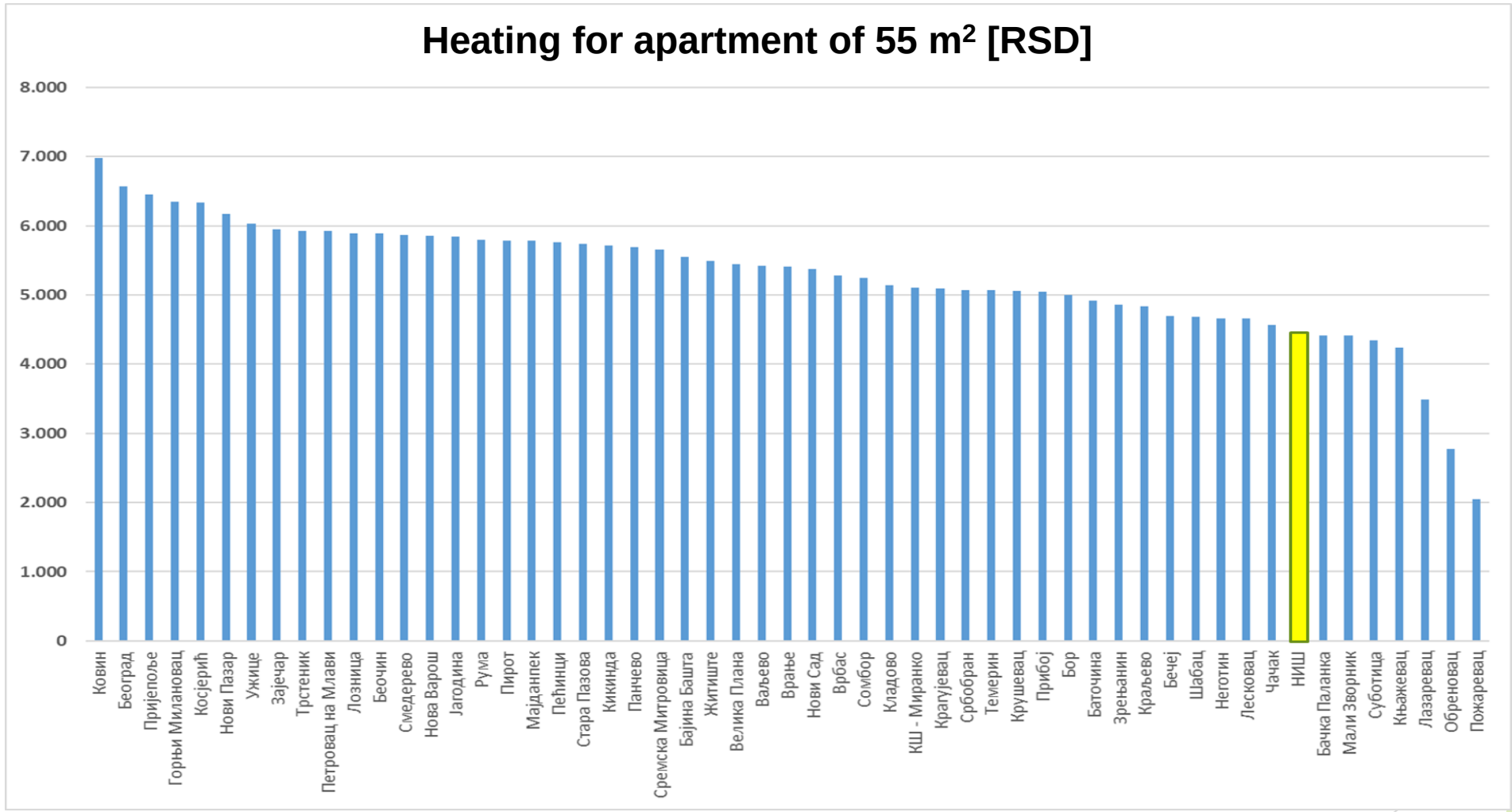
Price changes during heating seasons

	aug '13	sep '13	oct '13	nov '13	dec '13	jan '14	feb '14	mar '14	apr '14	may '14	jun '14	jul '14	aug '14	sep '14	oct '14	nov '14	dec '14	jan '15	feb '15	mar '15	apr '15	may '15	jun '15	jul '15	aug '15	sep '15	oct '15	nov '15	dec '15	jan '16	feb '16	mar '16	apr '16	may '16	jun '16	jul '16	aug '16	sep '16	oct '16	nov '16	dec '16	jan '17	feb '17	mar '17	apr '17	may '17
fixed price for 55 m^2 [€]	15,0	15,0	15,0	15,0	15,0	15,0	15,0	15,0	15,0	15,0	15,0	15,0	13,6	13,6	13,6	13,6	13,6	14,5	14,5	14,5	14,5	14,5	14,5	14,5	14,5	14,5	14,5	14,5	14,5	14,5	14,5	14,5	14,5	14,5	14,5	14,5	14,5	14,5	14,5	14,5	14,5	14,5	14,5	14,5	14,5
variable price [€/MWh]	57,2	57,2	57,2	57,2	57,2	57,2	57,2	57,2	57,2	57,2	57,2	57,2	57,2	57,2	55,5	55,5	55,5	58,4	70,2	70,2	70,2	70,2	70,2	70,2	51,6	51,6	47,8	47,8	47,8	43,2	43,8	43,3	36,5	36,5	36,5	36,5	48,6	48,6	48,6	48,6	50,4	50,4	50,4	50,4	50,4	50,4

	jun '17	jul '17	aug '17	sep '17	oct '17	nov '17	dec '17	jan '18	feb '18	mar '18	apr '18	may '18	jun '18	jul '18	aug '18	sep '18	oct '18	nov '18	dec '18	jan '19	feb '19	mar '19	apr '19	may '19	jun '19	jul '19	aug '19	sep '19	oct '19	nov '19	dec '19	jan '20	feb '20	mar '20	apr '20	may '20	jun '20	jul '20	aug '20	sep '20	oct '20	nov '20	dec '20	jan '21	feb '21	mar '21
fixed price for 55 m^2 [€]	14,5	14,5	13,9	13,9	13,9	13,9	13,9	13,9	13,9	13,9	13,9	13,9	13,9	13,9	11,4	11,4	11,4	11,4	11,4	11,4	11,4	11,4	11,4	11,4	11,4	11,4	11,4	11,4	11,4	11,4	11,4	11,4	11,4	11,4	11,4	11,4	11,4	12,6	12,6	12,6	12,6	12,6	12,6	12,6	12,6
variable price [€/MWh]	50,4	50,4	47,0	47,0	47,0	47,0	47,0	47,0	47,0	47,0	47,0	47,0	47,0	47,0	50,4	50,4	50,4	56,3	55,6	54,4	54,4	54,4	54,4	54,4	54,4	54,4	56,0	56,0	56,0	56,0	56,0	56,0	56,0	56,0	51,7	51,7	51,7	51,7	48,6	48,6	42,6	42,6	42,6	40,5	40,5	40,5



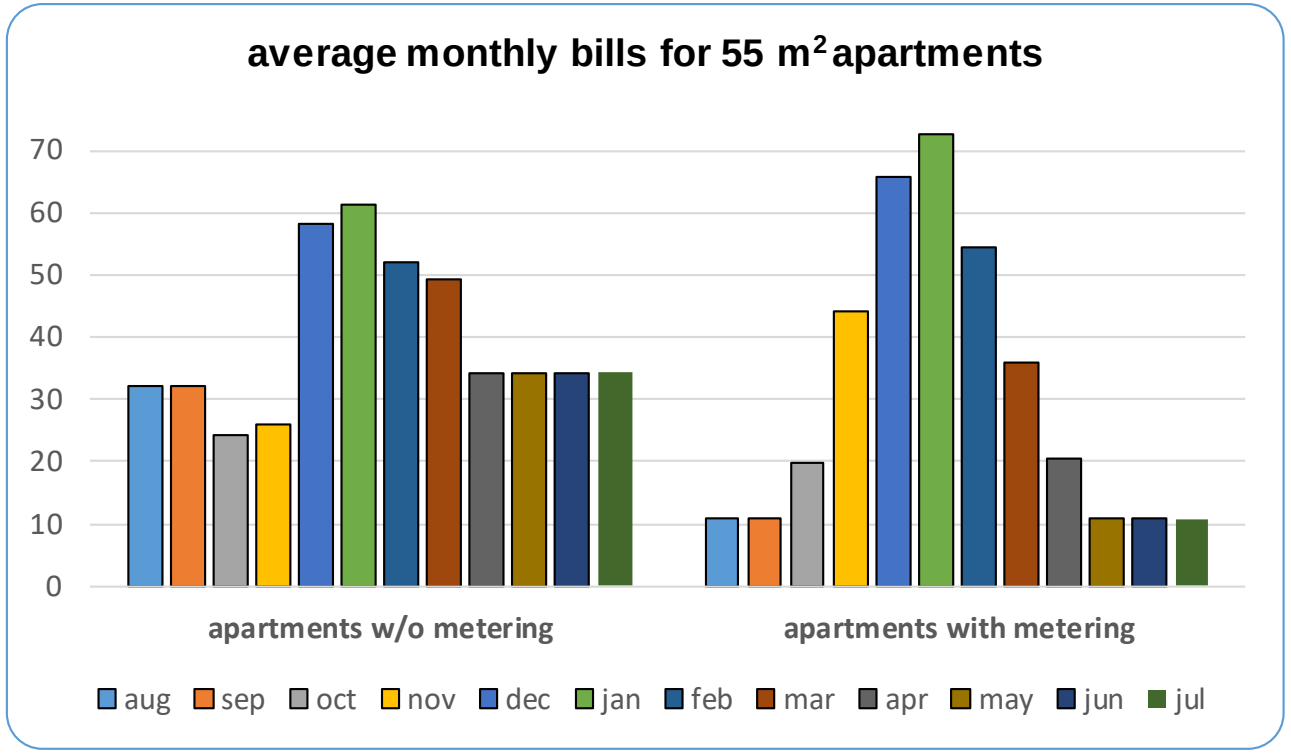
Yearly heating bills in Serbian towns with DHS



1 € = 117,91 RSD

Average bills for flats without and with individual metering – season 2019/20

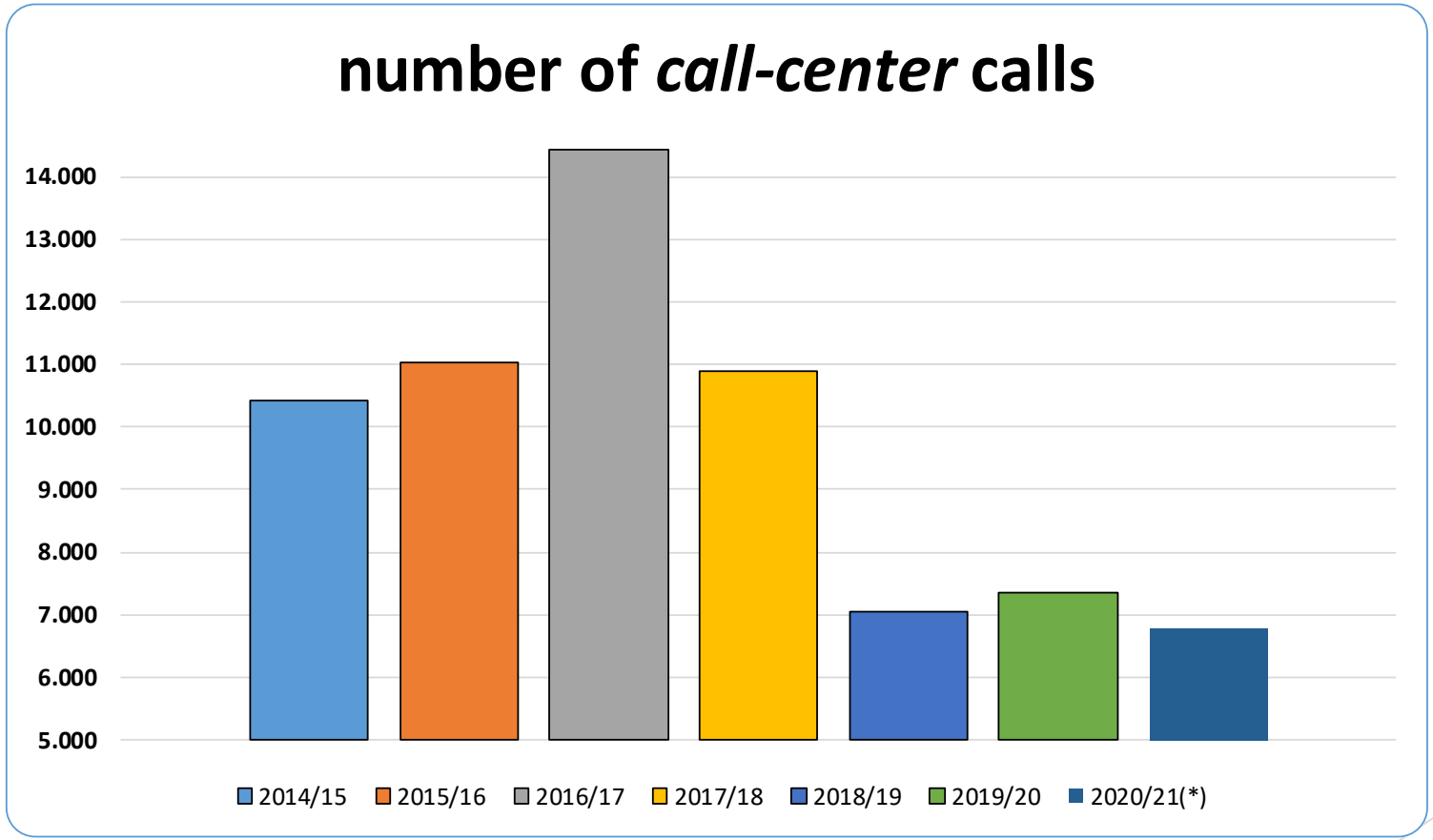
	w/o	with
aug	31,98	10,86
sep	31,98	10,86
oct	24,07	19,73
nov	25,86	44,27
dec	58,27	65,69
jan	61,33	72,74
feb	51,85	54,24
mar	49,31	35,93
apr	34,34	20,45
may	34,34	10,86
jun	34,34	10,86
jul	34,34	10,86
TOT	**472,01**	**367,37**
AVG	**39,33**	**30,61**
		77,83%



Reduced number of *call-center* calls

season	number of calls
2013/14	n/a
2014/15	10.421
2015/16	11.031
2016/17	14.440
2017/18	10.889
2018/19	7.055
2019/20	7.361
2020/21(*)	6.775

(*) - until 25th of April



Thank you for your attention!

DHC Gradska toplana Niš,
***Predrag Milačić*, director**
predrag.milacic@nitoplana.rs