



Heat metering and consumption-based billing experiences in City of Niš, Serbia

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Webinar on consumption metering in district heating

Heat metering & CBB – Serbian legal framework

Title (No of Official Gazette of Republic of Serbia)	Provisions that regulates Heat metering & CBB
Law on Energy (145/2014)	LSG is obliged to adopt regulations for allocating costs from a joint metering point in the heat substation (Art.361)
Law on Energy Efficiency (25/2013)	<p>The investor is obliged to equip each new building, to be connected to the DHS, with equipment for regulating and heat metering in heat substation, every apartment and heating body (Art. 44)</p> <p>Distributors of heat are obliged to carry out a series of activities to ensure the conditions and installation of equipment for individual metering of DH users (Art. 51)</p> <p>Ownership, maintenance and service of heat metering devices and devices for heat regulation and other property-legal relations are regulated by a contract btwn the owner of the apartment and the distributor (Art. 51)</p> <p>Minister determines the conditions under which the equipping of installation with metering devices would be technically unfeasible or in relation to the long-term estimated energy savings not economically profitable (Art. 51)</p>
Rulebook on Energy Efficiency of Buildings (61/2011)	Central heating systems should be designed and run so that central and local regulation and metering of heat consumption for is enabled (Art.13)
Methodology for Determining the Price for Heat Supplying of End-Customers (63/2015)	Defines the elements for calculation and the method of determining the maximum amount of revenues, the criteria and rules for the distribution of revenues of the Supplier, the category of End-Customers, tariff elements, tariffs and the method of their calculation for the heat billing and the conditions and the procedure for submitting a request for a change of the price for heat supply
Legal regulations of LSGs (DH Ordinances, Rulebooks, Tariff systems, Local methodologies for DH prices, Official notifications...)	<p>Among other these regulations are defining necessary elements for Heat metering & CBB:</p> <ul style="list-style-type: none"> • The minimum percentage of installed devices for determining of individual consumption • The levels of the heat cost allocation (level of the joint heat substation for several buildings, level of the building) • Joint consumption amount • Models of heat cost allocation (according to apartment heating area or according to individual heat metering) • The corrective coefficient (for apartments not equipped with devices)

Practical implementation – City of Niš

- ▶ **The main arrangements of CBB in City of Niš:**
 - ▶ 100% of consumers are in CBB from 2013
 - ▶ Same price for residential and commercial consumers
 - ▶ 100% of heat substations equipped with calorimeters
 - ▶ Around 10% of consumers have installed equipment and in individual metering
 - ▶ Investors are obliged to pay for the equipment of new buildings with calorimeters and individual calorimeters in apartments
 - ▶ Tenants of old buildings are paying for the installation of HCAs/individual calorimeters in their apartments and obliged to maintain them
 - ▶ Controllers are obliged to perform the service of installment HCAs/individual calorimeters, reading, division of costs and maintenance
 - ▶ District Heating Company calculates the bills according to the info about the allocation of costs received from Controllers

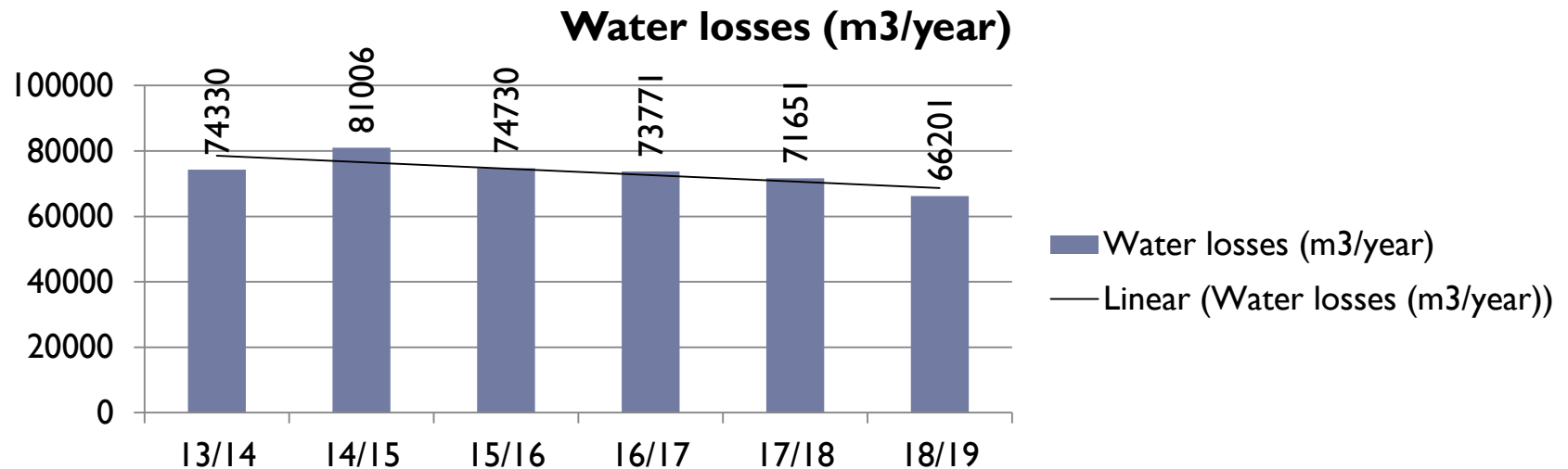
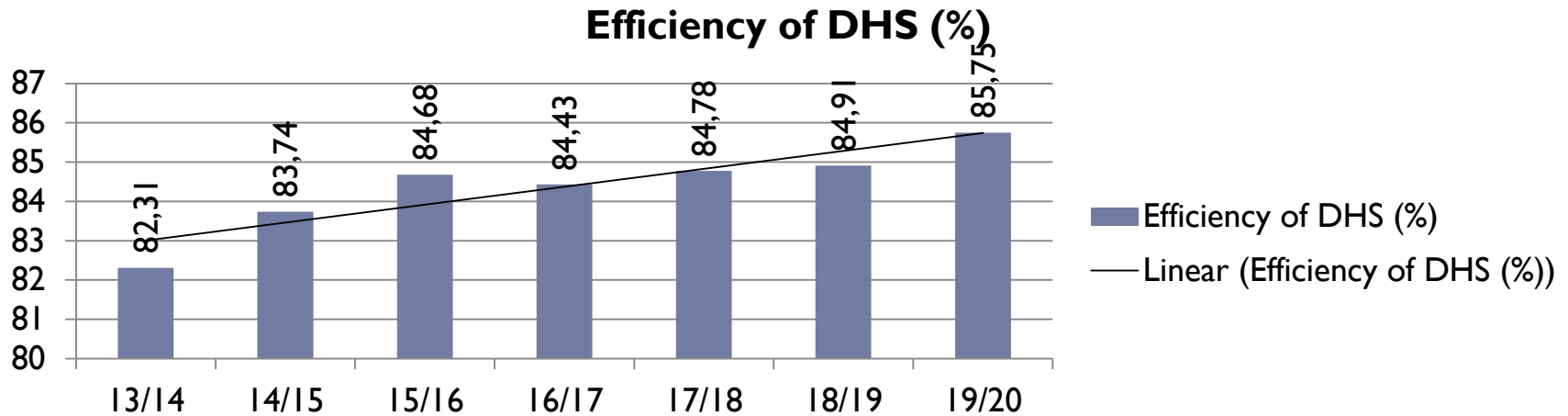


Lessons learned – heat savings

Heating season		13/14	14/15	15/16	16/17	17/18	18/19	19/20
Average temperature (°C)		7,75	5,81	6,78	4,16	6,58	6,81	7,74
HDD		2364	2597	2419	3152	2484	2493	2342
Heat potential of resources (MWh)		239.392	265.718	245.377	278.764	243.753	250.948	229.342
Heat produced (MWh)		211.025	241.369	224.317	252.357	220.570	227.156	207.950
Heat delivered (MWh)		197.033	222.523	207.774	235.348	206.651	213.073	196.666
Efficiency (%)	Heat production	88,15	90,84	91,42	90,53	90,49	90,52	90,67
	Heat distribution	93,37	92,19	92,63	93,26	93,69	93,80	94,57
	TOTAL	82,31	83,74	84,68	84,43	84,78	84,91	85,75
Water losses (m ³)		74.330	81.006	74.730	73.771	71.651	66.201	65.380
Specific heat consumption (kWh/m ² /an)	Houses	125,23	130,27	118,31	138,80	124,12	124,77	116,48
	Condominiums	99,99	113,64	109,39	127,64	114,72	119,57	111,68
	Condominiums CBB	92,50	77,84	74,27	87,15	78,15	77,24	69,43
	TOTAL	101,02	112,73	107,55	124,89	112,12	115,80	107,78

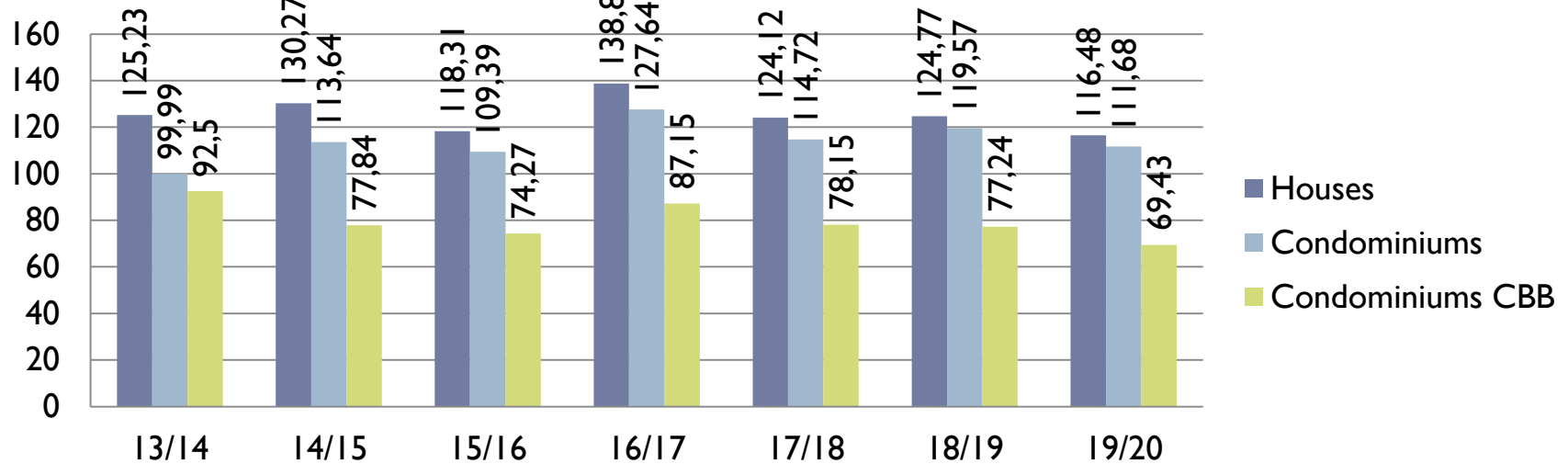


Lessons learned – heat savings

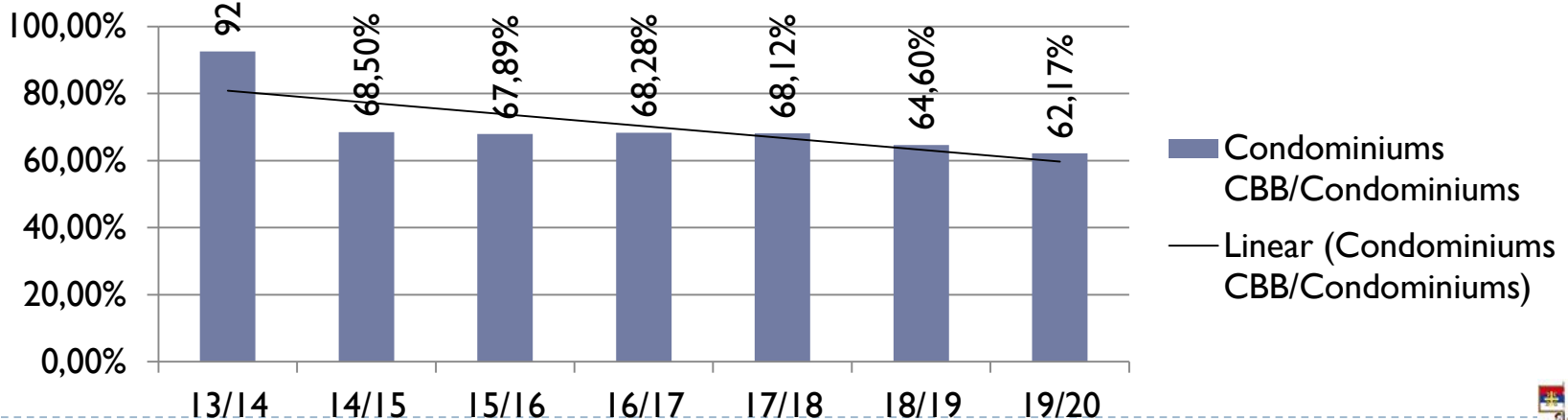


Lessons learned – heat savings

Specific Heat consumption (kWh/m²/an)



Condominiums CBB / Condominiums consumption



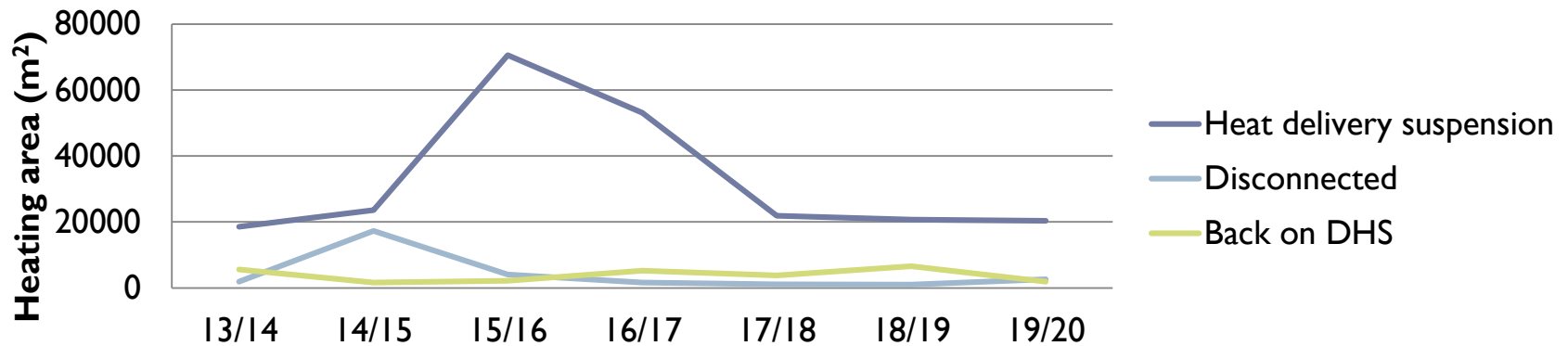
Lessons learned – customers satisfaction

		13/14	14/15	15/16	16/17	17/18	18/19	19/20
Suspension of heat delivery	Number of customers	154	378	1156	778	352	333	342
	Total heating area (m ²)	18.508,00	23.542,95	70.565,31	53.068,65	21.857,69	20.722,07	20.307,67
Contract termination / disconnection	Number of customers	18	137	35	13	10	11	6
	Total heating area (m ²)	1.876,25	17.305,83	4.058,70	1.646,54	1.089,76	1.009,52	2.588,42
Returning on DHS	Number of customers	108	4	36	63	72	60	22
	Total heating area (m ²)	5.622,61	1.624,18	2.130,26	5.204,67	3.769,98	6.603,46	1.850,11
Call center calls		n/a	10.421	11.031	14.440	10.889	7.055	7.361

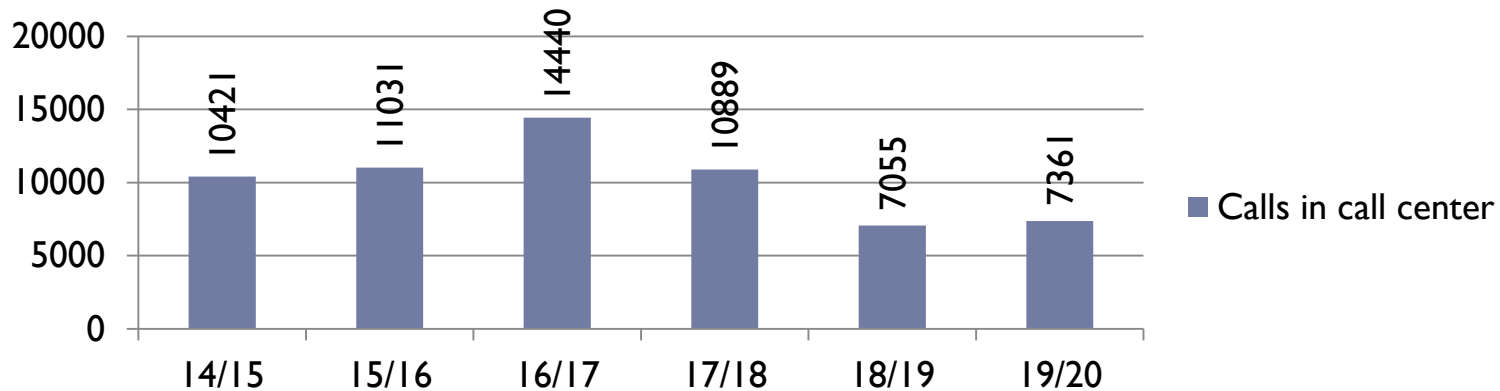


Lessons learned – customer satisfaction

Heating area disconnection trends



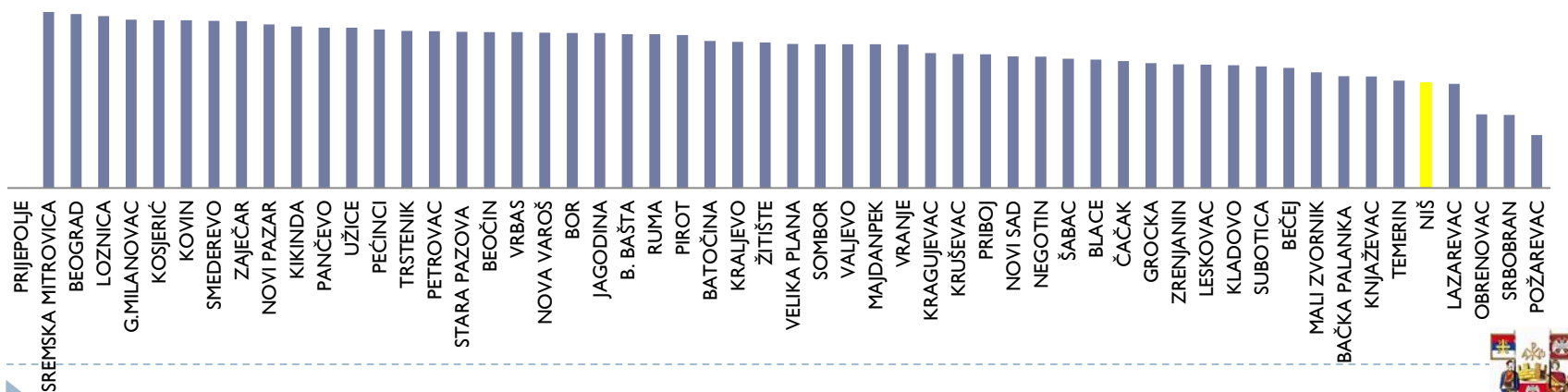
Number of calls in call center



Lessons learned – Pricing policy

RSD/m ²	RSD/kWh	Month
29,23*	6,13	Oct 13
26,48	5,95	Oct 14
28,26	6,26	Jan 15
28,26	7,53	Feb 15
28,26	5,53	Avg 15
28,26	5,12	Oct 15
28,26	4,63	Jan 16
28,26	4,69	Feb 16
28,26	4,64	Mar 16
28,26	3,91	Apr 16
28,26	5,21	Aug 16
28,26	5,40	Dec 16
27,08	5,04	Aug 17
27,08	5,40	Aug 18
21,18	6,04	Nov 18
21,18	5,96	Dec 18
21,18	5,83	Jan 19
21,18	6,00	Aug 19
21,18	5,54	Apr 20
21,18	4,68	Jul 20
24,57	5,23	Aug 20
24,57	4,53	Nov 20

**District Heating costs for the apartment (60m²; 110kWh/m²/an)
RSD/year**



* 1€ = 117,57 RSD



Lessons learned – current state & conclusions

- ▶ **City & DHC introduced a number of measures:**
 - ▶ More than 30 changes of regulations
 - ▶ Mechanism of vulnerable consumer (implemented in 2016)
 - ▶ DHC does not bill the consumption above 20% above average monthly consumption. Total amounts of subsidies:
 - ▶ 17/18 – 6.396.898,99 RSD (54.409 €)
 - ▶ 18/19 – 5.357.804,79 RSD (45.571 €)
 - ▶ 19/20 – 5.294.219,02 RSD (45.030 €)
 - ▶ Representative of customers in advisory body for pricing
 - ▶ Representative of citizens at Supervisory Board
 - ▶ Regular meetings btwn DHC management and representatives of customers
 - ▶ Public debates
- ▶ **Conclusions based on lessons learned:**
 - ▶ CBB eventually leads to optimization of DHC operations and better satisfaction of customers anyway
 - ▶ Large problems in implementation of CBB could be easily avoided:
 - ▶ Communication Strategy
 - ▶ Supporting scheme for customers to improve EE of their buildings
 - ▶ Provide technical support for legislation



Thank you for your attention!
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