



SMART METERING AND INDIVIDUAL HEAT COST ALLOCATION FOR BETTER ENERGY EFFICIENCY

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BRUNATA, A SHORT HISTORY

1917: The first prototype of heat cost allocator is installed in a building in Copenhagen, Denmark

1930: The Danish engineer Constantin Brun improves the heat cost allocators (evaporation)

1950: Brun merges with the Swiss company Ata: Brunata



1980s: The first electronic allocators are launched

1990s: Brunata launches WebMon: remote reading of meters and continuous monitoring via internet



THE LEGISLATIVE FRAMEWORK

DIRECTIVES

DIRECTIVE 2012/27/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

of 25 October 2012

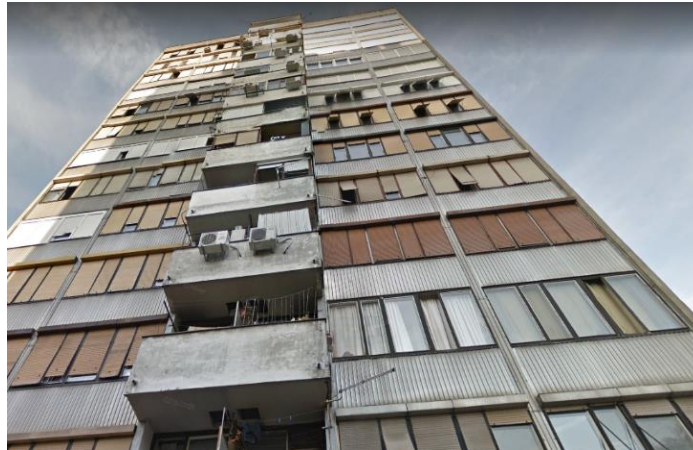
on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC

THE MAIN GOAL IS: REDUCING GAS IMPORT

- (16) Bearing in mind that the Council conclusions of 10 June 2011 on the Energy Efficiency Plan 2011 stressed that buildings represent 40 % of the Union's final energy consumption, and in order to capture the growth and

CASE STUDY 1, ZAGREB

- Building made in the 1960s, with 45 apartments
- Connected to District heating
- Apartments heating made by 220 cast iron radiators

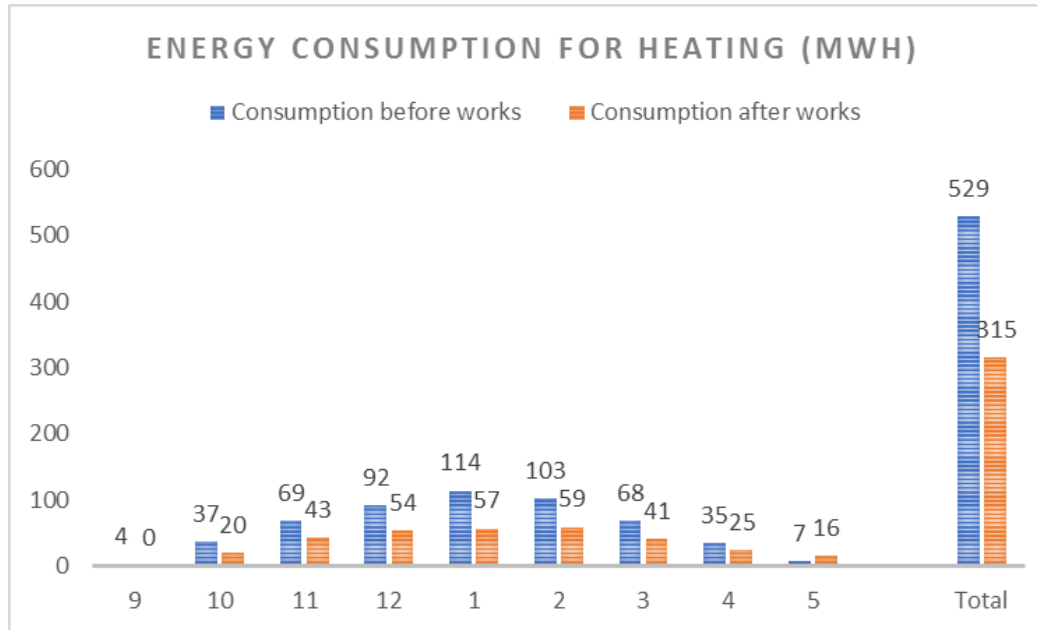


Total cost for heating before the works: HRK 121.494 (avg 2.700/flat)



Works made in the building:

- Flushing pipes with chemicals
- New electronic pumps
- Heat cost allocators
- Thermostatic valves with pre-setting
- Balancing valves on each vertical



RESULTS:

Energy consumption
-40% (MWh)

	Seasons before works (HRK/Y)	Seasons after works on heating system (HRK/Y)
Thermal energy	90.202,00 HRK	53.550,00 HRK
Power lease	31.292,00 HRK	31.292,00 HRK
Total	121.494,00 HRK	84.842,00 HRK

Cost -30,2% (HRK)

CASE STUDY 2, ZAGREB

- 5 buildings
- Each building has 3 entrances, 5 floors and 4 apartments per floor - Total of 300 flats
- Buildings have been built in 1967



The central thermal station is in the middle building
Each building has a thermal substation
Part of the energy is used to warm up the cold water
Each entrance has a separate water meter



Only three buildings decided to go for the individual Heat Cost Allocation. Works made in these 3 buildings:

- Flushing pipes with chemicals
- New electronic pumps
- Heat cost allocators
- Thermostatic valves

SEZONA 2015 / 2016		od 29.10.2015. - 20.05.2016.				prvi put razdjelnici		
zgrada	Srednjaci 15-19	Kikičeva 4-8	Kikičeva 10-14	Kikičeva 16-20	Kikičeva 22-26	UKUPNO	TOPLA VODA	SVEUKUPNO
šifra TS	SR029	SR025	SR026	SR027	SR028	sve zgrade	SR047	ENERGIJA
razdjelnici	ima	nema	ima	nema	ima	prostor	PTV	
potrošnja	kWh	kWh	kWh	kWh	kWh	kWh	kWh	kWh
X/15	25,820	34,000	28,873	38,000	28,000	154,693	78,307	233,000
XI/15	44,595	57,000	42,599	60,000	44,000	248,194	80,806	329,000
XII/15	60,178	76,000	55,127	72,000	59,000	322,305	72,695	395,000
I/16	116,482	123,000	88,502	115,000	94,000	536,984	88,016	625,000
II/16	26,005	61,000	42,926	63,000	48,000	240,931	97,069	338,000
III/16	39,317	57,000	39,636	61,000	44,000	240,953	72,047	313,000
IV/16	15,593	24,000	18,361	37,000	21,000	115,954	80,046	196,000
V/16	13,136	22,000	15,842	30,000	19,000	99,978	66,022	166,000
UKUPNO	341,126	454,000	331,866	476,000	357,000	1959,992	635,008	2595,000

SEZONA 2016 / 2017		od 01.10.2016. - 15.05.2017.						
zgrada	Srednjaci 15-19	Kikičeva 4-8	Kikičeva 10-14	Kikičeva 16-20	Kikičeva 22-26	UKUPNO	TOPLA VODA	SVEUKUPNO
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razdjelnici	ima	nema	ima	nema	ima	prostor	PTV	
potrošnja	kWh	kWh	kWh	kWh	kWh	kWh	kWh	kWh
X/16	19,327	33,000	23,168	37,000	26,000	138,495	71,505	210,000
XI/16	36,330	61,000	41,351	61,000	45,000	244,681	71,319	316,000
XII/16	80,889	120,000	83,491	111,000	87,000	482,380	96,620	579,000
I/17	97,119	129,000	100,985	119,000	106,000	552,104	96,896	649,000
II/17	53,206	75,000	53,929	74,000	61,000	317,135	79,865	397,000
III/17	27,174	41,000	28,151	45,000	34,000	175,325	73,675	249,000
IV/17	17,363	28,000	20,516	36,000	24,000	125,879	71,101	196,980
V/17	7,123	11,000	11,000	17,000	8,754	54,877	129,000	183,877
UKUPNO	338,531	498,000	362,591	500,000	391,754	2090,876	689,981	2780,857



RESULTS:

First winter -26,2%

Average Energy consumed,
compared to the buildings
without razdjelnici

Second winter -27%

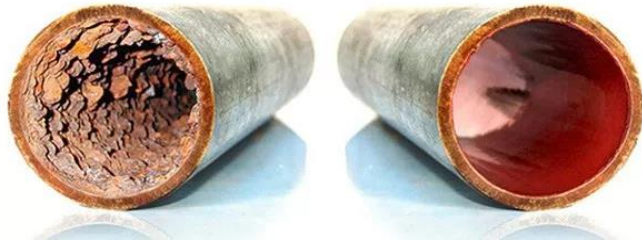
Average Energy consumed,
compared to the buildings
without razdjelnici

THE ALLOCATOR MEASURES...

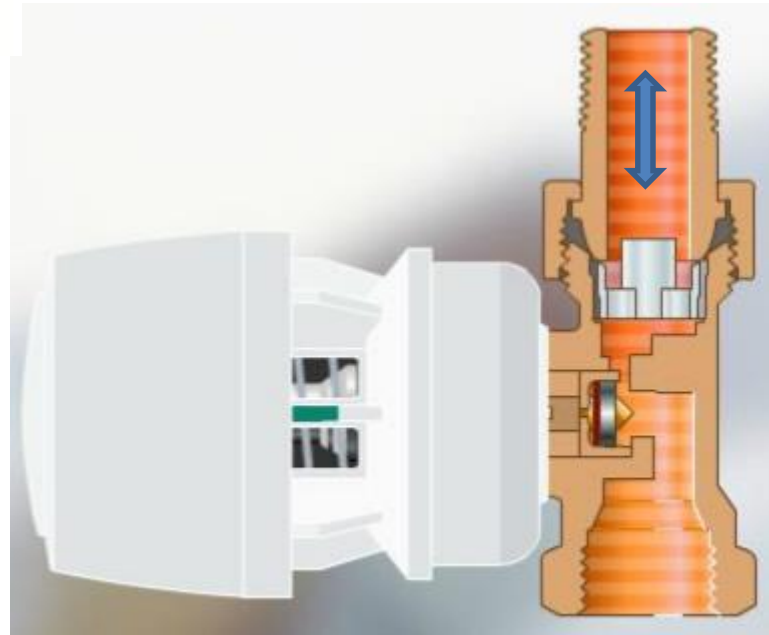
...BUT IT HAS NOTHING TO DO
WITH THE HYDRAULICS
WORKING BADLY



CLEANING BEFORE INSTALLING



If pipes have not been washed with chemicals, the mud and the debris will flow into the valves, blocking them soon.





BEFORE INSTALLATION

Set of rules / technical recommendations / best practice:

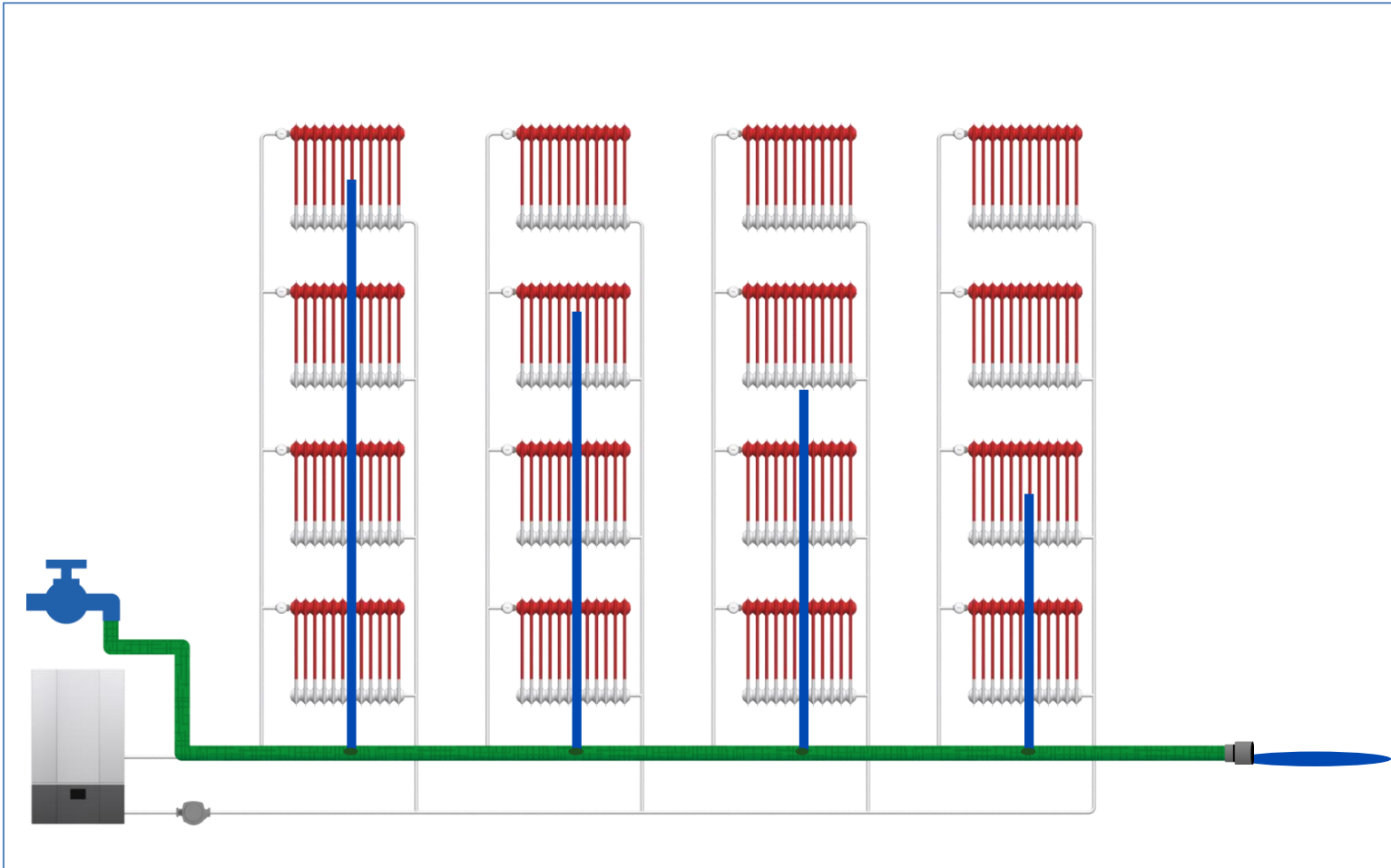
Project and calculation before installation.

Mandatory operations:

- Washing pipes with chemicals
- Balancing the hydraulic system



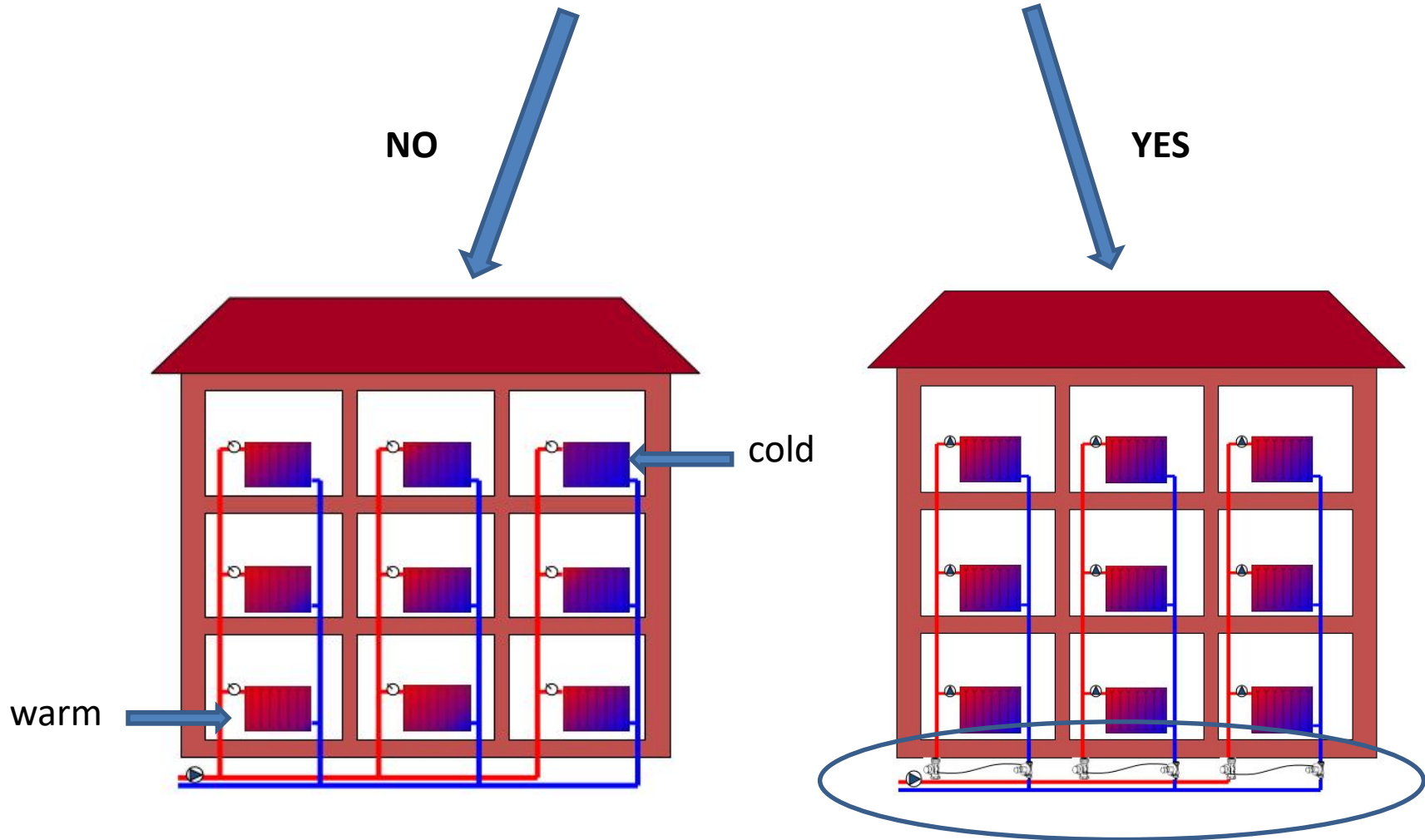
WITHOUT BALANCING VALVES



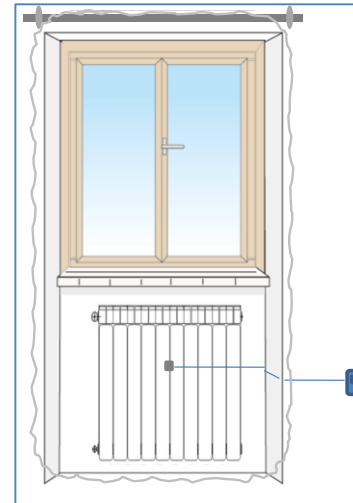
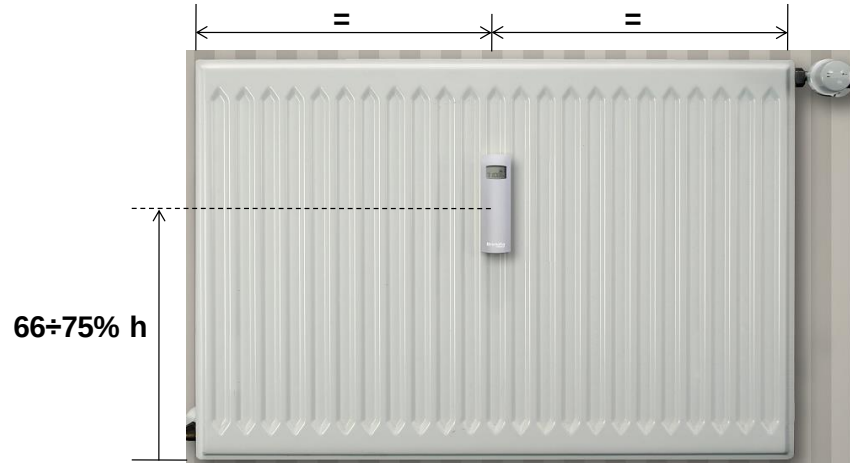
BALANCING DONE?

NO

YES



THE INSTALLATION



THE SAVINGS WITH CONSUMPTION-BASED ALLOCATION OF COSTS

- IN ORDER TO SHOW THE ENERGY SAVINGS THAT ARE POSSIBLE THANKS TO THE INDIVIDUAL COST ALLOCATION, 24 INTERNATIONAL STUDIES HAVE BEEN PERFORMED IN OVER 14 COUNTRIES:
- GERMANY, DENMARK, FINLAND, SWEDEN, NORWAY, AUSTRIA, UK, FRANCE, ITALY, POLAND, JAPAN, SWITZERLAND, RUSSIA, THE NETHERLANDS.
- THE RESULT WAS UNANIMOUS: ON AVERAGE, THERE ARE SAVINGS OF 20% OF THE ENERGY THANKS TO THE AWARENESS OF THE INDIVIDUAL CONSUMPTION (with peak of 40% in some of the studies).

<http://www.evve.com/98-1-news.html>

Thank you - Hvala

