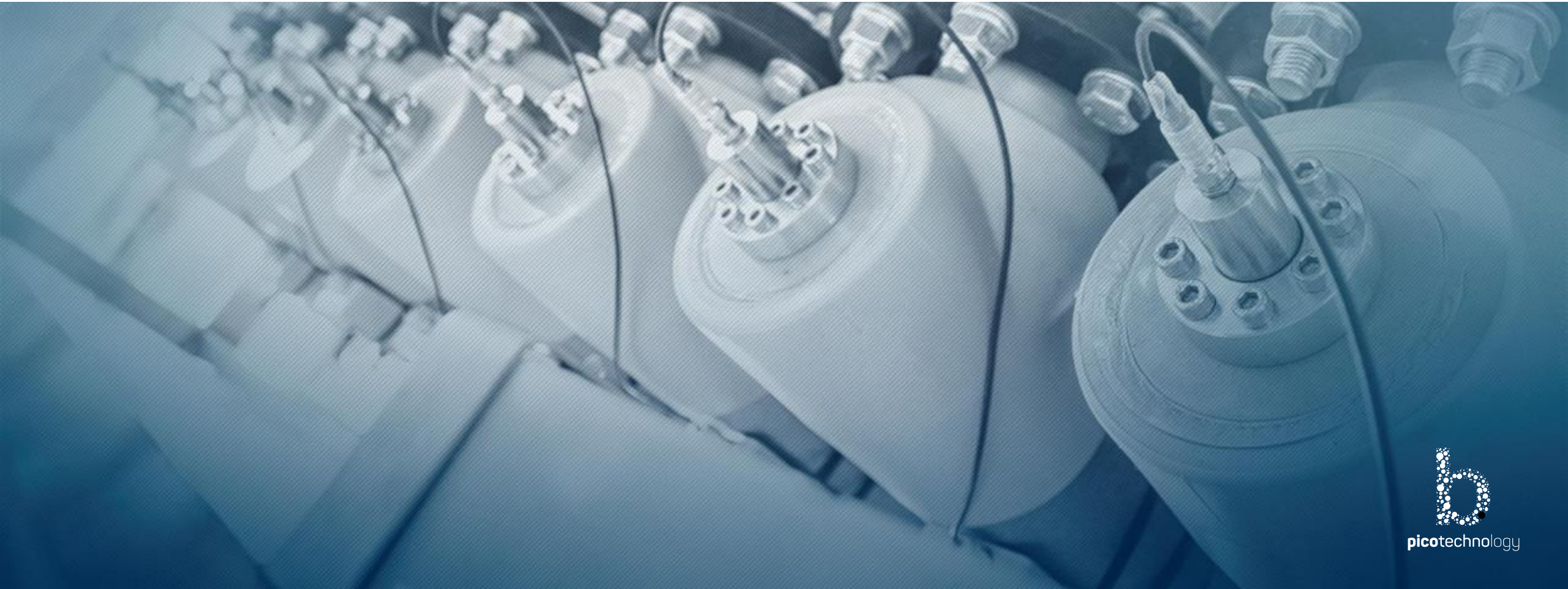
Blue Boson

COSTS OPTIMIZATION

IN THE HEAT PRODUCTION OPERATION HEATING CIRCUITS AND HEAT DISTRIBUTION



picotechnology

Blue **Boson** Technology

After the more than 20 years of research and development, dozens of successfully installations in various industry sectors in european region , our company Blue Boson SE
decided to enter the global market with itself patented environmental technology for water and fluids treatment based on supramolecular level.

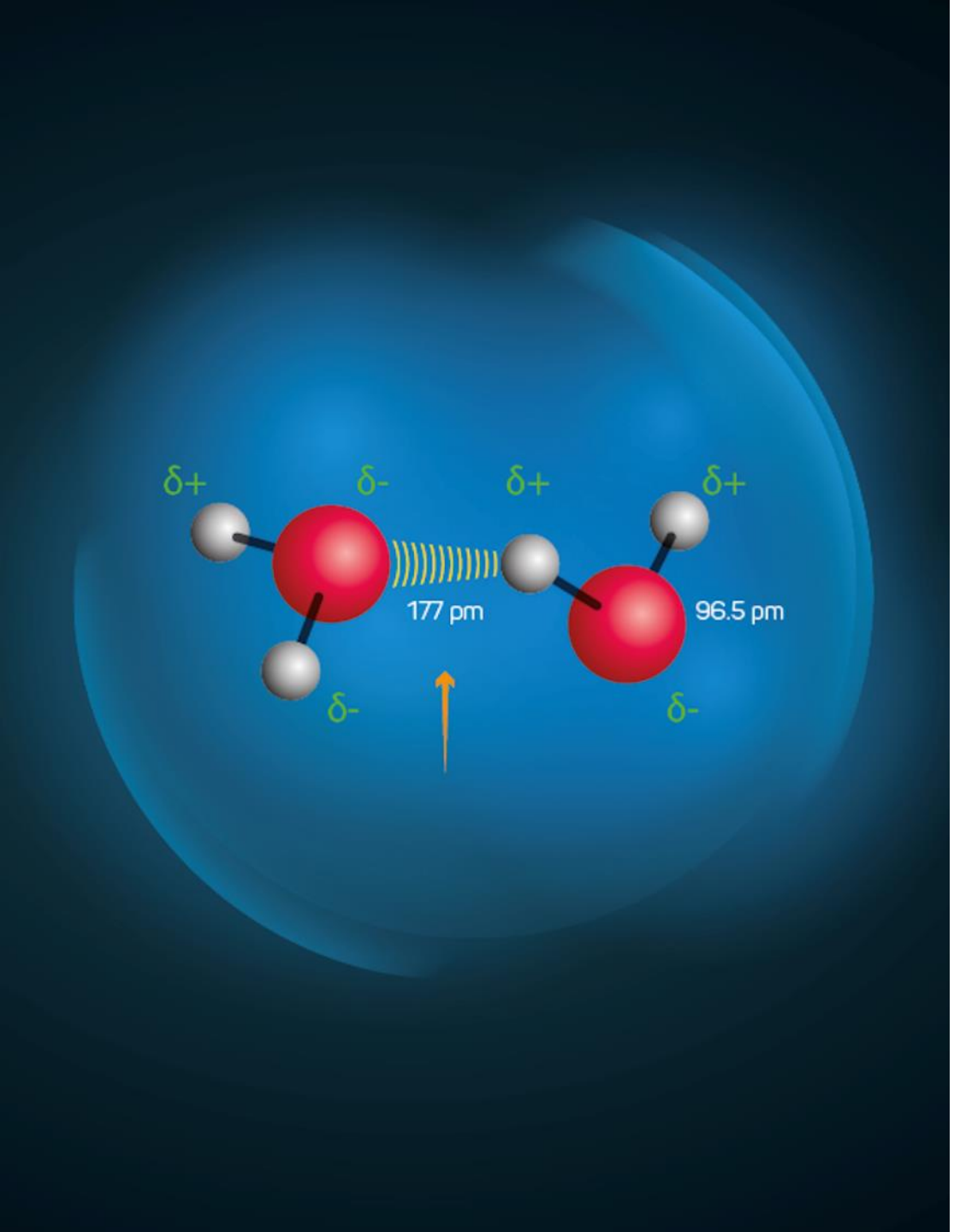
THE CHALENGES AND DEMANDS FOR CHANGES, TO WHICH NOWADAYS FACES THE SECTOR

Decreasing the production cost

Decreasing the distribution cost

Decreasing the operational cost

DECREASING THE ADVERSE IMPACT TO ENVIRONMENTAL



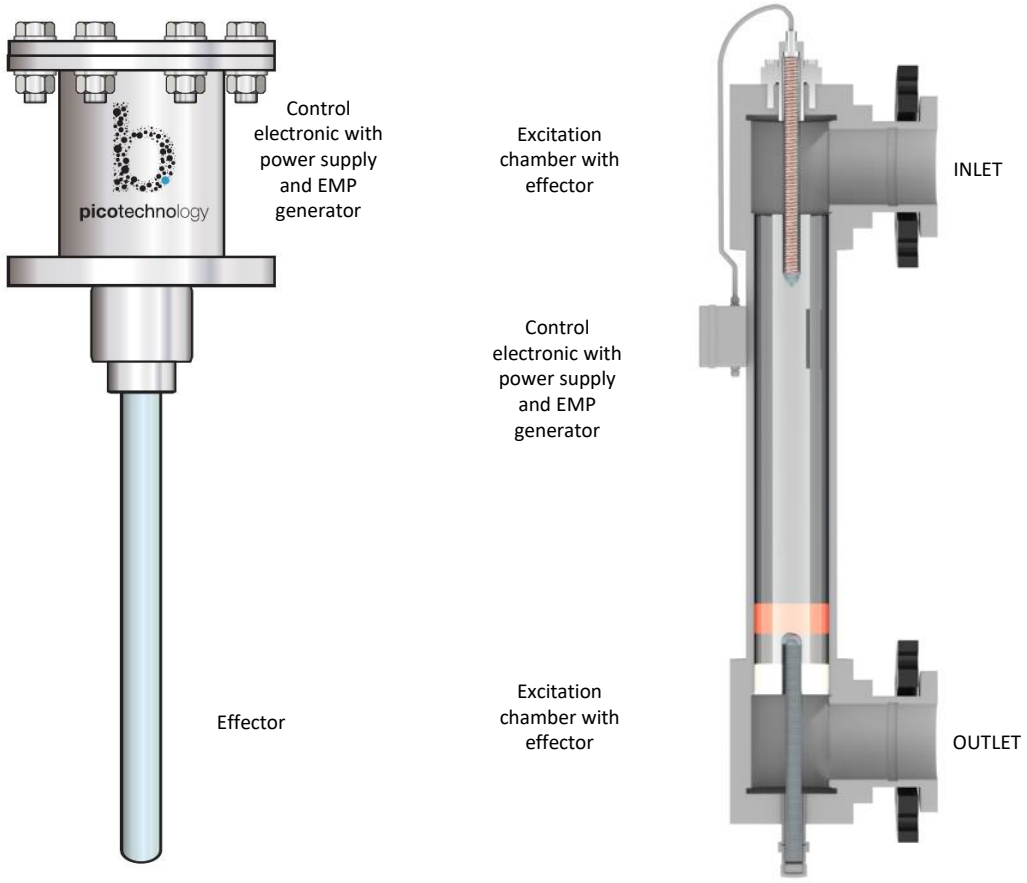
PRINCIPLE OF OPERATION

The flowing water is exposed to waves and pulses in the non-ionization zone from the Effector, which changes the supramolecular structure of the water and affects the amount and arrangement of the hydrogen bridges.

The change of amount and characteristics hydrogen bridges (hydrogen bonds) in the water has direct affect on change of the water structure where it occurs to modify the various physical parameters.

These changes possitivelly impact to hydraulic systems (circuits), increased their output, effectiveness and energetic efficiency.

DESCRIPTION OF **Blue** **Boson** TECHNOLOGY



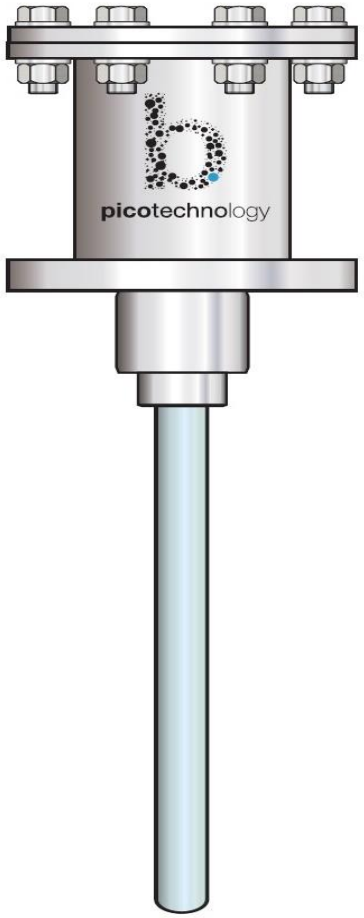
On the picture is one of the possible technical solution of Effector Water

The technological device from Blue Boson company is excitation module which can be installed on the by-pass or directly to the pipework. The device consists from Effector, control electronic, EMP generator, power source and excitation chamber.

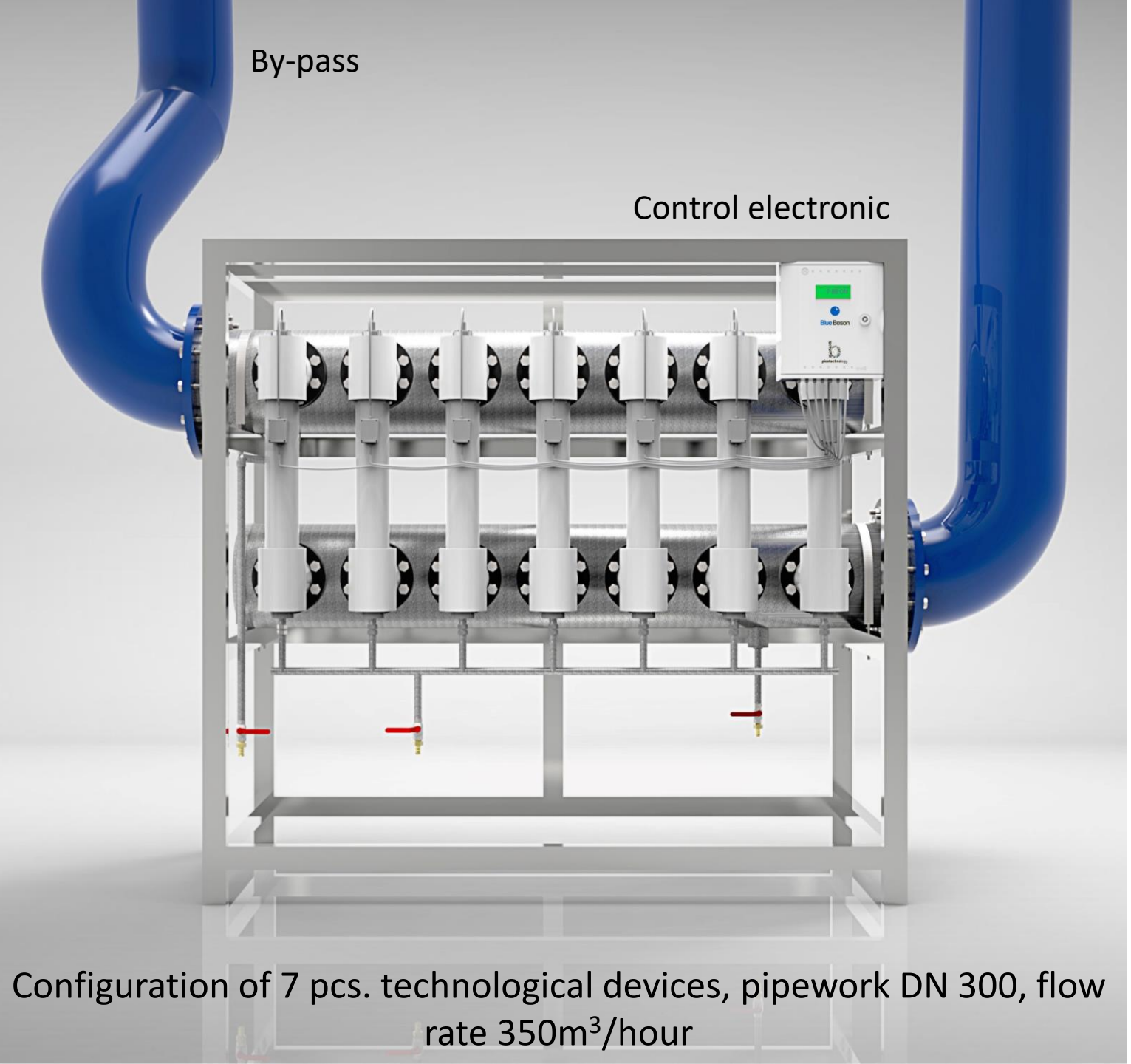
The device can be supplemented with the sludge and vent valve.

The technological device is tailor made and efficiency is preset according client needs.

PARAMETERS OF **Blue** **Boson** TECHNOLOGY



Flow rate:	without limit/scalable
Pipe diameter:	without limit/scalable
Temperature:	320°C/90°C
Preassure:	max. 16,0 MPa/1 MPa
Power supply:	230 V – 50 Hz/12 V DC
Curent:	60 mA
Output:	300 mW
Príkon:	1,5 VA
Ambient humidity:	max. 90%
Ingres protection:	IP 68



Configuration of 7 pcs. technological devices, pipework DN 300, flow rate 350m^3/hour

ENVIRONMENTAL BENEFITS

Reduction or total removing chemicals consumption for water treatment

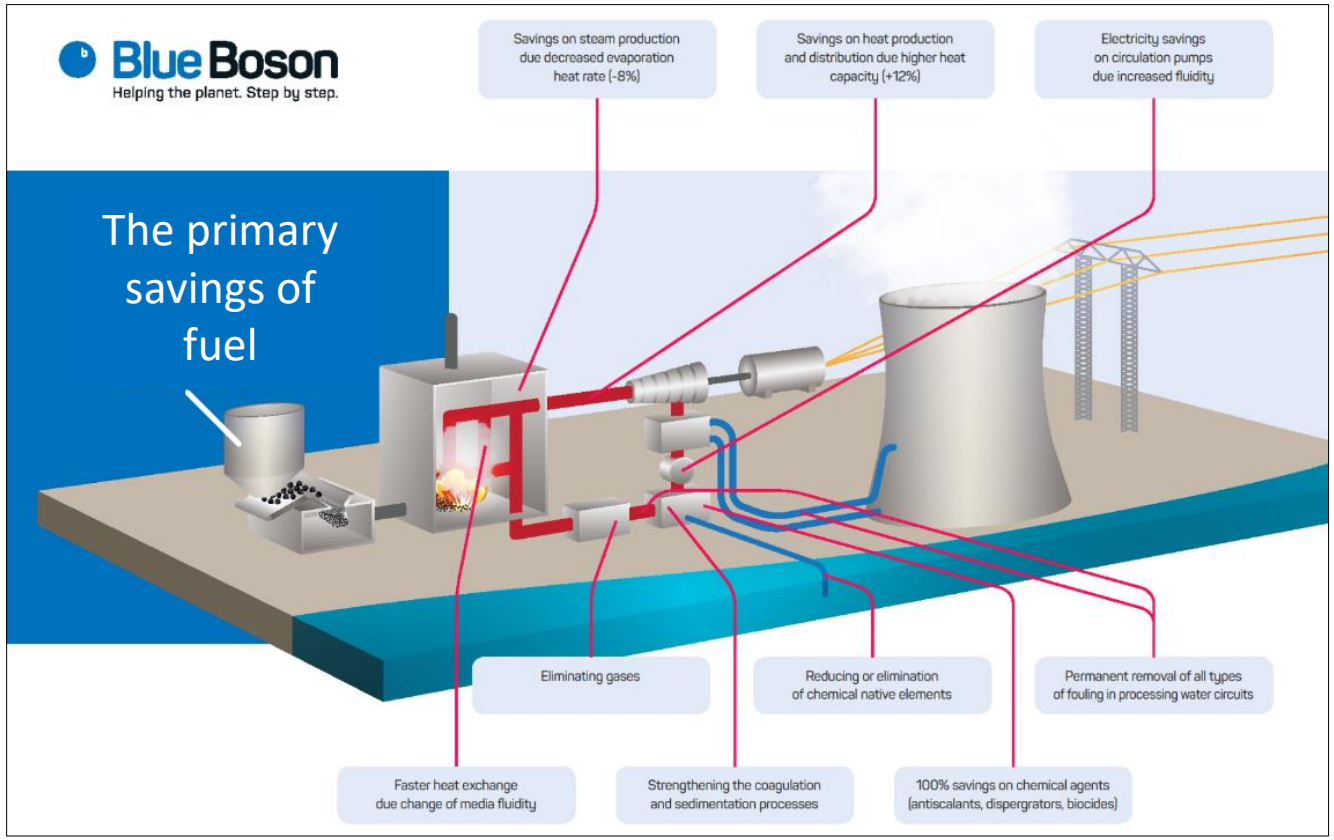
Reduction of input energy consumption

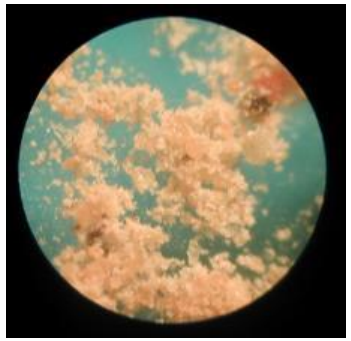
Reduction of greenhouses gas emission

Reduction of carbon footprint, pollution and environmental degradation

Improving of environmental quality

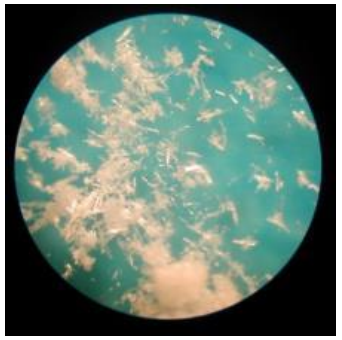
BENEFITS OF **Blue** **Boson** TECHNOLOGY





The microscope pictures of onset nucleus crystals creation, in the non-treated water by **Blue Boson** technology.

The microscope pictures of reduction of onset nucleus crystals, in the treated water by **Blue Boson** technology.



Removing of existing encrust

Preventing the creation of the new encrust

Removing of existing corrosion

Preventing the creation of the new corrosion

Reducing of fuel consumption

Reducing of air pollution

Reducing of greenhouse gas emission

Reducing of chemicals for water treatment

Reducing the load of pumps

Reducing of electricity consumption of pumps operation

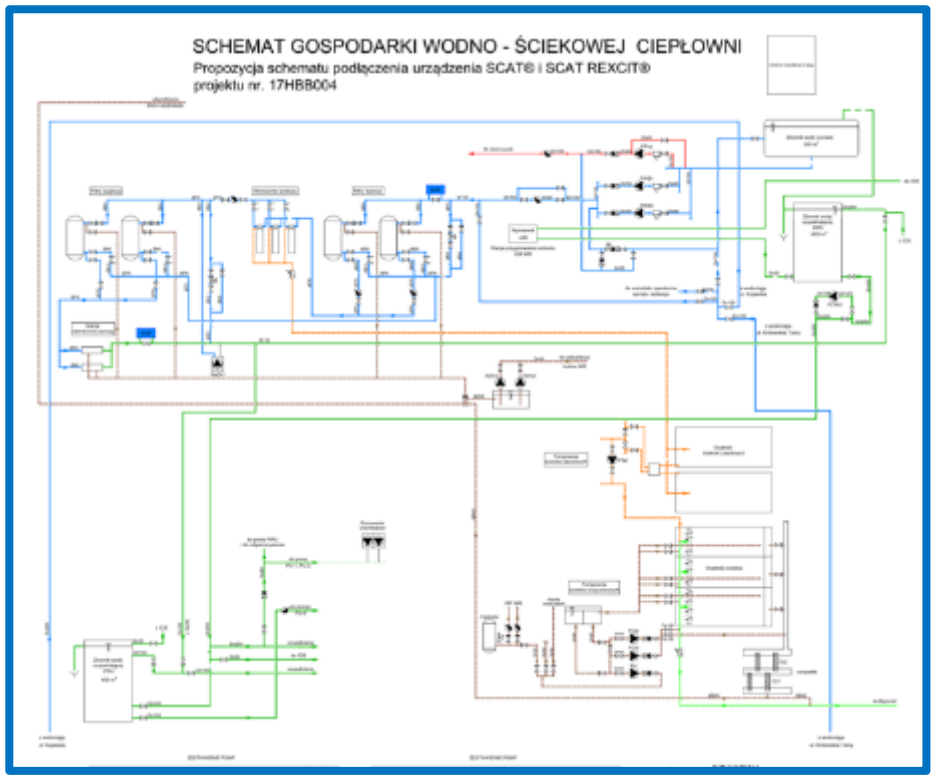
Power output stabilization of hydraulic circuiuts

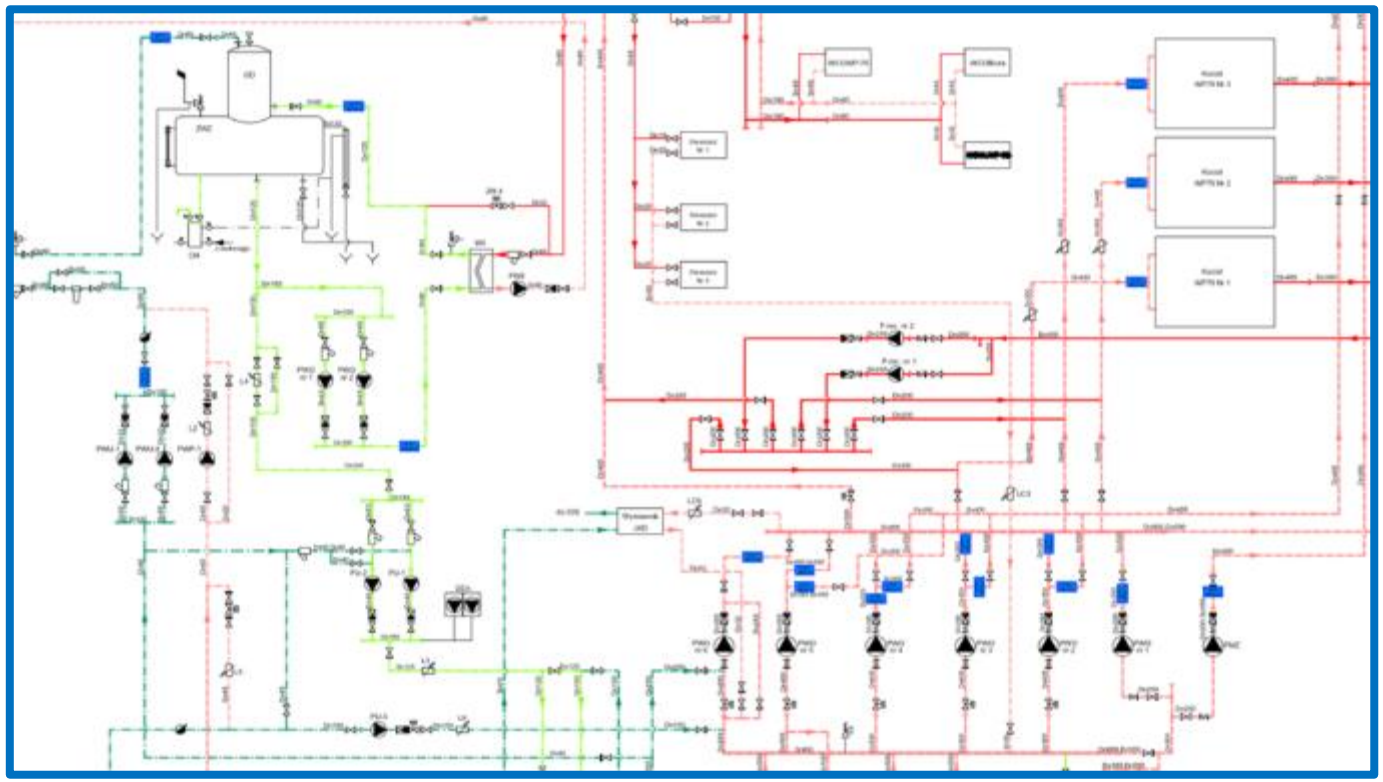
Prolongation of hydraulic circuits lifespan

Reducing of hydraulic circuits maintenance costs

TOTAL DECREASING THE ENVIRONMENTAL NEGATIVE IMPACTS

THE EXAMPLE OF INSTALLATION – HEATING PLANT



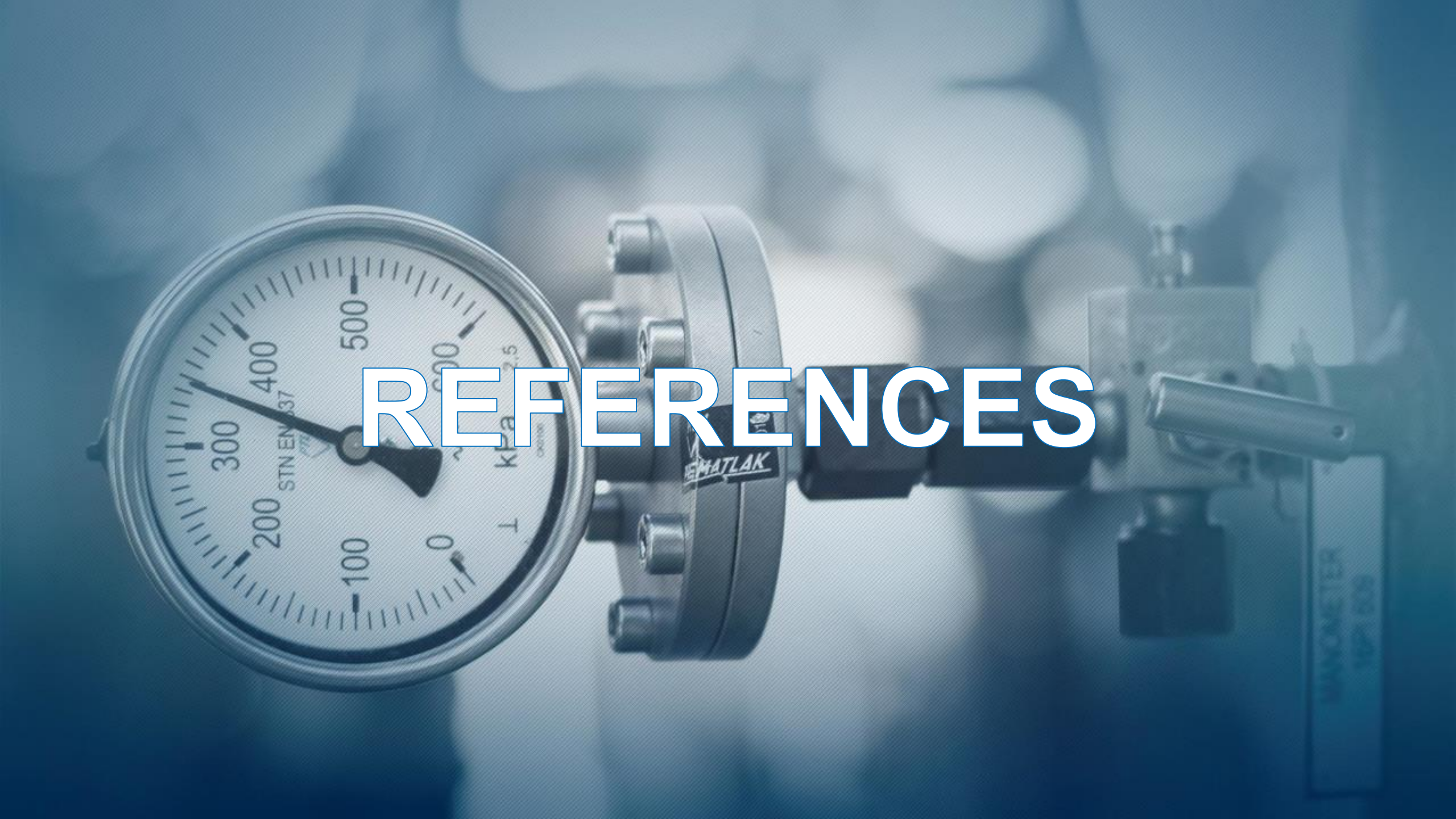


The recommended places of Blue Boson technology, in the heating plant circuits:

- On the entering pipework to chemical water treatment technology,
- Before KATEX, ANEX, mechanicacl/sand filters, hydrocyclones,
- On the entering pipework to demineralization station,
- Before heat exchangers, low/medium/high preheaters,
- Before circulating pumps,
- Colletion/storage tanks, boiler/DEMI water tanks, thermic degassing, boilers,
- On the enter to the distribution network, resp. on the output from heating plant

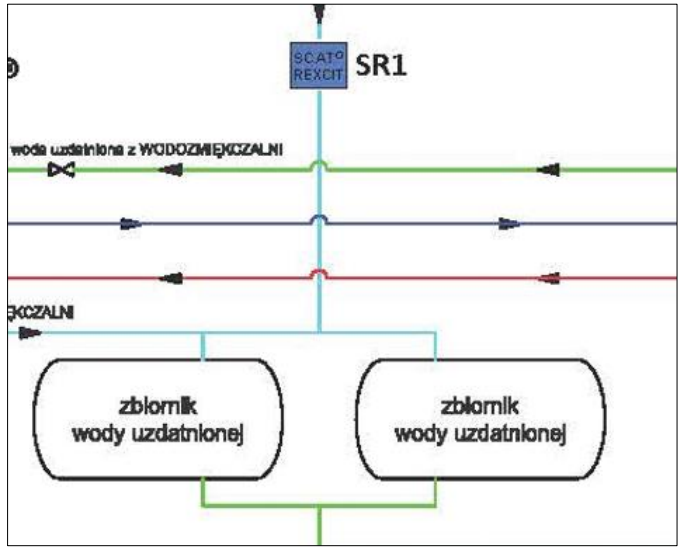
If the heating plant has cooling circuit, another installation places are:

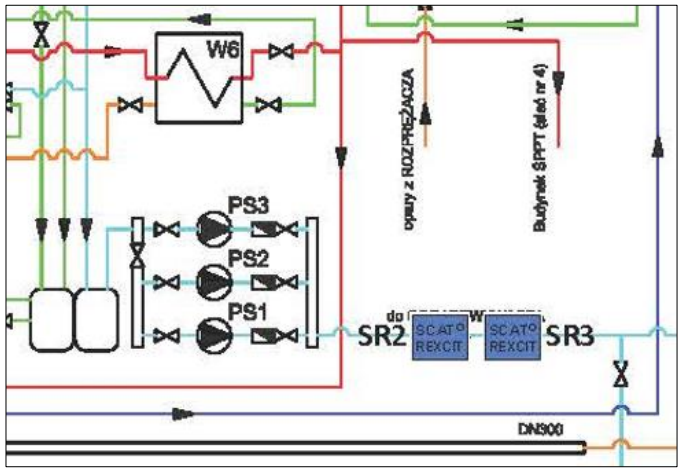
- In the pipework of feeding water to the cooling system,
- Before circulating pumps, compresors, fans,
- Before the heat exchangers (cooling towers/coolers/condensers/ chillers, ...),

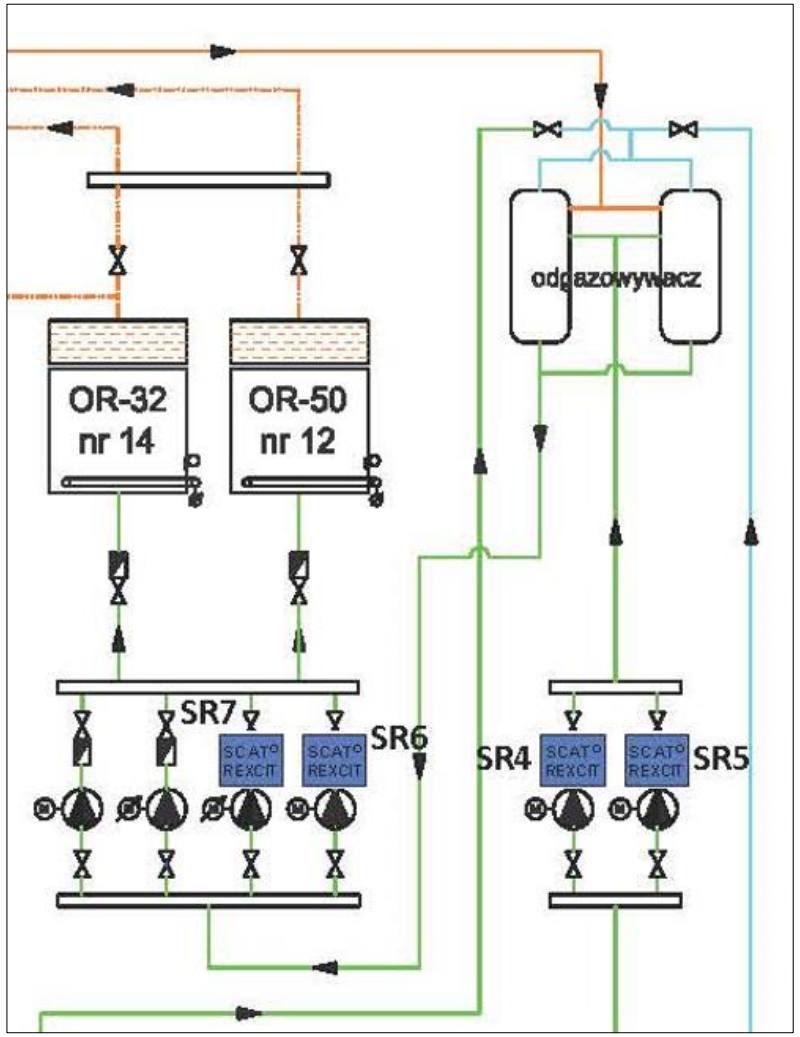


REFERENCES

The heat and electricity production



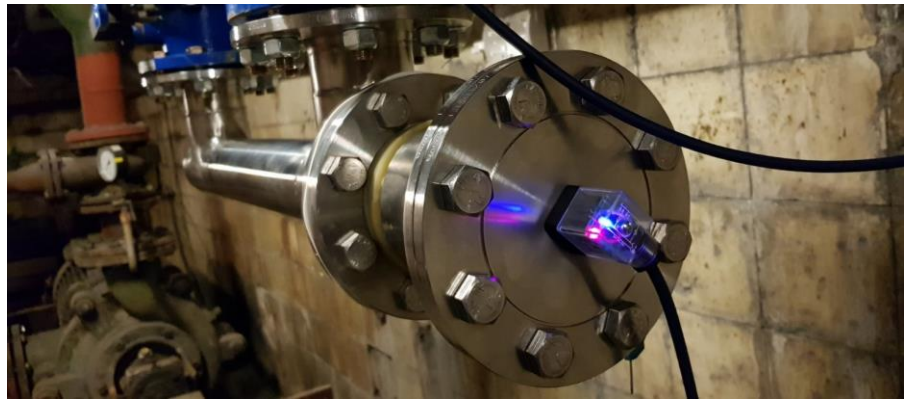




The devices have been installed on the entering pipework of raw water, before the collecting tanks of the condesate, behind the condensate pumps and before the thermic degassing.

WĘGLOKOKS Energia ZCP, Elektrociepłownia Mikołaj

The production of heat and electricity. In operation are 3 pcs. of steam boilers with total installed output 85 MW and 6 MW steam turbine.



ELECTRICITY AND HEAT PRODUCTION (steam, turbine)

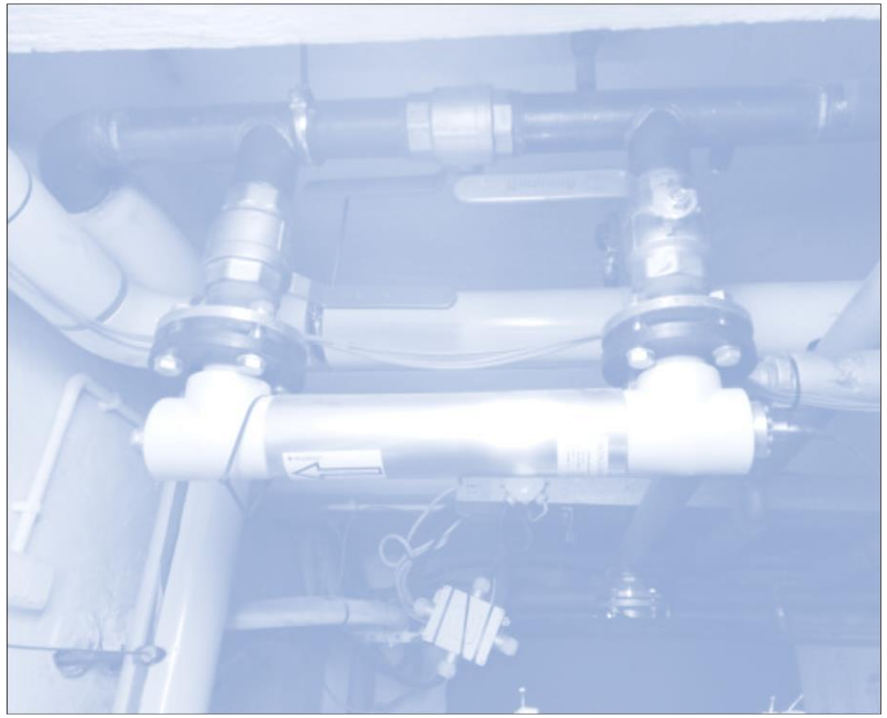
Parameters	
amount of electricity production	25 219 MWh/year
amount of heat production	940 199 GJ/year
fuel consumption (coal)	47 113 t/year
CO_2 production	103 526 t CO_2/year

Savings	
relative increase of heat production efficiency	2,6 %
relative increase of electricity production efficiency	16,88 %
relative increase in efficiency of the plant	3,9 %
reducing th fuel consumption	1 803 t/year
reducing the CO_2 emission production	4 244 t/year
total financial saving	566 877,- €/year

The administrative building in power plant Skawina

Blue Boson

CEZ SKAWINA



The technology device Effector Water is insttall on heating system of administrative building heating/power plant in Skawina, ČEZ Poland.

The heating system of administrative building	
average heat consumption	222,938 GJ/month
flow rate of primary side (heating)	3,3 m^3/hour
flow rate of secondary side (heating)	9,5 m^3/hour
temperature secondary side – supply	57,4 °C
temperature secondary side – return	51,1 °C
temterature difference – secondary side	6,3 °C
temperature primary side – supply	72,2 °C
temperature secondary side – return	54,1 °C
temterature difference – primary side	18,1 °C

Savings	
relative heat saving	15 %
absolute heat saving	37 GJ/month

The boiler room – district heating

Boiler circuit, DHW circuit	
installed boiler´s output (Prednádražie)	7 950 kW
heat consumption for DHW (Stred)	1 000 – 1 050 GJ/month
fuel	natural gas
cleaning the DHW exchangers	2 – 3 x/year
length of the one maintenace break	3 days

Savings	
boiler room Prednádražie – natural gas	18 %
chemicals to boiler circuit	60 %
boiler room Stred DHW	30%
reduction of greenhouse gas production	18 % KP a 30% TÚV
cleaning the DHW exchangers	1 x / 2 roky
length of the one maintenace break	3 hours

The heating circuit – reference

With Mr. Grega we cooperate in the field of reducing the operational costs from year 1992. we can confirm:

1. Decreasing the interval of cleaning the heat exchangers for DHW production. We realized a technological breaks 2-3 times per year, the lenght of each break was about 3 days, before we installed ScatRexcit® technological devices. After the installation of mentioned devices, it is enough to realize the preventive inspections on heat exchangers one time in 2 years. The maintenance´s length is 3 hours.

2. Year 2009 - installation ScatRexcit® technology by company PATAGGS s.r.o. On secondary circuit, DHW preparation, boiler room STRED - consumers are about 1 000 flats plus commercial operations. Before the installation ScatRexcit® devices, were the heat consumption for DHW preparation approximately 1 000 - 1 050 GJ monthly. After the installation ScatRexcit® technology the consumption in above mentioned location decreased to 700 - 750 GJ monthly, with the same quality of supplied water. The installation of these devices has secured us decreasing the normative consumption of gas depthly under the obligatory limits issued by SEIA .

3. Year 2012 - installation ScatRexcit® devices on boiler circuit in boiler room PREDNADRAZIE. By the installation of ScatRexcit® technology we decreased consumption of chemicals for chemical water treatment more than 60% and we decreased gas consumption for heat production about 1 GJ, that present more than 18%.

The rating of devices we operated in our company are under the supervising of state authority URSO (State Authority for Supervision of Network Industries). Even despite of we decided to decrease the costs for the heat and the DHW production. In non regulated deliveries URSO the savings reached value min. 20%, what we can on request declared.

In Bánovce nad Bebraou, 11-th of February, 2014

Anton Haňo
konateľ BytTherm s.r.o.
Technical director

BYTTHERM, s.r.o.
Hollého 148/46
BÁNOVCE nad BEBRAVOU
PSČ 957 01

THE HEATING CIRCUIT – THE HEALTH CENTRE

The technological devices in this facility have been installed on heating circuit. The produced heat is used for heating the building and DHW preparation. The devices are still in operation. The presented saving on heating for year 2015 is 18,4% and in year 2016 is 20,4 %.

THE HEATING CIRCUIT – THE HEALTH CENTRE

Blue Boson

LOVIS

Správa z vyhodnotenia prevádzky tepelnej sústavy zdravotného strediska v Prešove v rokoch 2015-2017

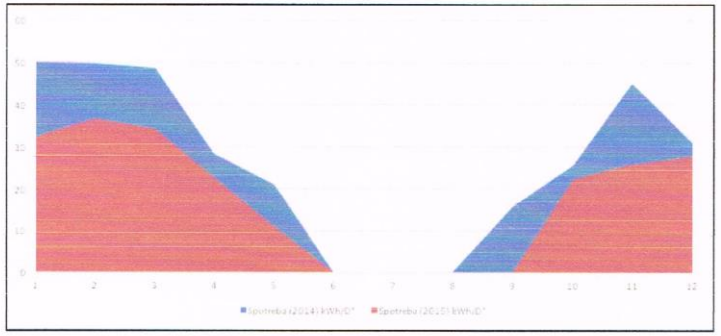
4. BILANCIA NAMERANÝCH HODNÔT TEPLA ZA ROKY 2015 – 2017

Pri výpočte úspory množstva tepla v objekte zdravotného strediska bol za referenčný rok definovaný rok 2014, kedy ešte nebolo zariadenie Scat Rexcit® inštalované. Nasledujúce tabuľky porovnávajú spotrebu tepla v rokoch 2015 – 2017 s referenčným rokom.

Tabuľka 3: Porovnanie nameraných hodnôt množstva tepla a počtu D° v rokoch 2014:2015

	Spotreba v roku 2015			Spotreba v roku 2014			Rok 2015		Úspora 2015	
	Počiatočný stav kWh	Koncový stav kWh	Spotreba (2015) kWh	Spotreba (2014) kWh	Počet D° (2014)	Spotreba (2014) kWh/D°	Počet D° (2015)	Spotreba (2015) kWh/D°	Podiel spotreby (2015)	Úspora %
január	45 939	66 462	20 523	30 225	605,7	49,9009411	631,8	32,48411	0,650971871	-34,9028
február	66 462	86 826	20 364	23 999	481,3	49,8628714	555,2	36,67867	0,735599099	-26,4409
marec	86 826	103 065	16 239	19 119	393,7	48,5623571	472,8	34,34645	0,707264822	-29,2735
apríl	103 065	109 786	6 721	6 958	246,6	28,215734	297,4	22,59919	0,800941296	-19,9057
máj	109 786	110 397	611	3 038	145,6	20,8653846	56,6	10,79505	0,517366618	-48,2633
jún										0
júl										0
august										0
september	110 397	110 397	0	1 171	74,0	15,8243243	27,3	0	0	0
október	110 397	117 723	7 325	6 893	270,6	25,4730229	330,1	22,19025	0,871127794	-12,8871
november	117 722	130 104	12 382	19 422	429,6	45,2094972	479,7	25,81197	0,570941234	-42,9059
december	130 104	145 991	15 887	18 453	596,1	30,9562154	570,1	27,86704	0,900208262	-9,97917
Spolu			100 052	129 278	3 243,2	39,8612481	3421	29,24655	0,733708933	-26,6251

V tabuľke sú uvedené namerané hodnoty tepla a počet dennostupňov za rok 2015 a sú porovnávané s referenčným rokom 2014. Na základe dennostupňovej metódy bola v roku 2015 definovaná výška úspory vo výške 26,63%.



Obrázok 8: Porovnanie nameraných spotrieb v rokoch 2014:2015 [kWh/D°]

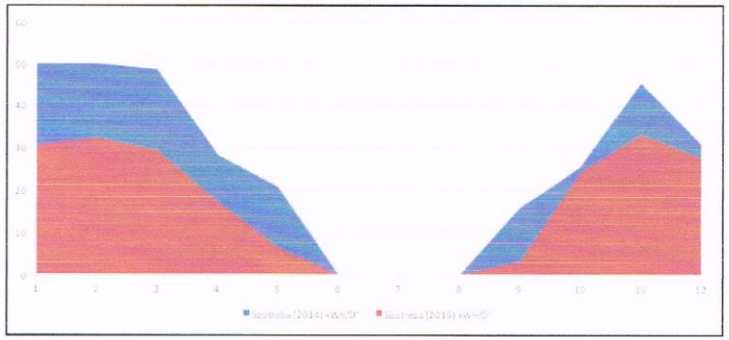
LOVIS

Správa z vyhodnotenia prevádzky tepelnej sústavy zdravotného strediska v Prešove v rokoch 2015-2017

Tabuľka 4: Porovnanie nameraných hodnôt množstva tepla a počtu D° v rokoch 2014:2016

	Spotreba v roku 2016			Spotreba v roku 2014			Rok 2016		Úspora 2016	
	Počiatočný stav kWh	Koncový stav kWh	Spotreba (2016) kWh	Spotreba (2014) kWh	Počet D° (2014)	Spotreba (2014) kWh/D°	Počet D° (2016)	Spotreba (2016) kWh/D°	Podiel spotreby (2016)	Úspora %
január	145 991	168 102	22 111	30 225	605,7	49,9009411	725,1	30,49373	0,611083	-38,8915
február	168 102	183 304	15 202	23 999	481,3	49,8628714	473,6	32,09882	0,643742	-35,6258
marec	183 304	196 830	13 526	19 119	393,7	48,5623571	461	29,34056	0,604183	-39,5817
apríl	196 830	201 030	4 200	6 958	246,6	28,215734	244	17,21311	0,610054	-38,9946
máj	201 030	201 709	679	3 038	145,6	20,8653846	106,2	6,393597	0,306421	-69,3579
jún										0
júl										0
august										0
september	201 709	201 890	181	1 171	74,0	15,8243243	55,4	3,267148	0,206464	-79,3536
október	201 890	210 688	8 799	6 893	270,6	25,4730229	363,7	24,19302	0,94975	-5,02495
november	210 689	227 140	16 451	19 422	429,6	45,2094972	499,8	32,91517	0,728059	-27,1941
december	227 140	246 670	19 530	18 453	596,1	30,9562154	705,9	27,66681	0,89374	-10,626
Spolu			100 679	129 278	3 243,2	39,8612481	3634,7	27,6994	0,694895	-30,5105

V tejto tabuľke sme taktiež porovnávali namerané hodnoty množstva tepla a počtu dennostupňov v roku 2016 s nameranými hodnotami množstva tepla a počtu dennostupňov v referenčnom roku 2014. Na základe dennostupňovej metódy bola v roku 2016 definovaná výška úspory vo výške 30,51%.



Obrázok 9: Porovnanie nameraných spotrieb v rokoch 2014:2016 [kWh/D°]

DRINKING WATER – water distribution in operational buildings in heating plant

"In cooperation with your company we have successfully resolved the problems with drinking and service water in the old and clogged pipelines of our heating plant. Drinking water was heavily polluted by incrustation, which manifested through discoloration and strong turbidity. Today our water is clean and complies with the drinking water standards"

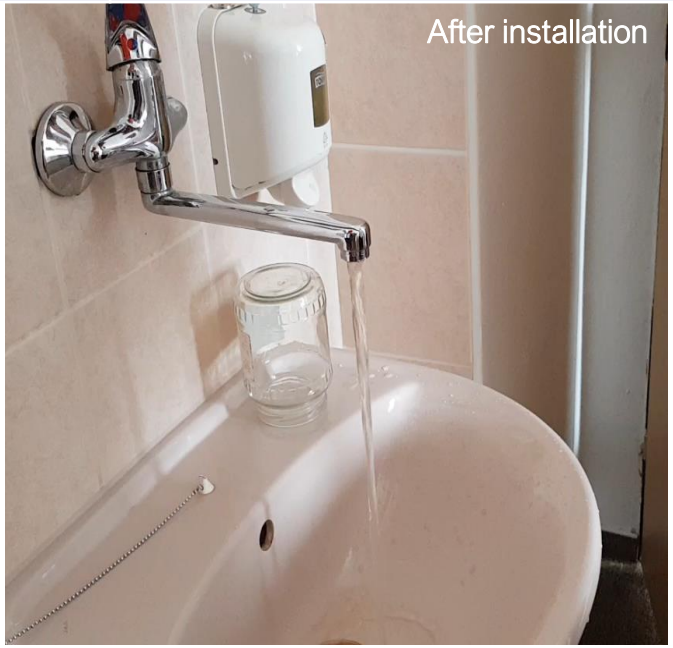
Ing. Pavol Fillo,
Production and Technology Director

"At last, we can drink tea, coffee and wash the dishes"

Dobroslava Petrovičová,
Secretariat of the CEO and Company Director

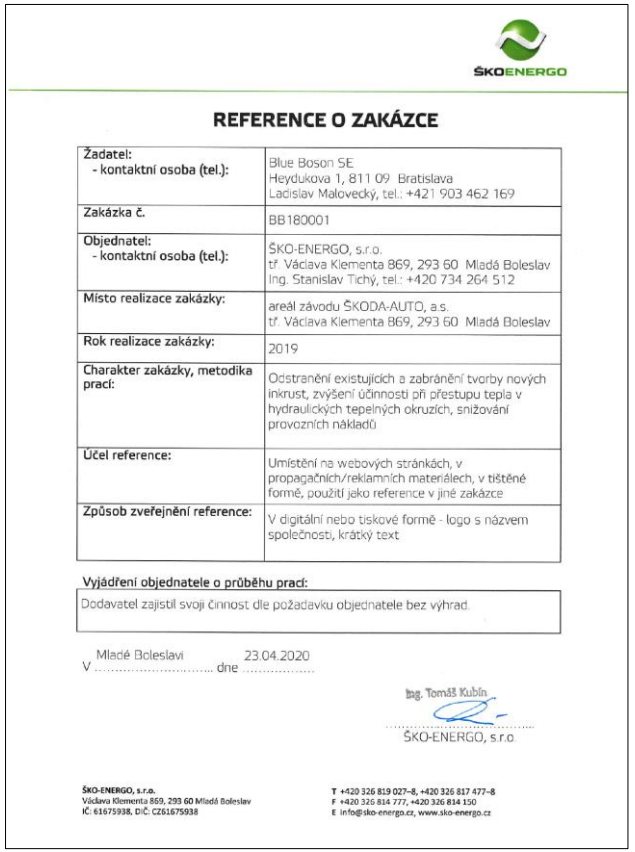
DRINKING WATER – water distribution in operational buildings in heating plant

The supplying pipework of raw water to heating plant areal	
water in building (rich orange color)	Non-drinking
Pipework	DN 100
pipework material	Cast iron/steel
pipework state	Corrosion, encrust



Removing the encrust from heating DHW circuit - ARAGONIT

The operator of heating circuits has long-term problems with gloging of pipeworks and heat-exchange surfaces of heat-exchangers. The target of this project was starting the process of existing encrust removing and then to prevent the creation of the new encrust. In march 2019 have been installed 2 pcs. of BB devices to DHW circuit in health center building. Based on regular inspections was proven of en-crust re-moving was successfully began. The benefits have been proven and technology will be install to another hydraulic circuits.



ŠKOENERGO

REFERENCE O ZAKÁZCE

Žadatel: - kontaktní osoba (tel.):	Blue Boson SE Heydukova 1, 811 09 Bratislava Ladislav Malovecký, tel.: +421 903 462 169
Zakázka č.	BB180001
Objednatel: - kontaktní osoba (tel.):	ŠKO-ENERGO, s.r.o. tř. Václava Klementa 869, 293 60 Mladá Boleslav Ing. Stanislav Tichý, tel.: +420 734 264 512
Místo realizace zakázky:	areál závodu ŠKODA-AUTO, a.s. tř. Václava Klementa 869, 293 60 Mladá Boleslav
Rok realizace zakázky:	2019
Charakter zakázky, metodika prací:	Odstranění existujících a zabránění tvorby nových inkrust, zvýšení účinnosti při přestupu tepla v hydraulických tepelných okruzích, snižování provozních nákladů
Účel reference:	Umístění na webových stránkách, v propagačních/reklamních materiálech, v tištěné formě, použití jako reference v jiné zakázce
Způsob zveřejnění reference:	V digitální nebo tiskové formě - logo s názvem společnosti, krátký text

Vyjádření objednatele o průběhu prací:

Dodavatel zajistil svoji činnost dle požadavku objednatele bez výhrad.

V Mladé Boleslavi dne 23.04.2020

Ing. Tomáš Kubín

ŠKO-ENERGO, s.r.o.

ŠKO-ENERGO, s.r.o.
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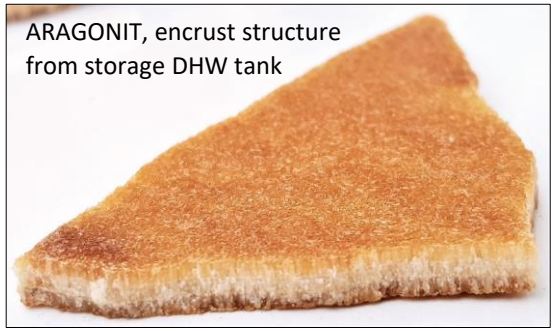
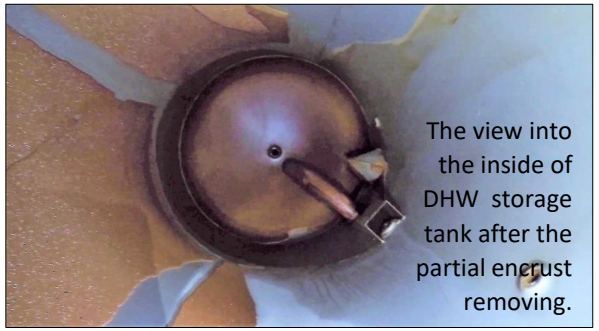
E info@sko-energo.cz, www.sko-energo.cz



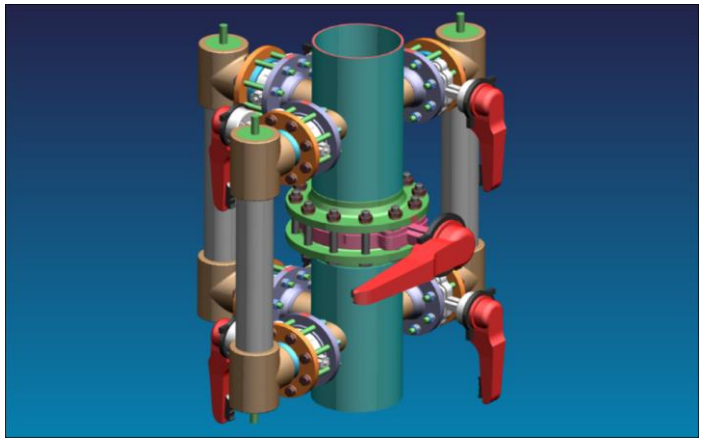
ARAGONIT, encrust structure from storage DHW tank

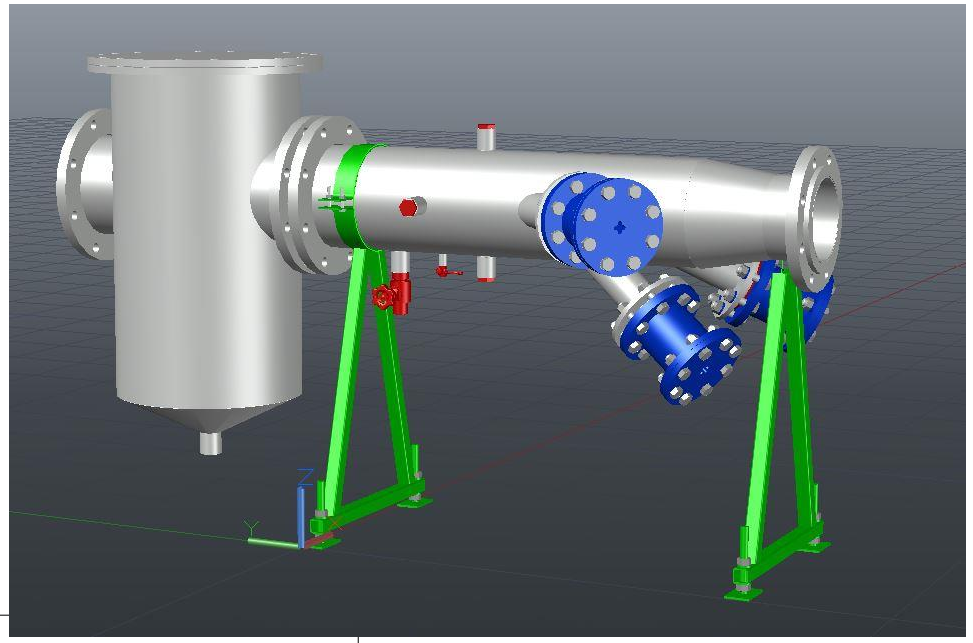


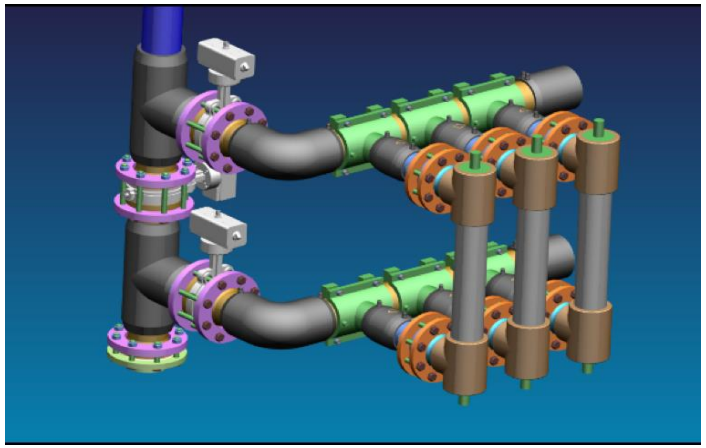
The view into the inside of DHW storage tank after the partial encrust removing.

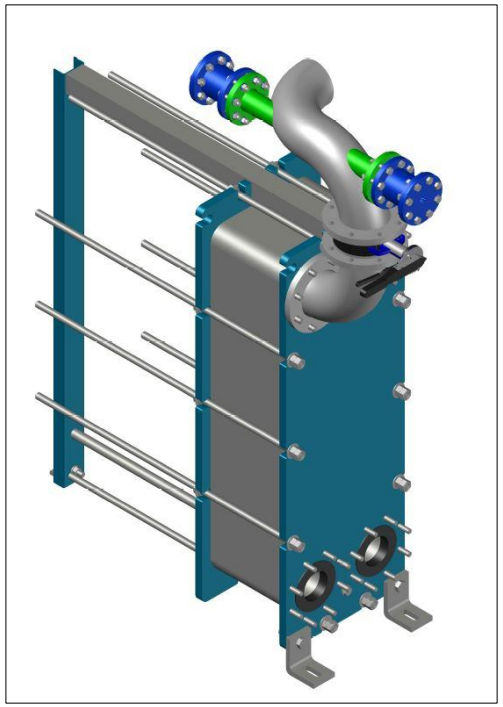
THE INSTALLATION EXAMPLES

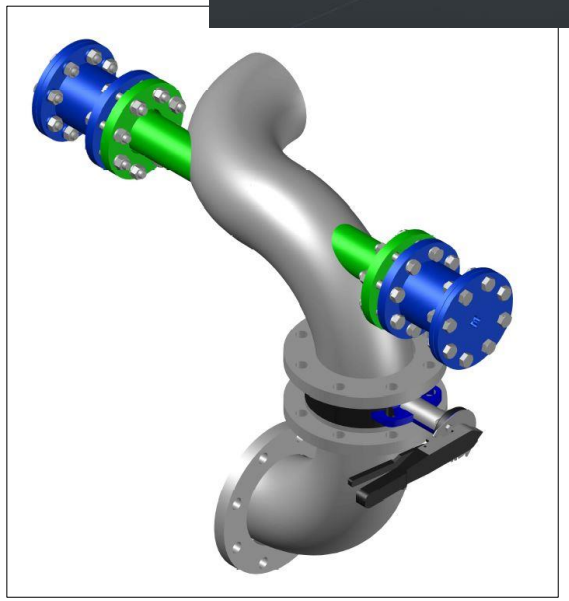
Blue Boson

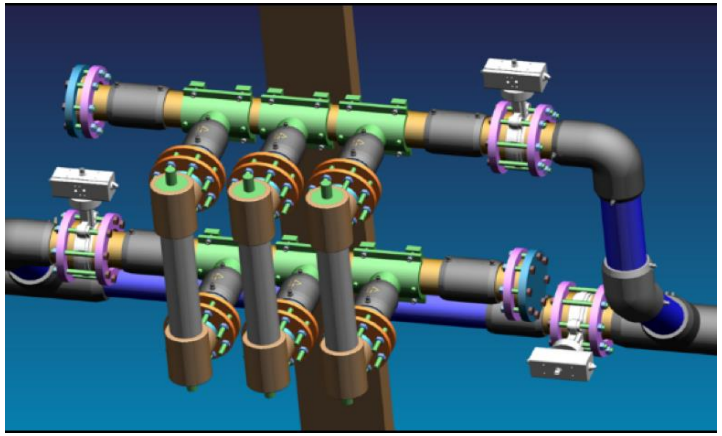


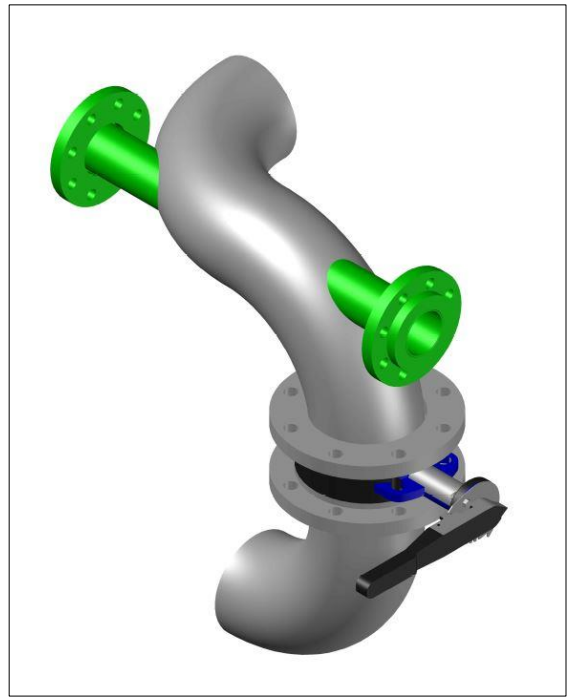




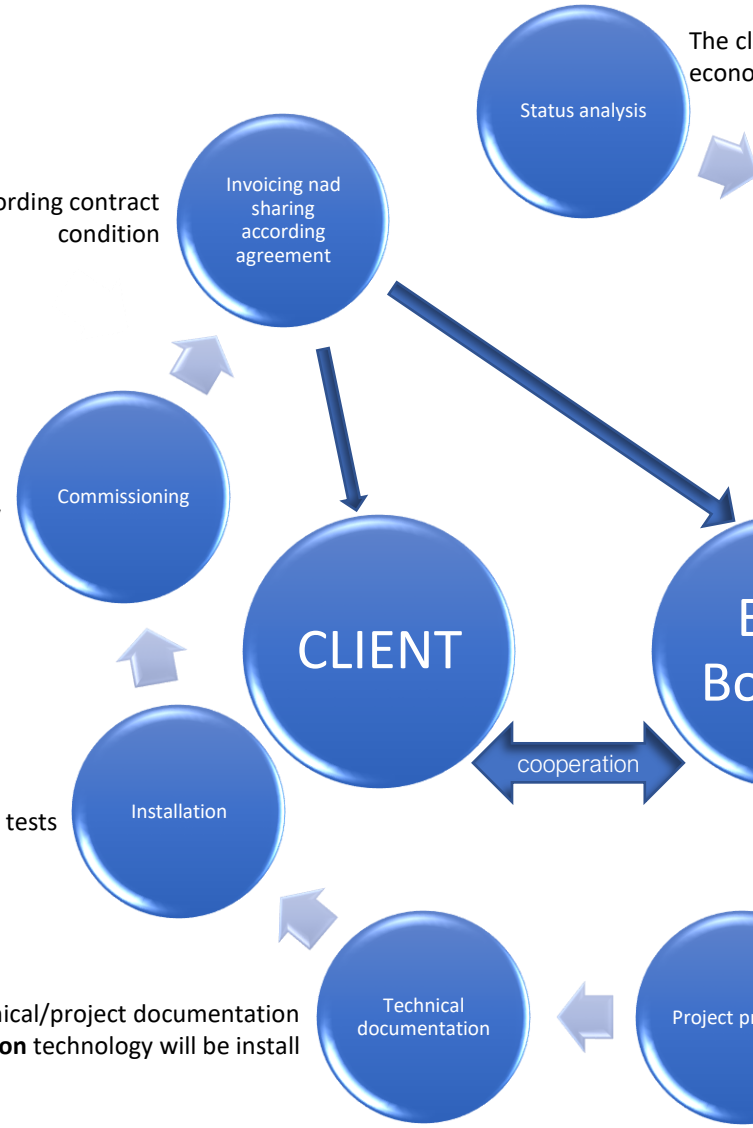








OPTIMIZATION OF ENERGY COST – ESCO model



The client provide technical and economical datas need to the design, project proposal and economic model, for the future cooperation

The technical team analyze and design optimal solutions

To the client is introduced the technical project solution and contract draft to comments. The contract shall determine the next steps and all cooperation conditions

To the client is introduced the measurement concept, request for providing the operational data (archived data)

To the client is placed the final project proposal including all technical details

The preparation of technical/project documentation according the **Blue Boson** technology will be install

The installation and operational tests

The technology commissioning, beginning of data collecting with **Blue Boson** technology

The beginning of sharing and invoicing according contract condition

Blue Boson

Thank you

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