

ENERGY OUTSOURCING™

ATHENS HILTON CHP

2nd ANNUAL REPORT

April 1, 2015 - March 31, 2016





ATHENS HILTON, OWNED BY IONIKI SA.



ATHENS HILTON SITE: VGF H24GLD GE-WAUKESHA GAS ENGINE

INTRODUCTION

Below please find the 2nd annual report on the operation of a GE CHP unit operating at ATHENS HILTON, since February the 10th, 2014.

The unit produces most of the heat needed for space and domestic hot water heating. Concurrently the unit covers a great amount of the electricity consumption of the building.

This venture is based on the relevant **Energy Procurement Contract, signed on** April 18, 2013 between **IONIKI** and **HELIOSTAT**.

The specific Energy Procurement Contract, is under the scheme **ENERGY OUTSOURCING™**, which is an innovative “state of the art” business method, developed by Heliostat Ltd to build-own and operate (BOO) CHP units.

The venture involves third party financing, in this case offered by **Alpha Leasing**.

1. REPORT

Production period: April 1st, 2015 until March 31st, 2016.

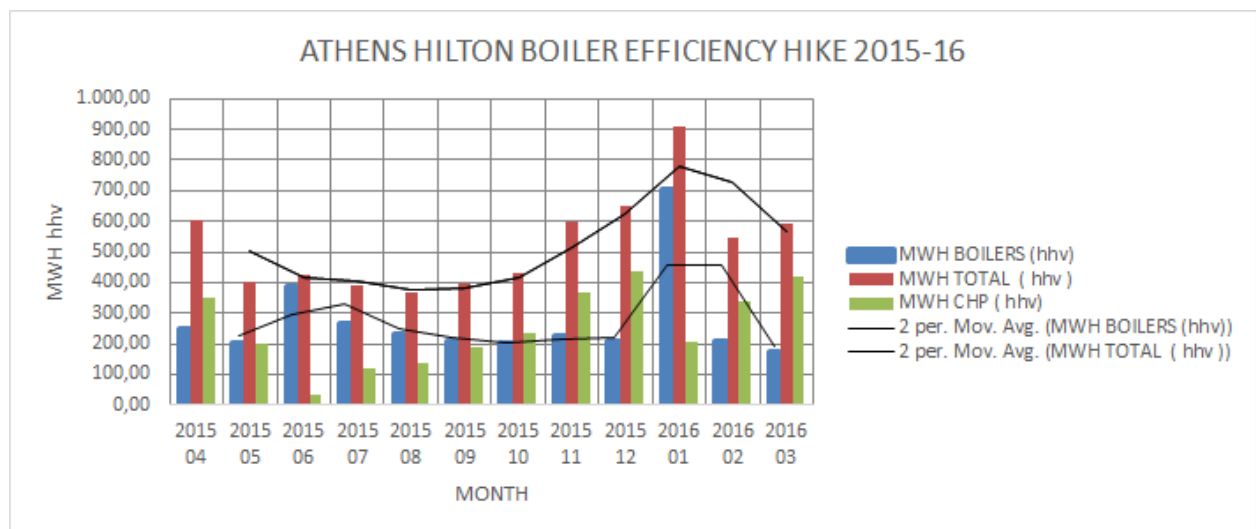
1.1. **BOILER EFFICIENCY**

The critical factor on the estimation of ATHENS HILTON’s CHP total profit, is the seasonal boiler efficiency, which since November 19, 2015, has been attempted to be calculated, rather than monitored.

This parameter converts the amount of the delivered heat, into equivalent, substituted natural gas for heating.

Based on the annual results presented on the below graphical presentation it is proved that the calculated boiler efficiency is even lower than the true.

Graphical Presentation:



In particular, from the above graph, we observe that on January 2016, when the CHP was brought to a halt (for 500 op. hours) due to the below reported malfunction(see 1.2.2. below), the total heat consumption of the Hotel (red column or total heat) made a hike, becoming higher than of February or even of March.

In more detail, comparing the months January and December, we observe that MWH CHP figure is 430 units for December and 200 units on January.

In parallel, we observe that MWH BOILER figure is 220 units for December and hikes to 710 units on January.

This means that the drop of CHP output by 230 units corresponds to the raise by 490 units of the BOILER output. i.e. the boiler output raise is more than double to the CHP thermal output drop.

This great difference cannot be attributed to weather conditions diversification.

This phenomenon is attributed to the fact that **the existing HILTON boilers are seriously oversized, both for summer as well as for winter operation.**

The application of CHP creates enormous savings, which through the assumption of a higher boiler efficiency than the true, are not attributed to the CHP.

1.2. MALFUNCTIONS

1.2.1. In the reported period it was discovered that by August 6th till September 17th 2015, there was a malfunction on the boiler inlet valves which caused an enormous amount of engines stops (i.e. **1.009 engine stops** from 6/8/2015 until 17/09/2015). This created damages and lowered the performance.

1.2.2. Starting December 23, 2015 and on, the domestic hot water (DHW) temperature of the Hotel was out of control. It was raised by almost 10°C within 10 minutes, for 28 times consecutively. As a result, a serious damage on engine's generator occurred on January 11th, 2016, and consequently brought to a halt the engine for 20 days for repairs, producing a loss of 500 prime operating hours.

The cost of this damage was 20.620€, i.e.:

- Cost for repairs: 6.260€ (VAT excluded), partially covered by our insurance.
- Lost savings for HILTON: 3.797€ (IONIKI damages).
- Lost savings for HELIOSTAT: 10.563€ (HELIOSTAT damages).

2. ENERGY PRODUCTION AND SAVINGS

Despite the above, CHP was extremely profitable.

Table 3: analysis of actual CHP savings

| MONTH | CHP OP. HOURS | Kwav. | MWH EL. | €/MWH | CHP HEAT MWH h/hv | €/MWH | € ELECTR. | € HEAT | ELECTR. DISC. | HEAT DISCOUNT | HILTON PROFIT | HELIOS PROFIT |
|---------------|------------------|------------|--------------|----------------|----------------------|---------------|------------------|------------------|------------------|------------------|------------------|------------------|
| 2015 04 | 489 | 287 | 145,34 | 123,443 | 350,519 | 65,274 | 17.941 € | 22.880 € | 3.588 € | 1.144 € | 4.732 € | |
| 2015 05 | 271 | 249 | 69,95 | 121,076 | 197,699 | 58,494 | 8.470 € | 11.564 € | 1.694 € | 578 € | 2.272 € | |
| 2015 06 | 6 | 251 | 1,56 | 120,138 | 35,494 | 53,781 | 187 € | 1.909 € | 37 € | 95 € | 133 € | |
| 2015 07 | 174 | 251 | 45,30 | 120,580 | 120,077 | 55,078 | 5.462 € | 6.614 € | 1.092 € | 331 € | 1.423 € | |
| 2015 08 | 225 | 191 | 44,53 | 120,818 | 136,202 | 55,025 | 5.380 € | 7.495 € | 1.076 € | 375 € | 1.451 € | |
| 2015 09 | 308 | 223 | 71,16 | 114,730 | 189,072 | 55,768 | 8.164 € | 10.544 € | 1.633 € | 527 € | 2.160 € | |
| 2015 10 | 392 | 261 | 106,19 | 116,451 | 232,169 | 54,949 | 12.366 € | 12.757 € | 2.473 € | 638 € | 3.111 € | |
| 2015 11 | 458 | 263 | 124,71 | 116,765 | 369,931 | 53,835 | 14.562 € | 19.915 € | 2.912 € | 996 € | 3.908 € | |
| 2015 12 | 682 | 297 | 210,12 | 119,974 | 436,127 | 54,653 | 25.209 € | 23.836 € | 5.042 € | 1.192 € | 7.048 € | |
| 2016 01 | 230 | 299 | 71,24 | 113,929 | 203,929 | 51,165 | 8.117 € | 10.434 € | 1.623 € | 522 € | 2.145 € | |
| 2016 02 | 515 | 278 | 148,63 | 117,619 | 339,488 | 53,477 | 17.481 € | 18.155 € | 3.496 € | 908 € | 4.404 € | |
| 2016 03 | 600 | 269 | 167,15 | 114,863 | 415,388 | 53,518 | 19.199 € | 22.231 € | 3.840 € | 1.112 € | 4.960 € | |
| TOTAL: | 4350 | 268 | 1.206 | 118,365 | 3.026 | 55,418 | 142.539 € | 168.333 € | 28.508 € | 8.417 € | 37.747 € | 41.277 € |

The annual profit for IONIKI is 37.747 € excluding VAT. On this amount we have to add 3.797 € which is due to production losses (see 1.2.2. above). Therefore the true annual net profit for our customer would have been 41.544€.

The corresponding annual profit for HELIOSTAT was 41.277 € excluding VAT. On this amount we have to add 10.563 € which is the production loss (see 1.2.2. above). Therefore, the true annual net profit for HELIOSTAT would have been 51.840 €.

Total annual profits after capex and opex are subtracted, exceed 79.000 €, which represents the 20% of the total investment, instead of 23% that it should have been. The possible profitability would have been over 90.000 €, should the above mentioned obstacles were not met.

Electricity production was thus 1.206 MWH el., dropping from 1.501 MWH el. (April 2014-March 2015) @ Average Annual Power output of 268 KWel.

3. CASH FLOW

The amount lent by IONIKI on the startup was 46.250,49 euro.

Till 31st of March, 2016, a total of 28.227,5 €, were amortized.

The balance due as of 1st April 2016 is 7.000 euros, has been also amortized.

The balance due to be paid till 31st of March, 2017, is 11.022,99 euros.

Effective June 1st, 2018, there will be a bonus of 20.000 € per year for IONIKI, due to the amortization of HELIOSTAT's machinery, so the minimum guaranteed profit for IONIKI will be raised to 60.000 € per year.

4. CHP FUTURE OPERATION (APPLICATION OF PARAGRAPH 3.2 OF THE CONTRACT)

At present CHP is operating at 5.123 hours/year at 268 kw el. instead of 8.000 hours/year at 340 kw el. The annual production has dropped to a mere 1.300 MWh el instead of 2.700 MWh el that can be produced, dropping the profitability of this CHP unit to the current levels.

Based on paragraph 3.2. of our contract, we requested the approval of IONIKI SA, to outsource thermal cooling In this way the profitability for IONIKI will increase from 40.000 € or later 60.000 € and reach 67.000 € or 87.000 € per year, with corresponding increase of savings for HELIOSTAT.

A relevant cost benefit analysis is given below.

| | HOURS | CHP PRODUCTION MWH | | | | | CHP KW | | | | | MWH to IONIKI | | | COSTS EURO | | | | SAVINGS EURO | | |
|------|-------|--------------------|---------|-------|------------|--------------|------------|------|---------|------|-------------|---------------|--------------------|---------|------------|--------------|-----------|------------|---------------|----------|----------|
| | | max 720 | ELECTR. | FUEL | TOTAL HEAT | HEAT heating | HEAT cool. | HEAT | ELECTR. | FUEL | HEAT therm. | COOL therm. | Elec. Subst. cool. | HEATING | ELECTR. | COOL electr. | CHP Heat | CHP Elect. | Chiller Elec. | CHP Fuel | HELIOS |
| Apr. | 670 | 222 | 737 | 427 | 305 | 221 | 637 | 320 | 1.100 | 450 | 181 | 48 | 430 | 222 | 34 | 20.855 € | 23.955 € | 3.626 € | 25.050 € | 8.784 € | 5.842 € |
| May | 670 | 222 | 737 | 601 | 218 | 388 | 637 | 320 | 1.100 | 318 | 319 | 85 | 300 | 222 | 59 | 14.550 € | 23.955 € | 4.380 € | 25.050 € | 5.549 € | 5.527 € |
| Jun. | 670 | 222 | 737 | 601 | 122 | 479 | 637 | 320 | 1.100 | 181 | 456 | 91 | 171 | 222 | 63 | 8.304 € | 23.955 € | 6.812 € | 25.050 € | 66 € | 5.214 € |
| Jul. | 670 | 222 | 737 | 601 | 122 | 479 | 637 | 320 | 1.100 | 181 | 456 | 91 | 171 | 222 | 63 | 8.304 € | 23.955 € | 6.812 € | 25.050 € | 66 € | 5.214 € |
| Aug. | 670 | 222 | 737 | 601 | 122 | 479 | 637 | 320 | 1.100 | 182 | 453 | 91 | 171 | 222 | 63 | 8.314 € | 23.955 € | 6.829 € | 25.050 € | 73 € | 5.235 € |
| Sep. | 670 | 222 | 737 | 601 | 122 | 479 | 637 | 320 | 1.100 | 182 | 455 | 91 | 171 | 222 | 63 | 8.314 € | 23.955 € | 6.829 € | 25.050 € | 73 € | 5.235 € |
| Oct. | 670 | 222 | 737 | 601 | 121 | 480 | 637 | 320 | 1.100 | 180 | 457 | 91 | 170 | 222 | 63 | 8.289 € | 23.955 € | 6.851 € | 25.050 € | 30 € | 5.211 € |
| Nov. | 670 | 222 | 737 | 601 | 218 | 388 | 637 | 320 | 1.100 | 318 | 319 | 64 | 300 | 222 | 44 | 14.550 € | 23.955 € | 4.785 € | 25.050 € | 3.954 € | 5.527 € |
| Dec. | 670 | 222 | 737 | 601 | 355 | 266 | 637 | 320 | 1.100 | 499 | 138 | 37 | 471 | 222 | 25 | 22.880 € | 23.955 € | 2.750 € | 25.050 € | 9.813 € | 3.942 € |
| Jan. | 670 | 222 | 737 | 601 | 309 | 292 | 637 | 320 | 1.100 | 461 | 176 | 47 | 485 | 222 | 33 | 21.108 € | 23.955 € | 3.515 € | 25.050 € | 8.914 € | 5.854 € |
| Feb. | 670 | 222 | 737 | 601 | 309 | 292 | 637 | 320 | 1.100 | 461 | 176 | 47 | 485 | 222 | 33 | 21.108 € | 23.955 € | 3.515 € | 25.050 € | 8.914 € | 5.854 € |
| Mar. | 670 | 222 | 737 | 601 | 322 | 279 | 637 | 320 | 1.100 | 481 | 156 | 42 | 454 | 222 | 29 | 22.007 € | 23.955 € | 1.123 € | 25.050 € | 9.375 € | 5.889 € |
| | 8.040 | 2.666 | 8.041 | 7.936 | 2.613 | 4.422 | 637 | 320 | 1.100 | 499 | 497 | 91 | 3.681 | 2.666 | 573 | 178.517 € | 287.940 € | 61.868 € | 300.602 € | 35.609 € | 66.514 € |

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HELIOSTAT Ltd



Distributor & Service Provider
Waukesha gas engines

