

**CARREFOUR MARINOPOULOS**

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To: SEMAN S.A.  
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Dear Dr. Satsios,

After two completely successful projects carried out by your company in our facilities in Efkarpia and Alexandroupoli we led to the decision to continue our cooperation at further store facilities. Were selected three CARREFOUR facilities in Thessaloniki area.

- Store in Macedonia mall.
- Store in City Gate mall.
- Store in Kordelio.

With this letter we would like to acquaint you with our opinion regarding the Scientific Power Quality Improvement – Electric Energy Saving Projects that your company, SEMAN S.A., carried out at the abovementioned electrical installations of CARREFOUR according to your scientific know-how.

Your projects concerned the scientific study and simulation of the electrical installations and according to the results the design and installation of customized systems aiming at the improvement of power quality, by the reduction of current – voltage harmonics, the improvement of electric motors' efficiency, the improvement of power transformers' efficiency to the substation and the minimization of reactive currents in the inner of the electrical installations.

Projects commissioning was realized in June 2014 and right after project implementation, measurements of the consumptions of our installation's electric



subpanels were realized, by the presence of representatives of both parties. The measurements were performed instantly (so that there is no variation in electric loads' charging), with and without saving systems in operation. Moreover, measurements were carried out for a long term period every three months in order to check the saving result and to ensure the proper operation of the interventions. According to measurements, it resulted that the reduction of the average electrical energy demand according to four measurements is:

- To Macedonia **11,8%** while the guaranteed according to contract was 9,8%.
- To City Gate **11,1%** while the guaranteed according to contract was 10%.
- To Kordelio **13,2%** while the guaranteed according to contract was 9,8%.

Furthermore, besides the remarkable electric energy saving achieved by projects execution, we also experienced additional benefits, such as the important increase of the electrical installation's redundancy, the great reduction in maintenance cost of the electrical equipment, as well as the reduction of problems caused to the electric loads due to voltage drops and other abnormalities occurring to the electric grid of Power Supply Company. In addition, we noticed a considerable improvement on supply voltage levels, reduction of harmonics and almost elimination of the reactive power demand in the inner of the electrical installations.

Concluding, we would like to congratulate you and your company, SEMAN S.A., for the absolutely successful projects you implemented at our installations, as the initial saving goals you had set, not only it was achieved but it was exceeded by far, resulting in an even shorter payback period of projects cost. In addition, many other benefits occurred due to the project, as analytically mentioned above.

Kind regards,



Christos Mavromatis.

Technical dep. N. Greece.