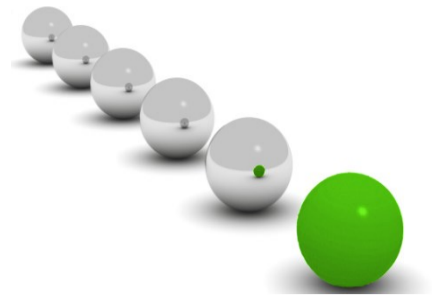




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SUSTAINABLE ENERGY REDUCTION, PRODUCTION AND MANAGEMENT AT PXL-TECH GEOTHERMAL ENERGY

INTRODUCTION

Recent developments have been done in energy policies all around the world in order to support renewable energy.

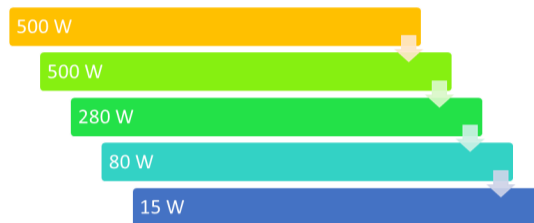


Nonetheless, PXL University College has a heating consumption which is over the real energy needs of the building and so, its gas emission and efficiency can be improved.

The aim of this projects is to analyse if a geothermal energy system at PXL-Tech Diepenbeek, will be viable.

RESULTS

The building would need 1369 kW for heating and 233 kW for cooling. For that, heat pumps with the next power would be installed from the Danish Renewable Energy Company.



A series vertical installation would be fixed with 56 U exchangers and a total area of 6612 m².



The investement that would have to be done would be the next:

- * Heat Pumps 406198 €
- * Pipes 25832 €
- * Holes 282240 €
- * TOTAL: 714269,68 €



The building would be able to save:

- ◇ 22365,64 € per year (%40,74 of its previous heating costs)
- ◇ 1,33x10⁸ g CO2 (%29,86 pf its previous heating pollution)
- ◇ 525 tree per year would be saved
- ◇ The payback of the installation would be around 32 years.



CONCLUSIONS

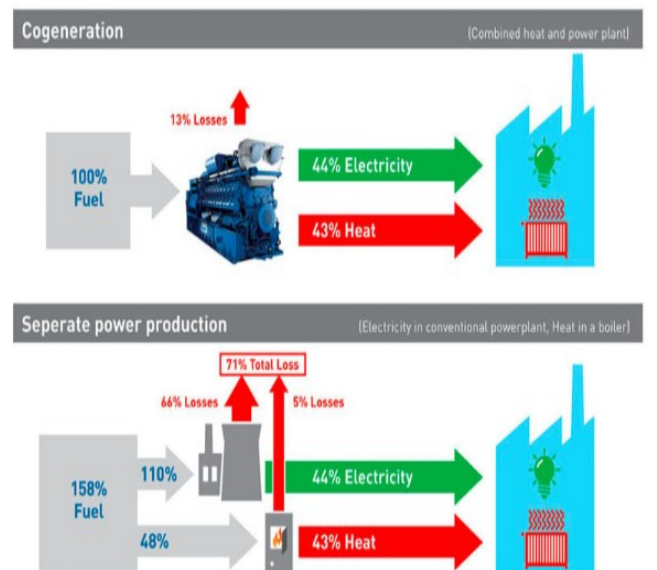
The new installation would cause a considerable saving to PXL-Tech, in both, environmental and economic aspect. It would be able to save 22365,64 € per year (40,74 %) and it would release 1,33 x 10⁸ g CO₂ less per year (29,86%).

The payback would be 32 years which would be long; firstly, because the heat pumps have an estimated life of 20 years without problems, and secondly, because the heat exchangers work properly for 50 years or so. As a result, the payback value is not very attractive.

Apart from that, the heat exchanger would need an area of 6612,70 m² and the available space that I mentioned at first, would be 4555, 0885 m². As a result, there would have to take more area from the east side of the building.

In conclusion, bearing in mind the current data, I can say that the geothermal installation at PXL-Tech is not viable.

Taking all this factor into account and knowing that the building needs a huge electricity supply, as well, I suggest studying the field of cogeneration. It could be the most suitable energy production system for PXL-Tech.



BACHELORPROEF ELEKTROMECHANICA