

DEI ECOVAT

Het Nieuwe Dorp - validation of business case assumptions

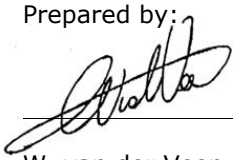
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Customer:	Ecovat, Poort van Veghel 4946, 5466 SB Veghel, The Netherlands	P.O. Box 9035 6800 ET ARNHEM The Netherlands
Contact person:	Eugène van Boudijk Bastiaanse	
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Prepared by:


W. van der Veen
Consultant

Verified by:



A. Aalberts
Consultant

Approved by:



P. de Boer-Meulman
Head of Department

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1 INTRODUCTION

Ecovat calculated the business case for an Ecovat system for the heat supply of Het Nieuwe Dorp in Arnhem. Calculations have been executed with a financial model prepared by Rebel company. The assumptions used for this model are explained in two documents:

- P151101-MR05 Memo toelichting op investeringen in Business Case Het Nieuwe Dorp.pdf (translation: memo explanation on investments business case "Het Nieuwe Dorp") and
- P151101 Benefits for Ecovat System for the shareholder of DDE bv 31012018.pdf

Both documents have several attachments which serve as substantiation of the used assumptions. DNV GL have reviewed both documents and the attachments. We have not reviewed the financial model¹.

2 VALIDATION OF ASSUMPTIONS

With this letter we confirm that we agree with the way this business case has been calculated and that the assumptions used seem reasonable. The business case however is, like every business case, sensitive for the used assumptions. For this particular business case we identified the following four major risks with regard to the assumptions:

1. Comparative investment risk
2. Heat demand risk
3. Risk of heat price development
4. Risk of electricity purchase price development

These risks are further discussed below.

1. Comparative investment risk

In the business case the investment for the Ecovat solution is compared to the investment of alternative solutions. The differences in investment costs are considered a benefit for the Ecovat solution. One of these differences are the avoided investment costs for building measures to further reduce the heat demand (like insulation) that need not be carried out in Ecovat solution. Whether this is allowed under foreseen new legislation² however is to be seen.

2. Heat demand risk

Heat demand risk encompasses two things. First one is the spend in which the plans for new buildings are realised. Second one is the risk that the actual heat demand differs from the assumed heat demand. The present business case is based on heat demand information of Siza. Our validation assumes that this heat demand is correct.

¹ Validation of financial model lies with Rebel.

² BENG legislation which will become effective in 2020

3. Risk of heat price development

In the business case a 4.55%³ annual increase of the heat price is assumed for the whole project period. This 4.55% is mentioned for the years until 2023 on a website of the Dutch government. Official scenarios for longer periods, for the development of fuel prices and cost of CO₂, like from the IEA⁴, also point in this direction.

One can argue whether this will be realised. In reality this may be lower or higher depending on fuel price development and development of CAPEX and OPEX of heating systems. Also for the period after 2023 there is a risk of deviation from this number.

4. Risk of electricity purchase price development

The seasonal storage of Ecovat will use electricity when prices are the lowest. A discount on the average prices has been used based on external studies. Also an annual increase of hours with zero prices is assumed based on these studies. This assumption seem fair to DNV GL⁵. The used values are based on an average of several scenarios. The risk exists that one of the more extreme scenarios will evolve which leads to more or less increase of zero cost electricity than assumed. Also reality may differ from assumptions of the external research which may lead to different values.

Sensitivity analysis may be executed to get a better view on the above mentioned risks.

3 CONCLUSION

Conclusion is that we validate the used assumptions and approach of the business case calculations performed by Ecovat with annotation of the four identified main risks.

We in fact state that:

- the calculation of the benefits and costs as indicated in the Ecovat documents looks good
- the basic assumptions and assumptions are all reasonable but
- there are four major risks with regard to the assumptions

We do not validate the business case since Ecovat does the calculations with the financial model and ultimately determines the business case.

4 RECOMMENDATION

We recommend to investigate the four major risks mentioned above using different values of the assumptions.

³ Of the nominal values.

⁴ International Energy Agency, World Energy Outlook (WEO) 2017

⁵ Also forecasted negative prices have not been used in the business case which is considered conservative.



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