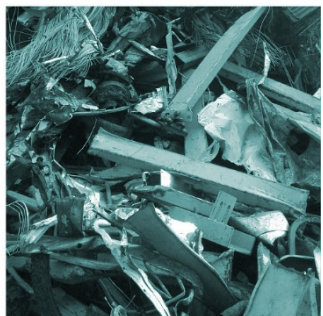
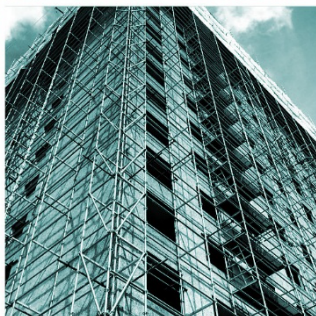
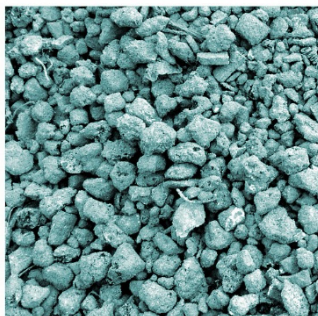
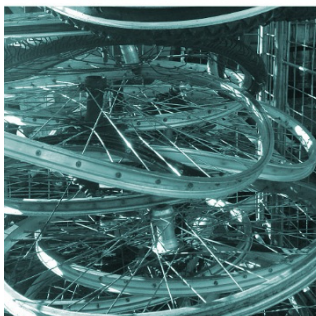
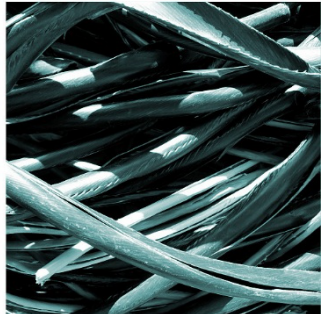


BIO DYNAMIC UK LIMITED

PERMIT VARIATION APPLICATION

Energy Balances and Resource Efficiency

July 2022



Client: Bio Dynamic UK Limited
Document Reference: HC1677-20

REPORT SCHEDULE

Operator: Bio Dynamic UK Limited

Client: Bio Dynamic UK Limited

Project Title: Bio Dynamic UK Limited Permit Variation Application

Document Title: Energy Balances and Resource Efficiency

Document Reference: HC1677-20

Report Status: Final 1.0

Project Director: Joanna Holland

Project Manager: Jo Chapman

AUTHOR	DATE
Jo Chapman	15 th July 2022
REVIEWER	
Joanna Holland	13 th August 2022
APPROVED	
Joanna Holland	13 th August 2022

REVISION HISTORY	DATE	COMMENTS	APPROVED
Final Version 1.0	13 th August 2022	For Submission to EA	Maxwell Bagnall

DISCLAIMER

This report has been prepared by H&C Consultancy Ltd with all reasonable skill, care and diligence. It has been prepared in accordance with instructions from the client and within the terms and conditions agreed with the client. The report is based on information provided by the Client and our professional judgment at the time this report was prepared.

The report presents H&C Consultancy’s professional opinion and no warranty, expressed or implied, is made.

This report is for the sole use of The Client, and H&C Consultancy Ltd shall not be held responsible for any user of the report or its content for any purpose other than that for which it was prepared and provided to the client. H&C Consultancy accepts no liability to third parties.

CONTENTS

1. Energy Balances	1
--------------------------	---

APPENDICES

Appendix 1	Plant Mass Balances
Appendix 2	Plant Mass Balances Phase 2 (Addition of Second Post Fermenter)

1. ENERGY BALANCES

1.1. Introduction

- 1.1.1. The Bio Dynamic UK Limited AD facility is an installation, and as such the operator will need to comply with permit conditions that require measures to be taken to ensure that energy is used efficiently. The operator will also need to carry out four yearly reviews to continually identify potential savings in energy efficiency on site.
- 1.1.2. At the time of writing this document, the site is undergoing a significant refurbishment which will result in a change in the operational parameters at the site. This document sets out the operator's intention regarding compliance with this aspect of the permit once newly configured plant becomes operational, as follows:

1.2. Energy Efficiency Measures Considered at Plant Design

- 1.2.1. The following Energy Efficiency Measures will be considered:
 - Heat from the hot water-cooling system within the CHP will be recovered to heat the site process tanks;
 - Electricity generated on site from burning of biogas in the CHP engines will be used to power the AD process;
 - When purchasing plant components for the site construction, wherever possible the operator will consider purchasing the most energy efficient models where this is fit for purpose.
- 1.2.2. The **mass balances for input materials, energy usage and outputs** for the plant are shown in **appendix 1**. Data for **phase 2 operations** following addition of a second post (secondary) digester are shown in **appendix 2**.
- 1.2.3. It is difficult to quantify the precise nature and savings made by these measures at this time, as the operational and constructional detail of the plant are still being finalised at the time of submission of this application.

1.3. Intended Action Points Following Plant Operation

- 1.3.1. The following action points will be implemented following plant operation:
 - The operator will identify energy uses on site and develop a framework monitoring schedule to enable detailed monitoring of specific energy use of different areas of the plant;
 - Following a period of monitoring, the operator will collate data on energy consumption from different areas of the plant and give an overall statement of primary energy consumption and energy exports from the plant. The operator will review the energy flow information to evaluate predicted relative amounts of energy usage throughout different parts of the process;
 - The operator will use the monitoring data and primary energy consumption calculation to calculate the specific energy consumption (SEC) for the activity. This SEC can then be compared to any sector specific benchmark to gain a measure of the relative energy efficiency of the plant in relation to industry standards;

- The operator will additionally carry out a review of the energy efficiency of the site taking into account available energy efficiency measures for all areas of the site.
- The operator will use the information, and assessments above to develop an energy efficiency plan that will be reviewed at least on a four-yearly basis. Objectives will be set and tracked to completion arising from opportunities identified for improved efficiencies at four yearly review



Registered office:
Staffordshire House
Beechdale Road
Nottingham NG8 3FH
Company No. 7861810

☎ 0115 923 2253
☎ 07506 658098 / 07525 211381
🌐 www.hc-consultancy.co.uk