

Title: Help Push Producers Forward in their Environmental Data Collection
Scientific Field: Information Technologies/ Environmental Engineering
Department: Product Development

Project Proposal: Help Push Producers Forward in their Environmental Data Collection

Background

After the release of the most recent IPCC report [1], urgent action by all stakeholders is again being called for if we are to limit global warming across the planet. To help achieve this, many stakeholders are being encouraged to set ‘science-based targets’ where quantifiable data is needed to see if the targets are achieved or not [2]. Gaining quantifiable environmental data has been a notoriously difficult area, with ‘green-washing’ claims afflicting many large companies who have been called out for flaws and omissions in environmental promises and statements [3]. One methodology that has become increasingly popular for gaining quantitative environmental data is Life Cycle Assessment (LCA), however, difficulties with data collection has also plagued many practitioners and can lead to highly varied results between studies [4].

Problem and Goal

The aggregates industry is vital for future development, with aggregates being the main component of concrete and asphalt in key infrastructure projects. The widespread use of aggregates means the industry is a large contributor to global warming, and efforts need to be taken to reduce their impacts. Building on work done in the Vinnova project, EPD-Berg, in collaboration with NCC, Skanska, and Swerock (an overview of which can be seen in Figure 2), and as part of the EU Horizon 2020 project, DigiEcoQuarry [5] in collaboration with 24 other companies and organisations, the Chalmers Rock Processing Systems group (CRPS) is developing a tool to simulate environmental impacts from aggregate production to be presented in an Environmental Product Declaration (EPD). Some of the key data needed to model the environmental impact comes from purchasing data which currently needs to be manually inputted. The aim of this thesis project is to:

- *Identify key technological advances from other areas for automating data collection and evaluate which can be applied to the aggregates industry considering its unique challenges.*
- *Develop and design a concept or a product to help automate the collection of relevant data for environmental simulation.*
- *Assess the benefits/ drawbacks of the examined data collection tools/methods in gaining reliable environmental information by aggregate producers.*



Figure 1: A quarry in Västra Götaland where aggregates are extracted and crushed.

The ideal candidate/candidates will have an understanding of systems approaches and development of digital solutions. They should have a key interest in sustainability issues and happy working across many disciplines. Insight into LCA and the aggregates industry is seen as a merit but not essential.

The supervisor for the project will be Christina Lee (leec@chalmers.se) and **the examiner** will be Gauti Asbjörnsson (gauti@chalmers.se).

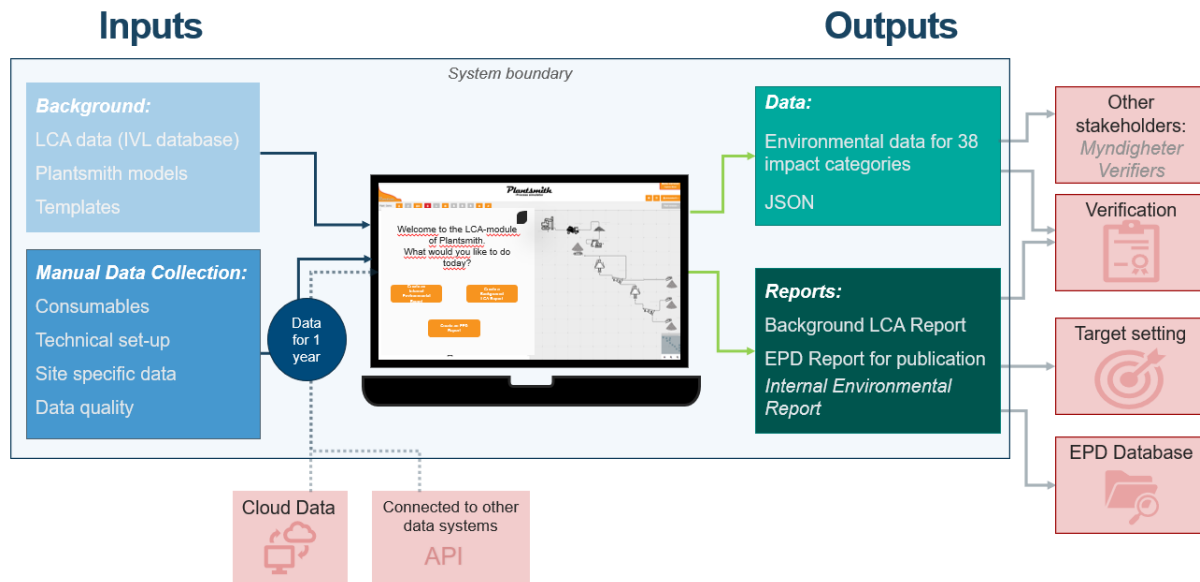


Figure 2: Overview of the EPD-Berg project on which this project will be built on with the inputs required and outputs received from the tool. Icons in red are out of the scope of the project but possible areas for further research.

References

1. Intergovernmental Panel on Climate Change [IPCC], *Summary for Policymakers*, in *Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*, V. Masson-Delmotte, P. Zhai, A. Pirani, S. L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M. I. Gomis, M. and K.L. Huang, E. Lonnoy, J. B. R. Matthews, T. K. Maycock, T. Waterfield, O. Yelekçi, R. Yu and B. Zhou Editors. 2021: Cambridge University Press.
2. Andersen, I., et al., *Defining 'science-based targets'*. National Science Review, 2021. **8**(7).
3. Hotten, R., *Ryanair rapped over low emissions claims*, in *BBC News*. 2020: <https://www.bbc.com/news/business-51372780>.
4. Santero, N. and J. Hendry, *Harmonization of LCA methodologies for the metal and mining industry*. The International Journal of Life Cycle Assessment, 2016. **21**(11): p. 1543-1553.
5. DigiEcoQuarry. *What is DEQ?* 2021; Available from: <https://digiecoquarry.eu/#what>.