## Greenlight form

## Thesis Research Project MSc Industrial Ecology Please send this form immediately after the Greenlight meeting\* filled in and signed by both supervisors to the graduation coordinator Linda Kamp: [L.M.Kamp@tudelft.nl](mailto:L.M.Kamp@tudelft.nl) and the programme administration [ocie@cml.leidenuniv.nl](mailto:ocie@cml.leidenuniv.nl)

The greenlight meeting is meant to determine whether the final draft of the thesis is sufficient to pass the final defense (i.e. can be graded with a 6 at minimum). This decision is based on the research quality, the research skills of the candidate and the quality and completeness of the draft report, which is assessed based on the thesis assessment rubric. This draft thesis report must include all required chapters, including the introduction, discussion, conclusions and appendices. Supervisors complete the Greenlight form after the Greenlight meeting. The form will be provided by the student.

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| **Student information** | | | | | |
| Student name: Florian Huber | | | Student number Leiden: 3677710 | | |
| **Declaration by the graduation committee** | | | | | |
| First supervisor:  Dr. Valerio Barbarossa | University: Leiden University | | Department: CML | | Section: Industrial Ecology |
| Second supervisor:  Dr. Mike Buxton | University: TU Delft | | Department: Faculty of Civil Engineering and Geosciences | | Section: Resource Engineering |
| Herewith the graduation committee declares that the student has passed the Greenlight meeting:  *The committee declares that the student is expected to complete the MSc IE thesis and to give the final presentation and defense within (approximately) one month* | | | Yes, the Student has passed the Greenlight meeting (‘GO’)  No, the Student did not pass the Greenlight meeting (‘NO GO’) | | |
| **GO** | | | | | |
| Scanned for plagiarism | | | Comment on ‘similarity’ scan (Turnitin): | | |
| Title thesis: Where did all the Ore came from? A Geospatial Machine Learning Framework for predicting cumulative production flows in 2019 for Copper, Nickel and Zinc operations. | | | | | |
| Agreed defense date:  15.04.2025 | | Time:  10am-11:30am | | Location:  online | |
| **NO GO** | | | | | |
| Motivation for extension of the Thesis Research Project: | | | | | |

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| **Deadline to submit revised thesis draft for second Greenlight meeting** | | Date: | | Time: | | |
| **Next Greenlight meeting**  *To be agreed between both supervisors and the student* | | Date: | | Time: | | |
| **Signature graduation committee** | | | | | | |
| **First supervisor** | Name:  Dr. Valerio Barbarossa | | Date: | | Signature: |
| **Second supervisor** | Name:  Dr. Mike Buxton | | Date: | | Signature: |
| **Feedback on Greenlight version MSc IE thesis** | | | | | |
| Please give feedback on the aspects or parts of the thesis report that can (in case of a GO) or must (in case of a NO GO) be improved. | | | | | |
| GO – Feedback on aspects that can be improved towards the final defense | | | | | |
| * Structure (Focus ML Model, Results and Discussion of it) * Reason for choosing ML as a model * Rooting of RQs in the Literature more specific * Typos, Referencing errors * Conclusion: Mapping RQs-Conclusion-Context * Scientific Narrative * Compress information especially in method part | | | | | |
| NO GO – Feedback on aspects that must be improved for the next Greenlight meeting | | | | | |
| Click or tap here to enter text. | | | | | |

**General criteria for graduation at IE**

The aim of IE is to educate student to become critical researchers or practitioners who are able to meaningfully contribute to developing solutions for persistent sustainability problems, such as related to environmental pollution, resource depletion, and climate change.

Industrial Ecology is a scientific field that takes a systemic approach to sustainability problems, integrating a technical, environmental and social perspective. Industrial Ecology studies society’s metabolism, i.e. the material and energy basis of society, from a socio-technical systems perspective in order to identify, design and critically evaluate solutions for sustainability problems and their implementation.

The following criteria would be considered to indicate a ‘typical’ IE thesis:

* The work focuses on a sustainability problem and/or solution
* The work shows a critical attitude towards sustainability, and shows awareness of the technical, environmental and social perspective on sustainability
* The work exhibits a systems perspective
* The work is interdisciplinary; it synthesizes methods, theories or concepts relevant to the field of IE
* IE methods and techniques for problem analysis and/or design are used systematically.

## Course objectives

By the end of this course, students should be able to:

* Independently conduct research that contributes to the field of Industrial Ecology by addressing a specific research question or problem within the context of sustainability challenges;
* Apply research methodologies and analytical tools to investigate complex industrial and urban systems and their environmental impacts;
* Synthesize and critically evaluate existing literature, theories, and empirical studies related to the chosen research topic, and identify research gaps and areas for further exploration;
* Collect and analyze relevant data, employing appropriate quantitative or qualitative methods, to generate meaningful insights and findings that advance knowledge in the field of Industrial Ecology;
* Integrating perspectives from various disciplines to develop and test innovative solutions or strategies for sustainable practices;
* Synthesize research findings effectively through academic writing in the form of a written report;
* Demonstrate the ability to present and defend research outcomes in a professional setting;
* Reflect on the ethical implications of research in Industrial Ecology and demonstrate awareness of the potential environmental, social, and economic consequences of any proposed solution.

Further detailed procedures are given in the Thesis Protocol. For completeness, see the Thesis Research Project assessment criteria on the next two pages. The rubric will only be filled in with the final assessment after the defense.

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| **MSc Thesis Assessment Rubric** | | | **Student name:** |  | | **Student number Leiden:** Click or tap here to enter text. | | | |  | |  | |
| - The MSc Thesis Assessment Rubric should be used by the Graduation Committee when grading a Master Thesis done within the master degree program IE. - This guide is meant to be used as a reference card, guiding the Graduation Committee in discussing the various criteria of the assessment leading to the final grade. | | | | | | | | | | |  |  |
| version: April 2018 | | | **Grading** | | | | | | | | | |
| **Assessment criteria** | **Indicative %** | **Sub criteria** |  | **5** | **6** | | **7** | **8** | **9** | | **10** | |
| **Unsatisfactory** | **Nearly satisfactory** | **Satisfactory** | | **More than satisfactory** | **Good** | **Very good** | | **Excellent** | |
| **A. Research quality** | 50-75% | Research problem and objective | Underdeveloped problematization | Mismatch between problematization and objective | Adequate problem statement | | Well-defined problem statement | Well-analysed problem statement | Innovative problem analysis | | Outstanding problem analysis with novel objective | |
|  |  | Literature review and theoretical perspective | Incomprehensive | Reproduction of theory with limited relevance to the research problem | Reproduction and application of relevant theory to the research problem | | Elaboration of theory based on known positions in literature | Evaluation and integration of theory into a novel perspective | Synthesis of existing theories into innovative perspectives | | Significant contribution to academic literature | |
|  |  | Research framework/model | No conceptual or theoretical discussion of any value | Mismatch with theoretical perspective or research problem | Adequate and appropriate to the research context | | Sound framework in the context of evaluated literature | Innovative framework that reflects state-of-the-art | Innovative framework that adds insights into state-of-the-art | | Significant addition to the state-of-the-art | |
|  |  | Research methods | Not well addressed | Unsystematically used | Competently used but not well argued | | Well elaborated and appropriate presentation of methodological issues | Very well discussed and limitations addressed | Innovative use of existing methods resolving some of their limitations | | Development of a method beyond the state-of-the-art | |
|  |  | Analyses of data | Mere description, no analysis | Underdeveloped analysis | Straightforward but superficially presented | | Straightforward and well presented | Well-argued interpretation of findings | In-depth analysis and good reflection on findings | | Sophisticated and brilliantly argued interpretation of the findings | |
|  |  | Conclusion | Not related to the research problem | Vaguely linked with research problem | Adequate connection between research problem and conclusion | | Adequate discussion of the research outcomes | Well-discussed and analysed research outcomes | Very good discussion and analyses of research outcomes | | Excellent discussion and analysis of research outcomes | |
|  |  | Discussion of societal/ managerial relevance & implications | Not addressed | Vaguely addressed | Adequate discussion of societal relevance and/or implications | | Societal/managerial relevance and implications well described | Societal/managerial relevance and implications clearly discussed and analysed | High awareness of societal/managerial implications of study | | Exceptional awareness of societal/managerial implications of study | |

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|  |  | Discussion on academic quality & contribution to literature | Not addressed | Vaguely addressed | Adequate recommendations for further research and/or discussion of limitations own research | Recommendations for further research and discussion of academic quality well described | Recommendations for further research and academic quality clearly discussed and analysed | Offers new academic insights | Contribution to academic debate |
|  |  | IE Perspective | No link to programme | Unclear link to programme | Fragmented use of study perspectives in analyses, methods and solutions | Perspectives used purposefully | Insightful use of perspectives | Clear and specific identification and integration of perspectives | Outstanding integration and application of perspectives |
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| **B. Research skills** | 10-20% | Originality and own contribution | Unable to execute a prescribed research plan | Partly able to execute a prescribed research plan | Following a prescribed research plan | Occasional initiative to modify research plan | Independent definition of the research design | Definition of an original and innovative research design | Surprising and innovative research design |
|  |  | Planning | Intense supervision needed **and** exceeded nominal project time significantly | Intense supervision needed **or** exceeded nominal project time significantly | Very regular supervision needed **or** did not keep planned targets | Regular steering and supervision needed, nominal project time | Independent planning within nominal project time | Very independent planning, with good progress | Independent researcher, with smart time allocation |
|  |  | Responsibility and managing relationships | No responsibility shown; difficulty connecting with people | Little responsibility shown and limited ability to function in a team | Responsibilities taken and adequate team player | Responsibilities taken and pro-active approach | Demonstrated leadership skills | Demonstrated leadership and gained commitment from key experts | Excellent leadership |
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| **C. Reporting quality** | 10-20% | Reporting clarity and English proficiency | Underdeveloped | Nearly acceptable | Acceptable line of reasoning, not cluttered with language and spelling errors | Adequate line of reasoning, free from serious language and spelling errors | Well-structured and well written | Very well-structured and proficient in writing | According to high academic standards |
|  |  | Referencing and data presentation | Underdeveloped | Nearly acceptable | Acceptable, sources of information are retrievable | Adequate | Carefully documented and presented | Carefully documented and innovative data presentation | According to high academic standards |
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| **D. Quality of oral defence** | 5-10% | Presentation of research | Unclear and incoherent | Superficial | Acceptable and straight forward | Good overview of the research | Convincing | Inspiring and insightful | Up to highest standards |
|  |  | Q&A | Poor | Difficulty answering questions | Acceptable but not always confident | Confident | Convincing and well argued | Inspiring discussion | Academic debate level |