



Universiteit
Leiden
The Netherlands

Life cycle assessment-based guidance for development of new energy technologies

Giesen, C.C. van der

Citation

Giesen, C. C. van der. (2020, October 27). *Life cycle assessment-based guidance for development of new energy technologies*. Retrieved from <https://hdl.handle.net/1887/137930>

Version: Publisher's Version

License: [Licence agreement concerning inclusion of doctoral thesis in the Institutional Repository of the University of Leiden](#)

Downloaded from: <https://hdl.handle.net/1887/137930>

Note: To cite this publication please use the final published version (if applicable).

Cover Page



Universiteit Leiden



The handle <http://hdl.handle.net/1887/137930> holds various files of this Leiden University dissertation.

Author: Giesen, C.C. van der

Title: Life cycle assessment-based guidance for development of new energy technologies

Issue date: 2020-10-27

Propositions

Life Cycle Assessment-Based Guidance for Development of New Energy Technologies

1. Qualitative sustainability claims might have merit in principle but often call forth questions of utility. These questions cannot be answered in abstracto but will require some form of (quantitative) life cycle assessment (LCA) (chapter 3).
2. Assessment of the environmental merit of a technology is only possible in the context of a specific application of the technology (chapter 3 and 4).
3. For a fair assessment of the potential contribution of a new technology to a sustainable future, one should compare its performance to an incumbent technology in that same future (chapter 5).
4. The need for new sustainable technology demands integration of life cycle thinking in the engineer's skill set (chapter 5).
5. Before claiming that an infant or emerging technology will contribute to reaching climate goals, one should first take into account the time needed for the technology to develop from idea to having a meaningful market share.
6. The potential environmental gains of new technologies are not indicative of the chance of realization of these technologies (derived from Fleischer, 2008)
7. Generic claims on the potential sustainability of a new technology made in research proposals are meaningless unless stated as research questions or hypotheses to be investigated.
8. Wynne's observation that *"The built-in ignorance of science towards its own limiting commitments and assumptions is a problem only when external commitments are built on it as if such intrinsic limitations did not exist"* (Wynne, 1992 : 115), warns us not to put our hopes on technologies in early stages of development for reaching climate targets.
9. LCA is a perfect tool to assess new technologies. Setting up an LCA model of a new technology closely resembles the process of *combinatorial evolution* (Arthur, 2009) which implies that inventions (or new technologies) are the result of intentional combinations of existing technologies through a process that involves interplay between experience and knowledge and is driven by need.
10. In sustainability it is all about system efficiency, not process efficiency.
11. While ex-ante LCA generates insights in the potential for environmental improvement of a new technology it does not provide a stamp of approval.