Life Cycle Assessment of Solar Energy Business

Life Cycle Assessment and Cost-efficiency Analysis of Renewable Energy Business Models

Theme: Science and Technology for Development

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1.Background

Life cycle assessment (LCA) is widely used to analyse the environmental impacts of renewable energy technologies. Well established renewable energy technologies like solar and wind are mature and efforts to reduce their environmental footprint can only be incremental technologically.

Compared to technological innovation, new business models can provide more dramatic improvements in reducing the environmental footprint of mature renewable energy technologies in a cost-efficient way.

Lake Turkana wind-farm, Turkana County, Kenya
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Talek solar-hybrid mini-grid, Narok County, Kenya
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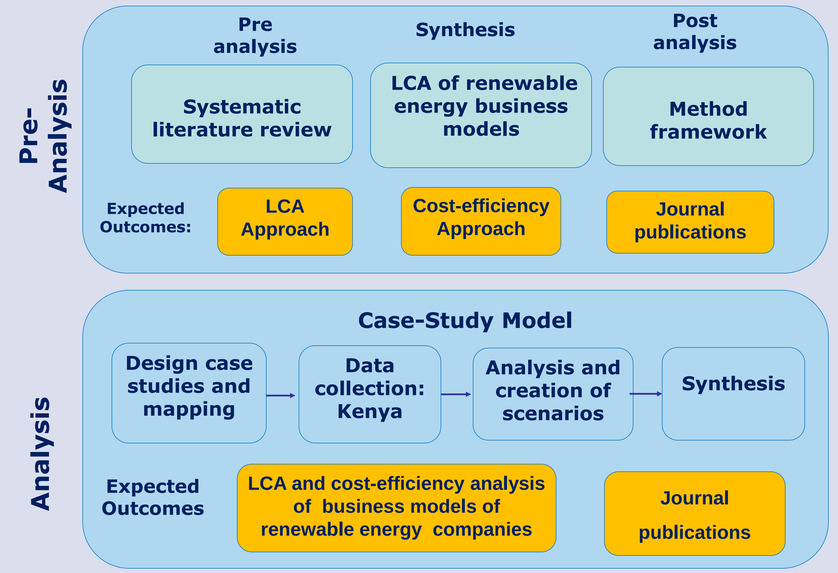
2. Aims

- To analyse the environmental hotspots of renewable energy business models from a life cycle perspective in order to develop a framework that companies can use to reduce their environmental footprint.
- To perform cost-efficiency analysis of renewable energy business models to identify ways of alleviating environmental impacts at the least cost.

3. Target beneficiaries

- Renewable energy companies
- Policy makers
- Development organizations
- Project developers
- Academics and researchers
- LCA practitioners
- Kenya Renewable Energy Association
- County Governments

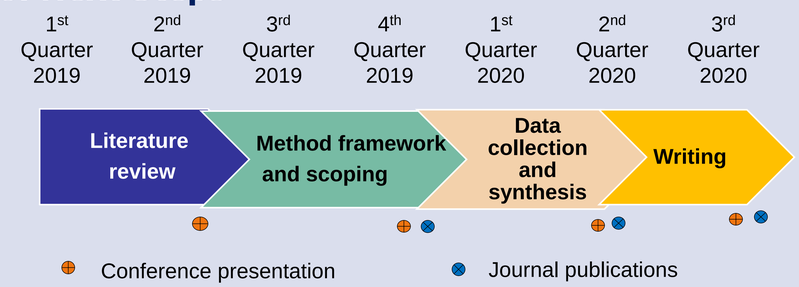
4. Method Structure

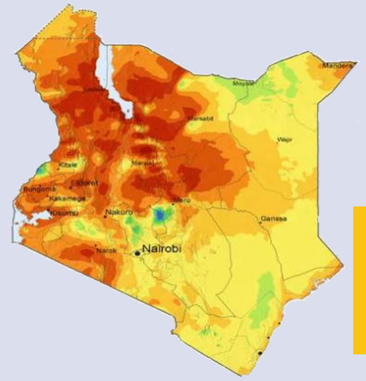


5. Preliminary results of literature review

- Value proposition, which encompasses product development, to be the main hotspot in renewable energy business models.
- Environmental impacts mostly occur on the supply side of business models i.e. from cradle to gate.
- Climate change is the predominant impact category in renewable energy business models.
- The severity of environmental impacts depends on the combination of business model and type of renewable energy

6. Next Steps





Country: Kenya

HDI Rank: 0.590

Relevance to SDGs

7. Anticipated development impacts

- Renewable energy companies adopt business models that have lower environmental footprint
- Policies and regulations that promote the uptake of renewable energy technologies that have low environmental footprint.
- Create tools and frameworks that renewable energy practitioners in the public and private sector can use to assess the environmental sustainability of prospective renewable energy projects

8. Partnerships and future engagement

- Create contextual tools, capacity building, initiatives
- Policy implementation, formulation of regulations
- Capacity building, research, knowledge exchange

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