

Life Cycle Thinking for Energy and Urban Sustainability Assessment Profiles in Guatemala

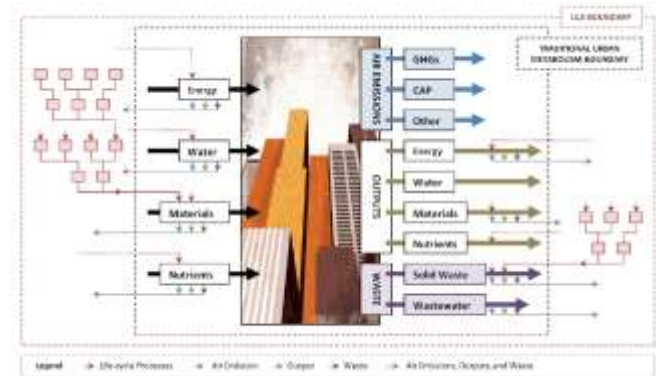
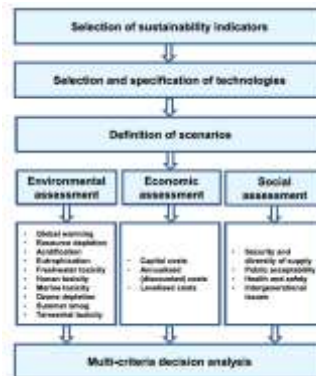
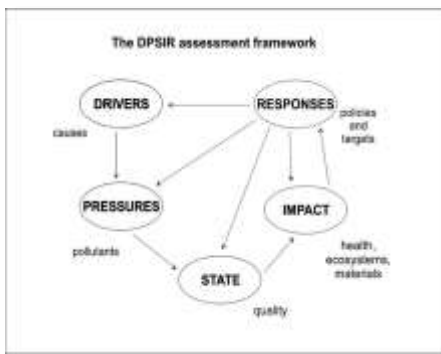
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Introduction

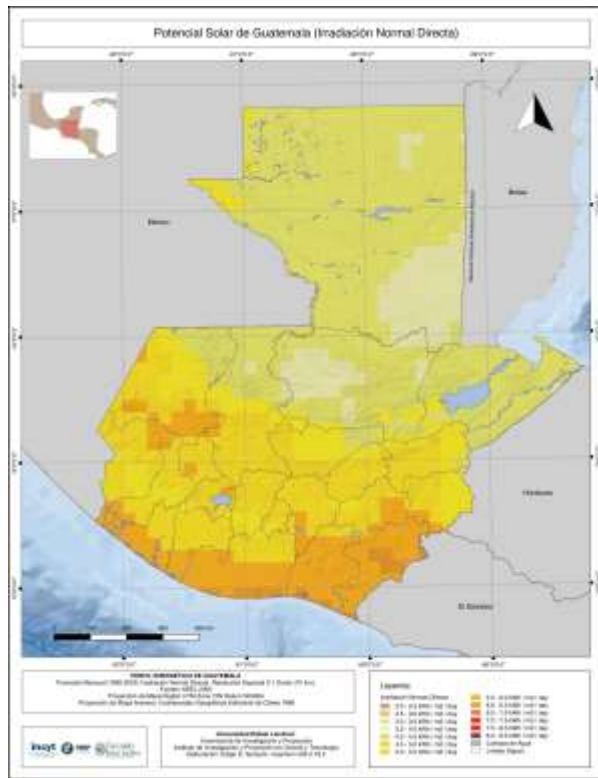


Based on the work of Santoyo-Castelazo & Azapagic (2104)

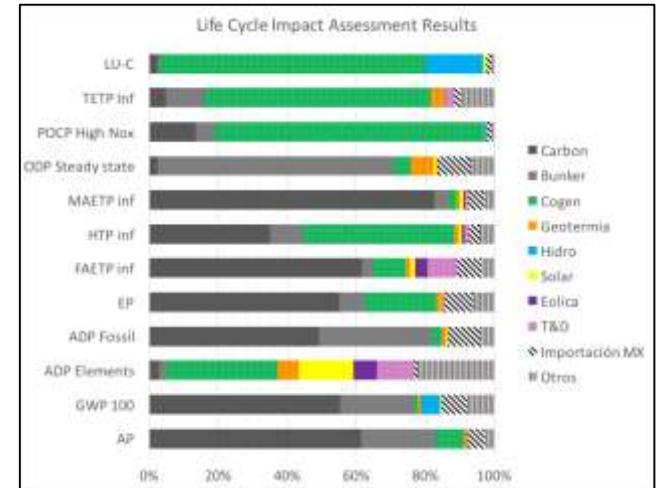
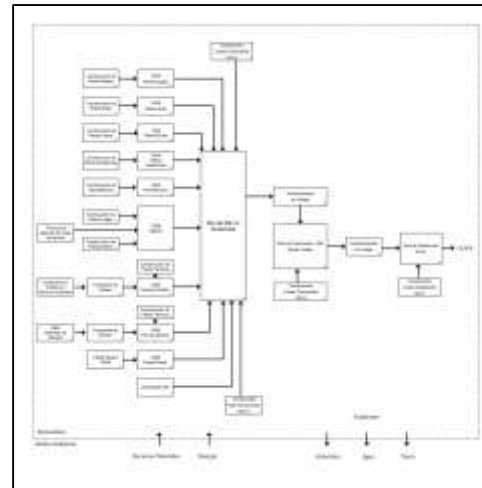
Chester M; Pincetl S; Bunje P and Zahn L. (2010)

Guatemala Energy Profile

Mapping Energy Resources and Energy Systems



Electricity Supply Life Cycle Assessment

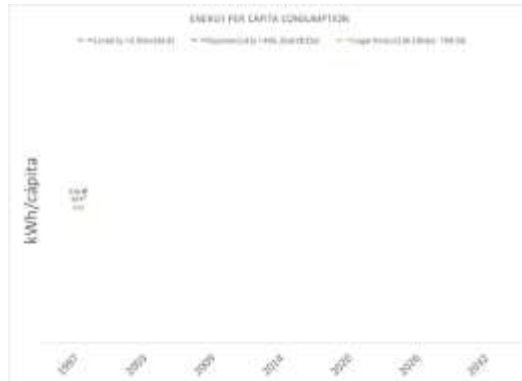


- Fossil power plants account for most of the life cycle environmental impacts. Specifically coal combustion and coal mining.
- The agricultural stage of cogeneration systems is the second contributor to life cycle environmental impacts.

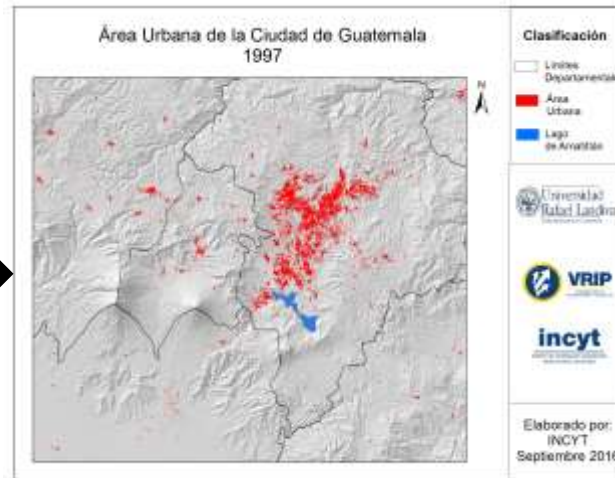
Guatemala Urban Growth Profile

Using Urban Metabolism + LCA Framework

Input

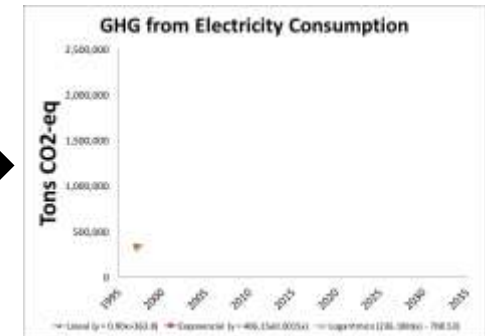


Energy consumption per capita is correlated to urban area with linear, logarithmic and exponential regression



ProLAMS model was used to predict urban growth for year 2032
 Probabilistic Landscape Modeling and Simulation Tool (Chiang and Tercero, 2012)

Output



Life Cycle Assessment is used to estimate GHG emissions from electricity consumption and results are then correlated to urban area

Conclusions and Recommendations

- **Using life cycle thinking for energy sustainability assessment the Guatemala Energy Profile aims to create awareness about:**
 - *Supply chain hotspots*
 - *Potential Environmental Impacts (carbon, water and land footprints)*
 - *Influence policy for sustainable energy supply*
- **Using the UM+LCA assessment framework the Urban Growth Profile will provide:**
 - *Urban metabolism indicators*
 - *Predictive urban growth models*
 - *Trends in consumption patterns and waste flows to the environment*
- Energy and urban sustainability assessment framework based on life cycle thinking need to be improve with advice and feedback from relevant stakeholders

Acknowledgements

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