

Interdisciplinary LCA in Government Decision Making: Producing Electricity from Forest Wildfire Fuels Treatments

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The USDA Forest Service is working with State and Federal agencies; universities; and energy, forestry, and environmental consultants, and to identify and analyze social, economic, and environmental costs and benefits of using biomass removed during forest remediation to generate electrical power throughout California. The project combines a detailed parametric forest fire model, habitat alternation models, and a broad economic analysis with LCA such that site-specific assessments result. In addition to each model's contribution to the project results, the Stewardship and Fire Assessment provides to the LCA inputs of the number of acres treated; the biomass removed per acre; the percent of trees by species and diameter class; the energy content by tree species; forest fire emissions; and infrastructure replacement needs. Also, the economic model provides to the LCA harvest equipment and fuel consumption.

Based on these input data, the life cycle provides two functions for each specific assessment region: forest management AND electricity production. Thus, wildfire adapted landscapes and electricity are the main products of the two life cycle systems. One way to think of this is to consider alternative systems to produce each main product: another way to manage a forest is not to remediate (resulting in increased wild fires, the reconstruction of homes, businesses, facilities, etc.) and another way to produce electricity is by combusting natural gas. Given these two system functions, the functional units are variable for each site so that scenarios can be assessed.

Preliminary modeling activities have focused on model interconnection, evaluating only a few inventory items for public forests in northern California. Lessons learned for which specific examples will be given are related to guidelines for parametric LCA model development and bridging interdisciplinary language and models resulting in team building and the improvement of all models.