

## **Emerging bio-energy technology solutions to reduce fire risk along the Wildland Urban Interface**

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As the Wildland Urban Interface (WUI) continues to expand into forested parts of the western US, we are increasingly faced with the problem of house structures being at high risk of burning due to their proximity to federally owned overly dense forests. Policies have focused on reducing fuel loads in the WUI by treating forests using mechanical thinning methods. However, the product of these thinning operations is often small diameter and low quality wood with little to no commercial value. This wood biomass must be transported from the site and deposited into a landfill or burned offsite. As a result of transportation costs and tipping fees at landfills, the high direct costs of the fuel reduction treatments constrain the number of acres that can be treated so that the fire risk to communities remains high. The indirect costs associated with these treatments are also undesirable: emissions of greenhouse gasses (e.g., CO<sub>2</sub>), particulate pollutants and acceleration in the decommission rate for landfills. These costs must be borne by all tax payers while relatively few tax payers receive the benefits of the treatments.

Our research has focused on integrating small-scale, mobile, wood biomass chemical conversion systems (producing methanol) with emerging technologies in the renewable-energy sector (hydrogen fuel cells). The added values of using this integrated system are its production of a carbon neutral energy from a negatively valued product while providing silvicultural options to promote a fire safe and vigorous forest that will lead to fire safe homes. In addition, the goals of sustainable forest management can also be achieved.