

## **Emerging bio-energy technology solutions to reduce fire risk along the wildland urban interface (WUI)**

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As the wildland urban interface continues to expand into forested parts of the western US, we are increasingly faced with the problem of house structures 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, what tends to be overlooked is that the product of these thinning operations is often small diameter and low quality wood which has little to no commercial value. This wood biomass must be transported from the site and dumped into a landfill or burned offsite. As a result of transportation costs and tipping fees, the direct cost of the fuel reduction treatments is so high that it constrains the number of acres that can be treated, leaving communities at risk. The indirect costs associated with these treatments are also undesirable: emissions of greenhouse gasses (CO<sub>2</sub>), particulate pollutants and accelerate the rate of the decommissioning of 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, semi-mobile, wood biomass chemical conversion systems (producing methanol) with emerging technologies in the renewable-energy sector (hydrogen fuel cells). The added values of our system are producing a carbon neutral energy from a negatively valued product as well as providing silvicultural options to promote a fire safe and vigorous forest, leading to fire safe homes and sustainable forest management.