Developed and proposed by: Bioeconomy Program Team, Department of Environmental Science Policy and Management at UC Berkeley.

Position title: Specialist in forest, woodland, and shrubland product manufacturing for fire risk reduction

Headquarter location and coverage area: Berkeley Wood Lab & Department of Environmental Science Policy and Management at University of California-Berkeley. Statewide coverage to meet statewide forest management goals.

The recruited specialist would have access to laboratory and demonstration infrastructure at the Berkeley Wood Lab in Richmond, CA, and complement related expertise in ESPM and Architecture. The Wood Lab, located at the former UC Berkeley Forest Products Laboratory, houses extensive wood products manufacturing and engineered wood product infrastructure. Two existing Cooperative Extension Specialists (Profs. Daniel Sanchez and Paul Mayencourt) oversee the Berkeley Wood Lab.

Position overview:
A specialist to investigate and commercialize innovative product manufacturing technologies that will reduce fire risk in California's forests, woodlands, and shrublands. Particular areas of interest include: 1) sustainable adhesives, including bio-derived adhesives used for wood products, 2) valued-added structural wood products, 3) innovations in wood processing and drying, and 4) integration of product manufacturing with burning, grazing and other management actions to reduce fire hazard and increase resilience on grasslands, woodlands, and forests. The specialist would develop a statewide program to engage researchers, land managers, architects, engineers, and designers to promote innovative manufacturing technologies across the State of California. The recruited specialist would have access to laboratory and demonstration infrastructure at the Berkeley Wood Lab in Richmond, CA, and complement related expertise in ESPM and Architecture.

PhD (or completion of all Ph.D. degree requirements except the dissertation) or relevant terminal degree such as a Master in Architecture or Landscape Architecture is required at the time of application. The successful candidate will have a doctoral degree (or relevant terminal degree) in a discipline related to forest products, technologies, design, and wood construction.

Justification:
California manages one of the nation’s largest forest resources, is a leading manufacturer of lumber and wood products, and is the leading consumer of wood-based products in the US. The dense urban population centers and agricultural industries in California also produce vast quantities of woody biomass residues that are an underutilized energy and economic resource with important implications for climate change, human health, and wellbeing.

This Specialist position fills a critical need and provides an opportunity for leadership by UCANR and collaboration with many universities and public agencies in the globally important issues related to sustainable manufacturing and use of products from a renewable resource that has a competitive greenhouse gas advantage over fossil fuel- based products. In addition, it addresses the potential opportunity to use small or cosmetically blemished biomass and other products from woodlands and shrublands that is not sold as dimensional lumber but could be utilized in new engineered wood products and emergent technologies such as additive manufacturing. The position opens an opportunity to

investigate and develop new approaches to wood products and biomanufacturing in support of carbon sequestration capacities and nature-based climate solutions across various design scales.

California has large biomass volumes, from densely packed stands of small diameter trees, drought-stressed and beetle-killed trees, chaparral, orchard waste, and other forms of non-commercial woody biomass in much of California's timberlands, fruit-growing regions, and the wildland/urban interface. This woody biomass significantly adds to fuel loads that contribute to catastrophic wildfires. The CE Specialist position will provide valuable support, information, analysis, and leadership to the CE Advisors, CE partners, landowners, land managers, planners, and policy developers involved with maintaining a healthy forest products economy, managing the wildfire risk, and providing economic and operational guidance for forest-based communities and users of wood products in multiple sectors encompassed in the built environment. The position provides capacity to help develop strategies to grow productive forest and biomass-based communities, design intelligent waste management systems, and build a sustainable bio-based materials research and technologies of architecture, landscape design, and engineering convergence relevant to California.

Extension:
Extension activities expected of this position include the initiation of successful outreach efforts to the wood products and biomanufacturing communities. Key expectations are:

- Assist and collaborate with county-based extension advisors, especially those involved with natural resources related community and economic development, and public policy. Relevant topics include evaluation of local resources and feedstocks, technological innovation in wood-based design and products, repositioning the resourcing/utilization of woody material from insect and disease outbreaks.
- Develop, implement, and facilitate statewide conferences and regional workshops.
- Participate in regional planning and economic development activities providing expertise in integrating engineered wood products into manufacturing, architecture and landscape design, and value-added processing.
- Provide leadership on statewide committees and workgroups involved with biomass issues, including the Joint Institute for Wood Products Innovation.
- Collaborate with AES and other UC faculty involved with wood products and design.
- Help identify areas of potential future research and link these ventures to the Berkeley IPIRA office and industry partners
- Expand on innovative extension delivery through the ANR websites and social media, factsheets, maps, interactive analysis tools, and ANR publications.
- Increase the knowledge base through collaboration with the major public, private industrial, and private non- industrial landowners of California.
- Provide expertise to the multiple sectors and agencies involved in wood -based design and engineering including policymakers and legislators on forest products and bioenergy, private sector, and community-based organizations.

Research:
Research will investigate innovative product manufacturing technologies that will reduce fire risk in California's forests, woodlands, and shrublands. Particular areas of interest include: 1) sustainable adhesives, including bio-derived adhesives used for wood products, 2) valued-added structural wood products, 3) innovations in wood processing and drying, and 4) integration of product manufacturing with burning, grazing and other management actions to reduce fire hazard and increase resilience on

grasslands, woodlands, and forests. Collaborators at the Berkeley Wood Lab promote the increased use of traditional and innovative wood products in building technology, and landscape design, ranging from small units to large commercial and residential structures, and landscapes.

UC ANR network:
Collaboration opportunities for this Specialist include the AES faculty of the UC Berkeley College of Natural Resources and the Dept. of Environmental Science, Policy and Management, the faculty of the UC Berkeley College of Environmental Design, and the Natural Resource and Fire Advisors in counties with important forest-based economies, high wildfire risk, or with wood or biomass processing facilities.

The Berkeley Wood Lab is an emerging organization to promote development of mass timber and other engineered wood products in the State, which is directed by two existing Cooperative Extension Specialists. Gaps in this network, however, include knowledge of adhesive production and other biomanufacturing processes.

Network external to UC ANR:
Provide leadership on statewide and regional committees and workgroups involved with biomass issues, including the Joint Institute for Wood Products Innovation and BioCircular Valley.

Support: The Department of Environmental Science Policy and Management will provide office space, and lab space to support this position.

Other support: Two of the strongest supporters of the program, the USDA Forest Service and Cal Fire (California Department of Forestry and Fire Protection), are committed to supporting a UCANR Specialist position. Specialist will pursue research and extension support from these agencies along with other federal and international sources.