Sargassum muticum is an invasive seaweed that has emerged over recent decades as a dominant component of nearshore ecosystems, replacing native kelps in the Pacific Ocean. It generates significant biomass annually that is thought to be of negligible value to nearshore ecosystems. The abundance of *Sargassum* on Washington shores led to our query: Could *Sargassum* serve a societal purpose? Prior studies suggest that *Sargassum* has several characteristics that may make it useful as a novel 'blue-green' building material, such as demonstrating flame-resistance and retaining inert configurations when dried. We sought to expand on this notion by investigating the feasibility and material properties of using dried *Sargassum* collected from Puget Sound as batt insulation. The process of collecting and assembling the insulation proved feasible and cost-effective. In flammability tests, *Sargassum* batt insulation was flame resistant and performed similarly to commercially treated cellulose insulation. However, measurable off-gassing of volatile organic compounds (VOCs), particularly after exposure to moisture, suggests risks posed by biodegradation of the seaweed that require further research. Our study highlighted the potential applicability, as well as the hurdles, of using *Sargassum* as an insulation material. This outcome creates a necessity for future research into treatments that could aid in minimizing off-gassing of *Sargassum*.