A new study led by a researcher from the University of Georgia has determined that the greenhouse gas (GHG) intensity of a unit of electricity generated in the U.K. using imported wood pellets is at least 50 percent lower than the GHG intensity of grid electricity derived from fossil fuels. The work was led by Puneet Dwivedi, an assistant professor of sustainability sciences in the UGA's Warnell School of Forestry and Natural Resources. Madhu Khanna of the University of Illinois at Urbana-Champaign's Energy Biosciences Institute and Robert Bailis and Adrian Ghilardi with Yale University's School of Forestry & Environmental Studies also contributed to the study.

According to the study, the researchers determined relative GHG emissions savings for electricity generated in the U.K. using imported wood pellets under 930 different scenarios. The analysis considered three types of woody feedstocks, two forest management choices, 31 plantation rotation ages and five power plant capacities. Depending on the power plant capacity and the rotation age, the results found relative per unit GHG savings in the range of 50 percent to 68 percent.

The researchers note that existing studies have shown that GHG intensity of a unit of energy generated in Europe using pellets from the U.S. or Canada is roughly 65 percent to 80 percent lower than the GHG intensity of a unit grid of electricity. However, they point out that those studies have typically assumed the feedstocks for pellet production were sourced from either nearby forest or from a wood processing facility located at a fixed distance to the pellet plant. The researchers also stressed that existing studies have considered only one harvest cycle when determining GHG savings, which has raised concerns among environmentalists and others.

The new considers GHG emissions associated with seven supply chain steps, including feedstock production, transportation of feedstock to the pellet plant, the manufacture of wood pellets, transportation to a U.S. seaport via rail, transatlantic shipment to Europe, transport to the European power plant via rail, and the burning of the pellets. According to the researchers, the GHG emissions associated with each step were summed up and divided by the total electricity generated at the power plant.

The results of the analysis determined that the relative GHG emission saves were only 2 percent higher for wood pellets manufactured from feedstock sourced from non-intensive rather than intensively managed forests. In addition, GHG emissions savings were almost similar no matter what the feedstock type was used. According to the information published in the study, the results of the analysis contradict the general belief that the use of wood pellets from 10 to 15 year old pine plantations in the southern U.S. do not provide GHG savings in Europe. Rather, GHG savings were found to be at least 50 percent, even at lower rotation ages.

The authors suggest that future research be directed to the impacts of additional forest management practices, changing climate, and solar carbon on GHG emissions savings. The study, titled “Potential greenhouse gas benefits of transatlantic wood pellet trade,” was published in the research journal *Environmental Research Letters*. A full copy of the study is available on the journal’s website.