**University of Illinois Facilities and Services**

**Illinois Business Consulting**

**Carbon Footprint Analysis**

**December 13, 2012**

**Executive Summary**

The central question posed to Illinois Business Consulting (IBC) is as follows: can Abbott Power Plant decrease its overall carbon footprint by using a 10% woodchip substitute instead of 10% of coal? After extensive research, analysis, and calculations it is the opinion of IBC that the co-firing of coal and biomass will reduce the overall carbon footprint if the carbon neutrality principle is utilized. While the carbon footprint will be slightly reduced, we do not recommend co-firing because of extenuating factors that are associated with location, energy trends, and current infrastructure at Abbott.

Carbon neutrality is a principle that is currently accepted by the EPA as an acceptable standard for calculating carbon emissions. The carbon neutrality principle states that carbon is emitted through the combustion of wood, and will later be absorbed back into trees, thus making biomass carbon neutral. The idea is that the amount of biomass that is co-fired will reduce emissions by the same amount. In 2011, Abbott Power Plant released 99,352 metric tons of carbon dioxide into the atmosphere. When co-firing utilizing the carbon neutrality principle and accounting for 10% of biomass co-fired, Abbott can reduce their carbon emissions to 90,019 metric tons of carbon dioxide.

Woody biomass contains less energy content than coal per pound. Therefore, more biomass needs to be burned in order to reach the same energy efficiency as the coal it is replacing. If Abbott burns enough biomass to maintain the same efficiency as coal, it will increase its overall carbon footprint from 99,352 metric tons to 99,725 metric tons of carbon dioxide solely looking at a combustion boundary. When expanding the boundary of scope to contain transportation, the metric tons of carbon dioxide released increases to 100,373. These considerations were all calculated *not using* the carbon neutrality principle.

Although utilizing the carbon neutrality principle decreases the carbon footprint, the excess factors have caused us to advise against co-firing at Abbott. If Abbott were to co-fire biomass, employees would need to be trained, labor hours would be increased, and boilers would have to run into the night from the excess amount of wood needed to match energy efficiencies. The stoker boilers currently at Abbott are extremely old and cannot handle more than a certain percentage of biomass, thus making them inefficient. The location of Abbott is also a concern as there are not readily available suppliers of biomass with the amount Abbott Power Plant would require. After conducting interviews, it is the common consensus from experts that completely firing biomass 100% is a much more viable and efficient technology. IBC has come to the conclusion that due to these multiple factors, co-firing would not be in Abbott Power Plant’s best interest now or in the future.