

DRAFT* Brief on the "Resolution to Recommend the City of Madison Pass an Ordinance to Ban the Use of Corn based Ethanol and Ethanol Fuel Blends" *DRAFT

The Sustainable Madison committee was asked by Mayor Paul Soglin to make a recommendation to the City Council about the use of ethanol and/or ethanol blended fuels in the cities fleet. The following brief explains the decision of the Sustainable Madison Committee to make a recommendation to pass a resolution specifically banning corn-based ethanol fuels and ethanol fuel blends

The use of ethanol as a fuel or ingredient in gasoline-ethanol blends is not inherently bad. In fact, a main motivator for the use of ethanol as a fuel or a fuel blend is that when burned there are less overall emissions of pollutants, including carbon dioxide (CO₂) when compared to petroleum based fuels.

Climate change is bringing atmospheric CO₂ levels to the front of our social consciousness. Ever increasing levels of CO₂ are believed to be a major cause of a rapid increase in the warming of the earth's atmosphere. The warming atmosphere leads to rising ocean levels, major environmental impacts and extreme weather.

Plant-based ethanol fuels and fuel blends have long been thought to be a perfect solution to rising CO₂ levels for a society with a large energy dependence such as the U.S. Not only do ethanol emissions have less CO₂ than petroleum based fuels but the plants used to make the fuel consume CO₂ during their life cycle. In theory, this means that the overall CO₂ addition to the atmosphere as a result of burning ethanol fuels could be zero.

However, since the 1970's when the use of ethanol blended fuels began to grow, it has been shown that only certain types of plant sources, or feed stock for ethanol provide a sizable reduction in overall CO₂ emissions and other environmental impacts. When Life cycle analysis is used, a technique used to analyze the environmental impacts from all stages of a product's life, it is shown that overall CO₂ emissions from corn based ethanol and ethanol fuel blends is much higher than that of cellulosic species. (6)

Although the Energy Independence and Security Act of 2007 encourages the growth of corn for ethanol production through federal subsidies for farmers, a Duke University study found the use of corn based ethanol as a fuel additive or alternative is an 'inefficient and expensive greenhouse gas mitigation policy.' (1)

Because farming corn requires high inputs of energy in the form of fuels, fertilizers, herbicides, pesticides, irrigation and annual plowing and replanting the overall reduction of CO₂ emissions are greatly reduced as compared to ethanol and ethanol fuel blends made from cellulosic species such as switch grass and miscanthus.

According to an Iowa State University Extension paper, miscanthus, a prairie grass which once established requires no fertilization, herbicide or pesticide applications or replanting can produce 10-15 harvested tons per acre compared to corn which produces only 6 tons per acre, requires large fertilizer and herbicide applications and has to be replanted annually. (2)

Furthermore, because corn has to be replanted annually, tilling occurs which releases a large amount of CO₂ trapped within the roots of the plants into the atmosphere. Cellulosic species such as miscanthus and switch grass are perennial grasses that do not need to be replanted thus eliminating tilling and the CO₂ emissions resulting from the decomposing roots.

Currently, the cost of producing ethanol from cellulosic species is prohibitive. However, research is being done to reduce the cost and overall production is slowly growing. Around the world, companies are investing in cellulosic ethanol production and it is hoped that by 2020 it

will be commercially viable. (5) Until this occurs, a ban on the use of corn based ethanol and ethanol fuel blends essentially bans the use of all ethanol.

Legislation has driven the growth of ethanol production since the 1970's. The Clean Air Act, originally passed in 1970 and later amended was a major driver for the industry in the US.

Since the passing of the Energy Independence and Security Act in 2007, ethanol production in the US has increased dramatically. (4)

It is likely that legislation will be a major driver for a switch from corn based to cellulosic species ethanol production. Municipalities, taking the initiative to say no to corn based ethanol fuels and fuel blends will only increase the likelihood that federal legislation encouraging cellulosic ethanol production will occur and subsidies for corn based ethanol will end.

Therefore, the Sustainable Madison Committee believes the city council should pass a resolution banning the use of corn-based ethanol and ethanol fuel blends.

(1) (3) <http://today.duke.edu/2009/03/ethcarbon.html>

(2) <http://www.extension.iastate.edu/publications/ag201.pdf>

(4) http://iopscience.iop.org/1748-9326/2/2/024001/pdf/er17_2_024001.pdf

(5)

<http://gigaom.com/2008/06/03/12-companies-racing-to-build-cellulosic-ethanol-plants-in-the-us/>

(6) http://www.afdc.energy.gov/vehicles/flexible_fuel_emissions.html