

# Biomass: A Source of Renewable Energy in Madison County

**Biomass**, as a source of renewable energy, could be a significant contributor to the energy portfolio of Madison County. Residues from agricultural crops and sustainably managed forests, as well as dedicated energy crops are forms of biomass that are well-suited to the climate and industries of Central New York. As numerous biomass-fed facilities in the Central New York region attest to, biomass is a budding regional market (Figure 1).

**The Madison County Land Inventory** assesses the potential use of marginal farm land and underutilized residential land in the county for biomass production using dedicated energy crops. There are several types of energy crops suitable for Madison County's climate. Willow, a short rotation woody crop (SWRC,) can be harvested every couple of years without needing to replant (Figure 2). Not only is willow a fairly hardy plant that can thrive in less than ideal conditions, such as on marginal land, but there is also a significant amount of research on willow production in the Central New York region from Dr. Tim Volk and his colleagues at SUNY ESF. For these reasons the land inventory focuses on potential willow production in Madison County.

To assess potential **willow production** the physical and political characteristics of the land are evaluated. Some of the physical characteristics needed for growing willow include: less than 15% slope, soil that is not too wet or too dry and at least 18" of topsoil. The political characteristics suitable for growing willow include: parcels larger than 10 acres and parcels classified as agricultural (excluding dairy & other high-value crops), residential or vacant.

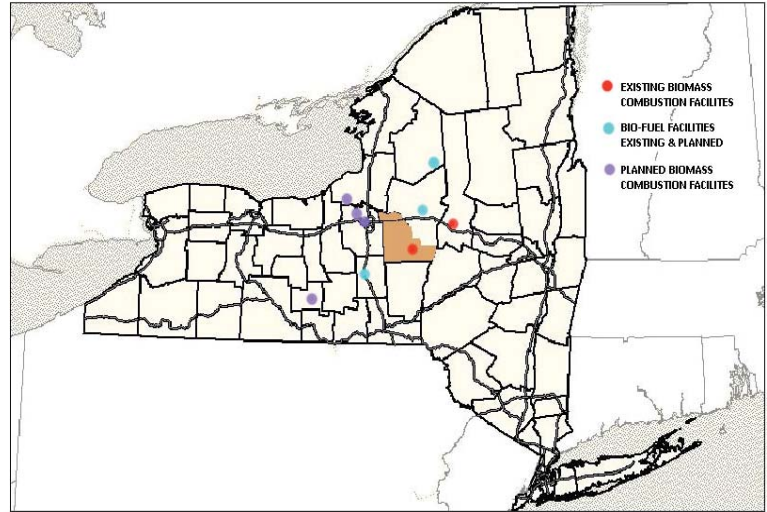


Figure 1: Existing and Planned Biomass & Bio-fuel Facilities near Madison County



Figure 2: Willow Plantation, an example of a SRWC

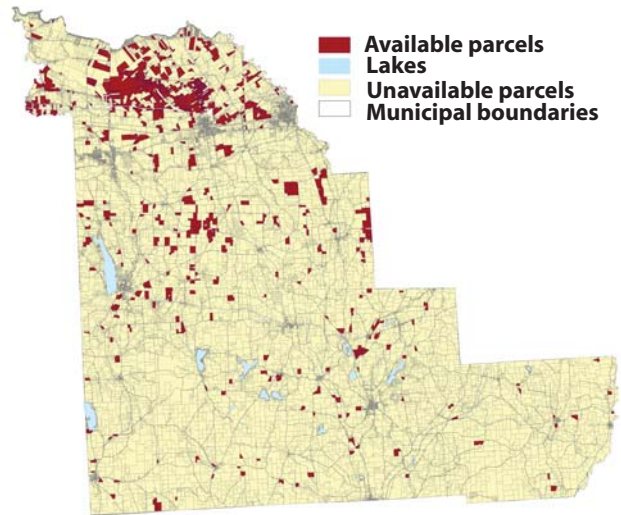
## The physical and political characteristics are used in three scenarios to determine potential yields:

- Scenario 1: Potential willow production on suitable parcels of marginal agricultural land
- Scenario 2: Potential willow production on suitable parcels of marginal agricultural, residential or vacant land
- Scenario 3: Potential willow production on available parcels with a minimum of 10 acres of suitable land

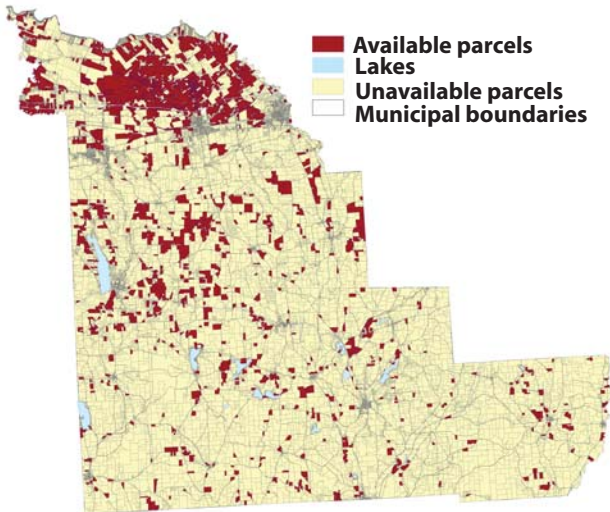
# Madison County Land Inventory

## What does this mean for Madison County?

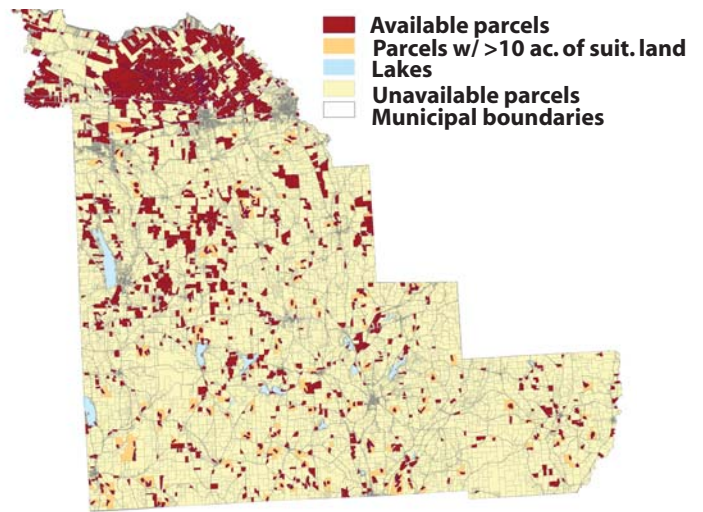
The total yields for the various scenarios, after considering land cover, range from 231,680 oven-dried tons per year (odt/yr) to 951,502 odt/yr (Figure 3). This opens up a lot of potential opportunities for Madison County. On the low-yield, low-acreage end, the county could provide enough biomass for a 35 MW Combined Heat and Power (CHP) facility; at the medium-yield, high-acreage end, Madison County alone could supply all of the existing and planned CHP and biofuel plants with biomass. This information is valuable when looking at potential large-scale biomass developments as well as smaller-scale opportunities for individual buildings and campuses.



**Scenario 1: Potential willow production on suitable parcels classified as marginal agricultural land**



**Scenario 2: Potential willow production on suitable parcels of marginal agricultural, residential or vacant**



**Scenario 3: Potential willow production on available parcels with a minimum of 10 acres of suitable land**

Scenario	Open Land Cover			Open + % Forest Land Cover		
	Total Available (Acres)	Low Yield (odt yr <sup>-1</sup> )	Medium Yield (odt yr <sup>-1</sup> )	Total Available (Acres)	Low Yield (odt yr <sup>-1</sup> )	Medium Yield (odt yr <sup>-1</sup> )
1-Avail. Agric.	13,898	231,680	386,225	18,275	304,644	507,862
2-All Available	25,717	428,702	714,675	32,740	545,776	909,845
3-All Avail. + Suit. Land > 10ac	26,809	446,906	745,022	34,239	570,761	951,502

Figure 3: Summary of Yield Scenarios