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Mechanical conversions include crushing oily biomass, densification, chipping & grinding, and drying. This is an especially important conversion because biomass is a solid and that means it almost always has to be turned into a different kind of solid, liquid, or gas to be used. This is much much harder from a conversion perspective than the challenges you face when your feedstock is a liquid or a gas.

Consider the changes a tree has to go through to become a piece of paper. Sure chemical reactions are used to make the pulp, but otherwise 90% of the entire process from tree to paper is mechanical and it is very complicated and expensive. Unfortunately many new bioenergy companies overlook the importance and challenges of mechanical conversion and it leads to their downfall. A good understanding of mechanical conversions is an important part of understanding how to utilize biomass for bioenergy.

Turning low density unpredictable biomass into high density predictable biomass makes a better fuel and allows us to make better wood stoves and engineer more advanced wood heating systems. Densification has become an extremely important part of the bioenergy community – we now ship hundreds of millions of dollars in wood pellets to Europe every year. Turning big biomass into small biomass is absolutely required. Trees have to be reduced in size to be transported and logs have to be reduced in size to be used for building. In the bioenergy world this dramatically increases the price of the biomass, but it is a cost that must be paid to use biomass.

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