

The Revolution Has Begun

How Biomass Is Changing the World

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“The Revolution Has Begun: How Biomass Is Changing the World”

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Introduction

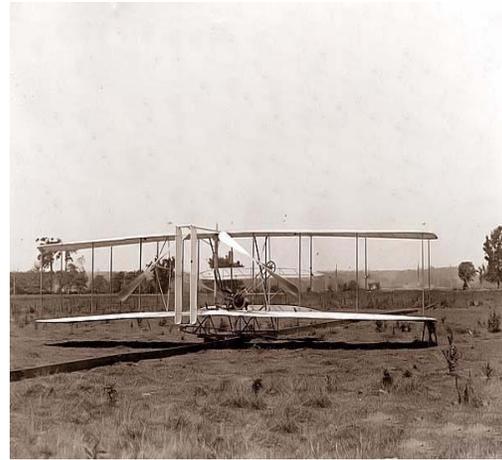
When two bicycle salesman arrived in Kitty Hawk, North Carolina in 1903, they couldn't have known that they were about to start a revolution. They just wanted to see if their experiment would work.

After months of planning and preparation, it finally happened on December 17, 1903. This was when history was made and the Wright Brothers successfully flew their aircraft. Afterwards, they sent word back to their friends and family in their hometown of Dayton, Ohio. The telegram said simply:

"First suspended flight. Very happy. Home for Christmas."

Yet when the local newspaper, the *Dayton Daily News*,

reported the news the next day, the headline read: "Wright Bros. To Return Home For Christmas."



Perhaps no greater example exists in history of people missing the story. Here history had just been made, and the local paper merely reported that the two men would return home for Christmas.

Fortunately, the rest of the world got the message. Transportation would never be the same again. For the next several generations, airplanes would play

an increasing role in both transportation and in economic growth.

Today, more than a century after the Wright Brothers revolutionized transportation, another revolution is happening in energy. And like the Dayton newspaper in 1903, many people don't even realize what's going on.

What Is Biomass?

As America continues to import oil and pay money to nations that don't wish us well, more and more people are looking for energy alternatives. Maybe it's wind, or solar, or nuclear. Maybe it's all of them. But one of the most promising solutions is found not in the sky or in the sun, but right here on the ground.

It's called biomass. And it is already changing the way this country does its energy business.

Ever since the beginning of time, people have burned wood in their campfires for heat. This is essentially what biomass is and what biomass does. In some ways, that makes biomass the oldest form of energy in the world. In pursuing more biomass, you might say we are going back to the future.



Here is the basic concept. As plants and trees evolve, the process of photosynthesis kicks in. This process take the energy from the sun and converts carbon dioxide into carbohydrates. Carbohydrates are important because they are the organic compounds that constitute biomass. As plants inevitably die, the energy in the carbohydrates is released.

But here is the key factor in all of this: biomass is renewable. Fossil fuels will be completely depleted at some point. And once they are depleted, they are not ever coming back.

But biomass has been here since creation and will be here until the world ends. All it takes to make biomass renewable is to simply grow more plants and trees. And, as an extra benefit, biomass is

an incredibly clean energy source that does not create additional carbon dioxide emissions.

How Does Biomass Work?

Biomass has many advantages, including the fact that there are many sources of biomass material. Forests, for example, provide much material for biomass. Lumber, paper and pulp mills use forestry waste to power their factories. Whether it's tree tops or branches that are leftovers from timber operations, these materials are readily available for biomass use.

There is also an abundance of biomass material from urban areas. Think of the construction sites that dot every city. In these sites there are always leftover wood and

shipping pallets. These are perfect raw materials for biomass use.



There are also numerous sources for biomass that are just being developed or soon to be realized. As we all know, animal farms produce manure. And the process for converting crops into food leaves waste that also helps in producing biomass. The early ranchers fed a nation with their beef that was driven from Mexico to Kansas. Even now, we are experiencing the impact of those cattle drives. Years ago in Texas, great ranchers like W.T. Waggoner

drove cattle all the way from Mexico, up the Chisholm, Western and Goodnight Loving Trails and into Abilene, Kansas. We tend to nostalgically look back at the cattle drives and think they lasted for decades. But with the advent of the railroads, the era of the cattle drives lasted only about 20 years. But parts of trails can still be seen today. The cattle that traveled through Texas, Oklahoma, Missouri and Kansas were carrying a hidden cargo in their stomachs. The seeds of the mesquite tree were dropped in manure all across the south west. This tree had previously been confined to Northern Mexico and deep South Texas. For generations, ranchers have cursed this tree and its development, as the tree consumed a lot of water and often invaded grazing pastures. Texas is listed as having more forestry lands than all

states except for Alaska all because of the mesquite tree. The seeds that were planted in just a short amount of time over a hundred years ago are now ready to be harvested and used to fuel biomass.

The state also believes that the thirsty mesquite with its long tap root (up to 150' deep) is directly to blame for the extensive drop in the Texas water table over the last 50 years. If its cut, the Mesquite Tree quickly grows back. Yet today, the Mesquite has a new purpose. Plans are being made for biomass power plants to use this timber that burns slow and very hot which perfectly fits with the needs for biomass. It's amazing how the Mesquite Tree has gone from a curse to a blessing in such a short time.

Clearly, the best resource for biomass is wood. How does it work? Essentially, the wood is gathered in large trucks. It is then taken to a biomass plant. This is where the wood is converted into biomass. The wood goes into the combustion process. Combustion allows for the biomass fuel to then be converted into hot air, hot water, steam and electricity.

Perhaps the most common form of combustion is the furnace. When the biomass heats up in the furnace, it transforms into heat energy. Another form is the boiler. In this case, the combustion heat is converted into steam. Steam can then be use for heat, mechanical energy or electricity.

That's it. It's that simple. It's that revolutionary.

Where Is Biomass Today?

Today in America, biomass sources account for nearly 3 percent of the energy consumed by this country. And in terms of renewable energy, biomass accounted for nearly half of the renewable energy consumed in America in 2002. In fact, biomass delivered more energy to the nation in 2002 than any other form of renewable energy. In the rest of the world, biomass meets 14 percent of the world's energy needs.

To put it another way, today in America, 45 billion kilowatt-hours of electricity comes from biomass. That constitutes close to 1.2 percent of total electric sales in the country.

How much could this increase in the coming years? The United States Department of Energy estimates that by 2010, four percent of transportation fuel could be produced by biomass; USDE further estimates that this could increase to 20 percent by 2030. In terms of electricity, the Department of Energy believes energy crops could eventually supply 14 percent of America's power needs.

But in order to reach that future and increase our biomass usage, we need to find new approaches. And my company, Advanced Trailer, has one.

Trailers for Biomass

Recently, Advanced Trailer announced that the University of

Idaho has been selected as the recipient of a grant to study the application of Advanced Trailer's agricultural crop drying trailer for biomass. For years, our trailers have been used to dry peanuts. But two years ago, Advanced Trailer began exploring the possibilities of using its drying trailer to remove moisture from woody mass by providing a trailer to the Herty Advanced Materials Development Center in Savannah, Georgia.



45' x 102" trailer with front drying transition

This revolutionary application removes moisture from wood chips that are used as fuel for the University of Idaho's steam boiler plant located at their campus in Moscow, Idaho. The results of this new research at the

University of Idaho will benefit biomass plants in other cities.

The prior testing has clearly shown that the trailer works and does the job. But we needed a facility or institution that had an actual application where we could daily see the benefits of lowering moisture in biomass products used to fuel a plant. We found it at the University of Idaho. Our partners there were eager to put the trailer to work at their steam boiler plant.

In December of last year, Advanced Trailer met with representatives at the University's steam boiler plant located in the heart of the university's campus. After touring the facility and seeing the similarities in handling wood chips compared to peanuts, plans were made to provide equipment to the school's steam plant. In late January 2009, a trailer and dryer

were transported from Advanced Trailer's plant in Vienna, Georgia 2600 miles to Moscow, Idaho. The initial 12 month testing period is expected to begin within the next few weeks. The grant will provide written research on lowering fuel (wood chips) cost while reducing carbon emissions by lowering the moisture content in woody mass products.

And we at Advanced Trailer are also interested in the Mesquite wood market. We believe this abundant Texas tree could be a boon to the biomass market. And we believe our drying trailer is the perfect vehicle to help harvest, transport, dry and store Mesquite wood chips for biomass.

Years ago, our company revolutionized the peanut industry. Now, we aim to revolutionize the biomass industry, too.

Conclusion

Biomass is the future. I'm proud to hitch my trailers to this star. And I hope in doing so that I am doing a service for this country.

Here is why: the world consumes 80 million barrels of oil a day. And the US only produces 7.5 million of that. Two thirds of the oil supply comes from places like Russia, Iran, Saudi Arabia. America imports 60% of its more than 20-barrels-per-day usage.

Translation: America is subsidizing some of the world's worst governments.

We cannot continue down this road. It is the road to nowhere. We must develop new sources of energy. And we must apply new techniques to renewable energy.

That's what Advanced Trailer is doing with biomass. We believe this is an investment we can make. In fact, we believe this is an investment we can't afford not to make.

Biomass energy. That is the mission. This is the moment.