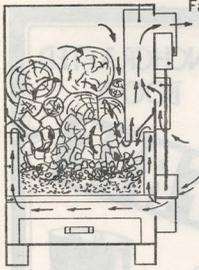


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## WOOD: A FUEL FOR

## ST. LAWRENCE COUNTY

by jim jackson

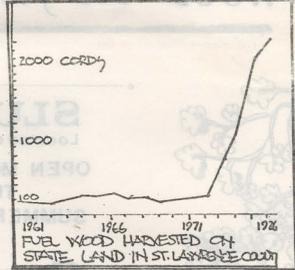
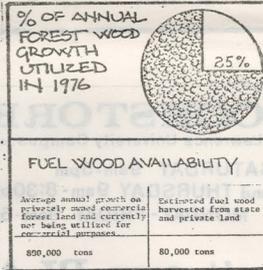
I would like to address my remarks to meeting some of St. Lawrence County's energy needs with some of the natural resources which the area has. We are all aware that the County has a few unique energy requirements. One of them is a very high need for space heating, water heating and also a very heavy dependence on transportation. As the County has developed, both of those needs have been met through petroleum. However, one of the things that would be helpful in St. Lawrence County would be to try and reduce the dependence on petroleum since the wood natural resource we have is certainly applicable, especially to the need for space heating. The technology required for space heating is readily available although more advanced technology would be required to use wood as a natural resource in the transportation mode.

What has happened is that when the practice of forestry first began, a forester entered a woodlot and he removed the trees that he could sell - and it sounds like logical economics. But after 50 or 60 years, the net result is that very few stands remain with any valuable trees. We have selectively removed what might be called the commercial tree species and left behind the trees that no one wants; the trees that are not suitable for furniture raw materials or paper manufacturing. One of the ways in which we might reverse this trend is to provide a market for this wood. Unquestionably, it would be suitable for use as fuel wood.

We're speaking just about harvesting the wood which grows annually in St. Lawrence County because it is very important that we don't deplete the forests. Of the growth in St. Lawrence County forests, currently about 7% is being cut and used for fuel wood primarily in private residential applications. About another 9% is being cut and used for furniture, baseball bats and other such applications. Another 9% is being used for pulp and paper. That leaves us exactly 75% of each and every year's growth which we're leaving in the forest. So, it seems like an abundant resource which is immediately available. Estimates say that between 1 million and 1.1 million tons of wood grow every year with removals running into the rate of 250,000 tons; we've got a great deal more. Historically not all of the wood has been available for harvest, for reasons such as the landowners; some has been withheld, some has been maintained as a hard core which would be handed down to future generations. Generally, only about 1/3 of the forest land is on the marketplace at any one time. In the short run, this is an important consideration. However, when one considers the scope of 25 to 30 years, you find in fact, that through the change of ownership or inheritance all the land is available for harvesting.

Now what would happen if we were using just 50% of the annual growth of St. Lawrence County forests? Just how much fuel energy would there be? Currently, in St. Lawrence County, about 35 million gallons of residential home heating oil are being used and 50% of annual forest growth would replace every bit of it. Another way of looking at it is that 50% of our annual growth would replace 80% of our natural gas requirement.

We often encounter a series of environmental questions in talking about harvesting wood. Just what will proceeding in this fashion do to us, and to the air, to the water and to the local rural environment? It's important to understand that St. Lawrence County, when harvesting under a policy as suggested by the Dept. of Environment and Conservation for example, would do no harm to the forests. The EEC recommends that each and every acre be cut once every 15 years; it's technically very difficult to approach one acre and only remove it's annual growth. At the same time, by using a cutting cycle, it's possible to remove mature sawlogs and mature pulp wood; it's a more efficient utilization of the forest. So, very definitely we're talking about harvesting approximately once every 15 years on any specific piece of property. The remainder of the time it would be allowed to grow and mature.



One of the problems environmentally has to do with logging trails and forest degradation - having trucks driving through, for example. But there is technology of careful use of logging roads, careful putting in of culverts and careful bridging of the road itself which can prevent any erosion problem, any pollution or environmental degradation that might take place. Air pollution is something to be considered. However, air pollution is not actually a problem in this instance. The air quality is very favorably compared to many more conventional sources of fuel. Sulfur Dioxide is a very serious air pollutant with many more conventional sources. Wood, because it is a biological material, has a very low Sulfur content - about 1/40 of 1%, the wastes that develop with combustion are often used as a fertilizer which you don't have with many other fossil fuels.

What about the animals and the biological environment of the forest? A great deal of research has been done which indicates that the diverse number of species and also the number of animal populations tends to increase. By cutting the forest, the interface between a mature forest and a young, developing forest is increased. It provides habitats for birds and animals who tend to feed on younger trees and younger, growing vegetation, also providing more ground coverage. The net result is that it's a very suitable environment for many animals after the mature woods have been removed.

We've considered a large scale application in which the promotion of combustion of wood in a residential application is desirable but it doesn't provide the kind of market that's needed to get large cutting forest underway. We looked at Ogdensburg State Hospital - the St. Lawrence Psychiatric Center there. Currently, it uses coal during winter and natural gas during the summer. What we found is that the average cost of providing coal for the psychiatric Center is about \$440,000; the energy equivalent in fuel wood could be supplied for \$48,000. Net savings just in fuel cost are about \$92,000. If we were to make this kind of substitution, what would the overall debt be to the environment? According to a chart by the Environmental Protection Agency, it is indicated what kind of emission can be expected from the combustion of 1 million B.T.U.'s of coal or wood and the total amount of emissions expected in the St. Lawrence Psychiatric Center over the years. Basically, wood compares fairly favorably except under the Nitrogen Oxides which have not been thoroughly determined. Wood has about 3% of the total pollutants that coal has.

Besides central savings of money and possible improvement to the environment, there are other benefits for the County and the local economy. Should this type of substitution take place, it has been estimated that 25 full-time, permanent jobs would be created whereas right now railroad cars arrive from Pennsylvania to deliver fuel. In the provision of wood fuel, men would be required to do the cutting and the shipping; more handling would be required. In addition to the fact that jobs would be created, all of the fuel expenses would be confined to St. Lawrence County. Instead of paying for fuel which is a product of another state or another region, much of the money spent to buy the fuel would remain in the local area.

In addition to the large, commercial application of fuel wood, we'd certainly like to see that more and more individual residents also make use of the resources that we have. Historically, wood has been abandoned as a fuel mostly because it requires a great deal of personal attention. It's difficult to regulate a thermostat, fuel wood has to be tended every 2 or 3 hours, and a great deal of wood has to be removed. A lot of time and effort has to be devoted to actually maintaining the space heating. However, technology has improved considerably; today we have air-tight stoves that can often maintain a fire for 14 hours. Since the combustion is much more

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efficient than before, the thermostat is much easier to regulate; fuel does not have to be added to the fire as frequently. A great deal less fuel needs to be consumed over a period of years. Increasingly, wood offers more of a benefit than it did at one time. As is repeatedly mentioned, oil is becoming very expensive which provides another incentive to return to the use of wood fuel. In St. Lawrence County, approximately 3/4 of all the residential housing units use oil heat. A great number of industrial and commercial applications use oil. The price of oil has been rising very dramatically in the past year and it is difficult to project exactly where it will go in the future. Therefore, wood becomes a more competitive fuel as the other alternatives become increasingly expensive.

One way of gauging just how important the use of wood is in the County is by considering the amount of wood fuel that has been cut from St. Lawrence County forest land. Basically, the EEC offers for bid each year different plots of State land. For a significant period of time there has been little interest in acquiring the State's wood. But as soon as the oil prices began to escalate, the interest in wood fuel as a substitute in St. Lawrence County began to escalate also. Now we're cutting about 2,000 cords of wood a year. It's about 5% of the total amount of wood which is used in the County for residential application. That's about 7% of what's grown every year which indicates that people are increasingly aware that other fuels are running out.

One of the problems in a residential application of wood fuel is the danger of a chimney fire. St. Lawrence County Planning Board has suggested that a County governmental agency or at least town governmental agencies assume the responsibility of checking each chimney installation, create a chimney-fire code and insure that once a chimney is installed, it will do its job safely without fire hazards. As wood has been used decreasingly, people have been making some mistakes with its use which has often led to tragedy. It is certainly something that has to be mentioned but something that can be rectified. We're hoping that very shortly, the County will be moving in a positive direction but we certainly hope that until that happens, anyone who does wish to use wood or is currently using it, will be very careful and very meticulous with its use.

## Controlling Creosote: A Key To Safe Woodstove Use by Wayne Cordwell

In this era of high oil and natural gas prices many people of St. Lawrence County have undertaken their own alternate energy source - wood energy. Wood fuel appears to be one of the most economical alternate energy sources for our immediate needs. Demand for woodstoves in many areas has reached a point where some dealers and manufacturers have been unable to meet it. Estimates of new stove sales this year in the United States exceed 100,000 units.

Several factors should be considered when purchasing a wood stove. One very important aspect of using wood for heat is the creosote problem. Creosote is a black, foul-smelling liquid, is the product of incomplete combustion of wood and low stack temperature (below 250°F.). Several wood stove manufacturers recommend a flue temperature in the 300 to 400 degree range. Above 400°, too much heat is being wasted.

Green wood compounds the creosote problem. Excessive moisture in wood not only causes incomplete combustion but also makes it difficult to maintain an adequate stack temperature, resulting in the formation of creosote on the chimney lining. If chimneys are left in this "dirty" condition and creosote becomes kindled, a chimney fire results.

Most chimney fires occur during the onset of an extreme cold spell. This is why. During early fall when stoves are burning slowly because little heat is required, creosote accumulates in the chimney. Once a real cold snap arrives, more heat is required from the wood stove and stack temperature rises, causing creosote to ignite. A chimney fire results. Chimney fires can be avoided by frequent cleaning and inspection of the chimney, but reducing the amount of creosote formation is also an important factor.

### Controlling Creosote

The amount of creosote deposited in the chimney and pipes is dependent on the amount of moisture in the flue gases, the temperature of the stack, the rate at which wood is burned, the amount of draft in the stack, and how completely the combustible elements in the flue gases have been burned in the combustion chamber.

Most problems with creosote are due to green wood, poor chimneys with low draft and cold walls and too slow a rate of burning when little heat is required during the spring and fall months. Moisture in the flue gases may be controlled by:

- using properly seasoned firewood;
- mixing small pieces (preferably slab wood) with every full load;
- never using only large pieces of wood during mild weather when combustion is relatively slow.

The stack temperature may be controlled by:

- connecting the woodstove to the chimney with a short length of pipe;
- if a long length of pipe is necessary insulating it so that it cools as little as possible before reaching the chimney;
- using an insulated chimney.

The amount of draft in the stack may be controlled by:

- having as few bends as possible;
- insuring adequate chimney height;
- preventing air leaks in the chimney (use tile liner);
- eliminating internal obstructions in the chimney.

Removing creosote and other methods of preventing creosote accumulations:

- when a pipe and chimney are badly plugged, the only practical way of cleaning is to disassemble the pipe and clean both it and the chimney by scraping;
- increase draft to the stove very carefully. This will increase the stack temperature and cause any creosote to dry. In the process of drying, the creosote shrinks and the scale will fall from the inner walls of the pipe. A light tap on the pipe is also helpful. If a small amount of chimney sweep is thrown over the glowing charcoal bed, it will aid in eliminating any creosote;
- if possible, use tee instead of elbows. The use of a tee serves as a clean out point as well as an inspection port;
- invert stove pipe so that the upper pipe fits inside the lower pipe. Many manufacturers suggest this in their literature. This not only reduced air leaks but also allows any creosote in the liquid state to run into the stove to be burned off or into a "clean out pocket".

Following these suggestions can result in the use of wood fuel as a safe, and economical source of heat.

The Author, Wayne Cordwell, is interested in forming a wood energy interest group in St. Lawrence County. Interested persons can contact Cordwell at RD 2, Baker Rd., Potsdam, N.Y. 13676. (phone 322-5619). He's a good person to talk to before you put in your woodstove.

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