1. Woodex Process

This is a pelletizing process developed by the:

Bio-Solar Research & Development Corp.
Woodex Incorporated
Eugene, Oregon 97401
(503) 686-0765 Telex 510-5970390

Mr. Rudolf W. Gunnerman, President

This corporation sells the license for the Woodex Process. In B.C. Doman Industries Ltd. and S. Madill Ltd. have the license and have formed the company Western Energy Corporation, P.O. Box 2200, Nanaimo B.C., V9R 5N3. This corporation has a plant at Fruitvale in the southern B.C. interior which uses waste from surrounding sawmills and exports the pellets to the Spokane area.

2. Mod-Log Machine

This is a wood briquette and fireplace log process by Trans Arctic Air Ltd. For information see enclosed publications. This company has a plant in B.C.

International Wood Fibre Fuels
2420 Viscount Way
Richmond, B.C.
(604) 278-7141
3. **Frajon Fuel Pellets**

This process mixes waste plastics with wood waste to give a hotter burning pellet. There are no plants in B.C. but information could be obtained from:

Frajon Fuels Canada Ltd.  
P.O. Box 2174  
Vancouver, B.C.  
V6B 3V3

Bernard M. Barron, President

4. **B.C. Research Process**

It is understood that this process is finally being commercialized but the name of the company concerned is confidential. Further information should be available from Mr. Jack Breeze, B.C. Research, 3650 Westbrook Crescent, Vancouver, (604) 224-4331.

5. **Pres-to-Logs**

This is a fireplace log manufactured by

MacMillan Bloedel Ltd.  
Pres-to-Log Division  
3512 S. Kent Avenue  
Vancouver, B.C.  
(604) 435-4466  
V5S 2J2

These logs are also manufactured in Victoria by the Victoria Plywood Division of B.C. Forest Products Ltd.

Mr. Weishaupt, Manager of the MacMillan Bloedel Ltd. Pres-to-Log Division, states the pres-to-log machines are no longer available. He also states that the economics of production of this type of
product is questionable in the west as the value of the raw material for other uses such as particle boards and in-plant fuel is rapidly overtaking its value for the pres-to-log product. The raw material is waste from the plywood operation.

6. **Totem Logs**

These are manufactured in Vancouver by:

Sauder Industries Ltd.
Tru-Fit Division
5776 Beresford Street
Burnaby, B.C. V5J 1J9
(604) 434-2441

The raw material is dry waste from the plant.

7. **Agnew Environmental Products**

Industrial Sales Division
P.O. Box 1168
Grants Pass, Oregon 97526
(503) 479-3396

This company has the license for the Hausmann Briquetter which is similar to the unit used by Sauder Industries Ltd. to make the Totem Logs.

8. **Duraflame Log**

This product which was a mixture of slack wax and wood waste is no longer manufactured in Canada due to a fire two years ago in the plant in Edmonton. A similar product is now manufactured as the Heart Fire Log by:

Canadian Fire Log
6231 A, Westminster Highway
Richmond, B.C.
V7C 4V4
(604) 270-9404
The California Cedar Duraflame II firelog is available on the local market and is made by:

1976 Duraflame Inc.

Stockton, California 95201
Mod-Log Machine Specifications

- Converts wood waste into high energy, clean burning, low ash residue, Superfire densified wood briquettes, suitable for a wide variety of industrial and domestic fuel applications or Superfire densified wood fireplace logs.

- Utilizes any combustible wood waste with ten percent or less moisture content.

- Continuous, constant extrusion rate.

- Output of 3/4 tons per hour.

- Uniform product density of 78 pounds per cubic foot.

- Lightweight - approximately 2,000 pounds.

- Compact - requires approximately 25 square feet of floor space, exclusive of motor and fireplace log cooling channel.

- Power source - 100 H.P., 1750 RPM, 440 Volt, three-phase motor.

- Heavy duty Timken bearings.

- Simplified construction, design and maintenance.

- Machine cost - lease U. S. $650 per month, royalty U. S. $3.60 per ton.

- TransArctic Air, Ltd. - exclusive leasing agent in Canada for Taiga Industries, Inc.
Superfire Densified Wood Briquette Specifications

- Diameter - 1 1/8", length - adjustable 1" to 3".
- Specific gravity - 1.25.
- Density - 78 pounds per cubic foot.
- Bulk storage density - 40 pounds per cubic foot.
- Moisture content - 3.5 percent - 5.0 percent
  (waste material moisture content 10.0 percent).
- Heating value - 8,350 BTU's per pound.
- Ash content - 1.25 percent.

Superfire densified wood briquettes may be used as a charcoal substitute, in a fireplace, for camping or in a wood stove. Superfire briquettes may also be substituted for coal, oil, or gas in industrial applications. The main advantages are that the raw material is above ground level, the briquettes burn with low emissions and they leave only 1.25 percent ash.

Superfire Densified Wood Fireplace Log Specifications

The Superfire fireplace logs have essentially the same specifications as the briquettes except as noted below.


Randall M. Pierson
Executive Vice President

RMP: ljp

October 11, 1978
PYROLYSIS OF DENSIIFIED WOOD BRIQUETTES

Preparation of Briquettes Using Mod-Log(R) Machine:

<table>
<thead>
<tr>
<th>Material</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moisture content</td>
<td>Douglas Fir plywood trims ten percent</td>
</tr>
<tr>
<td>Maximum particle size</td>
<td>7/16 inch</td>
</tr>
<tr>
<td>Processing temperature</td>
<td>360°F</td>
</tr>
<tr>
<td>Process rate</td>
<td>3/4 ton per hour</td>
</tr>
<tr>
<td>System weight</td>
<td>one ton</td>
</tr>
<tr>
<td>Motor size</td>
<td>100 H.P.</td>
</tr>
<tr>
<td>Current</td>
<td>75 AMPS</td>
</tr>
<tr>
<td>Voltage</td>
<td>440 V.</td>
</tr>
<tr>
<td>System cost</td>
<td>$650 per month plus $3.60 per ton of product</td>
</tr>
</tbody>
</table>

Resultant Briquette Specifications:

<table>
<thead>
<tr>
<th>Size</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific gravity</td>
<td>diameter - 1 1/8&quot;, length-adjustable, 1&quot; to 3&quot;</td>
</tr>
<tr>
<td>Density</td>
<td>1.25</td>
</tr>
<tr>
<td>Bulk storage density</td>
<td>78 pounds per cubic foot</td>
</tr>
<tr>
<td>Moisture content</td>
<td>40 pounds per cubic foot</td>
</tr>
<tr>
<td>Heating value</td>
<td>3.5 percent to 5.0 percent</td>
</tr>
<tr>
<td>Ash content</td>
<td>8,350 BTU's per pound</td>
</tr>
<tr>
<td></td>
<td>1.25 percent</td>
</tr>
</tbody>
</table>

Pyrolysis of Briquettes:

A sample of the densified briquettes was supplied to a well known university which conducted the following test. The briquettes were pyrolyzed in a six-inch tube furnace fitted with a liquid condensation and gas collection train so that all liquid condensates and gases were collected for analysis. The sample was pyrolyzed by heating in the absence of air from room temperature to a maximum of 700 degrees C. The data on the yields and heating values of the pyrolytic products were:
<table>
<thead>
<tr>
<th>Pyrolytic Products</th>
<th>Yield</th>
<th>Higher Heating Value BTU/Pound</th>
<th>Higher Heating Value/ Pound Dry Input Feed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Char</td>
<td>32.3</td>
<td>14,219</td>
<td>4,593</td>
</tr>
<tr>
<td>Heavy organics</td>
<td>22.7</td>
<td>13,279</td>
<td>3,014</td>
</tr>
<tr>
<td>Light oil</td>
<td>1.8</td>
<td>15,000*</td>
<td>270</td>
</tr>
<tr>
<td>Water</td>
<td>29.3</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Noncondensible gases</td>
<td>13.3</td>
<td>7,285**</td>
<td>969</td>
</tr>
</tbody>
</table>

* assumed heating value
** BTU/scf.

The char, 32.3 percent, contained 52.3 percent of the energy content of the dry input feed and the oil, 22.7 percent yield, contained 34.3 percent of the energy of the input dry feed. For comparison, the char and oil from the pyrolysis of pine sawdust under similar conditions contained approximately 52.0 percent and 21.0 percent, respectively, of the energy of dry input sawdust. It is possible that the additional oil yield could be due to the resins in the plywood trimmings and/or the high density of the wood briquettes and the large void space among the briquettes. The latter condition would allow the organics to escape from the hot pyrolysis zone rather than being trapped as in more closely packed sawdust or chips.

The char retained its physical shape, shrunk in diameter from 1.18 inches (3.0 cm) to 0.87 inches (2.2 cm) and had a density of 43.6 pounds per cubic foot (single briquette). The char had a volatile content of 5.6 percent and 90.0 percent fixed carbon. The volatile content is lower than the charcoal used in Brazilian steel mills, but the volatile content could be easily controlled by adjusting pyrolysis conditions. A critical factor in the utilization of char briquettes in steel mills is producing briquettes or char with the proper strength. Tumbling and impact tests could not be carried out with this briquette char because the specialized equipment and the quantities of char required for the tests were not available.

October 1978
More than $100-million in public money will be given to the Ontario pulp and paper industry over the next five years.

A report written by officials in the ministries of the Environment, Treasury, Natural Resource and Northern Affairs calls for massive grants and tax breaks to entice pulp and paper companies to modernize their mills and live up to pollution control orders often ignored in the past.

Ontario Treasurer Frank Miller, formerly Natural Resources Minister, says he favors the report. According to Miller, although the paper is not official government policy, there seems little doubt it will become so. He said the program might cost even more than $100-million. "I don't think you could arbitrarily set a limit." He said the program of modernization or rebuilding of mills must last at least five years if Ontario plants are to be competitive with those in the U.S.

The government could waste more than $100-million if plants take the money and become no more competitive or environmentally conscious, Miller said. "It's a risk, but it's a risk that I as a politician can't afford not to take.

Miller said the report is telling the industry, in effect, that it will be hit by no more unexpected environmental controls for some time, to give the companies a chance to live up to standards now in effect.

Among the tax breaks urged in the report is a reduction of the province's corporate tax rate from 13-to-10% for those pulp and paper companies that meet environmental requirements. That would cost the province about $2-million a year in lost revenue when all companies have complied, the report estimated.

The proposed grants would be only for investments yet to come, not for improvements already made. They would apply both to modernization and pollution control projects, but companies should put up $3 for every $1 the government throws in.

The cost of meeting the Environment Ministry's present control orders is about $180-million. Reaching long-range goals set by the ministry for a cleaner environment would cost a further $231-million.

The logging community of Hearst, Ont. is being considered for Shell Canada Ltd.'s first wood-waste plant. The $4-million plant may be operating by 1980.

Andy Borowski, project manager in Shell's new ventures department, says that the company has an option to become system licensee of the Woodex system in every province except B.C. The Woodex system is a process that converts waste wood into fuel pellets.

The Eastern Forest Products Laboratory will be holding several one-day seminars in eastern Canada on energy production from wood waste. Various techniques, their current state of development, the economics compared to conventional sources and future trends in energy development will be introduced. Case studies of industrial applications will be presented and federal and provincial government financial assistance programs will be discussed.

"Energy from Residues" sessions will be held in Halifax on January 10; Timmins, Ont. on January 17; Quebec City on January 24; and Val D'Or on January 31. For more information contact Eastern Forest Products Lab., 800 Montreal Rd., Ottawa, Ont. K1G 3Z3. Phone (613) 993-9900 or telex 053 3606.