Footnotes

[1]USDA's Marketing Bill for U.S. Farm Foods series explicitly measure for-hire intercity transportation charges. Trucking cost of distribution firms are included under their respective cost components of labor, depreciation, taxes, etc.

[2]Findings are derived from Case & Co. report to USDA, "Study of Cost and Innovations in Truck Transportation by Dry Grocery Products," May 1975. The analysis uses economic engineering techniques. Further information requests as to methods and assumptions should be directed to the authors.

[3]Super Market Institute, Special Study.

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# Food Processing

by
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The information in the following tables point out the various energy requirements in the food processing industry. The most immediate problem seems to be the availability of certain types of energy. For instance, the food processing industry is a heavy user of natural gas which also maybe much more difficult to obtain. Thus, if natural gas is not available, rather large capital investments may have to be made by the industry to adapt processing plants to other fuels. Research is also continuing in developing food processing methods which are less energy consuming.

Table 1. Relative Importance of Energy for Canning and Freezing

| Year and Energy Type | SIC 2032 Canned Specialties Billion BTU's | % of Total | SIC 2033 Canned Fruits & Vegetables Billion BTU's | % of Total | SIC 2037 Frozen Foods Billion BTU's | % of Total |
|---|---|---|---|---|---|---|
| 1962 | | | | | | |
| Fuel | | | | | | |
| Coal | 8,372.1 | 55.13 | 6,007.1 | 16.83 | 236.5 | 1.47 |
| Distillate > Residual | 1,841.0 | 12.12 | 9,392.9 | 26.31 | 5,032.5 | 31.22 |
| Natural Gas | 4,271.4 | 28.13 | 18,384.8 | 51.51 | 8,406.8 | 52.14 |
| Electricity | 702.9 | 4.63 | 1,910.7 | 5.35 | 2,446.4 | 15.17 |
| Total | 15,187.4 | 100.00 | 35,695.4 | 100.00 | 16,122.2 | 100.00 |
| 1967 | | | | | | |
| Fuel | | | | | | |
| Coal | 6,196.3 | 41.65 | - | - | - | - |
| Distillate | 431.1 | 2.90 | 4,153.2 | 11.51 | 1,357.2 | 6.50 |
| Residual | 3,061.8 | 20.58 | 4,828.4 | 13.38 | 4,168.3 | 19.97 |
| Natural Gas | 4,132.2 | 27.77 | 24,173.9 | 66.96 | 10,619.3 | 50.87 |
| Electricity | 1,057.7 | 7.10 | 2,944.6 | 8.15 | 4,732.4 | 22.66 |
| Total | 14,878.9 | 100.00 | 36,100.0 | 100.00 | 20,877.2 | 100.00 |
| 1971 | | | | | | |
| Fuel | | | | | | |
| Coal | 3,805.3 | 21.41 | 1,251.1 | 2.87 | - | - |
| Distillate | 3,365.7 | 18.94 | 3,562.5 | 8.19 | 3,552.7 | 12.35 |
| Residual | 1,719.5 | 9.68 | 4,586.6 | 10.54 | 2,286.6 | 7.95 |
| Natural Gas | 7,526.3 | 42.35 | 29,692.8 | 68.24 | 16,392.9 | 57.01 |
| Electricity | 1,353.9 | 7.62 | 4,422.0 | 10.16 | 6,524.8 | 22.69 |
| Total | 17,770.7 | 100.00 | 43,515.0 | 100.00 | 28,757.0 | 100.00 |
| 1974 | | | | | | |
| Fuel | | | | | | |
| Coal | 3,005.9 | 15.40 | - | - | - | - |
| Distillate | 1,446.3 | 7.41 | 4,535.3 | 11.01 | 2,944.5 | 7.87 |
| Residual | 3,941.3 | 20.19 | 3,597.4 | 8.73 | 5,040.9 | 13.48 |
| Natural Gas | 9,485.2 | 48.58 | 29,074.2 | 70.56 | 20,310.7 | 54.32 |
| Electricity | 1,644.6 | 8.42 | 3,999.2 | 9.70 | 9,098.8 | 24.33 |
| Total | 19,523.3 | 100.00 | 41,206.1 | 100.00 | 37,394.9 | 100.00 |

Table 2. Cost per Million BTU's by Energy Source and Industry

| Energy Source and Year | Industry SIC 2032 | SIC 2033 | SIC 2037 |
|---|---|---|---|
| 1962 | | | |
| Coal | .32 | .38 | .41 |
| Distillate Residual Oil | .56 | .55 | .47 |
| Natural Gas | .43 | .44 | .40 |
| Electricity | 3.70 | 4.40 | 3.49 |
| 1967 | | | |
| Coal | .31 | - | - |
| Distillate | .70 | .55 | .66 |
| Residual Oil | .39 | .48 | .46 |
| Natural Gas | .51 | .43 | .41 |
| Electricity | 3.03 | 3.94 | 3.28 |
| 1971 | | | |
| Coal | .53 | .64 | - |
| Distillate | .83 | .79 | .70 |
| Residual Oil | .64 | .70 | .70 |
| Natural Gas | .44 | .50 | .49 |
| Electricity | 3.40 | 3.78 | 3.33 |
| 1974' | | | |
| Coal | .90 | - | - |
| Distillate | 2.28 | 2.05 | 2.04 |
| Residual Oil | 1.90 | 1.92 | 1.47 |
| Natural Gas | .72 | .77 | .80 |
| Electricity | 4.99 | 5.58 | 4.48 |

Table 3. Geographic Distribution of Canning and Freezing Activity (1972)

| Geographic Region | Industry SIC 2032 | SIC 2033 | SIC 2037 |
|---|---|---|---|
| | Percent of U.S. Total | | |
| Northeast | 34.3 | 17.0 | 14.3 |
| North Central | 32.1 | 23.9 | 27.0 |
| South | 19.5 | 17.0 | 30.2 |
| West | 14.1 | 42.1 | 28.5 |

Table 4. Energy Cost as Percent of Value of Production

| Year | Current $'s | 1967 $'s |
|---|---|---|
| SIC 2032 | | |
| 1962 | .0075 | .0069 |
| 1967 | .0064 | .0064 |
| 1971 | .0080 | .0087 |
| 1973 | .0092 | .0107 |
| 1974 | .0136 | |
| Industry SIC 2033 | | |
| 1962 | .0091 | .0080 |
| 1967 | .0077 | .0077 |
| 1971 | .0099 | .0111 |
| 1973 | .0101 | .0127 |
| SIC 2037 | | |
| 1962 | .0109 | .0114 |
| 1967 | .0110 | .0110 |
| 1971 | .0110 | .0124 |
| 1973 | .0122 | .0148 |

Table 5. Energy Used per Constant Dollar Value of Production

| Year | 2032 | Industry 2033 (BTU's) | 2037 |
|---|---|---|---|
| 1962 | 12,928 | 11,892 | 12,825 |
| 1967 | 10,925 | 10,410 | 10,104 |
| 1971 | 11,150 | 12,645 | 10,533 |

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