

# 2022 U.S. LABOR-ENERGY INPUT SURVEY

# SAMPLE

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# U.S. LABOR-ENERGY INPUT SURVEY

## 2022

***The following analysis is prepared by the Portland Cement Association's Market Intelligence Group based on data sources believed to be reliable; however, accuracy cannot be guaranteed. This report is not intended to represent the viewpoint of Portland Cement Association member companies. The Portland Cement Association assumes no legal responsibility for the outcome of decisions or commitments made on the basis of this information.***



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# U.S. Labor-Energy Input Survey

2022

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## Executive Summary

# SAMPLE

### Labor Productivity

U.S. labor productivity  
This measure increased  
productivity ranged from  
labor productivity in  
tons per hour have a  
40 years.

Hourly labor represents  
contracted labor accounts  
year, contracted labor  
direct labor – in the field  
includes plant management  
hours, represented by  
personnel, sales, and

### Energy Efficiency

The amount of energy  
averaged  
The long-term  
technologies. Since  
intensity by 10%. In  
ton and the 75<sup>th</sup> perc

While cement and petroleum  
coke, their share of total  
2021. This is the lowest  
trending upward, with  
increase from last year  
percentage of cement  
The share of total energy  
year's alternative fuels  
between  
fuel mixtures, replacing  
fuels include: rail road  
biofuels and biomass  
renewable energy, a

rate (mtph) in 2022.  
level,  
begin tracking  
past five years,  
trend over the past

varied labor and  
added to the previous  
year engaged in  
labor, which  
industrial work  
ing, accounting,  
energy Survey.

of cement  
the previous year  
more efficient  
per ton energy  
BTU/

and petroleum  
decrease from  
natural gas has been  
representing a  
year years but the  
at just over  
increase from last  
year, hovering  
average fuel usage in  
field alternative  
in the form of  
diversified plants utilized

# Survey Overview

The **U.S. La**  
energy usa  
energy effic  
understandi  
from year to  
significance

# SAMPLE

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## Equivalent

Because a  
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Energy con  
directly to th  
92% of a pl  
reflects elec  
production

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## Equivalen

ClinkerPro  
Finish Cem

## Labor

Equi  
ClinkerProduct  
Finish Cement

## Energy

Fuel Type  
Example (tons

per Ton  
8,341.97



**United States**  
**Cement Industry**



**Labor Statistics**  
**Portland Cement Industry Historic Summary**

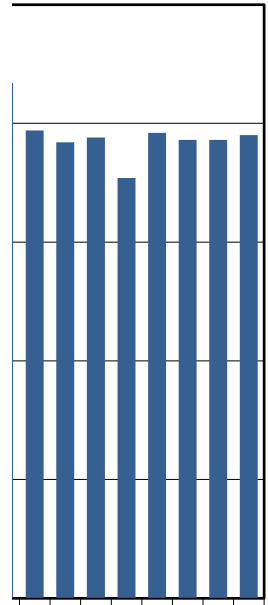
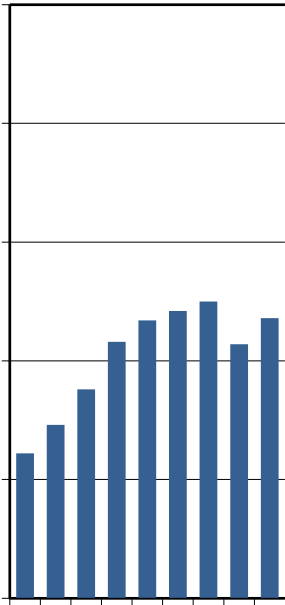
<u>Year</u>	<u>Clinker Capacity Utilization</u>	<u>Employee Hours per 1000 Metric Tons</u>			<u>Production (Metric Tons) per Employee Hour</u>
		<u>Direct</u>	<u>Indirect</u>	<u>Total</u>	

**SAMPLE**

Metric Tons per  
Employee Hour

## Labor Efficiency U.S. Cement Industry

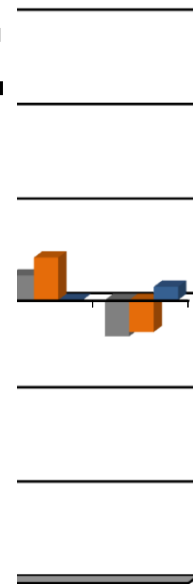
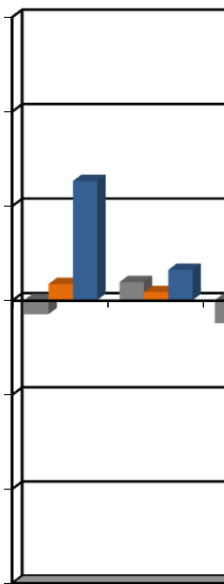
# SAMPLE



Year-Year  
Percent Change

## Output Per Employee Hour

# SAMPLE



■ Manufacturing ■ Non-Farm Business ■ Cement

**Energy Statistics  
Portland Cement Industry Historic Summary**

<u>Year</u>	<u>Clinker Capacity</u> <u>Utilization</u>	<u>Million BTU's per Metric Ton</u>					<u>Total Million BTU's</u> <u>per Metric Ton</u>
		<u>Coal &amp; Coke</u>	<u>Natural Gas</u>	<u>Petrol. Products</u>	<u>Alt Fuels</u>	<u>Electricity</u>	

**SAMPLE**

Millions of BTU's  
Per Metric Ton

## Energy Efficiency U.S. Cement Industry



Year-Year  
Percent Change

## Energy Input (BTU) Per Output



Industrial Sector   U.S. Economy   Cement

**U.S. Labor Productivity**  
(Equivalent Tons <sup>(1)</sup> per Employee Hour)

	<u>2012</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>	<u>% Change</u> <u>2022/2012</u>	<u>% Change</u> <u>2022/2021</u>
All Plants*	<b>SAMPLE</b>									
Wet Process										
Dry Process										

<sup>(1)</sup> Metric tons used to measure labor efficiency are an equivalent ton measure composed of 85% clinker production plus 15% finished cement production

\* Grinding only and white cement plants not included

**Energy Consumption by Type of U.S. Cement Plant**  
(Million BTU per Equivalent Tons <sup>(1)</sup>)

	<u>2012</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>	<u>% Change</u> <u>2022/2012</u>	<u>% Change</u> <u>2022/2021</u>
All Plants*	<b>SAMPLE</b>									
Wet Process										
Dry Process										
No Preheater										
Preheater										
Precalciner										
Preheater/Precalciner										

<sup>(1)</sup> Metric tons used to measure energy efficiency are an equivalent ton measure composed of 92% clinker production plus 8% finished cement production

\* Grinding only and white cement plants not included

\*\* Includes plants that are Preheater only

NOTE: Dash marks denote withheld data due to low plant counts for the given categories

**Distribution of Energy Consumption\***  
*(U.S. Cement Plants)*

	<u>1972</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>
Coal and Coke	<b>SAMPLE</b>							
Natural Gas								
Petroleum Products								
Electricity								
Alternative Fuels								
<b>Total Fuel</b>								

\* Based on Btu's consumed

**Alternative Fuel Summary**  
*(U.S. Cement Plants)*

	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>
<b>Total Plants Reporting</b>	<b>SAMPLE</b>								
<b>Plants using Alternative Fuels</b>									
<i>Percent</i>									
<b>Types of Alternative Fuels Utilized*</b>									
Tire Derived									
Waste Oil									
Solvents									
Other									
Renewables									

\*Plants may use more than one type of alternative fuel



**U.S. Energy Consumption**  
 Percent Distribution  
*(Based on BTU's consumed)*  
**Fuel Distribution**



**Alternative Fuels Breakout**



- Renewable
- Renewable
- Renewable
- Biomass
- Alt. Fuel - W
- Alt. Fuel - S
- Alt. Fuel - Ti
- Alt. Fuel - R
- Alt. Fuel - H
- Alt. Fuel - Ti
- Alt. Fuel - O



# 2022 Total Labor Productivity and Energy Efficiency

Tons<sup>(1)</sup> per  
Employee Hour

Million BTU per  
Metric Ton<sup>(2)</sup>

All Plants\*

# SAMPLE

Built or Modernized

Wet Process

Dry Process

<sup>(1)</sup> Metric tons used to measure labor efficiency are an equivalent ton measure composed of 85% clinker production plus 15% finished cement production

<sup>(2)</sup> Metric tons used to measure energy efficiency are an equivalent ton measure composed of 92% clinker production plus 8% finished cement production

\* Grinding only and white cement plants not included

NOTE: Dash marks denote withheld data due to low plant counts for the given categories

U.S. Labor Productivity  
2022

Metric Tons <sup>(1)</sup>  
Per Employee Hour



---

U.S. Energy Efficiency  
2022

Million BTU Per  
Metric Ton <sup>(2)</sup>





U.S. LABOR & ENERGY SURVEY

All Plants

I. INDUSTRY INFORMATION

Metric tons

- Clinker Production
- Finish Cement Production
- Annual Practical Clinker Capacity
- Capacity Utilization Rate (%)
- Response Rate (% of capacity)

II. LABOR INFORMATION

	<u>Number of Employees</u>	<u>Employee Hours</u>	<u>Tons per Employee Hour</u>
Direct Labor	<b>SAMPLE</b>	<b>SAMPLE</b>	<b>SAMPLE</b>
Indirect Labor			
<b>Total Labor</b>			
Hourly Labor			
Salaried Labor			
Contract Labor			

III. ENERGY INFORMATION

<u>Fuel Type</u>	<u>Quantity</u>	<u>BTUs (Billions)</u>	<u>BTUs per Ton</u>
Coal (tons)	<b>SAMPLE</b>	<b>SAMPLE</b>	<b>SAMPLE</b>
Petroleum Coke (tons)			
Natural Gas (millions cu. ft.)			
Gasoline (gallons)			
Middle Distillates - Diesel (gallons)			
Middle Distillates - Fuel Oil (gallons)			
Residual Oil			
LPG (gallons)			
Renewable - Power			
Renewable - Wood & Agricultural (H			
Renewable - Seeds and Shells (Hea			
Biomass			
Alt. Fuel - Waste Oil			
Alt. Fuel - Solvents			
Alt. Fuel - Tire Derived			
Alt. Fuel - Refuse Derived			
Alt. Fuel - Hazardous Waste			
Alt. Fuel - Tire Fluff & Ashes			
Alt. Fuel - Other Solid			
Electricity (Heat) (1000 kWh)			
Electricity (Power) (1000 kWh)			



U.S. LABOR & ENERGY SURVEY

Less than 1,000,000 Clinker Capacity

I. INDUSTRY INFORMATION

Metric tons

- Clinker Production
- Finish Cement Production
- Annual Practical Clinker Capacity
- Capacity Utilization Rate (%)

II. LABOR INFORMATION

	<u>Number of Employees</u>	<u>Employee Hours</u>	<u>Tons per Employee Hour</u>
Direct Labor	<b>SAMPLE</b>	<b>SAMPLE</b>	<b>SAMPLE</b>
Indirect Labor			
<b>Total Labor</b>			
Hourly Labor			
Salary Labor			
Contract Labor			

III. ENERGY INFORMATION

<u>Fuel Type</u>	<u>Quantity</u>	<u>BTUs (Billions)</u>	<u>BTUs per Ton</u>
Coal (tons)	<b>SAMPLE</b>	<b>SAMPLE</b>	<b>SAMPLE</b>
Petroleum Coke (tons)			
Natural Gas (million cu. Ft.)			
Gasoline (gallons)			
Middle Distillates - Diesel (gallons)			
Middle Distillates - Fuel Oil (gallons)			
Residual Oil			
LPG (gallons)			
Renewable - Power			
Renewable - Heat: Wood & Agriculture			
Renewable - Heat: Seeds and Shells			
Biomass			
Alt. Fuel - Waste Oil			
Alt. Fuel - Solvents			
Alt. Fuel - Tire Derived			
Alt. Fuel - Refuse Derived			
Alt. Fuel - Hazardous Waste			
Alt. Fuel - Tire Fluff & Ashes			
Alt. Fuel - Other Solid			
Electricity (Heat) (1000 kWh)			
Electricity (Power) (1000 kWh)			



U.S. LABOR & ENERGY SURVEY

1,000,000 and Greater Clinker Capacity

I. INDUSTRY INFORMATION

Metric tons

- Clinker Production
- Finish Cement Production
- Annual Practical Clinker Capacity
- Capacity Utilization Rate (%)

II. LABOR INFORMATION

	<u>Number of Employees</u>	<u>Employee Hours</u>	<u>Tons per Employee Hour</u>
Direct Labor	<b>SAMPLE</b>	<b>SAMPLE</b>	<b>LE</b>
Indirect Labor			
<b>Total Labor</b>			
Hourly Labor			
Salary Labor			
Contract Labor			

III. ENERGY INFORMATION

<u>Fuel Type</u>	<u>Quantity</u>	<u>BTUs (Billions)</u>	<u>BTUs per Ton</u>
Coal (tons)	<b>SAMPLE</b>	<b>SAMPLE</b>	<b>LE</b>
Petroleum Coke (tons)			
Natural Gas (million cu. Ft.)			
Gasoline (gallons)			
Middle Distillates - Diesel (gallons)			
Middle Distillates - Fuel Oil (gallons)			
Residual Oil			
LPG (gallons)			
Renewable - Power			
Renewable - Heat: Wood & Agricult			
Renewable - Heat: Seeds and Shell			
Biomass			
Alt. Fuel - Waste Oil			
Alt. Fuel - Solvents			
Alt. Fuel - Tire Derived			
Alt. Fuel - Refuse Derived			
Alt. Fuel - Hazardous Waste			
Alt. Fuel - Tire Fluff & Ashes			
Alt. Fuel - Other Solid			
Electricity (Heat) (1000 kWh)			
Electricity (Power) (1000 kWh)			



U.S. LABOR & ENERGY SURVEY

Built or Modernized before 1980

I. INDUSTRY INFORMATION

Metric tons

- Clinker Production
- Finish Cement Production
- Annual Practical Clinker Capacity
- Capacity Utilization Rate (%)

II. LABOR INFORMATION

	<u>Number of Employees</u>	<u>Employee Hours</u>	<u>Tons per Employee Hour</u>
Direct Labor	<b>SAMPLE</b>	<b>SAMPLE</b>	<b>SAMPLE</b>
Indirect Labor			
<b>Total Labor</b>			
Hourly Labor			
Salary Labor			
Contract Labor			

III. ENERGY INFORMATION

<u>Fuel Type</u>	<u>Quantity</u>	<u>BTUs (Billions)</u>	<u>BTUs per Ton</u>
Coal	<b>SAMPLE</b>	<b>SAMPLE</b>	<b>SAMPLE</b>
Petroleum Coke (tons)			
Natural Gas (million cu. Ft.)			
Gasoline (gallons)			
Middle Distillates - Diesel (gallons)			
Middle Distillates - Fuel Oil (gallon)			
Residual Oil			
LPG (gallons)			
Renewable - Power			
Renewable - Heat: Wood & Agric			
Renewable - Heat: Seeds and Sh			
Biomass			
Alt. Fuel - Waste Oil			
Alt. Fuel - Solvents			
Alt. Fuel - Tire Derived			
Alt. Fuel - Refuse Derived			
Alt. Fuel - Hazardous Waste			
Alt. Fuel - Tire Fluff & Ashes			
Alt. Fuel - Other Solid			
Electricity (Heat) (1000 kWh)			
Electricity (Power) (1000 kWh)			



U.S. LABOR & ENERGY SURVEY

Built or Modernized between 1980 and 1999

I. INDUSTRY INFORMATION

Metric tons

- Clinker Production
- Finish Cement Production
- Annual Practical Clinker Capacity
- Capacity Utilization Rate (%)

II. LABOR INFORMATION

	<u>Number of Employees</u>	<u>Employee Hours</u>	<u>Tons per Employee Hour</u>
Direct Labor	<b>SAMPLE</b>	<b>SAMPLE</b>	<b>SAMPLE</b>
Indirect Labor			
<b>Total Labor</b>			
Hourly Labor			
Salary Labor			
Contract Labor			

III. ENERGY INFORMATION

<u>Fuel Type</u>	<u>Quantity</u>	<u>BTUs (Billions)</u>	<u>BTUs per Ton</u>
Coal	<b>SAMPLE</b>	<b>SAMPLE</b>	<b>SAMPLE</b>
Petroleum Coke (tons)			
Natural Gas (million cu. Ft.)			
Gasoline (gallons)			
Middle Distillates - Diesel (gallons)			
Middle Distillates - Fuel Oil (gallons)			
Residual Oil			
LPG (gallons)			
Renewable - Power			
Renewable - Heat: Wood & Agricult			
Renewable - Heat: Seeds and Shell			
Biomass			
Alt. Fuel - Waste Oil			
Alt. Fuel - Solvents			
Alt. Fuel - Tire Derived			
Alt. Fuel - Refuse Derived			
Alt. Fuel - Hazardous Waste			
Alt. Fuel - Tire Fluff & Ashes			
Alt. Fuel - Other Solid			
Electricity (Heat) (1000 kWh)			
Electricity (Power) (1000 kWh)			





U.S. LABOR & ENERGY SURVEY

Built or Modernized after 1999

I. INDUSTRY INFORMATION

Metric tons

- Clinker Production
- Finish Cement Production
- Annual Practical Clinker Capacity
- Capacity Utilization Rate (%)

II. LABOR INFORMATION

	<u>Number of Employees</u>	<u>Employee Hours</u>	<u>Tons per Employee Hour</u>
Direct Labor	<b>SAMPLE</b>	<b>SAMPLE</b>	<b>SAMPLE</b>
Indirect Labor			
<b>Total Labor</b>			
Hourly Labor			
Salary Labor			
Contract Labor			

III. ENERGY INFORMATION

<u>Fuel Type</u>	<u>Quantity</u>	<u>BTUs (Billions)</u>	<u>BTUs per Ton</u>
Coal	<b>SAMPLE</b>	<b>SAMPLE</b>	<b>SAMPLE</b>
Petroleum Coke (tons)			
Natural Gas (million cu. Ft.)			
Gasoline (gallons)			
Middle Distillates - Diesel (gallon)			
Middle Distillates - Fuel Oil (gallon)			
Residual Oil			
LPG (gallons)			
Renewable - Power			
Renewable - Heat: Wood & Agric			
Renewable - Heat: Seeds and Sh			
Biomass			
Alt. Fuel - Waste Oil			
Alt. Fuel - Solvents			
Alt. Fuel - Tire Derived			
Alt. Fuel - Refuse Derived			
Alt. Fuel - Hazardous Waste			
Alt. Fuel - Tire Fluff & Ashes			
Alt. Fuel - Other Solid			
Electricity (Heat) (1000 kWh)			
Electricity (Power) (1000 kWh)			



U.S. LABOR & ENERGY SURVEY

Wet Process

I. INDUSTRY INFORMATION

Metric tons

- Clinker Production
- Finish Cement Production
- Annual Practical Clinker Capacity
- Capacity Utilization Rate (%)

II. LABOR INFORMATION

	<u>Number of Employees</u>	<u>Employee Hours</u>	<u>Tons per Employee Hour</u>
Direct Labor	<b>SAMPLE</b>	<b>SAMPLE</b>	<b>SAMPLE</b>
Indirect Labor			
<b>Total Labor</b>			
Hourly Labor			
Salary Labor			
Contract Labor			

III. ENERGY INFORMATION

<u>Fuel Type</u>	<u>Quantity</u>	<u>BTUs (Billions)</u>	<u>BTUs per Ton</u>
Coal	<b>SAMPLE</b>	<b>SAMPLE</b>	<b>SAMPLE</b>
Petroleum Coke (tons)			
Natural Gas (million cu. Ft.)			
Gasoline (gallons)			
Middle Distillates - Diesel (gallons)			
Middle Distillates - Fuel Oil (gallons)			
Residual Oil			
LPG (gallons)			
Renewable - Power			
Renewable - Wood & Agricultural (H			
Renewable - Seeds and Shells (He			
Biomass			
Alt. Fuel - Waste Oil			
Alt. Fuel - Solvents			
Alt. Fuel - Tire Derived			
Alt. Fuel - Refuse Derived			
Alt. Fuel - Hazardous Waste			
Alt. Fuel - Tire Fluff & Ashes			
Alt. Fuel - Other Solid			
Electricity (Heat) (1000 kWh)			
Electricity (Power) (1000 kWh)			



U.S. LABOR & ENERGY SURVEY

Dry Process - Preheater

I. INDUSTRY INFORMATION

Metric tons

- Clinker Production
- Finish Cement Production
- Annual Practical Clinker Capacity
- Capacity Utilization Rate (%)

II. LABOR INFORMATION

	<u>Number of Employees</u>	<u>Employee Hours</u>	<u>Tons per Employee Hour</u>
Direct Labor	<b>SAMPLE</b>	<b>SAMPLE</b>	<b>SAMPLE</b>
Indirect Labor			
<b>Total Labor</b>			
Hourly Labor			
Salary Labor			
Contract Labor			

III. ENERGY INFORMATION

<u>Fuel Type</u>	<u>Quantity</u>	<u>BTUs (Billions)</u>	<u>BTUs per Ton</u>
Coal	<b>SAMPLE</b>	<b>SAMPLE</b>	<b>SAMPLE</b>
Petroleum Coke (tons)			
Natural Gas (million cu. Ft.)			
Gasoline (gallons)			
Middle Distillates - Diesel (gallons)			
Middle Distillates - Fuel Oil (gallon)			
Residual Oil			
LPG (gallons)			
Renewable - Power			
Renewable - Wood & Agricultural			
Renewable - Seeds and Shells (H)			
Biomass			
Alt. Fuel - Waste Oil			
Alt. Fuel - Solvents			
Alt. Fuel - Tire Derived			
Alt. Fuel - Refuse Derived			
Alt. Fuel - Hazardous Waste			
Alt. Fuel - Tire Fluff & Ashes			
Alt. Fuel - Other Solid			
Electricity (Heat) (1000 kWh)			
Electricity (Power) (1000 kWh)			



U.S. LABOR & ENERGY SURVEY

Dry Process - Precliner

I. INDUSTRY INFORMATION

Metric tons

- Clinker Production
- Finish Cement Production
- Annual Practical Clinker Capacity
- Capacity Utilization Rate (%)

II. LABOR INFORMATION

	<u>Number of Employees</u>	<u>Employee Hours</u>	<u>Tons per Employee Hour</u>
Direct Labor	<b>SAMPLE</b>	<b>SAMPLE</b>	<b>SAMPLE</b>
Indirect Labor			
<b>Total Labor</b>			
Hourly Labor			
Salary Labor			
Contract Labor			

III. ENERGY INFORMATION

<u>Fuel Type</u>	<u>Quantity</u>	<u>BTUs (Billions)</u>	<u>BTUs per Ton</u>
Coal	<b>SAMPLE</b>	<b>SAMPLE</b>	<b>SAMPLE</b>
Petroleum Coke (tons)			
Natural Gas (million cu. Ft.)			
Gasoline (gallons)			
Middle Distillates - Diesel (gallons)			
Middle Distillates - Fuel Oil (gallons)			
Residual Oil			
LPG (gallons)			
Renewable - Power			
Renewable - Wood & Agricultural (H			
Renewable - Seeds and Shells (He			
Biomass			
Alt. Fuel - Waste Oil			
Alt. Fuel - Solvents			
Alt. Fuel - Tire Derived			
Alt. Fuel - Refuse Derived			
Alt. Fuel - Hazardous Waste			
Alt. Fuel - Tire Fluff & Ashes			
Alt. Fuel - Other Solid			
Electricity (Heat) (1000 kWh)			
Electricity (Power) (1000 kWh)			



U.S. LABOR & ENERGY SURVEY

Dry Process - Preheater or Precalciner

I. INDUSTRY INFORMATION

Metric tons

- Clinker Production
- Finish Cement Production
- Annual Practical Clinker Capacity
- Capacity Utilization Rate (%)

II. LABOR INFORMATION

	<u>Number of Employees</u>	<u>Employee Hours</u>	<u>Tons per Employee Hour</u>
Direct Labor	<b>SAMPLE</b>	<b>SAMPLE</b>	<b>LE</b>
Indirect Labor			
<b>Total Labor</b>			
Hourly Labor			
Salary Labor			
Contract Labor			

III. ENERGY INFORMATION

<u>Fuel Type</u>	<u>Quantity</u>	<u>BTUs (Billions)</u>	<u>BTUs per Ton</u>
Coal	<b>SAMPLE</b>	<b>SAMPLE</b>	<b>LE</b>
Petroleum Coke (tons)			
Natural Gas (million cu. Ft.)			
Gasoline (gallons)			
Middle Distillates - Diesel (gallons)			
Middle Distillates - Fuel Oil (gallons)			
Residual Oil			
LPG (gallons)			
Renewable - Power			
Renewable - Wood & Agricultural (H			
Renewable - Seeds and Shells (Hea			
Biomass			
Alt. Fuel - Waste Oil			
Alt. Fuel - Solvents			
Alt. Fuel - Tire Derived			
Alt. Fuel - Refuse Derived			
Alt. Fuel - Hazardous Waste			
Alt. Fuel - Tire Fluff & Ashes			
Alt. Fuel - Other Solid			
Electricity (Heat) (1000 kWh)			
Electricity (Power) (1000 kWh)			



U.S. LABOR & ENERGY SURVEY

Pacific Region

I. INDUSTRY INFORMATION

Metric tons

- Clinker Production
- Finish Cement Production
- Annual Practical Clinker Capacity
- Capacity Utilization Rate (%)

II. LABOR INFORMATION

	<u>Number of Employees</u>	<u>Employee Hours</u>	<u>Tons per Employee Hour</u>
Direct Labor	<b>SAMPLE</b>	<b>SAMPLE</b>	<b>SAMPLE</b>
Indirect Labor			
<b>Total Labor</b>			
Hourly Labor			
Salary Labor			
Contract Labor			

III. ENERGY INFORMATION

<u>Fuel Type</u>	<u>Quantity</u>	<u>BTUs (Billions)</u>	<u>BTUs per Ton</u>
Coal	<b>SAMPLE</b>	<b>SAMPLE</b>	<b>SAMPLE</b>
Petroleum Coke (tons)			
Natural Gas (million cu. Ft.)			
Gasoline (gallons)			
Middle Distillates - Diesel (gallons)			
Middle Distillates - Fuel Oil (gallons)			
Residual Oil			
LPG (gallons)			
Renewable - Power			
Renewable - Wood & Agricultural (He			
Renewable - Seeds and Shells (Heat			
Biomass			
Alt. Fuel - Waste Oil			
Alt. Fuel - Solvents			
Alt. Fuel - Tire Derived			
Alt. Fuel - Refuse Derived			
Alt. Fuel - Hazardous Waste			
Alt. Fuel - Tire Fluff & Ashes			
Alt. Fuel - Other Solid			
Electricity (Heat) (1000 kWh)			
Electricity (Power) (1000 kWh)			



U.S. LABOR & ENERGY SURVEY

Mountain Region

I. INDUSTRY INFORMATION

Metric tons

- Clinker Production
- Finish Cement Production
- Annual Practical Clinker Capacity
- Capacity Utilization Rate (%)

II. LABOR INFORMATION

	<u>Number of Employees</u>	<u>Employee Hours</u>	<u>Tons per Employee Hour</u>
Direct Labor	<b>SAMPLE</b>	<b>SAMPLE</b>	<b>SAMPLE</b>
Indirect Labor			
<b>Total Labor</b>			
Hourly Labor			
Salary Labor			
Contract Labor			

III. ENERGY INFORMATION

<u>Fuel Type</u>	<u>Quantity</u>	<u>BTUs (Billions)</u>	<u>BTUs per Ton</u>
Coal	<b>SAMPLE</b>	<b>SAMPLE</b>	<b>SAMPLE</b>
Petroleum Coke (tons)			
Natural Gas (million cu. Ft.)			
Gasoline (gallons)			
Middle Distillates - Diesel (gallons)			
Middle Distillates - Fuel Oil (gallons)			
Residual Oil			
LPG (gallons)			
Renewable - Power			
Renewable - Wood & Agricultural (			
Renewable - Seeds and Shells (He			
Biomass			
Alt. Fuel - Waste Oil			
Alt. Fuel - Solvents			
Alt. Fuel - Tire Derived			
Alt. Fuel - Refuse Derived			
Alt. Fuel - Hazardous Waste			
Alt. Fuel - Tire Fluff & Ashes			
Alt. Fuel - Other Solid			
Electricity (Heat) (1000 kWh)			
Electricity (Power) (1000 kWh)			



U.S. LABOR & ENERGY SURVEY

West North Central Region

I. INDUSTRY INFORMATION

Metric tons

- Clinker Production
- Finish Cement Production
- Annual Practical Clinker Capacity
- Capacity Utilization Rate (%)

II. LABOR INFORMATION

	<u>Number of Employees</u>	<u>Employee Hours</u>	<u>Tons per Employee Hour</u>
Direct Labor	<b>SAMPLE</b>	<b>SAMPLE</b>	<b>LE</b>
Indirect Labor			
<b>Total Labor</b>			
Hourly Labor			
Salary Labor			
Contract Labor			

III. ENERGY INFORMATION

<u>Fuel Type</u>	<u>Quantity</u>	<u>BTUs (Billions)</u>	<u>BTUs per Ton</u>
Coal	<b>SAMPLE</b>	<b>SAMPLE</b>	<b>LE</b>
Petroleum Coke (tons)			
Natural Gas (million cu. Ft.)			
Gasoline (gallons)			
Middle Distillates - Diesel (gallon)			
Middle Distillates - Fuel Oil (gallon)			
Residual Oil			
LPG (gallons)			
Renewable - Power			
Renewable - Wood & Agriculture			
Renewable - Seeds and Shells			
Biomass			
Alt. Fuel - Waste Oil			
Alt. Fuel - Solvents			
Alt. Fuel - Tire Derived			
Alt. Fuel - Refuse Derived			
Alt. Fuel - Hazardous Waste			
Alt. Fuel - Tire Fluff & Ashes			
Alt. Fuel - Other Solid			
Electricity (Heat) (1000 kWh)			
Electricity (Power) (1000 kWh)			





U.S. LABOR & ENERGY SURVEY

East North Central Region

I. INDUSTRY INFORMATION

Metric tons

- Clinker Production
- Finish Cement Production
- Annual Practical Clinker Capacity
- Capacity Utilization Rate (%)

II. LABOR INFORMATION

	<u>Number of Employees</u>	<u>Employee Hours</u>	<u>Tons per Employee Hour</u>
Direct Labor	<b>SAMPLE</b>	<b>SAMPLE</b>	<b>SAMPLE</b>
Indirect Labor			
<b>Total Labor</b>			
Hourly Labor			
Salary Labor			
Contract Labor			

III. ENERGY INFORMATION

<u>Fuel Type</u>	<u>Quantity</u>	<u>BTUs (Billions)</u>	<u>BTUs per Ton</u>
Coal	<b>SAMPLE</b>	<b>SAMPLE</b>	<b>SAMPLE</b>
Petroleum Coke (tons)			
Natural Gas (million cu. Ft.)			
Gasoline (gallons)			
Middle Distillates - Diesel (gall)			
Middle Distillates - Fuel Oil (gal)			
Residual Oil			
LPG (gallons)			
Renewable - Power			
Renewable - Wood & Agriculture			
Renewable - Seeds and Shells			
Biomass			
Alt. Fuel - Waste Oil			
Alt. Fuel - Solvents			
Alt. Fuel - Tire Derived			
Alt. Fuel - Refuse Derived			
Alt. Fuel - Hazardous Waste			
Alt. Fuel - Tire Fluff & Ashes			
Alt. Fuel - Other Solid			
Electricity (Heat) (1000 kWh)			
Electricity (Power) (1000 kWh)			



U.S. LABOR & ENERGY SURVEY

West South Central Region

I. INDUSTRY INFORMATION

Metric tons

- Clinker Production
- Finish Cement Production
- Annual Practical Clinker Capacity
- Capacity Utilization Rate (%)

II. LABOR INFORMATION

	<u>Number of Employees</u>	<u>Employee Hours</u>	<u>Tons per Employee Hour</u>
Direct Labor	<b>SAMPLE</b>	<b>SAMPLE</b>	<b>SAMPLE</b>
Indirect Labor			
<b>Total Labor</b>			
Hourly Labor			
Salary Labor			
Contract Labor			

III. ENERGY INFORMATION

<u>Fuel Type</u>	<u>Quantity</u>	<u>BTUs (Billions)</u>	<u>BTUs per Ton</u>
Coal	<b>SAMPLE</b>	<b>SAMPLE</b>	<b>SAMPLE</b>
Petroleum Coke (tons)			
Natural Gas (million cu. Ft.)			
Gasoline (gallons)			
Middle Distillates - Diesel (gallons)			
Middle Distillates - Fuel Oil (gallons)			
Residual Oil			
LPG (gallons)			
Renewable - Power			
Renewable - Wood & Agricultural (H			
Renewable - Seeds and Shells (Heat			
Biomass			
Alt. Fuel - Waste Oil			
Alt. Fuel - Solvents			
Alt. Fuel - Tire Derived			
Alt. Fuel - Refuse Derived			
Alt. Fuel - Hazardous Waste			
Alt. Fuel - Tire Fluff & Ashes			
Alt. Fuel - Other Solid			
Electricity (Heat) (1000 kWh)			
Electricity (Power) (1000 kWh)			



U.S. LABOR & ENERGY SURVEY

East South Central Region

I. INDUSTRY INFORMATION

Metric tons

- Clinker Production
- Finish Cement Production
- Annual Practical Clinker Capacity
- Capacity Utilization Rate (%)

II. LABOR INFORMATION

	<u>Number of Employees</u>	<u>Employee Hours</u>	<u>Tons per Employee Hour</u>
Direct Labor	<b>SAMPLE</b>	<b>SAMPLE</b>	<b>SAMPLE</b>
Indirect Labor			
<b>Total Labor</b>			
Hourly Labor			
Salary Labor			
Contract Labor			

III. ENERGY INFORMATION

<u>Fuel Type</u>	<u>Quantity</u>	<u>BTUs (Billions)</u>	<u>BTUs per Ton</u>
Coal	<b>SAMPLE</b>	<b>SAMPLE</b>	<b>SAMPLE</b>
Petroleum Coke (tons)			
Natural Gas (million cu. Ft.)			
Gasoline (gallons)			
Middle Distillates - Diesel (gallons)			
Middle Distillates - Fuel Oil (gallon)			
Residual Oil			
LPG (gallons)			
Renewable - Power			
Renewable - Wood & Agricultural (			
Renewable - Seeds and Shells (H			
Biomass			
Alt. Fuel - Waste Oil			
Alt. Fuel - Solvents			
Alt. Fuel - Tire Derived			
Alt. Fuel - Refuse Derived			
Alt. Fuel - Hazardous Waste			
Alt. Fuel - Tire Fluff & Ashes			
Alt. Fuel - Other Solid			
Electricity (Heat) (1000 kWh)			
Electricity (Power) (1000 kWh)			



U.S. LABOR & ENERGY SURVEY

South Atlantic Region

I. INDUSTRY INFORMATION

Metric tons

- Clinker Production
- Finish Cement Production
- Annual Practical Clinker Capacity
- Capacity Utilization Rate (%)

II. LABOR INFORMATION

	<u>Number of Employees</u>	<u>Employee Hours</u>	<u>Tons per Employee Hour</u>
Direct Labor	<b>SAMPLE</b>	<b>SAMPLE</b>	<b>SAMPLE</b>
Indirect Labor			
<b>Total Labor</b>			
Hourly Labor			
Salary Labor			
Contract Labor			

III. ENERGY INFORMATION

<u>Fuel Type</u>	<u>Quantity</u>	<u>BTUs (Billions)</u>	<u>BTUs per Ton</u>
Coal	<b>SAMPLE</b>	<b>SAMPLE</b>	<b>SAMPLE</b>
Petroleum Coke (tons)			
Natural Gas (million cu. Ft.)			
Gasoline (gallons)			
Middle Distillates - Diesel (gallons)			
Middle Distillates - Fuel Oil (gallon)			
Residual Oil			
LPG (gallons)			
Renewable - Power			
Renewable - Wood & Agricultural (			
Renewable - Seeds and Shells (He			
Biomass			
Alt. Fuel - Waste Oil			
Alt. Fuel - Solvents			
Alt. Fuel - Tire Derived			
Alt. Fuel - Refuse Derived			
Alt. Fuel - Hazardous Waste			
Alt. Fuel - Tire Fluff & Ashes			
Alt. Fuel - Other Solid			
Electricity (Heat) (1000 kWh)			
Electricity (Power) (1000 kWh)			



U.S. LABOR & ENERGY SURVEY

Middle Atlantic and New England Regions

I. INDUSTRY INFORMATION

Metric tons

- Clinker Production
- Finish Cement Production
- Annual Practical Clinker Capacity
- Capacity Utilization Rate (%)

II. LABOR INFORMATION

	<u>Number of Employees</u>	<u>Employee Hours</u>	<u>Tons per Employee Hour</u>
Direct Labor	<b>SAMPLE</b>	<b>SAMPLE</b>	<b>SAMPLE</b>
Indirect Labor			
<b>Total Labor</b>			
Hourly Labor			
Salary Labor			
Contract Labor			

III. ENERGY INFORMATION

<u>Fuel Type</u>	<u>Quantity</u>	<u>BTUs (Billions)</u>	<u>BTUs per Ton</u>
Coal	<b>SAMPLE</b>	<b>SAMPLE</b>	<b>SAMPLE</b>
Petroleum Coke (tons)			
Natural Gas (million cu. Ft.)			
Gasoline (gallons)			
Middle Distillates - Diesel (gallons)			
Middle Distillates - Fuel Oil (gallons)			
Residual Oil			
LPG (gallons)			
Renewable - Power			
Renewable - Wood & Agricultural (Heat)			
Renewable - Seeds and Shells (Heat)			
Biomass			
Alt. Fuel - Waste Oil			
Alt. Fuel - Solvents			
Alt. Fuel - Tire Derived			
Alt. Fuel - Refuse Derived			
Alt. Fuel - Hazardous Waste			
Alt. Fuel - Tire Fluff & Ashes			
Alt. Fuel - Other Solid			
	TOTAL F		
Electricity (Heat) (1000 kWh)			
Electricity (Power) (1000 kWh)			
	<b>TOTAL:</b>		

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# SAMPLE

**Contract Em**

If contract em  
year's industry  
adjusted acco

the prior  
unt

**Annual Clink**

If annual clink  
reported down

ity and

**Heat Content**

Changes to d  
are indicated i

inistration

(1)  
—  
alue)

**Gasoline**

**Middle Distill**

**Middle Distill**

**Coal**

**Residual Oil**

**Natural Gas**

**Petroleum C**

**LPG**

**Electricity**

**Alternative F**

**Alternative F**

**Alternative F**

**Alternative F**

**Alternative F**

**Alternative F**

5-150,000/gallon

5-100,000/gallon

2-35,000,000/ton

ent

ent

ent

(1) Source: Argon

**High and Low**

Prior to 2021,  
and most othe  
PCA has use  
the heat losse  
combustion of

n Canada,  
efore,  
e discounts  
m the



# SAMPLE

**ALTERNATIVE F**  
supplement or pa

ient energy to either  
combustion.

**CAPACITY UTILI**  
estimated maxim  
estimated by mult

as a share of  
heoretical value

**CEMENT:** Any ch  
materials into a u

unique and separate

**CLINKER:** The fu

**CLINKER CAPA**  
given a realistic w  
days. Normal do  
clean-up. Accord  
2019. Clinker ca

n produce per day  
s normal downtime  
ntenance, repair or  
raged 37.7 days in

**COAL:** A readily  
moisture, consist  
carbonaceous ma  
chemically altered

uding inherent  
volume of  
hardened,

**DIESEL:** A liquid

compression.

**DIRECT LABOR:**  
production, distrib

aterial handling,

**DRY PROCESS:**  
blended and store

ound, conveyed,

**FINISH GRINDIN**  
limestone.

dition gypsum and

**GASOLINE:** A liq  
petroleum.

distillation of

**HAZARDOUS W**  
industries that can  
ignitability, corrosi

ses or specific  
with specific

**INDIRECT LABO**  
department; such  
watchmen, and la  
considered indirec

a specific  
sonnel, clerks,  
or research is not

**KILN:** Equipment  
1450 degrees C.

emperature of about

**LPG:** Liquified pet  
hydrocarbon gase

ixtures of

**NATURAL GAS**  
wells. Consists e  
of carbon, nitrog

# SAMPLE

enings or bored  
e, hydrogen, oxide

**OIL:** A mixture of  
reservoirs, broad  
condensate, unfi  
plant liquids. Not  
as additives and

und pools or  
ude oil, lease  
oil, and natural gas  
compounds, such

**PETROLEUM C**  
thermal decomp

e final product of

**PRECALCINER:**  
separate burners  
calciner, calcinin

exit gases with  
lash furnace,

**PREHEATER:** In  
improve over-all f  
Parallel Flow Cy  
Fluidized Bed, an  
or (3) Crosses.

ry kiln proper to  
: (1) Suspension  
d or Grate,(5)  
Beds, (2) Chains,

**REFUSE-DERIV**

waste.

**RENEWABLE F**  
like ethanol and  
synthesized from

s include biofuels  
nsist of fuels

**SOLVENTS:** Mat  
applications inclu

stituents. Example  
s an extractant.

**TIRE DERIVED**

**WET PROCESS**  
cement raw mate  
and sticky, which

king and pumping  
s are extremely wet

**PORTLAND CEMENT ASSOCIATION**

**MEMBER COMPANIES**

**SAMPLE**



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