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## NELSON-FARRAR COST INDEXES<sup>1</sup>

### Refinery construction (1946 basis)

*Explained in OGJ, Dec. 30, 1985, p. 145.*

	1962	1980	2014	2015	2016	July 2016	June 2017	July 2017
<b>Pumps, compressors, etc.</b>								
222.5		777.3	2,271.9	2,313.6	2,336.3	2,336.0	2,365.3	2,366.2
<b>Electrical machinery</b>								
189.5		394.7	515.8	516.5	513.0	513.7	516.8	515.0
<b>Internal-comb. engines</b>								
183.4		512.6	1,052.9	1,062.3	1,035.6	1,037.0	1,048.3	1,045.1
<b>Instruments</b>								
214.8		587.3	1,533.6	1,554.4	1,597.5	1,597.2	1,596.1	1,611.7
<b>Heat exchangers</b>								
183.6		618.7	1,305.0	1,305.0	1,221.2	1,221.2	1,221.2	1,221.2
<b>Misc. equip. average</b>								
198.8		578.1	1,335.8	1,350.3	1,340.7	1,341.0	1,349.5	1,351.8
<b>Materials component</b>								
205.9		629.2	1,571.8	1,434.9	1,403.1	1,432.8	1,517.2	1,519.3
<b>Labor component</b>								
258.8		951.9	3,210.7	3,293.8	3,395.8	3,403.5	3,468.7	3,468.7
<b>Refinery (inflation) index</b>								
237.6		822.8	2,555.2	2,550.2	2,598.7	2,615.2	2,688.1	2,688.9

### Refinery operating (1956 basis)

*Explained in OGJ, Dec. 30, 1985, p. 145.*

	1962	1980	2014	2015	2016	July 2016	June 2017	July 2017
<b>Fuel cost</b>								
100.9		810.5	1,264.8	915.9	869.1	923.6	994.7	955.6
<b>Labor cost</b>								
93.9		200.5	312.8	319.2	339.6	333.1	315.5	306.2
Wages								
123.9		439.9	1,541.3	1,584.4	1,624.5	1,621.5	1,699.2	1,656.1
Productivity								
131.8		226.3	493.1	497.1	479.1	486.9	538.6	540.9
<b>Invest., maint., etc.</b>								
121.7		324.8	939.4	948.0	938.2	944.1	999.3	999.6
<b>Chemical costs</b>								
96.7		229.2	472.3	434.6	409.9	402.6	442.2	432.3
<b>Operating indexes<sup>2</sup></b>								
Refinery								
103.7		312.7	688.5	660.0	657.0	661.3	688.9	681.1
Process units								
103.6		457.5	865.3	748.1	734.4	753.6	792.6	776.2

<sup>1</sup>These indexes are published in the first of each month and are compiled by Gary Farrar, OGJ Contributing Editor.

<sup>2</sup>Add separate index(es) for chemicals, if any are used. Indexes of selected individual items of equipment and materials are also published on the Quarterly Costimating page in first issues for January, April, July, and October.

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### INDEXES FOR SELECTED EQUIPMENT ITEMS

Date	Materials component	Labor component	Misc. equip- ment	Nelson- Farrar inflation index	Date	Materials component	Labor component	Misc. equip- ment	Nelson- Farrar inflation index	Date	Materials component	Labor component	Misc. equip- ment	Nelson- Farrar inflation index
1926	87.7	61.5	94.0	72.0	1957	201.9	208.6	192.1	205.9	1987	748.9	1,370.0	703.1	1,121.5
1928	93.2	64.5	89.0	71.0	1958	204.1	220.4	192.4	213.9	1988	802.8	1,405.6	732.5	1,164.5
1929	83.2	64.5	87.0	72.0	1959	207.8	231.6	196.1	222.1	1989	829.2	1,440.4	769.9	1,195.9
1930	76.0	66.5	84.0	70.3	1960	207.6	241.9	200.0	228.1	1990	832.8	1,487.7	797.5	1,225.7
1931	72.2	60.0	82.0	64.9	1961	207.7	249.4	199.5	232.7	1991	832.3	1,533.3	827.5	1,252.9
1932	68.0	49.0	79.0	56.6	1962	205.9	258.8	198.8	237.6	1992	824.6	1,579.2	837.6	1,277.3
1933	68.3	49.0	76.0	56.7	1963	206.3	268.4	201.4	243.6	1993	846.7	1,620.2	842.8	1,310.8
1934	73.5	55.5	74.0	62.7	1964	209.6	280.5	206.8	252.1	1994	877.2	1,664.7	851.1	1,349.7
1935	74.3	55.0	76.0	62.7	1965	212.0	294.4	211.6	261.4	1995	918.0	1,708.1	879.5	1,392.1
1936	78.2	60.0	77.0	67.3	1966	216.2	310.9	220.9	273.0	1996	917.1	1,753.5	903.5	1,418.9
1937	86.7	66.5	80.0	74.6	1967	219.7	331.3	226.1	266.7	1997	923.9	1,799.5	910.5	1,449.2
1938	84.7	71.5	81.0	76.8	1968	224.1	357.4	228.8	304.1	1998	917.5	1,851.0	933.2	1,477.6
1939	82.0	73.0	82.0	76.6	1969	234.9	391.8	239.3	329.0	1999	883.5	1,906.3	920.3	1,497.2
1940	82.2	74.5	83.0	77.6	1970	250.5	441.1	254.3	364.9	2000	896.1	1,973.7	917.8	1,542.7
1941	84.5	77.0	84.0	80.0	1971	265.2	499.9	268.7	406.0	2001	877.7	2,047.7	939.3	1,579.7
1942	86.2	82.0	85.0	83.7	1972	277.8	545.6	278.0	438.5	2002	899.7	2,137.2	951.3	1,642.2
1943	86.7	86.5	86.0	86.6	1973	292.3	585.2	291.4	468.0	2003	933.8	2,228.1	956.7	1,710.4
1944	87.6	88.5	88.0	88.1	1974	373.3	623.6	361.8	522.7	2004	1,112.7	2,314.2	993.8	1,833.6
1945	89.7	90.0	90.0	89.9	1975	421.0	678.5	415.9	575.5	2005	1,179.8	2,411.6	1,062.1	1,918.8
1946	100.0	100.0	100.0	100.0	1976	445.2	729.4	423.8	615.7	2006	1,273.5	2,497.8	1,113.3	2,008.1
1947	122.4	113.5	114.2	117.0	1977	471.3	774.1	438.2	653.0	2007	1,364.8	2,601.4	1,189.3	2,106.7
1948	139.5	128.0	122.1	132.5	1978	516.7	824.1	474.1	701.1	2008	1,572.0	2,704.3	1,230.6	2,251.4
1949	143.6	137.1	121.6	139.7	1979	573.1	879.0	515.4	756.6	2009	1,324.8	2,813.0	1,239.7	2,217.7
1950	149.5	144.0	126.2	146.2	1980	629.2	951.9	578.1	822.8	2010	1,480.1	2,909.3	1,224.7	2,337.6
1951	164.0	152.5	145.0	157.2	1981	693.2	1,044.2	647.9	903.8	2011	1,610.5	2,985.6	1,256.4	2,435.6
1952	164.3	163.1	153.1	163.6	1982	707.6	1,154.2	662.8	976.9	2012	1,579.7	3,055.6	1,286.1	2,465.2
1953	172.4	174.2	158.8	173.5	1983	712.4	1,234.8	656.8	1,025.8	2013	1,538.7	3,123.4	1,317.5	2,489.5
1954	174.6	183.3	160.7	179.8	1984	735.3	1,278.1	665.6	1,061.0	2014	1,571.8	3,210.7	1,335.8	2,555.2
1955	176.1	189.6	161.5	184.2	1985	739.6	1,297.6	673.4	1,074.4					
1956	190.4	198.2	180.5	195.3	1986	730.0	1,330.0	684.4	1,089.9					

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### ITEMIZED REFINING COST INDEXES

The cost indexes may be used to convert prices at any date to prices at other dates by ratios to the cost indexes of the same date. Item indexes are published each quarter (first week issue of January, April, July, and October). In addition the Nelson Construction and Operating Cost Indexes are published in the first issue of each month of Oil & Gas Journal.

Operating cost (based on 1956 = 100.)	1954	1972	2014	2015	2016	May 2017	*References	Index for earlier year in Costimating and Questions on Technology issues
Power, industrial electrical	98.5	131.2	1,077.8	1,098.1	1,051.8	1,181.3	Code 0543	No. 13, May 19, 1958, p. 181
Fuel, refinery price	85.5	152.0	1,211.5	857.4	819.3	948.4	OGJ	No. 4, Mar. 17, 1958, p. 190
Gulf cargoes	85.0	130.4	3,403.2	3,403.2	3,403.2	3,403.2	OGJ	No. 4, Mar. 17, 1958, p. 190
NY barges	82.6	169.6	3,460.4	3,460.4	3,460.4	3,460.4	OGJ	No. 4, Mar. 17, 1958, p. 190
Chicago low sulfur	—	—	3,238.2	3,238.2	3,238.2	3,238.2	OGJ	July 7, 1975, p. 72
Western US	84.3	168.1	4,176.7	4,176.7	4,176.7	4,176.7	OGJ	No. 4, Mar. 17, 1958, p. 190
Central US	60.2	128.1	3,368.3	3,368.3	3,368.3	3,368.3	OGJ	No. 4, Mar. 17, 1958, p. 190
Natural gas at wellhead	83.5	190.3	3,912.8	2,173.2	1,986.4	2,620.5	Code 531-10-1	No. 4, Mar. 17, 1958, p. 190
Inorganic chemicals	96.0	123.1	1,083.7	1,089.2	1,018.9	1,021.1	Code 613	Oct. 5, 1964, p. 149
Acid, hydrofluoric	95.5	144.4	414.9	414.9	414.9	414.9	Code 613-0222	Apr. 1, 1963, p. 119
Acid, sulfuric	100.0	140.7	439.1	439.1	439.1	439.1	Code 613-0281	No. 94, May 15, 1961, p. 138
Platinum	92.9	121.1	1,098.4	978.4	955.7	1,029.5	Code 1022-02-73	July 5, 1965, p. 117
Sodium carbonate	90.9	119.4	714.0	717.6	671.4	672.8	Code 613-01-03	No. 58, Oct. 12, 1959, p. 186
Sodium hydroxide	95.5	136.2	978.6	983.6	920.1	922.0	Code 613-01-04	No. 94, May 15, 1961, p. 138
Sodium phosphate	97.4	107.0	844.2	844.2	844.2	844.2	Code 613-0267	No. 58, Oct. 12, 1959, p. 186
Organic chemicals	100.0	87.4	1,002.4	796.1	757.4	874.5	Code 614	Oct. 5, 1964, p. 149
Furfural	94.5	137.5	1,446.5	1,148.8	1,092.3	1,262.1	Chemical Marketing	No. 58, Oct. 12, 1959, p. 186
MEK, tank-car lots	82.6	87.5	625.0	625.0	625.0	625.0	Reporter	
Phenol	90.4	47.1	500.3	500.3	500.3	500.3	Code 614-0241	No. 58, Oct. 12, 1959, p. 186

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**ITEMIZED REFINING COST INDEXES**

Operating cost (based on 1956 = 100.)	1954	1972	2014	2015	2016	May 2017	*References	Index for earlier year in Costimating and Questions on Technology issues
<i>Operating labor cost (1956 = 100)</i>								
Wages and benefits	88.7	210.0	1,541.3	1,584.4	1,624.5	1,605.0	Employ & Earn	No. 41, Feb. 16, 1969
Productivity	97.2	197.0	493.1	497.1	479.1	530.7	Employ & Earn	No. 41, Feb. 16, 1969
<i>Construction labor cost (1946 = 100)</i>								
Skilled const.	174.6	499.9	2,866.3	2,943.9	3,026.9	3,078.3	Eng. News Record	No. 55, Nov. 3, 1949
Common labor	192.1	630.6	3,848.5	3,933.2	4,071.6	4,193.6	Eng. News Record	No. 55, Nov. 3, 1949
Refinery cost	183.3	545.9	3,210.7	3,293.8	3,395.8	3,468.7	OGJ	May 15, 1967, p. 97
<i>Equipment or materials (1946 = 100)</i>								
Bubble tray	161.4	324.4	1,827.1	1,773.1	1,774.5	1,872.6	Computed	July 8, 1962, p. 113
Building materials (nonmetallic)	143.6	212.4	1,204.8	1,233.6	1,259.2	1,284.2	Code 13	No. 61, Dec. 15, 1949
Brick—building	144.7	252.5	1,375.6	1,398.5	1,405.3	1,420.9	Code 1342	No. 20, Mar. 3, 1949
Brick—fireclay	193.1	322.8	2,077.9	2,112.7	2,126.4	2,149.8	Code 135	May 30, 1955, p. 104
Castings, iron	188.1	274.9	1,743.1	1,730.9	1,716.2	1,710.4	Code 1015	Apr. 1, 1963, p. 119
Clay products (structural, etc.)	159.1	342.0	963.2	984.1	997.2	995.4	Code 134	No. 20, Mar. 3, 1949
Concrete ingredients	141.1	218.4	1,360.7	1,418.0	1,488.7	1,548.8	Code 132	No. 22, Mar. 17, 1949
Concrete products	138.5	199.6	1,086.9	1,130.9	1,168.6	1,201.8	Code 133	Oct. 2, 1967, p. 112
Electrical machinery	159.9	216.3	515.8	516.5	513.0	516.8	Code 117	May 2, 1955, p. 104
Motors and generators	157.7	211.0	1,125.3	1,124.5	1,111.2	1,121.6	Code 1173	May 2, 1955, p. 104
Switchgear	171.2	271.0	1,400.6	1,402.7	1,411.8	1,415.0	Code 1175	May 2, 1955, p. 104
Transformers	161.9	149.3	798.2	757.2	738.0	768.6	Code 1174	No. 31, May 19, 1949
Engines (combustion)	150.5	233.3	1,052.9	1,062.3	1,035.6	1,048.3	Code 1194	No. 36, June 23, 1949
Exchangers (composite)	171.7	274.3	1,305.0	1,305.0	1,221.2	1,221.2	Manufacturer	Mar. 16, 1964, p. 154
Copper base	190.7	266.7	1,178.5	1,178.5	1,150.4	1,150.4	Manufacturer	Mar. 16, 1964, p. 154
Carbon steel	156.8	281.9	1,320.9	1,320.9	1,237.0	1,237.0	Manufacturer	Mar. 16, 1964, p. 154
Stainless steel (304)	—	—	1,312.7	1,312.7	1,201.2	1,201.2	Manufacturer	July 1, 1991, p. 58
Fractionating towers	151.0	278.5	1,457.9	1,449.5	1,454.6	1,432.7	Computed	June 8, 1963, p. 133
Hand tools	173.8	346.5	2,099.7	2,099.4	2,110.4	2,125.8	Code 1042	June 27, 1955
Instruments (composite)	154.6	328.4	1,533.6	1,554.4	1,597.5	1,603.8	Computed	No. 34, June 9, 1949
Insulation (composite)	198.5	272.4	2,014.9	2,072.6	2,167.4	2,254.4	Manufacturer	July 4, 1988, p. 193
Lumber (composite)	197.8	353.4	1,489.7	1,380.7	1,393.9	1,519.2	Code 81	No. 7, Dec. 2, 1948
Southern pine	181.2	303.9	1,025.0	966.4	988.8	1,140.8	Code 81102	No. 7, Dec. 2, 1948
Redwood, all heart	238.0	310.6	2,112.1	1,992.0	2,037.5	2,350.5	Code 811-0332	July 5, 1965, p. 117
<i>Machinery</i>								
General purpose	159.9	278.5	1,540.5	1,562.1	1,576.5	1,596.2	Code 114	Feb. 17, 1949
Construction	165.9	324.4	1,899.9	1,925.9	1,943.6	1,960.7	Code 112	Apr. 1, 1968, p. 184
Oil field	161.9	269.1	2,017.8	2,020.1	2,001.8	1,992.7	Code 1191	Oct. 10, 1955, p. 267
Paints—prepared	159.0	231.8	1,424.6	1,411.3	1,398.1	1,405.5	Code 621	May 16, 1955, p. 117
<i>Pipe</i>								
Gray iron pressure	195.0	346.9	3,392.1	3,369.5	3,339.8	3,328.5	Code 1015-0239	Jan. 3, 1983, p. 76
Standard carbon	182.7	319.9	2,895.4	2,633.2	2,497.7	2,854.0	Code 1017-0611	Jan. 3, 1983, p. 76
Pumps, compressors, etc.	166.5	337.5	2,271.9	2,313.6	2,336.3	2,362.5	Code 1141	No. 29, May 5, 1949
Steel-mill products	187.1	330.6	1,775.9	1,565.4	1,487.9	1,683.1	Code 1017	Jan. 3, 1983, p. 73
Alloy bars	198.7	349.4	1,419.2	1,408.0	1,438.1	1,536.7	Code 1017-0831	Apr. 1, 1963, p. 119
Cold-rolled sheets	187.0	365.5	1,969.8	1,695.2	1,673.7	1,983.5	Code 1017-0711	Jan. 3, 1983, p. 73
Alloy sheets	177.0	225.9	1,024.5	881.6	870.4	1,031.5	Code 1017-0733	Jan. 3, 1983, p. 73
Stainless strip	169.0	221.2	1,093.8	941.5	928.9	1,101.5	Code 1017-0755	Jan. 3, 1983, p. 73
Structural carbon, plates	193.4	386.7	2,153.6	1,914.5	1,712.2	1,850.3	Code 1017-0400	Jan. 3, 1983, p. 73
Welded carbon tubing	180.0	265.5	2,933.8	2,668.1	2,530.7	2,892.0	Code 1017-0622	Jan. 3, 1983, p. 73
Tanks and pressure vessels	147.3	246.4	1,181.8	1,179.3	1,173.5	1,081.4	Code 1072	No. 5, Nov. 18, 1949
Tube stills	123.0	125.3	692.8	642.6	627.9	684.0	Computed	Oct. 1, 1962, p. 85
Valves and fittings	197.0	350.9	2,445.5	2,467.2	2,489.4	2,511.4	Code 1149	No. 46, Sept. 1, 1940
<i>Nelson-Farrar Refinery (Inflation Index)</i>								
(1946)	179.8	438.5	2,555.2	2,550.2	2,598.7	2,687.6	OGJ	May 15, 1969
<i>Nelson-Farrar Refinery Operation</i>								
(1956)	88.7	118.5	688.5	660.0	657.0	684.8	OGJ	No. 2, Mar. 3, 1958, p. 167
<i>Nelson-Farrar Refinery Process Operation</i>								
(1956)	88.4	147.0	865.3	748.1	734.4	789.2	OGJ	No. 2, Mar. 3, 1958, p. 167

\*Code refers to the index number of the Bureau of Statistics, US Department of Labor, "Wholesale Prices" Itemized Cost Indexes, Oil &amp; Gas Journal.