

8. Pharmaceuticals

In 2005, the pharmaceutical industry had estimated global sales of more than \$600 billion. In the United States alone, the value of shipments for the industry totaled over \$180 billion in 2006, up 9.1 percent from 2005. Production facilities may be owned by pharmaceuticals firms, or by independent firms producing brand-name drugs (under license) and/or generic products.

a) Representative Operation – Pharmaceutical Production

The representative operation modeled is an independent plant producing prescription drugs on behalf of brand-name and/or generic distributors. As illustrated in Exhibit 3.30, this operation is characterized by:

- Substantial facility and equipment requirements
- A workforce weighted toward skilled operators, but also including a significant number of both professional/technical employees and unskilled staff
- Moderate energy requirements
- Modest in-house R&D activities

The business is assumed to operate as a stand-alone profit center.

b) International Results

International results are illustrated in Exhibit 3.31. These results reflect the combined impact of 27 location-sensitive cost components applied to the modeled operation. Detailed results, by key cost component, are presented in Exhibit 3.32.

c) Leading Cities

Exhibit 3.33 profiles results for the leading (lower-cost) cities, by country, from among the 102 cities featured in this report. Results for all other featured cities can be found in Chapter 4, Exhibit 4.10.

EXHIBIT 3.30 – PHARMACEUTICALS	
Pharmaceutical Production – Summary of Operating Parameters	
Facilities Requirements	
Industrial site purchased	6 acres (2.4 hectares)
Size of factory built	70,000 ft ² (6,503 m ²)
Other Initial Investment Requirements	
Machinery and equipment – US \$'000	\$6,000
Office equipment – US \$'000	\$200
R&D equipment – US \$'000	\$500
Inventory – US \$'000	\$2,000
Equity financing - % of project costs	50%
Workforce	
Management	7
Sales and administration	16
Production/non-dedicated product development	
- Professional, technical	30
- Operators	43
- Unskilled laborers	20
Other	4
Total employees	120
Energy Requirements	
Electricity monthly consumption/peak demand	160,000 kWh and 540 kW
Gas monthly consumption	800 CCF (2,266 m ³)
Other Annual Operating Characteristics	
Sales at full production – US \$'000	\$25,500
Materials and other direct costs - % of sales	30%
Other operating costs - % of sales	15%
Investment in tax-eligible R&D - % of sales	2.6%

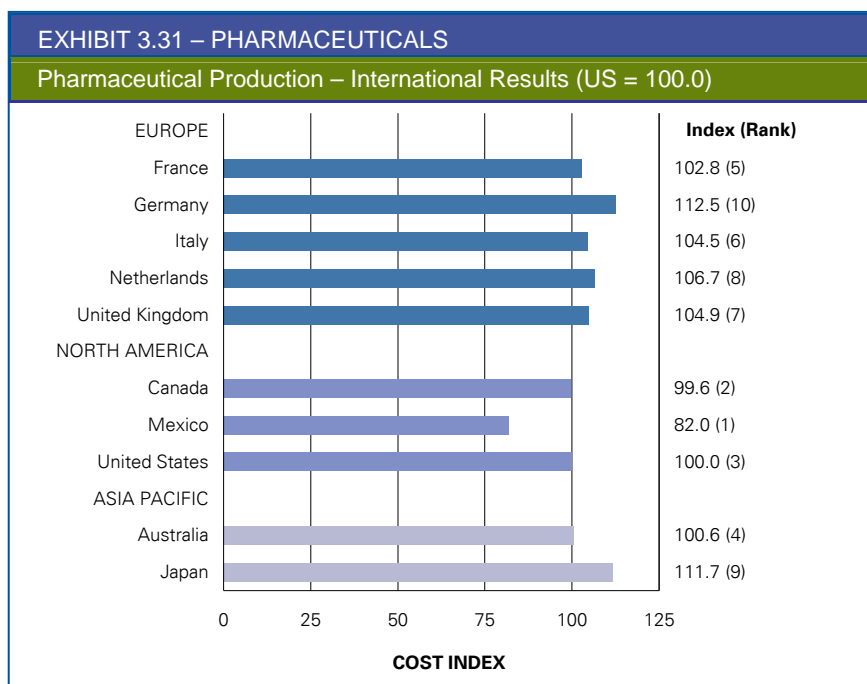


EXHIBIT 3.32 – PHARMACEUTICALS

Pharmaceutical Production – Costs, by Major Component, US \$'000

	Europe					North America			Asia Pacific	
	France	Germany	Italy	Netherlands	UK	Canada	Mexico	US	Australia	Japan
Revenues	24,250	24,250	24,250	24,250	24,250	24,250	24,250	24,250	24,250	24,250
Costs										
- Salaries & Wages	5,218	7,949	5,207	6,919	6,046	5,905	2,770	5,376	5,875	7,354
- Statutory Plans	2,221	1,291	1,704	889	730	497	342	495	773	676
- Other Benefits	1,053	1,579	1,378	2,068	1,892	1,258	618	1,499	1,260	2,380
- Total Labor & Benefits	8,491	10,819	8,289	9,876	8,669	7,661	3,730	7,370	7,907	10,409
- Transportation	473	517	656	494	491	681	638	621	496	529
- Utilities	241	333	502	315	287	188	346	147	293	392
- Interest & Depreciation	1,278	1,693	1,306	1,558	1,559	1,214	(259)	1,119	1,171	1,633
- Non-income Taxes	345	131	47	35	433	397	40	383	89	367
- Location-insensitive Costs	10,913	10,913	10,913	10,913	10,913	10,913	10,913	10,913	10,913	10,913
Profit Before Income Tax	2,509	(157)	2,536	1,338	1,899	3,197	8,843	3,710	3,381	8
- Income Taxes ¹	645	88	1,038	46	486	637	2,445	1,218	1,027	87
Effective Rate	25.7%	n/a	40.9%	24.4%	25.6%	19.9%	27.6%	33.2%	30.4%	n/a
After-tax Profit	1,864	(244)	1,498	1,012	1,413	2,560	6,399	2,480	2,355	(79)
Total Annual Costs	22,386	24,494	22,751	23,237	22,837	21,690	17,851	21,771	21,895	24,329
Index (US=100.0)	102.8	112.5	104.5	106.7	104.9	99.6	82.0	100.0	100.6	111.7
Rank	5	10	6	8	7	2	1	3	4	9

¹ Income taxes may be either positive or negative, irrespective of whether profit before income tax is positive or negative, due to the impact of specific expense deduction rules, minimum taxes, and refundable income tax credits. Effective tax rates are not shown where results are not meaningful because of low profitability.

EXHIBIT 3.33 – PHARMACEUTICALS

Pharmaceutical Production – Results for Leading Cities, by Country

Country	City	Index	Rank Among 102 Cities	Country	City	Index	Rank Among 102 Cities
France	Toulouse	101.6	59	Canada	Sherbrooke	95.4	9
	Mulhouse	102.3	69		Moncton	95.7	10
Germany	Halle	109.5	95	Fredericton	96.1	13	
	Erlangen	113.0	100	Charlottetown	96.8	16	
Italy	Vicenza	103.5	80	Mexico	Reynosa	80.0	1
	Livorno	104.8	86		Aguascalientes	82.0	2
Netherlands	Utrecht	106.7	91	United States	San Juan	88.4	6
United Kingdom	Barnsley	102.6	72		Shreveport	94.5	7
	Plymouth	103.1	74		McAllen	94.6	8
Australia	Adelaide	99.2	36		Little Rock	95.9	11
	Brisbane	100.0	44		Oklahoma City	96.0	12
Japan	Fukuoka	111.0	97		Greenville-Spartanburg	96.3	14
	Yokohama	112.0	98		Montgomery	96.3	15
				Lexington	97.0	18	
			Charleston	97.1	20		