

2023 Global Innovative Markets Forecast

1,3-Propanediol (Pdo)

Market - Materials



Product Code - PHP310001

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(Historical Data Trends)

Country Name	Code
Argentina	ARG
Australia	AUS
Austria	AUT
Bangladesh	BGD
Belgium	BEL
Brazil	BRA
Canada	CAN
Chile	CHL
China	CHN
Czech Republic	CZE
Denmark	DNK
Egypt, Arab Rep.	EGY
Finland	FIN
France	FRA
Germany	DEU
Hungary	HUN
India	IND
Indonesia	IDN
Ireland	IRL
Israel	ISR
Italy	ITA
Japan	JPN
Korea, Rep.	KOR
Malaysia	MYS

Country Name	Code
Mexico	MEX
Netherlands	NLD
Nigeria	NGA
Norway	NOR
Pakistan	PAK
Philippines	PHL
Poland	POL
Puerto Rico	PRI
Romania	ROU
Russian Federation	RUS
Saudi Arabia	SAU
Singapore	SGP
South Africa	ZAF
Spain	ESP
Sweden	SWE
Switzerland	CHE
Thailand	THA
Turkey	TUR
United Arab Emirates	ARE
United Kingdom	GBR
United States	USA
Venezuela, RB	VEN
Vietnam	VNM

Users' Guide

Market - 1,3-Propanediol (PDO)

Market - Materials

Scope of the Report

Market - Commodity Chemicals

The market study aims at estimating the market size and the growth potential of this market. Topics analyzed within the report include a detailed breakdown of the global markets for 1,3-propanediol (pdo) by geography and historical trend. The scope of the report extends to sizing of the 1,3-propanediol (pdo) market and global market trends with market data for 2021 as the base year, 2022 and 2022 as the estimate years and forecast for 2024 with projection of CAGR from 2024 to 2029.

Product shipments include the total value of all products produced and shipped by all producers. For selected products, this can represent value of receipts, value of production, or value of work done. Market data is provided in U.S. dollar value at global and regional levels, as well as local currencies for all countries.

Users' Guide

Report Coverage

The report focuses a detailed calculation of original equipment manufacturers and the related system providers. The study forecasts the market value of the 1,3-propanediol (pdo) market.

Published annually, this report provides a unique and accurate estimate on market sizing for this equipment/material using a proprietary economic model that integrates historical trends (horizontal analysis) and longitudinal analysis of incorporated industries (vertical analysis).

Regional summaries include North America, Europe, Asia-Pacific, Latin America, Africa, and Middle East. Percent shares are presented for each region as a share of the global market.

Product shipments values are also broken down by geographic areas in the countries in the report for regions, districts, provinces, states and cities.

This report does not list key players/companies in the market but focuses on a top-down and outlook view of the market despite the existing and entering of market companies.

Benefits of the Report

This report is primarily aimed at business professionals in fields related to the market. These may include manufacturers and their suppliers, financiers and investors, researchers with backgrounds in the market, marketing and sales professionals, and others.

This report may also prove valuable to professional analysts, investors, public policy advisors and others who are seeking a better understanding and definition of how 1,3-propanediol (pdo) fit into the broader global market.

The report will help the market leaders and new entrants in this market with information on the closest approximations of the revenue numbers for the overall market. This report will help stakeholders understand the competitive landscape and gain more insights to better position their businesses and to plan market strategies. The report also helps stakeholders understand the opportunities of the market.

Methodology

Market - 1,3-Propanediol (PDO)

Market: Materials

Definition: Commodity Chemicals

Methodology

The Global Innovative Markets Forecast report series by Perry/Hope Partners features market sales of thousands of high-tech products and services in various industries such as transportation, hardware, electronics, electrical products, printing services and food products. The reports are published annually based on a unique methodology that uses robust data sources and detailed logarithms to estimate global markets for manufactured products. The main steps in the methodology are:

- Products and services definitions and historical data are primarily based on secondary data collected from Internet research which is updated annually. Data sources include trade association databases, trade journal articles, press releases, published research reports, and annual reports.
- Market sales for the global countries are used as a ratio to all other countries in the report by GDP and the percent of the total manufacturing sector as percent of the countries total GDP.
- Adjustments to estimates are both vertical (industry) analysis and horizontal (trend) analysis.
- Demographic breakdowns of regions, cities, states, districts and provinces are based on historical population and regional GDP data projected forward.

Global Sales

Market - 1,3-Propanediol (PDO)

Market Sales by Countries (USD Millions)

Country Name	2018	2019	2020	2021	2022	2023	2024	2029
Argentina	2.5	2.1	1.9	1.8	1.8	1.7	1.5	0.8
Australia	2.3	2.6	2.6	2.7	3.0	3.1	3.3	3.8
Austria	2.1	2.4	2.4	2.6	3.0	3.3	3.5	5.0
Bangladesh	1.3	1.5	1.9	2.3	3.0	3.7	4.5	12.4
Belgium	1.9	2.1	2.1	2.2	2.5	2.7	2.8	3.7
Brazil	6.6	5.8	6.2	6.3	7.0	7.2	7.5	7.9
Canada	6.2	6.6	7.0	8.0	9.5	10.7	12.0	19.2
Chile	0.9	1.0	0.9	1.0	1.2	1.3	1.4	1.8
China	109.4	121.4	125.0	143.9	171.9	193.6	217.7	377.7
Czech Republic	1.6	1.8	1.9	2.1	2.5	2.7	3.0	5.0
Denmark	1.3	1.5	1.6	1.6	1.9	2.0	2.2	3.1
Egypt, Arab Rep.	1.2	1.3	1.6	1.6	1.8	1.9	2.0	2.3
Finland	1.2	1.3	1.3	1.3	1.5	1.6	1.7	2.1
France	7.9	8.7	8.9	9.6	11.1	12.0	12.9	17.1
Germany	22.9	25.3	24.7	27.6	31.9	34.6	37.4	50.7
Hungary	0.8	0.9	0.9	1.0	1.2	1.3	1.4	2.0
India	12.0	12.4	12.5	14.2	16.5	18.2	20.0	30.9
Indonesia	6.2	6.5	7.2	8.3	10.1	11.5	13.2	23.1
Ireland	3.2	3.9	4.2	4.7	5.6	6.4	7.2	13.1
Israel	1.3	1.4	1.4	1.6	1.8	2.0	2.2	3.4
Italy	8.9	9.8	9.8	10.9	12.7	13.9	15.1	21.1
Japan	30.6	32.3	34.2	39.3	43.8	48.3	53.0	81.8
Korea, Rep.	13.6	14.4	13.6	15.9	18.6	20.5	22.4	32.4
Malaysia	2.1	2.4	2.6	3.0	3.7	4.2	4.8	8.5
Mexico	6.1	6.6	7.2	7.7	8.9	9.7	10.6	14.6
Netherlands	2.8	3.2	3.2	3.5	4.1	4.5	4.9	7.3
Nigeria	1.0	1.2	1.7	1.7	2.1	2.4	2.7	4.2
Norway	0.8	0.8	0.8	0.9	1.0	1.1	1.2	1.3
Pakistan	1.1	1.2	1.1	1.3	1.4	1.5	1.6	2.1
Philippines	1.9	2.1	2.3	2.7	3.3	3.8	4.3	7.8
Poland	2.8	3.1	3.2	3.5	4.0	4.3	4.6	6.5
Puerto Rico	1.5	1.5	1.6	1.8	2.0	2.2	2.4	3.2
Romania	1.3	1.4	1.4	1.7	2.0	2.3	2.6	4.4
Russian Federation	5.8	6.8	7.2	7.9	9.3	10.4	11.5	18.8
Saudi Arabia	2.7	3.2	3.3	3.9	4.9	5.7	6.6	12.7
Singapore	2.0	2.4	2.4	3.0	3.7	4.4	5.1	10.4

Global Sales

Market - 1,3-Propanediol (PDO)

Market Sales by Countries (USD Millions)

Country Name	2018	2019	2020	2021	2022	2023	2024	2029
South Africa	1.3	1.4	1.4	1.5	1.7	1.8	2.0	2.6
Spain	4.5	5.0	5.0	5.3	6.1	6.6	7.1	8.2
Sweden	2.2	2.3	2.2	2.4	2.6	2.8	2.9	3.3
Switzerland	3.8	4.0	4.4	4.8	5.6	6.2	6.9	10.2
Thailand	3.8	4.3	4.6	5.3	6.5	7.5	8.6	16.5
Turkey	4.6	4.6	4.6	5.0	5.5	5.8	6.0	6.3
United Arab Emirates	1.1	1.2	1.2	1.4	1.7	1.9	2.1	3.6
United Kingdom	7.3	7.9	8.0	8.7	9.8	10.4	11.0	12.1
United States	65.9	71.9	76.6	85.5	101.8	113.6	126.6	198.4
Venezuela, RB	1.6	1.6	1.6	1.6	1.7	1.7	1.7	1.6
Vietnam	1.0	1.2	1.4	1.7	2.1	2.5	2.9	6.6
GLOBAL	374.7	408.1	422.6	476.0	559.5	621.1	688.7	1,091.7

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Regional Sales

Market - 1,3-Propanediol (PDO)

The market for this equipment in North America is estimated to be \$0.1 billion dollars in 2023 and is expected to change by 11.4 percent from 2022 to 2023. The market in the Asia-Pacific region for this equipment is estimated to be \$0.3 billion in 2023 and is forecast to change by 12 percent from 2023 to 2024. The European market is \$0.1 billion in 2023.

Market Size by Year (US\$ Millions)

	2018	2019	2020	2021	2022	2023	2024	2029
North America	78.1	85.1	90.8	101.1	120.3	134.0	149.1	232.1
Latin America	9.1	7.9	8.1	8.1	8.8	8.9	9.0	8.8
Europe	66.7	73.9	74.6	82.1	95.0	103.3	112.0	155.1
Asia-Pacific	190.9	208.8	215.3	247.3	291.8	326.9	365.5	613.8
Middle East	4.6	4.6	4.6	5.0	5.5	5.8	6.0	6.3
Africa	2.3	2.6	3.0	3.2	3.8	4.2	4.7	6.8
GLOBAL	349.4	380.3	393.3	443.7	521.5	578.8	641.7	1,016.0

Regional Distribution

	2018	2019	2020	2021	2022	2023	2024	2029
North America	22.4%	22.4%	23.1%	22.8%	23.1%	23.2%	23.2%	22.8%
Latin America	2.6%	2.1%	2.1%	1.8%	1.7%	1.5%	1.4%	0.9%
Europe	19.1%	19.4%	19.0%	18.5%	18.2%	17.8%	17.5%	15.3%
Asia-Pacific	54.6%	54.9%	54.7%	55.7%	56.0%	56.5%	57.0%	60.4%
Middle East	1.3%	1.2%	1.2%	1.1%	1.1%	1.0%	0.9%	0.6%
Africa	0.7%	0.7%	0.8%	0.7%	0.7%	0.7%	0.7%	0.7%
GLOBAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Year-to-Year Change

	CAGR							
	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023	2023-2024	2024-2029	
North America		8.9%	6.6%	11.4%	19.0%	11.4%	11.3%	55.7%
Latin America		-13.6%	3.3%	0.1%	7.9%	1.3%	1.3%	-2.4%
Europe		10.8%	0.9%	10.1%	15.7%	8.6%	8.5%	38.4%
Asia-Pacific		9.4%	3.1%	14.9%	18.0%	12.0%	11.8%	67.9%
Middle East		1.3%	-1.3%	9.1%	11.1%	4.8%	4.6%	3.6%
Africa		13.0%	18.6%	5.0%	18.1%	11.2%	11.1%	46.7%
GLOBAL		8.9%	3.4%	12.8%	17.5%	11.0%	10.9%	58.3%

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Argentina

Market - 1,3-Propanediol (PDO)

Market Sales by Country

<u>US Dollars</u>	<u>Market Sales</u>	<u>Pct. of Global</u>		
<u>Year</u>	<u>(USD 000s)</u>	<u>Market</u>	<u>Year-to-Year Change</u>	
2018	2,505.8	0.67%		
2019	2,070.7	0.51%	2018-2019	-17.4%
2020	1,894.2	0.45%	2019-2020	-8.5%
2021	1,777.8	0.37%	2020-2021	-6.1%
2022	1,765.3	0.32%	2021-2022	-0.7%
2023	1,651.6	0.27%	2022-2023	-6.4%
2024	1,540.8	0.22%	2023-2024	-6.7%
2029	837.1	0.08%	CAGR 2024-2029	-9.1%

<u>Pesos</u>	<u>Market Sales</u>		
<u>Year</u>	<u>(Pesos 000s)</u>	<u>Year-to-Year Change</u>	
2018	92,676.4		
2019	76,585.4	2018-2019	-17.4%
2020	70,058.0	2019-2020	-8.5%
2021	65,752.9	2020-2021	-6.1%
2022	65,290.7	2021-2022	-0.7%
2023	61,084.0	2022-2023	-6.4%
2024	56,984.3	2023-2024	-6.7%
2029	30,958.4	CAGR 2024-2029	-9.1%

In 2023, sales for this product in Argentina is forecast to be \$1.7 million dollars. Sales are forecast to change by -6.7 percent in the next year (2023 to 2024). In 2023, sales will be 61.1 million Pesos and will change by -6.4 percent in the next year (2023 to 2024).

In 2029, sales for this product in Argentina is forecast to be \$0.8 million dollars. The compound annual growth rate is projected to change by -9.1 percent from 2024 to 2029. In 2029, sales will be 61.1 million Pesos and will change by -6.4 percent from 2024 to 2029.

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Argentina

Product - 1,3-Propanediol (PDO)

Market Sales by Regional Provinces (USD 000s)

	2022	2023	2024	2029
Buenos Aires	681.8	637.8	594.9	322.8
Catamarca	17.4	16.3	15.3	8.6
Chaco	47.2	44.2	41.2	22.5
Chubut	23.9	22.5	21.2	11.9
Ciudad Autónoma de Buenos Aires (114.3	105.8	97.6	50.1
Córdoba	143.6	134.1	124.9	67.2
Corrientes	44.3	41.4	38.7	21.0
Entre Ríos	53.9	50.3	46.9	25.3
Formosa	24.7	23.2	21.7	12.0
Jujuy	30.6	28.7	26.9	14.8
La Pampa	14.1	13.2	12.3	6.7
La Rioja	16.4	15.5	14.6	8.4
Mendoza	76.6	71.7	66.8	36.2
Misiones	51.4	48.4	45.4	25.4
Neuquén	26.5	24.9	23.4	13.2
Río Negro	28.3	26.5	24.8	13.5
Salta	57.4	54.0	50.7	28.4
San Juan	30.8	28.9	27.0	14.8
San Luis	21.2	20.1	18.9	10.8
Santa Cruz	14.1	13.4	12.8	7.6
Santa Fe	135.2	125.9	117.0	62.2
Santiago del Estero	39.2	36.8	34.4	18.8
Tierra del Fuego	7.0	6.7	6.4	3.8
Tucumán	65.4	61.2	57.2	31.3

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Australia

Market - 1,3-Propanediol (PDO)

Market Sales by Country

<u>US Dollars</u>	<u>Market Sales</u>	<u>Pct. of Global</u>		
<u>Year</u>	<u>(USD 000s)</u>	<u>Market</u>	<u>Year-to-Year Change</u>	
2018	2,338.0	0.62%		
2019	2,599.4	0.64%	2018-2019	11.2%
2020	2,578.0	0.61%	2019-2020	-0.8%
2021	2,687.0	0.56%	2020-2021	4.2%
2022	3,004.8	0.54%	2021-2022	11.8%
2023	3,146.4	0.51%	2022-2023	4.7%
2024	3,290.1	0.48%	2023-2024	4.6%
2029	3,755.6	0.34%	CAGR 2024-2029	2.8%

<u>Dollars</u>	<u>Market Sales</u>		
<u>Year</u>	<u>(Dollars 000s)</u>	<u>Year-to-Year Change</u>	
2018	3,245.0		
2019	3,607.8	2018-2019	11.2%
2020	3,578.0	2019-2020	-0.8%
2021	3,729.4	2020-2021	4.2%
2022	4,170.5	2021-2022	11.8%
2023	4,367.0	2022-2023	4.7%
2024	4,566.5	2023-2024	4.6%
2029	5,212.4	CAGR 2024-2029	2.8%

In 2023, sales for this product in Australia is forecast to be \$3.1 million dollars.

Sales are forecast to change by 4.6 percent in the next year (2023 to 2024). In 2023, sales will be 4.4 million Dollars and will change by 4.7 percent in the next year (2023 to 2024).

In 2029, sales for this product in Australia is forecast to be \$3.8 million dollars.

The compound annual growth rate is projected to change by 2.8 percent from 2024 to 2029. In 2029, sales will be 4.4 million Dollars and will change by 4.7 percent from 2024 to 2029.

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Australia

Product - 1,3-Propanediol (PDO)

Market Sales by Regions (USD 000s)

	2022	2023	2024	2029
Adelaide	178.1	185.2	192.4	212.1
Brisbane	340.4	358.6	377.2	443.3
Cairns (Northern Beaches)	23.7	24.9	26.1	30.4
Canberra (NSW)	65.7	68.7	71.7	81.0
Central Coast (Gosford)	50.9	53.2	55.5	62.8
Darwin	17.0	17.7	18.5	20.8
Geelong	23.4	24.3	25.2	27.9
Gold Coast (NSW)	100.4	106.2	112.3	135.1
Hobart	27.6	28.8	29.9	33.0
Melbourne	641.2	671.5	702.2	801.2
Newcastle	48.5	50.3	52.1	56.5
Perth	304.2	320.9	338.1	400.4
Sunshine Coast (Caloundra)	39.4	41.6	43.9	52.2
Sydney	639.2	665.7	692.4	768.8
Toowoomba	15.5	16.1	16.7	18.3
Townsville (Thuringowa)	28.3	29.8	31.4	36.8
Wollongong	38.8	40.3	41.7	45.5

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Austria

Market - 1,3-Propanediol (PDO)

Market Sales by Country

<u>US Dollars</u>	<u>Market Sales</u>	<u>Pct. of Global</u>		
<u>Year</u>	<u>(USD 000s)</u>	<u>Market</u>	<u>Year-to-Year Change</u>	
2018	2,142.4	0.57%		
2019	2,420.2	0.59%	2018-2019	13.0%
2020	2,418.7	0.57%	2019-2020	-0.1%
2021	2,625.6	0.55%	2020-2021	8.6%
2022	3,014.3	0.54%	2021-2022	14.8%
2023	3,263.9	0.53%	2022-2023	8.3%
2024	3,527.1	0.51%	2023-2024	8.1%
2029	5,015.0	0.46%	CAGR 2024-2029	8.4%

<u>Euros</u>	<u>Market Sales</u>		
<u>Year</u>	<u>(Euros 000s)</u>	<u>Year-to-Year Change</u>	
2018	1,867.7		
2019	2,109.9	2018-2019	13.0%
2020	2,108.5	2019-2020	-0.1%
2021	2,289.0	2020-2021	8.6%
2022	2,627.8	2021-2022	14.8%
2023	2,845.3	2022-2023	8.3%
2024	3,074.9	2023-2024	8.1%
2029	4,371.9	CAGR 2024-2029	8.4%

In 2023, sales for this product in Austria is forecast to be \$3.3 million dollars. Sales are forecast to change by 8.1 percent in the next year (2023 to 2024). In 2023, sales will be 2.8 million Euros and will change by 8.3 percent in the next year (2023 to 2024).

In 2029, sales for this product in Austria is forecast to be \$5.0 million dollars. The compound annual growth rate is projected to change by 8.4 percent from 2024 to 2029. In 2029, sales will be 2.8 million Euros and will change by 8.3 percent from 2024 to 2029.

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Austria

Product - 1,3-Propanediol (PDO)

Market Sales by Regions (USD 000s)

	2022	2023	2024	2029
Amstetten	18.0	19.5	21.1	29.9
Baden	20.2	21.9	23.6	33.8
Bregenz	23.1	25.1	27.2	39.1
Dornbirn	36.1	39.2	42.5	61.2
Feldkirch	26.9	29.4	32.0	47.1
Graz	166.0	178.8	192.1	265.5
Hallein	17.2	18.8	20.4	30.1
Innsbruck	86.7	93.5	100.7	140.5
Judenburg	6.9	7.4	7.9	10.6
Kapfenberg	16.7	17.9	19.2	26.3
Klagenfurt am Wörthersee	72.9	78.9	85.2	120.8
Klosterneuburg	21.0	22.8	24.7	35.5
Krems an der Donau	18.9	20.4	22.1	31.3
Kufstein	13.7	14.9	16.2	23.8
Leoben	16.5	17.6	18.8	25.1
Leonding	19.9	21.6	23.5	34.2
Linz	135.1	145.3	156.1	215.0
Lustenau	17.3	18.9	20.5	29.7
Mödling	17.0	18.4	19.9	28.4
Saalfelden am Steinernen Meer	15.2	16.6	18.2	27.4
Salzburg	115.1	124.5	134.4	190.3
Spittal an der Drau	13.6	14.8	16.0	23.0
St. Pölten	37.5	40.5	43.6	61.0
Steyr	31.1	33.6	36.3	51.2
Telfs	16.3	18.1	20.0	32.0
Traun	19.9	21.6	23.4	33.7
Villach	48.7	52.9	57.3	82.4
Wels	48.3	52.4	56.9	82.0
Wien [Vienna]	1,226.6	1,326.4	1,431.4	2,020.3
Wiener Neustadt	31.2	33.8	36.6	52.4
Wolfsberg	20.6	22.3	24.1	34.3

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Note: Sales for 2018-2019 are forecasts and sales for 2020-2025 projections

Bangladesh

Market - 1,3-Propanediol (PDO)

Market Sales by Country

<u>US Dollars</u>	<u>Market Sales</u>	<u>Pct. of Global</u>		
<u>Year</u>	<u>(USD 000s)</u>	<u>Market</u>	<u>Year-to-Year Change</u>	
2018	1,310.5	0.35%		
2019	1,544.6	0.38%	2018-2019	17.9%
2020	1,873.4	0.44%	2019-2020	21.3%
2021	2,276.8	0.48%	2020-2021	21.5%
2022	2,978.9	0.53%	2021-2022	30.8%
2023	3,676.0	0.59%	2022-2023	23.4%
2024	4,527.4	0.66%	2023-2024	23.2%
2029	12,375.7	1.13%	CAGR 2024-2029	34.7%

<u>Takas</u>	<u>Market Sales</u>		
<u>Year</u>	<u>(Takas 000s)</u>	<u>Year-to-Year Change</u>	
2018	109,952.8		
2019	129,587.9	2018-2019	17.9%
2020	157,175.0	2019-2020	21.3%
2021	191,024.9	2020-2021	21.5%
2022	249,928.2	2021-2022	30.8%
2023	308,416.6	2022-2023	23.4%
2024	379,841.5	2023-2024	23.2%
2029	1,038,311.9	CAGR 2024-2029	34.7%

In 2023, sales for this product in Bangladesh is forecast to be \$3.7 million dollars. Sales are forecast to change by 23.2 percent in the next year (2023 to 2024). In 2023, sales will be 308.4 million Takas and will change by 23.4 percent in the next year (2023 to 2024).

In 2029, sales for this product in Bangladesh is forecast to be \$12.4 million dollars. The compound annual growth rate is projected to change by 34.7 percent from 2024 to 2029. In 2029, sales will be 308.4 million Takas and will change by 23.4 percent from 2024 to 2029.

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Bangladesh

Product - 1,3-Propanediol (PDO)

Market Sales by Regions (USD 000s)

	2022	2023	2024	2029
Barisal	79.2	96.8	117.9	305.4
Chittagong	295.2	364.3	448.8	1,227.0
Brahmanbaria	28.6	35.2	43.3	117.1
Chittagong	81.4	100.6	124.2	342.8
Comilla	54.7	67.4	82.8	224.5
Noakhali	32.2	39.8	49.0	134.4
Dhaka	392.2	486.3	601.9	1,684.3
Dhaka	150.1	189.0	237.5	717.2
Gazipur	40.5	51.1	64.2	194.9
Kishoreganj	29.0	35.6	43.6	116.6
Narayanganj	32.8	40.9	50.9	146.0
Tangail	35.0	42.9	52.5	138.6
Mymensingh	109.6	134.7	165.1	441.2
Jalalpur	22.6	27.7	33.9	89.9
Mymensingh	51.3	63.1	77.5	208.1
Netrakona (Netrokona)	22.5	27.6	33.9	91.0
Khulna	156.7	192.3	235.5	625.9
Jessore	28.2	34.7	42.6	115.0
Khulna	22.9	28.0	34.1	89.1
Satkhira	19.9	24.4	30.0	79.7
Rajshahi	186.8	229.9	282.3	759.7
Bogra	34.0	41.7	51.2	137.1
Naogaon	25.5	31.2	38.2	101.0
Pabna	25.4	31.3	38.5	103.9
Rajshahi	27.1	33.5	41.2	112.4
Sirajganj	32.1	39.6	48.8	132.9
Rangpur	160.2	197.3	242.4	654.3
Dinajpur	30.5	37.6	46.2	124.9
Gaibandha	23.2	28.5	34.9	92.4
Kurigram	20.7	25.4	31.2	83.8
Rangpur	29.5	36.4	44.8	121.2
Sylhet	104.3	129.1	159.4	442.0
Habiganj	21.4	26.4	32.5	88.7
Sunamganj	25.9	32.0	39.5	109.3
Sylhet	37.2	46.2	57.3	162.3

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Note: Sales for 2018-2019 are forecasts and sales for 2020-2025 projections

Belgium

Market - 1,3-Propanediol (PDO)

Market Sales by Country

<u>US Dollars</u>	<u>Market Sales</u>	<u>Pct. of Global</u>		
<u>Year</u>	<u>(USD 000s)</u>	<u>Market</u>	<u>Year-to-Year Change</u>	
2018	1,908.6	0.51%		
2019	2,094.0	0.51%	2018-2019	9.7%
2020	2,120.8	0.50%	2019-2020	1.3%
2021	2,234.3	0.47%	2020-2021	5.4%
2022	2,520.1	0.45%	2021-2022	12.8%
2023	2,680.8	0.43%	2022-2023	6.4%
2024	2,846.2	0.41%	2023-2024	6.2%
2029	3,704.0	0.34%	CAGR 2024-2029	6.0%

<u>Euros</u>	<u>Market Sales</u>		
<u>Year</u>	<u>(Euros 000s)</u>	<u>Year-to-Year Change</u>	
2018	1,663.8		
2019	1,825.5	2018-2019	9.7%
2020	1,848.8	2019-2020	1.3%
2021	1,947.8	2020-2021	5.4%
2022	2,196.9	2021-2022	12.8%
2023	2,337.1	2022-2023	6.4%
2024	2,481.2	2023-2024	6.2%
2029	3,229.0	CAGR 2024-2029	6.0%

In 2023, sales for this product in Belgium is forecast to be \$2.7 million dollars. Sales are forecast to change by 6.2 percent in the next year (2023 to 2024). In 2023, sales will be 2.3 million Euros and will change by 6.4 percent in the next year (2023 to 2024).

In 2029, sales for this product in Belgium is forecast to be \$3.7 million dollars. The compound annual growth rate is projected to change by 6 percent from 2024 to 2029. In 2029, sales will be 2.3 million Euros and will change by 6.4 percent from 2024 to 2029.

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Belgium

Product - 1,3-Propanediol (PDO)

Market Sales by Regions (USD 000s)

	2022	2023	2024	2029
Vlaams Gewest [Flanders]	729.6	776.2	824.2	1,073.1
Antwerpen [Antwerp]	202.9	215.9	229.2	298.4
Limburg	100.0	106.6	113.4	148.9
Oost-Vlaanderen	164.9	175.2	185.9	240.8
Vlaams-Brabant	127.9	136.3	144.9	190.0
West-Vlaanderen	134.1	142.5	151.1	195.4
Wallonia	406.6	432.4	459.0	596.3
Brabant Wallon	47.9	51.3	54.8	73.7
Hainaut	148.0	156.9	166.1	212.9
Liège	123.1	130.8	138.8	179.8
Luxembourg	32.4	34.6	36.9	48.8
Namur	56.1	59.8	63.6	83.5
Brussels Gewest [Brussels]	123.2	131.1	139.2	181.1
Bruxelles-Capitale [Brussels]	123.2	131.1	139.2	181.1

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Brazil

Market - 1,3-Propanediol (PDO)

Market Sales by Country

US Dollars	Market Sales	Pct. of Global	Year-to-Year Change	
Year	(USD 000s)	Market		
2018	6,595.2	1.76%		
2019	5,789.0	1.42%	2018-2019	-12.2%
2020	6,227.8	1.47%	2019-2020	7.6%
2021	6,348.6	1.33%	2020-2021	1.9%
2022	7,001.7	1.25%	2021-2022	10.3%
2023	7,230.6	1.16%	2022-2023	3.3%
2024	7,456.7	1.08%	2023-2024	3.1%
2029	7,941.2	0.73%	CAGR 2024-2029	1.3%

Reals	Market Sales	Year-to-Year Change	
Year	(Reals 000s)		
2018	24,371.7		
2019	21,392.5	2018-2019	-12.2%
2020	23,013.9	2019-2020	7.6%
2021	23,460.4	2020-2021	1.9%
2022	25,873.8	2021-2022	10.3%
2023	26,719.6	2022-2023	3.3%
2024	27,555.3	2023-2024	3.1%
2029	29,345.5	CAGR 2024-2029	1.3%

In 2023, sales for this product in Brazil is forecast to be \$7.2 million dollars. Sales are forecast to change by 3.1 percent in the next year (2023 to 2024). In 2023, sales will be 26.7 million Reals and will change by 3.3 percent in the next year (2023 to 2024).

In 2029, sales for this product in Brazil is forecast to be \$7.9 million dollars. The compound annual growth rate is projected to change by 1.3 percent from 2024 to 2029. In 2029, sales will be 26.7 million Reals and will change by 3.3 percent from 2024 to 2029.

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Brazil

Product - 1,3-Propanediol (PDO)

Market Sales by Regions (USD 000s)

	2022	2023	2024	2029
Acre	30.5	31.9	33.4	38.1
Alagoas	111.0	114.3	117.6	123.4
Amapá	30.7	32.5	34.4	41.5
Amazonas	141.9	148.2	154.5	173.9
Bahia	490.8	504.3	517.4	536.9
Ceará	307.2	317.2	327.1	348.2
Distrito Federal	102.9	107.3	111.7	124.9
Espírito Santo	133.3	137.9	142.6	153.4
Goiás	236.0	245.4	254.8	280.5
Maranhão	238.2	246.0	253.8	270.5
Mato Grosso	117.9	122.5	127.1	139.8
Mato Grosso do Sul	92.5	95.8	99.1	107.1
Minas Gerais	702.5	723.6	744.3	782.1
Pará	293.7	305.5	317.2	349.7
Paraíba	132.0	135.6	139.2	144.6
Paraná	377.1	388.5	399.7	420.2
Pernambuco	315.6	325.1	334.4	351.4
Piauí	108.9	111.9	114.9	119.7
Rio de Janeiro	572.8	590.2	607.2	638.8
Rio Grande do Norte	116.7	120.5	124.3	132.6
Rio Grande do Sul	374.9	385.0	394.8	408.7
Rondônia	59.4	61.5	63.6	68.6
Roraima	20.6	21.7	22.9	27.3
Santa Catarina	237.9	246.4	254.9	275.6
São Paulo	1,526.2	1,576.2	1,625.6	1,731.2
Sergipe	77.3	80.1	82.8	89.2
Tocantins	53.5	55.6	57.7	63.3

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Canada

Market - 1,3-Propanediol (PDO)

Market Sales by Country

<u>US Dollars</u>	<u>Market Sales</u>	<u>Pct. of Global</u>		
<u>Year</u>	<u>(USD 000s)</u>	<u>Market</u>	<u>Year-to-Year Change</u>	
2018	6,155.8	1.64%		
2019	6,625.2	1.62%	2018-2019	7.6%
2020	7,005.2	1.66%	2019-2020	5.7%
2021	7,969.3	1.67%	2020-2021	13.8%
2022	9,536.7	1.70%	2021-2022	19.7%
2023	10,686.3	1.72%	2022-2023	12.1%
2024	11,958.0	1.74%	2023-2024	11.9%
2029	19,154.6	1.75%	CAGR 2024-2029	12.0%

<u>Dollars</u>	<u>Market Sales</u>		
<u>Year</u>	<u>(Dollars 000s)</u>	<u>Year-to-Year Change</u>	
2018	8,165.8		
2019	8,788.5	2018-2019	7.6%
2020	9,292.6	2019-2020	5.7%
2021	10,571.4	2020-2021	13.8%
2022	12,650.7	2021-2022	19.7%
2023	14,175.6	2022-2023	12.1%
2024	15,862.5	2023-2024	11.9%
2029	25,409.1	CAGR 2024-2029	12.0%

In 2023, sales for this product in Canada is forecast to be \$10.7 million dollars.

Sales are forecast to change by 11.9 percent in the next year (2023 to 2024). In 2023, sales will be 14.2 million Dollars and will change by 12.1 percent in the next year (2023 to 2024).

In 2029, sales for this product in Canada is forecast to be \$19.2 million dollars.

The compound annual growth rate is projected to change by 12 percent from 2024 to 2029. In 2029, sales will be 14.2 million Dollars and will change by 12.1 percent from 2024 to 2029.

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Canada

Product - 1,3-Propanediol (PDO)

Market Sales by Regions (USD 000s)

	2022	2023	2024	2029
Alberta	1,154.2	1,306.5	1,476.9	2,487.9
British Columbia	1,249.7	1,400.3	1,567.0	2,509.6
Manitoba	343.6	384.7	430.0	685.0
New Brunswick	191.8	212.9	235.9	360.0
Newfoundland and Labrador	133.7	148.4	164.6	251.9
Northwest Territories	11.4	12.7	14.1	21.8
Nova Scotia	240.8	267.3	296.3	452.7
Nunavut	10.1	11.4	12.9	21.5
Ontario	3,685.3	4,128.7	4,619.2	7,389.8
Prince Edward Island	38.9	43.4	48.4	76.2
Québec [Quebec]	2,167.6	2,422.7	2,704.0	4,274.8
Saskatchewan	299.5	335.7	375.7	602.1
Yukon	10.2	11.5	13.0	21.4

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Chile

Market - 1,3-Propanediol (PDO)

Market Sales by Country

<u>US Dollars</u>	<u>Market Sales</u>	<u>Pct. of Global</u>		
<u>Year</u>	<u>(USD 000s)</u>	<u>Market</u>	<u>Year-to-Year Change</u>	
2018	881.2	0.24%		
2019	985.5	0.24%	2018-2019	11.8%
2020	926.5	0.22%	2019-2020	-6.0%
2021	1,033.6	0.22%	2020-2021	11.6%
2022	1,185.8	0.21%	2021-2022	14.7%
2023	1,273.8	0.21%	2022-2023	7.4%
2024	1,366.5	0.20%	2023-2024	7.3%
2029	1,772.6	0.16%	CAGR 2024-2029	5.9%

<u>Pesos</u>	<u>Market Sales</u>		
<u>Year</u>	<u>(Pesos 000s)</u>	<u>Year-to-Year Change</u>	
2018	594,045.2		
2019	664,396.6	2018-2019	11.8%
2020	624,571.2	2019-2020	-6.0%
2021	696,799.7	2020-2021	11.6%
2022	799,402.3	2021-2022	14.7%
2023	858,752.1	2022-2023	7.4%
2024	921,244.7	2023-2024	7.3%
2029	1,195,013.9	CAGR 2024-2029	5.9%

In 2023, sales for this product in Chile is forecast to be \$1.3 million dollars. Sales are forecast to change by 7.3 percent in the next year (2023 to 2024). In 2023, sales will be 858.8 million Pesos and will change by 7.4 percent in the next year (2023 to 2024).

In 2029, sales for this product in Chile is forecast to be \$1.8 million dollars. The compound annual growth rate is projected to change by 5.9 percent from 2024 to 2029. In 2029, sales will be 858.8 million Pesos and will change by 7.4 percent from 2024 to 2029.

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Chile

Product - 1,3-Propanediol (PDO)

Market Sales by Regions (USD 000s)

	2022	2023	2024	2029
Antofagasta	41.1	44.3	47.7	63.1
Arica y Parinacota	14.9	16.0	17.1	22.0
Atacama	19.6	21.0	22.5	29.1
Aisén	7.0	7.5	8.1	10.5
Biobío (Bío Bío)	135.7	145.2	155.0	196.6
Coquimbo	51.5	55.5	59.8	79.2
La Araucanía	63.8	68.3	73.0	93.0
O'Higgins	61.5	66.1	70.9	91.9
Los Lagos	55.6	59.7	64.1	82.9
Los Ríos	25.2	26.9	28.7	36.1
Magallanes y de la Antártica	10.8	11.5	12.3	15.5
Maule	69.3	74.3	79.5	101.7
Región Metro. de Santiago	485.3	522.1	560.9	732.6
Tarapacá	23.8	26.0	28.3	39.8
Valparaíso	120.5	129.3	138.6	178.6

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

China

Market - 1,3-Propanediol (PDO)

Market Sales by Country

<u>US Dollars</u>	<u>Market Sales</u>	<u>Pct. of Global</u>		
<u>Year</u>	<u>(USD 000s)</u>	<u>Market</u>	<u>Year-to-Year Change</u>	
2018	109,429.3	29.20%		
2019	121,414.8	29.75%	2018-2019	11.0%
2020	125,040.4	29.59%	2019-2020	3.0%
2021	143,856.7	30.22%	2020-2021	15.0%
2022	171,852.1	30.71%	2021-2022	19.5%
2023	193,632.0	31.18%	2022-2023	12.7%
2024	217,741.5	31.62%	2023-2024	12.5%
2029	377,715.4	34.60%	CAGR 2024-2029	14.7%

<u>RMBs</u>	<u>Market Sales</u>		
<u>Year</u>	<u>(RMBs 000s)</u>	<u>Year-to-Year Change</u>	
2018	740,657.1		
2019	821,779.0	2018-2019	11.0%
2020	846,318.7	2019-2020	3.0%
2021	973,674.0	2020-2021	15.0%
2022	1,163,157.0	2021-2022	19.5%
2023	1,310,570.8	2022-2023	12.7%
2024	1,473,752.9	2023-2024	12.5%
2029	2,556,513.7	CAGR 2024-2029	14.7%

In 2023, sales for this product in China is forecast to be \$193.6 million dollars.

Sales are forecast to change by 12.5 percent in the next year (2023 to 2024). In 2023, sales will be 1310.6 million RMBs and will change by 12.7 percent in the next year (2023 to 2024).

In 2029, sales for this product in China is forecast to be \$377.7 million dollars.

The compound annual growth rate is projected to change by 14.7 percent from 2024 to 2029. In 2029, sales will be 1310.6 million RMBs and will change by 12.7 percent from 2024 to 2029.

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

China

Product - 1,3-Propanediol (PDO)

Market Sales by Regions (USD 000s)

	2022	2023	2024	2029
Anhui	7,231.6	8,116.1	9,090.5	15,450.6
Beijing	2,725.7	3,122.4	3,569.7	6,721.2
Chongqing	3,475.7	3,891.6	4,348.4	7,303.2
Fujian	4,758.5	5,375.0	6,059.1	10,634.7
Gansu	3,243.9	3,653.5	4,106.5	7,102.9
Guangdong	14,274.3	16,267.6	18,502.0	33,950.5
Guangxi	5,639.4	6,339.2	7,111.4	12,182.2
Guizhou	4,307.9	4,839.0	5,424.6	9,260.0
Hainan	1,107.0	1,252.0	1,413.1	2,495.7
Hebei	9,035.3	10,185.1	11,458.1	19,907.5
Heilongjiang	4,507.1	5,054.4	5,656.7	9,576.4
Henan	11,631.2	13,078.2	14,675.7	25,176.7
Hubei	7,121.4	7,996.3	8,960.7	15,266.5
Hunan	7,939.4	8,914.5	9,989.2	17,016.1
Jiangsu	9,687.9	10,906.5	12,253.6	21,150.5
Jiangxi	5,514.4	6,213.3	6,986.7	12,110.5
Jilin	3,345.6	3,758.4	4,213.5	7,195.1
Liaoning	5,291.6	5,944.0	6,663.4	11,375.1
Nei Menggu [Inner Mongolia]	3,043.8	3,425.0	3,846.2	6,622.7
Ningxia	844.3	957.9	1,084.7	1,946.6
Qinghai	704.5	795.7	897.0	1,574.1
Shaanxi	4,618.0	5,196.1	5,834.9	10,044.8
Shandong	11,787.2	13,262.1	14,891.4	25,628.0
Shanghai	3,096.2	3,535.9	4,030.0	7,472.5
Shanxi	4,549.3	5,137.0	5,788.9	10,143.9
Sichuan	8,146.0	9,032.2	9,994.7	15,988.3
Tianjin	1,652.9	1,876.5	2,126.0	3,826.6
Xinjiang	2,935.5	3,335.2	3,781.8	6,834.5
Xizang [Tibet]	398.8	452.3	511.9	916.5
Yunnan	5,895.3	6,657.9	7,504.0	13,159.2
Zhejiang	6,671.2	7,530.5	8,483.5	14,841.0
Zhejiang	6,671.2	7,530.5	8,483.5	14,841.0

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Czech Republic

Market - 1,3-Propanediol (PDO)

Market Sales by Country

<u>US Dollars</u>	<u>Market Sales</u>	<u>Pct. of Global</u>		
<u>Year</u>	<u>(USD 000s)</u>	<u>Market</u>	<u>Year-to-Year Change</u>	
2018	1,576.0	0.42%		
2019	1,774.8	0.43%	2018-2019	12.6%
2020	1,868.0	0.44%	2019-2020	5.3%
2021	2,079.0	0.44%	2020-2021	11.3%
2022	2,454.8	0.44%	2021-2022	18.1%
2023	2,733.7	0.44%	2022-2023	11.4%
2024	3,038.3	0.44%	2023-2024	11.1%
2029	4,971.2	0.46%	CAGR 2024-2029	12.7%

<u>Korunas</u>	<u>Market Sales</u>		
<u>Year</u>	<u>(Korunas 000s)</u>	<u>Year-to-Year Change</u>	
2018	35,109.8		
2019	39,538.1	2018-2019	12.6%
2020	41,615.2	2019-2020	5.3%
2021	46,316.6	2020-2021	11.3%
2022	54,686.7	2021-2022	18.1%
2023	60,901.0	2022-2023	11.4%
2024	67,687.6	2023-2024	11.1%
2029	110,747.6	CAGR 2024-2029	12.7%

In 2023, sales for this product in Czech Republic is forecast to be \$2.7 million dollars. Sales are forecast to change by 11.1 percent in the next year (2023 to 2024). In 2023, sales will be 60.9 million Korunas and will change by 11.4 percent in the next year (2023 to 2024).

In 2029, sales for this product in Czech Republic is forecast to be \$5.0 million dollars. The compound annual growth rate is projected to change by 12.7 percent from 2024 to 2029. In 2029, sales will be 60.9 million Korunas and will change by 11.4 percent from 2024 to 2029.

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Czech Republic

Product - 1,3-Propanediol (PDO)

Market Sales by Regions (USD 000s)

	2022	2023	2024	2029
South Bohemian Region	148.8	165.7	184.2	301.3
South Moravian Region	273.4	304.6	338.6	554.7
Karlovy Vary Region	69.1	76.8	85.2	137.9
Hradec Králové Region	127.1	141.3	156.7	253.5
Liberecký kraj [Liberec Region]	102.6	114.2	127.0	207.9
Moravian-Silesian Region	279.8	310.5	343.9	552.9
Olomouc Region	147.3	163.8	181.8	295.4
Pardubice Region	121.2	135.0	150.1	246.2
Plzeňský kraj [Plzeň Region]	134.0	149.3	166.0	271.8
Praha [Prague]	295.3	329.3	366.5	603.7
Central Bohemian Region	312.0	349.4	390.6	657.6
Ústecký kraj [Ústí Region]	190.4	211.7	234.9	381.2
Vysočina	118.0	131.2	145.5	235.7
Zlínský kraj [Zlín Region]	135.7	150.8	167.3	271.3

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Denmark

Market - 1,3-Propanediol (PDO)

Market Sales by Country

<u>US Dollars</u>	<u>Market Sales</u>	<u>Pct. of Global</u>		
<u>Year</u>	<u>(USD 000s)</u>	<u>Market</u>	<u>Year-to-Year Change</u>	
2018	1,282.3	0.34%		
2019	1,451.7	0.36%	2018-2019	13.2%
2020	1,558.2	0.37%	2019-2020	7.3%
2021	1,638.9	0.34%	2020-2021	5.2%
2022	1,882.9	0.34%	2021-2022	14.9%
2023	2,040.4	0.33%	2022-2023	8.4%
2024	2,206.6	0.32%	2023-2024	8.1%
2029	3,149.4	0.29%	CAGR 2024-2029	8.5%

<u>Kroners</u>	<u>Market Sales</u>		
<u>Year</u>	<u>(Kroners 000s)</u>	<u>Year-to-Year Change</u>	
2018	8,343.9		
2019	9,446.6	2018-2019	13.2%
2020	10,139.5	2019-2020	7.3%
2021	10,664.7	2020-2021	5.2%
2022	12,252.6	2021-2022	14.9%
2023	13,277.1	2022-2023	8.4%
2024	14,359.0	2023-2024	8.1%
2029	20,493.6	CAGR 2024-2029	8.5%

In 2023, sales for this product in Denmark is forecast to be \$2.0 million dollars. Sales are forecast to change by 8.1 percent in the next year (2023 to 2024). In 2023, sales will be 13.3 million Kroners and will change by 8.4 percent in the next year (2023 to 2024).

In 2029, sales for this product in Denmark is forecast to be \$3.1 million dollars. The compound annual growth rate is projected to change by 8.5 percent from 2024 to 2029. In 2029, sales will be 13.3 million Kroners and will change by 8.4 percent from 2024 to 2029.

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Denmark

Product - 1,3-Propanediol (PDO)

Market Sales by Regions (USD 000s)

	2022	2023	2024	2029
Hovedstaden [Capital Region]	590.1	640.8	694.4	1,001.1
Midtjylland [Mid Jutland]	428.2	464.2	502.3	718.8
Nordjylland [North Jutland]	192.5	208.2	224.7	317.6
Sjælland [Zealand]	272.9	295.2	318.8	451.3
Syddanmark [South Denmark]	399.2	432.0	466.4	660.6

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Egypt

Market - 1,3-Propanediol (PDO)

Market Sales by Country

<u>US Dollars</u>	<u>Market Sales</u>	<u>Pct. of Global</u>		
<u>Year</u>	<u>(USD 000s)</u>	<u>Market</u>	<u>Year-to-Year Change</u>	
2018	1,174.1	0.31%		
2019	1,275.2	0.31%	2018-2019	8.6%
2020	1,577.3	0.37%	2019-2020	23.7%
2021	1,575.7	0.33%	2020-2021	-0.1%
2022	1,783.1	0.32%	2021-2022	13.2%
2023	1,903.4	0.31%	2022-2023	6.7%
2024	2,028.3	0.29%	2023-2024	6.6%
2029	2,305.9	0.21%	CAGR 2024-2029	2.7%

<u>Pounds</u>	<u>Market Sales</u>		
<u>Year</u>	<u>(Pounds 000s)</u>	<u>Year-to-Year Change</u>	
2018	21,025.8		
2019	22,836.3	2018-2019	8.6%
2020	28,246.3	2019-2020	23.7%
2021	28,218.4	2020-2021	-0.1%
2022	31,932.3	2021-2022	13.2%
2023	34,087.3	2022-2023	6.7%
2024	36,323.2	2023-2024	6.6%
2029	41,295.9	CAGR 2024-2029	2.7%

In 2023, sales for this product in Egypt is forecast to be \$1.9 million dollars. Sales are forecast to change by 6.6 percent in the next year (2023 to 2024). In 2023, sales will be 34.1 million Pounds and will change by 6.7 percent in the next year (2023 to 2024).

In 2029, sales for this product in Egypt is forecast to be \$2.3 million dollars. The compound annual growth rate is projected to change by 2.7 percent from 2024 to 2029. In 2029, sales will be 34.1 million Pounds and will change by 6.7 percent from 2024 to 2029.

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Egypt

Product - 1,3-Propanediol (PDO)

Market Sales by Regions (USD 000s)

	2022	2023	2024	2029
Ad-Daqahiyah [Dakahlia]	120.9	128.8	137.0	154.2
Al-Baḥr al-Aḥmar [Red Sea]	7.3	7.9	8.5	10.4
Al-Buḥayrah [Beheira]	115.4	123.0	130.9	147.6
Al-Fayyūm [Fayoum]	68.5	73.5	78.8	92.3
Al-Gharbiyah [Gharbia]	92.9	98.7	104.7	116.6
Al-Iskandariyah [Alexandria]	96.7	103.0	109.5	123.1
Al-Ismā'īliyah [Ismailia]	25.0	26.8	28.7	33.6
Al-Jīzah [Giza]	164.7	176.8	189.3	220.9
Al-Minūfiyah [Monufia]	80.3	85.6	91.1	102.9
Al-Minyā	104.3	111.5	119.0	136.5
Al-Qāhirah [Cairo]	176.2	186.9	197.9	217.7
Al-Qalyūbyah [Qalyubia]	106.7	114.3	122.1	140.7
Al-Uqṣor [Luxor]	23.5	25.1	26.8	30.5
Al-Wādī al-Jadīd [New Valley]	4.6	4.9	5.3	6.0
Ash-Sharqiyah [Sharqia]	135.2	144.6	154.4	177.2
As-Suways [Suez]	13.7	14.7	15.7	18.3
Aswān	27.7	29.5	31.4	35.3
Asyūt	82.7	88.2	93.8	106.1
Banī Suwayf [Beni Suef]	59.7	63.9	68.3	78.8
Būr Sa'īd [Port Said]	14.0	14.9	15.9	18.0
Dumyāṭ [Damietta]	28.0	29.9	31.9	36.5
Kafr ash-Shaykh [Kafr el-Sheikh]	62.7	66.7	70.9	79.5
Maṭrūḥ [Matrouh]	8.5	9.2	9.9	11.8
Qinā [Qena]	59.7	63.6	67.7	76.4
Sawḥāj [Sohag]	93.4	99.7	106.3	120.8
Sīnā' al-Janūbiyah [South Sinai]	2.2	2.3	2.5	2.8
North Sinai	8.6	9.2	9.9	11.5

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Finland

Market - 1,3-Propanediol (PDO)

Market Sales by Country

<u>US Dollars</u>	<u>Market Sales</u>	<u>Pct. of Global</u>		
<u>Year</u>	<u>(USD 000s)</u>	<u>Market</u>	<u>Year-to-Year Change</u>	
2018	1,173.4	0.31%		
2019	1,271.7	0.31%	2018-2019	8.4%
2020	1,267.7	0.30%	2019-2020	-0.3%
2021	1,338.7	0.28%	2020-2021	5.6%
2022	1,503.0	0.27%	2021-2022	12.3%
2023	1,591.5	0.26%	2022-2023	5.9%
2024	1,681.9	0.24%	2023-2024	5.7%
2029	2,138.8	0.20%	CAGR 2024-2029	5.4%

<u>Euros</u>	<u>Market Sales</u>		
<u>Year</u>	<u>(Euros 000s)</u>	<u>Year-to-Year Change</u>	
2018	1,023.0		
2019	1,108.6	2018-2019	8.4%
2020	1,105.1	2019-2020	-0.3%
2021	1,167.1	2020-2021	5.6%
2022	1,310.2	2021-2022	12.3%
2023	1,387.4	2022-2023	5.9%
2024	1,466.2	2023-2024	5.7%
2029	1,864.5	CAGR 2024-2029	5.4%

In 2023, sales for this product in Finland is forecast to be \$1.6 million dollars. Sales are forecast to change by 5.7 percent in the next year (2023 to 2024). In 2023, sales will be 1.4 million Euros and will change by 5.9 percent in the next year (2023 to 2024).

In 2029, sales for this product in Finland is forecast to be \$2.1 million dollars. The compound annual growth rate is projected to change by 5.4 percent from 2024 to 2029. In 2029, sales will be 1.4 million Euros and will change by 5.9 percent from 2024 to 2029.

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Finland

Product - 1,3-Propanediol (PDO)

Market Sales by Regions (USD 000s)

	2022	2023	2024	2029
Åland [Åland Islands]	8.1	8.6	9.1	11.7
Etelä-Karjala [South Karelia]	34.7	36.5	38.3	47.0
South Ostrobothnia	51.0	53.6	56.3	69.4
Etelä-Savo [South Savonia]	39.0	40.9	42.8	51.5
Kainuu	19.5	20.3	21.2	25.3
Kanta-Häme [Tavastia Proper]	47.3	50.1	52.8	66.6
Central Ostrobothnia	18.5	19.5	20.5	25.6
Keski-Suomi [Central Finland]	75.1	79.4	83.8	105.6
Kymenlaakso (Kymmenedalen)	47.0	49.3	51.7	63.3
Lappi [Lapland]	47.4	49.8	52.2	63.6
Päijät-Häme [Päijänne Tavastia]	54.4	57.4	60.5	75.7
Pirkanmaa	140.4	149.1	158.0	203.4
Pohjanmaa [Ostrobothnia]	48.8	51.5	54.3	68.2
Pohjois-Karjala [North Karelia]	43.4	45.6	47.8	58.6
North Ostrobothnia	113.2	120.1	127.1	163.1
Pohjois-Savo [North Savonia]	65.7	69.2	72.7	89.6
Satakunta	58.7	61.7	64.7	79.3
Uusimaa (Nyland)	460.4	490.8	522.1	685.7
Southwest Finland	130.4	138.1	146.0	185.6

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

France

Market - 1,3-Propanediol (PDO)

Market Sales by Country

<u>US Dollars</u>	<u>Market Sales</u>	<u>Pct. of Global</u>		
<u>Year</u>	<u>(USD 000s)</u>	<u>Market</u>	<u>Year-to-Year Change</u>	
2018	7,867.7	2.10%		
2019	8,654.8	2.12%	2018-2019	10.0%
2020	8,931.4	2.11%	2019-2020	3.2%
2021	9,612.9	2.02%	2020-2021	7.6%
2022	11,076.8	1.98%	2021-2022	15.2%
2023	11,951.4	1.92%	2022-2023	7.9%
2024	12,877.4	1.87%	2023-2024	7.7%
2029	17,073.9	1.56%	CAGR 2024-2029	6.5%

<u>Euros</u>	<u>Market Sales</u>		
<u>Year</u>	<u>(Euros 000s)</u>	<u>Year-to-Year Change</u>	
2018	6,858.8		
2019	7,545.1	2018-2019	10.0%
2020	7,786.2	2019-2020	3.2%
2021	8,380.3	2020-2021	7.6%
2022	9,656.4	2021-2022	15.2%
2023	10,418.9	2022-2023	7.9%
2024	11,226.1	2023-2024	7.7%
2029	14,884.5	CAGR 2024-2029	6.5%

In 2023, sales for this product in France is forecast to be \$12.0 million dollars. Sales are forecast to change by 7.7 percent in the next year (2023 to 2024). In 2023, sales will be 10.4 million Euros and will change by 7.9 percent in the next year (2023 to 2024).

In 2029, sales for this product in France is forecast to be \$17.1 million dollars. The compound annual growth rate is projected to change by 6.5 percent from 2024 to 2029. In 2029, sales will be 10.4 million Euros and will change by 7.9 percent from 2024 to 2029.

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

France

Product - 1,3-Propanediol (PDO)

Market Sales by Regions (USD 000s)

	2022	2023	2024	2029
Auvergne - Rhône - Alpes	1,343.0	1,450.3	1,564.0	2,082.5
Bourgogne [Burgundy]	478.5	514.5	552.4	719.4
Bretagne [Brittany]	559.0	603.3	650.4	864.0
Centre - Val de Loire	451.1	486.3	523.5	691.1
Corse [Corsica]	54.5	59.0	63.8	85.9
Grand Est	951.6	1,023.6	1,099.6	1,435.9
Hauts-de-France	1,022.6	1,099.6	1,180.8	1,538.9
Île-de-France	2,089.3	2,254.7	2,430.0	3,225.3
Normandie [Normandy]	579.4	624.1	671.3	882.2
Nouvelle-Aquitaine	998.6	1,077.2	1,160.3	1,536.0
Pyrénées-Méditerranée	1,007.6	1,091.6	1,180.8	1,597.0
Pays de la Loire	635.1	686.4	740.8	990.3
Provence - Alpes - Côte d'Azur	906.5	980.8	1,059.8	1,425.2

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Germany

Market - 1,3-Propanediol (PDO)

Market Sales by Country

<u>US Dollars</u>	<u>Market Sales</u>	<u>Pct. of Global</u>		
<u>Year</u>	<u>(USD 000s)</u>	<u>Market</u>	<u>Year-to-Year Change</u>	
2018	22,865.8	6.10%		
2019	25,292.3	6.20%	2018-2019	10.6%
2020	24,665.2	5.84%	2019-2020	-2.5%
2021	27,552.3	5.79%	2020-2021	11.7%
2022	31,889.1	5.70%	2021-2022	15.7%
2023	34,560.0	5.56%	2022-2023	8.4%
2024	37,403.2	5.43%	2023-2024	8.2%
2029	50,704.6	4.64%	CAGR 2024-2029	7.1%

<u>Euros</u>	<u>Market Sales</u>		
<u>Year</u>	<u>(Euros 000s)</u>	<u>Year-to-Year Change</u>	
2018	19,933.8		
2019	22,049.1	2018-2019	10.6%
2020	21,502.4	2019-2020	-2.5%
2021	24,019.3	2020-2021	11.7%
2022	27,800.1	2021-2022	15.7%
2023	30,128.4	2022-2023	8.4%
2024	32,607.1	2023-2024	8.2%
2029	44,202.9	CAGR 2024-2029	7.1%

In 2023, sales for this product in Germany is forecast to be \$34.6 million dollars. Sales are forecast to change by 8.2 percent in the next year (2023 to 2024). In 2023, sales will be 30.1 million Euros and will change by 8.4 percent in the next year (2023 to 2024).

In 2029, sales for this product in Germany is forecast to be \$50.7 million dollars. The compound annual growth rate is projected to change by 7.1 percent from 2024 to 2029. In 2029, sales will be 30.1 million Euros and will change by 8.4 percent from 2024 to 2029.

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Germany

Product - 1,3-Propanediol (PDO)

Market Sales by Regions (USD 000s)

	2022	2023	2024	2029
Baden-Württemberg	4,267.8	4,635.4	5,027.7	6,889.2
Bayern [Bavaria]	5,058.0	5,498.2	5,968.4	8,211.8
Berlin	1,359.6	1,474.8	1,597.5	2,175.1
Brandenburg	962.9	1,041.8	1,125.7	1,513.5
Bremen	259.6	281.3	304.3	411.9
Hamburg	702.3	762.9	827.5	1,134.6
Hessen [Hesse]	2,405.2	2,609.3	2,826.8	3,851.0
Western Pomerania	607.0	653.7	703.1	923.4
Niedersachsen [Lower Saxony]	3,087.4	3,347.2	3,623.8	4,920.7
North Rhine-Westphalia	6,911.2	7,485.8	8,096.9	10,943.1
Rheinland-Pfalz	1,581.7	1,715.1	1,857.2	2,523.8
Saarland	379.5	409.4	441.1	584.6
Sachsen [Saxony]	1,538.3	1,657.7	1,783.9	2,350.1
Sachsen-Anhalt [Saxony-Anhalt]	830.3	890.9	954.5	1,230.3
Schleswig-Holstein	1,126.7	1,223.6	1,327.0	1,817.2
Thüringen [Thuringia]	811.5	872.9	937.7	1,224.2

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Hungary

Market - 1,3-Propanediol (PDO)

Market Sales by Country

<u>US Dollars</u>	<u>Market Sales</u>	<u>Pct. of Global</u>		
<u>Year</u>	<u>(USD 000s)</u>	<u>Market</u>	<u>Year-to-Year Change</u>	
2018	838.9	0.22%		
2019	923.7	0.23%	2018-2019	10.1%
2020	945.4	0.22%	2019-2020	2.3%
2021	1,039.3	0.22%	2020-2021	9.9%
2022	1,208.8	0.22%	2021-2022	16.3%
2023	1,316.4	0.21%	2022-2023	8.9%
2024	1,431.6	0.21%	2023-2024	8.8%
2029	1,988.3	0.18%	CAGR 2024-2029	7.8%

<u>Forints</u>	<u>Market Sales</u>		
<u>Year</u>	<u>(Forints 000s)</u>	<u>Year-to-Year Change</u>	
2018	235,278.2		
2019	259,054.5	2018-2019	10.1%
2020	265,135.4	2019-2020	2.3%
2021	291,477.8	2020-2021	9.9%
2022	338,997.1	2021-2022	16.3%
2023	369,174.3	2022-2023	8.9%
2024	401,487.1	2023-2024	8.8%
2029	557,615.3	CAGR 2024-2029	7.8%

In 2023, sales for this product in Hungary is forecast to be \$1.3 million dollars. Sales are forecast to change by 8.8 percent in the next year (2023 to 2024). In 2023, sales will be 369.2 million Forints and will change by 8.9 percent in the next year (2023 to 2024).

In 2029, sales for this product in Hungary is forecast to be \$2.0 million dollars. The compound annual growth rate is projected to change by 7.8 percent from 2024 to 2029. In 2029, sales will be 369.2 million Forints and will change by 8.9 percent from 2024 to 2029.

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Hungary

Product - 1,3-Propanediol (PDO)

Market Sales by Regions (USD 000s)

	2022	2023	2024	2029
Bács-Kiskun	62.7	68.2	74.1	102.2
Baranya	45.3	49.1	53.3	72.8
Békés	41.7	45.2	48.8	65.9
Borsod-Abaúj-Zemplén	80.3	87.0	94.3	128.1
Budapest	208.1	225.8	244.8	334.1
Csongrád	49.8	54.1	58.8	80.9
Fejér	52.2	57.0	62.1	86.8
Győr-Moson-Sopron	57.0	62.3	68.0	96.3
Hajdú-Bihar	66.3	72.2	78.6	109.4
Heves	36.6	39.7	43.1	59.0
Jász-Nagykun-Szolnok	45.8	49.7	53.9	73.5
Komárom-Esztergom	36.9	40.1	43.6	60.3
Nógrád	23.6	25.6	27.7	37.6
Pest	162.3	178.9	196.9	290.4
Somogy	37.5	40.7	44.1	60.4
Szabolcs-Szatmár-Bereg	69.0	75.2	81.9	113.9
Tolna	27.1	29.4	31.9	43.5
Vas	31.1	33.8	36.7	50.5
Veszprém	42.3	46.0	49.9	68.7
Zala	33.4	36.3	39.4	53.9

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

India

Market - 1,3-Propanediol (PDO)

Market Sales by Country

<u>US Dollars</u>	<u>Market Sales</u>	<u>Pct. of Global</u>		
<u>Year</u>	<u>(USD 000s)</u>	<u>Market</u>	<u>Year-to-Year Change</u>	
2018	11,966.5	3.19%		
2019	12,419.0	3.04%	2018-2019	3.8%
2020	12,511.4	2.96%	2019-2020	0.7%
2021	14,162.2	2.98%	2020-2021	13.2%
2022	16,529.1	2.95%	2021-2022	16.7%
2023	18,195.5	2.93%	2022-2023	10.1%
2024	19,990.3	2.90%	2023-2024	9.9%
2029	30,867.9	2.83%	CAGR 2024-2029	10.9%

<u>Rupees</u>	<u>Market Sales</u>		
<u>Year</u>	<u>(Rupees Mills)</u>	<u>Year-to-Year Change</u>	
2018	846.9		
2019	878.9	2018-2019	3.8%
2020	885.4	2019-2020	0.7%
2021	1,002.3	2020-2021	13.2%
2022	1,169.8	2021-2022	16.7%
2023	1,287.7	2022-2023	10.1%
2024	1,414.7	2023-2024	9.9%
2029	2,184.6	CAGR 2024-2029	10.9%

In 2023, sales for this product in India is forecast to be \$18.2 million dollars. Sales are forecast to change by 9.9 percent in the next year (2023 to 2024). In 2023, sales will be 1.3 million Rupees and will change by 10.1 percent in the next year (2023 to 2024).

In 2029, sales for this product in India is forecast to be \$30.9 million dollars. The compound annual growth rate is projected to change by 10.9 percent from 2024 to 2029. In 2029, sales will be 1.3 million Rupees and will change by 10.1 percent from 2024 to 2029.

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

India

Product - 1,3-Propanediol (PDO)

Market Sales by Regions (USD 000s)

	2022	2023	2024	2029
Andhra Pradesh	653.0	714.9	781.0	1,172.3
Arunāchal Pradesh	19.2	21.2	23.4	36.8
Assam	421.1	463.0	508.0	779.4
Bihār	1,453.4	1,606.3	1,771.7	2,789.8
Chandīgarh	15.4	17.0	18.8	29.8
Chhattīsgarh	343.4	378.0	415.2	640.8
Goa	19.4	21.3	23.3	35.1
Gujarāt	826.9	910.7	1,001.1	1,549.8
Haryāna	354.2	390.9	430.5	673.2
Himāchal Pradesh	92.2	101.3	110.9	168.9
Jammu & Kashmīr	176.0	194.5	214.6	337.9
Jhārkhand	452.1	498.5	548.5	853.4
Karnāataka	820.3	901.1	987.8	1,509.1
Kerala	435.3	475.4	518.2	769.2
Madhya Pradesh	999.3	1,101.5	1,211.7	1,883.2
Mahārāshtra	1,539.1	1,693.8	1,860.3	2,868.2
Manipur	39.3	43.4	47.8	74.8
Meghālaya	41.7	46.1	51.0	80.7
Odisha (Orissa)	561.0	615.7	674.5	1,026.1
Punjab	376.4	413.7	453.7	694.6
Rājasthān	957.3	1,056.8	1,164.4	1,823.8
Tamil Nādu	946.4	1,037.5	1,135.2	1,716.7
Telangana	471.3	517.6	567.2	865.2
Tripura	49.0	53.8	59.0	89.8
Uttarākhnd (Uttaranchal)	136.3	149.9	164.6	253.3
Uttar Pradesh	2,766.0	3,050.4	3,357.5	5,231.1
West Bengal	1,227.3	1,347.7	1,477.0	2,252.1

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Indonesia

Market - 1,3-Propanediol (PDO)

Market Sales by Country

<u>US Dollars</u>	<u>Market Sales</u>	<u>Pct. of Global</u>		
<u>Year</u>	<u>(USD 000s)</u>	<u>Market</u>	<u>Year-to-Year Change</u>	
2018	6,212.3	1.66%		
2019	6,497.8	1.59%	2018-2019	4.6%
2020	7,211.3	1.71%	2019-2020	11.0%
2021	8,292.9	1.74%	2020-2021	15.0%
2022	10,108.4	1.81%	2021-2022	21.9%
2023	11,537.3	1.86%	2022-2023	14.1%
2024	13,150.1	1.91%	2023-2024	14.0%
2029	23,095.1	2.12%	CAGR 2024-2029	15.1%

<u>Rupiahs</u>	<u>Market Sales</u>		
<u>Year</u>	<u>(Rupiahs Mill.)</u>	<u>Year-to-Year Change</u>	
2018	87,655.1		
2019	91,682.4	2018-2019	4.6%
2020	101,750.1	2019-2020	11.0%
2021	117,011.6	2020-2021	15.0%
2022	142,628.0	2021-2022	21.9%
2023	162,789.3	2022-2023	14.1%
2024	185,546.0	2023-2024	14.0%
2029	325,868.4	CAGR 2024-2029	15.1%

In 2023, sales for this product in Indonesia is forecast to be \$11.5 million dollars. Sales are forecast to change by 14 percent in the next year (2023 to 2024). In 2023, sales will be 162.8 million Rupiahs and will change by 14.1 percent in the next year (2023 to 2024).

In 2029, sales for this product in Indonesia is forecast to be \$23.1 million dollars. The compound annual growth rate is projected to change by 15.1 percent from 2024 to 2029. In 2029, sales will be 162.8 million Rupiahs and will change by 14.1 percent from 2024 to 2029.

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Indonesia

Product - 1,3-Propanediol (PDO)

Market Sales by Regions (USD 000s)

	2022	2023	2024	2029
Aceh	200.1	229.0	261.7	465.4
Bali	170.6	195.6	224.0	402.2
Banten	471.0	539.9	618.0	1,108.4
Bengkulu	77.9	89.5	102.6	185.7
Gorontalo	44.4	50.7	57.9	102.1
Jakarta	394.2	448.4	509.4	879.0
Jambi	142.6	164.3	189.0	347.2
Jawa Barat [West Java]	1,821.8	2,078.4	2,367.8	4,146.3
Jawa Tengah [Central Java]	1,315.1	1,492.4	1,691.2	2,884.0
Jawa Timur [East Java]	1,518.5	1,724.5	1,955.8	3,348.2
West Borneo	195.7	224.1	256.1	456.0
South Borneo	162.7	186.6	213.8	385.1
Central Borneo	105.9	122.1	140.6	260.0
East Borneo	145.9	168.4	194.2	361.2
North Borneo	23.0	26.0	29.5	50.2
Bangka Belitung Islands	54.6	62.7	71.9	130.0
Kepulauan Riau [Riau Islands]	81.3	94.2	109.0	206.7
Lampung	324.1	369.8	421.4	738.9
Maluku [Moluccas]	56.6	63.8	71.7	117.6
Northern Moluccas	45.5	52.0	59.5	105.8
Western Lesser Sunda Islands	196.6	224.8	256.7	455.1
Eastern Lesser Sunda Islands	210.9	242.2	277.7	502.2
Papua (Irian Jaya)	134.1	155.6	180.3	343.7
Papua Barat [West Papua]	35.0	40.3	46.3	85.1
Riau	269.6	312.2	361.2	682.4
Sulbar [West Sulawesi]	50.6	57.9	66.2	118.2
[South Sulawesi	329.7	374.8	425.5	732.2
Central Sulawesi	121.7	140.1	161.1	295.1
Southeast Sulawesi	107.7	124.4	143.5	267.6
North Sulawesi	85.9	96.9	109.1	180.0
Sumatera Barat [West Sumatra]	203.9	232.4	264.4	460.5
South Sumatra	311.0	354.4	403.2	701.4
North Sumatra	556.4	635.0	723.6	1,269.5
Yogyakarta	144.0	163.8	186.2	322.2

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Ireland

Market - 1,3-Propanediol (PDO)

Market Sales by Country

US Dollars	Market Sales	Pct. of Global		
Year	(USD 000s)	Market	Year-to-Year Change	
2018	3,223.5	0.86%		
2019	3,890.3	0.95%	2018-2019	20.7%
2020	4,178.3	0.99%	2019-2020	7.4%
2021	4,667.8	0.98%	2020-2021	11.7%
2022	5,620.6	1.00%	2021-2022	20.4%
2023	6,383.4	1.03%	2022-2023	13.6%
2024	7,235.3	1.05%	2023-2024	13.3%
2029	13,058.8	1.20%	CAGR 2024-2029	16.1%

Euros	Market Sales		
Year	(Euros 000s)	Year-to-Year Change	
2018	2,810.2		
2019	3,391.4	2018-2019	20.7%
2020	3,642.5	2019-2020	7.4%
2021	4,069.3	2020-2021	11.7%
2022	4,899.9	2021-2022	20.4%
2023	5,564.8	2022-2023	13.6%
2024	6,307.6	2023-2024	13.3%
2029	11,384.3	CAGR 2024-2029	16.1%

In 2023, sales for this product in Ireland is forecast to be \$6.4 million dollars.

Sales are forecast to change by 13.3 percent in the next year (2023 to 2024). In 2023, sales will be 5.6 million Euros and will change by 13.6 percent in the next year (2023 to 2024).

In 2029, sales for this product in Ireland is forecast to be \$13.1 million dollars.

The compound annual growth rate is projected to change by 16.1 percent from 2024 to 2029. In 2029, sales will be 5.6 million Euros and will change by 13.6 percent from 2024 to 2029.

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Ireland

Product - 1,3-Propanediol (PDO)

Market Sales by Regions (USD 000s)

	2022	2023	2024	2029
Connacht	649.3	736.1	832.8	1,489.5
Leinster	3,130.1	3,561.8	4,045.1	7,372.2
Munster	1,487.7	1,684.1	1,902.6	3,377.8
Ulster (part of)	353.6	401.4	454.8	819.3

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Israel

Market - 1,3-Propanediol (PDO)

Market Sales by Country

<u>US Dollars</u>	<u>Market Sales</u>	<u>Pct. of Global</u>		
<u>Year</u>	<u>(USD 000s)</u>	<u>Market</u>	<u>Year-to-Year Change</u>	
2018	1,293.5	0.35%		
2019	1,390.9	0.34%	2018-2019	7.5%
2020	1,403.2	0.33%	2019-2020	0.9%
2021	1,576.7	0.33%	2020-2021	12.4%
2022	1,840.0	0.33%	2021-2022	16.7%
2023	2,025.2	0.33%	2022-2023	10.1%
2024	2,224.7	0.32%	2023-2024	9.8%
2029	3,432.8	0.31%	CAGR 2024-2029	10.9%

<u>Shekels</u>	<u>Market Sales</u>		
<u>Year</u>	<u>(Shekels 000s)</u>	<u>Year-to-Year Change</u>	
2018	4,737.7		
2019	5,094.3	2018-2019	7.5%
2020	5,139.5	2019-2020	0.9%
2021	5,775.1	2020-2021	12.4%
2022	6,739.3	2021-2022	16.7%
2023	7,417.7	2022-2023	10.1%
2024	8,148.3	2023-2024	9.8%
2029	12,573.5	CAGR 2024-2029	10.9%

In 2023, sales for this product in Israel is forecast to be \$2.0 million dollars. Sales are forecast to change by 9.8 percent in the next year (2023 to 2024). In 2023, sales will be 7.4 million Shekels and will change by 10.1 percent in the next year (2023 to 2024).

In 2029, sales for this product in Israel is forecast to be \$3.4 million dollars. The compound annual growth rate is projected to change by 10.9 percent from 2024 to 2029. In 2029, sales will be 7.4 million Shekels and will change by 10.1 percent from 2024 to 2029.

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Israel

Product - 1,3-Propanediol (PDO)

Market Sales by Regions (USD 000s)

	2022	2023	2024	2029
HaDarom [Southern District]	291.1	322.3	356.2	566.2
HaMerkaz [Central District]	483.9	535.6	591.6	938.2
HaZafon [Northern District]	317.8	349.8	384.3	592.9
Hefa [Haifa]	216.2	236.5	258.2	385.7
Tel Aviv	288.0	312.9	339.3	490.0
Yerushalayim [Jerusalem]	243.0	268.1	295.1	459.8

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Italy

Market - 1,3-Propanediol (PDO)

Market Sales by Country

<u>US Dollars</u>	<u>Market Sales</u>	<u>Pct. of Global</u>		
<u>Year</u>	<u>(USD 000s)</u>	<u>Market</u>	<u>Year-to-Year Change</u>	
2018	8,897.2	2.37%		
2019	9,819.0	2.41%	2018-2019	10.4%
2020	9,759.7	2.31%	2019-2020	-0.6%
2021	10,914.7	2.29%	2020-2021	11.8%
2022	12,711.5	2.27%	2021-2022	16.5%
2023	13,862.1	2.23%	2022-2023	9.1%
2024	15,096.1	2.19%	2023-2024	8.9%
2029	21,110.9	1.93%	CAGR 2024-2029	8.0%

<u>Euros</u>	<u>Market Sales</u>		
<u>Year</u>	<u>(Euros 000s)</u>	<u>Year-to-Year Change</u>	
2018	7,756.3		
2019	8,560.0	2018-2019	10.4%
2020	8,508.2	2019-2020	-0.6%
2021	9,515.1	2020-2021	11.8%
2022	11,081.5	2021-2022	16.5%
2023	12,084.6	2022-2023	9.1%
2024	13,160.4	2023-2024	8.9%
2029	18,403.9	CAGR 2024-2029	8.0%

In 2023, sales for this product in Italy is forecast to be \$13.9 million dollars. Sales are forecast to change by 8.9 percent in the next year (2023 to 2024). In 2023, sales will be 12.1 million Euros and will change by 9.1 percent in the next year (2023 to 2024).

In 2029, sales for this product in Italy is forecast to be \$21.1 million dollars. The compound annual growth rate is projected to change by 8 percent from 2024 to 2029. In 2029, sales will be 12.1 million Euros and will change by 9.1 percent from 2024 to 2029.

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Italy

Product - 1,3-Propanediol (PDO)

Market Sales by Regions (USD 000s)

	2022	2023	2024	2029
Abruzzo	277.4	302.4	329.1	458.9
Basilicata	117.9	127.8	138.4	188.2
Calabria	404.2	438.6	475.3	648.3
Campania	1,222.7	1,331.5	1,448.0	2,010.5
Emilia-Romagna	944.4	1,032.5	1,127.2	1,596.0
Friuli-Venezia Giulia	255.1	277.7	301.9	418.2
Lazio [Latium]	1,224.4	1,338.7	1,461.7	2,070.6
Liguria	320.7	347.8	376.8	513.1
Lombardia [Lombardy]	2,120.0	2,317.3	2,529.5	3,578.4
Marche	327.4	357.3	389.4	546.8
Molise	64.0	69.4	75.2	102.4
Piemonte [Piedmont]	915.6	996.7	1,083.5	1,501.9
Puglia [Apulia]	848.0	922.5	1,002.1	1,384.1
Sardegna [Sardinia]	343.7	373.8	406.0	560.1
Sicilia [Sicily]	1,052.0	1,144.7	1,243.8	1,720.0
Toscana [Tuscany]	783.2	853.8	929.6	1,298.2
Trentino-Alto Adige	228.4	250.2	273.7	391.5
Umbria	188.4	205.7	224.2	315.2
Valle d'Aosta (Vallée d'Aoste)	27.0	29.4	32.1	45.1
Veneto [Venetia]	1,047.0	1,144.1	1,248.4	1,763.2

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Japan

Market - 1,3-Propanediol (PDO)

Market Sales by Country

US Dollars	Market Sales	Pct. of Global	Year-to-Year Change	
Year	(USD 000s)	Market		
2018	30,601.2	8.17%		
2019	32,263.6	7.91%	2018-2019	5.4%
2020	34,193.5	8.09%	2019-2020	6.0%
2021	39,334.1	8.26%	2020-2021	15.0%
2022	43,840.1	7.84%	2021-2022	11.5%
2023	48,255.0	7.77%	2022-2023	10.1%
2024	53,009.6	7.70%	2023-2024	9.9%
2029	81,812.5	7.49%	CAGR 2024-2029	10.9%

Yen	Market Sales	Year-to-Year Change	
Year	(Yen Bills)		
2018	3,311.6		
2019	3,491.5	2018-2019	5.4%
2020	3,700.4	2019-2020	6.0%
2021	4,256.7	2020-2021	15.0%
2022	4,744.3	2021-2022	11.5%
2023	5,222.1	2022-2023	10.1%
2024	5,736.6	2023-2024	9.9%
2029	8,853.6	CAGR 2024-2029	10.9%

In 2023, sales for this product in Japan is forecast to be \$48.3 million dollars. Sales are forecast to change by 9.9 percent in the next year (2023 to 2024). In 2023, sales will be 5.2 million Yen and will change by 10.1 percent in the next year (2023 to 2024).

In 2029, sales for this product in Japan is forecast to be \$81.8 million dollars. The compound annual growth rate is projected to change by 10.9 percent from 2024 to 2029. In 2029, sales will be 5.2 million Yen and will change by 10.1 percent from 2024 to 2029.

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Japan

Product - 1,3-Propanediol (PDO)

Market Sales by Regions (USD 000s)

	2022	2023	2024	2029
Aichi	2,630.1	2,905.4	3,203.1	5,031.4
Akita	342.1	373.2	406.3	599.4
Aomori	443.7	485.1	529.4	790.0
Chiba	2,188.2	2,415.9	2,662.0	4,170.3
Ehime	467.5	512.0	559.6	842.2
Fukui	268.2	294.2	322.2	489.0
Fukuoka	1,742.6	1,918.5	2,108.0	3,256.2
Fukushima	664.8	728.2	796.0	1,198.3
Gifu	699.4	768.2	842.1	1,285.6
Gumma (Gunma)	679.7	747.1	819.5	1,255.3
Hiroshima	959.7	1,054.3	1,155.8	1,765.3
Hokkaidō	1,822.6	1,998.6	2,187.3	3,312.0
Hyōgo	1,934.2	2,130.3	2,341.6	3,623.9
Ibaraki	1,003.9	1,103.5	1,210.6	1,855.2
Ishikawa	391.4	429.9	471.2	719.0
Iwate	432.7	473.4	517.0	774.5
Kagawa	329.4	361.2	395.4	599.1
Kagoshima	558.1	611.2	668.1	1,005.7
Kanagawa	3,244.4	3,588.0	3,960.1	6,255.4
Kōchi	248.5	271.9	296.9	444.6
Kumamoto	604.0	662.7	725.8	1,102.4
Kyōto	891.0	979.3	1,074.3	1,646.1
Mie	630.2	693.0	760.5	1,167.3
Miyagi	797.4	876.7	962.0	1,476.1
Miyazaki	373.8	409.8	448.4	678.3
Nagano	720.0	790.2	865.6	1,316.3
Nagasaki	457.5	500.2	545.7	813.6
Nara	466.1	511.5	560.1	850.7
Niigata	777.5	851.7	931.2	1,403.2
Ōita	395.3	433.6	474.7	719.8
Okayama	655.4	720.2	789.9	1,208.6
Okinawa	499.5	552.3	609.4	961.4
Ōsaka	2,994.2	3,292.2	3,612.7	5,544.1
Saga	279.4	306.2	335.0	506.1
Saitama	2,524.5	2,785.7	3,067.9	4,793.2

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

South Korea

Market - 1,3-Propanediol (PDO)

Market Sales by Country

<u>US Dollars</u>	<u>Market Sales</u>	<u>Pct. of Global</u>		
<u>Year</u>	<u>(USD 000s)</u>	<u>Market</u>	<u>Year-to-Year Change</u>	
2018	13,582.6	3.62%		
2019	14,391.2	3.53%	2018-2019	6.0%
2020	13,637.3	3.23%	2019-2020	-5.2%
2021	15,902.2	3.34%	2020-2021	16.6%
2022	18,639.2	3.33%	2021-2022	17.2%
2023	20,457.1	3.29%	2022-2023	9.8%
2024	22,421.5	3.26%	2023-2024	9.6%
2029	32,376.3	2.97%	CAGR 2024-2029	8.9%

<u>Won</u>	<u>Market Sales</u>		
<u>Year</u>	<u>(Won Mills)</u>	<u>Year-to-Year Change</u>	
2018	15,228.2		
2019	16,134.8	2018-2019	6.0%
2020	15,289.5	2019-2020	-5.2%
2021	17,828.8	2020-2021	16.6%
2022	20,897.5	2021-2022	17.2%
2023	22,935.6	2022-2023	9.8%
2024	25,137.9	2023-2024	9.6%
2029	36,298.8	CAGR 2024-2029	8.9%

In 2023, sales for this product in South Korea is forecast to be \$20.5 million dollars. Sales are forecast to change by 9.6 percent in the next year (2023 to 2024). In 2023, sales will be 22.9 million Won and will change by 9.8 percent in the next year (2023 to 2024).

In 2029, sales for this product in South Korea is forecast to be \$32.4 million dollars. The compound annual growth rate is projected to change by 8.9 percent from 2024 to 2029. In 2029, sales will be 22.9 million Won and will change by 9.8 percent from 2024 to 2029.

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

South Korea

Product - 1,3-Propanediol (PDO)

Market Sales by Regions (USD 000s)

	2022	2023	2024	2029
Busan (Pusan)	1,122.6	1,212.7	1,308.1	1,739.5
North Chungcheong	561.8	614.3	670.7	947.5
South Chungcheong	721.4	790.1	864.0	1,230.4
Daegu (Taegu)	870.1	946.8	1,028.6	1,418.1
Daejeon (Taejŏn)	599.9	660.1	725.3	1,057.6
Gangwon-do (Kangwŏn-do)	521.7	567.8	617.0	851.0
Gwangju (Kwangju)	586.2	644.7	708.0	1,029.9
Gyeonggi-do (Kyŏnggi-do)	5,388.0	6,023.3	6,723.1	10,607.5
North Gyeongsang	899.1	975.9	1,057.8	1,440.8
South Gyeongsang	1,191.7	1,305.0	1,426.8	2,030.2
Incheon (Inch'ŏn)	1,035.2	1,136.9	1,246.7	1,799.7
Jeju-do (Cheju-do)	197.4	215.6	235.2	330.7
Jeollabuk-do [North Jeolla]	595.1	644.3	696.5	936.3
Jeollanam-do [South Jeolla]	545.9	586.9	630.1	818.4
Sejong	29.2	31.9	34.7	48.1
Seoul (Sŏul)	3,358.8	3,645.5	3,950.5	5,376.7
Ulsan	415.3	455.3	498.5	713.9

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Malaysia

Market - 1,3-Propanediol (PDO)

Market Sales by Country

<u>US Dollars</u>	<u>Market Sales</u>	<u>Pct. of Global</u>		
<u>Year</u>	<u>(USD 000s)</u>	<u>Market</u>	<u>Year-to-Year Change</u>	
2018	2,114.8	0.56%		
2019	2,426.9	0.59%	2018-2019	14.8%
2020	2,557.4	0.61%	2019-2020	5.4%
2021	2,987.6	0.63%	2020-2021	16.8%
2022	3,653.9	0.65%	2021-2022	22.3%
2023	4,184.6	0.67%	2022-2023	14.5%
2024	4,785.7	0.69%	2023-2024	14.4%
2029	8,548.5	0.78%	CAGR 2024-2029	15.7%

<u>Ringgits</u>	<u>Market Sales</u>		
<u>Year</u>	<u>(Ringgits 000s)</u>	<u>Year-to-Year Change</u>	
2018	8,666.7		
2019	9,945.9	2018-2019	14.8%
2020	10,480.6	2019-2020	5.4%
2021	12,243.6	2020-2021	16.8%
2022	14,974.6	2021-2022	22.3%
2023	17,149.3	2022-2023	14.5%
2024	19,612.9	2023-2024	14.4%
2029	35,033.3	CAGR 2024-2029	15.7%

In 2023, sales for this product in Malaysia is forecast to be \$4.2 million dollars.

Sales are forecast to change by 14.4 percent in the next year (2023 to 2024). In 2023, sales will be 17.1 million Ringgits and will change by 14.5 percent in the next year (2023 to 2024).

In 2029, sales for this product in Malaysia is forecast to be \$8.5 million dollars.

The compound annual growth rate is projected to change by 15.7 percent from 2024 to 2029. In 2029, sales will be 17.1 million Ringgits and will change by 14.5 percent from 2024 to 2029.

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Malaysia

Product - 1,3-Propanediol (PDO)

Market Sales by Regions (USD 000s)

	2022	2023	2024	2029
Johor	422.0	482.3	550.5	972.2
Kedah	240.0	273.4	311.0	540.3
Kelantan	195.9	222.9	253.3	437.4
Kuala Lumpur	198.3	225.4	255.8	439.3
Labuan	11.2	12.9	14.7	26.0
Melaka [Malacca]	103.5	118.4	135.2	239.8
Negeri Sembilan	125.1	142.5	162.0	281.0
Pahang	183.7	209.0	237.5	410.3
Perak	268.8	303.9	343.1	573.6
Perlis	27.2	30.8	34.8	58.7
Pinang (Pulau Pinang) [Penang]	193.9	220.9	251.3	436.4
Putrajaya	12.4	15.1	18.4	45.3
Sabah	444.9	512.3	589.0	1,078.6
Sarawak	308.6	351.9	400.7	699.3
Selangor	787.9	914.4	1,059.6	2,019.4
Terengganu	130.7	148.6	168.8	290.7

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Mexico

Market - 1,3-Propanediol (PDO)

Market Sales by Country

<u>US Dollars</u>	<u>Market Sales</u>	<u>Pct. of Global</u>		
<u>Year</u>	<u>(USD 000s)</u>	<u>Market</u>	<u>Year-to-Year Change</u>	
2018	6,061.4	1.62%		
2019	6,636.7	1.63%	2018-2019	9.5%
2020	7,190.9	1.70%	2019-2020	8.4%
2021	7,682.0	1.61%	2020-2021	6.8%
2022	8,928.3	1.60%	2021-2022	16.2%
2023	9,716.6	1.56%	2022-2023	8.8%
2024	10,559.9	1.53%	2023-2024	8.7%
2029	14,617.2	1.34%	CAGR 2024-2029	7.7%

<u>New Pesos</u>	<u>Market Sales</u>		
<u>Year</u>	<u>(New Pesos 000s)</u>	<u>Year-to-Year Change</u>	
2018	115,038.8		
2019	125,957.6	2018-2019	9.5%
2020	136,477.2	2019-2020	8.4%
2021	145,796.4	2020-2021	6.8%
2022	169,451.4	2021-2022	16.2%
2023	184,411.7	2022-2023	8.8%
2024	200,417.8	2023-2024	8.7%
2029	277,420.5	CAGR 2024-2029	7.7%

In 2023, sales for this product in Mexico is forecast to be \$9.7 million dollars.

Sales are forecast to change by 8.7 percent in the next year (2023 to 2024). In 2023, sales will be 184.4 million New Pesos and will change by 8.8 percent in the next year (2023 to 2024).

In 2029, sales for this product in Mexico is forecast to be \$14.6 million dollars.

The compound annual growth rate is projected to change by 7.7 percent from 2024 to 2029. In 2029, sales will be 184.4 million New Pesos and will change by 8.8 percent from 2024 to 2029.

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Mexico

Product - 1,3-Propanediol (PDO)

Market Sales by Regions (USD 000s)

	2022	2023	2024	2029
Aguascalientes	101.6	111.4	121.9	174.6
Baja California	290.2	319.7	351.7	517.3
Baja California Sur	61.6	68.5	76.0	116.7
Campeche	67.1	73.2	79.7	111.5
Chiapas	400.8	438.2	478.6	678.0
Chihuahua	271.6	295.2	320.4	440.0
Ciudad de México	630.6	678.3	728.6	950.4
Coahuila	220.8	240.6	261.8	364.4
Colima	53.3	58.2	63.5	89.4
Durango	121.4	131.4	141.9	190.7
Guanajuato	430.1	467.9	508.4	701.8
Guerrero	254.3	275.3	297.6	400.9
Hidalgo	209.7	228.4	248.3	344.1
Jalisco	579.0	629.6	683.6	941.2
México	1,252.3	1,366.2	1,488.4	2,083.6
Michoacán	316.1	341.4	368.2	490.4
Morelos	139.2	151.3	164.2	225.7
Nayarit	82.2	89.3	96.8	132.2
Nuevo León	384.0	419.4	457.4	644.1
Oaxaca	289.0	313.2	338.9	458.8
Puebla	464.9	506.0	550.0	760.9
Querétaro	162.6	178.9	196.6	287.1
Quintana Roo	144.9	162.3	181.5	289.8
San Luis Potosí	197.8	214.4	232.1	314.9
Sinaloa	207.6	224.6	242.6	325.6
Sonora	214.5	233.8	254.5	355.1
Tabasco	179.2	195.3	212.5	295.9
Tamaulipas	270.3	295.0	321.5	451.0
Tlaxcala	98.0	107.1	116.9	165.3
Veracruz	567.0	613.1	662.1	887.2
Yucatán	158.4	172.6	187.7	261.0
Zacatecas	108.1	116.8	125.9	167.6

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Netherlands

Market - 1,3-Propanediol (PDO)

Market Sales by Country

<u>US Dollars</u>	<u>Market Sales</u>	<u>Pct. of Global</u>		
<u>Year</u>	<u>(USD 000s)</u>	<u>Market</u>	<u>Year-to-Year Change</u>	
2018	2,795.8	0.75%		
2019	3,186.5	0.78%	2018-2019	14.0%
2020	3,207.2	0.76%	2019-2020	0.6%
2021	3,536.3	0.74%	2020-2021	10.3%
2022	4,102.7	0.73%	2021-2022	16.0%
2023	4,489.4	0.72%	2022-2023	9.4%
2024	4,902.8	0.71%	2023-2024	9.2%
2029	7,347.3	0.67%	CAGR 2024-2029	10.0%

<u>Euros</u>	<u>Market Sales</u>		
<u>Year</u>	<u>(Euros 000s)</u>	<u>Year-to-Year Change</u>	
2018	2,437.3		
2019	2,777.9	2018-2019	14.0%
2020	2,796.0	2019-2020	0.6%
2021	3,082.9	2020-2021	10.3%
2022	3,576.6	2021-2022	16.0%
2023	3,913.7	2022-2023	9.4%
2024	4,274.1	2023-2024	9.2%
2029	6,405.1	CAGR 2024-2029	10.0%

In 2023, sales for this product in Netherlands is forecast to be \$4.5 million dollars. Sales are forecast to change by 9.2 percent in the next year (2023 to 2024). In 2023, sales will be 3.9 million Euros and will change by 9.4 percent in the next year (2023 to 2024).

In 2029, sales for this product in Netherlands is forecast to be \$7.3 million dollars. The compound annual growth rate is projected to change by 10 percent from 2024 to 2029. In 2029, sales will be 3.9 million Euros and will change by 9.4 percent from 2024 to 2029.

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Netherlands

Product - 1,3-Propanediol (PDO)

Market Sales by Regions (USD 000s)

	2022	2023	2024	2029
Drenthe	117.9	128.7	140.3	207.9
Flevoland	102.4	113.1	124.6	195.0
Fryslân (Friesland)	154.6	168.7	183.7	271.5
Gelderland	491.4	537.4	586.5	875.9
Groningen	138.9	151.6	165.1	244.1
Limburg	263.3	286.5	311.1	453.2
Noord-Brabant [North Brabant]	602.2	658.5	718.7	1,073.3
Noord-Holland [North Holland]	677.0	742.3	812.3	1,229.6
Overijssel	275.9	301.6	329.1	490.9
Utrecht	314.6	345.8	379.5	582.2
Zeeland [Zealand]	91.1	99.3	108.1	159.4
Zuid-Holland [South Holland]	873.5	955.8	1,043.9	1,564.2

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Nigeria

Market - 1,3-Propanediol (PDO)

Market Sales by Country

<u>US Dollars</u>	<u>Market Sales</u>	<u>Pct. of Global</u>		
<u>Year</u>	<u>(USD 000s)</u>	<u>Market</u>	<u>Year-to-Year Change</u>	
2018	996.4	0.27%		
2019	1,205.8	0.30%	2018-2019	21.0%
2020	1,688.6	0.40%	2019-2020	40.0%
2021	1,707.2	0.36%	2020-2021	1.1%
2022	2,063.8	0.37%	2021-2022	20.9%
2023	2,353.5	0.38%	2022-2023	14.0%
2024	2,679.2	0.39%	2023-2024	13.8%
2029	4,238.2	0.39%	CAGR 2024-2029	11.6%

<u>Nairas</u>	<u>Market Sales</u>		
<u>Year</u>	<u>(Nairas 000s)</u>	<u>Year-to-Year Change</u>	
2018	362,539.0		
2019	438,705.0	2018-2019	21.0%
2020	614,378.9	2019-2020	40.0%
2021	621,127.5	2020-2021	1.1%
2022	750,876.3	2021-2022	20.9%
2023	856,290.3	2022-2023	14.0%
2024	974,772.5	2023-2024	13.8%
2029	1,541,977.7	CAGR 2024-2029	11.6%

In 2023, sales for this product in Nigeria is forecast to be \$2.4 million dollars.

Sales are forecast to change by 13.8 percent in the next year (2023 to 2024). In 2023, sales will be 856.3 million Nairas and will change by 14 percent in the next year (2023 to 2024).

In 2029, sales for this product in Nigeria is forecast to be \$4.2 million dollars.

The compound annual growth rate is projected to change by 11.6 percent from 2024 to 2029. In 2029, sales will be 856.3 million Nairas and will change by 14 percent from 2024 to 2029.

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Nigeria

Product - 1,3-Propanediol (PDO)

Market Sales by Regions (USD 000s)

	2022	2023	2024	2029
Abia	37.7	42.5	47.9	71.7
Adamawa	45.1	51.2	58.2	90.6
Akwa Ibom	58.4	66.7	76.0	120.5
Anambra	58.6	66.6	75.5	117.3
Bauchi	69.7	79.6	90.7	144.0
Bayelsa	24.2	27.5	31.2	48.7
Benue	61.1	69.5	79.0	123.7
Borno	62.7	71.6	81.6	129.8
Cross River	41.0	46.6	52.9	82.5
Delta	60.3	68.8	78.3	123.4
Ebonyi	33.2	38.2	43.8	72.3
Edo	45.0	51.1	57.9	89.8
Ekiti	34.8	39.6	45.1	70.8
Enugu	46.9	53.3	60.6	94.8
Federal Capital Territory	40.7	48.5	57.7	113.8
Imo	57.6	65.6	74.6	117.6
Jigawa	61.9	70.3	79.9	124.5
Kaduna	87.9	100.1	113.7	178.2
Kano	139.7	159.3	181.5	287.5
Katsina	83.3	94.8	107.7	168.7
Kebbi	47.3	53.9	61.3	96.4
Kogi	47.6	54.1	61.5	96.3
Lagos	133.8	152.6	173.6	273.9
Niger	59.3	67.7	77.2	122.6
Ogun	55.6	63.5	72.3	114.3
Ondo	49.6	56.5	64.2	100.4
Osun	50.1	57.1	65.0	102.4
Oyo	83.5	95.3	108.6	172.2
Plateau	44.8	51.0	57.8	90.0
Rivers	78.0	89.0	101.4	161.1
Sokoto	53.0	60.4	68.6	107.2
Taraba	32.6	37.0	42.0	65.5
Yobe	35.2	40.2	45.9	73.2
Zamfara	48.2	55.0	62.5	98.7

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Note: Sales for 2018-2019 are forecasts and sales for 2020-2025 projections

Norway

Market - 1,3-Propanediol (PDO)

Market Sales by Country

<u>US Dollars</u>	<u>Market Sales</u>	<u>Pct. of Global</u>		
<u>Year</u>	<u>(USD 000s)</u>	<u>Market</u>	<u>Year-to-Year Change</u>	
2018	773.5	0.21%		
2019	803.8	0.20%	2018-2019	3.9%
2020	837.3	0.20%	2019-2020	4.2%
2021	887.4	0.19%	2020-2021	6.0%
2022	1,027.5	0.18%	2021-2022	15.8%
2023	1,111.6	0.18%	2022-2023	8.2%
2024	1,198.7	0.17%	2023-2024	7.8%
2029	1,343.8	0.12%	CAGR 2024-2029	2.4%

<u>Krones</u>	<u>Market Sales</u>		
<u>Year</u>	<u>(Krones 000s)</u>	<u>Year-to-Year Change</u>	
2018	6,603.1		
2019	6,861.9	2018-2019	3.9%
2020	7,147.6	2019-2020	4.2%
2021	7,575.6	2020-2021	6.0%
2022	8,771.0	2021-2022	15.8%
2023	9,489.3	2022-2023	8.2%
2024	10,233.0	2023-2024	7.8%
2029	11,471.2	CAGR 2024-2029	2.4%

In 2023, sales for this product in Norway is forecast to be \$1.1 million dollars. Sales are forecast to change by 7.8 percent in the next year (2023 to 2024). In 2023, sales will be 9.5 million Krones and will change by 8.2 percent in the next year (2023 to 2024).

In 2029, sales for this product in Norway is forecast to be \$1.3 million dollars. The compound annual growth rate is projected to change by 2.4 percent from 2024 to 2029. In 2029, sales will be 9.5 million Krones and will change by 8.2 percent from 2024 to 2029.

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Norway

Product - 1,3-Propanediol (PDO)

Market Sales by Regions (USD 000s)

	2022	2023	2024	2029
Akershus	120.4	131.0	142.1	163.8
Aust-Agder	22.7	24.5	26.4	29.3
Buskerud	54.5	59.0	63.6	71.2
Finnmark (Finnmárku)	14.5	15.5	16.6	17.9
Hedmark	37.8	40.6	43.5	47.2
Hordaland	101.4	109.8	118.4	133.0
Møre og Romsdal	51.2	55.1	59.2	64.9
Nordland	46.5	49.9	53.4	57.4
Oppland	36.5	39.2	42.0	45.5
Oslo	131.5	143.1	155.1	178.6
Østfold	57.1	61.8	66.6	74.5
Rogaland	93.4	101.4	109.8	125.7
Sogn og Fjordane	21.1	22.7	24.3	26.3
Telemark	33.4	35.9	38.5	41.8
Troms (Romsa)	32.0	34.5	37.1	40.7
Trøndelag	88.4	95.5	102.9	114.5
Vest-Agder	36.3	39.4	42.5	47.8
Vestfold	48.7	52.7	56.8	63.7

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Pakistan

Market - 1,3-Propanediol (PDO)

Market Sales by Country

<u>US Dollars</u>	<u>Market Sales</u>	<u>Pct. of Global</u>		
<u>Year</u>	<u>(USD 000s)</u>	<u>Market</u>	<u>Year-to-Year Change</u>	
2018	1,108.6	0.30%		
2019	1,202.9	0.29%	2018-2019	8.5%
2020	1,133.5	0.27%	2019-2020	-5.8%
2021	1,258.0	0.26%	2020-2021	11.0%
2022	1,438.1	0.26%	2021-2022	14.3%
2023	1,539.3	0.25%	2022-2023	7.0%
2024	1,645.3	0.24%	2023-2024	6.9%
2029	2,096.0	0.19%	CAGR 2024-2029	5.5%

<u>Rupees</u>	<u>Market Sales</u>		
<u>Year</u>	<u>(Rupees 000s)</u>	<u>Year-to-Year Change</u>	
2018	154,832.7		
2019	168,012.8	2018-2019	8.5%
2020	158,309.7	2019-2020	-5.8%
2021	175,711.0	2020-2021	11.0%
2022	200,856.6	2021-2022	14.3%
2023	214,990.1	2022-2023	7.0%
2024	229,802.9	2023-2024	6.9%
2029	292,753.9	CAGR 2024-2029	5.5%

In 2023, sales for this product in Pakistan is forecast to be \$1.5 million dollars. Sales are forecast to change by 6.9 percent in the next year (2023 to 2024). In 2023, sales will be 215 million Rupees and will change by 7 percent in the next year (2023 to 2024).

In 2029, sales for this product in Pakistan is forecast to be \$2.1 million dollars. The compound annual growth rate is projected to change by 5.5 percent from 2024 to 2029. In 2029, sales will be 215 million Rupees and will change by 7 percent from 2024 to 2029.

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Pakistan

Product - 1,3-Propanediol (PDO)

Market Sales by Regions (USD 000s)

	2022	2023	2024	2029
Balochistān	88.3	95.3	102.7	136.1
Tribal Areas	31.1	32.9	34.9	42.5
Islāmābād	14.5	15.8	17.3	24.6
Khyber Pakhtūnkhwā	209.7	225.1	241.2	311.0
Punjāb	759.5	811.2	865.3	1,090.7
Sindh	335.0	358.9	383.9	491.1

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Philippines

Market - 1,3-Propanediol (PDO)

Market Sales by Country

US Dollars	Market Sales	Pct. of Global		
Year	(USD 000s)	Market	Year-to-Year Change	
2018	1,938.6	0.52%		
2019	2,079.0	0.51%	2018-2019	7.2%
2020	2,281.9	0.54%	2019-2020	9.8%
2021	2,661.0	0.56%	2020-2021	16.6%
2022	3,266.6	0.58%	2021-2022	22.8%
2023	3,754.9	0.60%	2022-2023	14.9%
2024	4,310.3	0.63%	2023-2024	14.8%
2029	7,843.2	0.72%	CAGR 2024-2029	16.4%

Pesos	Market Sales		
Year	(Pesos 000s)	Year-to-Year Change	
2018	101,194.4		
2019	108,523.5	2018-2019	7.2%
2020	119,113.2	2019-2020	9.8%
2021	138,903.0	2020-2021	16.6%
2022	170,516.5	2021-2022	22.8%
2023	196,004.6	2022-2023	14.9%
2024	224,994.0	2023-2024	14.8%
2029	409,408.0	CAGR 2024-2029	16.4%

In 2023, sales for this product in Philippines is forecast to be \$3.8 million dollars. Sales are forecast to change by 14.8 percent in the next year (2023 to 2024). In 2023, sales will be 196 million Pesos and will change by 14.9 percent in the next year (2023 to 2024).

In 2029, sales for this product in Philippines is forecast to be \$7.8 million dollars. The compound annual growth rate is projected to change by 16.4 percent from 2024 to 2029. In 2029, sales will be 196 million Pesos and will change by 14.9 percent from 2024 to 2029.

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Philippines

Product - 1,3-Propanediol (PDO)

Market Sales by Regions (USD 000s)

	2022	2023	2024	2029
Luzon	1,875.1	2,158.2	2,480.7	4,543.2
Mindanao	781.9	899.2	1,032.6	1,883.0
Visayas	609.6	697.5	797.0	1,417.0

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Poland

Market - 1,3-Propanediol (PDO)

Market Sales by Country

<u>US Dollars</u>	<u>Market Sales</u>	<u>Pct. of Global</u>		
<u>Year</u>	<u>(USD 000s)</u>	<u>Market</u>	<u>Year-to-Year Change</u>	
2018	2,808.8	0.75%		
2019	3,093.0	0.76%	2018-2019	10.1%
2020	3,242.5	0.77%	2019-2020	4.8%
2021	3,451.9	0.73%	2020-2021	6.5%
2022	3,952.6	0.71%	2021-2022	14.5%
2023	4,268.8	0.69%	2022-2023	8.0%
2024	4,601.2	0.67%	2023-2024	7.8%
2029	6,457.9	0.59%	CAGR 2024-2029	8.1%

<u>Zlotys</u>	<u>Market Sales</u>		
<u>Year</u>	<u>(Zlotys 000s)</u>	<u>Year-to-Year Change</u>	
2018	10,507.2		
2019	11,570.4	2018-2019	10.1%
2020	12,129.6	2019-2020	4.8%
2021	12,913.2	2020-2021	6.5%
2022	14,786.3	2021-2022	14.5%
2023	15,969.1	2022-2023	8.0%
2024	17,212.5	2023-2024	7.8%
2029	24,158.2	CAGR 2024-2029	8.1%

In 2023, sales for this product in Poland is forecast to be \$4.3 million dollars. Sales are forecast to change by 7.8 percent in the next year (2023 to 2024). In 2023, sales will be 16 million Zlotys and will change by 8 percent in the next year (2023 to 2024).

In 2029, sales for this product in Poland is forecast to be \$6.5 million dollars. The compound annual growth rate is projected to change by 8.1 percent from 2024 to 2029. In 2029, sales will be 16 million Zlotys and will change by 8 percent from 2024 to 2029.

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Poland

Product - 1,3-Propanediol (PDO)

Market Sales by Regions (USD 000s)

	2022	2023	2024	2029
Dolnośląskie [Lower Silesia]	298.5	322.3	347.3	486.7
Kujawsko-Pomorskie	214.7	231.9	250.0	351.1
Łódzkie [Łódź]	255.1	274.9	295.6	410.2
Lubelskie [Lublin]	219.5	236.7	254.8	355.1
Lubuskie [Lubusz]	104.8	113.2	122.0	171.4
Małopolskie [Lesser Poland]	347.9	376.3	406.2	574.3
Mazowieckie [Mazovia]	551.3	596.3	643.8	910.5
Opolskie [Opole]	101.7	109.5	117.7	162.7
Podkarpackie [Subcarpathia]	219.0	236.6	255.1	358.8
Podlaskie [Podlachia]	122.1	131.7	141.8	198.1
Pomorskie [Pomerania]	238.6	258.2	279.0	395.8
Śląskie [Silesia]	467.8	504.3	542.6	754.5
Świętokrzyskie [Holy Cross]	128.9	139.0	149.6	208.2
Warmińsko-Mazurskie	148.2	160.0	172.5	242.2
Wielkopolskie [Greater Poland]	358.4	387.5	418.2	590.7
West Pomerania	176.0	190.1	204.9	287.7

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Puerto Rico

Market - 1,3-Propanediol (PDO)

Market Sales by Country

US Dollars	Market Sales	Pct. of Global	Year-to-Year Change	
Year	(USD 000s)	Market		
2018	1,517.8	0.41%		
2019	1,501.3	0.37%	2018-2019	-1.1%
2020	1,621.5	0.38%	2019-2020	8.0%
2021	1,751.4	0.37%	2020-2021	8.0%
2022	2,026.2	0.36%	2021-2022	15.7%
2023	2,195.1	0.35%	2022-2023	8.3%
2024	2,374.7	0.34%	2023-2024	8.2%
2029	3,212.8	0.29%	CAGR 2024-2029	7.1%

Dollars	Market Sales	Year-to-Year Change	
Year	(Dollars 000s)		
2018	1,517.8		
2019	1,501.3	2018-2019	-1.1%
2020	1,621.5	2019-2020	8.0%
2021	1,751.4	2020-2021	8.0%
2022	2,026.2	2021-2022	15.7%
2023	2,195.1	2022-2023	8.3%
2024	2,374.7	2023-2024	8.2%
2029	3,212.8	CAGR 2024-2029	7.1%

In 2023, sales for this product in Puerto Rico is forecast to be \$2.2 million dollars. Sales are forecast to change by 8.2 percent in the next year (2023 to 2024). In 2023, sales will be 2.2 million Dollars and will change by 8.3 percent in the next year (2023 to 2024).

In 2029, sales for this product in Puerto Rico is forecast to be \$3.2 million dollars. The compound annual growth rate is projected to change by 7.1 percent from 2024 to 2029. In 2029, sales will be 2.2 million Dollars and will change by 8.3 percent from 2024 to 2029.

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Puerto Rico

Product - 1,3-Propanediol (PDO)

Market Sales by Regions (USD 000s)

	2022	2023	2024	2029
Culebra	1.1	1.2	1.3	1.8
Puerto Rico	2,019.9	2,188.2	2,367.3	3,202.6
Vieques	5.2	5.7	6.1	8.4

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Romania

Market - 1,3-Propanediol (PDO)

Market Sales by Country

<u>US Dollars</u>	<u>Market Sales</u>	<u>Pct. of Global</u>		
<u>Year</u>	<u>(USD 000s)</u>	<u>Market</u>	<u>Year-to-Year Change</u>	
2018	1,280.3	0.34%		
2019	1,418.8	0.35%	2018-2019	10.8%
2020	1,396.1	0.33%	2019-2020	-1.6%
2021	1,673.9	0.35%	2020-2021	19.9%
2022	2,026.0	0.36%	2021-2022	21.0%
2023	2,296.0	0.37%	2022-2023	13.3%
2024	2,598.6	0.38%	2023-2024	13.2%
2029	4,405.0	0.40%	CAGR 2024-2029	13.9%

<u>New Leus</u>	<u>Market Sales</u>		
<u>Year</u>	<u>(New Leus 000s)</u>	<u>Year-to-Year Change</u>	
2018	5,223.6		
2019	5,788.5	2018-2019	10.8%
2020	5,696.1	2019-2020	-1.6%
2021	6,829.5	2020-2021	19.9%
2022	8,265.9	2021-2022	21.0%
2023	9,367.8	2022-2023	13.3%
2024	10,602.0	2023-2024	13.2%
2029	17,972.4	CAGR 2024-2029	13.9%

In 2023, sales for this product in Romania is forecast to be \$2.3 million dollars.

Sales are forecast to change by 13.2 percent in the next year (2023 to 2024). In 2023, sales will be 9.4 million New Leus and will change by 13.3 percent in the next year (2023 to 2024).

In 2029, sales for this product in Romania is forecast to be \$4.4 million dollars.

The compound annual growth rate is projected to change by 13.9 percent from 2024 to 2029. In 2029, sales will be 9.4 million New Leus and will change by 13.3 percent from 2024 to 2029.

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Romania

Product - 1,3-Propanediol (PDO)

Market Sales by Regions (USD 000s)

	2022	2023	2024	2029
Alba	33.7	38.1	42.9	71.5
Arad	43.4	49.2	55.7	94.2
Argeş	61.2	69.4	78.5	133.0
Bacău	61.0	68.9	77.7	129.5
Bihor	58.4	66.3	75.1	127.9
Botoşani	40.6	46.0	51.9	87.5
Braşov	56.1	63.5	71.8	121.5
Bucureşti [Bucharest]	190.0	215.6	244.4	416.8
Buzău	44.0	49.8	56.2	94.2
Cluj	72.7	82.8	94.1	162.6
Constanţa	70.1	79.6	90.3	154.4
Dâmboviţa	52.1	59.1	67.0	114.2
Dolj	65.6	74.2	83.8	140.8
Galaţi	52.8	59.6	67.2	111.7
Gorj	33.4	37.7	42.6	71.0
Hunedoara	39.6	44.5	50.0	81.5
Iaşi	82.1	93.5	106.2	183.9
Ilfov	49.6	57.7	67.0	129.1
Maramureş	48.1	54.5	61.6	104.3
Mureş	55.9	63.4	71.8	122.3
Neamţ	46.1	52.0	58.5	96.8
Olt	41.8	47.1	53.1	88.0
Prahova	75.5	85.5	96.6	162.5
Sălaj	22.1	24.9	28.1	47.0
Satu Mare	34.4	38.9	44.0	74.1
Sibiu	40.9	46.4	52.5	89.4
Suceava	65.1	73.8	83.6	142.4
Teleorman	35.4	39.8	44.7	72.8
Timiş	72.8	83.0	94.5	165.0
Tulcea	20.4	23.0	25.8	42.2
Vâlcea	36.6	41.4	46.7	78.0
Vaslui	39.4	44.6	50.3	84.3
Vrancea	33.8	38.3	43.2	72.4

Note: Sales for 2022-2023 are forecasts and sales 1

Note: Sales for 2018-2019 are forecasts and sales for 2020-2025 projections

Russia

Market - 1,3-Propanediol (PDO)

Market Sales by Country

<u>US Dollars</u>	<u>Market Sales</u>	<u>Pct. of Global</u>		
<u>Year</u>	<u>(USD 000s)</u>	<u>Market</u>	<u>Year-to-Year Change</u>	
2018	5,834.4	1.56%		
2019	6,827.2	1.67%	2018-2019	17.0%
2020	7,169.4	1.70%	2019-2020	5.0%
2021	7,891.2	1.66%	2020-2021	10.1%
2022	9,312.4	1.66%	2021-2022	18.0%
2023	10,365.2	1.67%	2022-2023	11.3%
2024	11,514.2	1.67%	2023-2024	11.1%
2029	18,790.0	1.72%	CAGR 2024-2029	12.6%

<u>Rubles</u>	<u>Market Sales</u>		
<u>Year</u>	<u>(Rubles 000s)</u>	<u>Year-to-Year Change</u>	
2018	390,896.8		
2019	457,410.4	2018-2019	17.0%
2020	480,341.0	2019-2020	5.0%
2021	528,698.9	2020-2021	10.1%
2022	623,917.0	2021-2022	18.0%
2023	694,452.5	2022-2023	11.3%
2024	771,436.8	2023-2024	11.1%
2029	1,258,901.8	CAGR 2024-2029	12.6%

In 2023, sales for this product in Russia is forecast to be \$10.4 million dollars.

Sales are forecast to change by 11.1 percent in the next year (2023 to 2024). In 2023, sales will be 694.5 million Rubles and will change by 11.3 percent in the next year (2023 to 2024).

In 2029, sales for this product in Russia is forecast to be \$18.8 million dollars.

The compound annual growth rate is projected to change by 12.6 percent from 2024 to 2029. In 2029, sales will be 694.5 million Rubles and will change by 11.3 percent from 2024 to 2029.

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Russia

Product - 1,3-Propanediol (PDO)

Market Sales by Regions (USD 000s)

	2022	2023	2024	2029
Central Russia	2,471.0	2,750.4	3,055.3	4,984.8
Dal'nevostočnyj Federal'nyj	396.5	439.1	485.2	771.3
[Southern Russia	922.4	1,028.8	1,145.1	1,887.0
Volga	1,914.7	2,126.7	2,357.5	3,806.1
Northern Caucasus	685.3	771.1	866.0	1,491.9
Northwestern Russia	860.6	955.0	1,057.5	1,699.0
Siberia	1,247.7	1,386.5	1,537.6	2,488.1
Ural'skij Federal'nyj Okrug [Ural]	814.1	907.7	1,010.0	1,661.8

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Saudi Arabia

Market - 1,3-Propanediol (PDO)

Market Sales by Country

<u>US Dollars</u>	<u>Market Sales</u>	<u>Pct. of Global</u>		
<u>Year</u>	<u>(USD 000s)</u>	<u>Market</u>	<u>Year-to-Year Change</u>	
2018	2,693.0	0.72%		
2019	3,162.1	0.77%	2018-2019	17.4%
2020	3,252.0	0.77%	2019-2020	2.8%
2021	3,944.6	0.83%	2020-2021	21.3%
2022	4,897.5	0.88%	2021-2022	24.2%
2023	5,693.8	0.92%	2022-2023	16.3%
2024	6,610.4	0.96%	2023-2024	16.1%
2029	12,730.0	1.17%	CAGR 2024-2029	18.5%

<u>Rials</u>	<u>Market Sales</u>		
<u>Year</u>	<u>(Rials 000s)</u>	<u>Year-to-Year Change</u>	
2018	10,098.7		
2019	11,857.8	2018-2019	17.4%
2020	12,195.1	2019-2020	2.8%
2021	14,792.1	2020-2021	21.3%
2022	18,365.7	2021-2022	24.2%
2023	21,351.6	2022-2023	16.3%
2024	24,789.0	2023-2024	16.1%
2029	47,737.4	CAGR 2024-2029	18.5%

In 2023, sales for this product in Saudi Arabia is forecast to be \$5.7 million dollars. Sales are forecast to change by 16.1 percent in the next year (2023 to 2024). In 2023, sales will be 21.4 million Rials and will change by 16.3 percent in the next year (2023 to 2024).

In 2029, sales for this product in Saudi Arabia is forecast to be \$12.7 million dollars. The compound annual growth rate is projected to change by 18.5 percent from 2024 to 2029. In 2029, sales will be 21.4 million Rials and will change by 16.3 percent from 2024 to 2029.

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Saudi Arabia

Product - 1,3-Propanediol (PDO)

Market Sales by Regions (USD 000s)

	2022	2023	2024	2029
Al-Bāḥah	68.5	78.7	90.4	164.1
Northern Frontier	55.1	63.6	73.4	136.8
Al-Jawf (incl. Al-Qurayyāt)	79.1	92.0	106.9	206.3
Medīna	323.5	376.4	437.2	844.3
Al-Qaṣīm [Al-Qaseem]	218.8	254.3	295.3	568.6
Ar-Riyād [Riyadh]	1,259.7	1,470.7	1,714.6	3,371.8
Eastern Region	735.6	854.9	992.2	1,907.4
'Asīr [Aseer]	331.6	383.4	442.6	828.4
Ḥā'il	104.2	120.6	139.3	261.6
Jīzān	244.3	283.6	328.8	628.5
Mecca	1,242.3	1,442.5	1,672.6	3,200.2
Najrān	91.8	106.9	124.2	240.9
Tabūk [Tabouk]	143.0	166.2	192.9	371.0

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Singapore

Market - 1,3-Propanediol (PDO)

Market Sales by Country

<u>US Dollars</u>	<u>Market Sales</u>	<u>Pct. of Global</u>		
<u>Year</u>	<u>(USD 000s)</u>	<u>Market</u>	<u>Year-to-Year Change</u>	
2018	1,957.0	0.52%		
2019	2,429.6	0.60%	2018-2019	24.1%
2020	2,382.0	0.56%	2019-2020	-2.0%
2021	2,968.9	0.62%	2020-2021	24.6%
2022	3,722.8	0.67%	2021-2022	25.4%
2023	4,371.0	0.70%	2022-2023	17.4%
2024	5,125.1	0.74%	2023-2024	17.3%
2029	10,370.0	0.95%	CAGR 2024-2029	20.5%

<u>Dollars</u>	<u>Market Sales</u>		
<u>Year</u>	<u>(Dollars 000s)</u>	<u>Year-to-Year Change</u>	
2018	2,648.5		
2019	3,288.0	2018-2019	24.1%
2020	3,223.6	2019-2020	-2.0%
2021	4,017.9	2020-2021	24.6%
2022	5,038.1	2021-2022	25.4%
2023	5,915.4	2022-2023	17.4%
2024	6,935.9	2023-2024	17.3%
2029	14,033.9	CAGR 2024-2029	20.5%

In 2023, sales for this product in Singapore is forecast to be \$4.4 million dollars.

Sales are forecast to change by 17.3 percent in the next year (2023 to 2024). In 2023, sales will be 5.9 million Dollars and will change by 17.4 percent in the next year (2023 to 2024).

In 2029, sales for this product in Singapore is forecast to be \$10.4 million dollars.

The compound annual growth rate is projected to change by 20.5 percent from 2024 to 2029. In 2029, sales will be 5.9 million Dollars and will change by 17.4 percent from 2024 to 2029.

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Singapore

Product - 1,3-Propanediol (PDO)

Market Sales by Regions (USD 000s)

	2022	2023	2024	2029
Central Region	575.5	661.7	759.6	1,375.9
East Region	428.3	492.8	566.2	1,029.4
North-East Region	585.0	688.8	809.7	1,651.6
North Region	359.8	420.8	491.3	968.5
West Region	586.4	680.7	788.9	1,499.1
Non-Resident Population	1,187.7	1,426.1	1,709.5	3,845.6

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

South Africa

Market - 1,3-Propanediol (PDO)

Market Sales by Country

<u>US Dollars</u>	<u>Market Sales</u>	<u>Pct. of Global</u>		
<u>Year</u>	<u>(USD 000s)</u>	<u>Market</u>	<u>Year-to-Year Change</u>	
2018	1,273.7	0.34%		
2019	1,358.8	0.33%	2018-2019	6.7%
2020	1,354.0	0.32%	2019-2020	-0.4%
2021	1,487.7	0.31%	2020-2021	9.9%
2022	1,710.9	0.31%	2021-2022	15.0%
2023	1,842.4	0.30%	2022-2023	7.7%
2024	1,981.3	0.29%	2023-2024	7.5%
2029	2,601.4	0.24%	CAGR 2024-2029	6.3%

<u>Rands</u>	<u>Market Sales</u>		
<u>Year</u>	<u>(Rands 000s)</u>	<u>Year-to-Year Change</u>	
2018	17,529.2		
2019	18,700.7	2018-2019	6.7%
2020	18,634.2	2019-2020	-0.4%
2021	20,474.9	2020-2021	9.9%
2022	23,546.9	2021-2022	15.0%
2023	25,356.5	2022-2023	7.7%
2024	27,267.9	2023-2024	7.5%
2029	35,803.0	CAGR 2024-2029	6.3%

In 2023, sales for this product in South Africa is forecast to be \$1.8 million dollars. Sales are forecast to change by 7.5 percent in the next year (2023 to 2024). In 2023, sales will be 25.4 million Rands and will change by 7.7 percent in the next year (2023 to 2024).

In 2029, sales for this product in South Africa is forecast to be \$2.6 million dollars. The compound annual growth rate is projected to change by 6.3 percent from 2024 to 2029. In 2029, sales will be 25.4 million Rands and will change by 7.7 percent from 2024 to 2029.

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

South Africa

Product - 1,3-Propanediol (PDO)

Market Sales by Regions (USD 000s)

	2022	2023	2024	2029
Eastern Cape	189.4	201.1	213.3	260.9
Free State (Oranje Free State)	83.8	89.2	94.7	116.9
Gauteng	448.8	488.8	531.7	738.1
KwaZulu-Natal	331.5	355.2	380.0	486.0
Limpopo (Northern Transvaal)	169.5	181.3	193.7	245.7
Mpumalanga (Eastern Transvaal)	133.9	144.2	155.1	203.6
Northern Cape	35.5	38.0	40.5	51.3
North West	117.3	126.3	135.9	178.3
Western Cape	201.3	218.3	236.3	320.6

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Spain

Market - 1,3-Propanediol (PDO)

Market Sales by Country

<u>US Dollars</u>	<u>Market Sales</u>	<u>Pct. of Global</u>		
<u>Year</u>	<u>(USD 000s)</u>	<u>Market</u>	<u>Year-to-Year Change</u>	
2018	4,548.2	1.21%		
2019	5,005.3	1.23%	2018-2019	10.1%
2020	4,988.7	1.18%	2019-2020	-0.3%
2021	5,295.8	1.11%	2020-2021	6.2%
2022	6,074.6	1.09%	2021-2022	14.7%
2023	6,558.3	1.06%	2022-2023	8.0%
2024	7,053.3	1.02%	2023-2024	7.5%
2029	8,243.5	0.76%	CAGR 2024-2029	3.4%

<u>Euros</u>	<u>Market Sales</u>		
<u>Year</u>	<u>(Euros 000s)</u>	<u>Year-to-Year Change</u>	
2018	3,965.0		
2019	4,363.5	2018-2019	10.1%
2020	4,349.0	2019-2020	-0.3%
2021	4,616.8	2020-2021	6.2%
2022	5,295.6	2021-2022	14.7%
2023	5,717.4	2022-2023	8.0%
2024	6,148.9	2023-2024	7.5%
2029	7,186.4	CAGR 2024-2029	3.4%

In 2023, sales for this product in Spain is forecast to be \$6.6 million dollars. Sales are forecast to change by 7.5 percent in the next year (2023 to 2024). In 2023, sales will be 5.7 million Euros and will change by 8 percent in the next year (2023 to 2024).

In 2029, sales for this product in Spain is forecast to be \$8.2 million dollars. The compound annual growth rate is projected to change by 3.4 percent from 2024 to 2029. In 2029, sales will be 5.7 million Euros and will change by 8 percent from 2024 to 2029.

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Spain

Product - 1,3-Propanediol (PDO)

Market Sales by Regions (USD 000s)

	2022	2023	2024	2029
Andalucía [Andalusia]	1,088.3	1,174.7	1,262.9	1,473.3
Aragón	168.9	181.7	194.7	223.4
Asturias	130.0	138.9	148.0	164.5
Canarias [Canary Islands]	282.7	307.0	332.2	400.1
Cantabria	74.7	80.3	86.1	98.7
Castilla-La Mancha	268.4	290.0	312.2	366.1
Castilla y León	305.8	327.0	348.4	388.3
Cataluña [Catalonia]	987.0	1,067.0	1,149.1	1,351.8
Ceuta	11.0	11.9	12.8	15.1
Comunitat Valenciana	655.0	708.9	764.3	904.1
Extremadura	136.5	146.3	156.3	176.1
Galicia	341.8	366.1	390.6	438.3
Illes Balears [Balearic Islands]	153.0	166.9	181.4	223.3
La Rioja	41.2	44.5	47.9	55.8
Madrid	860.7	932.3	1,006.0	1,194.9
Melilla	11.4	12.4	13.5	16.4
Murcia	197.3	214.3	231.8	278.7
Navarra [Navarre]	84.2	91.0	97.9	114.9
País Vasco [Basque Country]	276.6	296.9	317.3	359.6

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Sweden

Market - 1,3-Propanediol (PDO)

Market Sales by Country

<u>US Dollars</u>	<u>Market Sales</u>	<u>Pct. of Global</u>		
<u>Year</u>	<u>(USD 000s)</u>	<u>Market</u>	<u>Year-to-Year Change</u>	
2018	2,154.2	0.57%		
2019	2,271.8	0.56%	2018-2019	5.5%
2020	2,235.6	0.53%	2019-2020	-1.6%
2021	2,365.9	0.50%	2020-2021	5.8%
2022	2,647.8	0.47%	2021-2022	11.9%
2023	2,774.6	0.45%	2022-2023	4.8%
2024	2,903.6	0.42%	2023-2024	4.6%
2029	3,326.9	0.30%	CAGR 2024-2029	2.9%

<u>Kronas</u>	<u>Market Sales</u>		
<u>Year</u>	<u>(Kronas 000s)</u>	<u>Year-to-Year Change</u>	
2018	19,278.3		
2019	20,331.5	2018-2019	5.5%
2020	20,007.6	2019-2020	-1.6%
2021	21,173.6	2020-2021	5.8%
2022	23,696.0	2021-2022	11.9%
2023	24,831.3	2022-2023	4.8%
2024	25,985.3	2023-2024	4.6%
2029	29,773.9	CAGR 2024-2029	2.9%

In 2023, sales for this product in Sweden is forecast to be \$2.8 million dollars. Sales are forecast to change by 4.6 percent in the next year (2023 to 2024). In 2023, sales will be 24.8 million Kronas and will change by 4.8 percent in the next year (2023 to 2024).

In 2029, sales for this product in Sweden is forecast to be \$3.3 million dollars. The compound annual growth rate is projected to change by 2.9 percent from 2024 to 2029. In 2029, sales will be 24.8 million Kronas and will change by 4.8 percent from 2024 to 2029.

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Sweden

Product - 1,3-Propanediol (PDO)

Market Sales by Regions (USD 000s)

	2022	2023	2024	2029
Blekinge län	41.2	43.0	44.8	50.3
Dalarnas län	73.1	76.1	79.0	87.5
Gävleborgs län	72.9	75.9	78.9	87.2
Gotlands län	15.2	15.8	16.5	18.4
Hallands län	86.1	90.5	95.0	110.2
Jämtlands län	33.0	34.3	35.6	39.2
Jönköpings län	93.8	98.2	102.6	116.8
Kalmar län	62.2	64.8	67.4	74.9
Kronobergs län	50.8	53.1	55.4	62.7
Norrbottnens län	64.4	66.9	69.4	76.3
Örebro län	77.0	80.5	83.9	94.6
Östergötlands län	119.0	124.5	130.0	147.6
Skåne län	355.5	373.3	391.6	453.5
Södermanlands län	75.3	78.8	82.3	93.6
Stockholms län	615.5	649.0	683.3	807.0
Uppsala län	97.8	102.9	108.0	125.8
Värmlands län	71.9	74.8	77.8	86.1
Västerbottens län	69.8	72.9	75.9	85.2
Västernorrlands län	62.6	65.1	67.5	74.1
Västmanlands län	69.7	72.9	76.1	86.0
Västra Götalands län	440.8	461.4	482.4	550.0

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Switzerland

Market - 1,3-Propanediol (PDO)

Market Sales by Country

<u>US Dollars</u>	<u>Market Sales</u>	<u>Pct. of Global</u>		
<u>Year</u>	<u>(USD 000s)</u>	<u>Market</u>	<u>Year-to-Year Change</u>	
2018	3,771.1	1.01%		
2019	4,027.3	0.99%	2018-2019	6.8%
2020	4,361.5	1.03%	2019-2020	8.3%
2021	4,786.8	1.01%	2020-2021	9.8%
2022	5,643.6	1.01%	2021-2022	17.9%
2023	6,230.3	1.00%	2022-2023	10.4%
2024	6,868.7	1.00%	2023-2024	10.2%
2029	10,212.6	0.94%	CAGR 2024-2029	9.7%

<u>Swiss Francs</u>	<u>Market Sales</u>		
<u>Year</u>	<u>Swiss Francs 000s)</u>	<u>Year-to-Year Change</u>	
2018	3,701.0		
2019	3,952.4	2018-2019	6.8%
2020	4,280.4	2019-2020	8.3%
2021	4,697.8	2020-2021	9.8%
2022	5,538.6	2021-2022	17.9%
2023	6,114.5	2022-2023	10.4%
2024	6,740.9	2023-2024	10.2%
2029	10,022.7	CAGR 2024-2029	9.7%

In 2023, sales for this product in Switzerland is forecast to be \$6.2 million dollars. Sales are forecast to change by 10.2 percent in the next year (2023 to 2024). In 2023, sales will be 6.1 million Swiss Francs and will change by 10.4 percent in the next year (2023 to 2024).

In 2029, sales for this product in Switzerland is forecast to be \$10.2 million dollars. The compound annual growth rate is projected to change by 9.7 percent from 2024 to 2029. In 2029, sales will be 6.1 million Swiss Francs and will change by 10.4 percent from 2024 to 2029.

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Switzerland

Product - 1,3-Propanediol (PDO)

Market Sales by Regions (USD 000s)

	2022	2023	2024	2029
Aargau [Argovia]	449.0	496.9	549.1	826.3
Appenzell Outer Rhodes	36.0	39.5	43.3	62.4
Appenzell Inner Rhodes	10.8	11.9	13.1	19.3
Basel-Landschaft	190.6	209.9	230.8	338.8
Basel-Stadt [Basel-City]	123.2	134.8	147.2	209.0
Bern	673.8	740.3	812.2	1,178.6
Fribourg	213.3	237.0	263.0	403.6
Genève [Geneva]	333.1	368.5	407.0	611.0
Glarus	26.2	28.7	31.5	45.3
Graubünden [Grisons]	132.5	145.8	160.2	234.3
Jura	48.2	53.0	58.2	84.6
Luzern	271.1	299.4	330.1	490.9
Neuchâtel	117.2	128.7	141.2	204.7
Nidwalden [Nidwald]	29.4	32.5	35.9	53.9
Obwalden [Obwald]	25.6	28.3	31.2	46.8
Schaffhausen	53.2	58.5	64.3	93.8
Schwyz	108.3	120.2	133.1	202.7
Solothurn	179.6	197.8	217.6	319.7
St. Gallen	335.9	370.2	407.3	599.9
Thurgau [Thurgovia]	182.7	202.0	223.1	334.6
Ticino	238.2	263.1	290.2	432.3
Uri	23.9	26.2	28.7	41.5
Valais	230.8	255.7	283.0	428.9
Vaud	526.5	582.5	643.7	967.6
Zug	85.9	95.4	105.8	162.1
Zürich [Zurich]	998.6	1,103.6	1,217.9	1,820.1

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Thailand

Market - 1,3-Propanediol (PDO)

Market Sales by Country

<u>US Dollars</u>	<u>Market Sales</u>	<u>Pct. of Global</u>		
<u>Year</u>	<u>(USD 000s)</u>	<u>Market</u>	<u>Year-to-Year Change</u>	
2018	3,781.7	1.01%		
2019	4,250.5	1.04%	2018-2019	12.4%
2020	4,561.7	1.08%	2019-2020	7.3%
2021	5,306.7	1.11%	2020-2021	16.3%
2022	6,475.0	1.16%	2021-2022	22.0%
2023	7,451.6	1.20%	2022-2023	15.1%
2024	8,558.6	1.24%	2023-2024	14.9%
2029	16,502.8	1.51%	CAGR 2024-2029	18.6%

<u>Bahts</u>	<u>Market Sales</u>		
<u>Year</u>	<u>(Bahts 000s)</u>	<u>Year-to-Year Change</u>	
2018	120,766.6		
2019	135,739.3	2018-2019	12.4%
2020	145,677.6	2019-2020	7.3%
2021	169,470.3	2020-2021	16.3%
2022	206,778.5	2021-2022	22.0%
2023	237,965.7	2022-2023	15.1%
2024	273,316.2	2023-2024	14.9%
2029	527,015.3	CAGR 2024-2029	18.6%

In 2023, sales for this product in Thailand is forecast to be \$7.5 million dollars.

Sales are forecast to change by 14.9 percent in the next year (2023 to 2024). In 2023, sales will be 238 million Bahts and will change by 15.1 percent in the next year (2023 to 2024).

In 2029, sales for this product in Thailand is forecast to be \$16.5 million dollars.

The compound annual growth rate is projected to change by 18.6 percent from 2024 to 2029. In 2029, sales will be 238 million Bahts and will change by 15.1 percent from 2024 to 2029.

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Thailand

Product - 1,3-Propanediol (PDO)

Market Sales by Regions (USD 000s)

	2022	2023	2024	2029
Bangkok Metropolitan	1,603.1	1,872.3	2,182.2	4,520.5
Central	293.6	336.2	384.3	721.4
Eastern	559.2	650.0	753.9	1,525.0
Northeastern (Isan)	1,719.4	1,956.2	2,221.1	4,036.5
Northern	1,073.8	1,227.2	1,399.6	2,601.0
Southern	888.1	1,022.8	1,175.5	2,270.3
Western	337.9	386.8	441.9	828.2

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Turkey

Market - 1,3-Propanediol (PDO)

Market Sales by Country

US Dollars	Market Sales	Pct. of Global		
Year	(USD 000s)	Market	Year-to-Year Change	
2018	4,550.0	1.21%		
2019	4,611.1	1.13%	2018-2019	1.3%
2020	4,551.7	1.08%	2019-2020	-1.3%
2021	4,966.6	1.04%	2020-2021	9.1%
2022	5,516.6	0.99%	2021-2022	11.1%
2023	5,780.3	0.93%	2022-2023	4.8%
2024	6,045.9	0.88%	2023-2024	4.6%
2029	6,262.8	0.57%	CAGR 2024-2029	0.7%

Liras	Market Sales		
Year	(Liras 000s)	Year-to-Year Change	
2018	24,752.1		
2019	25,084.5	2018-2019	1.3%
2020	24,761.3	2019-2020	-1.3%
2021	27,018.4	2020-2021	9.1%
2022	30,010.5	2021-2022	11.1%
2023	31,445.0	2022-2023	4.8%
2024	32,889.7	2023-2024	4.6%
2029	34,069.5	CAGR 2024-2029	0.7%

In 2023, sales for this product in Turkey is forecast to be \$5.8 million dollars. Sales are forecast to change by 4.6 percent in the next year (2023 to 2024). In 2023, sales will be 31.4 million Liras and will change by 4.8 percent in the next year (2023 to 2024).

In 2029, sales for this product in Turkey is forecast to be \$6.3 million dollars. The compound annual growth rate is projected to change by 0.7 percent from 2024 to 2029. In 2029, sales will be 31.4 million Liras and will change by 4.8 percent from 2024 to 2029.

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Turkey

Product - 1,3-Propanediol (PDO)

Market Sales by Regions (USD 000s)

	2022	2023	2024	2029
Adana	151.6	158.6	165.6	169.5
Ankara	374.3	393.8	413.5	436.1
Antalya	169.1	179.2	189.4	206.7
Aydın	71.6	74.6	77.6	77.9
Balıkesir	80.1	83.3	86.5	86.2
Bursa	207.1	218.6	230.3	246.9
Denizli	67.8	70.7	73.7	74.6
Diyarbakır	116.6	122.3	128.0	132.8
Erzurum	49.2	50.5	51.8	48.3
Eskişehir	56.4	58.9	61.3	61.9
Gaziantep	140.4	148.7	157.2	171.3
Hatay	106.3	111.2	116.1	118.9
İstanbul	1,091.7	1,158.3	1,226.7	1,349.9
İzmir	295.9	310.6	325.5	339.5
Kahramanmaraş	74.3	77.4	80.3	80.2
Kayseri	92.1	96.4	100.7	103.6
Kocaeli	131.5	139.3	147.4	161.2
Konya	144.7	150.3	155.8	154.1
Malatya	51.6	53.3	55.1	53.3
Manisa	93.1	96.8	100.4	99.8
Mardin	55.5	58.0	60.5	61.9
Mersin (İçel)	122.0	127.3	132.7	134.7
Muğla	64.5	67.8	71.2	74.8
Sakarya	65.6	68.6	71.7	73.6
Samsun	85.1	88.2	91.3	89.4
Şanlıurfa	139.7	147.7	155.9	168.6
Tekirdağ	69.8	74.0	78.4	86.4
Trabzon	50.7	52.2	53.6	50.5
Van	79.8	84.1	88.5	93.9

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Note: Sales for 2018-2019 are forecasts and sales for 2020-2025 projections

United Arab Emirates

Market - 1,3-Propanediol (PDO)

Market Sales by Country

<u>US Dollars</u>	<u>Market Sales</u>	<u>Pct. of Global</u>		
<u>Year</u>	<u>(USD 000s)</u>	<u>Market</u>	<u>Year-to-Year Change</u>	
2018	1,061.1	0.28%		
2019	1,157.3	0.28%	2018-2019	9.1%
2020	1,201.1	0.28%	2019-2020	3.8%
2021	1,399.2	0.29%	2020-2021	16.5%
2022	1,686.3	0.30%	2021-2022	20.5%
2023	1,903.0	0.31%	2022-2023	12.8%
2024	2,144.5	0.31%	2023-2024	12.7%
2029	3,558.6	0.33%	CAGR 2024-2029	13.2%

<u>Dirhams</u>	<u>Market Sales</u>		
<u>Year</u>	<u>(Dirhams 000s)</u>	<u>Year-to-Year Change</u>	
2018	3,896.9		
2019	4,250.3	2018-2019	9.1%
2020	4,411.1	2019-2020	3.8%
2021	5,138.7	2020-2021	16.5%
2022	6,193.0	2021-2022	20.5%
2023	6,988.7	2022-2023	12.8%
2024	7,875.8	2023-2024	12.7%
2029	13,069.0	CAGR 2024-2029	13.2%

In 2023, sales for this product in United Arab Emirates is forecast to be \$1.9 million dollars. Sales are forecast to change by 12.7 percent in the next year (2023 to 2024). In 2023, sales will be 7 million Dirhams and will change by 12.8 percent in the next year (2023 to 2024).

In 2029, sales for this product in United Arab Emirates is forecast to be \$3.6 million dollars. The compound annual growth rate is projected to change by 13.2 percent from 2024 to 2029. In 2029, sales will be 7 million Dirhams and will change by 12.8 percent from 2024 to 2029.

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

United Arab Emirates

Product - 1,3-Propanediol (PDO)

Market Sales by Regions (USD 000s)

	2022	2023	2024	2029
Abū Ḥaby [Abu Dhabi]	523.2	585.0	653.2	1,034.1
'Ajmān	88.7	100.6	114.0	193.8
Al-Fujayrah [Fujairah]	47.4	53.3	59.7	96.6
Ash-Shāriqah [Sharjah]	337.5	382.7	433.4	735.9
Dubayy [Dubai]	591.3	671.7	762.1	1,306.3
Rā's al-Khaymah	80.5	89.8	100.1	157.1
Umm al-Qaywayn	17.7	19.8	22.1	34.7

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

United Kingdom

Market - 1,3-Propanediol (PDO)

Market Sales by Country

<u>US Dollars</u>	<u>Market Sales</u>	<u>Pct. of Global</u>		
<u>Year</u>	<u>(USD 000s)</u>	<u>Market</u>	<u>Year-to-Year Change</u>	
2018	7,263.3	1.94%		
2019	7,936.4	1.94%	2018-2019	9.3%
2020	8,037.1	1.90%	2019-2020	1.3%
2021	8,740.1	1.84%	2020-2021	8.7%
2022	9,817.4	1.75%	2021-2022	12.3%
2023	10,402.6	1.67%	2022-2023	6.0%
2024	11,003.2	1.60%	2023-2024	5.8%
2029	12,054.7	1.10%	CAGR 2024-2029	1.9%

<u>Pounds</u>	<u>Market Sales</u>		
<u>Year</u>	<u>(Pounds 000s)</u>	<u>Year-to-Year Change</u>	
2018	5,634.8		
2019	6,157.0	2018-2019	9.3%
2020	6,235.1	2019-2020	1.3%
2021	6,780.5	2020-2021	8.7%
2022	7,616.2	2021-2022	12.3%
2023	8,070.2	2022-2023	6.0%
2024	8,536.1	2023-2024	5.8%
2029	9,351.9	CAGR 2024-2029	1.9%

In 2023, sales for this product in United Kingdom is forecast to be \$10.4 million dollars. Sales are forecast to change by 5.8 percent in the next year (2023 to 2024). In 2023, sales will be 8.1 million Pounds and will change by 6 percent in the next year (2023 to 2024).

In 2029, sales for this product in United Kingdom is forecast to be \$12.1 million dollars. The compound annual growth rate is projected to change by 1.9 percent from 2024 to 2029. In 2029, sales will be 8.1 million Pounds and will change by 6 percent from 2024 to 2029.

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

United Kingdom

Product - 1,3-Propanediol (PDO)

Market Sales by Regions (USD 000s)

	2022	2023	2024	2029
England	8,271.5	8,767.9	9,277.5	10,183.2
Northern Ireland	281.5	298.5	315.9	347.2
Scotland	800.3	845.6	891.8	963.1
Wales (Cymru)	464.1	490.7	517.9	561.2

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

United States

Market - 1,3-Propanediol (PDO)

Market Sales by Country

<u>US Dollars</u>	<u>Market Sales</u>	<u>Pct. of Global</u>		
<u>Year</u>	<u>(USD 000s)</u>	<u>Market</u>	<u>Year-to-Year Change</u>	
2018	65,928.5	17.60%		
2019	71,864.9	17.61%	2018-2019	9.0%
2020	76,587.5	18.12%	2019-2020	6.6%
2021	85,469.4	17.96%	2020-2021	11.6%
2022	101,833.5	18.20%	2021-2022	19.1%
2023	113,609.8	18.29%	2022-2023	11.6%
2024	126,574.2	18.38%	2023-2024	11.4%
2029	198,360.7	18.17%	CAGR 2024-2029	11.3%

<u>Dollars</u>	<u>Market Sales</u>		
<u>Year</u>	<u>(Dollars 000s)</u>	<u>Year-to-Year Change</u>	
2018	65,928.5		
2019	71,864.9	2018-2019	9.0%
2020	76,587.5	2019-2020	6.6%
2021	85,469.4	2020-2021	11.6%
2022	101,833.5	2021-2022	19.1%
2023	113,609.8	2022-2023	11.6%
2024	126,574.2	2023-2024	11.4%
2029	198,360.7	CAGR 2024-2029	11.3%

In 2023, sales for this product in United States is forecast to be \$113.6 million dollars. Sales are forecast to change by 11.4 percent in the next year (2023 to 2024). In 2023, sales will be 113.6 million Dollars and will change by 11.6 percent in the next year (2023 to 2024).

In 2029, sales for this product in United States is forecast to be \$198.4 million dollars. The compound annual growth rate is projected to change by 11.3 percent from 2024 to 2029. In 2029, sales will be 113.6 million Dollars and will change by 11.6 percent from 2024 to 2029.

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

United States

Product - 1,3-Propanediol (PDO)

Market Sales by Regions (USD 000s)

	2022	2023	2024	2029
Alabama	1,513.6	1,682.5	1,867.6	2,871.6
Arizona	2,357.8	2,666.0	3,010.1	5,039.5
Arkansas	941.9	1,049.2	1,167.0	1,813.2
California	12,320.3	13,741.6	15,305.3	23,934.9
Colorado	1,816.0	2,043.6	2,296.6	3,755.2
Connecticut	1,094.3	1,212.0	1,340.5	2,024.3
Florida	6,694.7	7,522.0	8,439.5	13,690.5
Georgia	3,385.8	3,803.9	4,267.6	6,920.7
Illinois	3,952.3	4,380.8	4,848.8	7,349.3
Indiana	2,060.2	2,289.6	2,540.9	3,902.4
Iowa	955.3	1,059.2	1,172.8	1,780.6
Kentucky	1,378.9	1,532.8	1,701.5	2,616.6
Louisiana	1,416.9	1,569.6	1,736.2	2,623.4
Maryland	1,874.1	2,086.8	2,320.3	3,597.8
Massachusetts	2,072.0	2,297.6	2,544.2	3,864.2
Michigan	3,030.0	3,352.0	3,703.0	5,558.6
Minnesota	1,729.2	1,925.6	2,141.3	3,322.2
Mississippi	925.7	1,027.4	1,138.6	1,736.6
Missouri	1,892.6	2,103.0	2,333.5	3,581.2
Nevada	1,072.8	1,225.0	1,396.8	2,456.5
New Jersey	2,768.5	3,072.8	3,405.8	5,197.5
New York	6,019.3	6,667.0	7,374.0	11,136.1
North Carolina	3,297.0	3,699.4	4,145.0	6,678.6
Ohio	3,536.9	3,913.9	4,325.1	6,502.5
Oklahoma	1,213.3	1,350.3	1,500.7	2,321.6
Oregon	1,310.1	1,466.0	1,638.2	2,604.3
Pennsylvania	3,887.0	4,302.6	4,756.0	7,160.4
South Carolina	1,575.6	1,762.9	1,969.8	3,129.7
Tennessee	2,115.2	2,362.5	2,635.0	4,149.2
Texas	9,037.7	10,166.2	11,419.3	18,630.7
Utah	1,012.1	1,141.8	1,286.3	2,129.6
Virginia	2,659.5	2,970.2	3,312.6	5,214.4
Washington	2,343.3	2,626.5	2,939.6	4,710.7
Wisconsin	1,793.0	1,991.6	2,209.1	3,383.8

Note: Sales for 2022-2023 are forecasts and sales 1

Note: Sales for 2018-2019 are forecasts and sales for 2020-2025 projections

Venezuela

Market - 1,3-Propanediol (PDO)

Market Sales by Country

<u>US Dollars</u>	<u>Market Sales</u>	<u>Pct. of Global</u>		
<u>Year</u>	<u>(USD 000s)</u>	<u>Market</u>	<u>Year-to-Year Change</u>	
2018	1,620.3	0.43%		
2019	1,592.6	0.39%	2018-2019	-1.7%
2020	1,576.5	0.37%	2019-2020	-1.0%
2021	1,624.2	0.34%	2020-2021	3.0%
2022	1,650.1	0.29%	2021-2022	1.6%
2023	1,655.6	0.27%	2022-2023	0.3%
2024	1,657.8	0.24%	2023-2024	0.1%
2029	1,610.0	0.15%	CAGR 2024-2029	-0.6%

<u>Bolivars</u>	<u>Market Sales</u>		
<u>Year</u>	<u>(Bolivars 000s)</u>	<u>Year-to-Year Change</u>	
2018	16,183.1		
2019	15,906.3	2018-2019	-1.7%
2020	15,745.5	2019-2020	-1.0%
2021	16,221.7	2020-2021	3.0%
2022	16,480.3	2021-2022	1.6%
2023	16,535.0	2022-2023	0.3%
2024	16,557.1	2023-2024	0.1%
2029	16,080.1	CAGR 2024-2029	-0.6%

In 2023, sales for this product in Venezuela is forecast to be \$1.7 million dollars. Sales are forecast to change by 0.1 percent in the next year (2023 to 2024). In 2023, sales will be 16.5 million Bolivars and will change by 0.3 percent in the next year (2023 to 2024).

In 2029, sales for this product in Venezuela is forecast to be \$1.6 million dollars. The compound annual growth rate is projected to change by -0.6 percent from 2024 to 2029. In 2029, sales will be 16.5 million Bolivars and will change by 0.3 percent from 2024 to 2029.

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Venezuela

Product - 1,3-Propanediol (PDO)

Market Sales by Regions (USD 000s)

	2022	2023	2024	2029
Amazonas	10.5	10.8	11.1	12.3
Anzoátegui	92.3	93.0	93.5	92.6
Apure	30.5	30.8	31.0	30.8
Aragua	96.6	96.6	96.5	92.3
Barinas	51.2	51.8	52.2	52.8
Bolívar	93.0	93.6	94.1	93.0
Carabobo	133.4	133.7	133.7	129.2
Cojedes	19.7	19.9	20.0	19.9
Delta Amacuro	10.6	10.8	11.0	11.4
Dependencias Federales	0.1	0.1	0.1	0.1
Distrito Capital	102.5	101.2	99.8	89.5
Falcón	54.7	54.9	54.9	53.2
Guárico	46.9	47.1	47.2	46.2
Lara	105.8	105.9	105.9	101.8
Mérida	51.5	51.7	51.7	50.1
Miranda	164.8	165.2	165.1	159.2
Monagas	56.3	56.9	57.4	57.7
Nueva Esparta	31.8	32.2	32.6	33.0
Portuguesa	53.4	53.6	53.7	52.2
Sucre	53.2	53.2	53.0	50.2
Táchira	66.5	66.4	66.2	63.0
Trujillo	42.5	42.5	42.5	40.8
Vargas	19.0	18.9	18.8	17.4
Yaracuy	37.4	37.6	37.7	37.0
Zulia	225.9	227.3	228.2	224.4

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Vietnam

Market - 1,3-Propanediol (PDO)

Market Sales by Country

US Dollars	Market Sales	Pct. of Global		
Year	(USD 000s)	Market	Year-to-Year Change	
2018	1,040.8	0.28%		
2019	1,231.1	0.30%	2018-2019	18.3%
2020	1,411.9	0.33%	2019-2020	14.7%
2021	1,657.7	0.35%	2020-2021	17.4%
2022	2,086.9	0.37%	2021-2022	25.9%
2023	2,478.1	0.40%	2022-2023	18.7%
2024	2,936.7	0.43%	2023-2024	18.5%
2029	6,622.4	0.61%	CAGR 2024-2029	25.1%

Dongs	Market Sales		
Year	(Dongs Mill.)	Year-to-Year Change	
2018	24,139.0		
2019	28,553.9	2018-2019	18.3%
2020	32,746.4	2019-2020	14.7%
2021	38,446.5	2020-2021	17.4%
2022	48,402.4	2021-2022	25.9%
2023	57,474.4	2022-2023	18.7%
2024	68,112.1	2023-2024	18.5%
2029	153,594.1	CAGR 2024-2029	25.1%

In 2023, sales for this product in Vietnam is forecast to be \$2.5 million dollars.

Sales are forecast to change by 18.5 percent in the next year (2023 to 2024). In 2023, sales will be 57.5 million Dongs and will change by 18.7 percent in the next year (2023 to 2024).

In 2029, sales for this product in Vietnam is forecast to be \$6.6 million dollars.

The compound annual growth rate is projected to change by 25.1 percent from 2024 to 2029. In 2029, sales will be 57.5 million Dongs and will change by 18.7 percent from 2024 to 2029.

Source: Perry/Hope Partners

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Vietnam

Product - 1,3-Propanediol (PDO)

Market Sales by Regions (USD 000s)

	2022	2023	2024	2029
An Giang	48.2	56.9	67.0	146.2
Bắc Giang	36.7	43.4	51.2	112.6
Bến Tre	27.8	32.7	38.4	82.2
Bình Định	33.7	39.8	46.8	101.8
Bình Dương	49.1	60.2	73.7	195.6
Cần Thơ	28.1	33.3	39.3	87.0
Đắk Lắk	43.0	51.3	61.0	139.8
Đồng Nai	66.9	80.0	95.4	222.3
Đồng Tháp	37.8	44.6	52.6	115.1
Gia Lai	32.7	39.1	46.7	108.8
Hải Dương	39.6	46.7	55.0	120.5
Hải Phòng	44.2	52.4	61.9	138.0
Hà Nội (incl. Hà Tây) [Hanoi]	167.0	199.5	237.9	552.1
Hà Tĩnh	27.7	32.6	38.3	82.5
Kiên Giang	40.1	47.5	56.2	125.6
Lâm Đồng	29.2	34.7	41.2	93.4
Long An	33.5	39.6	46.8	103.6
Nam Định	40.6	47.8	56.1	120.3
Nghệ An	68.4	80.7	95.1	208.2
Phú Thọ	30.7	36.3	42.7	93.8
Quảng Nam	32.9	38.9	45.8	100.2
Quảng Ngãi	27.8	32.8	38.6	84.2
Sóc Trăng	29.6	35.0	41.3	91.2
Thái Bình	39.6	46.6	54.8	118.1
Thái Nguyên	27.4	32.5	38.4	85.6
Thanh Hóa	77.4	91.1	107.1	231.5
Ho Chi Minh City	193.2	232.0	278.2	663.4
Tiền Giang	38.7	45.7	53.8	118.0

Note: Sales for 2022-2023 are forecasts and sales for 2024-2029 projections

Note: Sales for 2018-2019 are forecasts and sales for 2020-2025 projections

Appendix

Market - 1,3-Propanediol (PDO)

Overview

PRODCOM statistics aim at providing a full picture at EU level of developments in industrial production for a given product or for an industry in a comparable manner across countries. This aim became more important together with the establishment of the single market in 1992, and with rapid changes occurring in Europe the statistical system had to adapt to these changes.

The acronym PRODCOM comes from the French “PRODUCTION COMMUNAUTAIRE” (Community Production). The PRODCOM list is updated each year by the PRODCOM Expert Group. The headings of the PRODCOM list are linked to those from the Combined Nomenclature (CN) used to compile International Trade in Goods statistics, which thus enables direct comparisons between industrial production statistics and trade statistics (see below). PRODCOM headings are coded using an eight-digit numerical code, the first six digits of which are identical to those of the Statistical Classification of Products by Activity (CPA) code. The PRODCOM list is therefore also fully consistent with the CPA, while further detailing the CPA product categories.

PRODCOM statistics are broken down to a detail level of almost 3900 products available in the PRODCOM list. The main indicators of the production sold during the calendar year are collected and published both in monetary (EUR) and physical (kg, m², number of items, etc.) terms.

Eurostat releases in its database PRODCOM statistics for the EU as a whole as well as by Member State. The EU total excludes currently three EU Member States which are exempt from transmitting industrial production data given their small share in the EU total; these are Cyprus, Malta and Luxembourg.

How are PRODCOM statistics measured?

As mentioned above, PRODCOM statistics are based upon data on manufacturing of goods produced by the enterprises on the national territory. These enterprises carry out one or more activities at one or more locations and may comprise one or more legal units. When an enterprise is active in more than one economic activity, then the value added and turnover that it generates, the persons it employs, and the values of all other statistical variables will be classified under the enterprise’s principal activity. The principal activity is normally the one that generates the largest amount of value added. For PRODCOM statistics, the survey population consists of enterprises whose principal activity or one of its secondary activities was manufacturing of goods during the reference period.

PRODCOM statistics are compiled from the enterprises that cover at least 90 % of the national production per NACE class and employ at least 20 people (different thresholds may nonetheless be adopted by countries in exceptional cases). The territory covered in each country refers to the specifications of the Nomenclature of Countries and Territories for the External Trade Statistics of the Community and Statistics of Trade between Member States.

Indicator definitions for key PRODCOM statistics

PRODCOM statistics consist of the following set of indicators:

the physical volume of production sold during the survey period,
the value of production sold during the survey period,

the physical volume of actual production during the survey period, including any production which is incorporated into the manufacture of other products from the same undertaking.

The national statistical institutes transmit this set of indicators to Eurostat on an annual basis, six months after the end of the reference year. Data are available in both NACE Rev. 1.1 and NACE Rev. 2 classifications until 2008 reference year and from reference year 2009 onwards only in NACE Rev.2.

Appendix

Which parts of the economy does PRODCOM cover?

The PRODCOM statistics cover the industrial production (with the exception of military products and some energy products) carried out by enterprises classified within the Sections B to C of NACE Rev. 2, which include:

- Section B - Mining and quarrying
 - Division 07 - Mining of metal ores
 - Division 08 - Other mining and quarrying
 - Division 09 - Mining support service activities
- Section C - Manufacture
 - Division 10 - Manufacture of food products
 - Division 11 - Manufacture of beverages
 - Division 12 - Manufacture of tobacco products
 - Division 13 - Manufacture of textiles
 - Division 14 - Manufacture of wearing apparel
 - Division 15 - Manufacture of leather and related products
 - Division 16 - Manufacture of wood and of products of wood and cork, except furniture
 - Division 17 - Manufacture of paper and paper products
 - Division 18 - Printing and reproduction of recorded media
 - Division 19 - Manufacture of coke and refined petroleum products
 - Division 20 - Manufacture of chemicals and chemical products
 - Division 21 - Manufacture of basic pharmaceutical products and pharmaceutical preparations
 - Division 22 - Manufacture of rubber and plastic products
 - Division 23 - Manufacture of other non-metallic mineral products
 - Division 24 - Manufacture of basic metals
 - Division 25 - Manufacture of fabricated metal products, except machinery and equipment
 - Division 26 - Manufacture of computer, electronic and optical products
 - Division 27 - Manufacture of electrical equipment
 - Division 28 - Manufacture of machinery and equipment n.e.c.
 - Division 29 - Manufacture of motor vehicles, trailers and semi-trailers
 - Division 30 - Manufacture of other transport equipment
 - Division 31 - Manufacture of furniture
 - Division 32 - Other manufacturing
 - Division 33 - Repair and installation of machinery and equipment

Legislation

PRODCOM statistics are compiled under the legal basis provided by Council Regulation (EEC) NO 3924/1991 of 19 December 1991 and by Commission Regulation (EC) No 0912/2004 of 29 April 2004 implementing the Council Regulation (EEC) No 3924/91 on the establishment of a Community survey of industrial production. Additionally, a Commission Regulation updating the PRODCOM classification is available annually since 2003.

Methodology

A summary of the methodology applied for PRODCOM statistics accompanies the data on Eurostat's website as a European Statistics Metadata System (ESMS) metadata file (prodcom_esms). The national European Statistics Metadata System (ESMS) metadata files, employed by countries for PRODCOM statistics are available under the ESMS metadata file (prodcom_esms).

Classifications

Appendix

As mentioned above, the enterprises which are surveyed for PRODCOM statistics are classified according to their activity and assigned to a particular NACE code. The revised NACE Rev. 2 classification was adopted at the end of 2006, and is applicable to the PRODCOM Statistics since 2008 reference year. These changes in the classifications allowed a broader and more detailed collection of information to be compiled on industry, and provided the possibility to better identify new products from new areas of economic activity (such as technology-producing sectors).

Existing PRODCOM statistics presented in terms of NACE Rev. 1.1 will be maintained in the database for those users wishing to analyse historical series.

Before industrial production data collection could start, it was necessary to draw up a common list of products to be covered. Drawing up the PRODCOM list was a unique opportunity for Eurostat, the National Statistical Institutes and the European Trade Associations to work together to produce a classification that would work on the micro, national and European levels. The two main objectives of this work were to enable measuring the industrial production and to allow linking production statistics to trade statistics. As PRODCOM statistics have to be comparable with trade statistics, which are based on the CN, there had to be a close relationship between the two nomenclatures. Furthermore, the basic building blocks for PRODCOM are NACE (Rev. 2, as from 2008) and the CPA. Therefore, the PRODCOM list had to be developed in close association with these nomenclatures.

To understand how the different nomenclatures fit together, and their links to world-wide nomenclatures, it is useful to consider the diagram below which gives an overview of the revised system of integrated statistical classifications. This diagram shows the clear links between the PRODCOM list and the CN, which then links up to the HS at a world-wide level.

Diagram links: PRODCOM list, CN and HS

Policy context

Industrial production statistics collected within PRODCOM are used as one of the data sources in a number of policy areas covered mainly by the work of the Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs (GROW). The European Commission's enterprise policies aim to create a favourable environment for business to thrive within the EU, creating higher productivity, economic growth, jobs and wealth. Many of the policies that have been introduced in recent years have been aimed at reducing administrative burdens, stimulating innovation, encouraging sustainable production, and ensuring the smooth functioning of the EU's internal market.

At the European Council meeting of 26 March 2010, EU leaders set out their plan for Europe 2020, a strategy to enhance the competitiveness of the EU and to create more growth and jobs. The latest revision of the integrated economic and employment guidelines (revised as part of the Europe 2020 strategy for smart, sustainable and inclusive growth) includes a guideline to improve the business and consumer environment and modernise Europe's industrial base. Additional information about the Europe 2020 strategy can be found on the Europe 2020 website.

In October 2010, the European Commission presented a Communication on "An industrial policy for the globalisation era", establishing a strategic agenda and proposing broad cross-sectoral measures, as well as tailor-made actions for specific industries, mainly targeting so-called "green innovation" performance of various sectors. Prodcum statistics represent an important data input in order to take informed political decisions in these areas.

The central principles governing the internal market for services guarantee EU enterprises the freedom to establish themselves in other Member States, and the freedom to provide services on the territory of another EU Member State other than the one in which they are established. These central principles governing the internal market were set out in the EC Treaty. The objective of the Directive 0123/2006 of 12 December 2006 is to eliminate obstacles to trade in services, thus allowing the development of cross-border operations. It is intended to improve competitiveness, not just of service enterprises but also of European industry as a whole. In December 2006, the Directive was adopted by the European Parliament and the Council with transposition by the Member States required by the end of 2009. A comprehensive and structured listing of the legislative acts in force relating to industrial policy is available on Eurlex's website.