

2023

STATISTICAL REVIEW OF GLOBAL LPG



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INTRODUCTION

The World LPG Association (WLPGA) and Argus Media are pleased to welcome you to the *Statistical Review of Global LPG 2023*, which provides data on supply, demand and trade in LPG for the calendar year 2022. Once again, we express our appreciation of the efforts of WLPGA members and other organisations that have contributed to the data collection process and offered insight into market developments across the world.

The outbreak of the Russia-Ukraine conflict delivered another shock to global energy markets in 2022. Almost immediately European buyers started to halt purchases of Russian crude and refined products, with Russia responding by sharply reducing the supply of natural gas to Europe. Oil and gas prices surged as buyers wrestled with the possibility of shortages. In the event markets adjusted, Europe found new suppliers and prices returned to pre-crisis levels by the end of the year. Russian oil is now subject to formal EU sanctions, but Europe remains free to trade in Russian LPG, and exports in 2022 were hardly changed from year-earlier levels. Demand in Europe continued to run at 35mn t, despite high prices, only slightly lower than in 2021.

Global LPG demand grew by 3.5pc, taking global demand to a record level of 342mn t. The global market goes from strength to strength with further demand growth expected to be fuelled by expanding production and export availability. Rising supply in the US and Middle East is making the global marketplace increasingly competitive. At almost half of total demand, consumption by domestic consumers continues to dominate but the availability of competitively priced supply is generating massive investment in LPG-based petrochemical capacity. This will drive global demand to new highs in the coming years.

The growth of LPG production from renewable sources slowed down in 2022, with output rising by just under 14pc to around 250,000 t/yr. This segment of the market is in its infancy, but numerous announced projects and an increasingly supportive regulatory framework are likely to see availability of rLPG almost triple by 2025. Renewable dimethyl ether (rDME) is increasingly attracting attention as another way to decarbonise the LPG supply chain.

We hope that you find this review useful and that WLPGA members in particular continue to benefit from the insight it provides on global LPG markets.



James Rockall,
Chief Executive and Managing Director, WLPGA



Adrian Binks,
Chairman and Chief Executive, Argus Media group

KEY LPG GLOBAL STATISTICS

Top 10 LPG Producers			'000t
Country	2021	2022	±% 21/22
1 US	91,211	97,224	6.6
2 China	47,570	48,192	1.3
3 Saudi Arabia	24,494	27,396	11.8
4 Canada	15,712	16,399	4.4
5 Russia	15,029	15,305	1.8
6 India	12,184	12,821	5.2
7 UAE	10,520	11,789	12.1
8 Iran	8,976	11,013	22.7
9 Qatar	10,511	10,592	0.8
10 Algeria	8,521	8,490	-0.4
Global total	332,578	344,234	3.50

Top 10 LPG Consumers			'000t
Country	2021	2022	±% 21/22
1 China	71,079	73,929	4.0
2 US	43,455	46,550	7.1
3 India	29,036	30,140	3.8
4 Saudi Arabia	17,924	18,686	4.3
5 Japan	13,892	13,510	-2.7
6 Russia	10,867	11,322	4.2
7 South Korea	10,390	11,161	7.4
8 Canada	8,396	10,511	25.2
9 Mexico	9,111	9,433	3.5
10 Indonesia	8,620	8,627	0.1
Global total	330,261	341,752	3.48

EXECUTIVE SUMMARY

2022: Resilience tested

The Russia-Ukraine conflict brought new geopolitical and macroeconomic headwinds in 2022, yet global LPG supply and demand still recorded another year of solid growth. Output increased by almost 12mn t to 344mn t, fuelled by still rising flows of natural gas liquids (NGLs) from upstream shale fields in the US and growing production in the Mideast Gulf. The demand side proved equally resilient, rising by 12mn t to 342mn t in 2022, even as inflation spiked and global gross domestic product (GDP) growth weakened.

The market's strength once again illustrated the versatility of LPG as a product in energy and non-energy sectors. Unusually, the largest increase in demand was in oil refining, with use jumping by 28pc as surging natural gas prices encouraged operators to use in-house LPG as a fuel in preference to gas.

Residential sector demand generally weathered the storm in good shape despite higher than average temperatures and bigger energy bills, edging up to 154mn t. This was only slightly higher than the year before, with demand among the emerging markets suffering under the impact of high outright prices. Meanwhile, demand for LPG as a petrochemical feedstock continued its relentless expansion, exceeding 90mn t. Plagued by weak or negative production margins, demand from ethylene producers fell, but this was offset by the start-up of new propane dehydrogenation (PDH) plants, mostly in China. Growth in autogas demand came to a virtual standstill, with a collapse in sales in Ukraine a significant contributor. Autogas demand was broadly unchanged at just over 25mn t, despite being more competitive than gasoline and diesel.

Global length

A feature of the oil market since the pandemic has been the slow recovery of US crude production. But US NGL output has been growing steadily and LPG production last year rose by 6.5pc to another all-time high of 97mn t. The US now accounts for nearly 30pc of global output, almost 90pc of which comes from gas processing. But the country's exports could not keep up the pace, edging only 1.5pc higher to 53mn t as global appetite for US product was curbed by the combination of slower demand growth in Asia-Pacific and a rise in availability from the Middle East. With the domestic market unable to absorb excess product following a mild winter, US inventories swelled well above the five-year average.

This length will deepen in coming years, according to Argus forecasts, driven primarily by investment in gas processing in the US. This will be accompanied by further expansions to export terminal capacity — effectively every incremental

tonne of production is an incremental tonne of export, headed mainly to the key importing countries in Asia-Pacific.

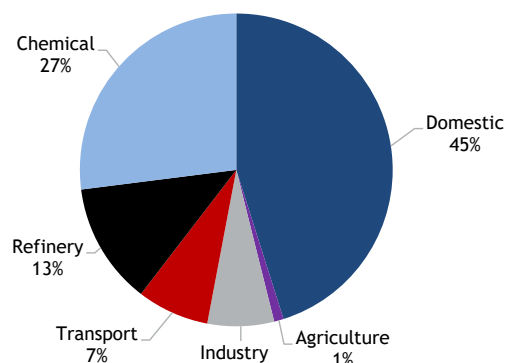
Adding to availability in the global market last year was the Middle East — historically the traditional source of supply to Asia-Pacific. The region's deliveries soared by 16pc to 43mn t, returning to 2019 levels as increasing crude production from Opec+ members resulted in key LPG producers Saudi Arabia, the UAE and Kuwait raising LPG output. Opec+ output quotas affect LPG supplies and exports from the Mideast Gulf, since much of the gas supply that feeds NGL fractionation in the region is associated with crude production. Strong increases in exports were recorded in Saudi Arabia, while Iran boosted exports by 35pc to 7.8mn t in 2022, with most heading to China. Iraq saw exports rise fivefold in 2022 to almost 450,000t, and further increases to around 2.5mn t are expected by 2025, potentially pointing to a new player in global markets.

Economic headwinds

China dominates the world market with LPG demand of 74mn t/yr — equivalent to 21.5pc of global consumption. But its thirst for LPG was partially curbed by slow economic growth and weak petrochemical buying. Beijing's strict Covid-19 policy limited LPG demand in the commercial and industrial sectors, in particular during full lockdowns of cities. The country's petrochemical sector has struggled with persistently weak margins as softening domestic polymer demand met additional supply pressure from the opening of new LPG-fed PDH plants. With operating rates reduced and much of the new capacity delayed, China's import growth slowed compared with the steep rises before the pandemic.

Asia-Pacific's second-largest market, India, reported 4pc growth in consumption to over 30mn t, after increasing by only 1.5pc in 2021. Domestic demand found support

LPG consumption by sector, 2022



Source: Argus/WLPGA

EXECUTIVE SUMMARY

from government subsidies to retail prices, which cushioned the impact of the sharp rise in global LPG prices. But LPG demand growth in India is yet to return to the 8.5pc/yr levels seen before the pandemic, as nearly the entire country now has access to the fuel. This has coincided with more robust domestic production, curbing India's appetite for imports from the Mideast Gulf.

Growth in sub-Saharan markets was impacted by the surge in global energy prices, with some facing LPG cylinder prices of twice the amount they were in 2019. Nigerian demand, already slowed by the pandemic, contracted by 5pc to 1.6mn t, making the country's 5mn t target by 2030 harder to achieve. LPG is primarily used as a cooking fuel in countries such as Nigeria and Kenya, with both aiming to displace the use of firewood, charcoal and other traditional dirty fuels with LPG. But rising prices have driven families back to using more polluting solid biomass fuels, undermining efforts to move to cleaner cooking fuels.

Europe looks to new suppliers

The EU has so far not imposed sanctions on Russian LPG exports, unlike oil. Nevertheless, the conflict in Ukraine has forced change on the market in Europe. Ukraine's traditional reliance on rail LPG imports from the east has ended, forcing a rapid switch to depend entirely on supply from Europe. Some traditional buyers such as Poland and the Czech Republic have looked to reduce their exposure to Russian imports. Normally supplied by rail from Russia, Poland's sea-borne imports surged to an all-time high of 1mn t in 2022. Across the board, traditional northwest European buyers of cargoes from Russia's 2.4mn t/yr Ust-Luga terminal halted dealings with Russian suppliers.

Regional product availability plunged by over 5pc to 42mn t in 2022, after reduced Russian pipeline flows drove natural gas prices to a four-digit premium to LPG, pushing upstream producers to leave LPG in the gas stream and refinery operators to use it as an alternative to gas. The sudden deficit was easily covered by readily available imports from the US, which shifted from being a swing to a base-load supplier. This meant that suddenly Europe was being supplied not from Russia and a wide network of local refineries, but by deliveries to a few big seaborne terminals in the Amsterdam-Rotterdam-Antwerp (ARA) hub. This strained Europe's capacity to distribute product inland, a task complicated by railway modernisation works in Germany and competition from coal distributors for access to rail infrastructure. This all resulted in significantly higher inland premiums early in the year.

European demand edged down by 1pc to 49mn t in 2022. Ukrainian LPG consumption slumped by 40pc to 1.2mn t in 2022 following a large outflow of the population, regular missile strikes and power outages in the country, and the economic slowdown. Across the region, petrochemical LPG intake slid by 4pc to 19mn t in 2022 as spiralling inflation cut spending on consumer goods, pushing European olefins production to a 29-year low. The decline was only partially cushioned by propane's consistent discount to competing feedstock naphtha. Residential demand was also reduced, owing to milder weather, higher prices and government calls to conserve energy owing to the Ukraine crisis.

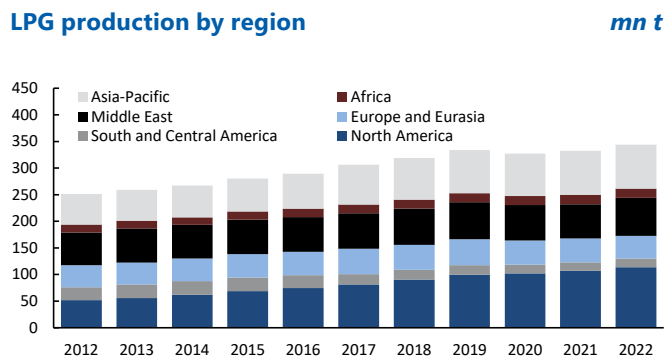
Shifting trade patterns

The conflict in Ukraine disrupted Russia's LPG trade patterns in 2022, trimming its exports by almost 8pc to 3.6mn t, largely because of European buyers halting purchases. Russian exporters sought other outlets for their product, with deliveries to Turkey surging and ex-Ust-Luga cargoes occasionally travelling to India and even to China. But the country's production still edged 1.8pc higher to just over 15.3mn t — the first increase since the pandemic. Rising production and declining exports left Russia increasingly oversupplied, resulting in a sharp fall in prices.

But low domestic prices may be short-lived as the supply situation in Russia appears weaker in 2023, with production declining in line with lower gas output. European exports are also making a comeback, with it becoming increasingly clear that the EU is unlikely to introduce formal sanctions on Russian supply.

Kazakhstan's LPG exports declined by 33pc to just over 1mn t, with supply routes disrupted, supply falling and demand rising. Higher demand was driven by the fast-growing autogas market, which increased to 1.3mn t in 2022 from as little as 75,000t in 2011. Additional support was provided by the commissioning of Kazakhstan Petrochemical Industries' PDH plant in Atyrau.

LPG production by region



EXECUTIVE SUMMARY

Sailing the high seas

Very large gas carrier (VLGC) freight rates strengthened further in 2022, with average spot rates for Houston to Chiba, the bellwether route for shipments between the US and Asia-Pacific, jumping by over 27pc to \$127/t. Underpinning this was strong demand for vessels to carry the growing flow of exports from the US and Middle East to Asia-Pacific.

Rates were also boosted by growing congestion through the Panama Canal, a key logistical bottleneck for the transportation of US exports to destinations in Asia-Pacific. Northbound waiting times lengthened to an average of nearly 20 days, while southbound delays averaged around 15.5 days in November, owing to a seasonal increase in traffic and persistent fog. The combination of those factors resulted in Houston-Chiba freight rates rising to a seven-year high of \$208/t by the end of the year. The market expects this tightness to persist, despite the delivery of new vessels.

Market environment

Energy markets and pricing in 2022 were sent reeling by the outbreak of the Russia-Ukraine conflict. European buyers rushed to halt purchases of Russian crude and refined products while the EU moved towards the adoption of formal sanctions on Russian oil. In retaliation, Russia sharply reduced its gas supplies to most European countries. Prices shot higher as the market looked for alternative sources of oil and gas. Crude at one point hit \$132/bl, with diesel premiums to crude trading at an all-time record high. Gas peaked at \$85/mn Btu, equivalent to a crude price of \$528/bl.

Prices returned to pre-crisis levels by the end of last year, with the market reassured that Europe would not be short of oil and gas and that Russian oil exports would continue to flow, albeit increasingly to non-European destinations. By the start of 2023, fears of an economic downturn and weaker oil demand started to weigh on market sentiment, with oil prices coming under pressure as a result. In response, the Opec+ alliance again cut production, with output currently 3mn b/d lower than at the same point last year. This is helping to keep crude prices strong.

Refined product prices also remain high owing to the disruption that EU sanctions have had on global trade flows, but also because the global refining system is relatively tight after significant capacity closures since 2019. Gas markets have cooled significantly since the disruptions of 2022. A mild European winter left storage levels higher than usual

by early 2023, and they look to be more than adequate for the approaching winter. Gas prices are not expected to spike again as they did in 2022, but they will remain strong relative to historical levels.

Global transformation

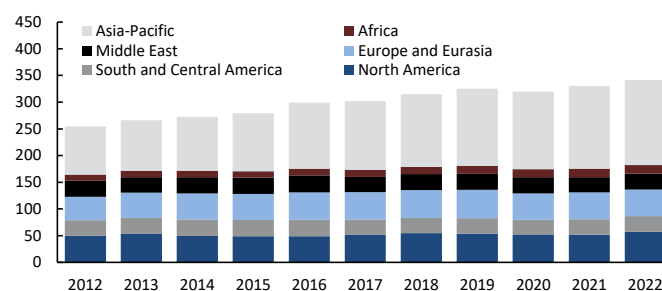
US LPG exports continue to transform the global market. Total exports — primarily propane — were 1.8mn b/d in 2022, one-third higher than pre-Covid levels. Europe imported 300,000 b/d from the US in 2022, representing 17pc of total exports. This was almost 45pc higher than 2021 volumes and although the bulk of US exports continue to go to Asia-Pacific, Europe's share of US exports is growing.

Rising US export availability is a key reason why LPG prices are weakening. Outright prices in 2022 were pulled higher by the increase in crude prices and were their highest since 2014, with ARA large cargo propane averaging \$682/t and the equivalent butane price averaging \$721/t. But relative to competing feedstock naphtha, LPG weakened in 2022, with the propane and butane ratios to naphtha falling to 0.89 and 0.94, respectively, compared with 0.98 and 0.97 a year earlier.

The weaker macroeconomic environment that has developed in the wake of rising inflation and higher interest rates in 2022 has weighed on demand for petrochemical products, which combined with rising US exports has helped create an increasingly competitive feedstock environment. This is putting downward pressure on LPG prices relative to naphtha while also increasing naphtha's discount to crude. In north-west Europe, this discount averaged \$15/bl in 2022, about three times the level immediately before Covid. Without a pick-up in demand for petrochemical products, there is a risk of prices for naphtha and LPG falling further still, as the two feedstocks compete for limited offtake.

LPG consumption by region

mn t



PETROCHEMICALS

Consumption of LPG for domestic purposes continues to dominate global demand, but the use of LPG as a petrochemical feedstock is rapidly growing in importance. Global LPG consumption rose by 63mn t between 2015 and 2022, with 27pc of this resulting from the use of LPG as a petrochemical feedstock. Total feedstock demand amounted to around 90mn t in 2022, representing 26pc of global LPG demand. This makes it the next most important market for LPG after the residential sector, which represents 45pc of global demand.

Until 2000, the use of LPG as a petrochemical feedstock was almost entirely confined to North America and in particular the US, reflecting the significant level of local production from gas processing. But by 2022 the situation had changed completely. Now North America accounts for just 25pc of global non-energy LPG demand and Asia-Pacific over 45pc. This increase in Asia-Pacific use has been based almost completely on imports of competitively priced US product.

Building blocks

LPG is used to make aromatics including benzene, toluene and xylene, which are used in gasoline production, among other processes, but the vast majority is used to produce olefins, either ethylene from steam cracking or propylene from propane dehydrogenation (PDH). Both products are key building blocks for a large array of downstream consumer products. Global demand growth in both products remains robust, and is expected to be 4-5pc/yr over the medium term. To meet this, a further 20mn t/yr of ethylene capacity is in the pipeline and more than 30mn t/yr of propylene. Of the latter, half will be PDH plants, potentially creating incremental demand for almost 15mn t/yr of additional propane as feedstock.

In the past, propylene has mainly been sourced from crude refining and from ethylene steam crackers, where it is a significant co-product. But growing availability of low-cost propane from the US has generated a wave of investment in on-purpose PDH facilities, which produce propylene directly from propane feedstock. China alone is building around 13mn t/yr of new PDH capacity, almost half of all planned global additions.

It is PDH that is driving the world's appetite for LPG as a petrochemical feedstock. PDH feedstock requirements in 2022 were 21mn t, more than double what they were five years earlier. In contrast, propane use in ethylene production was up by 19pc, or 6mn t. On the basis of current investments, PDH propane demand by 2025 could be double what it was in 2022.

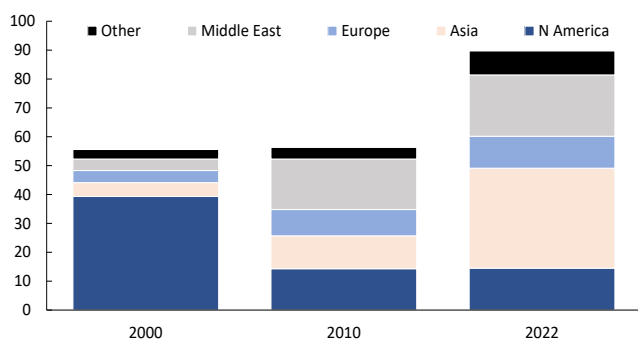
Pricing tool

LPG's future as a feedstock for ethylene production, although less impressive than in PDH, is likely to still be significant. The combination of more ethylene production capacity and an increase in the share of LPG in the global feedstock slate — fuelled by competitive supply from the US — suggests that LPG use could grow by more than 45pc, or 16mn t, between 2022 and 2026.

Underpinning these developments is the US shale revolution, which has transformed the US from being a net importer of LPG before 2010 to become the world's largest net exporter today, at 50mn t/yr and growing. And other countries are increasing exports too. These incremental volumes need to find a market, and that market is petrochemicals. And price is the tool to do it.

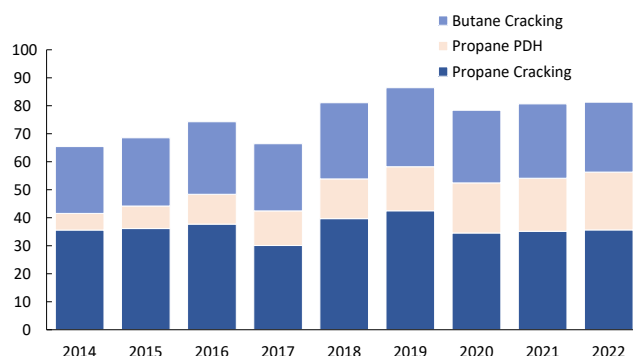
Regional LPG feedstock use

mn t



LPG use in petrochemicals

mn t



RENEWABLE LIQUID GAS (LPG AND DME)

Renewable liquid gas production capacity — LPG and DME — has been increasing steadily in recent years. Global renewable LPG capacity currently is an estimated 200-250,000t/yr. If all the currently planned projects come to market on target, bioLPG production in 2025 could be as high as 625,000t.

Short-term growth in bioLPG yields will mainly be from hydrotreating vegetable oils (HVO) to produce biodiesel, sustainable aviation fuel (SAF) and other biofuels. This currently accounts for around 98pc of bioLPG output. Broad political support for biofuels will mean more investment in HVO production, much of it in Europe, where refinery conversions and greenfield biofuel projects are being encouraged by government mandates. But strong growth will also occur in Asia-Pacific, with several major projects in the pipeline, specifically in China and Australia. In the US, incentives provided by the Inflation Reduction Act will encourage supply growth.

New pathways

The industry has also developed alternative production pathways that directly convert feedstocks to bioLPG. Polish firm Ekobenz and partner UGI International led the way in 2021 with its bioLPG from ethanol technology. In 2022, several European LPG companies teamed up with US energy research non-profit organisation GTI Energy to develop further, bring to production and use its "Cool LPG" technology to convert biogas into bioLPG and other renewable fuels. Green LG Energy, a new joint venture of five leading Italian companies, aims to reach 10,000-20,000t of output from a pilot plant within two years using GTI's technology. In Germany, retailer Friedrich Scharr has also signed an agreement to access the GTI technology, as too has a consortium in the US, rLPG North America. SHV Energy is also collaborating with GTI Energy and Drochaid Research Services to develop their designs for bioLPG plants using bioethanol. SHV Energy also has a strategic partnership with Lanzatech to use their Carbon Capture and Transformation technology to bring renewable propane to the market. Non-HVO/SAF bioLPG capacity should more than triple to 77,000 t/yr by 2025.

rDME is also gaining increasing attention. US firm Suburban Propane has sold the first-ever propane and rDME blend in California using rDME from Oberon Fuels' 4,500 USG/d Maverick Innovation Centre. Oberon has plans to raise rDME production to 500,000 t/yr by 2027. Netherlands-based joint venture Dimeta launched its 50,000 t/yr rDME project in Teesside, UK, in May 2022, to be completed in 2025. The renewable fuel has also attracted engine and appliance manufacturers looking to develop DME applications for off-road, heavy duty and autogas vehicles, as well as for domestic and

industrial heating.

Elsewhere, the Haru-Oni project in southern Chile has just started producing bioLPG from captured CO₂ and renewable electricity. The plant is currently operating in its pilot stage but aims to produce over 7,000 t/yr once phase one commercial operations start. Multiple projects have started in Japan but are all currently in the trial phase, with commercial operations expected 2025-30.

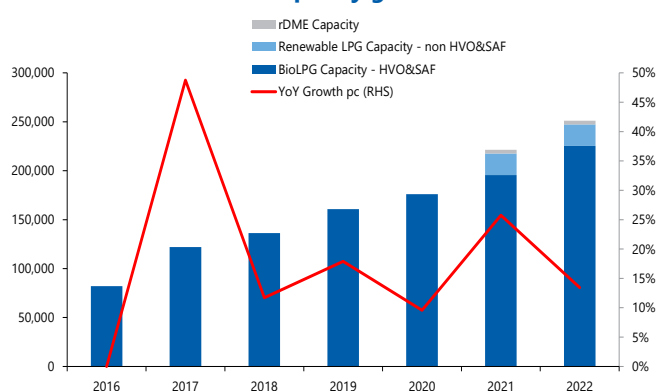
Exciting future

Companies continue to announce new rDME plans, such as Dimeta's co-operation with Canadian biofuels firm Enkernem to develop 165,000 t/yr plants in Europe and North America. Dimeta has also partnered with NextChem and MyRechemical to convert municipal solid waste into methanol and then into DME. Outside North America, Oberon Fuels has teamed up with Ireland-based LPG distributor DCC Energy to produce and sell renewable DME in Europe.

Despite few measures aimed specifically at promoting renewable liquid gas, a big push by LPG associations to raise its profile has begun to bear fruit. In the UK, the role of renewable liquid gas (including bioLPG and rDME) in decarbonising heating was recognised in the government's Biomass Strategy report. Around 1.1mn homes in England are not connected to the gas grid, of which around a fifth are not readily suitable for electrification, government modelling suggests. In the EU, a proposed new Energy Performance of Buildings Directive offers real hope for the future of LPG as a heating fuel in Europe.

These developments have set the stage for an exciting future for renewable DME, with production forecast to reach over 60,000 t/yr in the next three years from just under 4,000 t/yr today.

Global renewable LPG capacity growth



PRODUCTION

LPG Production, 2012-22												'000t
Country	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	±%21/22
US	45,954	52,075	58,726	64,586	65,652	69,152	76,516	84,580	87,442	91,211	97,224	6.6
Canada	9,789	10,015	10,255	10,220	11,399	12,380	14,030	15,124	14,631	15,712	16,399	4.4
Total North America	55,743	62,090	68,981	74,806	77,051	81,532	90,546	99,704	102,073	106,923	113,623	6.3
Argentina	2,775	2,856	2,847	2,583	2,654	2,627	2,717	2,818	2,466	2,770	2,972	7.3
Bolivia	303	340	373	341	480	496	483	520	440	430	386	-10.2
Brazil	5,756	5,680	5,419	5,537	5,093	5,709	5,555	5,611	5,846	5,324	5,795	8.8
Chile	604	312	338	332	279	204	250	280	278	443	469	6.0
Colombia	635	642	603	615	555	551	625	625	699	757	856	13.1
Costa Rica	0	0	0	0	0	0	0	0	0	0	0	-
Cuba	42	73	72	69	48	16	48	48	47	44	41	-6.3
Dominican Republic	15	13	16	7	17	11	11	11	11	11	11	0.0
Ecuador	266	250	197	150	248	252	218	218	218	218	196	-10.3
El Salvador	6	0	0	0	0	0	0	0	0	0	0	-
Jamaica	9	6	6	8	9	13	11	10	9	4	2	-42.2
Mexico	6,423	6,487	6,464	5,490	4,987	4,586	3,839	3,372	3,209	2,837	2,902	2.3
Netherlands Antilles	30	24	51	59	45	37	37	37	37	37	40	8.9
Nicaragua	9	11	10	13	18	20	17	17	17	19	21	6.2
Panama	0	0	0	0	0	0	0	0	0	0	0	-
Paraguay	0	0	0	0	0	0	0	0	0	0	0	-
Peru	1,528	1,766	1,719	1,572	1,548	1,525	1,559	1,680	1,352	1,494	1,447	-3.1
Trinidad & Tobago	707	703	668	607	490	537	450	469	365	301	270	-10.5
Uruguay	75	90	80	80	85	21	93	92	95	100	87	-12.4
US Virgin Islands	0	0	0	0	0	0	0	0	0	0	0	-
Venezuela	6,113	6,069	6,279	6,110	5,786	2,603	2,095	1,989	1,219	1,152	1,111	-3.5
Other	86	105	121	119	120	125	117	77	77	77	77	0.0
Total South & C. America	25,382	25,427	25,263	23,692	22,462	19,333	18,126	17,873	16,385	16,017	16,683	4.2
Austria	257	240	245	349	450	376	447	431	452	422	371	-12.1
Azerbaijan	215	263	202	172	200	210	224	224	210	283	246	-13.1
Belarus	640	637	682	649	458	546	525	552	512	516	534	3.5
Belgium	580	576	707	671	697	739	829	984	1,036	1,060	693	-34.7
Bulgaria	118	92	98	101	102	120	112	129	77	64	90	40.6
Croatia	281	250	225	248	248	283	256	219	214	212	188	-11.3
Czech Republic	240	217	267	248	283	383	380	443	312	394	355	-9.9
Denmark	168	103	118	124	94	106	0	122	112	87	74	-14.7
Finland	256	310	293	241	275	285	255	289	245	174	154	-11.5
France	1,466	1,472	1,474	1,430	1,416	1,444	1,329	1,250	880	1,029	954	-7.3
Germany	2,624	2,645	2,518	2,656	2,745	3,419	3,224	3,232	2,885	3,025	2,768	-8.5
Greece	631	671	735	703	825	838	848	801	780	862	845	-2.0
Hungary	208	239	289	251	222	188	180	167	159	145	152	4.8
Ireland	72	63	59	47	42	48	57	45	52	42	37	-10.2
Italy	1,541	1,684	1,327	1,499	1,507	1,758	1,630	1,432	1,237	1,437	1,390	-3.3

LPG Production, 2012-22												'000t
Country	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	±%21/22
Kazakhstan	2,215	2,448	2,464	2,536	2,680	2,902	3,115	3,196	3,178	3,170	2,857	-9.9
Lithuania	221	253	218	265	288	310	315	350	294	288	214	-25.8
Macedonia	10	3	0	0	0	0	0	0	0	0	0	-
Malta	0	0	0	0	0	0	0	0	0	0	0	-
Moldova	0	0	0	0	0	0	0	0	0	0	0	-
Montenegro	0	0	0	0	0	0	0	0	0	0	0	-
Netherlands	1,551	1,507	1,632	1,735	1,790	1,719	1,690	1,690	1,489	1,736	1,389	-20.0
Norway	5,730	5,625	5,833	5,512	5,160	5,548	4,883	5,240	5,100	4,806	3,604	-25.0
Poland	358	340	405	375	440	430	485	495	530	500	490	-2.0
Portugal	221	261	198	175	240	237	195	261	244	214	246	14.9
Romania	527	523	560	567	590	617	624	592	522	463	550	18.9
Russia	13,395	14,241	15,834	15,844	16,555	16,660	16,690	17,030	16,280	15,029	15,305	1.8
Serbia	113	193	158	176	166	127	83	83	100	134	138	3.0
Slovakia	122	172	155	181	177	177	180	133	163	163	163	0.0
Spain	1,344	1,335	1,241	1,087	1,541	1,401	1,824	1,698	1,474	1,623	1,519	-6.4
Sweden	391	308	423	473	481	421	498	446	401	626	566	-9.5
Switzerland	119	193	173	106	116	107	133	110	97	70	77	10.0
Turkey	844	804	769	899	1,138	1,180	1,082	1,247	1,135	1,014	1,100	8.5
Turkmenistan	365	467	476	437	435	410	430	468	365	355	360	1.4
Ukraine	563	503	440	412	401	428	403	409	412	438	320	-26.9
UK	3,509	3,523	3,268	3,301	3,301	3,324	2,969	4,115	3,739	3,322	3,408	2.6
Uzbekistan	274	361	366	470	610	660	740	730	715	795	861	8.3
Other	127	121	101	231	236	236	236	243	228	221	209	-5.4
Total Europe & Eurasia	41,296	42,643	43,953	44,171	45,909	47,637	46,871	48,857	45,630	44,718	42,229	-5.6
Bahrain	216	201	216	220	239	225	225	393	376	344	374	8.7
Iran	7,570	7,717	7,778	8,024	9,409	9,244	7,734	8,062	7,808	8,976	11,013	22.7
Iraq	1,538	1,310	1,100	1,578	1,986	1,832	1,930	1,642	1,874	1,853	2,217	19.7
Israel	498	581	605	621	597	611	592	613	539	666	666	0.0
Jordan	102	78	91	80	81	78	80	80	76	51	51	0.0
Kuwait	4,992	4,843	4,760	4,804	4,925	4,914	6,099	6,287	5,769	5,580	6,022	7.9
Lebanon	0	0	0	0	0	0	0	0	0	0	0	-
Oman	586	557	573	549	530	530	768	980	843	1,007	859	-14.7
Qatar	10,479	10,829	10,917	11,203	10,159	10,458	10,669	10,807	10,730	10,511	10,592	0.8
Saudi Arabia	27,798	26,273	27,325	26,445	30,324	27,239	28,891	27,687	26,420	24,494	27,396	11.8
Syria	323	189	151	132	139	137	139	139	139	144	133	-8.1
UAE	9,532	10,021	10,491	10,869	10,466	10,793	10,925	12,123	11,636	10,520	11,789	12.1
Yemen	667	690	605	610	516	417	407	405	397	371	371	0.0
Other	0	0	0	0	0	0	0	0	0	0	0	-
Total Middle East	64,301	63,289	64,612	65,135	69,371	66,478	68,460	69,219	66,606	64,518	71,482	10.8

LPG Production, 2012-22												'000t
Country	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	±%21/22
Algeria	7,429	7,484	9,176	9,005	9,207	9,155	8,972	8,443	7,996	8,521	8,490	-0.4
Angola	542	712	591	526	732	760	837	1,054	1,266	1,114	1,079	-3.1
Cameroon	30	25	25	17	17	15	25	24	25	35	27	-22.4
Chad	5	13	5	5	5	17	20	20	20	20	20	0.0
Congo	287	308	20	20	12	8	9	0	0	0	0	-
Egypt	1,996	2,312	2,342	2,448	2,533	2,480	2,513	2,502	2,376	2,546	2,776	9.0
Gabon	14	14	13	13	13	26	8	8	8	8	8	0.0
Ghana	27	26	7	92	114	205	222	70	85	95	116	22.6
Ivory Coast	45	44	53	42	21	22	22	22	22	13	13	0.0
Kenya	17	12	13	13	0	0	0	0	0	0	0	-
Libya	446	374	343	316	349	321	304	315	590	588	543	-7.7
Morocco	116	96	99	15	0	0	0	0	0	0	0	-
Nigeria	2,304	1,747	2,282	2,552	2,940	2,886	2,978	3,864	3,744	3,997	3,691	-7.7
Senegal	1	1	3	5	3	3	3	3	3	3	3	0.0
South Africa	360	270	250	270	250	283	246	267	235	99	102	3.0
Sudan	306	298	310	300	310	320	320	320	320	320	320	0.0
Tunisia	148	189	163	147	235	142	128	105	86	101	71	-29.6
Other	156	169	182	38	40	40	40	76	69	64	65	2.7
Total Africa	14,229	14,094	15,877	15,824	16,781	16,683	16,647	17,093	16,845	17,524	17,326	-1.1
Australia	2,606	2,454	2,553	2,174	2,325	2,068	2,175	3,359	3,647	3,363	2,989	-11.1
Bangladesh	21	21	21	17	20	17	16	16	13	14	15	7.1
China	22,515	24,559	26,493	28,886	34,804	36,709	38,719	40,615	44,286	47,570	48,192	1.3
India	10,382	10,525	10,626	11,072	12,094	12,286	13,109	12,768	12,231	12,184	12,821	5.2
Indonesia	2,415	2,299	2,437	2,752	2,241	2,241	2,026	1,977	1,936	1,917	2,002	4.4
Japan	3,573	4,443	4,302	5,663	5,353	5,377	5,200	5,199	1,795	1,788	1,502	-16.0
Malaysia	2,725	2,388	2,162	1,797	3,075	2,621	2,734	3,057	3,050	2,820	2,820	-0.0
New Zealand	166	177	206	193	168	177	187	162	161	148	152	2.7
Pakistan	423	398	440	629	650	677	784	784	720	753	735	-2.3
Philippines	318	321	301	464	450	448	508	292	152	96	96	0.0
Singapore	1,043	934	966	967	989	828	785	614	614	614	614	0.0
South Korea	2,475	2,466	2,703	3,216	3,028	3,432	3,759	3,434	2,988	3,054	2,971	-2.7
Sri Lanka	17	22	28	10	9	10	19	26	22	17	13	-24.1
Taiwan	1,396	1,530	1,228	1,163	1,163	1,026	1,063	1,065	674	1,062	1,025	-3.5
Thailand	5,687	5,447	5,506	5,513	5,719	6,056	6,247	5,980	5,496	5,671	5,123	-9.7
Timor Leste	1,665	948	780	400	0	0	0	0	0	0	0	-
Vietnam	654	712	743	727	804	757	828	1,774	1,634	1,743	1,757	0.8
Other	86	105	121	119	120	125	117	77	77	77	77	0.6
Total Asia-Pacific	58,131	59,693	61,547	65,697	72,947	74,785	78,217	81,182	79,480	82,878	82,891	0.0
Total World	259,082	267,236	280,233	289,325	304,521	306,448	318,866	333,928	327,020	332,578	344,234	3.5

Availability to Local Market, 2022						'000t
	Production			Imports	Exports	Consumption
	Refinery	Gas processing	Total			
US	10,303	86,921	97,224	4,803	53,302	46,550
Canada	1,444	14,955	16,399	183	7,190	10,511
Total North America	11,747	101,876	113,623	4,986	60,492	57,060
Argentina	808	2,164	2,972	0	1,116	1,848
Bolivia	76	310	386	0	31	430
Brazil	4,160	1,635	5,795	1,800	0	7,595
Chile	469	0	469	1,635	246	1,444
Colombia	388	468	856	63	0	847
Costa Rica	0	0	0	176	0	176
Cuba	24	17	41	133	0	175
Dominican Republic	11	0	11	1,046	0	1,057
Ecuador	196	0	196	1,187	0	1,351
El Salvador	0	0	0	339	0	339
Guatemala	0	0	0	657	123	535
Honduras	0	0	0	241	0	244
Jamaica	2	0	2	84	0	87
Mexico	336	2,567	2,902	6,521	0	9,433
Netherlands Antilles	40	0	40	0	32	6
Nicaragua	21	0	21	120	0	135
Panama	0	0	0	177	0	177
Paraguay	0	0	0	90	0	90
Peru	17	1,430	1,447	607	0	2,054
Puerto Rico	0	0	0	86	0	77
Trinidad & Tobago	0	270	270	0	211	58
Uruguay	87	0	87	37	0	119
US Virgin Islands	0	0	0	315	0	297
Venezuela	117	994	1,111	646	406	974
Other	77	0	0	213	52	212
Total South & C. America	6,829	9,854	16,683	16,173	2,217	29,761
Austria	371	0	371	96	64	347
Azerbaijan	216	30	246	0	0	246
Belarus	232	302	534	766	905	395
Belgium	693	0	693	2,545	869	2,334
Bulgaria	90	0	90	412	44	458
Croatia	147	41	188	21	98	111
Cyprus	0	0	0	62	0	68
Czech Republic	355	0	355	177	112	422
Denmark	74	0	74	38	48	78
Estonia	0	0	0	66	10	57
Finland	154	0	154	783	0	989
France	954	0	954	3,044	1,017	2,504
Germany	2,768	0	2,768	1,319	303	3,367
Greece	845	0	845	98	165	734
Hungary	124	28	152	375	73	454
Republic of Ireland	37	0	37	154	17	172
Italy	1,390	0	1,390	2,534	315	3,622

Availability to Local Market, 2022						'000t
	Production			Imports	Exports	Consumption
	Refinery	Gas processing	Total			
Kazakhstan	770	2,087	2,857	1	1,118	1,740
Latvia	0	0	0	266	190	76
Lithuania	214	0	214	130	215	128
Macedonia	0	0	0	70	0	70
Malta	0	0	0	23	0	19
Moldova	0	0	0	55	0	57
Montenegro	0	0	0	17	0	19
Netherlands	1,389	0	1,389	3,181	2,019	2,557
Norway	292	3,312	3,604	246	3,338	481
Poland	464	26	490	2,465	460	2,495
Portugal	246	0	246	821	48	804
Romania	550	0	550	280	340	484
Russia	4,105	11,200	15,305	0	3,580	11,322
Serbia	138	0	138	64	43	153
Slovakia	163	0	163	49	75	136
Slovenia	0	0	0	86	5	81
Spain	1,519	0	1,519	1,040	528	1,892
Sweden	566	0	566	1,250	1,083	733
Switzerland	77	0	77	82	8	151
Tajikistan	0	0	0	396	0	396
Turkey	1,100	0	1,100	3,205	410	4,067
Turkmenistan	235	125	360	0	191	169
Ukraine	70	250	320	857	0	1,175
UK	1,682	1,726	3,408	1,292	1,311	2,762
Uzbekistan	16	845	861	0	60	801
Other	88	121	209	50	61	197
Total Europe & Eurasia	22,136	20,093	42,229	28,417	19,122	49,323
Bahrain	126	247	374	0	298	75
Iran	2,302	8,710	11,013	0	7,803	3,210
Iraq	335	1,882	2,217	0	450	1,767
Israel	666	0	666	212	246	632
Jordan	51	0	51	395	0	446
Kuwait	703	5,319	6,022	0	5,370	652
Lebanon	0	0	0	248	0	248
Oman	595	265	859	21	407	474
Qatar	348	10,245	10,592	0	10,343	249
Saudi Arabia	1,994	25,402	27,396	0	8,710	18,686
Syria	63	70	133	435	0	568
UAE	523	11,266	11,789	0	9,399	2,390
Yemen	70	301	371	31	0	402
Other	0	0	0	223	0	185
Total Middle East	7,775	63,707	71,482	1,564	43,026	29,983
Algeria	705	7,785	8,490	0	5,826	2,664
Angola	39	1,040	1,079	61	793	360
Burkina Faso	0	0	0	83	4	79
Cameroon	0	27	27	111	0	138

Availability to Local Market, 2022						'000t
	Production			Imports	Exports	Consumption
	Refinery	Gas processing	Total			
Chad	20	0	20	25	0	45
Congo	0	0	0	15	0	15
Egypt	1,149	1,627	2,776	1,691	304	4,398
Ethiopia	0	0	0	11	0	11
Gabon	8	0	8	45	0	53
Ghana	8	108	116	227	0	344
Ivory Coast	10	4	13	565	0	579
Kenya	0	0	0	357	33	342
Libya	35	508	543	0	257	287
Mali	0	0	0	24	0	24
Mauritius	0	0	0	92	0	88
Morocco	0	0	0	3,012	0	3,012
Nigeria	75	3,616	3,691	0	2,064	1,627
Reunion	0	0	0	22	0	22
Senegal	3	0	3	190	14	179
South Africa	102	0	102	369	104	332
Sudan	320	0	320	109	0	429
Togo	0	0	0	0	0	0
Tunisia	20	51	71	552	0	624
Uganda	0	0	0	25	0	25
Other	65	0	65	238	0	266
Total Africa	2,559	14,767	17,326	7,825	9,400	15,943
Australia	168	2,821	2,989	341	2,378	795
Bangladesh	12	3	15	1,412	0	1,426
China	48,192	0	48,192	26,604	868	73,929
Hong Kong	0	0	0	286	0	286
India	11,094	1,728	12,821	17,647	522	30,140
Indonesia	908	1,093	2,002	6,791	0	8,627
Japan	1,502	0	1,502	10,769	236	13,510
Malaysia	1,498	1,322	2,820	620	1,069	2,370
Nepal	0	0	0	567	0	567
New Zealand	0	152	152	25	30	194
Pakistan	200	536	735	457	0	1,219
Philippines	96	0	96	1,734	0	1,830
Singapore	614	0	614	453	97	970
South Korea	2,971	0	2,971	8,885	58	11,161
Sri Lanka	13	0	13	247	0	260
Taiwan	1,025	0	1,025	750	0	1,766
Thailand	2,184	2,939	5,123	1,549	169	6,451
Timor Leste	0	0	0	0	0	0
Vietnam	1,339	418	1,757	2,236	58	3,935
Other	65	0	65	399	51	244
Total Asia-Pacific	71,880	11,011	82,891	81,772	5,535	159,681
Total World	122,926	221,308	344,234	140,738	139,791	341,752

CONSUMPTION

LPG Consumption, 2012-22												'000t
Country	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	±% 21/22
US	41,994	46,368	42,726	42,035	41,493	43,256	46,223	47,250	43,649	43,455	46,550	7.1
Canada	7,716	6,876	6,857	6,671	7,681	7,989	8,520	6,552	8,427	8,396	10,511	25.2
Total North America	49,710	53,244	49,583	48,706	49,174	51,245	54,743	53,802	52,076	51,851	57,060	10.0
Argentina	1,778	2,026	1,988	1,750	1,775	1,672	1,577	1,559	1,407	1,756	1,848	5.2
Bolivia	368	374	387	395	401	377	389	398	380	418	430	2.8
Brazil	7,145	7,410	7,428	7,308	7,400	7,390	7,300	7,539	7,688	7,657	7,595	-0.8
Chile	1,355	1,268	1,412	1,324	1,237	1,294	1,317	1,326	1,353	1,448	1,444	-0.3
Colombia	567	553	600	598	630	630	700	672	728	775	847	9.3
Costa Rica	120	127	137	146	159	168	176	187	181	200	176	-12.0
Cuba	106	113	121	123	124	145	161	169	171	192	175	-9.0
Dominican Republic	744	773	828	922	913	987	1,017	1,027	988	1,037	1,057	1.9
Ecuador	1,057	1,090	1,139	1,126	1,073	1,118	1,127	1,229	1,237	1,295	1,351	4.3
El Salvador	217	236	275	373	291	300	304	310	314	334	339	1.6
Guatemala	261	274	285	331	355	373	391	409	415	505	535	5.9
Honduras	104	114	119	139	144	159	168	182	174	221	244	10.5
Jamaica	85	78	73	79	89	92	87	89	84	90	87	-3.7
Mexico	9,119	8,988	9,070	8,800	8,947	8,976	8,753	9,010	9,100	9,111	9,433	3.5
Netherlands Antilles	8	7	7	6	6	6	6	6	6	6	6	1.8
Nicaragua	83	95	98	105	117	125	124	131	141	138	135	-1.6
Panama	159	165	175	140	139	143	148	151	146	153	177	15.7
Paraguay	86	83	80	80	81	81	87	88	80	92	90	-2.2
Peru	1,341	1,503	1,579	1,619	1,600	1,764	1,919	1,985	1,767	2,004	2,054	2.5
Puerto Rico	96	102	102	98	91	83	79	76	75	76	77	1.9
Trinidad & Tobago	14	40	44	57	61	54	39	40	32	73	58	-20.5
Uruguay	122	133	124	118	120	111	112	116	131	119	119	0.3
US Virgin Islands	20	20	20	25	50	88	104	303	274	289	297	2.7
Venezuela	3,813	4,105	4,385	4,649	4,529	2,723	2,324	1,500	499	911	974	6.9
Other	198	218	211	220	224	232	245	209	204	208	212	1.8
Total South & C. America	28,966	29,895	30,687	30,531	30,556	29,091	28,654	28,715	27,574	29,109	29,761	2.2
Austria	316	279	285	316	435	380	413	403	407	358	347	-2.9
Azerbaijan	123	167	169	150	140	133	136	133	182	278	246	-11.6
Belarus	419	418	426	424	410	410	376	445	406	396	395	-0.3
Belgium	1,479	1,560	1,832	2,271	2,101	1,586	2,283	2,305	2,191	2,268	2,334	2.9
Bulgaria	339	387	411	432	441	447	437	427	438	433	458	5.8
Croatia	147	146	139	140	145	132	138	127	100	108	111	3.3
Cyprus	56	51	47	54	55	57	54	61	65	65	68	5.1
Czech Republic	206	222	273	213	327	396	422	445	388	433	422	-2.5
Denmark	50	48	48	50	54	58	57	54	59	60	78	30.2
Estonia	18	18	17	18	19	23	25	27	32	42	57	35.7
Finland	720	757	946	873	915	840	876	1,011	874	897	989	10.2
France	3,373	3,680	3,986	3,826	3,566	3,438	3,465	3,839	3,124	3,110	2,504	-19.5
Germany	3,289	3,384	2,846	2,956	3,083	4,478	3,625	3,889	3,493	3,740	3,367	-10.0
Greece	406	493	497	512	601	563	546	555	483	550	734	33.5
Hungary	409	409	444	458	481	521	568	555	530	568	454	-20.1

CONSUMPTION

LPG Consumption, 2012-22												'000t
Country	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	±% 20/21
Ireland	121	135	133	136	145	148	159	165	165	161	172	6.9
Italy	3,446	3,551	3,309	3,525	3,637	3,624	3,506	3,570	3,072	3,225	3,622	12.3
Kazakhstan	419	455	606	674	993	1,043	1,282	1,334	1,235	1,495	1,740	16.4
Latvia	73	85	93	97	91	92	86	75	74	73	76	4.1
Lithuania	193	183	180	162	154	151	142	143	127	121	128	6.3
Macedonia	56	58	63	71	78	76	79	82	67	68	70	2.5
Malta	24	24	25	26	24	24	25	27	25	24	19	-21.4
Moldova	63	74	77	74	77	72	71	67	63	61	57	-6.6
Montenegro	17	14	16	18	17	19	18	19	13	19	19	0.0
Netherlands	2,284	4,192	4,927	3,970	3,626	3,108	3,381	2,950	3,032	2,579	2,557	-0.9
Norway	885	872	776	715	722	692	413	459	485	477	481	0.8
Poland	2,145	2,117	2,160	2,245	2,355	2,495	2,415	2,520	2,340	2,435	2,495	2.5
Portugal	589	823	996	843	865	796	676	862	861	839	804	-4.2
Romania	555	555	541	529	541	540	475	511	493	518	484	-6.5
Russia	9,738	9,548	10,007	9,657	10,175	10,290	10,255	11,015	11,003	10,867	11,322	4.2
Serbia	367	362	295	310	281	219	148	146	129	165	153	-7.5
Slovakia	153	156	124	160	158	166	163	123	112	131	136	3.9
Slovenia	83	75	74	82	81	88	88	87	77	82	81	-1.2
Spain	2,267	2,174	2,333	2,578	2,865	2,538	2,623	2,434	1,960	1,668	1,892	13.4
Sweden	819	1,125	969	911	1,131	1,005	1,058	1,055	749	978	733	-25.1
Switzerland	173	178	189	189	187	155	170	169	156	161	151	-6.2
Tajikistan	171	225	296	336	349	360	381	431	448	413	396	-4.1
Turkey	3,826	3,808	3,856	4,131	4,268	4,243	4,311	4,343	4,034	4,164	4,067	-2.3
Turkmenistan	10	10	10	10	197	229	209	224	200	170	169	-0.6
Ukraine	837	949	1,055	1,140	1,488	1,603	1,828	2,020	2,022	1,978	1,175	-40.6
UK	2,876	3,117	2,994	3,144	3,158	2,969	3,568	3,257	2,740	2,808	2,762	-1.6
Uzbekistan	246	272	277	449	590	640	650	678	662	704	801	13.8
Other	347	336	238	225	217	216	212	209	193	200	197	-1.6
Total Europe & Eurasia	44,133	47,492	48,985	49,100	51,243	51,063	51,813	53,247	49,309	49,889	49,323	-1.1
Bahrain	55	55	58	60	64	69	73	77	74	68	75	10.4
Iran	3,262	3,281	3,116	3,243	3,135	3,165	3,265	3,030	2,985	3,198	3,210	0.4
Iraq	1,704	1,825	1,668	1,700	1,610	1,720	1,750	1,476	1,710	1,715	1,767	3.0
Israel	689	651	644	675	693	733	714	724	697	651	632	-2.9
Jordan	378	363	367	415	417	434	454	475	460	440	446	1.3
Kuwait	340	352	362	364	162	548	620	619	612	627	652	3.9
Lebanon	244	270	247	258	267	261	233	257	245	233	248	6.5
Oman	121	141	168	181	192	207	218	231	214	228	474	107.8
Qatar	817	867	926	971	937	217	234	245	246	265	249	-6.2
Saudi Arabia	20,098	18,973	20,625	19,644	21,810	18,583	19,622	19,585	19,678	17,924	18,686	4.3
Syria	600	516	471	456	456	400	471	510	517	484	568	17.4
UAE	753	865	875	1,447	1,579	1,649	1,820	2,309	2,358	2,356	2,390	1.4
Yemen	649	669	590	595	506	455	405	405	397	402	402	-0.1
Other	48	50	51	50	54	169	186	181	173	178	185	4.3
Total Middle East	29,758	28,878	30,168	30,059	31,882	28,610	30,065	30,124	30,366	28,769	29,983	4.2

CONSUMPTION

LPG Consumption, 2012-22												'000t
Country	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	±% 21/22
Algeria	2,112	2,065	1,943	1,918	1,897	1,983	2,221	2,435	2,368	2,682	2,664	-0.7
Angola	254	266	247	259	239	274	285	295	247	356	360	1.3
Burkina Faso	43	50	54	58	63	69	74	82	75	83	79	-4.4
Cameroon	70	82	87	94	102	105	117	125	133	141	138	-2.1
Chad	8	8	10	17	26	28	35	41	39	41	45	9.8
Congo	na	na	na	11	12	13	15	16	15	16	15	-1.4
Egypt	4,246	4,433	4,510	4,488	4,444	4,369	4,267	4,226	4,018	4,292	4,398	2.5
Ethiopia	6	6	7	9	8	9	10	11	10	10	11	10.0
Gabon	33	35	37	37	38	43	46	49	46	50	53	6.0
Ghana	262	243	241	280	267	356	394	340	359	373	344	-7.8
Ivory Coast	189	213	245	271	280	319	332	356	346	514	579	12.5
Kenya	107	120	133	148	174	192	224	304	321	374	342	-8.6
Libya	293	321	303	264	282	278	287	295	289	291	287	-1.4
Mali	8	11	5	12	13	18	21	22	21	23	24	4.3
Mauritius	66	69	71	73	74	75	77	84	76	81	88	8.6
Morocco	2,137	2,186	2,277	2,380	2,494	2,500	2,599	2,740	2,829	2,796	3,012	7.7
Nigeria	159	193	201	350	450	650	780	1,525	1,651	1,715	1,627	-5.1
Reunion	22	20	20	20	21	21	22	21	22	22	22	0.4
Senegal	101	103	106	127	139	143	152	161	199	199	179	-10.4
South Africa	350	340	349	359	360	386	402	417	399	324	332	2.5
Sudan	410	453	472	475	478	507	537	569	554	575	429	-25.3
Togo	na	na	na	15	17	18	0	0	0	0	0	0.0
Tunisia	485	511	509	529	528	559	573	604	603	616	624	1.3
Uganda	11	12	13	14	14	16	18	20	25	24	25	4.2
Other	271	269	215	227	250	250	265	276	259	269	266	-1.4
Total Africa	11,643	12,009	12,055	12,435	12,670	13,181	13,753	15,013	14,904	15,867	15,943	0.5
Australia	1,973	1,768	1,645	1,573	1,500	1,290	1,326	1,297	1,103	1,043	795	-23.8
Bangladesh	79	83	108	148	343	518	764	960	1,232	1,395	1,426	2.3
China	24,842	27,884	32,594	39,312	48,411	52,316	56,115	59,729	62,939	71,079	73,929	4.0
Hong Kong	392	390	403	373	371	337	339	338	289	290	286	-1.3
India	16,317	16,527	18,343	19,780	22,041	23,762	24,642	27,046	28,309	29,036	30,140	3.8
Indonesia	5,032	5,608	6,094	6,400	6,667	7,192	7,564	7,825	8,230	8,620	8,627	0.1
Japan	16,781	16,368	15,930	16,450	16,046	15,576	15,934	15,836	14,269	13,892	13,510	-2.7
Malaysia	2,658	2,710	2,419	2,073	3,116	3,160	3,216	3,252	3,248	2,595	2,370	-8.7
Nepal	181	207	232	252	287	332	369	392	404	509	567	11.4
New Zealand	150	144	152	163	167	179	180	190	185	193	194	0.4
Pakistan	487	522	566	868	1,124	1,179	1,187	1,156	1,141	1,210	1,219	0.7
Philippines	1,091	1,107	1,140	1,306	1,458	1,599	1,797	1,829	1,769	1,796	1,830	1.9
Singapore	781	777	764	762	875	721	873	902	990	968	970	0.3
South Korea	8,667	8,338	8,176	7,794	9,386	8,986	9,381	10,361	10,242	10,390	11,161	7.4
Sri Lanka	211	220	243	291	346	424	422	471	401	380	260	-31.6
Taiwan	2,162	2,890	2,991	2,621	3,111	2,504	2,679	2,775	1,723	1,581	1,766	11.7
Thailand	7,387	7,527	7,516	6,695	6,136	6,341	6,621	6,562	5,743	6,108	6,451	5.6
Vietnam	1,212	1,307	1,316	1,550	1,751	1,979	2,106	3,075	3,160	3,446	3,935	14.2
Other	152	165	176	213	210	220	234	245	238	246	244	-0.9
Total Asia-Pacific	90,555	94,542	100,808	108,624	123,346	128,615	135,749	144,241	145,616	154,777	159,681	3.2
Total World	254,765	266,061	272,286	279,455	298,871	301,805	314,777	325,142	319,846	330,261	341,752	3.5

CONSUMPTION

LPG Consumption for Energy Purposes Only, 2012-22											'000t
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
US	15,968	19,054	18,698	17,749	17,910	17,811	19,995	20,992	19,340	18,444	18,889
Canada	3,341	2,788	2,580	2,520	2,618	2,743	2,824	2,978	2,702	2,779	3,258
Total North America	19,309	21,842	21,278	20,269	20,528	20,554	22,819	23,970	22,042	21,223	22,147
Argentina	1,733	1,980	1,940	1,701	1,725	1,622	1,527	1,509	1,357	1,706	1,798
Bolivia	368	374	387	395	401	377	389	398	380	418	430
Brazil	7,145	7,340	7,423	7,308	7,400	7,390	7,300	7,290	7,510	7,429	7,367
Chile	1,344	1,231	1,398	1,310	1,237	1,281	1,304	1,313	1,339	1,435	1,428
Colombia	567	553	600	598	581	578	571	533	561	691	759
Costa Rica	120	127	137	146	159	168	176	187	181	200	176
Cuba	106	113	121	123	124	145	161	169	171	192	175
Dominican Republic	744	773	828	922	913	987	1,017	1,027	988	1,037	1,057
Ecuador	1,026	1,067	1,110	1,096	1,060	1,104	1,113	1,214	1,222	1,281	1,327
El Salvador	217	236	275	373	291	300	304	310	314	334	339
Guatemala	261	274	285	331	355	373	391	409	415	505	535
Honduras	104	114	119	139	144	159	168	182	174	221	244
Jamaica	85	78	73	79	89	92	87	89	84	90	87
Mexico	9,119	8,988	9,070	8,800	8,947	8,908	8,682	8,942	9,034	9,048	9,369
Netherlands Antilles	7	7	6	6	6	6	6	6	6	6	6
Nicaragua	81	91	94	101	113	121	120	127	128	133	131
Panama	159	165	175	140	139	143	148	151	146	153	177
Paraguay	86	83	80	80	81	81	87	88	80	92	90
Peru	1,341	1,503	1,579	1,619	1,600	1,764	1,919	1,985	1,767	2,004	2,054
Puerto Rico	102	102	98	98	91	83	79	76	75	76	77
Trinidad & Tobago	14	40	44	57	61	54	39	40	32	73	58
Uruguay	122	133	124	118	120	111	112	116	131	119	119
US Virgin Islands	20	20	25	25	50	88	104	303	274	289	297
Venezuela	1,605	1,513	1,400	1,460	1,376	916	878	504	336	335	381
Other	198	218	211	220	220	224	232	245	209	204	208
Total South & C. America	26,674	27,123	27,602	27,245	27,283	27,075	26,915	27,216	26,914	28,073	28,690
Austria	122	99	101	90	80	84	71	68	66	69	64
Azerbaijan	69	63	55	42	47	14	26	23	3	25	26
Belarus	280	279	286	283	270	270	266	265	246	236	235
Belgium	337	335	375	217	216	184	195	183	209	212	189
Bulgaria	339	387	411	432	441	447	437	427	438	433	458
Croatia	144	144	139	140	145	132	138	127	100	108	111
Cyprus	56	51	47	54	55	57	54	61	65	65	68
Czech Republic	104	102	109	121	172	166	180	165	178	176	164
Denmark	50	48	48	50	54	58	57	54	59	60	78
Estonia	18	18	17	18	19	23	25	27	32	42	57
Finland	212	253	266	273	277	263	267	246	110	109	212
France	2,007	1,978	1,710	1,791	1,769	1,756	1,691	1,661	1,524	1,609	1,406
Germany	1,783	1,844	1,730	1,589	1,722	1,679	1,690	1,593	1,446	1,542	1,542
Greece	370	416	456	471	506	507	515	524	453	471	511
Hungary	154	151	169	161	170	173	166	167	140	169	125
Ireland	121	135	133	136	145	148	159	165	165	161	172
Italy	3,138	3,280	3,079	3,253	3,355	3,361	3,264	3,314	2,834	2,995	3,126

CONSUMPTION

LPG Consumption for Energy Purposes Only, 2012-22											'000t
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Kazakhstan	419	455	606	674	993	1,043	1,262	1,309	1,160	1,400	1,630
Latvia	73	85	93	97	91	92	86	75	74	73	76
Lithuania	193	183	180	162	154	151	142	143	127	121	128
Macedonia	56	58	63	71	78	76	79	82	67	68	70
Malta	24	24	25	26	24	24	25	27	25	24	19
Moldova	63	74	77	74	77	72	71	67	63	61	57
Montenegro	17	14	16	28	17	19	18	19	13	19	19
Netherlands	454	442	325	321	316	303	294	305	268	272	260
Norway	184	192	173	161	184	182	132	176	242	248	280
Poland	2,145	2,117	2,160	2,245	2,355	2,495	2,415	2,520	2,340	2,435	2,495
Portugal	574	557	542	518	512	473	402	466	462	463	428
Romania	507	515	499	487	499	500	475	469	451	475	444
Russia	4,051	3,967	4,114	4,600	4,385	4,490	4,530	4,595	4,440	4,350	4,539
Serbia	361	362	295	310	246	193	123	124	106	131	119
Slovakia	57	56	47	50	51	49	47	47	47	52	53
Slovenia	83	75	74	82	81	88	88	87	77	82	81
Spain	1,575	1,529	1,410	1,430	1,540	1,518	1,448	1,417	1,143	1,224	1,223
Sweden	342	352	347	338	346	356	339	346	288	340	285
Switzerland	90	86	77	76	80	74	76	74	64	66	57
Tajikistan	171	225	296	336	349	360	381	431	448	413	396
Turkey	3,754	3,737	3,785	3,966	4,103	4,078	4,146	4,178	3,869	3,999	3,918
Turkmenistan	10	10	10	10	11	12	12	12	10	10	6
Ukraine	837	949	1,055	1,140	1,488	1,603	1,725	1,909	1,970	1,901	1,160
UK	1,107	1,077	987	1,061	1,073	1,036	1,069	1,062	1,060	1,098	1,133
Uzbekistan	246	272	277	449	590	640	650	678	662	704	801
Other	347	336	238	225	225	217	216	212	209	193	200
Total Europe & Eurasia	27,044	27,332	26,902	28,058	29,311	29,466	29,451	29,899	27,752	28,703	28,421
Bahrain	55	55	58	60	64	69	73	77	74	68	75
Iran	2,208	2,227	2,059	2,020	1,954	1,942	1,999	1,734	1,742	1,777	1,798
Iraq	1,704	1,825	1,668	1,700	1,610	1,720	1,750	1,476	1,710	1,715	1,767
Israel	449	439	444	425	435	436	432	428	413	377	384
Jordan	378	363	367	415	417	434	454	475	460	440	446
Kuwait	129	141	141	141	162	165	205	211	198	215	231
Lebanon	244	270	247	258	267	261	233	257	245	233	248
Oman	121	141	168	181	192	207	218	231	214	228	260
Qatar	105	109	113	113	134	137	154	165	174	188	177
Saudi Arabia	1,410	1,315	1,309	1,390	1,544	1,450	1,290	1,339	1,457	1,490	1,580
Syria	600	516	471	456	456	400	471	510	517	484	568
United Arab Emirates	203	312	326	344	380	361	522	513	550	550	582
Yemen	649	669	590	595	506	455	405	405	397	402	402
Other	48	50	51	50	50	54	169	186	181	173	178
Total Middle East	8,303	8,432	8,012	8,148	8,171	8,091	8,375	8,006	8,333	8,339	8,695
Algeria	2,112	2,046	1,895	1,897	1,882	1,970	2,190	2,404	2,337	2,676	2,658
Angola	254	266	247	259	239	274	285	295	247	356	360
Burkina Faso	43	50	54	58	63	69	74	82	75	83	79
Cameroon	70	82	87	94	102	105	117	125	133	141	138

CONSUMPTION

LPG Consumption for Energy Purposes Only, 2012-22											'000t
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Chad	8	8	10	17	26	28	35	41	39	41	45
Congo	na	na	58	11	12	13	15	16	15	16	15
Egypt	4,246	3,936	3,922	3,913	3,787	3,666	3,537	3,413	3,133	3,393	3,489
Ethiopia	6	6	7	9	8	9	10	11	10	10	11
Gabon	33	35	37	37	38	43	46	49	46	50	53
Ghana	262	243	241	280	267	356	394	340	359	373	344
Ivory Coast	189	213	245	271	280	319	332	356	346	514	579
Kenya	107	120	133	148	174	192	224	304	321	374	342
Libya	293	321	303	264	282	278	287	295	289	291	287
Mali	8	11	5	12	13	18	21	22	21	23	24
Mauritius	66	69	71	73	74	75	77	84	76	81	88
Morocco	2,137	2,186	2,277	2,380	2,494	2,500	2,599	2,740	2,829	2,796	3,012
Nigeria	140	160	190	350	450	650	780	992	1,150	1,213	1,097
Reunion	22	20	20	20	21	21	22	21	22	22	22
Senegal	101	103	106	127	139	143	152	161	199	199	179
South Africa	350	340	349	359	360	386	402	417	399	324	332
Sudan and South Sudan	410	453	472	475	478	507	537	569	554	575	429
Togo	na	na	na	15	17	18	0	0	0	0	0
Tunisia	485	511	509	529	528	559	573	604	603	616	624
Uganda	11	12	13	14	14	16	18	20	25	24	25
Other	271	269	215	227	227	250	250	265	276	259	269
Total Africa	11,624	11,460	11,466	11,839	11,975	12,465	12,977	13,624	13,505	14,449	14,502
Australia	1,710	1,540	1,444	1,323	1,276	1,190	1,119	1,091	897	850	795
Bangladesh	79	83	108	148	343	518	764	960	1,232	1,395	1,426
China	20,940	23,344	26,583	29,816	33,311	34,870	37,532	39,202	35,398	37,554	35,429
Hong Kong	392	390	403	373	371	337	339	338	289	290	286
India	15,645	15,855	17,671	19,040	21,232	22,992	23,872	26,276	27,441	27,908	28,694
Indonesia	5,032	5,608	6,094	6,400	6,667	7,192	7,564	7,825	8,230	8,620	8,627
Japan	12,661	11,724	11,423	11,738	11,487	11,185	11,557	11,308	10,515	10,473	10,178
Malaysia	1,353	1,479	1,360	1,304	1,281	1,357	1,357	1,335	1,293	1,481	1,100
Nepal	181	207	232	252	287	332	369	392	404	509	567
New Zealand	150	144	152	163	167	179	180	190	185	193	194
Pakistan	487	522	566	868	1,124	1,179	1,187	1,156	1,141	1,210	1,219
Philippines	1,091	1,107	1,140	1,306	1,458	1,599	1,797	1,829	1,769	1,768	1,796
Singapore	132	128	115	113	106	106	104	102	101	98	100
South Korea	7,064	6,958	6,336	6,030	6,073	6,047	5,742	5,810	5,378	5,573	5,723
Sri Lanka	211	220	243	291	346	424	422	471	401	380	260
Taiwan	1,412	1,389	1,369	1,355	1,337	1,331	1,205	1,177	886	1,190	1,179
Thailand	4,722	4,788	4,739	4,418	4,188	4,123	4,023	3,810	3,400	3,384	3,633
Vietnam	1,212	1,307	1,316	1,550	1,751	1,979	2,106	2,275	2,360	2,529	2,697
Other	152	165	176	213	213	210	220	234	245	238	246
Total Asia-Pacific	74,626	76,958	81,470	86,701	93,018	97,150	101,459	105,782	101,565	105,642	104,150
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Total World	167,580	173,148	176,730	182,260	190,286	194,801	201,996	208,496	200,111	206,428	206,604

Note: Energy purposes includes domestic, agriculture, industrial, and transport sectors.

CONSUMPTION

LPG Consumption by sector, 2022							'000t
	Domestic	Agriculture	Industry	Transport	Refinery	Chemical	Total
US	15,166	1,552	1,982	189	14,456	13,205	46,550
Canada	1,207	227	1,548	276	5,814	1,438	10,511
Total North America	16,372	1,779	3,531	466	20,270	14,643	57,060
Argentina	1,508	90	198	3	0	50	1,848
Bolivia	421	0	9	0	0	0	430
Brazil	6,039	0	1,328	0	0	228	7,595
Chile	1,098	0	297	34	17	0	1,444
Colombia	583	47	129	0	88	0	847
Costa Rica	93	0	66	17	0	0	176
Cuba	160	0	14	0	0	0	175
Dominican Republic	525	0	60	472	0	0	1,057
Ecuador	1,184	23	94	27	24	0	1,351
El Salvador	250	0	88	1	0	0	339
Guatemala	434	0	96	5	0	0	535
Honduras	94	0	61	89	0	0	244
Jamaica	86	0	1	0	0	0	87
Mexico	6,776	108	1,030	1,455	65	0	9,433
Netherlands Antilles	6	0	0	0	0	0	6
Nicaragua	116	1	14	0	4	0	135
Panama	135	0	42	0	0	0	177
Paraguay	81	0	1	8	0	0	90
Peru	1,191	0	267	596	0	0	2,054
Puerto Rico	70	0	7	0	0	0	77
Trinidad & Tobago	58	0	0	0	0	0	58
Uruguay	106	6	7	0	0	0	119
US Virgin Islands	10	0	287	0	0	0	297
Venezuela	323	0	58	0	593	0	974
Other	212	0	0	0	0	0	212
Total South & C. America	21,558	275	4,153	2,707	790	278	29,761
Austria	32	3	27	2	18	265	347
Azerbaijan	3	0	1	22	1	219	246
Belarus	70	8	7	150	0	160	395
Belgium	137	1	8	43	33	2,112	2,334
Bulgaria	37	5	16	400	0	0	458
Croatia	50	2	8	51	0	0	111
Cyprus	49	1	17	1	0	0	68
Czech Republic	50	6	31	76	0	258	422
Denmark	26	5	45	1	0	0	78
Estonia	6	6	20	25	0	0	57
Finland	2	0	209	0	0	777	989
France	808	301	214	83	0	1,098	2,504
Germany	559	0	676	227	175	1,731	3,367
Greece	111	24	172	204	223	0	734
Hungary	64	16	28	17	0	329	454

CONSUMPTION

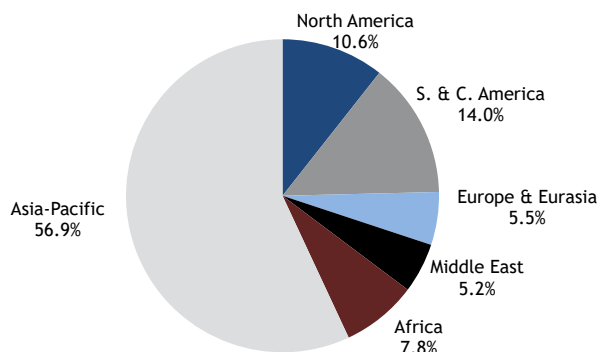
LPG Consumption by sector, 2022							'000t
	Domestic	Agriculture	Industry	Transport	Refinery	Chemical	Total
Ireland	53	0	117	2	0	0	172
Italy	1,475	24	92	1,535	169	327	3,622
Kazakhstan	215	2	75	1,338	0	110	1,740
Latvia	20	8	16	32	0	0	76
Lithuania	28	4	12	84	0	0	128
Macedonia	10	0	12	48	0	0	70
Malta	19	0	0	0	0	0	19
Moldova	9	0	3	46	0	0	57
Montenegro	4	0	7	9	0	0	19
Netherlands	93	39	13	115	147	2,150	2,557
Norway	36	18	220	6	7	194	481
Poland	240	125	250	1,880	0	0	2,495
Portugal	347	4	41	36	1	375	804
Romania	155	11	18	260	40	0	484
Russia	760	160	169	3,450	1,050	5,733	11,322
Serbia	27	3	21	68	0	34	153
Slovakia	10	4	4	35	0	83	136
Slovenia	42	0	28	11	0	0	81
Spain	911	39	165	107	49	619	1,892
Sweden	13	1	271	0	31	417	733
Switzerland	12	4	40	2	1	93	151
Tajikistan	35	1	2	358	0	0	396
Turkey	740	0	80	3,098	0	149	4,067
Turkmenistan	6	0	0	0	158	5	169
Ukraine	55	130	45	930	0	15	1,175
United Kingdom	350	86	636	61	0	1,629	2,762
Uzbekistan	558	1	2	240	0	0	801
Other	151	1	35	9	0	0	197
Total Europe & Eurasia	8,382	1,043	3,853	15,059	2,103	18,882	49,323
Bahrain	75	0	0	0	0	0	75
Iran	1,764	0	29	5	0	1,412	3,210
Iraq	1,767	0	0	0	0	0	1,767
Israel	207	11	161	6	0	247	632
Jordan	434	0	12	0	0	0	446
Kuwait	231	0	0	0	0	420	652
Lebanon	218	0	30	0	0	0	248
Oman	210	0	49	0	0	214	474
Qatar	177	0	0	0	72	0	249
Saudi Arabia	1,223	0	357	0	0	17,107	18,686
Syria	568	0	0	0	0	0	568
UAE	556	0	26	0	0	1,808	2,390
Yemen	360	0	0	42	0	0	402
Other	173	0	12	0	0	0	185
Total Middle East	7,963	11	676	53	72	21,209	29,983

CONSUMPTION

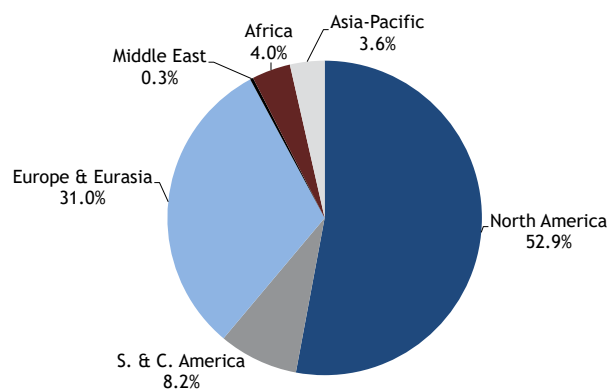
LPG Consumption by sector, 2022							'000t
	Domestic	Agriculture	Industry	Transport	Refinery	Chemical	Total
Algeria	1,086	22	51	1,499	6	0	2,664
Angola	344	0	3	13	0	0	360
Burkina Faso	79	0	0	0	0	0	79
Cameroon	134	0	4	0	0	0	138
Chad	45	0	0	0	0	0	45
Congo	15	0	0	0	0	0	15
Egypt	3,470	0	19	0	0	909	4,398
Ethiopia	11	0	0	0	0	0	11
Gabon	48	0	5	0	0	0	53
Ghana	163	1	93	87	0	0	344
Ivory Coast	515	0	63	0	0	0	579
Kenya	296	0	38	8	0	0	342
Libya	287	0	0	0	0	0	287
Mali	24	0	0	0	0	0	24
Mauritius	79	0	7	3	0	0	88
Morocco	2,690	110	211	0	0	0	3,012
Nigeria	1,097	0	0	0	0	530	1,627
Reunion	20	0	2	0	0	0	22
Senegal	173	0	6	0	0	0	179
South Africa	170	0	162	0	0	0	332
Sudan	415	0	14	0	0	0	429
Togo	0	0	0	0	0	0	0
Tunisia	586	0	26	12	0	0	624
Uganda	25	0	0	0	0	0	25
Other	266	0	0	0	0	0	266
Total Africa	12,038	134	704	1,623	6	1,439	15,943
Australia	136	0	534	124	0	0	795
Bangladesh	1,218	0	185	23	0	0	1,426
China	31,401	105	3,040	883	17,668	20,831	73,929
Hong Kong	66	0	7	213	0	0	286
India	27,260	8	1,018	408	0	1,446	30,140
Indonesia	8,502	0	125	0	0	0	8,627
Japan	7,303	0	2,505	370	1,828	1,504	13,510
Malaysia	994	0	106	0	0	1,270	2,370
Nepal	567	0	0	0	0	0	567
New Zealand	113	2	76	3	0	0	194
Pakistan	1,013	0	142	63	0	0	1,219
Philippines	1,376	0	388	32	0	34	1,830
Singapore	86	0	14	0	0	870	970
South Korea	1,999	0	1,182	2,542	0	5,438	11,161
Sri Lanka	232	1	27	1	0	0	260
Taiwan	949	0	222	8	153	434	1,766
Thailand	2,070	3	689	871	44	2,774	6,451
Vietnam	2,290	0	407	0	0	1,238	3,935
Other	233	0	7	5	0	0	244
Total Asia-Pacific	87,810	120	10,674	5,545	19,694	35,840	159,681
Total World	154,123	3,360	23,591	25,452	42,935	92,291	341,752

LPG REGIONAL SHARE OF MARKET SUBSECTORS, 2022

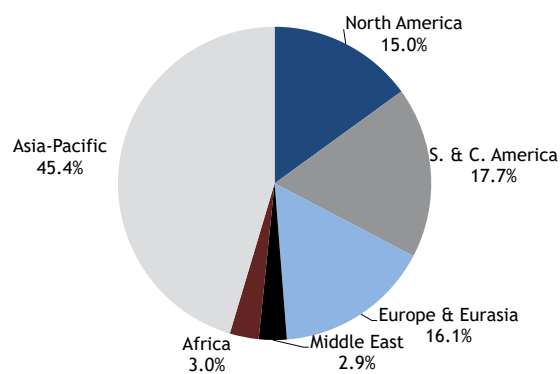
Domestic



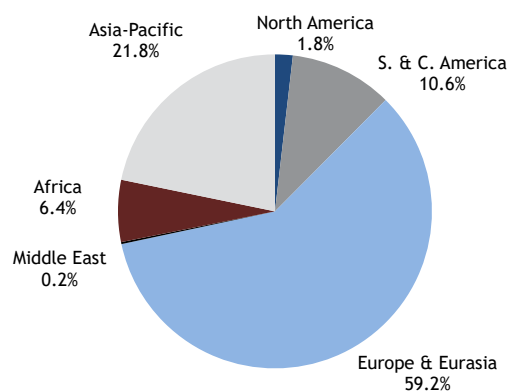
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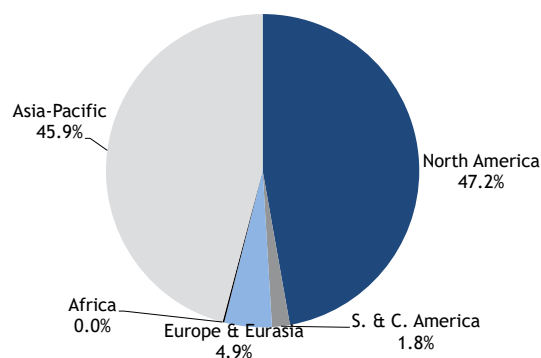
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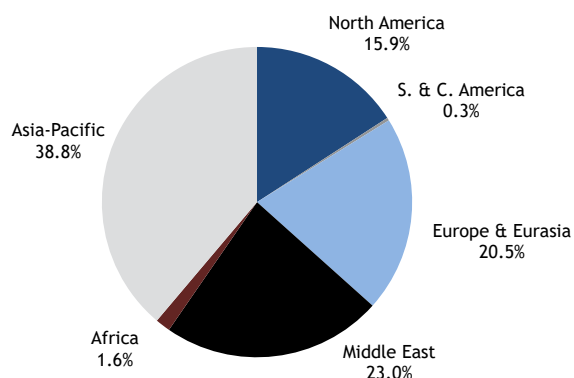
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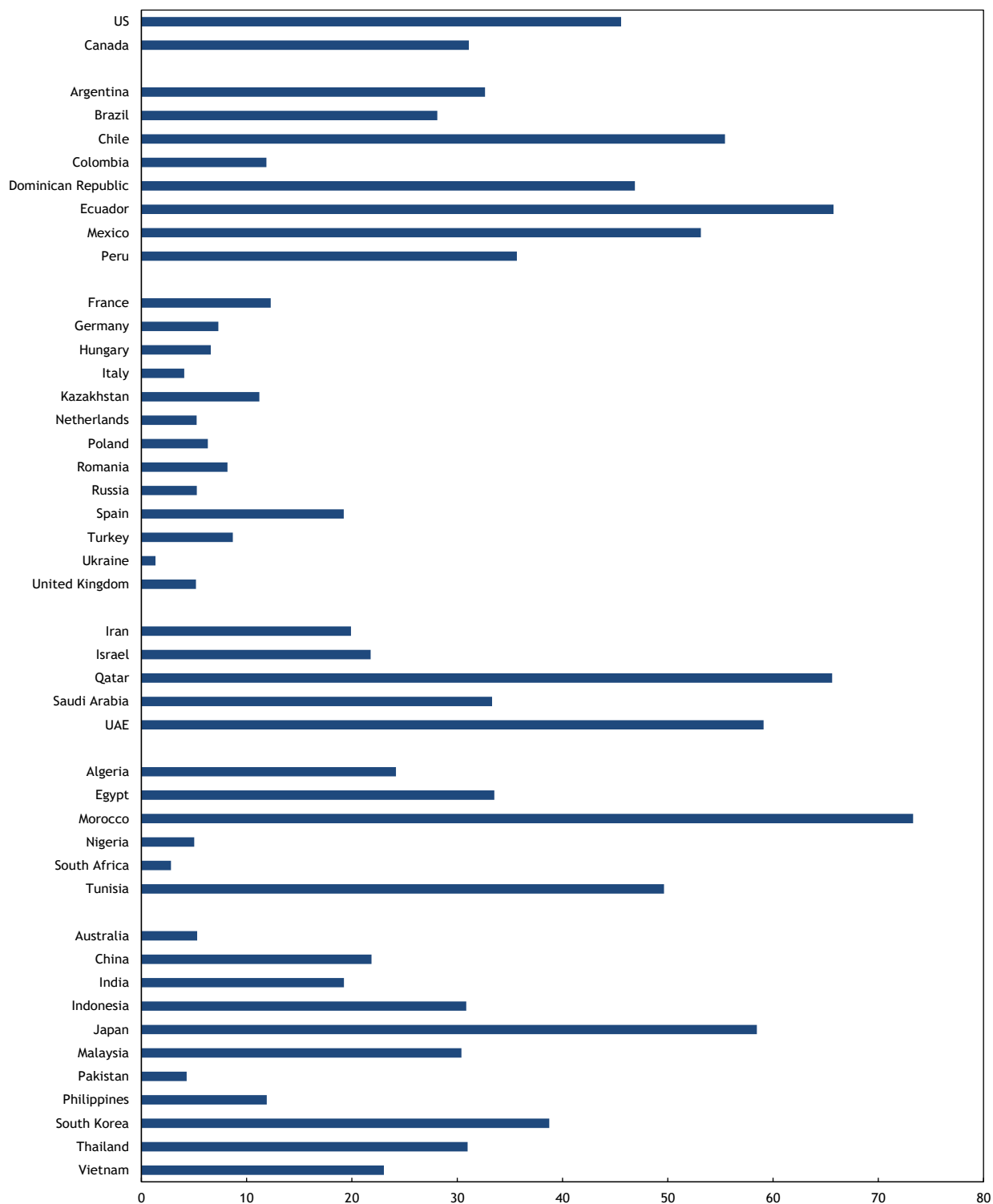
Refinery



Chemical



Domestic LPG consumption per capita for selected countries, 2022 (kg/capita)



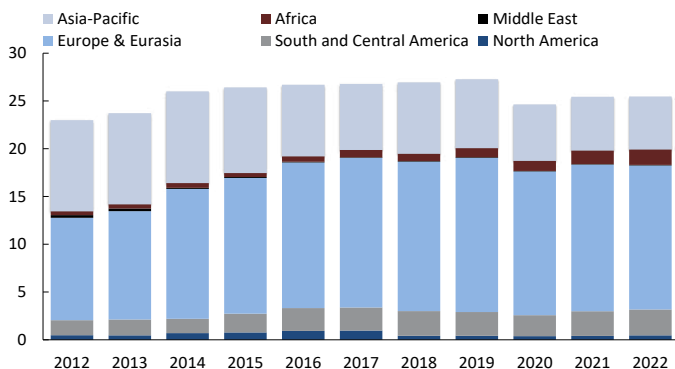
AUTOGAS

Autogas Consumption, Vehicles and Dispensing Sites							
	Consumption ('000t)			Vehicle fleet		Retail sites	
	2021	2022	±% 21/22	2021	2022	2021	2022
US	189	189	0.0	188,000	192,000	3,100	3,200
Canada	216	276	28.2	53,500	53,000	2,230	2,210
Total North America	405	466	15.0	241,500	245,000	5,330	5,410
Chile	33	34	2.0	23,000	23,000	200	200
Costa Rica	18	17	-5.6	9,000	9,000	100	100
Dominican Republic	464	472	1.7	230,000	230,000	1,550	1,550
Ecuador	12	27	122.1	4,500	10,000	20	35
Guatemala	5	5	-0.8	5,500	5,501	22	23
Honduras	81	89	10.7	66,500	66,500	230	240
Mexico	1,390	1,455	4.7	407,000	427,000	2,080	2,180
Paraguay	8	8	0.0	11,500	12,000	40	45
Peru	573	596	4.0	262,500	276,000	850	900
Total South & C. America	2,589	2,707	4.6	1,024,500	1,065,501	5,132	5,313
Austria	3	2	-18.0	5,225	4,964	35	35
Azerbaijan	22	22	1.4	8,800	8,700	120	130
Belarus	150	150	0.0	94,200	92,400	300	300
Belgium	43	43	0.2	25,000	25,300	350	350
Bulgaria	380	400	5.3	480,200	490,000	2,700	2,700
Croatia	49	51	4.1	71,400	72,900	500	550
Czech Republic	89	76	-14.8	160,500	153,500	870	900
Denmark	1	1	45.2	20	20	5	7
Estonia	17	25	47.1	13,000	15,000	90	95
France	49	83	69.4	220,000	220,156	1,559	1,554
Germany	244	227	-7.1	331,481	326,853	6,028	5,914
Greece	199	204	2.3	290,000	290,000	1,375	1,395
Hungary	23	17	-28.2	23,000	23,000	550	560
Ireland	2	2	-15.0	3,500	3,500	45	45
Italy	1,407	1,535	9.1	2,846,644	2,900,799	4,450	4,500
Kazakhstan	1,183	1,338	13.1	516,000	550,000	2,494	2,195
Latvia	25	32	28.0	22,106	22,531	255	281
Lithuania	84	84	0.1	98,000	98,000	340	340
Macedonia	46	48	3.7	20,000	20,700	250	250
Malta	1	0	-100.0	2,300	2,500	11	12
Moldova	56	46	-18.6	55,000	52,400	560	547
Montenegro	9	9	0.0	7,400	7,800	55	65
Netherlands	107	115	7.8	128,936	127,695	1,124	1,095
Norway	5	6	20.0	1,500	1,500	94	73
Poland	1,815	1,880	3.6	3,388,000	3,415,000	7,441	7,486
Portugal	30	36	18.7	59,401	62,237	405	389
Romania	281	260	-7.6	230,000	220,000	1,100	1,100
Russia	3,250	3,450	6.2	3,000,000	3,000,000	4,900	4,900
Serbia	78	68	-12.9	112,200	98,477	550	600
Slovakia	34	35	1.6	16,000	16,400	360	370
Slovenia	11	11	-0.7	14,300	13,900	150	150
Spain	87	107	23.7	98,500	98,500	1,100	1,100
Sweden	0	0	-	80	80	25	25
Switzerland	2	2	-13.4	900	900	50	50
Tajikistan	370	358	-3.2	202,000	210,000	1,200	1,548

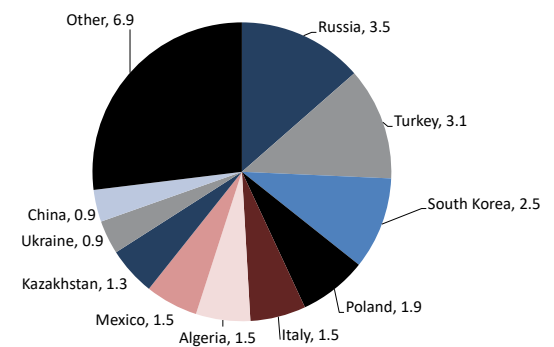
AUTOGAS

Autogas Consumption, Vehicles and Dispensing Sites							
	Consumption ('000t)			Vehicle fleet		Retail sites	
	2021	2022	±% 21/22	2021	2022	2021	2022
Turkey	3,117	3,098	-0.6	4,923,275	4,883,888	10,950	10,059
Ukraine	1,810	930	-48.6	2,660,000	1,600,000	5,500	3,700
United Kingdom	59	61	2.5	95,000	95,000	950	950
Uzbekistan	200	240	20.0	310,000	310,000	900	900
Other	9	9	-1.9	0	0	0	0
Total Europe & Eurasia	15,348	15,059	-1.9	20,534,118	19,530,349	59,748	57,228
Iran	5	5	-7	4,750	4,800	65	70
Israel	6	6	5.1	19,000	19,000	90	0
Yemen	43	42	-3.0	48,500	47,500	190	180
Total Middle East	54	53	-2.5	72,250	71,300	345	250
Algeria	1,296	1,499	15.7	547,000	547,000	900	900
Mauritius	3	3	10.7	7,000	7,000	6	6
Tunisia	12	12	1.3	10,500	10,500	22	22
Total Africa	1,424	1,623	14.0	570,000	570,000	966	966
Australia	157	124	-20.8	270,000	256,000	2,400	2,400
Bangladesh	22	23	2.3	7,500	7,750	25	25
China	930	883	-5.0	176,000	167,450	520	483
Hong Kong	216	213	-1.3	16,700	16,500	60	60
India	396	408	2.8	2,704,000	2,704,000	1,510	1,470
Indonesia	0	0	-	1,000	1,000	28	28
Japan	552	370	-33.0	137,496	126,743	1,212	1,197
Nepal	0	0	-	5,500	5,500	38	38
New Zealand	3	3	0.4	2,400	2,400	150	150
Pakistan	67	63	-5.5	3,650	3,700	270	270
Philippines	31	32	2.3	22,500	20,500	155	140
South Korea	2,563	2,542	-0.8	1,960,971	1,919,024	1,992	1,972
Sri Lanka	1	1	-13.2	1,000	1,000	10	10
Taiwan	8	8	-2.6	8,000	8,000	36	35
Thailand	668	871	30.3	707,800	690,500	1,570	1,530
Vietnam	0	0	0.0	0	0	0	0
Other	5	5	-1.3	6,000	6,000	55	55
Total Asia-Pacific	5,619	5,545	-1.3	6,030,517	5,936,067	10,031	9,863
Total World	25,437	25,452	0.1	28,472,885	27,418,217	81,553	79,031

Autogas demand by region

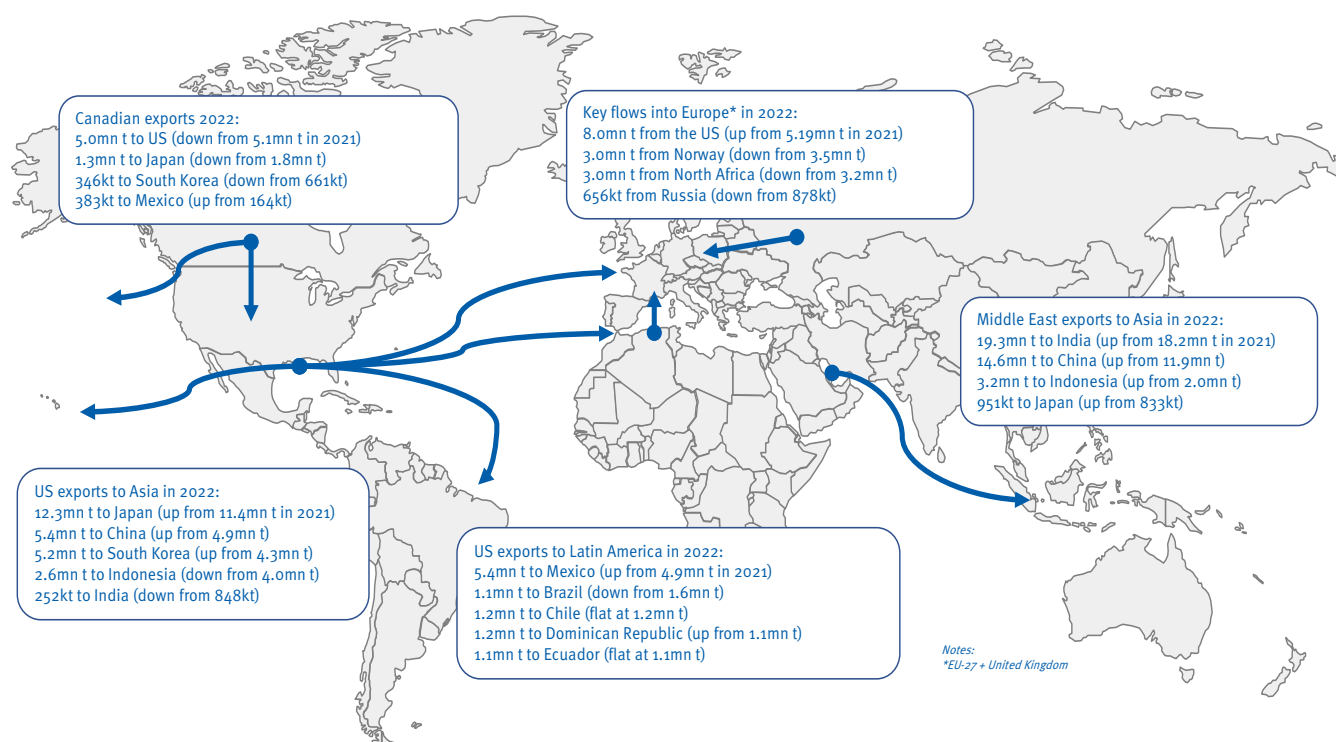


Autogas consumption top 10



TRADE, INFRASTRUCTURE AND SHIPPING

Global Trade Flows



Regional LPG exports and imports, 2012-22

	2012		2022	
	Imports	Exports	Imports	Exports
North America	3,528	7,573	4,986	60,492
South and Central America	8,570	4,522	16,173	2,217
Europe and Eurasia	20,674	18,661	28,417	19,122
Middle East	1,280	32,030	1,564	43,026
Africa	5,542	9,227	7,825	9,400
Asia-Pacific	36,472	4,806	81,772	5,535
Total	76,066	76,818	140,738	139,791

LPG shipping

Freight was highly volatile in 2022 because of multiple factors pulling the market in different directions. Surging exports from the US stretched the VLGC fleet, but lacklustre demand from a locked down China tempered demand for cargoes. The standard deviation for the Mideast Gulf to Japan freight rate in 2022 was \$27.80/t, the highest since *Argus* began recording data in 2003.

US LPG export growth continued in 2022, reaching an all-time high of 53mn t. Exports from the US increased demand for VLGCs owing to increasing loadings and they decrease supply when requiring longer voyages meaning VLGCs spend more time travelling and less time loading and unloading LPG. Growth in the VLGC fleet has been slow for many years, and was slowed further by the pandemic.

Panama Canal delays have also been a significant factor in the volatility. The changing climate has resulted in lower rainfall around the canal and the new Neopanamax locks have caused more water to flow out of Gatun Lake than ever before. This has made water shortages more common at the canal, pushing delays as high as 35 days for a round trip

LPG shipping fleet capacity by type 2022		'000m ³
Type	Number of vessels	Capacity
Semi-refrigerated	365	4,435
Fully refrigerated	498	33,968
Pressurised	733	4,369

– Clarksons

in November 2022. This even caused some VLGCs to travel to Asia though the Suez Canal or round the Cape of Good Hope — both trips are around 40pc longer than through the Panama Canal.

High oil prices pushed up outright LPG prices in the first half of 2022, dampening demand and keeping the freight market under control. But as oil eased and winter heating demand emerged, freight rates ballooned rising to the highest levels *Argus* has recorded. This bullish environment has continued into 2023 with VLGC rates breaking this record again in September 2023.

Shipping freight rates 2012-22											\$/t
Spot freight rates	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Mideast Gulf-Japan	55	59	91	90	29	29	34	58	59	52	79
Assessed 12 Month Timecharter Rates											
84,000m ³	917	944	1,575	1,919	750	554	607	999	1,062	1,035	1,071
59,000m ³ (57,000-59,000m ³ until 2009)	886	976	1,394	1,887	747	509	546	801	886	887	934
22,500m ³ (22,500-24,000m ³ until 2011)	728	774	844	862	643	374	423	483	567	593	662

– Clarksons

LOOKING TO THE FUTURE

■ The near-term economic outlook continues to be uncertain with advanced economies flirting with recession. Many countries are struggling with inflation following deficit spending during the pandemic and because of disruption stemming from the Russia-Ukraine conflict. This has caused central bankers to raise interest rates, which is depressing growth.

■ Chinese lockdowns have ended but the economic rebound has been weaker than expected. The Chinese gov-

ernment has been unusually slow to provide stimulus. The adoption of the “three red lines” policy for the real-estate sector has depressed activity and investment in the sector is significantly below historical levels.

■ Crude prices are expected to remain well supported by market tightness as a result of Opec+ quota policy. This will keep outright prices for LPG strong even as fundamentals look increasingly bearish.

LOOKING TO THE FUTURE

■ Petrochemicals will be the main driver of demand growth moving forward. The build up of steam cracker and PDH capacity over the next few years implies an increase to petrochemical consumption at a rate several times faster than energy demand. But the gloomy macroeconomic outlook suggests that demand for petrochemical derivatives may fail to keep pace in the short term, leading to downside risk of reduced utilisation or start-up delays.

■ Energy use demand growth will be slower than over the past decade. India has been one of the main drivers of demand growth, but is fast approaching market saturation. Competition from natural gas and renewables will increasingly displace LPG in the more mature markets, but there are still large opportunities for growth in Africa and southeast Asia.

■ Peak demand for LPG is expected later than that for oil more generally. The role of natural gas as a transition fuel will keep LPG availability high. Long-term demand for petrochemicals will continue to grow sustaining rising demand for feedstock. With few alternatives available, the use of traditional feedstocks such as naphtha, ethane and LPG will continue.

■ Asia is expected to account for around 70pc of demand growth between 2022 and 2030. China's massive investment in PDH capacity and bottled LPG markets in south and south-east Asia are the main drivers. Additional supplies to meet this demand will come from the Middle East and the US.

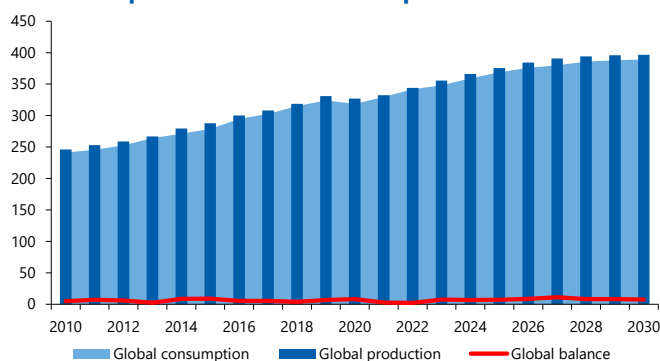
■ Shale crude and natural gas are expected to continue driving increased exports from the US. The country's midstream NGLs sector has proven to be one of the most profitable and reliable areas to invest in, ensuring continued growth even in a difficult economic environment. Investment in improved export capacity has resumed with an expected increase in capacity of more than 20pc in the next five years.

■ Increased interest in LNG exports in the Middle East will help support LPG exports. Development of the North Field gas field in Qatar will be of particular importance.

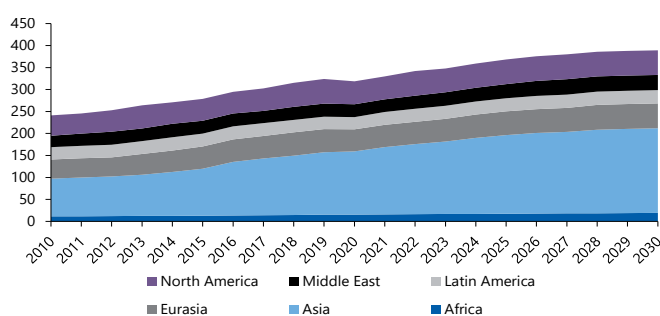
■ The largest potential new market is sub-Saharan Africa where large numbers of people are still using biomass fuels. Governments across the region continue to actively promote the use of LPG as an alternative in an effort to reduce environmental pollution and to halt deforestation. Many governments offer generous subsidies to try and encourage higher uptake. This could reshape global trade as the region becomes a significant demand hub. But the high prices of recent years have served to slow the penetration of LPG in these markets.

■ We expect an underlying structural surplus in world markets to increase in the medium term as supplies from the US and Middle East continue to grow, before stabilising towards the end of the decade. Petrochemical demand is firm but energy use demand has struggled to make headway into new markets.

World LPG production and consumption 2010-30 *mn t*



World LPG consumption by region 2010-30 *mn t*



LPG STORAGE

Total LPG storage by country '000t	
Country	Total storage
North America	
United States	46,962
Canada	5,984
South and Central America	
Argentina	374
Brazil	551
Chile	417
Colombia	13
Costa Rica	28
Dominican Republic	126
Ecuador	109
El Salvador	23
Jamaica	4
Mexico	1,082
Peru	121
Trinidad and Tobago	57
US Virgin Islands	6
Europe and Eurasia	
Austria	2
Belarus	10
Belgium	277
Bulgaria	17
Czech Republic	4
Denmark	10
Finland	315
France	319
Germany	147
Greece	10
Hungary	18
Ireland	11
Italy	85
Kazakhstan	61
Lithuania	5
Netherlands	194
Norway	366
Poland	27
Portugal	132
Romania	10
Russia	264
Serbia	11
Spain	201
Sweden	622
Switzerland	1
Turkey	306
Turkmenistan	9
Ukraine	58
UK	736
Uzbekistan	9

Total LPG storage by country '000t	
Country	Total storage
Middle East	
Bahrain	40
Iran	314
Iraq	222
Israel	17
Jordan	89
Kuwait	1,280
Lebanon	18
Qatar	533
Saudi Arabia	1,222
UAE	708
Africa	
Algeria	418
Cameroon	3
Egypt	355
Ghana	27
Ivory Coast	3
Kenya	24
Libya	57
Morocco	244
Nigeria	206
Senegal	3
South Africa	34
Tunisia	22
Asia-Pacific	
Australia	556
Bangladesh	93
China	5,336
India	743
Indonesia*	1,167
Japan	4,405
Malaysia	181
New Zealand	11
Pakistan	15
Philippines	143
Singapore	46
South Korea	1,389
Sri Lanka	41
Taiwan	301
Thailand	160
Vietnam	372

Notes: LPG storage of over 1,000t is included but some volumes are unconfirmed and totals may not be comprehensive

* Indonesia - includes floating storage

— LPG Storage Survey from Argus LPG World

PRICES

Propane monthly contract prices, plus key regional spot prices, 2022												
	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22
Middle East \$/t												
Saudi Arabia	740.00	775.00	895.00	940.00	850.00	750.00	725.00	670.00	650.00	590.00	610.00	650.00
Kuwait	740.00	775.00	895.00	940.00	850.00	750.00	725.00	670.00	650.00	590.00	610.00	650.00
Mediterranean \$/t												
Algeria (Sonatrach)	700.00	705.00	830.00	870.00	730.00	730.00	700.00	660.00	640.00	550.00	572.00	580.00
Spot Prices \$/t												
Large cargo cif ARA	701.08	749.81	875.26	770.82	749.73	716.86	663.71	635.59	608.47	558.60	587.98	544.68
Large cargo cif Lavera	714.08	762.54	887.52	787.70	753.75	711.21	657.21	628.75	616.46	574.90	603.57	561.43
Large cargo Japan CFR	765.81	819.36	935.13	850.47	815.46	771.62	730.53	682.48	659.79	627.37	701.56	626.00
Large cargo East China CFR	768.93	821.08	936.04	851.64	817.59	773.10	732.88	683.84	661.20	628.11	703.72	630.24
Large cargo South China CFR	773.86	824.58	939.52	857.21	823.54	773.53	733.93	680.15	662.03	633.70	712.88	640.92
Large cargo Far East Index	743.50	879.25	950.00	796.75	794.75	761.50	706.25	702.50	614.50	621.25	709.75	618.50
Asia spot premiums to CP \$/t												
Mideast Gulf	-20.24	-5.33	-3.39	-11.30	-16.47	-16.77	-15.45	-16.23	-19.45	-18.20	-14.23	-14.48
South China (pressurised)	63.76	67.33	69.83	70.00	70.00	70.00	68.65	66.50	68.00	68.00	69.91	#N/A
East China (refrigerated)	28.93	46.08	41.04	-88.36	-32.41	23.10	7.88	13.84	11.20	38.11	93.72	-19.76
South China (refrigerated)	33.86	49.58	44.52	-82.79	-26.46	23.53	8.93	10.15	12.03	43.70	102.88	-9.08
Vietnam	83.71	90.00	93.70	97.00	97.00	92.55	90.00	89.64	90.00	90.00	93.77	94.90
Japan	15.53	18.64	42.48	-30.44	28.09	44.53	34.68	29.07	32.80	44.62	70.38	30.67
Mont Belvieu ¢/USG												
LDH	116.64	131.51	143.82	130.79	123.34	121.52	114.69	109.33	99.36	85.46	85.16	69.40
Non-LDH	116.32	130.22	142.48	129.29	122.59	121.32	114.51	109.75	99.35	84.81	84.47	68.52
Europe \$/t												
Coasters fob NWE	720.43	828.95	1106.93	852.91	760.20	738.56	693.39	682.93	669.93	648.14	615.78	567.83
Barges fob NWE	885.95	848.04	1410.97	1289.11	907.00	787.15	736.43	732.73	743.57	717.37	672.23	648.35
Coasters fob Med	796.79	871.89	1026.78	927.67	859.08	785.29	679.31	610.58	643.06	634.07	624.27	581.20

PRICES

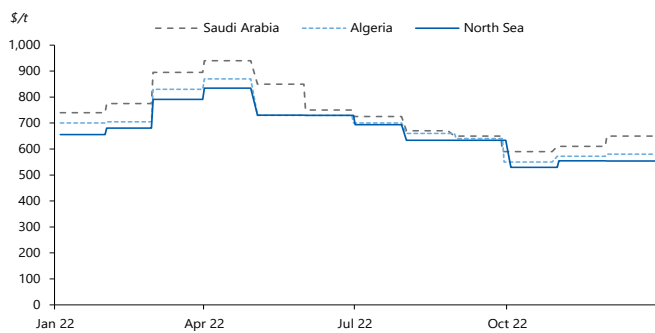
Butane monthly contract prices, plus key regional spot prices, 2022												
	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22
Middle East \$/t												
Saudi Arabia	710.00	775.00	920.00	960.00	860.00	750.00	725.00	660.00	630.00	560.00	610.00	650.00
Kuwait	710.00	775.00	920.00	960.00	860.00	750.00	725.00	660.00	630.00	560.00	610.00	650.00
Mediterranean \$/t												
Algeria (Sonatrach)	715.00	800.00	860.00	930.00	835.00	825.00	650.00	645.00	612.00	545.00	590.00	600.00
Spot Prices \$/t												
Large cargo cif ARA	784.10	842.73	945.20	855.17	866.76	737.74	636.67	605.23	592.13	610.69	623.32	554.11
Large cargo cif Lavera	765.10	823.73	926.09	836.17	847.54	712.56	607.85	575.23	583.99	607.69	620.23	551.11
Large cargo Japan CFR	757.34	831.36	949.96	861.32	818.14	773.26	723.33	670.98	627.16	612.97	697.70	634.10
Large cargo East China CFR	760.45	833.08	950.87	862.49	820.28	774.74	725.68	672.34	628.57	613.71	699.85	638.33
Large cargo South China CFR	765.38	836.58	954.35	868.06	826.22	775.17	726.73	668.65	629.40	619.30	709.01	649.01
Large cargo Far East Index	733.50	904.25	963.00	804.75	791.75	763.50	695.25	690.50	587.50	616.25	709.75	628.50
Asia spot premiums to CP \$/t												
Mideast Gulf	-20.24	-5.33	-3.39	-11.30	-16.47	-16.77	-15.45	-16.23	-19.45	-18.20	-14.23	-14.48
India cfr	28.06	28.18	45.24	40.37	43.42	40.56	32.31	27.31	32.99	50.53	88.26	88.84
South China (pressurised)	63.76	67.11	69.83	70.00	70.00	70.00	68.65	67.18	70.50	68.00	69.91	71.05
East China (refrigerated)	50.45	58.08	30.87	-97.51	-39.72	24.74	0.68	12.34	-1.43	53.71	89.85	-11.67
South China (refrigerated)	55.38	61.58	34.35	-91.94	-33.78	25.17	1.73	8.65	-0.60	59.30	99.01	-0.99
Vietnam	83.71	88.33	93.70	97.00	97.00	92.55	90.00	89.64	90.00	90.00	93.77	94.90
Japan	17.66	21.02	37.52	-31.29	28.25	45.58	34.13	29.20	28.70	47.91	68.88	31.86
Mont Belvieu ¢/USG												
LDH	153.36	154.78	167.67	141.63	127.55	136.99	114.24	112.11	105.03	96.56	99.34	93.75
Non-LDH	150.76	153.12	172.62	155.75	150.88	144.55	128.30	121.09	107.39	98.36	99.95	93.73
Europe \$/t												
Coasters fob NWE	889.68	876.76	1045.37	929.47	910.88	788.00	625.60	551.10	627.38	665.52	695.27	618.00
Barges fob NWE	810.26	884.76	1054.12	918.42	828.94	689.50	604.82	559.75	621.08	739.52	706.92	594.11
Coasters fob Med	921.56	929.55	971.59	945.58	951.81	798.65	658.76	569.72	616.58	734.95	707.86	648.40

PRICES

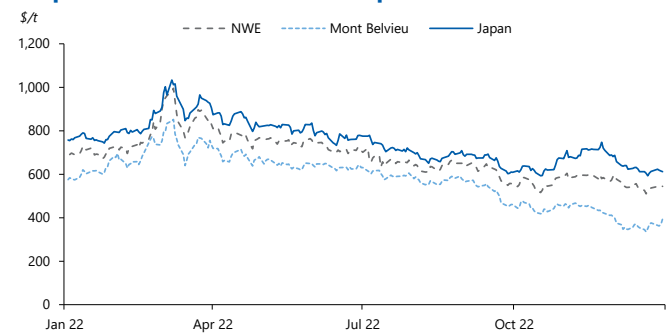
Naphtha	\$/t											
	Jan 22	Feb 22	Mar 22	Apr 22	May 22	Jun 22	Jul 22	Aug 22	Sep 22	Oct 22	Nov 22	Dec 22
Cargoes cif NWE	777.18	862.34	1,011.80	906.80	888.11	802.81	765.82	660.22	625.31	672.73	668.86	594.16
Cargoes c+f Japan	770.04	858.10	1,004.25	902.96	900.80	822.71	784.32	695.61	661.68	680.06	699.02	639.17

Ethane	¢/USG											
	Jan 22	Feb 22	Mar 22	Apr 22	May 22	Jun 22	Jul 22	Aug 22	Sep 22	Oct 22	Nov 22	Dec 22
Mont Belvieu	37.64	39.97	42.71	50.94	59.96	64.70	57.51	60.27	46.35	40.48	40.42	35.60

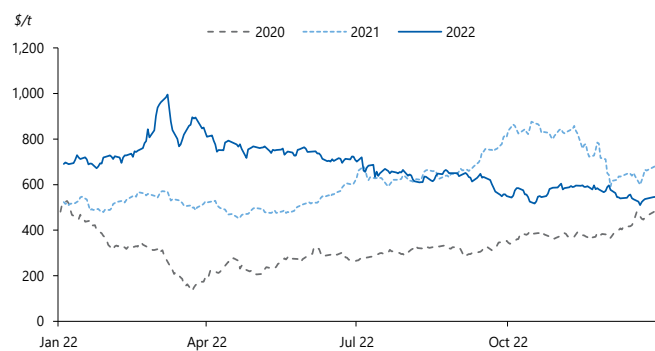
Propane export prices



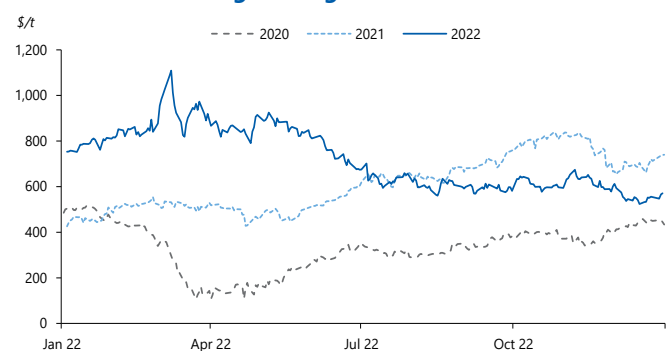
Propane NWE, Mont Belvieu, Japan



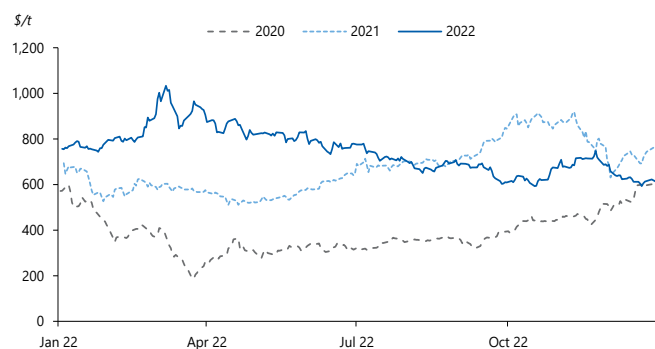
Propane cif NWE cargoes large



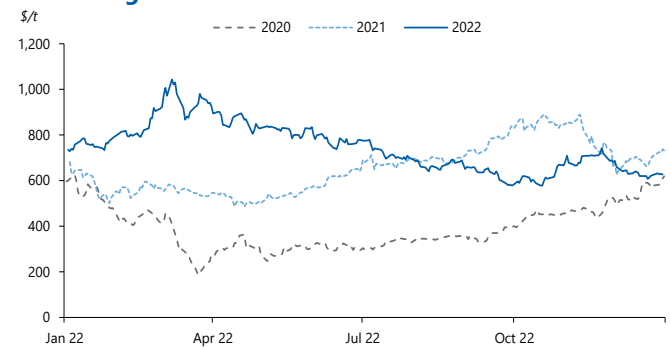
Butane cif NWE cargoes large



Propane Argus Far East Index

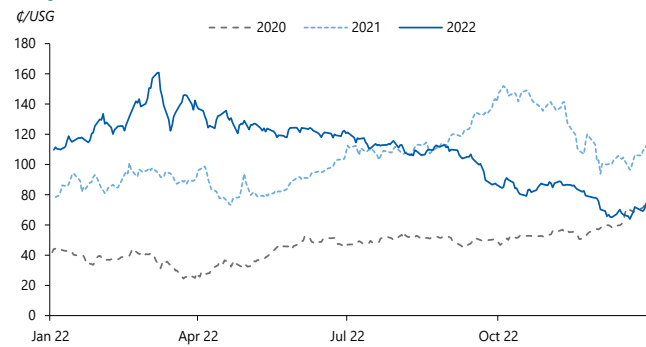


Butane Argus Far East Index

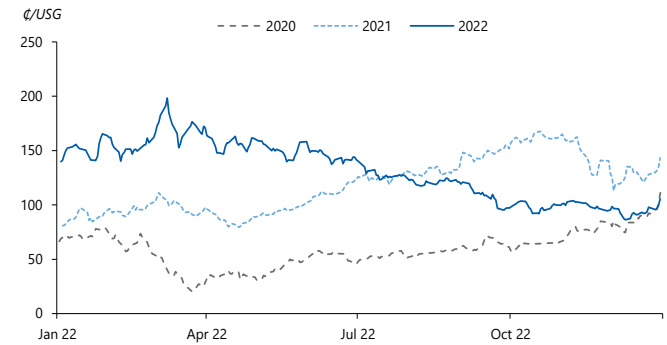


PRICES

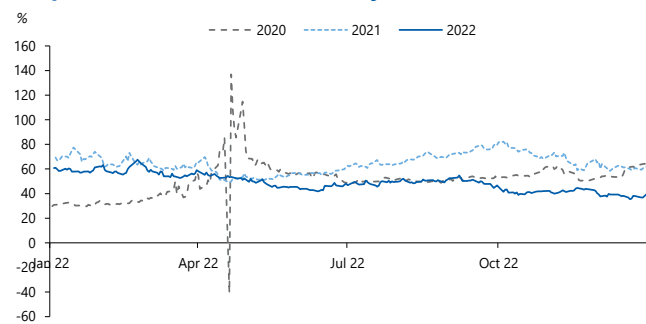
Propane Mont Belvieu non-LST



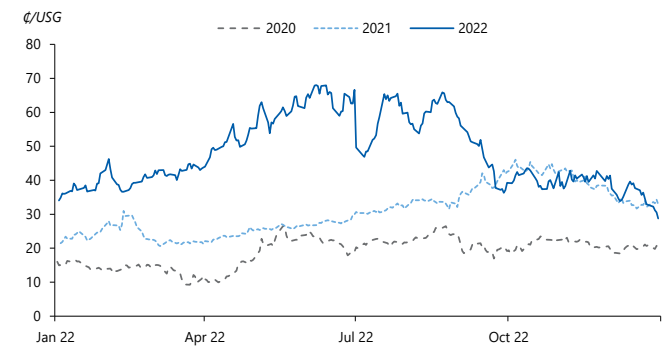
Butane Mont Belvieu non-LST



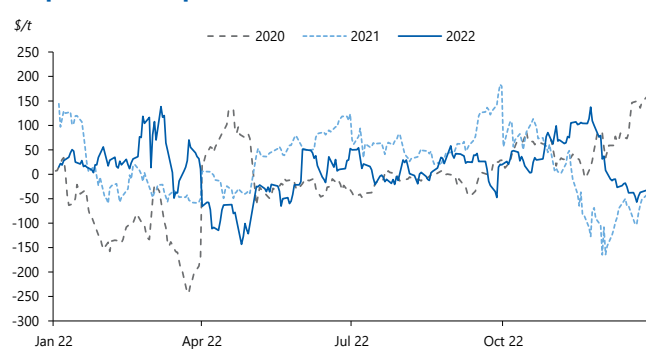
Propane Mont Belvieu LST vs Nymex WTI



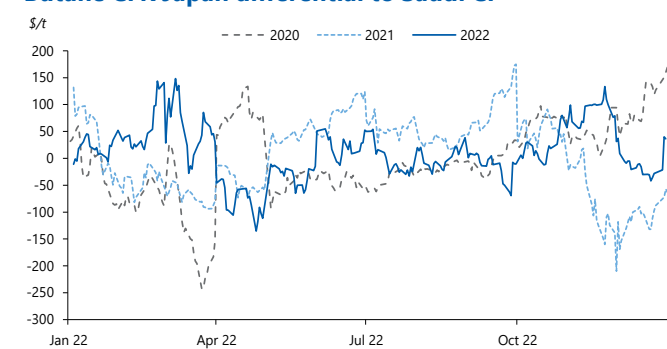
Ethane Mont Belvieu



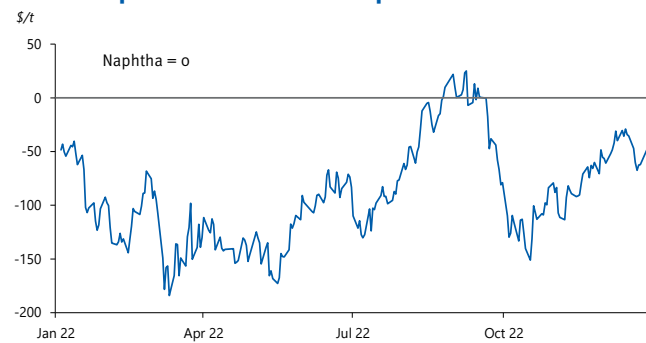
Propane CFR Japan differential to Saudi CP



Butane CFR Japan differential to Saudi CP



NWE: Propane differential to naphtha



Propane: NWE differential to Mont Belvieu



BACKGROUND

Primary energy developments 2022

Global primary energy consumption grew by 1.1pc in 2022 compared with 2021. This was relatively weak compared with the 2009-19 average of 1.6pc/yr and significantly weaker than the 5.5pc growth seen in 2021. This was the result of global economic growth being weaker in 2022 than in 2021 when the world was recovering from the impact of Covid-19. Global GDP growth in 2022 was impacted by the Russia-Ukraine conflict and the combination of rising inflation and higher interest rates in most regions. Some regions continued to feel the lingering impact of the pandemic.

Energy use from fossil fuels — oil, coal and natural gas — accounted for 81.6pc of total primary energy consumption in 2022, a small decrease compared with 2021. The share of fossil fuels has been declining steadily over the past four years. Renewable energy, which includes biofuels, wind and solar, grew by the most of any fuel type, increasing by 13pc to 1.08bn t of oil equivalent (toe). 2022 was the first year that renewable energy consumption has exceeded 1bn toe.

Asia-Pacific consumed 6.58bn toe of primary energy, the most of any region and 46.1pc of total global consumption. China alone accounts for 27pc of global consumption, with primary energy consumption totalling 3.79bn toe. Growth in 2021 was weak at less than 1pc, reflecting the zero-Covid policy in force in China throughout 2022. For context the average growth in energy consumption in China in 2009-19

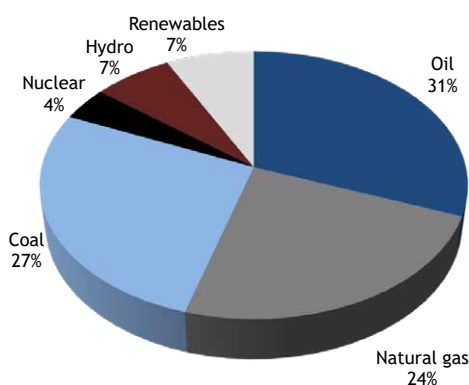
was 4.1pc. Consumption in China of oil, natural gas and hydroelectricity all decreased in 2022, by 4.7pc, 1.2pc and 0.1pc, respectively. The only significant growth was seen in renewable energy, which grew by 18pc to 318mn toe.

Energy consumption in the US was second only to China. Total energy consumption was 2.25bn t, a 2.7pc increase on 2021. Again the biggest increase was in the renewables sector, which gained 13pc, in line with global growth. Historically growth in the renewables sector in the US has lagged behind global growth. Between 2009 and 2019 average growth in the sector was 14pc globally but only 10pc in the US.

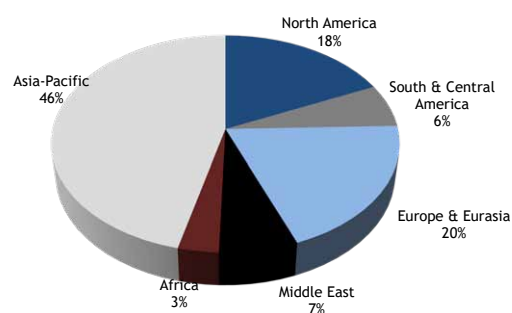
Disruption to the Russian economy, as a result of the conflict with Ukraine and sanctions imposed subsequently by western countries, led to total primary energy consumption falling. Total consumption was 683mn toe, down by 8pc compared with 2021. The conflict also impacted primary energy consumption in Ukraine, which dropped by 31pc to 55.3mn toe. Consumption fell across all fuels, except for hydroelectric, which grew by 6pc.

Primary energy consumption in Europe, including Ukraine and Turkey, fell by 3.8pc. In keeping with global trends, renewable energy also grew strongly, increasing by 9pc to 264mn toe in 2022. Oil was the only fossil fuel to see consumption grow, by 3.8pc to 663mn t. Natural gas consumption slumped by 13pc after Russia — the largest gas supplier to Europe — reduced exports sharply.

Primary energy consumption by fuel, 2022



Primary energy consumption by region, 2022



Primary Energy Consumption by Fuel							mn toe
	Oil	Natural gas	Coal	Nuclear	Hydroelectric	Renewables	Total
Total World 2021	4,260	3,496	3,831	605	965	954	14,266
Total World 2022	4,395	3,388	3,856	576	971	1,079	14,424
Difference	3.2%	-3.1%	0.6%	-4.8%	0.7%	13.0%	1.1%

BACKGROUND

In Africa, energy consumption stayed roughly constant at 476mn toe, 0.2pc higher than in 2021. But changes in consumption were seen in the different energy sectors. Oil, hydroelectric and renewables all increased, by 6pc, 2pc and 4pc, respectively. Meanwhile natural gas, coal and nuclear all decreased, by 4pc, 5pc and 19pc, respectively.

In Latin America, total energy consumption was 915mn toe in 2022, an increase of 5.1pc compared with 2021. Oil

consumption was 381mn t in 2022 and accounts for 42pc of primary energy consumption, the largest share of any fuel. Energy consumption in the renewable sector increased by 6pc, about half the global average of 13pc. But hydroelectric consumption — which is counted separately from other renewables — achieved the fastest growth, with consumption growing by 11pc. This was well above the global average of 0.7pc growth.

Primary Energy Consumption, 2022							mn toe
	Oil	Natural gas	Coal	Nuclear	Hydroelectric	Renewables	Total
US	823	758	236	175	58	201	2,250
Canada	98	105	9	19	89	14	334
Total North America	921	862	245	193	147	215	2,584
							0
Argentina	32	39	1	2	5	6	85
Brazil	116	27	14	3	96	60	317
Chile	18	6	5	0	5	7	42
Colombia	22	11	2	0	14	2	51
Ecuador	12	0	0	0	6	0	18
Mexico	95	83	6	2	8	11	205
Peru	11	8	1	0	7	1	28
Trinidad & Tobago	1	13	0	0	0	0	14
Venezuela	12	25	0	0	15	0	52
Other	61	8	5	0	20	8	101
Total South & C. America	381	222	34	7	175	95	915
							0
Austria	11	7	2	0	8	4	32
Azerbaijan	6	10	0	0	0	0	17
Belarus	7	16	1	1	0	0	25
Belgium	27	13	3	9	0	6	57
Czech Republic	10	6	14	7	0	2	40
Finland	8	1	3	5	3	8	28
France	67	33	5	63	10	19	198
Germany	97	66	56	7	4	59	289
Greece	14	5	2	0	1	4	27
Hungary	8	8	1	3	0	2	23
Italy	57	56	7	0	6	18	145
Kazakhstan	18	19	34	0	2	1	74
Netherlands	41	23	6	1	0	12	83
Norway	8	3	1	0	29	4	45
Poland	34	15	43	0	0	9	102
Portugal	11	5	0	0	1	5	22
Romania	10	8	4	2	3	3	31
Russian Federation	161	351	76	48	44	2	683
Spain	62	28	4	13	4	25	136
Sweden	12	1	2	11	16	13	54
Switzerland	9	3	0	5	7	2	25
Turkey	50	44	42	0	15	16	167

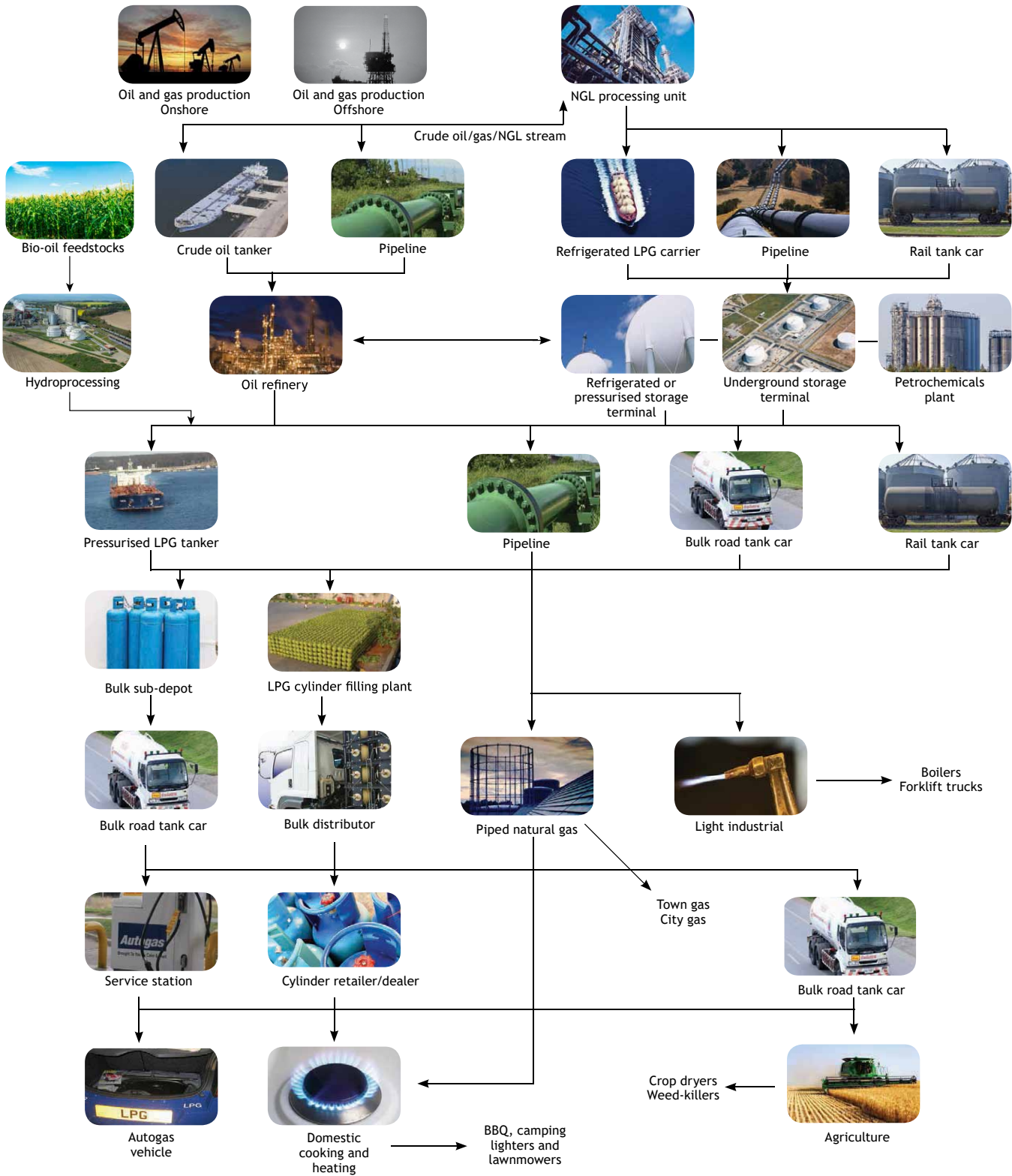
BACKGROUND

Primary Energy Consumption, 2022							mn toe
	Oil	Natural gas	Coal	Nuclear	Hydroelectric	Renewables	Total
Turkmenistan	7	32	0	0	0	0	39
Ukraine	9	17	12	13	2	2	55
United Kingdom	61	62	5	10	1	33	172
Uzbekistan	5	42	2	0	1	0	50
Other Europe and Eurasia	63	28	31	9	23	18	172.9
Total Europe & Eurasia	872	903	357	209	183	268	2,790
Iran	84	197	2	1	2	0	286
Iraq	37	16	0	0	1	0	54
Israel	11	10	4	0	0	2	26
Kuwait	18	19	0	0	0	0	37
Oman	10	25	0	0	0	0	35
Qatar	12	32	0	0	0	0	44
Saudi Arabia	166	103	0	0	0	0	270
United Arab Emirates	50	60	2	4	0	2	119
Other Middle East	25	21	1	0	0	2	48
Total Middle East	414	482	9	6	3	6	919
Algeria	20	38	0	0	0	0	58
Egypt	35	52	1	0	3	2	94
Morocco	13	0	7	0	0	2	22
South Africa	24	4	79	2	1	4	114
Other	100	45	8	0	31	4	188
Total Africa	192	140	95	2	35	12	476
Australia	47	36	37	0	4	17	141
Bangladesh	13	25	4	0	0	0	43
China	659	323	2,111	90	292	318	3,793
China Hong Kong SAR	11	4	4	0	0	0	19
India	237	50	480	10	39	51	867
Indonesia	70	32	105	0	6	18	230
Japan	152	86	117	11	17	37	420
Malaysia	39	42	22	0	7	2	114
New Zealand	7	3	1	0	6	3	20
Pakistan	23	33	15	5	8	1	85
Philippines	20	3	20	0	2	4	49
Singapore	63	11	0	0	0	0	75
South Korea	124	53	69	38	1	12	297
Sri Lanka	5	0	1	0	2	0	8.0
Taiwan	40	24	38	5	1	4	112
Thailand	54	38	17	0	1	7	118
Vietnam	24	7	49	0	22	8	109
Other Asia Pacific	28	9	25	0	20	1	83
Total Asia-Pacific	1,615	780	3,116	159	428	483	6,582
Total World	4,395	3,388	3,856	576	971	1,079	14,266

^ Less than 0.5

— BP Statistical Review of World Energy - June 2023

LPG DISTRIBUTION CHAIN



METHODOLOGY

Definitions

LPG:

Liquefied petroleum gas including propane, n-butane, isobutane, butane mixtures and propane-butane mixtures only. In some markets a small amount of unsaturated product may be included.

rLPG:

Renewable LPG (rLPG) is a low-carbon energy source as its carbon footprint is up to 80pc lower than that of conventional LPG. It is identical in its chemical structure to conventional LPG. It is a flexible drop-in fuel, making it easy for a conventional LPG user to switch to a renewable alternative.

Consumption by sectors*

Domestic:

Includes residential and commercial use for LPG as a cooking and heating fuel primarily from cylinders and bulk tanks.

Agriculture:

LPG use in crop drying, weed and pest control, irrigation and non-highway agricultural vehicles.

Industry:

LPG consumed in manufacturing and light industrial applications, such as glass-blowing, ceramics manufacture, welding, food processing and heating for boilers. Some volumes in the commercial sector may be included.

Autogas:

Use as automotive vehicle fuel in passenger cars, taxi fleets, company vehicle fleets, buses and light trucks, but excluding forklift trucks.

Refinery:

LPG used as a feedstock for crude oil refining processes or as a fuel at refineries.

Chemical:

LPG used as a feedstock for olefins production and other chemical processes. Some feedstock use in refineries may be included.

*A comprehensive resource on the more than 1,000 applications of LPG can be found at the WLPGA's global portal on LPG applications, at <http://www.lpg-apps.org>.

LPG properties and conversion factors

LPG Properties		
Property	Propane (C ³ H ⁸)	Butane (C ⁴ H ¹⁰)
Liquid density	0.50-0.51	0.57-0.58
Gas density/Air	1.40-1.55	1.90-2.10
Ratio Gas/Liquid	274 Vols	233 Vols
Boiling Point	-45 °C	-2 °C
Latent Heat Vaporisation	358 KJ/kg	372 KJ/kg
Specific Heat Liquid	0.60 Btu/ft ³	0.57 Btu/ft ³
Sulphur Content	0-0.02%	0-0.02%
Flammability Limit	2.2-10.0%	1.8-9.0%
Calorific Values	2,500 Btu/ft ³	3,270 Btu/ft ³
	21,500 Btu/lb	21,200 Btu/lb
	11,900 Kcal/kg	11,800 Kcal/kg
	50.4 MJ/kg	49.5 MJ/kg
Minimum ignition temp.	460 °C	410 °C

Useful Conversion Factors		
	Propane (C ³ H ⁸)	Butane (C ⁴ H ¹⁰)
USG/t	521	458
Imperial gallons/t	433	381
Litres/t	1,968	1,732
Therms/t	474	465
b/t	12	11
t/m ³	0.582	0.600
1t of LPG = 1.18t of oil equivalent		

1 nautical mile = 1.85km

WORLD LPG ASSOCIATION AND ARGUS MEDIA

About the WLPGA

The World LPG Association (WLPGA) is the authoritative voice of the global LPG industry, representing all its sectors. The primary aim of the association is to add value to the sector through driving premium demand for LPG, while also promoting compliance to good business and safety practices. It brings together private and public companies involved in one, several or all activities of the industry. It develops partnerships with international organisations and implements projects on local and global scales. The association was established in 1987 and granted Special Consultative Status with the UN Economic and Social Council in 1989.

WLPGA Vision

The WLPGA promotes the use of LPG worldwide to foster a safer, cleaner, healthier and more prosperous world.

WLPGA mission statement

The WLPGA mission statement forms the three principal goals of the WLPGA, namely advocacy, business improvement, and innovation and growth.

About Argus Media

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LPG Statistical Review editorial board: David Tyler (WLPGA) and Francis Osborne (*Argus*)

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Note on data revisions

Each year *Argus* updates the previous year's figures in cases where new data have become available and revised data have been published — or statistical mismatches have been identified. In particular, we would like to highlight the following changes to figures in this edition of the *Statistical Review of Global LPG*:

- **Algeria:** Historical 2021 figures for gas processing production and transport demand have both been revised up to reflect better data that have become available.

