

Geopolitics of Gas

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Raitenhaslach, 25.8.2020

A few facts about Natural Gas

- Natural gas **consumption** increased by 78 billion cubic metres (bcm), or 2%. Nevertheless, **the share of gas in primary energy rose to a record high of 24.2%.**
- **Increases** in gas demand were driven by the US (27 bcm) and China (24 bcm), while Russia and Japan saw the largest **declines** (10 and 8 bcm respectively).
- Gas **production grew** by 132 bcm (3.4%), with the US accounting for almost two-thirds of this increase (85 bcm). Australia (23 bcm) and China (16 bcm) were also key contributors to growth.

A few more facts about natural gas

- **Inter-regional gas trade** expanded at a rate of 4.9%, more than double its 10-year average, driven by a record increase in liquefied natural gas (LNG) of 54 bcm (12.7%).
- **LNG supply** growth was led by the US (19 bcm) and Russia (14 bcm), with most incremental supplies heading to Europe: European LNG imports (+49 bcm) rose by more than two-thirds.

Dynamics

- The **slowdown in energy demand growth**, combined with a shift in the fuel mix away from coal and toward natural gas and renewables, led to a significant slowing in the growth of carbon emissions
- **Energy prices fell** on the whole, particularly for coal and gas where growth in production outpaced consumption leading to a build up of inventories. Oil prices were a little lower.

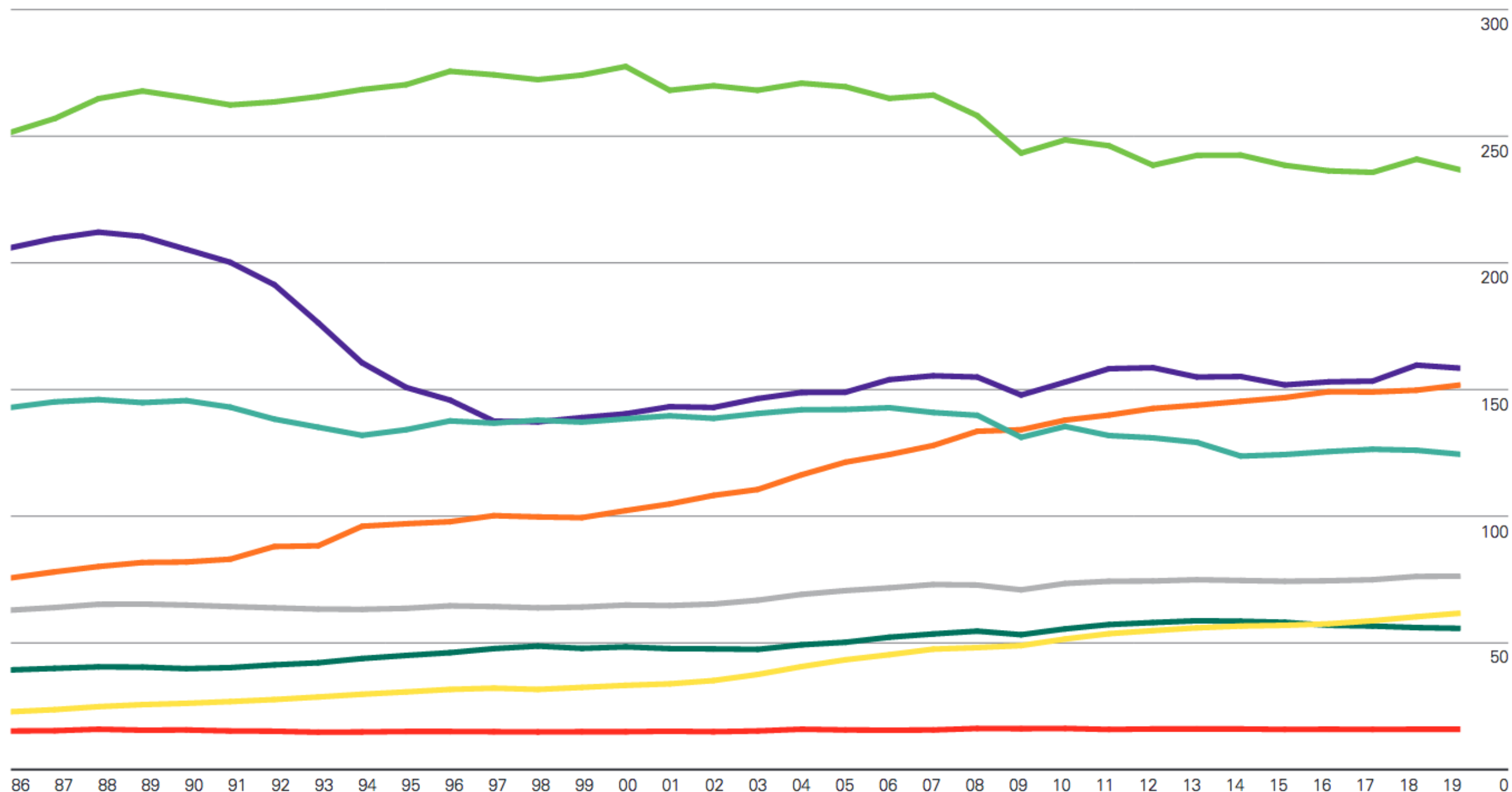
● 41 % ...

- ...Renewables contribution to the increase in energy demand, the largest of an energy source!

Energy per capita by region

Gigajoules per head

North America S. & Cent. America Europe CIS
 Middle East Africa Asia Pacific World

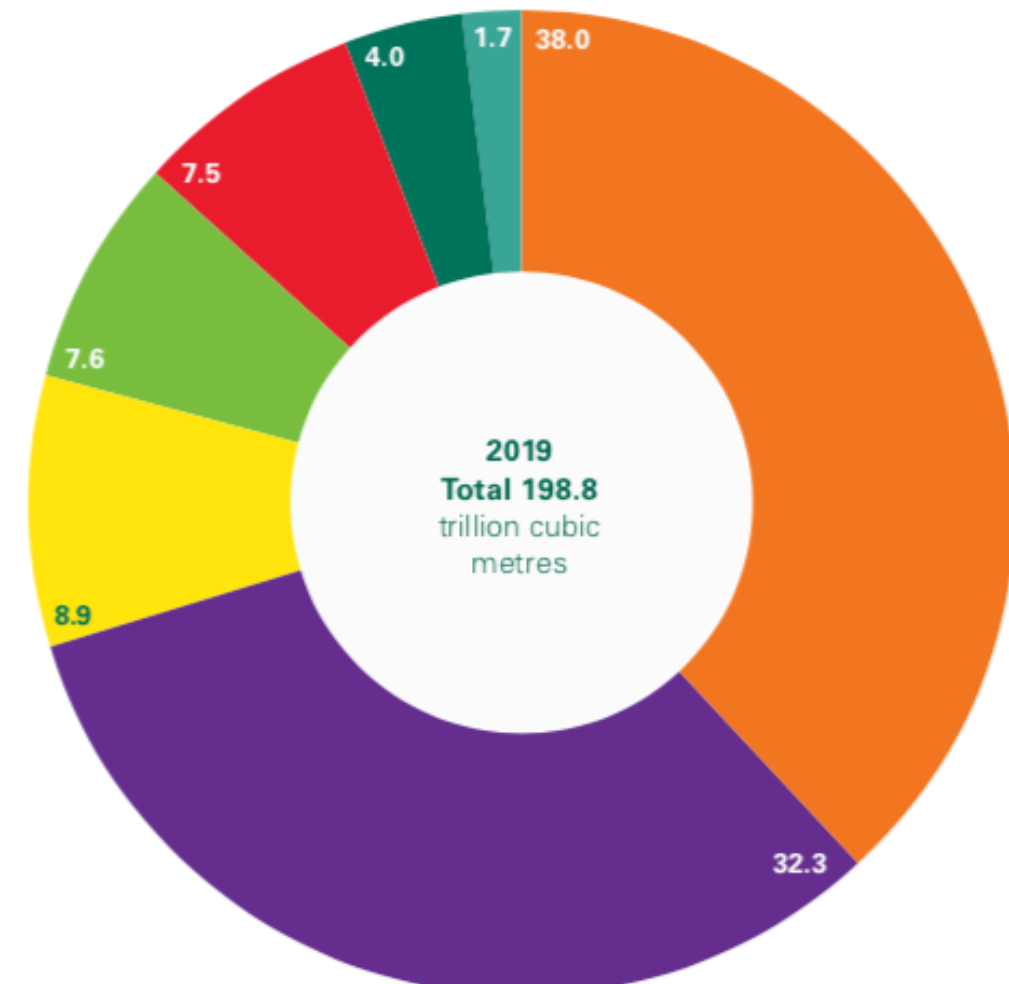
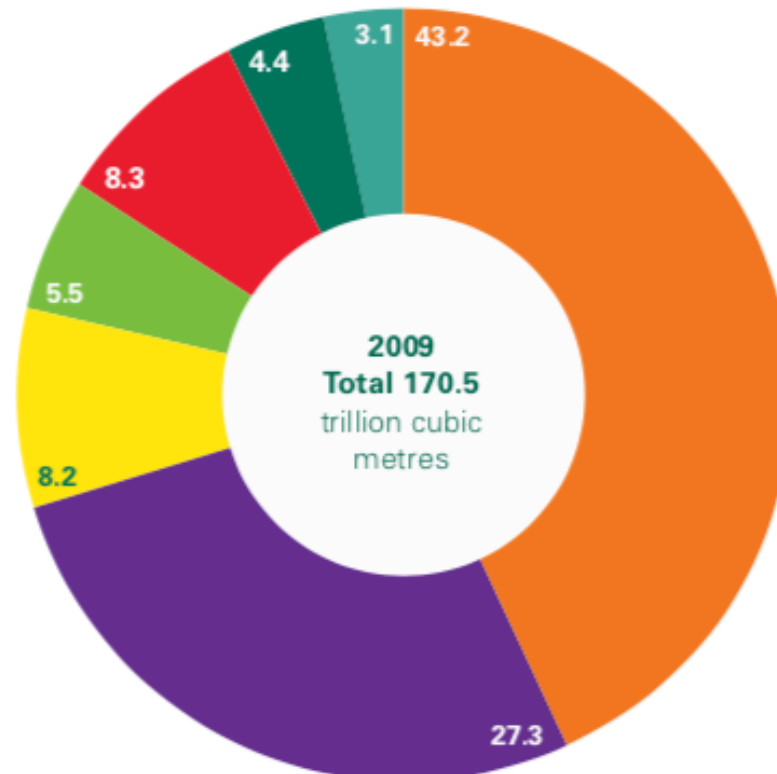
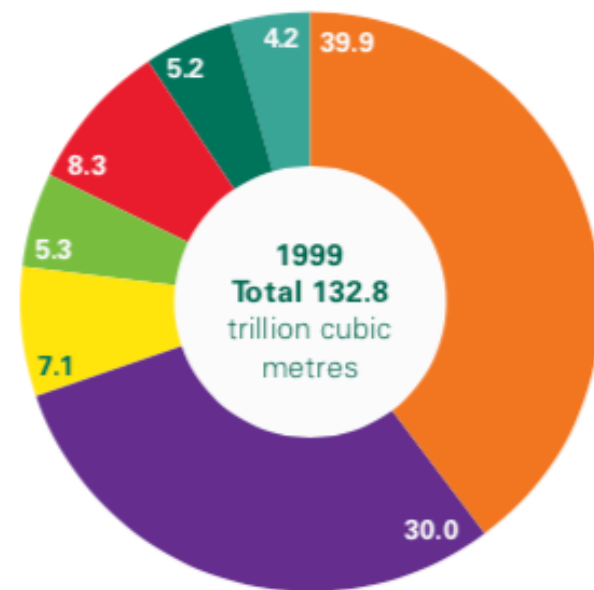


Average global energy consumption per capita increased by only 0.2% in 2019 to 75.7 GJ/head, driven by growth in the Middle East (1.4%) and Asia Pacific (2.4%). Energy demand per head fell in all other regions. North America is the region with the highest consumption per capita (236 GJ/head), followed by CIS (158 GJ/head) and the Middle East (151 GJ/head). Africa remains the region with the lowest average consumption (15 GJ/head).

Distribution of proved reserves in 1999, 2009 and 2019

Percentage

- Middle East
- CIS
- Asia Pacific
- North America
- Africa
- S. & Cent. America
- Europe



Natural gas: Production in billion cubic metres*

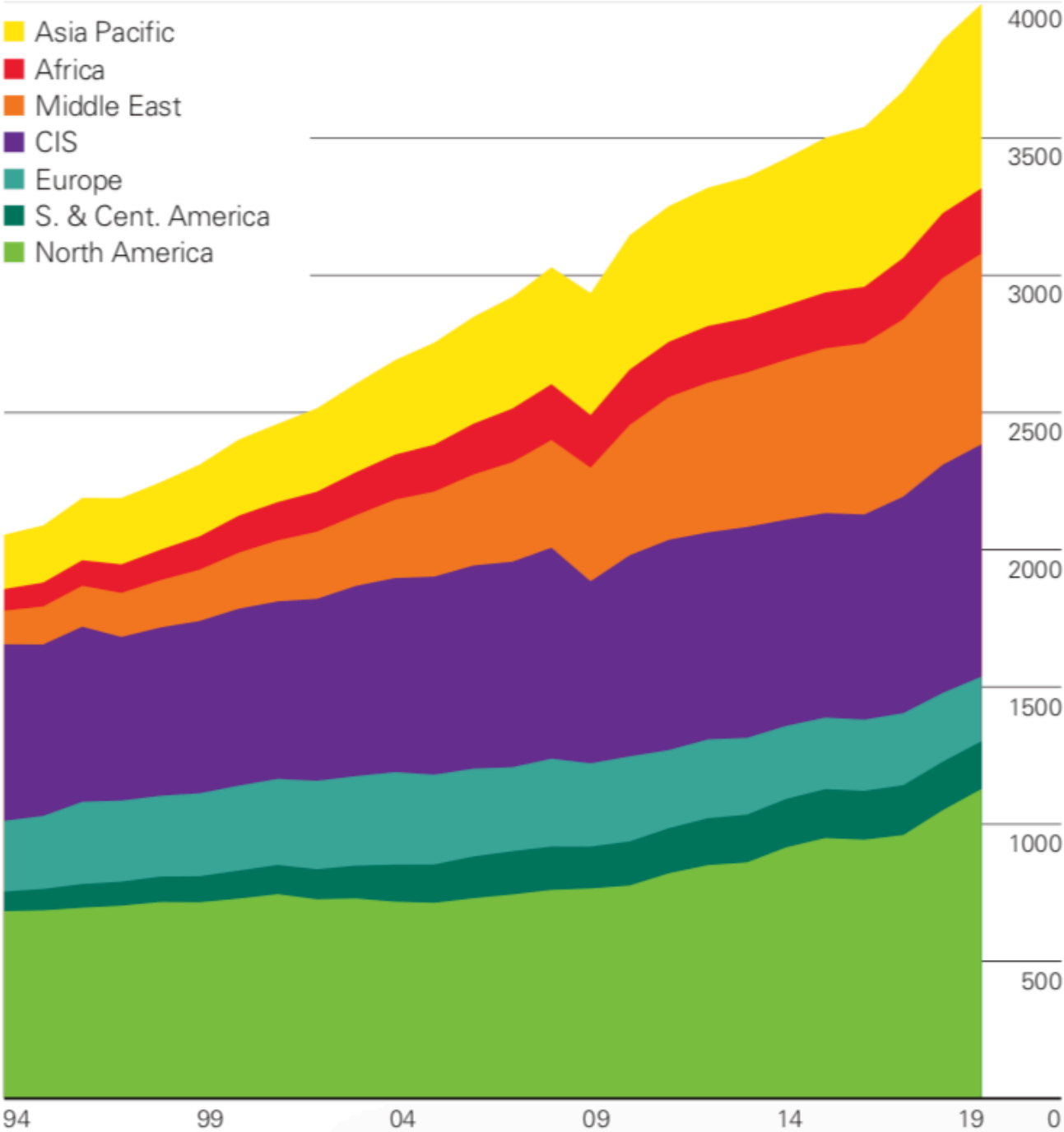
Billion cubic metres	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Growth rate per annum		Share 2019
												2019	2008-18	
Canada	155.1	149.6	151.1	150.3	151.9	159.0	160.8	171.8	175.6	179.0	173.1	-3.3%	0.7%	4.3%
Mexico	52.6	51.2	52.1	50.9	52.5	51.3	47.9	43.7	38.3	35.2	34.0	-3.4%	-2.9%	0.9%
US	557.6	575.2	617.4	649.1	655.7	704.7	740.3	727.4	746.2	835.9	920.9	10.2%	4.3%	23.1%
Total North America	765.2	775.9	820.5	850.3	860.1	915.0	949.0	942.8	960.0	1050.1	1128.0	7.4%	3.3%	28.3%
Argentina	40.3	39.0	37.7	36.7	34.6	34.5	35.5	37.3	37.1	39.4	41.6	5.6%	-0.8%	1.0%
Bolivia	11.9	13.7	15.0	17.1	19.6	20.3	19.6	18.8	18.2	17.0	15.0	-12.2%	2.1%	0.4%
Brazil	12.3	15.0	17.2	19.8	21.9	23.3	23.8	24.1	27.2	25.2	25.8	2.6%	5.8%	0.6%
Colombia	10.1	10.8	10.5	11.5	13.2	12.3	11.6	12.0	12.3	12.9	13.2	2.6%	4.0%	0.3%
Peru	3.6	7.3	11.5	12.0	12.4	13.1	12.7	14.0	13.0	12.8	13.5	5.6%	13.8%	0.3%
Trinidad & Tobago	38.6	40.3	38.7	38.5	38.7	38.1	36.0	31.3	31.9	34.0	34.6	1.8%	-1.0%	0.9%
Venezuela	31.8	30.5	30.2	31.9	30.6	31.8	36.1	37.2	38.6	31.6	26.5	-16.3%	-0.6%	0.7%
Other S. & Cent. America	3.8	3.8	3.2	3.0	2.7	2.6	2.9	3.1	3.1	3.3	3.5	5.2%	-1.5%	0.1%
Total S. & Cent. America	152.3	160.4	164.1	170.6	173.8	176.0	178.0	177.9	181.4	176.2	173.6	-1.5%	1.1%	4.4%
Denmark	8.8	8.5	6.9	6.0	5.0	4.8	4.8	4.7	5.1	4.3	3.2	-25.4%	-8.5%	0.1%
Germany	12.7	11.1	10.5	9.5	8.6	8.1	7.5	6.9	6.4	5.5	5.3	-3.8%	-8.6%	0.1%
Italy	7.6	8.0	8.0	8.2	7.4	6.8	6.4	5.5	5.3	5.2	4.6	-10.9%	-5.2%	0.1%
Netherlands	65.5	75.3	69.5	68.4	72.4	60.4	45.9	44.3	38.5	32.3	28.1	-13.0%	-7.6%	0.7%
Norway	103.6	106.4	100.5	113.9	107.9	108.0	116.2	115.9	123.2	121.3	114.4	-5.7%	2.0%	2.9%
Poland	4.3	4.3	4.5	4.5	4.4	4.3	4.3	4.1	4.0	4.0	4.0	0.1%	-0.7%	0.1%
Romania	10.4	10.0	10.1	10.1	10.0	10.2	10.2	9.1	10.0	10.0	9.7	-2.8%	-0.5%	0.2%
Ukraine	20.3	19.4	19.5	19.4	20.2	20.2	18.8	19.0	19.4	19.7	19.6	-0.5%	-0.3%	0.5%
United Kingdom	61.2	57.9	46.1	39.2	37.0	37.4	40.7	41.7	41.9	40.5	39.6	-2.2%	-5.7%	1.0%
Other Europe	9.3	9.3	9.2	8.4	7.2	6.3	6.1	8.7	9.0	8.5	7.4	-12.9%	-1.1%	0.2%
Total Europe	303.7	310.4	284.8	287.5	280.0	266.6	261.0	259.9	262.8	251.2	235.9	-6.1%	-2.4%	5.9%
Azerbaijan	15.9	16.3	16.0	16.8	17.4	18.4	18.8	18.3	17.8	19.0	24.3	27.7%	1.8%	0.6%
Kazakhstan	19.0	20.4	20.1	19.8	21.4	21.7	22.0	22.9	23.4	23.9	23.4	-2.2%	2.7%	0.6%
Russian Federation	536.2	598.4	616.8	601.9	614.5	591.2	584.4	589.3	635.6	669.1	679.0	1.5%	0.9%	17.0%
Turkmenistan	33.3	40.1	56.3	59.0	59.0	63.5	65.9	63.2	58.7	61.5	63.2	2.7%	♦	1.6%
Uzbekistan	58.4	57.1	56.6	56.5	55.9	56.3	53.6	53.1	53.4	57.2	56.3	-1.6%	-0.7%	1.4%
Other CIS	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	2.0%	0.2%	♦
Total CIS	663.2	732.7	766.2	754.3	768.5	751.4	745.0	747.2	789.1	831.1	846.5	1.9%	0.8%	21.2%
Bahrain	12.1	12.4	12.6	13.1	14.0	14.7	14.8	14.4	14.5	14.6	16.9	15.4%	2.0%	0.4%
Iran	135.7	143.9	151.0	156.9	157.5	175.5	183.5	199.3	219.5	238.3	244.2	2.4%	6.8%	6.1%

Natural gas: Consumption in billion cubic metres*

Billion cubic metres	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Growth rate per annum		Share 2019
												2019	2008-18	
Canada	86.6	88.3	97.5	97.2	104.3	109.6	109.8	106.2	109.3	118.3	120.3	1.7%	2.8%	3.1%
Mexico	65.2	66.0	70.8	73.7	77.8	78.8	80.8	83.0	86.0	87.6	90.7	3.5%	3.9%	2.3%
US	617.6	648.2	658.2	688.1	707.0	722.3	743.6	749.1	740.0	819.9	846.6	3.3%	2.7%	21.5%
Total North America	769.4	802.5	826.6	859.0	889.1	910.7	934.1	938.3	935.3	1025.8	1057.6	3.1%	2.8%	26.9%
Argentina	41.8	42.1	43.8	45.7	46.0	46.2	46.7	48.2	48.3	48.7	47.5	-2.5%	1.2%	1.2%
Brazil	20.7	27.6	27.5	32.6	38.4	40.7	42.9	37.1	37.6	35.9	35.8	-0.2%	3.4%	0.9%
Chile	2.8	5.7	5.8	5.3	5.3	4.4	4.8	5.9	5.6	6.4	6.5	1.1%	8.8%	0.2%
Colombia	8.4	8.7	8.5	9.5	10.5	11.4	11.2	12.1	12.4	13.2	13.4	1.8%	6.1%	0.3%
Ecuador	0.6	0.6	0.6	0.7	0.9	0.9	0.8	0.9	0.8	0.7	0.6	-10.6%	3.6%	♦
Peru	3.3	5.4	6.3	6.9	6.7	7.4	7.6	8.5	7.5	8.0	8.3	3.7%	9.4%	0.2%
Trinidad & Tobago	19.1	20.7	20.5	20.2	20.4	20.5	19.6	16.9	18.3	17.4	17.5	1.0%	-1.0%	0.4%
Venezuela	34.2	31.3	33.3	34.6	32.3	34.0	37.0	37.2	38.6	31.6	26.5	-16.3%	-1.0%	0.7%
Other S. & Cent. America	4.9	5.1	5.8	6.3	6.9	7.2	7.1	7.3	7.2	8.0	9.2	14.7%	5.4%	0.2%
Total S. & Cent. America	135.8	147.3	152.1	161.8	167.3	172.6	177.8	174.2	176.3	169.9	165.4	-2.7%	1.9%	4.2%
Austria	8.8	9.6	9.0	8.6	8.2	7.5	8.0	8.3	9.1	8.7	8.9	2.5%	-0.4%	0.2%
Belgium	17.6	19.4	16.5	16.7	16.5	14.5	15.8	16.2	16.4	16.9	17.4	3.0%	-0.3%	0.4%
Czech Republic	7.9	9.4	7.9	8.0	8.1	7.2	7.5	8.2	8.4	8.0	8.3	4.3%	-0.4%	0.2%
Finland	3.7	4.1	3.6	3.2	3.0	2.7	2.3	2.0	1.8	2.1	2.0	-3.8%	-6.7%	0.1%
France	44.7	49.6	43.0	44.4	45.1	37.9	40.8	44.5	44.8	42.7	43.4	1.7%	-0.8%	1.1%
Germany	84.4	88.1	80.9	81.1	85.0	73.9	77.0	84.9	87.7	85.9	88.7	3.3%	-0.4%	2.3%
Greece	3.4	3.7	4.6	4.2	3.7	2.8	3.1	4.0	4.8	4.7	5.1	9.0%	1.5%	0.1%
Hungary	10.6	11.4	10.9	9.7	9.1	8.1	8.7	9.3	9.9	9.6	9.8	2.0%	-2.4%	0.2%
Italy	74.3	79.1	74.2	71.4	66.7	59.0	64.3	67.5	71.6	69.2	70.8	2.3%	-1.5%	1.8%
Netherlands	41.4	46.8	40.9	39.3	39.1	34.5	34.1	35.2	36.2	35.4	36.8	4.2%	-1.3%	0.9%
Norway	4.1	4.1	4.0	4.0	4.0	4.3	4.5	4.4	4.6	4.5	4.5	0.2%	0.4%	0.1%
Poland	15.1	16.2	16.5	17.4	17.4	17.0	17.1	18.3	19.2	19.9	20.4	2.3%	2.4%	0.5%
Portugal	4.8	5.2	5.3	4.6	4.3	4.1	4.8	5.1	6.3	5.8	6.1	5.7%	1.9%	0.2%
Romania	12.3	12.5	12.9	12.5	11.4	10.9	10.4	10.5	11.3	11.6	10.9	-5.9%	-2.0%	0.3%
Spain	36.3	36.2	33.6	33.2	30.3	27.5	28.5	29.1	31.7	31.5	36.1	14.8%	-2.5%	0.9%
Sweden	1.1	1.5	1.2	1.1	1.0	0.8	0.9	1.0	1.0	1.0	1.0	3.2%	1.7%	♦
Switzerland	3.1	3.5	3.1	3.4	3.6	3.1	3.3	3.5	3.5	3.3	3.4	2.4%	0.2%	0.1%
Turkey	33.7	35.8	41.8	43.3	44.0	46.6	46.0	44.5	51.6	47.2	43.2	-8.5%	3.0%	1.1%
Ukraine	48.9	54.6	56.1	51.8	47.7	40.3	32.0	31.4	30.2	30.6	28.2	-7.7%	-6.9%	0.7%
United Kingdom	91.2	98.5	81.9	76.9	76.3	70.1	72.0	80.7	78.6	79.3	78.8	-0.5%	-2.1%	2.0%
Other Europe	29.8	33.5	32.3	30.7	29.7	27.2	28.1	28.9	30.3	30.2	30.1	-0.4%	-1.2%	0.8%
Total Europe	577.4	622.9	580.4	565.7	554.4	500.0	509.2	537.4	558.9	548.0	554.1	1.1%	-1.3%	14.1%
Azerbaijan	8.6	8.1	8.9	9.4	9.4	9.9	11.1	10.9	10.6	10.8	11.8	9.0%	0.8%	0.3%
Belarus	16.9	20.7	19.2	19.4	19.3	19.1	17.9	17.8	18.2	19.3	19.3	-0.3%	-0.3%	0.5%
Kazakhstan	10.1	11.0	12.2	13.0	13.6	15.0	15.3	15.8	16.8	19.0	17.9	-5.8%	6.0%	0.5%
Russian Federation	397.8	423.9	435.6	428.6	424.9	422.2	408.7	420.6	431.1	454.5	444.3	-2.2%	0.7%	11.3%
Turkmenistan	17.1	18.3	20.7	22.9	19.3	20.0	25.4	25.1	24.8	28.4	31.5	11.1%	13.7%	0.8%
Uzbekistan	44.1	44.0	47.4	46.2	46.2	48.5	46.3	43.3	43.1	44.4	43.4	-2.2%	0.1%	1.1%
Other CIS	5.3	5.2	5.5	5.7	4.8	5.3	5.2	5.1	5.1	5.9	5.5	-6.0%	-0.1%	0.1%
Total CIS	499.9	531.3	549.5	545.2	537.3	539.9	530.0	538.8	549.6	582.3	573.7	-1.5%	1.1%	14.6%
Iran	134.8	144.4	153.2	152.5	153.8	173.4	184.0	196.3	209.1	224.1	223.6	-0.2%	5.9%	5.7%
Iraq	6.9	7.1	6.3	6.3	7.1	7.5	7.3	9.9	11.4	14.6	19.9	36.5%	8.5%	0.5%
Israel	4.0	5.1	4.7	2.4	6.6	7.2	8.1	9.2	9.9	10.5	10.8	2.4%	11.3%	0.3%

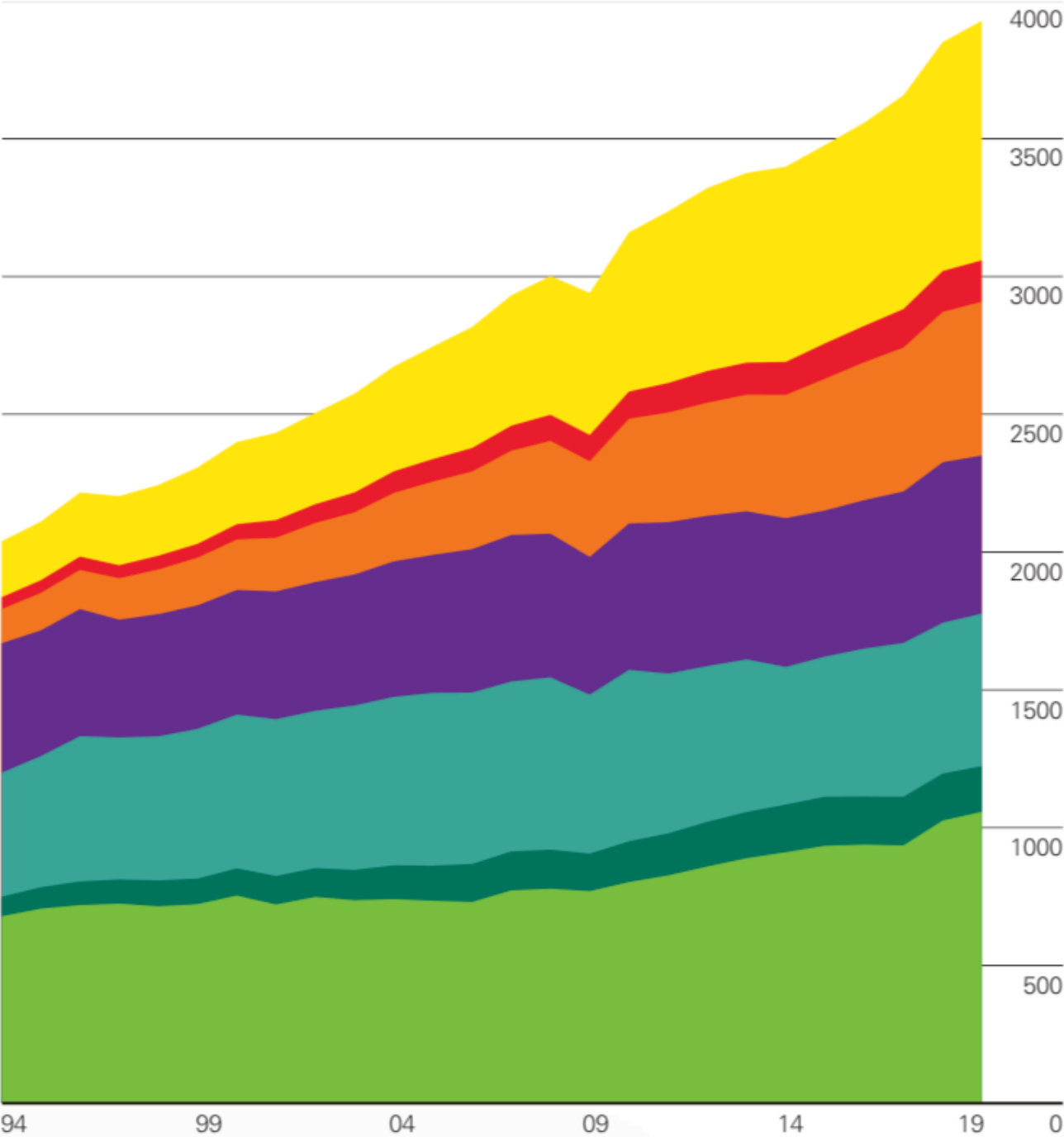
Natural gas: Production by region

Billion cubic metres



Natural gas: Consumption by region

Billion cubic metres



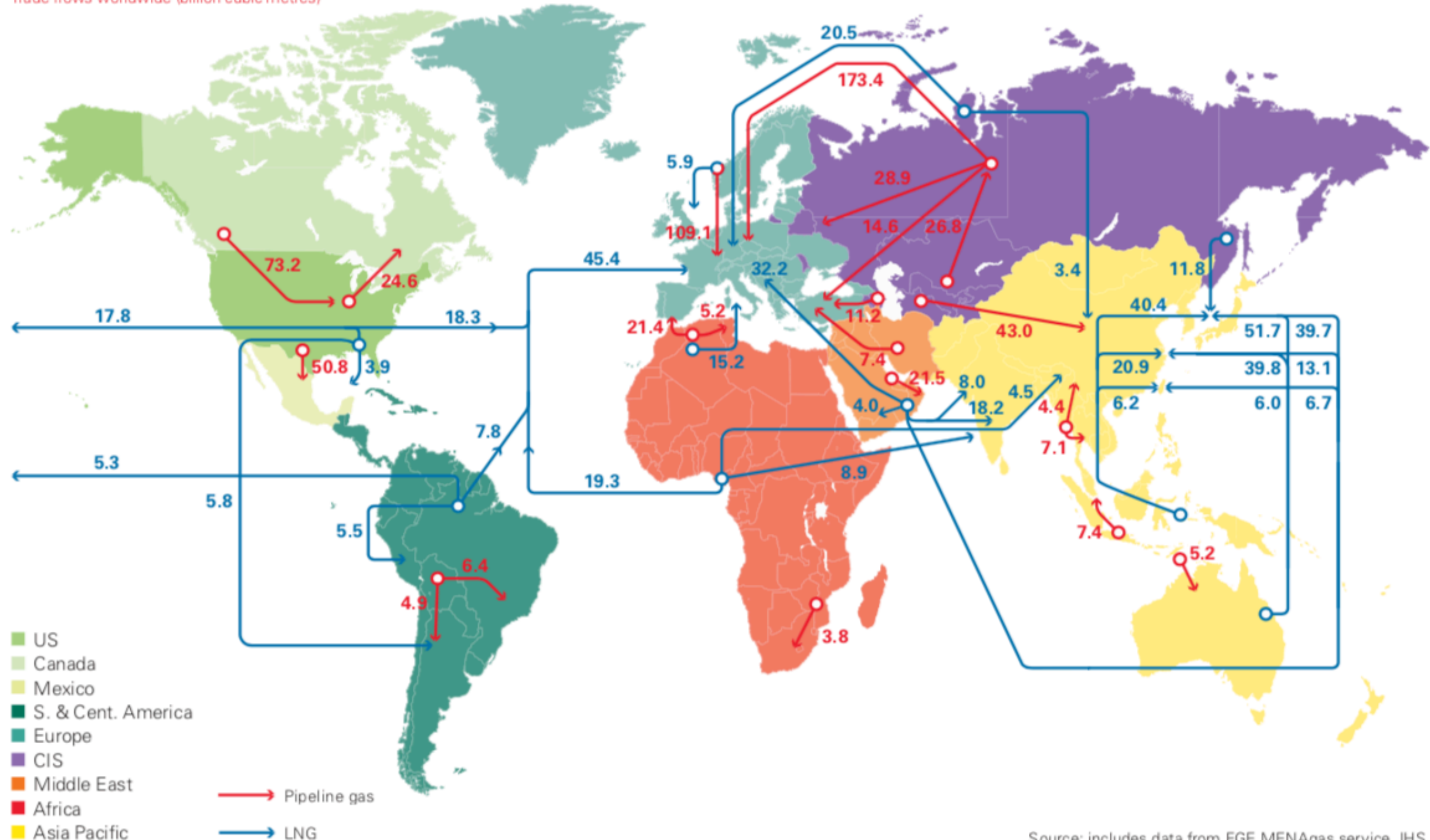
Result: A Battle for the European Gas Market

- Production in the US increased by 7.4 %, but consumption increased only by 3.1 %, **resulting in a need for export.**
- Production in the Middle East increase by 2.1 %, consumption increased by 2.3%.
- Production in the CIS countries increased by 1.9%, and consumption -1.5%, **resulting in a need for export.**

Battle for the European Gas

Major trade movements 2019

Trade flows worldwide (billion cubic metres)

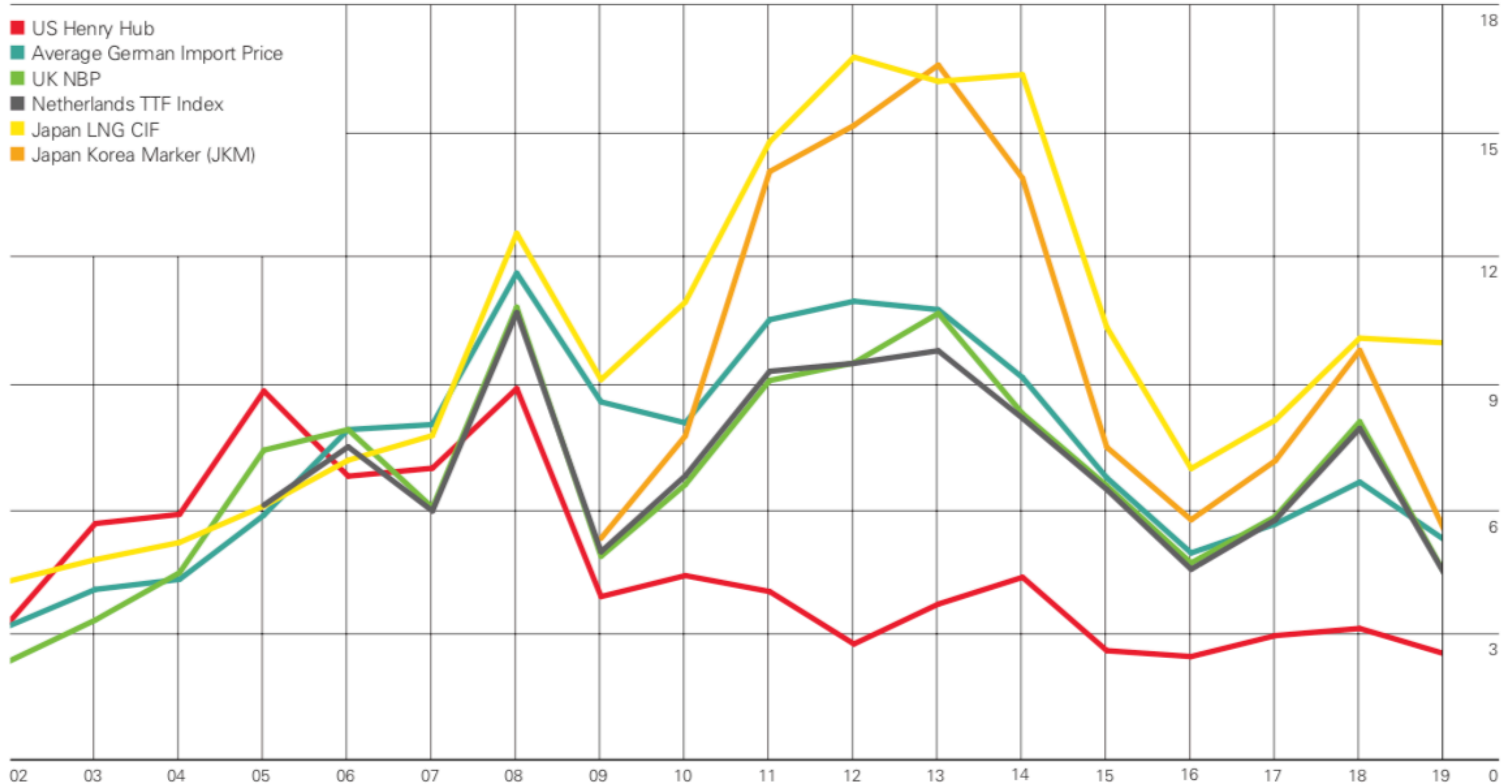


Source: includes data from FGE MENAgas service, IHS.

Price Developments

Prices

\$/mmBtu



Economic level: Competition around the European Gas Market

Conflicts resulting from the gas situation

- Economic level: Competition for market shares in the European Gas Market
- Economic level: competition of pipelines (fixed routes!) and LNG (mobile commodity on the world market!)
- Political Level: Tensions and Conflict, i.e. around North Stream, South Stream, Turkish Stream and spheres of influence



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The technologies required to reach net zero exist today – the challenge is to use them at pace and scale, and I remain optimistic that we can make this happen.”

Thank you for your interest in Geopolitics of Gas

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Raitenhaslach, 25.8.2020