

Oil price outlook survey 2020-2024

Expectations firmly anchored around \$65-70

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Reuters

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Summary: Oil price outlook survey 2020-2024

Survey sent to 9000+ recipients on daily best in energy circulation list

Full or partial responses from 950

Survey conducted between Jan 7 and Jan 10, 2020

	Expected annual average Brent price in:				
	2020	2021	2022	2023	2024
Mean	67	67	67	68	69
Mode	65	65	70	70	60
5th percentile	55	50	50	45	45
10th percentile	60	55	55	50	50
25th percentile	65	60	60	60	60
Median	65	65	65	65	65
75th percentile	70	70	75	75	75
90th percentile	75	80	80	85	90
95th percentile	80	80	85	90	95
Standard deviation	9.07	10.40	13.19	15.30	19.23
Skew	1.32	0.09	2.06	1.55	2.38

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Oil price outlook surveys 2016 through 2020

Summary of forecasts and realised values

Participants asked to forecast average price in current year and four subsequent years

Survey	Expected average Brent crude price in calendar year								
	Mean (\$U.S./bbl)								
Survey	2016	2017	2018	2019	2020	2021	2022	2023	2024
2016 (Mar)	40	50	58	63	67				
2017 (Jan)		57	62	66	68	68			
2018 (Jan)			65	68	70	71	71		
2019 (Jan)				63	66	68	69	70	
2020 (Jan)					67	67	67	68	69
Realised value	45	55	72	64					

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Oil price outlook survey 2020-2024

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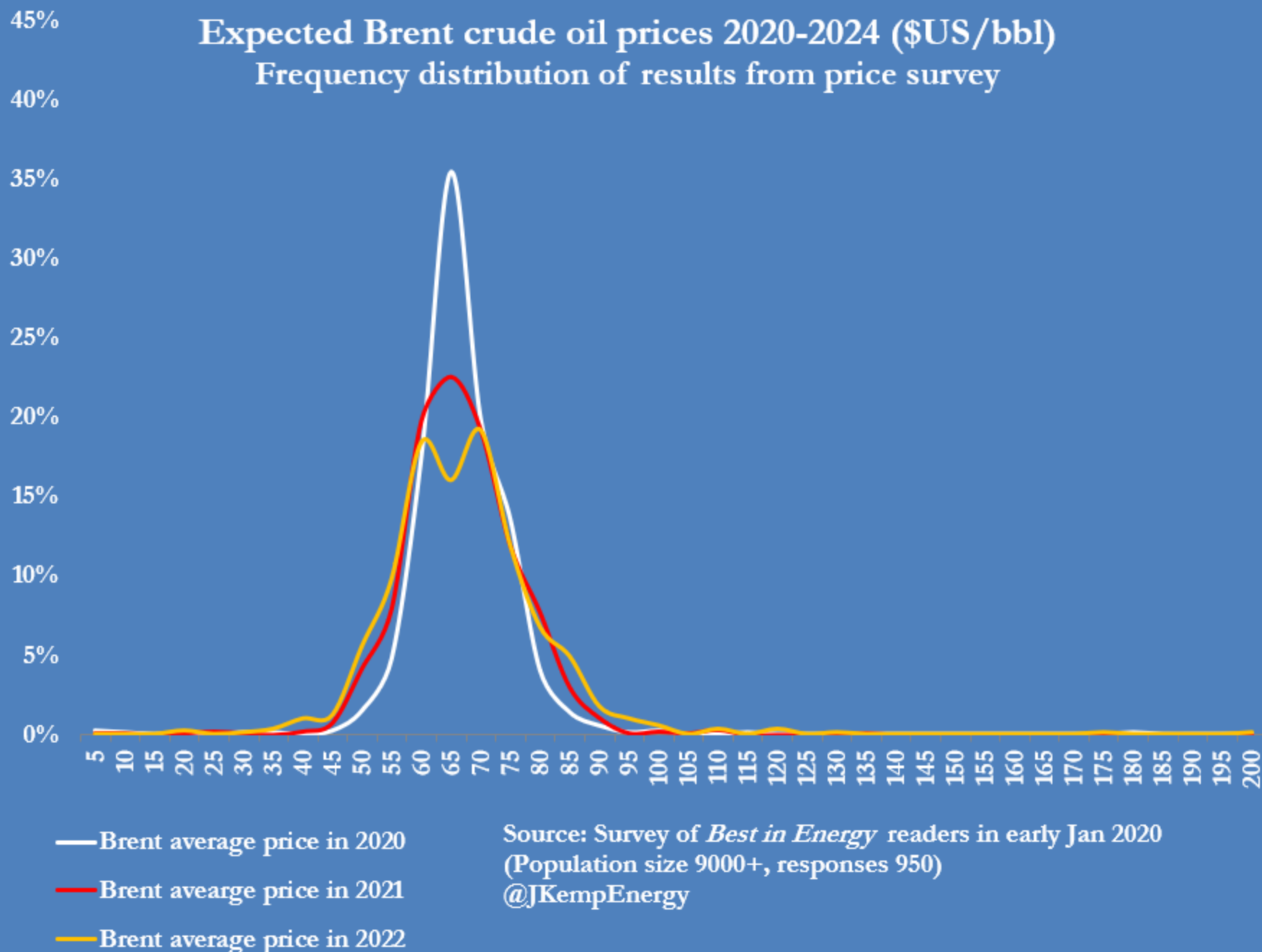
Forecast Year	Number of respondents expecting avg. price of Brent in US\$/bbl to be																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
2020	2	1	0	1	0	1	1	0	2	14	45	165	335	188	128	38	13	5	1	2
2021	1	1	0	1	2	1	0	2	7	39	74	184	210	179	111	72	28	10	1	2
2022	0	0	0	2	0	1	3	9	11	51	90	169	147	176	109	62	45	16	9	5
2023	1	0	0	1	3	3	3	12	24	53	85	144	134	151	112	78	35	32	13	11
2024	0	1	1	0	4	6	4	23	17	85	74	129	113	125	114	76	37	36	13	19

Forecast Year	Number of respondents expecting avg. price of Brent in US\$/bbl to be																			
	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200
2020	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
2021	1	3	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
2022	0	3	0	3	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	1
2023	1	2	2	2	0	1	0	0	0	3	0	0	0	1	0	0	0	0	1	0
2024	5	4	1	1	1	1	1	0	0	1	0	0	0	1	1	0	2	0	0	4

	Dispersion measures (US\$/bbl)						Central tendency (US\$/bbl)				
	2020	2021	2022	2023	2024		2020	2021	2022	2023	2024
5th percentile	55	50	50	45	45	Mode	65	65	70	70	60
10th percentile	60	55	55	50	50	Median	65	65	65	65	65
25th percentile	65	60	60	60	60	Mean	66.7	66.6	67.3	67.9	68.5
75th percentile	70	70	75	75	75	Futures prices (U.S.\$/bbl)					
90th percentile	75	80	80	85	90						
95th percentile	80	80	85	90	95						
Standard deviation	9.1	10.4	13.2	15.3	19.2						
Skew	1.32	0.09	2.06	1.55	2.38	Fut. strip (7 Jan 2020)	60.1	57.9	57.2	58.3	

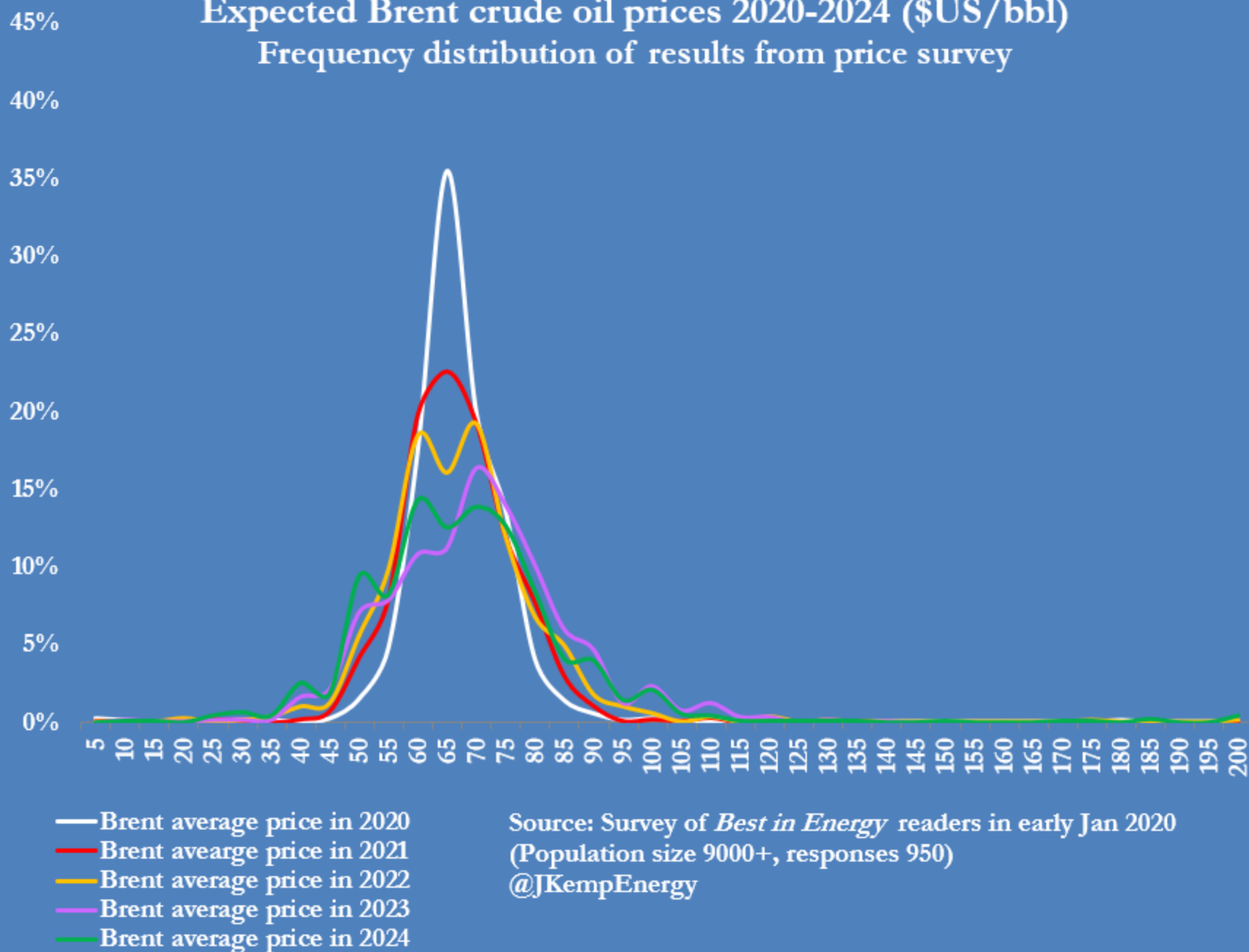
Expected Brent crude oil prices 2020-2024 (\$US/bbl)

Frequency distribution of results from price survey



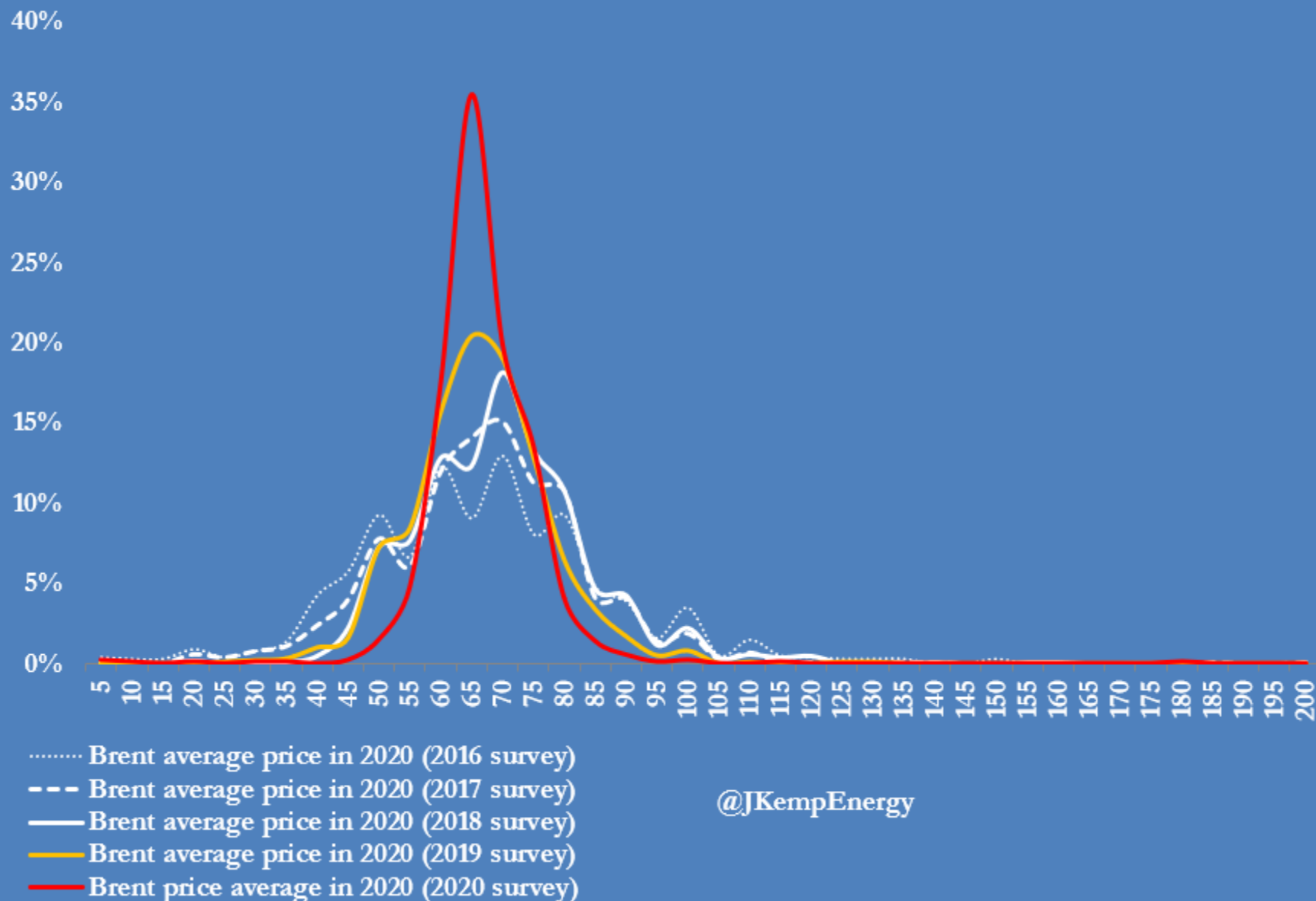
Expected Brent crude oil prices 2020-2024 (\$US/bbl)

Frequency distribution of results from price survey



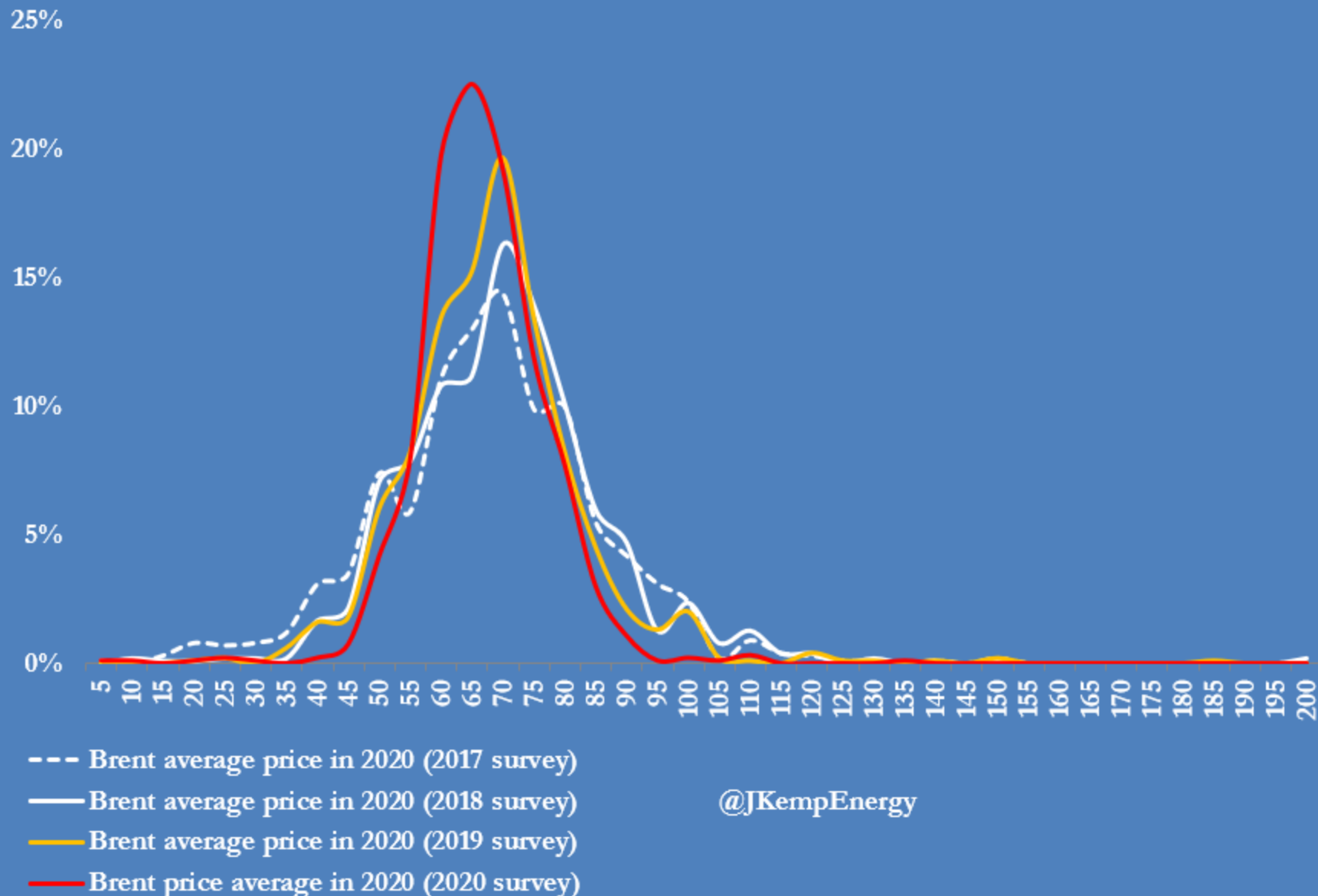
Expected Brent crude oil prices in 2020 (\$US/bbl)

Distribution of results from surveys in 2016, 2017, 2018, 2019 and 2020



Expected Brent crude oil prices in 2021 (\$US/bbl)

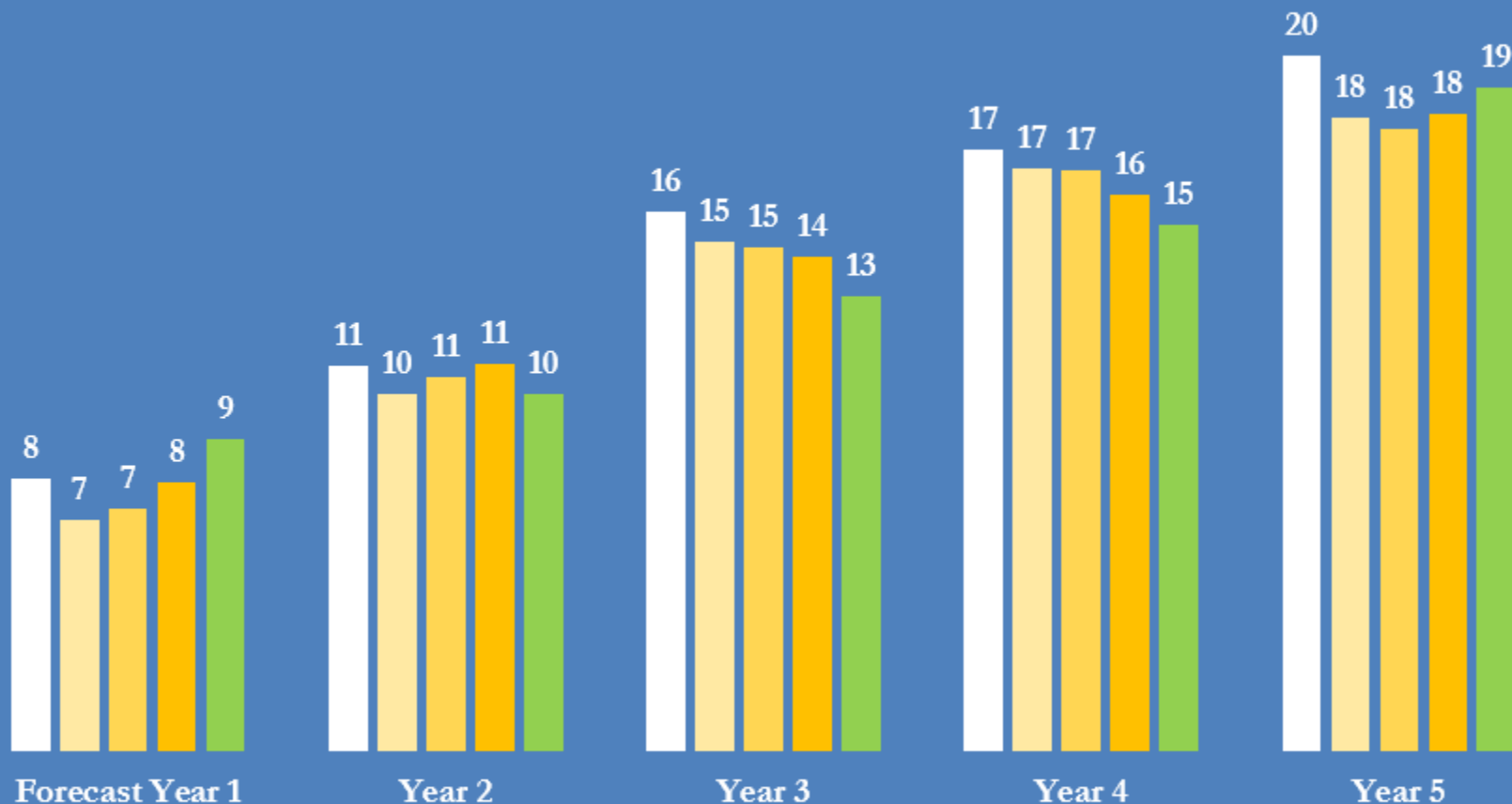
Distribution of results from surveys in 2017, 2018, 2019 and 2020



Oil price forecast uncertainty

Standard deviation of price forecasts from Year 1 to Year 5

U.S.\$/bbl, successive oil price surveys conducted annually 2016-2020



- 2016 survey
- 2017 survey
- 2018 survey
- 2019 survey
- 2020 survey

Source: @JKempEnergy

Oil price outlook survey 2020-2024

Distribution of survey respondents (n=950)

Oil and gas (exploration, drilling, production, refining, distribution, marketing, oilfield services)	26%
Banking and finance	19%
Research	11%
Other	8%
Professional services	7%
Hedge fund	7%
Other energy (coal, electricity, gas, carbon markets)	5%
Physical commodity trading	5%
Government	3%
Other corporate (transport, manufacturing, construction, mining, services)	3%
Media	3%
Education	1%

Results of previous surveys

Oil outlook survey 2019-2023

Survey sent to 7000 recipients on daily best in energy circulation list

Full or partial responses from 1026

Survey conducted between Jan 8 and Jan 11, 2019

Forecast Year	Number of respondents expecting avg. price of Brent in US\$/bbl to be																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
2018	0	0	0	0	1	0	3	9	11	55	121	228	320	170	77	16	4	3	2	0
2019	0	0	0	0	1	2	3	10	16	73	85	158	206	192	130	65	34	17	5	8
2020	0	0	0	1	2	0	6	16	18	60	82	134	152	196	134	82	45	21	13	20
2021	0	0	0	0	3	5	4	21	17	58	79	127	135	164	117	105	57	34	8	13
2022	0	0	1	0	3	9	7	21	18	74	69	127	104	156	112	102	48	44	14	19

Forecast Year	Number of respondents expecting avg. price of Brent in US\$/bbl to be																			
	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200
2018	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2019	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2020	2	1	0	4	1	1	0	1	0	2	0	0	0	0	0	0	1	0	0	0
2021	5	4	1	5	0	1	1	2	1	1	0	1	0	1	0	0	0	0	0	1
2022	6	5	5	4	1	2	1	1	1	1	0	2	0	1	1	0	0	0	0	2

	Dispersion measures (US\$/bbl)						Central tendency (US\$/bbl)				
	2019	2020	2021	2022	2023		2019	2020	2021	2022	2023
5th percentile	50	50	50	45	45	Mode	65	65	70	70	70
10th percentile	55	50	50	50	50	Median	65	65	70	70	70
25th percentile	60	60	60	60	60	Mean	63	66	68	69	70
75th percentile	70	75	75	75	80	Futures prices (U.S.\$/bbl)					
90th percentile	71	80	85	85	90						
95th percentile	75	85	90	90	100						
Standard deviation	7.8	11.2	14.3	16.2	18.5	Fut. strip (8 Jan 2019)	60.0	60.4	60.9		

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Oil outlook survey 2018-2022

Survey sent to 7000 recipients on daily best in energy circulation list

Full or partial responses from 1052

Survey conducted between Jan 9 and Jan 11, 2018

Forecast Year	Number of respondents expecting avg. price of Brent in US\$/bbl to be																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
2018	0	0	0	0	1	2	0	0	4	14	97	233	325	217	116	34	4	3	0	0
2019	0	0	0	1	2	1	2	0	11	46	91	164	209	216	121	91	43	19	9	8
2020	0	1	0	2	0	1	1	5	23	75	79	132	127	187	137	111	48	44	12	23
2021	0	2	1	1	2	2	2	17	22	72	80	110	114	166	142	103	61	48	13	24
2022	1	1	1	2	2	2	1	18	34	88	68	107	117	127	129	107	64	45	25	26

Forecast Year	Number of respondents expecting avg. price of Brent in US\$/bbl to be																			
	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200
2018	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2019	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2020	4	6	4	5	0	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0
2021	8	13	4	4	0	2	0	1	0	1	0	0	0	0	0	0	0	0	0	2
2022	10	14	2	6	5	0	0	1	0	3	0	0	1	0	0	0	0	0	0	1

	Dispersion measures (US\$/bbl)					Central tendency (US\$/bbl)				
	2018	2019	2020	2021	2022	2018	2019	2020	2021	2022
5th percentile	55	50	50	50	45	Mode	65	70	70	75
10th percentile	55	55	50	50	50	Median	65	65	70	70
25th percentile	60	60	60	60	60	Mean	65.4	67.8	69.8	70.8
75th percentile	70	75	80	80	80	Futures prices (U.S.\$/bbl)				
90th percentile	75	80	85	90	90					
95th percentile	75	85	95	100	100					
Standard deviation	7.1	10.9	14.6	16.9	18.1					
						Fut. strip	62.8	60.3	59.1	
						(9 Jan 2018)				

Oil outlook survey 2017-2021

Survey sent to 5000 recipients on daily best in energy circulation list

Full or partial responses from 1033

Survey conducted between Jan 9 and Jan 11, 2017

Forecast Year	Number of respondents expecting avg. price of Brent in US\$/bbl to be																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
2017	0	0	0	0	1	1	5	19	41	131	330	312	148	29	7	1	2	0	0	1
2018	0	0	0	0	0	3	6	19	43	83	134	220	226	159	70	23	13	5	5	2
2019	1	0	1	1	3	3	10	21	42	77	78	159	175	168	109	79	34	18	7	10
2020	1	1	0	6	4	8	11	24	40	78	61	119	140	150	112	107	41	41	14	19
2021	1	0	3	8	7	8	12	31	35	73	58	109	128	142	98	99	54	41	31	24

Forecast Year	Number of respondents expecting avg. price of Brent in US\$/bbl to be																			
	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200
2017	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2018	0	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2019	0	2	1	0	2	1	1	1	0	0	0	0	0	0	0	1	0	0	0	1
2020	3	7	1	1	0	1	1	1	0	0	0	0	0	0	0	0	1	0	0	1
2021	2	9	4	3	1	1	0	1	0	2	0	0	0	0	0	0	0	0	0	1

	Dispersion measures (US\$/bbl)						Central tendency (US\$/bbl)				
	2017	2018	2019	2020	2021		2017	2018	2019	2020	2021
5th percentile	45	45	45	40	40	Mode	55	65	65	70	70
10th percentile	50	50	50	50	45	Median	55	60	65	70	70
25th percentile	55	55	60	60	60	Mean	57.2	62.3	65.7	67.5	68.3
75th percentile	60	70	75	75	80	Futures prices (U.S.\$/bbl)					
90th percentile	65	75	80	85	90		2017	2018	2019	2020	2021
95th percentile	65	77	85	92	95						
Standard deviation	6.7	10.4	14.8	16.9	18.4	Fut. strip (9 Jan 2017)	56.8	56.7	57.1		

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Oil outlook survey 2016-2020

Survey sent to 2500+ recipients on daily best in energy circulation list

Full or partial responses from 830

Survey conducted between Mar 1 and Mar 6, 2016

Forecast Year	Number of respondents expecting avg. price of Brent in US\$/bbl to be																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
2016	2	0	1	3	14	44	202	303	162	63	18	9	1	3	0	0	0	0	0	1
2017	2	0	0	4	7	18	43	112	170	151	119	89	48	18	12	7	1	3	0	1
2018	2	1	1	2	4	15	19	62	76	115	89	136	88	79	41	37	14	8	1	7
2019	2	1	2	3	4	8	22	34	54	95	65	110	93	103	55	63	26	24	9	16
2020	3	2	2	7	3	6	11	34	46	74	53	98	72	103	64	74	38	31	13	28

Forecast Year	Number of respondents expecting avg. price of Brent in US\$/bbl to be												Response rate	
	105	110	115	120	125	130	135	140	145	150	155	160	Total Response	No Response
2016	0	0	0	0	0	0	0	1	0	0	0	0	827	3
2017	0	0	0	1	0	0	0	0	0	0	0	0	806	24
2018	2	2	0	2	1	0	0	0	0	1	1	0	806	24
2019	3	2	1	4	0	1	0	1	0	1	0	0	802	28
2020	4	12	4	3	2	2	2	0	0	2	0	1	794	36

	Dispersion measures (US\$/bbl)						Central tendency (US\$/bbl)				
	2016	2017	2018	2019	2020		2016	2017	2018	2019	2020
5th percentile	30	35	35	35	40	Mode	40	45	60	60	70
10th percentile	35	40	40	45	45	Median	40	50	60	65	65
25th percentile	35	45	50	50	55	Mean	40.4	50	58.4	63.3	67
75th percentile	45	55	65	75	80		Futures prices (U.S.\$/bbl)				
90th percentile	50	65	75	85	90		2016	2017	2018	2019	2020
95th percentile	50	70	80	90	100						
Standard deviation	7.9	11.2	15.7	17.4	20.2	Fut. strip (1 Mar 2016)		43.9	46.6	48.5	50.2