

Global Energy Outlook: Summary

We forecast multi-year tightness in Exajoules: an Energy Supercycle

Figure 1: World energy demand (EJ): In our conservative estimate, we expect growth at a 1.0% CAGR to 680EJ by 2030 (from 606EJ in 2019), with population growth and rising per capita consumption in EM nations outweighing energy efficiency measures in OECD economies

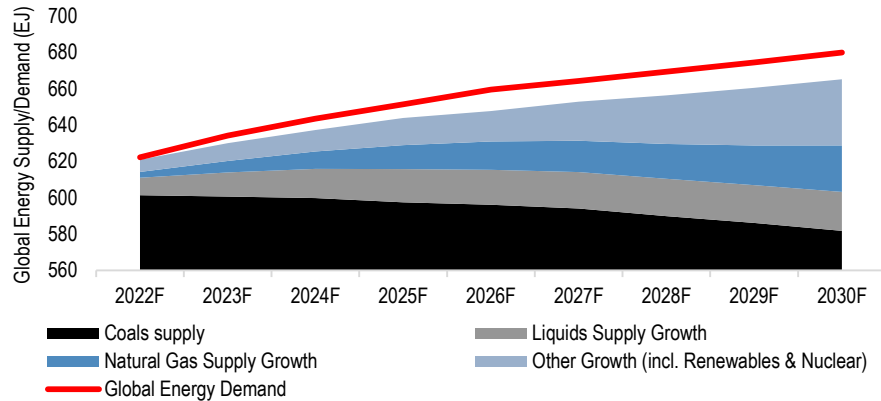
Total Energy Demand (in EJ)	2019	2020	2021	2022F	2023F	2024F	2025F	2026F	2027F	2028F	2029F	2030F
OECD	225	208	216	220	221	221	220	220	220	220	220	221
Non-OECD	364	358	377	387	399	408	417	425	431	436	441	447
International Bunkers	18	15	15	15	15	15	14	14	14	13	13	12
World	607	581	608	622	634	644	652	660	664	670	675	680
Total Energy Supply (in EJ)	2019	2020	2021	2022F	2023F	2024F	2025F	2026F	2027F	2028F	2029F	2030F
Oil	190	178	181	190	194	197	199	200	201	201	201	202
Natural Gas	142	138	140	143	146	149	153	155	157	159	162	165
Coal	158	149	160	164	164	163	161	159	157	153	149	145
Renewables & Nuclear	116	118	117	124	127	129	132	134	139	144	149	154
World	606	582	598	621	630	637	644	648	653	656	661	665
Total Liquids Supply/Demand (mb/d)	2019	2020	2021	2022F	2023F	2024F	2025F	2026F	2027F	2028F	2029F	2030F
Total Liquids demand	100.4	91.9	97.5	100.5	102.4	103.8	104.6	105.3	105.9	106.5	107.1	107.5
Total Liquids supply			95.0	100.0	101.8	103.2	104.4	104.8	105.4	105.7	105.9	106.0
Total Liquids supply deficit			2.5	0.5	0.6	0.6	0.2	0.5	0.5	0.8	1.2	1.5
Total Power Demand (TWh)	2019	2020	2021	2022F	2023F	2024F	2025F	2026F	2027F	2028F	2029F	2030F
Coal	9,500	9,200	9,300	9,300	9,600	9,700	9,700	9,700	9,600	9,600	9,600	9,600
Gas-fired	6,000	5,800	5,800	5,900	6,000	6,100	6,200	6,300	6,400	6,500	6,500	6,400
Hydro	4,500	4,400	4,800	4,400	4,400	4,400	4,500	4,800	4,800	4,800	4,800	4,800
Wind (onshore)	1,500	1,700	2,100	2,400	2,600	2,900	3,200	3,400	3,700	4,000	4,400	4,700
Wind (offshore)	100	100	200	300	400	400	500	600	700	800	900	1,100
Solar	800	1,000	1,300	1,600	1,800	2,000	2,200	2,500	2,700	3,000	3,300	3,500
Nuclear	2,800	2,700	2,900	2,900	2,900	3,000	3,000	3,100	3,100	3,100	3,200	3,200
Biomass and others	600	600	600	600	600	600	700	700	600	600	600	600

Source: J.P. Morgan estimates.

The J.P. Morgan Global Energy Supply/Demand Outlook

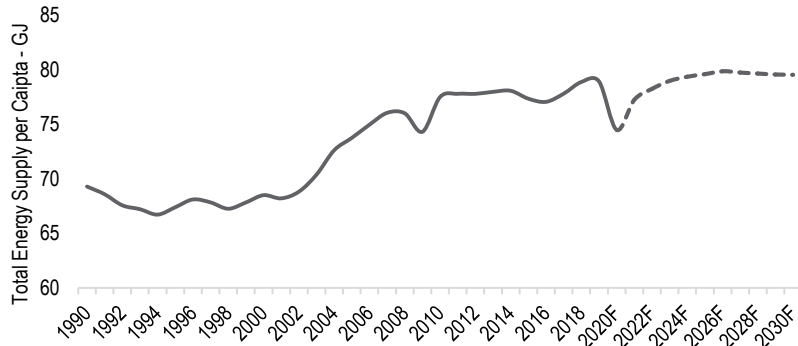
Primary energy demand to grow +74EJ 2019-30, led by EM industrial activity

Figure 2: At current spending rates, growth in global energy supply is set to fall 20% short of growth in demand to 2030 (2022-30 avg 9EJ p.a.).



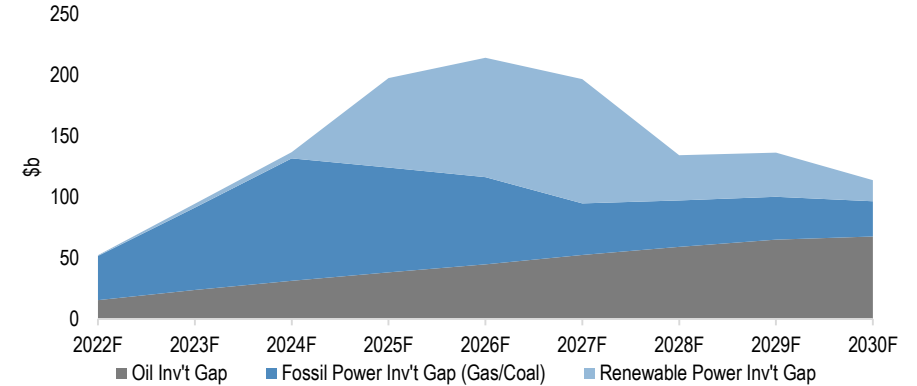
Source: J.P. Morgan estimates. 1 EJ = 1018 (a quintillion) Joules.

Figure 4: Our forecasted energy demand growth is primarily led by increased population growth, as opposed to rising consumption per capita



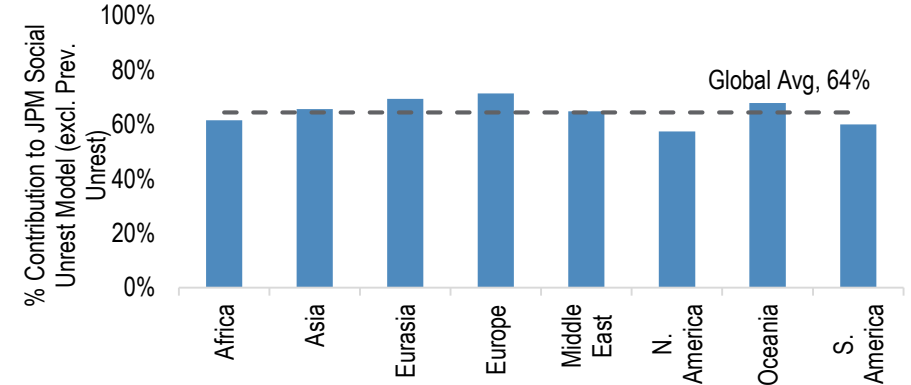
Source: J.P. Morgan estimates. 2019 Demand figures are based on data from International Energy Agency (2021), as modified by the J.P. Morgan Global Energy Strategy team.

Figure 3: To balance S/D, we estimate ~\$1.3tn of incremental capex is required (on a cumulative basis; 2022-2030 avg \$140bn p.a.)



Source: J.P. Morgan estimates.

Figure 5: High energy prices owing to a sustained S/D deficit will impact societies, higher commodity and food prices are key factors in social unrest, highlighting the need for a 'just' transition

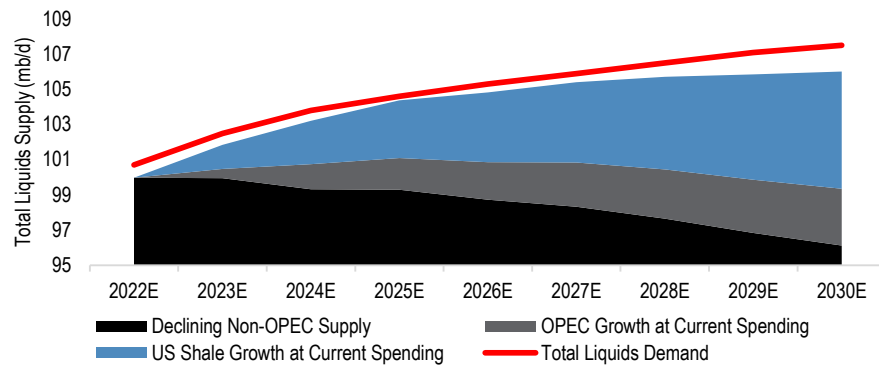


Source: J.P. Morgan estimates. Note: % Contribution adjusted to exclude Seasonality and previous unrest.

\$1.3tn of incremental investment is required to close the energy deficit

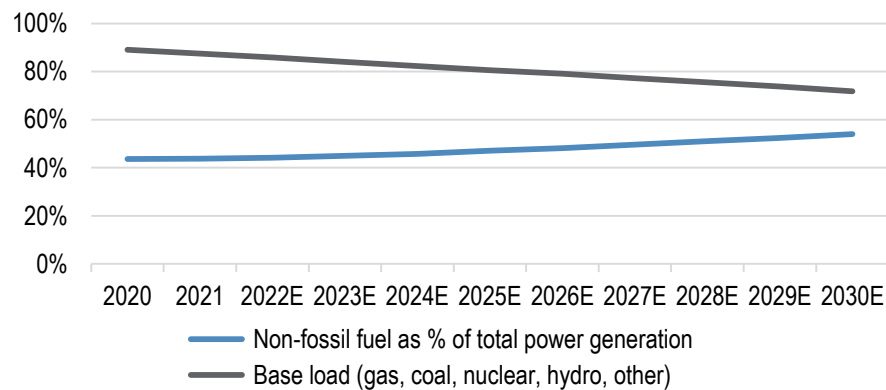
Despite accelerated growth, wind and solar should represent 5% of demand by 2030

Figure 6: Oil: Supercycle set to play out as supply growth continues to lag demand; current spend implies 2022-30 avg deficit 0.7mb/d



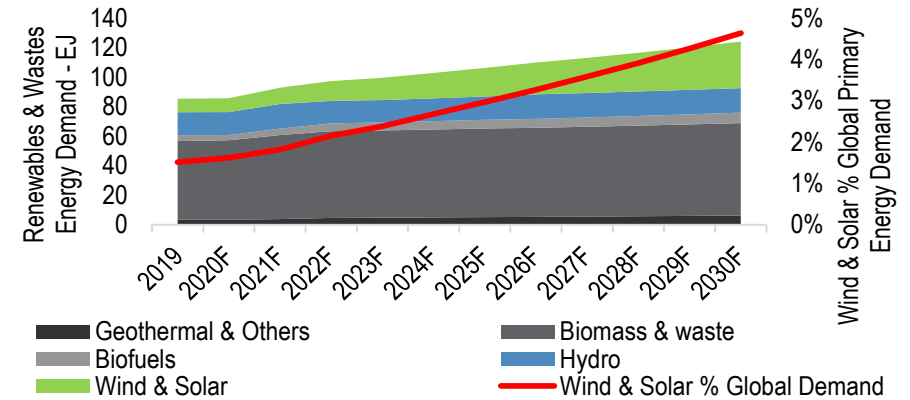
Source: J.P. Morgan estimates.

Figure 8: Share of global electricity supply from intermittent & nonfossil fuel sources, (% of global total, TWh)



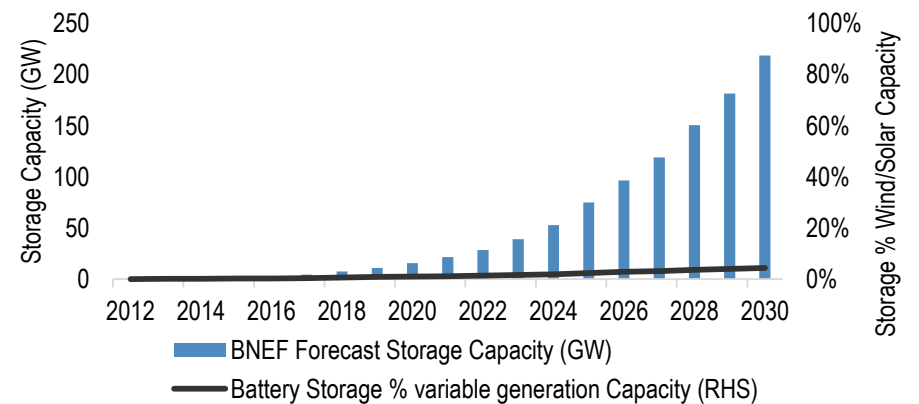
Source: J.P. Morgan estimates, Bloomberg Finance L.P.

Figure 7: Wind & Solar are expected to grow significantly, but will not play a key role in meeting global demand (3.3% on avg 2022-30)



Source: J.P. Morgan estimates, Shell Scenarios, 2019 Demand figures are based on data from International Energy Agency (2021), as modified by the J.P. Morgan Global Energy Strategy team.

Figure 9: 2030 installed storage capacity is expected to reach just ~220GW, equivalent to ~4% of installed wind/solar capacity

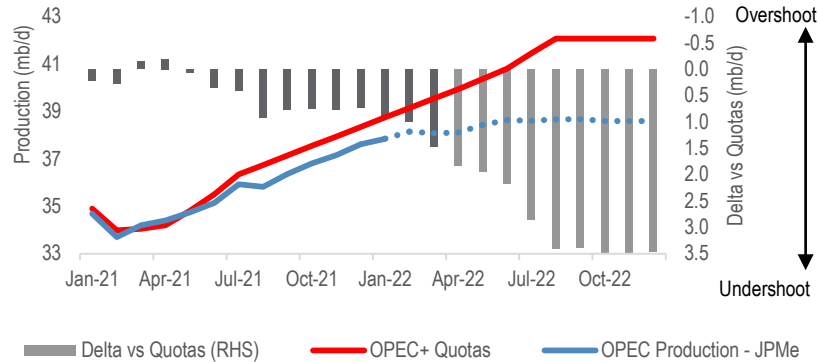


Source: J.P. Morgan Estimates: Bloomberg New Energy Finance.

Oil: Supercycle in early innings as spare capacity risk premium here to stay

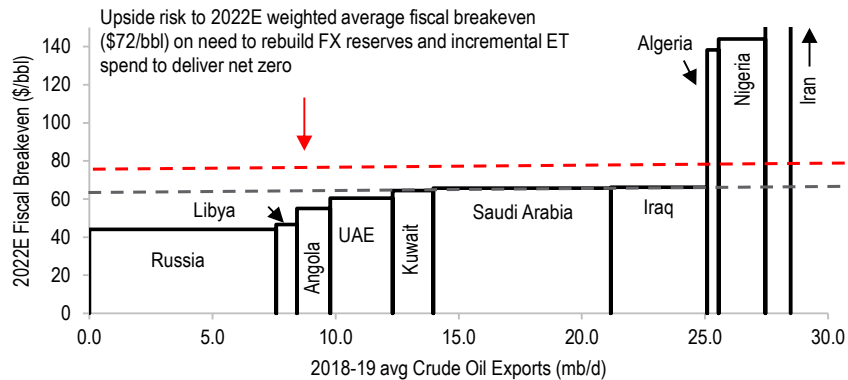
We see increased risk of oil prices reaching \$125/bbl in 2022 and upside to \$150/bbl in 2023 (JPM Commodities base case avg. of \$104/bbl in 2022 and \$98/bbl in 2023).

Figure 10: OPEC expected to stick to output quotas despite misses; We model the undershoot expanding to a 2022 avg undershoot 2.3mb/d



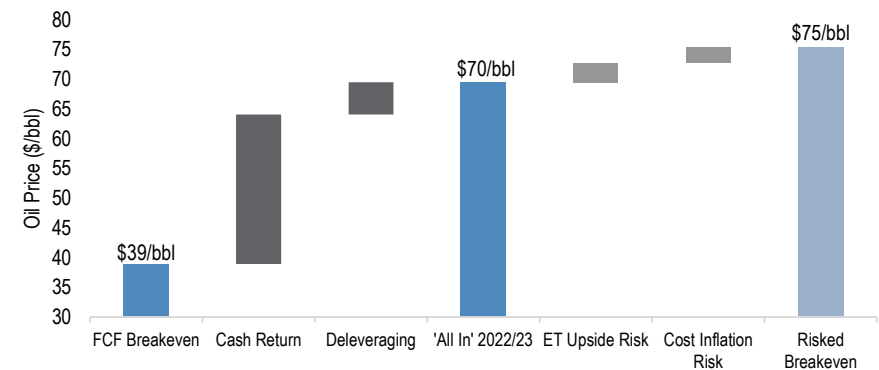
Source: J.P. Morgan Estimates, Manaar, OPEC MOMR. OPEC historical figures based on secondary data available on the most recent MOMR report. Note: The displayed OPEC Quotas have been adjusted vs initial publication to reflect the agreement announced on June 2, 2022, for an acceleration in Supply additions for July/August

Figure 12: OPEC+ fiscal breakevens >>\$75/bbl on need to rebuild FX reserves and incremental ET spend to deliver net zero



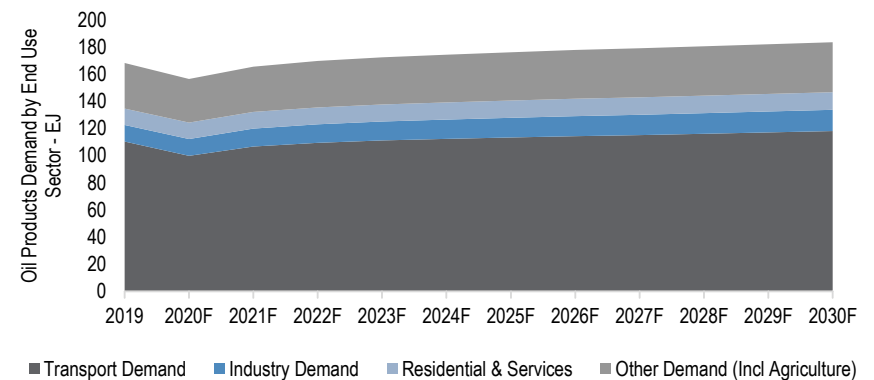
Source: J.P. Morgan estimates, IEA, BP Statistical Review of World Energy 2020

Figure 11: Green (ET) and black (TSR) premiums mean the marginal oil price needed to justify incremental volume growth for the Global Oil Majors is >\$75



Source: J.P. Morgan estimates, Company Data

Figure 13: Demand for oil remains heavily dependent on the transport sector; and the fuel is largely non-fungible (vs gas/renewables)

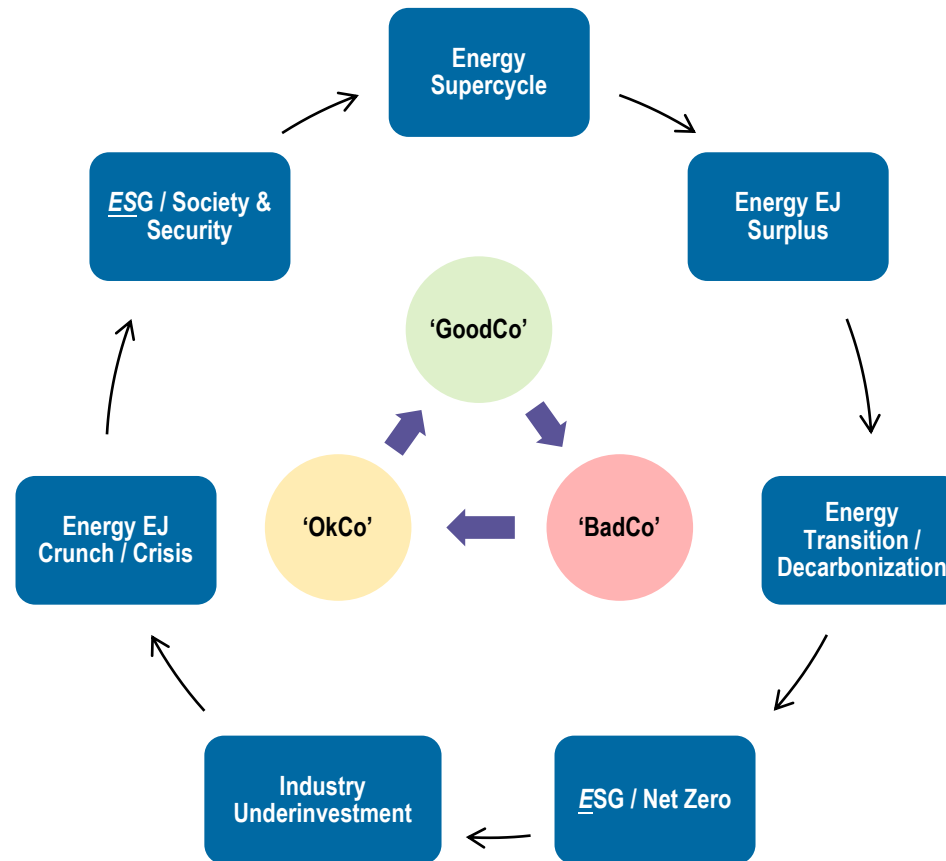


Source: J.P. Morgan estimates, 2019 Demand figures are based on data from International Energy Agency (2021), as modified by the J.P. Morgan Global Energy Strategy team.

Energy Highest Conviction OW; Sector = Value, Growth & Momentum

From 'BadCo' to 'GoodCo': Energy Supercycle underpins fundamental sector re-rating

Figure 14: Energy Transition viewed as an ecosystem of joules reveals a call for investment across all fuels; Energy Majors and OFS companies are on the critical path of meeting 680EJ of total energy demand by 2030.

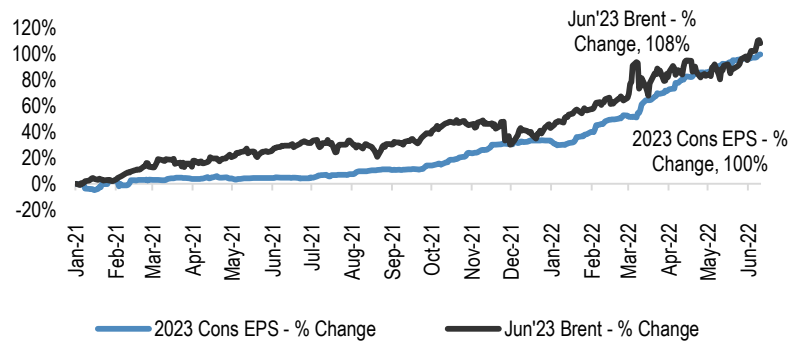


Source: J.P. Morgan estimates.

Positive macro view underpinned by attractive valuation and implied LT Brent at \$65-70/bbl

JPM Strategists show Energy is the cheapest sector on forward earnings and book value

Figure 15: Forward EPS revisions inflecting on translation of macro recovery into financial delivery as capex discipline holds



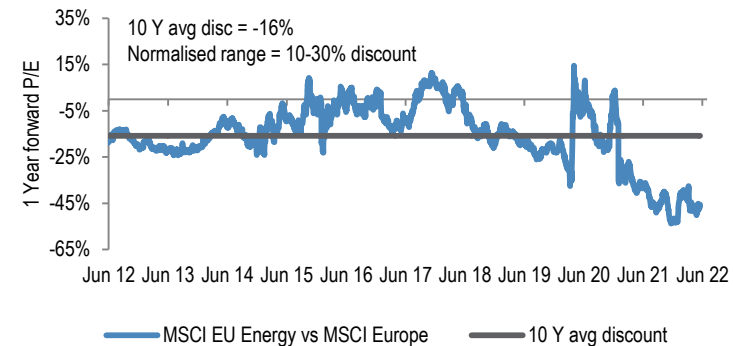
Source: J.P. Morgan estimates, Company data. Priced as on 10th June COB

Figure 17: Implied valuation provide an additional cushion to oil prices: we estimate EU equities discounting LT oil prices of “\$65-70/bbl”

	Implied LT oil price (\$/bbl)	3yr. total cash return (% mkt cap)
EU Oils	\$65-70/bbl	26%
US Majors	\$70/bbl	26%
US E&P	\$65/bbl	23-25%
Canadian Integrateds	\$65-70/bbl	32%
LatAM	\$45-55/bbl	36-38%

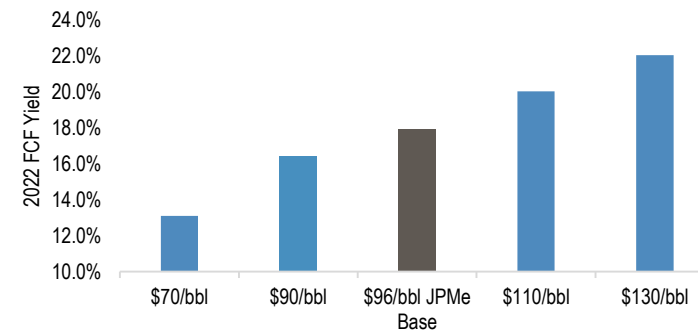
Source: J.P. Morgan estimates

Figure 16: Sector forward P/E vs 10Y history; trading at a c.43% discount to the EU Market (10Y avg discount ~16%)



Source: J.P. Morgan estimates, Company data. Priced as on 10th June COB

Figure 18: O&G upcycle, and capital reset drive premium EU Oils FCF runway; 18% 2022 yield at \$96/bbl ramps to 22% at \$130/bbl

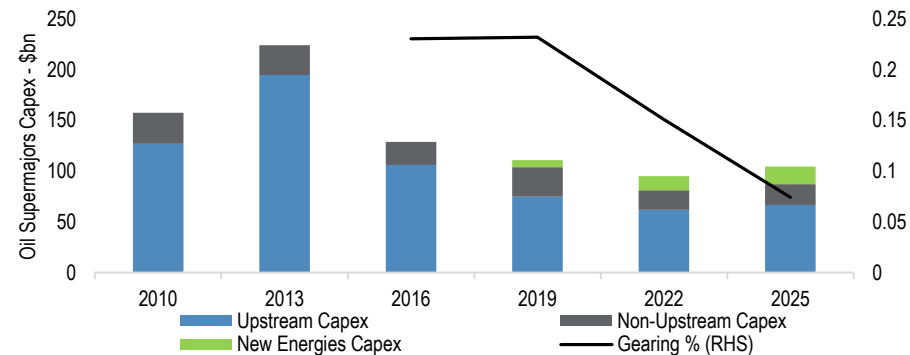


Source: J.P. Morgan estimates, Company data. Prices as of 10th June COB

Global Supermajor capital frames: cash return accelerating as gearing continues to fall

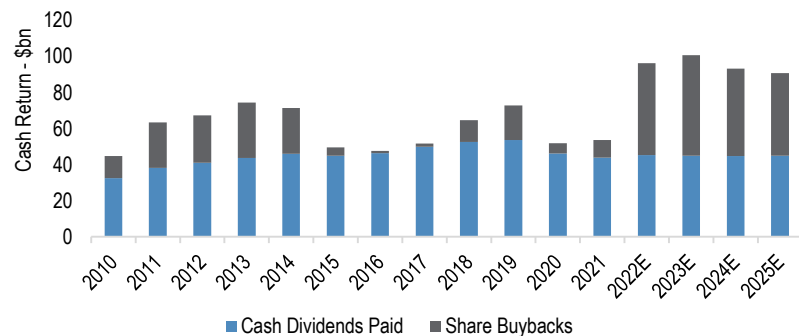
Into 'offense' on TSR as buybacks move into full swing

Figure 19: Gearing continues to fall as higher for longer oil and continued capex discipline deliver superior FCF runway; Upstream investment remains subdued



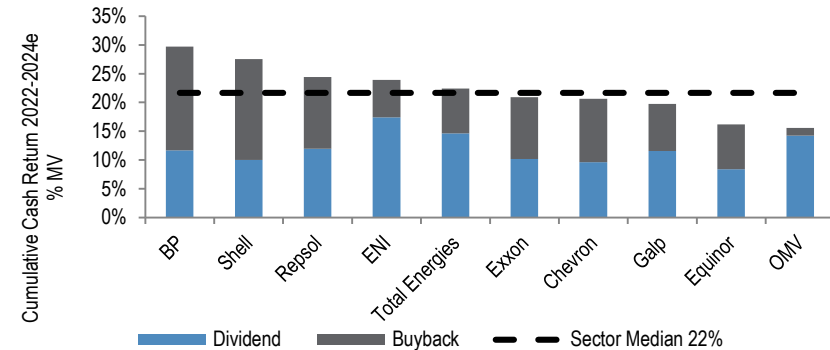
Source: J.P. Morgan estimates, Company data. The forecasts are based on Brent: (2022E \$96/bbl; 2023E \$90/bbl; 2024E \$80/bbl); EU Gas: (2022E \$33/MMBtu; 2023E \$20/MMBtu; 2024E \$8.5/MMBtu)

Figure 21: Absolute cash return set to return to pre-pandemic levels despite reduced DPS quantum...



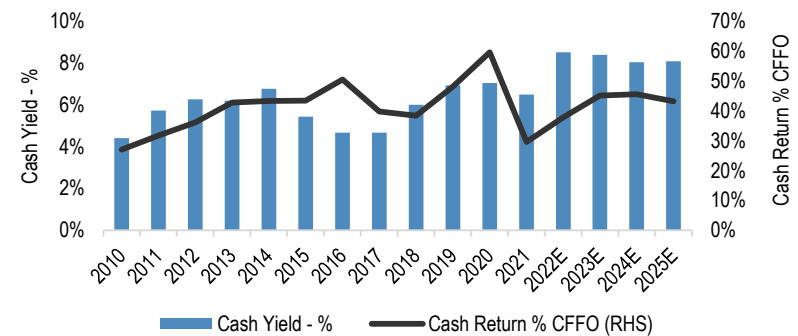
Source: J.P. Morgan estimates, Company data. Companies are Shell, BP, Total Energies, Exxon and Chevron. The forecasts are based on Brent: (2022E \$96/bbl; 2023E \$90/bbl; 2024E \$80/bbl); EU Gas: (2022E \$33/MMBtu; 2023E \$20/MMBtu; 2024E \$8.5/MMBtu). Note: 2010-15 data for the US IOCs is sourced from Bloomberg L.P.

Figure 20: Energy sector cash return average 2022-24e 22% of mkt cap...BP stands out



Source: J.P. Morgan estimates, Company data. The forecasts are based on Brent: (2022E \$96/bbl; 2023E \$90/bbl; 2024E \$80/bbl); EU Gas: (2022E \$33/MMBtu; 2023E \$20/MMBtu; 2024E \$8.5/MMBtu)

Figure 22: ... Supermajors expected to average ~9% 2022/23 cash yields at current valuations, led by BP



Source: J.P. Morgan estimates, Company data. Companies are Shell, BP, Total Energies, Exxon and Chevron. The forecasts are based on Brent: (2022E \$96/bbl; 2023E \$90/bbl; 2024E \$80/bbl); EU Gas: (2022E \$33/MMBtu; 2023E \$20/MMBtu; 2024E \$8.5/MMBtu) Note: 2010-15 data for the US IOCs is sourced from Bloomberg L.P.