

The Carbon Underground 200™ 2017

| Rank | Coal Companies | Coal Gt CO ₂ | Rank | Oil and Gas Companies | Oil Gt CO ₂ | Gas Gt CO ₂ | Total O&G Gt CO ₂ |
|------|------------------------------------|-------------------------|------|----------------------------|------------------------|------------------------|------------------------------|
| 1 | Coal India | 32,039 | 1 | Gazprom | 7,046 | 36,844 | 43,889 |
| 2 | Shaanxi Coal Industry | 28,885 | 2 | Rosneft | 11,536 | 5,939 | 17,475 |
| 3 | Adani Enterprises | 25,311 | 3 | PetroChina | 3,363 | 4,309 | 7,671 |
| 4 | China Shenhua Energy | 22,305 | 4 | ExxonMobil | 3,956 | 3,079 | 7,035 |
| 5 | Inner Mongolia Yitai Coal | 14,849 | 5 | BP | 4,309 | 2,364 | 6,672 |
| 6 | Yanzhou Coal Mining | 10,633 | 6 | Lukoil | 5,285 | 1,280 | 6,565 |
| 7 | China Coal Energy | 9,492 | 7 | Royal Dutch Shell | 2,112 | 2,209 | 4,322 |
| 8 | Public Power | 9,339 | 8 | Chevron | 2,473 | 1,567 | 4,040 |
| 9 | Exxaro Resources | 8,928 | 9 | Petrobras | 3,516 | 0,508 | 4,023 |
| 10 | Glencore | 8,369 | 10 | Novatek | 0,550 | 3,377 | 3,927 |
| 11 | Peabody Energy | 7,998 | 11 | Total | 2,076 | 1,798 | 3,873 |
| 12 | Bukit Asam | 7,844 | 12 | Tatneft | 2,618 | 0,063 | 2,681 |
| 13 | BHP Billiton | 7,310 | 13 | ENI | 1,439 | 1,217 | 2,656 |
| 14 | Foresight Energy | 6,759 | 14 | ONGC | 1,518 | 0,796 | 2,314 |
| 15 | Lu'an Environmental Energy | 6,443 | 15 | ConocoPhillips | 1,236 | 0,830 | 2,065 |
| 16 | BUMI Resources | 5,499 | 16 | Statoil | 1,018 | 0,798 | 1,816 |
| 17 | Shanxi Xishan Coal and Electricity | 5,416 | 17 | CNOOC | 0,983 | 0,439 | 1,422 |
| 18 | Mechel | 5,308 | 18 | Inpex | 0,908 | 0,328 | 1,236 |
| 19 | Mitsubishi | 5,128 | 19 | Canadian Natural Resources | 0,873 | 0,322 | 1,195 |
| 20 | China Coal Xinji Energy | 4,873 | 20 | Sinopec | 0,657 | 0,391 | 1,048 |
| 21 | Raspads kaya OAO | 3,968 | 21 | Bashneft | 1,007 | 0,000 | 1,007 |
| 22 | Alliance Resource Partners | 3,893 | 22 | Occidental | 0,706 | 0,206 | 0,912 |
| 23 | Arch Coal | 3,878 | 23 | EOG Resources | 0,621 | 0,181 | 0,802 |
| 24 | Anglo American | 3,592 | 24 | Repsol | 0,247 | 0,550 | 0,797 |
| 25 | DaTong Coal Industry | 3,508 | 25 | Antero Resources | 0,281 | 0,513 | 0,794 |
| 26 | China Cinda Asset Management | 3,316 | 26 | Suncor Energy | 0,732 | 0,002 | 0,733 |
| 27 | EVRAZ | 3,189 | 27 | EQT | 0,055 | 0,672 | 0,727 |
| 28 | Vale | 3,179 | 28 | Imperial Oil | 0,617 | 0,020 | 0,637 |
| 29 | Rio Tinto | 2,710 | 29 | Range Resources | 0,203 | 0,429 | 0,632 |
| 30 | Severstal | 2,661 | 30 | Marathon Oil | 0,495 | 0,133 | 0,628 |
| 31 | Tata Steel | 2,643 | 31 | Ecopetrol | 0,460 | 0,167 | 0,627 |
| 32 | Westmoreland Coal | 2,529 | 32 | Anadarko Petroleum | 0,374 | 0,241 | 0,615 |
| 33 | Jastrzębska Spółka Węglowa | 2,516 | 33 | Devon Energy | 0,304 | 0,307 | 0,611 |
| 34 | Resource Generation | 2,441 | 34 | BASF | 0,205 | 0,384 | 0,589 |
| 35 | Teck Resources | 2,376 | 35 | Chesapeake Energy | 0,225 | 0,354 | 0,579 |
| 36 | United RUSAL | 2,233 | 36 | Noble Energy | 0,207 | 0,289 | 0,497 |
| 37 | Adaro Energy | 2,200 | 37 | Apache | 0,330 | 0,156 | 0,486 |
| 38 | AGL Energy | 2,144 | 38 | Continental Resources | 0,272 | 0,207 | 0,479 |
| 39 | Shanghai Datun Energy Resources | 2,032 | 39 | Cabot Oil & Gas | 0,020 | 0,451 | 0,471 |
| 40 | Yang Quan Coal | 2,023 | 40 | BHP Billiton | 0,195 | 0,262 | 0,458 |
| 41 | Shanxi Lanhua Sci-Tech | 1,959 | 41 | Hess | 0,327 | 0,092 | 0,419 |
| 42 | Whitehaven Coal | 1,946 | 42 | YPF | 0,235 | 0,159 | 0,395 |
| 43 | Kuzbasskaya Toplivnaya | 1,890 | 43 | OMV | 0,266 | 0,123 | 0,389 |
| 44 | Cloud Peak Energy | 1,886 | 44 | Cenovus Energy | 0,351 | 0,033 | 0,385 |
| 45 | CONSOL Energy | 1,807 | 45 | Woodside Petroleum | 0,042 | 0,318 | 0,360 |
| 46 | South32 | 1,712 | 46 | CONSOL Energy | 0,019 | 0,318 | 0,337 |
| 47 | New Hope | 1,635 | 47 | KazMunaiGas EP | 0,290 | 0,026 | 0,316 |
| 48 | Yancoal Australia | 1,622 | 48 | Southwestern Energy | 0,019 | 0,265 | 0,284 |
| 49 | NACCO Industries | 1,459 | 49 | Encana | 0,091 | 0,192 | 0,283 |
| 50 | Huolinhe Coal | 1,387 | 50 | Concho Resources | 0,181 | 0,095 | 0,277 |
| 51 | ITOCHU | 1,361 | 51 | Husky Energy | 0,168 | 0,107 | 0,275 |
| 52 | Beijing Haohua Energy Resource | 1,317 | 52 | Seven Generations Energy | 0,158 | 0,113 | 0,271 |
| 53 | NLC India | 1,296 | 53 | Pioneer Natural Resources | 0,199 | 0,069 | 0,268 |
| 54 | Novolipetsk Steel | 1,236 | 54 | Tourmaline Oil | 0,044 | 0,222 | 0,265 |



All companies in the Carbon Underground 200™ are investable as of October 4, 2017. The rankings are based on calculated carbon emissions data using reserves reported as of July 31, 2017. The ranking are adjusted for company mergers and acquisitions as of September 22, 2017.

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|-----|---------------------------------------|-------|-----|------------------------|-------|-------|-------|
| 55 | Indika Inti Corpindo | 1,182 | 55 | SK Innovation | 0,263 | 0,000 | 0,263 |
| 56 | Datang International Power Generation | 1,147 | 56 | QEP Resources | 0,119 | 0,139 | 0,258 |
| 57 | Coal of Africa | 1,137 | 57 | PTT | 0,072 | 0,184 | 0,256 |
| 58 | Golden Energy Mines | 1,112 | 58 | Murphy Oil | 0,153 | 0,102 | 0,255 |
| 59 | Jindal Steel & Power | 1,033 | 59 | Whiting Petroleum | 0,198 | 0,039 | 0,237 |
| 60 | Mitsui | 0,998 | 60 | Sasol | 0,157 | 0,073 | 0,230 |
| 61 | Banpu | 0,950 | 61 | Aker BP | 0,224 | 0,000 | 0,224 |
| 62 | Berau Coal Energy | 0,942 | 62 | California Resources | 0,186 | 0,034 | 0,220 |
| 63 | Wesfarmers | 0,832 | 63 | Crescent Point Energy | 0,202 | 0,018 | 0,220 |
| 64 | Up Energy Development | 0,826 | 64 | Rice Energy | 0,000 | 0,218 | 0,218 |
| 65 | Kangaroo Resources | 0,794 | 65 | Linn Energy | 0,071 | 0,125 | 0,197 |
| 66 | Shanxi Meijin Energy | 0,784 | 66 | Newfield Exploration | 0,108 | 0,074 | 0,183 |
| 67 | Mongolian Mining | 0,767 | 67 | MEG Energy | 0,178 | 0,000 | 0,178 |
| 68 | Jizhong Energy | 0,742 | 68 | Lundin | 0,167 | 0,006 | 0,173 |
| 69 | Allele | 0,723 | 69 | Mitsui | 0,063 | 0,107 | 0,170 |
| 70 | Aspire Mining | 0,670 | 70 | Birchcliff Energy | 0,027 | 0,137 | 0,164 |
| 71 | ArcelorMittal | 0,640 | 71 | Cimarex Energy | 0,084 | 0,080 | 0,164 |
| 72 | Hallador Energy | 0,599 | 72 | EP Energy | 0,120 | 0,040 | 0,160 |
| 73 | Vedanta | 0,599 | 73 | Maersk | 0,153 | 0,000 | 0,153 |
| 74 | LG International | 0,595 | 74 | Santos | 0,016 | 0,133 | 0,149 |
| 75 | Rhino Resource Partners | 0,560 | 75 | Oil India | 0,096 | 0,049 | 0,145 |
| 76 | Ramaco Resources | 0,555 | 76 | Ultra Petroleum | 0,013 | 0,127 | 0,140 |
| 77 | Lubelski Węgiel Bogdanka | 0,554 | 77 | Oil Search | 0,022 | 0,117 | 0,140 |
| 78 | CLP Holdings | 0,552 | 78 | SM Energy | 0,075 | 0,061 | 0,135 |
| 79 | Bayan Resources | 0,529 | 79 | ENGIE | 0,033 | 0,096 | 0,130 |
| 80 | Steel Authority of India | 0,515 | 80 | Painted Pony Petroleum | 0,014 | 0,115 | 0,129 |
| 81 | Vimetco | 0,512 | 81 | WPX Energy | 0,088 | 0,040 | 0,128 |
| 82 | Indo Tambangraya Megah (Banpu) | 0,508 | 82 | ARC Resources | 0,045 | 0,083 | 0,128 |
| 83 | Black Hills | 0,495 | 83 | JX Holdings | 0,059 | 0,068 | 0,128 |
| 84 | Monnet Ispat & Energy | 0,492 | 84 | Gulfport Energy | 0,008 | 0,118 | 0,126 |
| 85 | Kinetic Mines and Energy | 0,463 | 85 | Oasis Petroleum | 0,100 | 0,022 | 0,123 |
| 86 | Feishang Anthracite Resources | 0,463 | 86 | Polish Oil & Gas | 0,031 | 0,091 | 0,122 |
| 87 | FirstEnergy | 0,463 | 87 | PDC Energy | 0,075 | 0,045 | 0,120 |
| 88 | Sasol | 0,456 | 88 | Energen | 0,100 | 0,019 | 0,119 |
| 89 | Prairie Mining | 0,428 | 89 | Peyto E&D | 0,009 | 0,110 | 0,119 |
| 90 | Tata Power | 0,424 | 90 | MOL | 0,072 | 0,047 | 0,119 |
| 91 | American Energy | 0,415 | 91 | Oando | 0,051 | 0,064 | 0,114 |
| 92 | Coal Energy | 0,414 | 92 | Galp Energia | 0,099 | 0,013 | 0,112 |
| 93 | Agritrade Resources | 0,414 | 93 | Denbury Resources | 0,105 | 0,002 | 0,107 |
| 94 | Beijing Jingneng Thermal Power | 0,411 | 94 | National Fuel Gas | 0,012 | 0,091 | 0,104 |
| 95 | African Rainbow Minerals | 0,400 | 95 | Centrica | 0,029 | 0,069 | 0,098 |
| 96 | Huadian Power International | 0,397 | 96 | TAQA | 0,051 | 0,046 | 0,097 |
| 97 | Golden Eagle Energy | 0,386 | 97 | Premier Oil | 0,077 | 0,020 | 0,097 |
| 98 | JSW Energy | 0,369 | 98 | Great Eastern | 0,000 | 0,094 | 0,094 |
| 99 | Wollongong Coal | 0,353 | 99 | Japex | 0,042 | 0,051 | 0,093 |
| 100 | TBEA Co | 0,329 | 100 | DNO International | 0,093 | 0,000 | 0,093 |