

Background briefing

JUST 7% OF GLOBAL BANKS' ENERGY FINANCING GOES TO RENEWABLES, NEW DATA SHOWS

Major global banks are standing in the way of climate targets with new data showing just 7% of their financial backing for energy companies representing the majority of production went to renewable energy activities between 2016 and 2022.

The data indicates major failings by financial institutions to help meet global commitments on net zero emissions by 2050 since it shows shockingly low financial support through loans and bond underwriting for clean energy. It calls into question pledges from the industry-led Glasgow Financial Alliance for Net Zero, whose [commissioned research](#) shows low carbon energy investments need to be at least four times fossil fuels investments by 2030 to reach climate goals. The requirement for this 4:1 ratio by the end of the decade (which should be regarded as the minimum level needed not least given some of the items often included by the industry as low carbon energy¹) was acknowledged by Mark Carney - the Co-Chair of GFANZ - in his recent evidence to the UK Environmental Audit Committee.²

The research assessed lending and bond underwriting transactions by the world's sixty largest commercial banks to 377 companies operating in the global energy sector (coal, oil & gas, electricity, and renewable energy) for the period January 1, 2016 to 31st July 2022. These companies represent around 75% of the global production volume in the past three years for all activities related to renewable energy and to fossil fuels.

¹ We do not believe energy sources such as biomass, nuclear, or blue hydrogen should be considered renewable energy nor that investment in carbon capture and storage should be included in calculating investments in clean energy.

² <https://parliamentlive.tv/Event/Index/823310c9-b857-47e1-81de-e87ac06366f0>
<https://carbontracker.org/gfanz-under-the-parliamentary-spotlight/>
<https://twitter.com/MarkJCarney/status/1592874082319884290?s=20&t=e8cF4ZFN3pYNTSFMazJKDg>

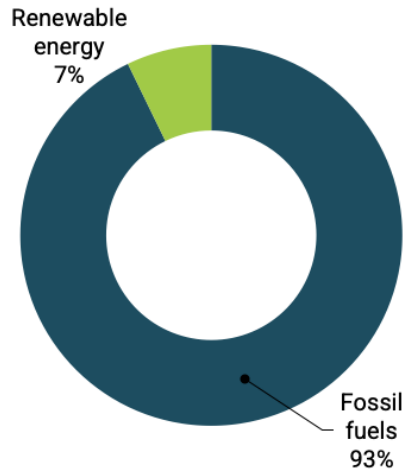
The research also calls into question claims by major global banks that they are continuing to lend to fossil fuel clients to help them to move to a low carbon business model. By examining the designated ‘use of proceeds’ of the financing made available and the proportion of business activities related to fossil fuels or renewable energy for each company, the research assesses how much of the financing received is being used to fund clean energy business strategies versus conventional fossil fuel activities.

The research was carried out by Profundo for Sierra Club, Fair Finance International, BankTrack and Rainforest Action Network.

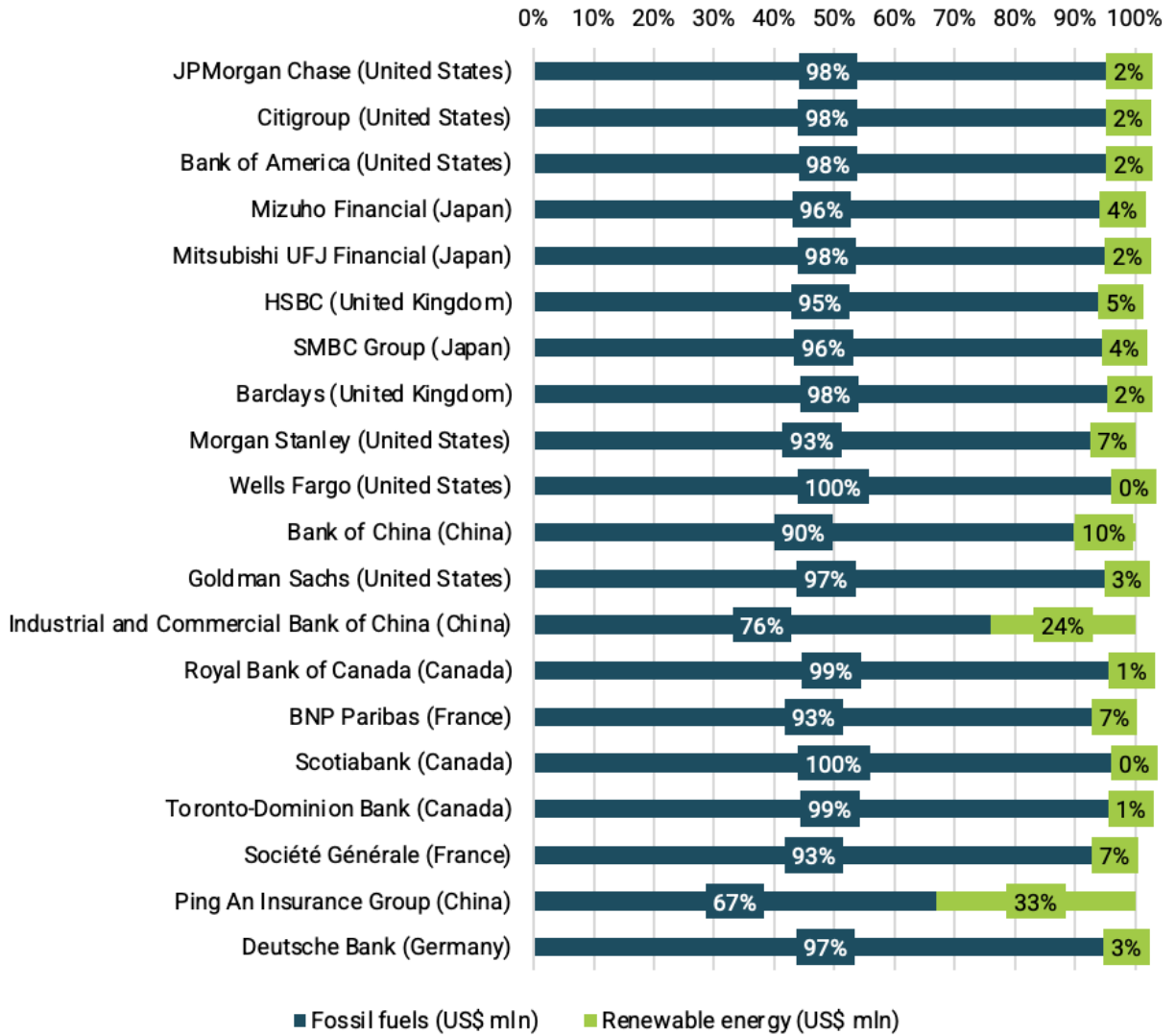
Key Findings:

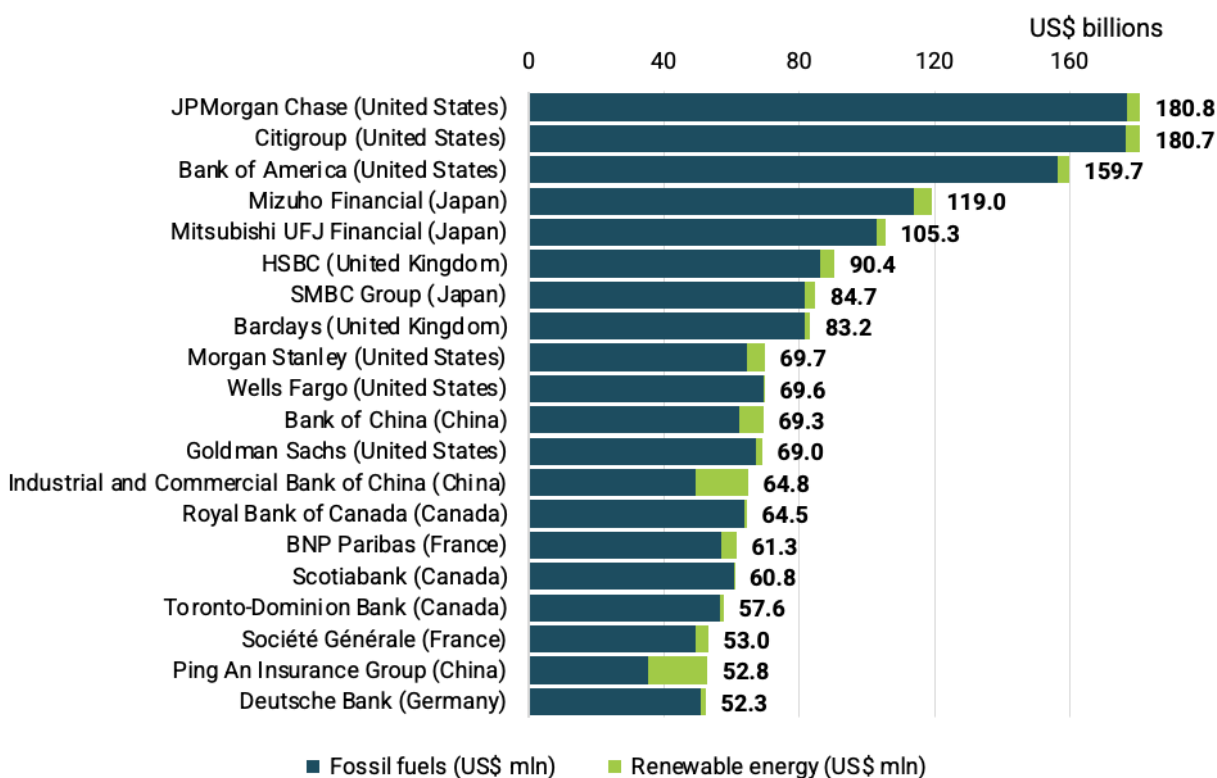
- Of the \$2.5trn in loans and bond underwriting services for energy activities provided by 60 major banks to 377 leading energy companies in the period January 2016 - July 2022, US \$2.3trn was for activities related to the production of fossil fuel energy, versus \$178 billion for clean energy activities. This represented only 7%.

Year	Sum of Fossil fuels (US\$ mln)	Sum of Renewable energy (US\$ mln)
2016	333,032.23	23,195.82
2017	324,505.48	21,455.92
2018	316,497.32	24,735.83
2019	443,191.60	26,048.37
2020	434,933.08	33,470.89
2021	299,183.71	34,576.75
2022	165,022.91	14,853.48
Total	2,316,366.34	178,337.06



- For some individual major banks the picture is even more dismal with no banks close to the 80% proportion of funding for renewable energy which is required by 2030.
 - of the \$181 billion that each of Citi and JPMorgan Chase pumped into the energy companies examined in the study between 2016 and 2022 just 2% went to renewables;
 - similarly, only 2% of Barclays financing of the energy companies examined went to renewables;
 - Royal Bank of Canada: 1%
 - Mizuho: 4%
 - HSBC: 5%
 - BNP Paribas: 7%





- The banks that are members of GFANZ actually provided less financing for renewable energy, on average, than their counterparts that are not in the alliance.

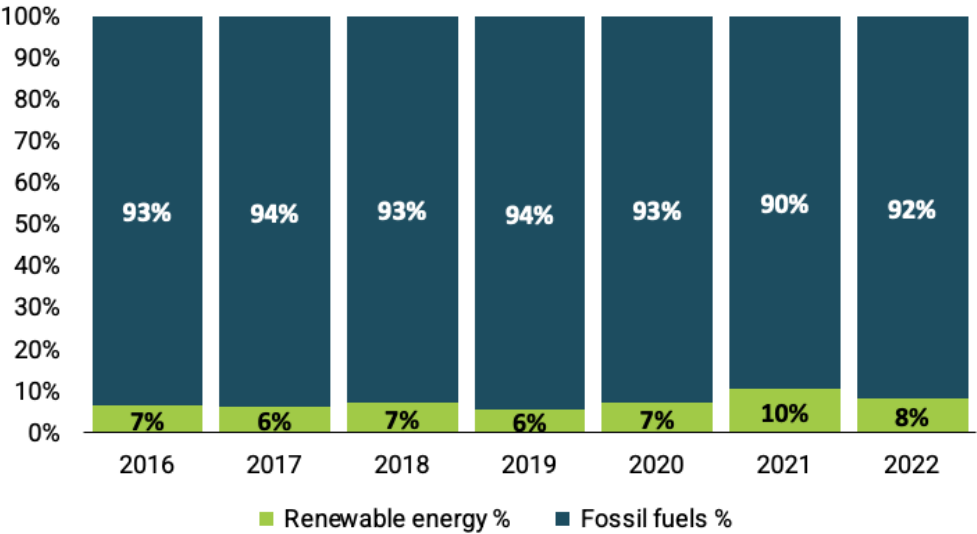
Non GFANZ Banks

Year	Fossil fuels %	Renewable energy %
2016	85%	15%
2017	78%	22%
2018	81%	19%
2019	84%	16%
2020	86%	14%
2021	79%	21%
2022	82%	18%

GFANZ Banks

Year	Fossil fuels %	Renewable energy %
2016	96%	4%
2017	97%	3%
2018	96%	4%
2019	97%	3%
2020	95%	5%
2021	94%	6%
2022	97%	3%

- Despite there needing to be 4 dollars invested in renewable energy for every 1 dollar invested in fossil fuels by the end of 2030, progress has remained virtually stagnant since the Paris Agreement. The proportion of bank loans and bond underwriting to renewables was stuck at no higher than 7% between 2016 and 2010, then rose slightly in 2021 to 10% but only because of a drop in fossil fuel lending before falling again to 8% in 2022.



Summary Methodology

1. Selection of energy companies

This analysis focuses on sectors that can be considered as inputs for power generation and/or for energy used in transport, manufacturing industries and construction, and fugitive emissions from the production of fuels. Together these sectors are relevant for more than 60% of GHG emissions attributable to energy use and 49% of total global GHG emissions.³

The selection of companies, therefore, includes power generation companies; fossil fuel feedstock companies, and renewable energy input companies. The selection of fossil fuel companies is based on a selection of the largest companies on the Global Coal Exit List (GCEL) and the Global Oil & Gas Exit List (GOGEL) which are engaged in activities related to fossil fuels as shown in Table 1. The selection of “clean energy” companies is based on companies active in the production of equipment used for renewable energy (e.g. wind turbines or solar panels), or the generation of renewable energy. Finally, a selection of 25 largest electric utility companies globally, are included in the scope of this proposed research. The top 25 account for approximately 30% of global installed capacity. Reaching a higher proportion of total global installed capacity is beyond the scope of this research as it would involve a vastly longer list of companies due to far smaller levels of installed capacity of many more localized power producers. This resulted in a total of 377 companies.

This selection is based on market studies, data from industry federations and other reliable sources. With the number of (international) companies selected for this study we cover around 75% of the global production volumes in the past three years for all activities related to Renewable Energy and to Fossil Fuels.

Table 1 Activities related to Renewable Energy and Fossil Fuels

Activities related to Renewable Energy	Activities related to Fossil Fuels
Geothermal energy equipment manufacturing	Coal-fired power generation
Geothermal energy generation	Coal mining
Green hydrogen	Gas-fired power generation

³ United Nations Framework Convention on Climate Change (n.d.), “GHG Profiles – Annex I”, online: http://di.unfccc.int/ghg_profile_annex1, viewed in February 2021.

Mini hydro (under 10 MW, run-of-the-river)	Gas production and refining
Ocean energy generation	Oil-fired power generation
Solar energy generation	Oil production and refining
Solar panel manufacturing (PV and CSP)	Oilfield services
Wind power generation	Pipelines
Wind turbine manufacturing	

2. Analysing the activities of the Energy companies and Applying Segment Adjusters

Many of the selected companies have diversified portfolios, including potentially both fossil fuels and renewable energy (e.g. electric utility companies). A general corporate loan to an energy company can be used by the company to finance all types of activities in which it is involved. For general corporate loans provided to companies active in more than one segment, segment adjusters therefore can be used to attribute the financing amounts to different activities in which the energy company is involved. The proportion of business activities related to fossil fuels or renewable energy was calculated for all identified borrowers/issuers for each year a financial relationship was identified. These proportions are known as “segment adjusters” since their application to identified financing “adjusts” the original value to reflect the “segment” value more accurately. This makes it possible to show trends in financing attributable to fossil fuels and renewable energy, and the relative weight of each in the identified energy financing portfolios of the selected financial institutions.

Preferably, data on the annual capital expenditure (capex) per sector or segment in which the company is active has been used as it is forward looking. Where capex data per segment are not available, or the segment classification used by the company is too broad to distinguish between activities, the following proxies were used in order of preference:

- for electricity companies, the installed electricity generation capacity broken down by energy source;
- segment distribution of assets;

- segment distribution of costs;
- segment distribution of profits;
- An estimate based on the description of the company's activities.

The segment distribution of capex, assets, costs and/or revenues was primarily identified through annual reports, company filings and investor presentations. Segment adjusters were calculated separately for each of the years (2016-2022).

Note that the credit or investment figures for individual financial institutions might differ from the figures published by the financial institutions themselves on their credits to the fossil fuels sector, as these figures might cover more companies and count the full credit to each company. We only count the proportions which are directly attributable to fossil fuels and to renewable energy. The proportions of investments in these companies which are used for other energy sources, for electricity transportation and for non-energy activities are not taken into account.

3. Researching the financing of the selected energy companies

This research used financial databases Refinitiv, Bloomberg, TradeFinanceAnalytics, and IJGlobal to identify the loans and issuance underwriting services provided by the selected financial institutions to the selected companies engaged in the fossil fuels and renewable energy.

Creditor links were researched for the period 1st January 2016 to 31st July 2022.

From these data sources, the following data was retrieved for different forms of financing and investments:

- All loans (trade finance, project finance, general corporate loans, revolving credits) provided from 1st January 2016 to 31st July 2022 are taken into account.
- All underwritings of share and bond issuances in the last three years from 1st January 2016 to 31st July 2022 are taken into account.

All amounts found were converted, where necessary, to US dollars against the prevailing exchange rates at the moment the financing was provided.

For syndicated loans and underwriting syndicates some extra estimates might be needed to divide the so-called principal amount among all banks participating in the syndicate. The names and roles of all banks that participate in the syndicate are usually found in the data sources.

When the actual amounts for which banks participated in the syndicate are also available, this break-down was used and no further estimates were needed.

When no data was available on how the principal amount was divided among the various banks participating in the syndicate, an estimate was made based on the following guidelines:

- When the fees received per bank were known, the ratio of a bank's management fee was used to estimate its financial contribution to the loan or issuance. This was calculated as follows:

$$\text{Bank's contribution: } \left(\frac{\text{individual bank's fee}}{\Sigma \text{ of all banks' fees}} * \text{principal amount} \right)$$

- When the fees were unknown for one or more participants in a deal, we first calculated the bookratio to determine how the principal amount was divided between the bookrunners (the banks arranging the deal) and the other banks participating more passively in the syndicate. The bookratio was calculated as follows:

$$\text{Bookratio: } \frac{\text{number of banks} - \text{number of bookrunners}}{\text{number of bookrunners}}$$

Table 2 shows which share of the principal amount is then divided to the bookrunners, depending on the bookratio calculated. This table is based on experience gained by Profundo over the years with analysing thousands of loan and issuance syndicates for which the contributions of individual banks were known. Experience learns that for loan syndicates, the share of the principal amount that is divided between the bookrunners decreases when the total number of banks in the syndicate increases. For issuance syndicates this is not the case.

Table 2

Contributions assigned to the bookrunners in loan and issuance syndicates

Bookratio	Loans	Issuances
>1/3	75%	75%
>2/3	60%	75%
>1.5	40%	75%
>3.0	<40%*	<75%*

*For loan and issuance syndicates with a bookratio of more than 3.0, we used a formula which gradually lowers the commitment assigned to the bookrunners as the bookratio increases. The formula used for this is:

$$\frac{1}{\frac{\sqrt{\text{bookratio}}}{1.443375673}}$$

The number in the denominator is used to let the formula start at 40% in case of a bookratio of 3.0. As the bookratio increases the formula will go down from 40%. For issuance syndicates the figure in the denominator is 0.769800358.

This research step results in an overview of the selected financial institutions showing per bank with which companies from the selected list of companies they have financial links and for which amounts they financed, or invested in, these companies in the past six years (2016 - 2022).

4. Combining financings with segment adjusters

The financing identified for each financial institution were then combined with the relevant segment adjusters. For example, if we found that Oil Company A received a general corporate

loan from Bank B for US\$100 million in 2019. During this financial year, 95% of Oil Company A's capex went to oil, 3% to wind power, and 2% to activities which are not relevant for our analysis. US\$95 million was therefore attributed to fossil fuels, US\$3 million to renewable energy, and US\$2 million was not included in the analysis.

After making these calculations for all financings found, the total amounts financed by each bank were added up, both for *Renewable energy* activities and for *Fossil fuel* activities. As all financing attributable to other energy activities as well as to non-energy sectors is ignored, the total financing analysed for each financial institution will usually be lower than the actual financing provided to the selected companies.

Using the total financing amounts, we also calculated which percentage of the combined energy financings and investments of the banks went to *Renewable energy* in the past three years and which percentage to *Fossil fuels*. These percentages were calculated per individual financial institution and for the three groups: banks, insurers and pension funds.

The findings about their own financial institution were shared with the banks for their comments.

The Banks

Agricultural Bank of China

ANZ

Banco Bilbao Vizcaya Argentaria (BBVA)

Bank of America

Bank of China

Bank of Communications

Barclays

BMO Financial Group

BNP Paribas

China Construction Bank

China Everbright Group

China Merchants Bank

China Minsheng Banking

CIBC

CITIC

Citigroup

Commerzbank

Commonwealth Bank of Australia

Crédit Agricole

Credit Suisse

Danske Bank

Deutsche Bank

DZ Bank

Goldman Sachs

Crédit Mutuel

Groupe BPCE

HSBC

Industrial and Commercial Bank of China

Industrial Bank Company

ING Group

Intesa Sanpaolo

JPMorgan Chase

KB Financial Group

La Banque Postale

La Caixa Group

Lloyds Banking Group

Mitsubishi UFJ Financial

Mizuho Financial

Morgan Stanley

National Australia Bank

NatWest

Nordea

Ping An Insurance Group

PNC Financial Services

Postal Savings Bank of China

Rabobank

Royal Bank of Canada

Santander

Scotiabank

Shanghai Pudong Development Bank

SMBC Group

Société Générale

Standard Chartered

State Bank of India

Sumitomo Mitsui Trust

Toronto-Dominion Bank

UBS

UniCredit

Wells Fargo

Westpac

Appendix 1 Energy companies researched in this project

Company	Sector	Country
Abengoa	Solar Panel CSP	Spain
ABM Investama	Mining	Indonesia
Abu Dhabi National Oil Company (ADNOC)	Oil & Gas	UAE
Acciona	Solar Panel CSP	Spain
Adani Group	Power Generation	India
Adani Group	Mining	India
Adaro Energy	Mining	Indonesia
AES	Power Generation	United States
Africa Coal Partners Ltd	Mining	South Africa
AGL Energy Ltd	Mining	Australia
Aiko Solar	Solar Panel PV	China
Alliance Resource Partners LP	Mining	USA
ALLTECH Group	Mining	Russia
Altraso Ventures Ltd	Mining	Russia
Aluminum Corporation of China Ltd	Mining	China
Ameren	Power Generation	United States
American Electric Power	Power Generation	United States
Anglo American PLC	Mining	United Kingdom
Anglo Pacific Group PLC	Mining	United Kingdom
Anhui Wanbei Coal - Electricity Group Co Ltd	Mining	China
Antero Resources Corporation	Oil & Gas	USA
APA Corporation	Oil & Gas	USA
Arch Resources Inc	Mining	USA
ARM Coal Pty Ltd	Mining	South Africa
Ascent Resources LLC	Oil & Gas	USA
Atlas Copco	Geothermal energy	Sweden
Baker Hughes	Oil Field Service	United States
Ballard Power Systems	Hydrogen	Canada
Bangladesh Petroleum	Pipelines	Bangladesh
Banpu Public Company Ltd	Mining	Thailand
Baramulti Suksessarana	Mining	Indonesia
Basra Oil Company	Oil & Gas	Iraq
Batchfire Resources Pty Ltd	Mining	Australia
Bayan Resources	Mining	Indonesia
Beijing Energy Group	Power Generation	China
Beijing Energy Holding Co Ltd	Mining	China
Berkshire Hathaway	Power Generation	United States

Company	Sector	Country
BHP Group Ltd	Mining	Australia
Bin County Coal Co Ltd	Mining	China
BioTherm Energy	Ocean energy	South Africa
Blackhawk Mining LLC	Mining	USA
Bloom Energy	Hydrogen	United States
Blue Energy Canada	Ocean energy	Canada
BP plc	Oil & Gas	UK
Brightsource	Solar Panel CSP	Israel
Bukit Asam	Mining	Indonesia
Bulgarian Energy Holding (BEH)	Mining	Bulgaria
Bumi Resources	Mining	Indonesia
Cabot Oil & Gas Corporation	Oil & Gas	USA
Canada Development Investment Corporation	Pipelines	Canada
Canadian Natural Resources Ltd (CNRL)	Oil & Gas	Canada
Canadian Solar	Solar Panel PV	Canada/China
CC Kolmar LLC	Mining	Russia
Celikler Holding	Mining	Turkey
Cenovus Energy Inc	Oil & Gas	Canada
Ceres Power	Hydrogen	United Kingdom
CEZ AS	Mining	Czech Republic
CEZ Group	Power Generation	Czech Republic
Chesapeake Energy Corporation	Oil & Gas	USA
Chevron Corporation	Oil & Gas	USA
China Datang	Power Generation	China
China Energy Investment Corporation (China Energy/ CHN Energy)	Mining	China
China Huadian	Power Generation	China
China Huadian Co Ltd	Mining	China
China Huaneng	Power Generation	China
China Huaneng Group Co Ltd	Mining	China
China National Coal Group Corp (ChinaCoal)	Mining	China
China National Offshore Oil Corporation (CNOOC)	Oil & Gas	China
China National Petroleum Corporation	Pipelines	China
China National Petroleum Corporation (CNPC)	Oil & Gas	China
China Petrochemical Corporation (Sinopec Group)	Oil & Gas	China
China Petrochemical Group (Sinopec Group)	Mining	China
China Petroleum & Chemical Corporation (Sinopec Corp)	Oil & Gas	China
China Pingmei Shenma Group	Mining	China

Company	Sector	Country
China Qinfu Group Ltd	Mining	China
China Resources	Power Generation	China
China Shipbuilding New Power Company	Solar Panel CSP	China
Chubu Electric Power	Power Generation	Japan
Chugoku Electric Power	Power Generation	Japan
CLP Group	Power Generation	Hong Kong
Coal India Ltd	Mining	India
Comisión Federal de Electricidad	Power Generation	Mexico
Complexul Energetic Oltenia SA	Mining	Romania
Concho Resources Inc	Oil & Gas	USA
ConocoPhillips	Oil & Gas	USA
CONSOL Energy Inc	Mining	USA
Continental Resources Inc	Oil & Gas	USA
Contura Energy Inc	Mining	USA
Datong Coal Mine Group Co Ltd	Mining	China
Devon Energy Corporation	Oil & Gas	USA
Diamondback Energy Inc	Oil & Gas	USA
DMCI Holdings Inc	Mining	Philippines
Dominion	Power Generation	United States
Dongfang	Wind Turbines	China
Drummond Company Inc	Mining	USA
DTE Energy	Power Generation	United States
DTEK	Power Generation	Ukraine
DTEK BV Group	Mining	Ukraine
Duke Energy	Power Generation	United States
E.ON	Power Generation	Germany
E.on	Power companies in NL	Netherlands
Eagle Spirit Energy Holdings	Pipelines	Canada
Ecopetrol SA	Oil & Gas	Colombia
EDF Group	Power Generation	France
Electricity Generating Authority of Thailand (EGAT)	Mining	Thailand
Elektrik Uretim A.S. Genel Mudurlugu (EUAS)	Mining	Turkey
Elektroprivreda Srbije (EPS)	Mining	Serbia
EN+ Group IPJSC	Mining	Russia
Enbridge	Pipelines	Canada
EnBW	Power Generation	Germany
Enea SA	Mining	Poland
Eneco	Power companies in NL	Netherlands

Company	Sector	Country
Enel	Power Generation	Italy
Enercon	Wind Turbines	Germany
Energeticky a prumyslovy holding a.s. (EPH)	Mining	Czech Republic
Energy Transfer	Pipelines	United States
Enerjisa Uretim Santralleri A.S.	Mining	Turkey
Engie	Power Generation	France
Engie	Power companies in NL	Netherlands
Eni SpA	Oil & Gas	Italy
Enterprise Products Partners	Pipelines	United States
Envision	Wind Turbines	China
EOG Resources Inc	Oil & Gas	USA
EP Investment II S.à.r.l.	Mining	Luxembourg
EP Investment S.à.r.l.	Mining	Luxembourg
EQT Corporation	Oil & Gas	USA
Equinor ASA	Oil & Gas	Norway
Erdenes Mongol LLC	Mining	Mongolia
Eskom	Power Generation	South Africa
Essel Mining & Industries Ltd (EMIL)	Mining	India
Eurasian Resources Group S.à.r.l (ERG)	Mining	Luxembourg
Evergy	Power Generation	United States
EVN	Power Generation	Vietnam
Exergy	Geothermal energy	Italy
Exxaro Resources Ltd	Mining	South Africa
Exxon Mobil Corporation	Oil & Gas	USA
Famur SA	Mining	Poland
First Solar	Solar Panel PV	United States
FirstEnergy	Power Generation	United States
FM Coal LLC	Mining	USA
Foresight Energy LP	Mining	USA
Formosa Plastics Group	Power Generation	Taiwan
Fortum	Power Generation	Russia
Fuji Electric	Geothermal energy	Japan
Gazprom	Pipelines	Russia
Gazprom	Oil & Gas	Russia
Gaz-System	Pipelines	Poland
GE Renewable Energy	Wind Turbines	United States
GE/Alstom	Geothermal energy	France
General Electric	Solar Panel CSP	United States
Geo Energy Resources Ltd	Mining	Singapore

Company	Sector	Country
Glencore PLC	Mining	Switzerland
Global Mining Holding Company LLC	Mining	USA
GMR Infrastructure Ltd	Mining	India
Goldwind	Wind Turbines	China
Guangdong Energy Group Co Ltd	Mining	China
Guangdong Yudean Group	Power Generation	China
Guanghui Energy Co Ltd	Mining	China
Guizhou Panjiang Coal And Electricity Group Co Ltd	Mining	China
Guizhou Panjiang Investment Holding (Group) Co Ltd	Mining	China
Guizhou Panjiang Refined Coal Co Ltd	Mining	China
Gujarat Mineral Development Corp Ltd	Mining	India
Gujarat State Petronet	Pipelines	India
Hallador Energy Co	Mining	USA
Halliburton	Oil Field Service	United States
Hanwha Q-Cells	Solar Panel PV	Republic of Korea
Hebei Construction & Investment Group	Power Generation	China
Heilongjiang Longmay Mining Holding Group Co Ltd	Mining	China
Helmerich & Payne	Oil Field Service	United States
Henan Energy and Chemical Industry Group Co Ltd	Mining	China
Henan Investment Group	Power Generation	China
Henan Shenhua Group Co Ltd	Mining	China
Hess Corporation	Oil & Gas	USA
Hindalco Industries Ltd	Mining	India
Hokkaido Electric Power	Power Generation	Japan
Hokuriku Electric Power Company	Power Generation	Japan
Huaibei Mining Group Company	Mining	China
Huaihe Energy Holding Group Co Ltd	Mining	China
Huainan Mining Group	Power Generation	China
Hubei Yihua Group Co Ltd	Mining	China
Idemitsu Kosan Co Ltd	Mining	Japan
Indian Oil Corporation	Pipelines	India
Indika Energy	Mining	Indonesia
Indonesia Asahan Aluminium LLP	Mining	Indonesia
Inner Mongolia Energy Generation & Investment Group	Mining	China
Inner Mongolia Huineng Coal and Electricity Group Co Ltd	Mining	China

Company	Sector	Country
Inner Mongolia Manshi Investment Group Co Ltd	Mining	China
Inner Mongolia Yitai Group Co Ltd	Mining	China
Inpex Corporation	Oil & Gas	Japan
ITM Power	Hydrogen	United Kingdom
JA Solar	Solar Panel PV	China
Jemena	Pipelines	China
Jiangsu Guoxin Investment Group	Power Generation	China
Jiangsu Yueda Group Co Ltd	Mining	China
Jindal Steel & Power Ltd (JSPL)	Mining	India
Jingyuan Coal Industry Group	Mining	China
Jinko Solar	Solar Panel PV	China
Jinneng Group Co Ltd	Mining	China
Jizhong Energy Group Co Ltd	Mining	China
J-POWER	Power Generation	Japan
JSC HC SDS	Mining	Russia
JSC SUEK Group (Siberian Coal Energy Company)	Mining	Russia
JSC Uzbekneftegaz	Oil & Gas	Uzbekistan
Kailuan (Group) Ltd Liability Corporation	Mining	China
Karazhyra JSC	Mining	Kazakhstan
KEPCO	Power Generation	South Korea
Kiewit Peter Sons' Inc	Mining	USA
Kinder Morgan	Pipelines	United States
Kosovo Energy Corporation J. S. C. (KEK)	Mining	Kosovo
Kuwait Petroleum Corporation (KPC)	Oil & Gas	Kuwait
LG International Corp	Mining	South Korea
Liaoning Energy Industry Holding Group Co Ltd	Mining	China
LONGi	Solar Panel PV	China
Lukoil	Oil & Gas	Russia
Magellan Midstream Partners	Pipelines	United States
Mamoura Diversified Global Holding PJSC	Oil & Gas	UAE
Marathon Oil Corporation	Oil & Gas	USA
Menar Holding	Mining	Luxembourg
Minera del Norte S.A. de C.V. (MINOSA)	Mining	Mexico
Minesto	Ocean energy	Sweden
Ming Yang	Wind Turbines	China
Mitsubishi	Geothermal energy	Japan
Mongolian Mining Corporation	Mining	Mongolia
Moroccan National Board of Hydrocarbons and Mines	Pipelines	Morocco

Company	Sector	Country
MPLX	Pipelines	United States
Murray Energy Corp	Mining	USA
NACCO Industries Inc	Mining	USA
National Energy Investment Group	Power Generation	China
National Iranian Oil Company (NIOC)	Oil & Gas	Iran
Navajo Transitional Energy Company LLC (NTEC)	Mining	USA
Nel	Hydrogen	Norway
New Hope Corporation Ltd	Mining	Australia
Nigerian National Petroleum Corporation	Pipelines	Nigeria
Nigerian National Petroleum Corporation (NNPC)	Oil & Gas	Nigeria
NLC India Ltd	Mining	India
Nordex-Acciona	Wind Turbines	Germany
North Oil Company (Iraq)	Oil & Gas	Iraq
Nova Innovation	Ocean energy	United Kingdom
NRG Energy	Power Generation	United States
NTPC	Power Generation	India
NTPC Ltd	Mining	India
OAO Kuzbasskaya Toplivnaya Kompaniya (KTK)	Mining	Russia
Occidental Petroleum Corporation	Oil & Gas	USA
Ocean Renewable Power	Ocean energy	United States
Oil and Natural Gas Corporation	Pipelines	India
Oil and Natural Gas Corporation Ltd (ONGC)	Oil & Gas	India
OMV AG	Oil & Gas	Austria
ONEOK	Pipelines	United States
OQ SAOC	Oil & Gas	Oman
Ordos Wulan Coal (Group) Co Ltd	Mining	China
Ormat	Geothermal energy	United States
Ovintiv Inc	Oil & Gas	USA
PAO NOVATEK	Oil & Gas	Russia
Patterson-UTI Energy	Oil Field Service	United States
Peabody Energy Corp	Mining	USA
Pembina Pipeline	Pipelines	Canada
Pertamina (Persero)	Oil & Gas	Indonesia
Petoro AS	Oil & Gas	Norway
PetroAmazonas EP	Oil & Gas	Ecuador
Petrobras	Pipelines	Brazil
PetroChina Company Ltd	Oil & Gas	China
Petroleo Brasileiro SA – Petrobras	Oil & Gas	Brazil
Petroleos de Venezuela SA (PDVSA)	Oil & Gas	Venezuela

Company	Sector	Country
Petroleos Mexicanos (PEMEX)	Oil & Gas	Mexico
Petroliam Nasional Berhad (Petronas)	Oil & Gas	Malaysia
PGE	Power Generation	Poland
PGE SA (Polska Grupa Energetyczna SA)	Mining	Poland
Phillips 66	Pipelines	United States
Pioneer Natural Resources Company	Oil & Gas	USA
PipeChina	Pipelines	China
Plains All American Pipeline	Pipelines	United States
PLN Persero	Power Generation	Indonesia
Plug Power	Hydrogen	United States
Polska Grupa Górnicza (PGG)	Mining	Poland
Posco	Mining	South Korea
PTT Exploration and Production Public Company Ltd (PTTEP)	Oil & Gas	Thailand
PTT Global Management Co. Ltd (PTTGM)	Mining	Thailand
Public Power Corporation SA (PPC)	Mining	Greece
Qatar Petroleum	Oil & Gas	Qatar
Rajasthan Rajya Vidyut Utpadan Nigam Ltd (RVUNL)	Mining	India
Range Resources Corporation	Oil & Gas	USA
Reliance Power Ltd	Mining	India
Repsol SA	Oil & Gas	Spain
Rosneft Oil Company	Oil & Gas	Russia
Royal Dutch Shell plc	Oil & Gas	Netherlands
RusHydro	Power Generation	Russia
Russian Coal Co	Mining	Russia
RWE	Power Generation	Germany
RWE	Power companies in NL	Netherlands
RWE AG	Mining	Germany
Sabella	Ocean energy	France
Samruk Energy JSC	Mining	Kazakhstan
Sasol Ltd	Mining	South Africa
Saudi Arabian Oil Company (Saudi Aramco)	Oil & Gas	Saudi Arabia
Schlumberger	Oil Field Service	United States
Sener	Solar Panel CSP	Spain
Seriti Resources Holdings Pty Ltd	Mining	South Africa
Sev.en Energy Group	Mining	Czech Republic
Shaanxi Coal and Chemical Industry Group Co Ltd	Mining	China
Shaanxi Investment Group Co Ltd	Mining	China

Company	Sector	Country
Shaanxi Yulin Energy Group Co Ltd	Mining	China
Shandong Energy Group Co Ltd	Mining	China
Shandong Weiqiao Group	Power Generation	China
Shanghai Electric	Solar Panel CSP	China
Shanxi Coal Import & Export Group Co Ltd	Mining	China
Shanxi Coking Coal Group Co Ltd	Mining	China
Shanxi Jincheng Anthracite Mining Group Co Ltd	Mining	China
Shanxi Lanhua Coal Industry Group Co Ltd	Mining	China
Shanxi Lu'an Mining Industry (Group) Co Ltd	Mining	China
Shanxi Luxin Energysources Group	Mining	China
Shanxi Xinzhou Shenda Energy Group Co Ltd	Mining	China
Shenyang Coal Industry (Group) Co Ltd	Mining	China
Shenyang Coal Trade Group Corp Ltd	Mining	China
Sichuan Coal Industry Group LLC	Mining	China
Siemens Gamesa	Wind Turbines	Spain
SIMEC Atlantis (formerly Atlantis Resources Corporation)	Ocean energy	Scotland
Sinar Mas	Mining	Indonesia
Singareni Collieries Company Ltd (SCCL)	Mining	India
Sinopec	Pipelines	China
Sokolovská Uhelná AS	Mining	Czech Republic
Sonatrach	Pipelines	Algeria
Sonatrach SpA	Oil & Gas	Algeria
South32 Ltd	Mining	Australia
Southern Company	Power Generation	United States
Southwestern Energy Company	Oil & Gas	USA
Sowitec	Ocean energy	Germany
State Oil Company of the Azerbaijan Republic (SOCAR)	Oil & Gas	Azerbaijan
State Power Investment Corporation	Power Generation	China
State Power Investment Corporation (SPIC)	Mining	China
SUEK	Power Generation	Russia
Suncor Energy Inc	Oil & Gas	Canada
Surgutneftegas PJSC	Oil & Gas	Russia
Taipower	Power Generation	Taiwan
Tallgrass Energy	Pipelines	United States
Tata Power Co Ltd	Mining	India
Tatneft	Oil & Gas	Russia
TC Energy	Pipelines	Canada

Company	Sector	Country
Tennessee Valley Authority	Power Generation	United States
TEPCO	Power Generation	Japan
TerraCom Ltd	Mining	Australia
TNB	Power Generation	Malaysia
Tocado	Ocean energy	Netherlands
Tohoku Electric Power	Power Generation	Japan
Tongwei	Solar Panel PV	China
Toshiba	Geothermal energy	Japan
Total	Pipelines	France
Total SE	Oil & Gas	France
TransAlta Corp	Mining	Canada
Transgaz	Pipelines	Romania
Transnet	Pipelines	South Africa
Transocean	Oil Field Service	United States
Trina Solar	Solar Panel PV	China
Turboden (subsidiary of Mitsubishi)	Geothermal energy	Italy
Turkish Coal Enterprises (TKI)	Mining	Turkey
Turkmengaz	Pipelines	Turkmenistan
Turkmengaz State Concern	Oil & Gas	Turkmenistan
Uniper	Power Generation	Germany
Uniper	Power companies in NL	Netherlands
United Tractors	Mining	Indonesia
Ural Mining Metallurgical Company (UMMC)	Mining	Russia
UREC	Solar Panel PV	Taiwan
Vattenfall	Power Generation	Germany
Vattenfall	Power companies in NL	Netherlands
Vestas	Wind Turbines	Denmark
Vietnam National Coal Mineral Industries Holding Corporation Ltd (Vinacomin)	Mining	Vietnam
Vistra Corp	Mining	USA
Westmoreland Mining Holdings LLC	Mining	USA
Whitehaven Coal Ltd	Mining	Australia
Williams Companies	Pipelines	United States
Windey	Wind Turbines	China
Wintershall Dea GmbH	Oil & Gas	Germany
Wintime Holding Group Ltd	Mining	China
Wolverine Fuels LLC	Mining	USA
Xuzhou Mining Group Co Ltd	Mining	China
Yangquan Coal Industry (Group) Co Ltd	Mining	China

Company	Sector	Country
Yankuang Group Co Ltd	Mining	China
YPF SA	Oil & Gas	Argentina
Yunnan Coal Chemical Industry Group Co Ltd	Mining	China
Yunnan Xiaolongtan Mining Bureau	Mining	China
ZAO Stroyservis	Mining	Russia
ZE PAK SA Group (Zespół Elektrowni Pątnów Adamów Konin SA)	Mining	Poland
Zhejiang Provincial Energy Group	Power Generation	China
Zhengzhou Coal Industry Group Co Ltd	Mining	China

Sector	Count of Company
Geothermal energy utilization equipment	8
Hydrogen	6
Mining	161
Ocean energy	9
Oil & Gas	69
Oil Field Service	6
Pipelines	33
Power Generation	58

Solar Panel CSP	7
Solar Panel PV	10
Wind Turbines	10
Total	377

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