



ENERGY FINANCE IN JAPAN:

Funding Climate Change and Nuclear Risk

A research paper prepared for 350.org Japan



A vertical strip on the left side of the page shows a blue sky at the top and a building facade with scaffolding at the bottom.

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Funding Climate Change and Nuclear Risk

A research paper prepared for 350.org Japan

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SUMMARY

This research was conducted to identify which Japanese financial institutions are financing the fossil fuel and nuclear power sector in Japan and which financial institutions are not.

To investigate investment in the fossil fuel sector, 17 Japanese fossil fuel related companies were selected for research. This includes the top 7 coal, oil and gas related companies ranked by the carbon content of their fossil fuel reserves and 10 companies involved in the expansion of domestic coal-fired power plants ranked by the greatest capacity of planned installations. To examine investments in the nuclear sector, 3 nuclear plant manufacturers and 3 owners of domestic nuclear plants were selected, in addition to 6 electric companies owning nuclear plants that were also included in the domestic coal expansion list.

137 parent companies of Japanese financial institutions (covering 197 subsidiaries) were selected to be included in this research to give a broad picture of the extent of investment by Japanese financial institutions in the fossil fuel and nuclear powers and to identify financial institutions that are effectively free of investments in these industries. The lists of selected banks and institutional investors are provided in section 1.1.

Overall, financing in 23 selected companies engaged in the fossil fuel and nuclear power sector by selected financial institutions was examined. Financial databases were used to identify all known corporate loans, underwritings, bondholdings and shareholdings of the selected Japanese financial institutions in the selected companies engaged in the fossil fuel and nuclear power sector, over the period January 2011 to April 2016.

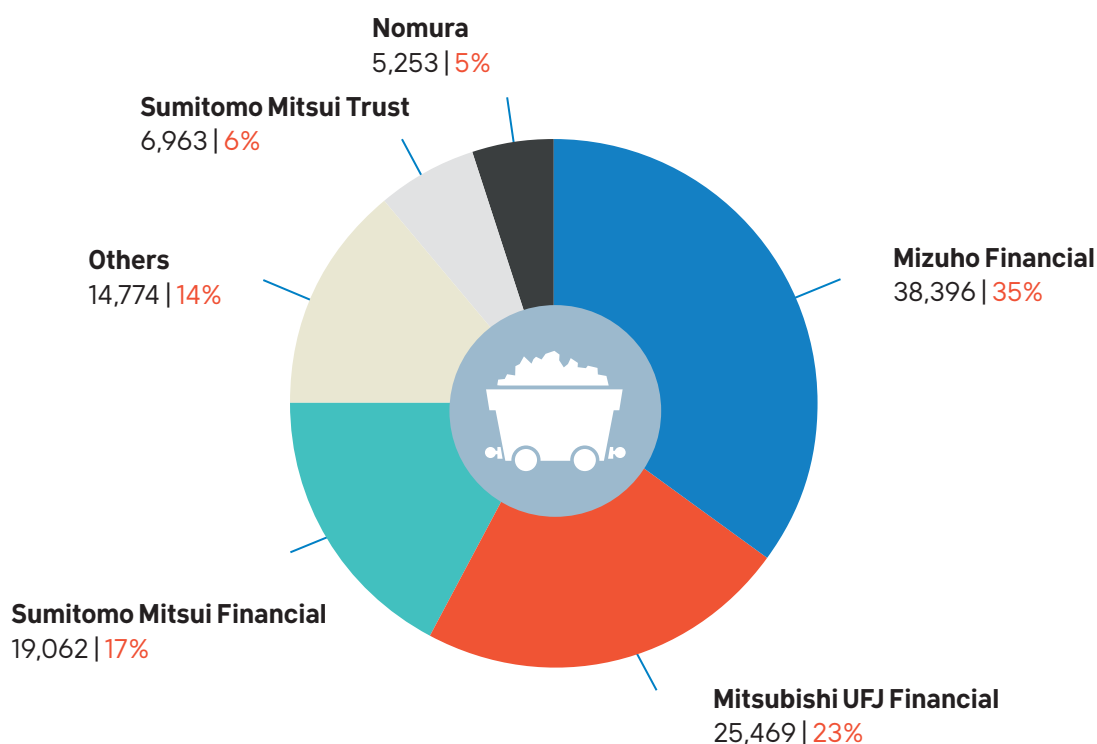
Loans and underwritings

The total loans and underwritings provided by the selected financial institutions to the selected fossil fuel-related companies was approximately US\$ 109.9 billion. Meanwhile the total loans and underwritings provided for nuclear related companies was approximately US\$ 20 billion. The biggest 5 financial institutions that provided loans and underwritings attributed to the fossil fuel sector were Mizuho Financial, Mitsubishi UFJ Financial, Sumitomo Mitsui Financial, Sumitomo Mitsui Trust and Nomura. Figure 1 provides an overview of the relative share of loans and underwritings provided by the selected financial institutions to the selected companies in the fossil fuel sector.

FIGURE 1

SHARE OF LOANS AND UNDERWRITINGS (FOSSIL FUELS)

provided by the selected financial institutions to the selected companies in the fossil fuel sector (2011-2016, US\$ million)



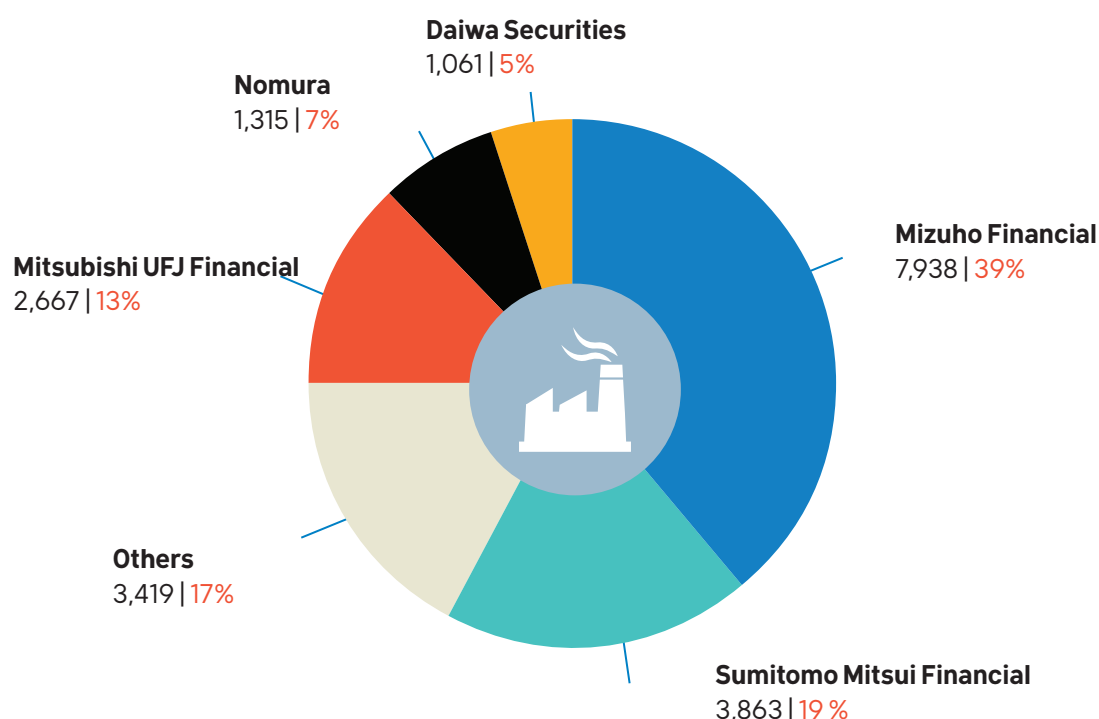
Sources: Bloomberg Database, viewed in May 2016; Thomson Reuters Database, viewed in May 2016

The biggest 5 financial institutions that held bonds and shares attributed to the nuclear power sector were Nippon Life Insurance, Mitsubishi UFJ Financial, Mizuho Financial, Sumitomo Mitsui Trust and Nomura. Figure 4 provides an overview of the relative share of bondholdings and shareholdings of the selected financial institutions in the selected companies in the nuclear sector.

FIGURE 2

SHARE OF LOANS AND UNDERWRITINGS (NUCLEAR)

provided by the selected financial institutions to the selected companies in the nuclear power sector (2011-2016, US\$ million)



Sources: Bloomberg Database, viewed in May 2016; Thomson Reuters Database, viewed in May 2016

Among the selected financial institutions, 61 parent companies were identified as having provided syndicated loans or underwriting services to the fossil fuel sector. Meanwhile 54 parent companies were identified as having provided syndicated loans or underwriting services to the nuclear power sector.

Bondholding and shareholding

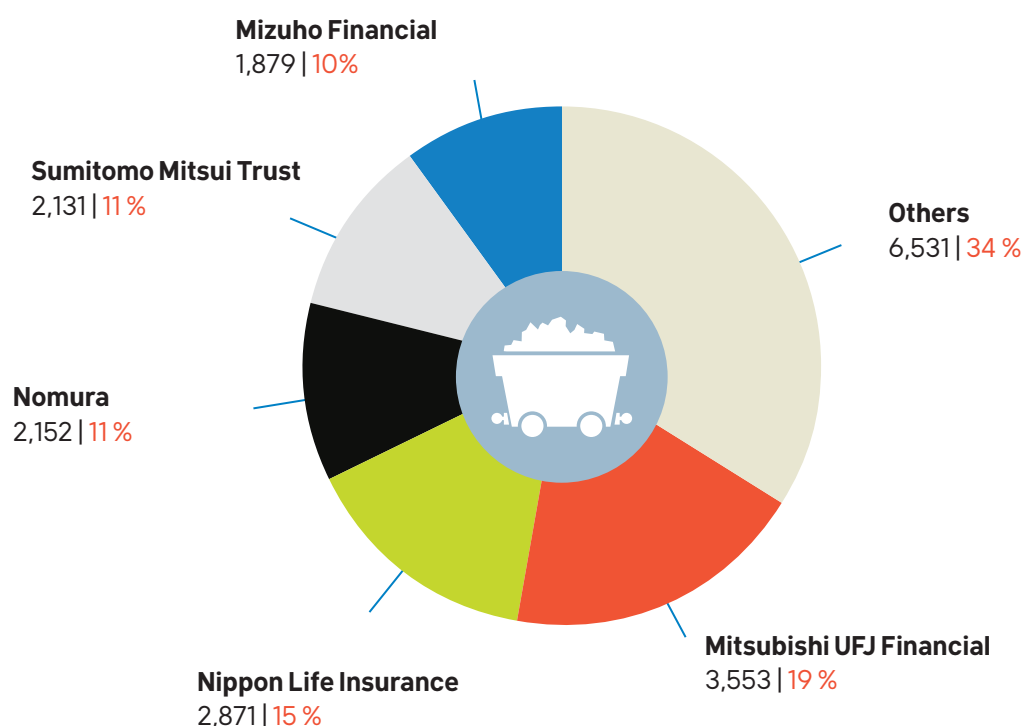
The total amount of bonds and shares held by the selected financial institutions attributable to fossil fuel was much more significant than the one attributable to nuclear power. The total bondholding and shareholding of the selected financial institutions in the selected companies is approximately US\$ 19 billion attributable to fossil fuels and US\$ 2 billion attributable to nuclear power. The biggest 5 financial institutions that held bonds and shares attributed to the fossil fuel sector were Mitsubishi UFJ Financial, Nippon Life Insurance, Nomura, Sumitomo Mitsui Trust, and Mizuho Financial. Figure 3 provides an overview of the relative share of bondholdings and shareholdings of the selected financial institutions in the selected companies in the fossil fuel sector.

FIGURE 3

SHARE OF BONDHOLDINGS AND SHAREHOLDINGS (FOSSIL FUELS)

provided by the selected financial institutions to the selected companies in the fossil fuel sector (2011-2016, US\$ million)

10



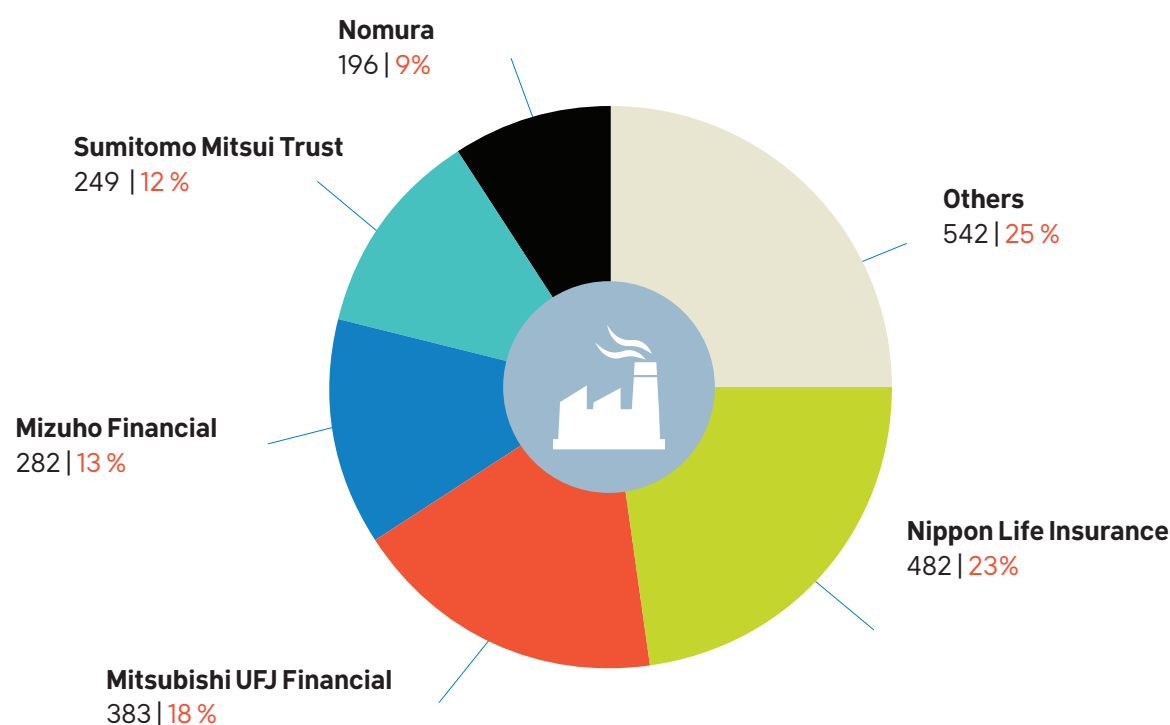
Sources: Bloomberg Database, viewed in May 2016; Thomson Reuters Database, viewed in May 2016

The biggest 5 financial institutions that held bonds and shares attributed to the nuclear power sector were Nippon Life Insurance, Mitsubishi UFJ Financial, Mizuho Financial, Sumitomo Mitsui Trust and Nomura. Figure 4 provides an overview of the relative share of bondholdings and shareholdings of the selected financial institutions in the selected companies in the fossil fuel sector

FIGURE 4

SHARE OF BONDHOLDINGS AND SHAREHOLDINGS (NUCLEAR)

provided by the selected financial institutions to the selected companies in the nuclear sector (2011-2016, US\$ million)



Sources: Bloomberg Database, viewed in May 2016; Thomson Reuters Database, viewed in May 2016

Among the selected financial institutions, 68 parent companies were identified as holding bonds and/or shares in the fossil fuel sector. Meanwhile 54 parent companies were identified as holding bonds and/or shares in the nuclear power sector.

Among the Japanese financial institutions selected for this research, investigation of financial databases did not identify financing provided by 49 parent companies of the financial institutions to the 23 selected companies engaged in both fossil fuel and nuclear power sectors. Supplementary

analysis based on securities reports or related disclosed documents on the 49 parent companies uncovered additional investments in the selected companies by 2 parent companies. Therefore, 47 financial institutions were found not to have investments in fossil fuel and nuclear power related companies. However, it is possible that these financial institutions did provide direct (bilateral) financing to the selected companies, which was not captured by the financial databases or by disclosed reports.

All financial institutions that were identified as financing the nuclear power sector were also financing the fossil fuel sector. Table 1 provides a list of 47 parent¹ companies for which financing to the 23 selected companies in the fossil fuel and nuclear power sectors were not identified in the financial databases and supplementary analysis.



TABLE 1

FINANCIAL INSTITUTIONS WITHOUT FINANCING FOR FOSSIL FUELS AND NUCLEAR

the selected companies engaged in the fossil fuel and nuclear power sectors were not identified

12

No.	Parent company	No.	Parent company
1	Aeon Bank	16	Johanan Shinkin Bank
2	Bank of Okinawa	17	Kanagawa Bank
3	Bank of The Ryukyus	18	Kinki Labour Bank
4	Chugoku Labour Bank	19	Kita-Nippon Bank
5	Chuo Labour Bank	20	Kyushu Labour Bank
6	Ehime Bank	21	Minami Nippon Bank
7	Fukuho Bank	22	Miyazaki Taiyo Bank
8	Fukushima Bank	23	Nagano Labour Bank
9	Hokkaido Bank	24	Naganobank
10	Hokkaido Labour Bank	25	Niigata Labour Bank
11	Hokuetsu Bank	26	Okinawa Kaiho Bank
12	Hokuriku Labour Bank	27	Okinawa Labour Bank
13	Howa Bank	28	Rakuten
14	Japan Net Bank	29	Saga Kyoei Bank
15	Jibun Bank	30	Seibu Shinkin Bank



TABLE 1

FINANCIAL INSTITUTIONS WITHOUT FINANCING FOR FOSSIL FUELS AND NUCLEAR

No.	Parent company	No.	Parent company
31	Seven & I Holdings	40	Tohoku Labour Bank
32	Shikoku Labour Bank	41	Tokai Labour Bank
33	Shimane Bank	42	Tokyo Star Bank
34	Shimizu Bank	43	Tomony Holdings
35	Shizuoka Chuo Bank	44	Towa Bank
36	Shizuoka Labour Bank	45	Toyokawa Shinkin Bank
37	Sony Financial Holdings	46	Tsukuba Bank
38	Tajima Bank	47	Yachiyo Bank
39	Tama Shinkin Bank		



INTRODUCTION

The relationship between energy and climate change risk is becoming an unavoidable consideration in the financial sector for institutional investors and individuals alike.

After the signing of the Paris Climate Treaty in early 2016, which sets out a pathway for achieving net zero emissions globally by mid-century, there is even greater momentum for decarbonizing the energy sector and realizing a just transition to a 100% renewable energy society.

Most consumers in Japan however do not realize how their banks or asset managers invest their funds. Despite the worsening impacts of climate change and nuclear risk, Japanese financial institutions continue to support fossil fuel and nuclear projects at home and across the globe through financing both fossil fuel and nuclear related companies. Continued support for fossil fuels may make it difficult for Japan to meet its pledged GHG emissions reduction targets set out in Paris. Coupled with continued finance for the nuclear sector, Japan's energy finance may be hindering the transition to a renewable energy future.

To highlight the role of the financial industry in the energy sector in Japan, the research presented in this report was designed to identify which banks and other financial institutions are continuing to finance the fossil fuel and nuclear power generation sector and which institutions are not.

Financial databases were used to calculate all known corporate loans, underwritings, bondholdings and shareholdings of selected Japanese financial institutions in 23 selected Japanese companies engaged in the fossil fuel and nuclear power generation sector, over the period January 2011 to April 2016. It should be noted that this research analysis covers syndicate loans, and does not cover financing through direct (bilateral) loans and limited company reports/documents. Data and information on direct loans are not publicly available. Therefore, this research covered only part of all

financial transactions in the fossil fuel and nuclear power generation sector. Supplementary research was conducted by Yuki Tanabe from Japan Center for a Sustainable Environment and Society (JACSES) to investigate further based on limited securities reports or related disclosed documents. The findings of this research nonetheless provide the first quantitative and representative analysis of Japanese financial institution's support of the fossil fuel and nuclear power generation sector.

Chapter 1 describes the methodology applied and data used in the analysis. Chapter 2 provides research findings and results of the analysis on identified financing in the selected companies. Chapter 3 provides an overall conclusion for the presented research. A summary of the findings of this report can be found on the first pages of this report.

CHAPTER 1 - METHODOLOGY

The research presented in this report aims to identify which among the selected Japanese banks and institutional investors are financing the fossil fuel and nuclear power generation sectors. The research methodology developed is described in the following subsections.

1.1 Scope

For this research 23 Japanese companies were selected as representative companies engaged in fossil fuel and nuclear power generation, as well as power systems manufacturing (nuclear and thermal) in Japan.

To investigate investment in the fossil fuel sector, 17 Japanese fossil fuel related companies were selected based on the top 7 coal, oil and gas related companies ranked by the carbon content of their fossil fuel reserves, and 10 companies most involved in the expansion of domestic coal-fired power plants. To examine investments in the nuclear sector, 3 nuclear plant manufacturers and 3 owners of domestic nuclear plants were selected, in addition to 6 electric companies owning nuclear plants included in the domestic coal expansion list. The following are the selected companies:

17



Japanese companies listed in the Coal Top 100 ranked by the carbon content of their fossil fuel reserves¹:

- Mitsubishi Corp
- Idemitsu Kosan
- Mitsui & Co. Ltd
- Itochu Corporation
- Marubeni



Japanese companies listed in the Oil + Gas Top 100 ranked by the carbon content of their fossil fuel reserves²:

- INPEX
- JX holdings



Japanese nuclear plant manufacturers:

- Toshiba
- Mitsubishi Heavy Industries
- Hitachi



Companies related to domestic coal expansion³:

- Kansai electric
- J-POWER
- Tokyo Electric
- Chubu Electric
- Kyushu Electric
- Chugoku Electric
- Kobe Steel Ltd
- Tohoku Electric
- Tokyo Gas
- Osaka Gas



Companies owning domestic nuclear facilities:

- 6 general electric companies listed above: Kansai Electric, Tokyo Electric, Chubu Electric, Kyushu Electric, Chugoku electric, Tohoku electric, plus
- Hokkaido Electric Power Company, Incorporated
- Hokuriku Electric Power Company, Incorporated
- Shikoku Electric Power Company, Incorporated

1 Fossil Free Indexes (n.d.), "The World's Top 100 Public Companies", online: <http://fossilfreeindexes.com/research/the-carbon-underground/>, viewed in July 2016.

2 Fossil Free Indexes (n.d.), "The World's Top 100 Public Companies", online: <http://fossilfreeindexes.com/research/the-carbon-underground/>, viewed in July 2016

3 Sekitan.jp (n.d.), "石炭発電所新設ウォッチ Don't go back to the 石炭!" online: http://sekitan.jp/plant-map/ja/v/table_ja, viewed in July 2016

Furthermore, 137 parent companies of Japanese financial institutions (covering 197 subsidiaries) were selected to be included in the research analysis. This list of financial institutions selected is a broad sample of the institutional investor landscape within Japan. Table 2 provides a list of selected financial institutions to be identified for this research.

TABLE 2

LIST OF SELECTED FINANCIAL INSTITUTIONS

Investigated in this research

IN ALPHABETICAL ORDER, A TO H

Parent company	Subsidiary
77 Bank	77 Bank
Aeon Bank	Aeon Bank
Aichi Bank	Aichi Bank
Akita Bank	Akita Bank
Aomori Bank	Aomori Bank
Aozora Bank	Aozora Bank
Ashikaga Bank	Ashikaga Bank
Awa Bank	Awa Bank
Bank of Iwate	Bank of Iwate
Bank of Kochi	Bank of Kochi
Bank of Kyoto	Bank of Kyoto
Bank of Nagoya	Bank of Nagoya
Bank of Okinawa	Bank of Okinawa
Bank of Saga	Bank of Saga
Bank of The Ryukyus	Bank of The Ryukyus
Bank of Yokohama	Bank of Yokohama
Chiba Bank	Chiba Bank
Chikuho Bank	Chikuho Bank
Chugoku Bank	Chugin Securities
	Chugoku Bank



TABLE 2

LIST OF SELECTED FINANCIAL INSTITUTIONS

Investigated in this research

IN ALPHABETICAL ORDER, A TO H

Parent company

Subsidiary

Chugoku Labour Bank

Chugoku Labour Bank

Chukyo Bank

Chukyo Bank

Chuo Labour Bank

Chuo Labour Bank

Daisan Bank

Daisan Bank

Daishi Bank

Daishi Bank

Daito Bank

Daito Bank

Daiwa Securities

Daiwa Asset Management

Daiwa Capital Markets

Daiwa Next Bank

Daiwa SB Investments

Daiwa Securities

Ehime Bank

Ehime Bank

Eighteenth Bank

Eighteenth Bank

FIDEA Holdings

Hokuto Bank

Shonai Bank

First Bank of Toyama

First Bank of Toyama

Fukoku Mutual Life Insurance

Fukoku Mutual Life Insurance

Fukuho Bank

Fukuho Bank

Fukui Bank

Fukui Bank

Fukuoka Chuo Bank

Fukuoka Chuo Bank

Fukuoka Financial Group

Bank of Fukuoka

Fukuoka Securities

Shinwa Bank

Fukushima Bank

Fukushima Bank

Gunma Bank

Gunma Bank

TABLE 2

LIST OF SELECTED FINANCIAL INSTITUTIONS

Investigated in this research

IN ALPHABETICAL ORDER, A TO H

Parent company	Subsidiary
Hachijuni Bank	Hachijuni Bank
Higashi Nippon Bank	Higashi Nippon Bank
Hiroshima Bank	Hiroshima Bank
Hokkaido Bank	Hokkaido Bank
Hokkaido Labour Bank	Hokkaido Labour Bank
Hokkoku Bank	Hokkoku Bank
Hokuetsu Bank	Hokuetsu Bank
Hokuhoku Financial Group	Hokkaido Bank
	Hokuriku Bank
Hokuriku Labour Bank	Hokuriku Labour Bank
Howa Bank	Howa Bank
Hyakugo Bank	Hyakugo Bank
Hyakujushi Bank	Hyakujushi Bank
Iyo Bank	Iyo Bank
Japan Net Bank	Japan Net Bank
Japan Post Bank	Japan Post Bank
Jibun Bank	Jibun Bank
Jimoto Holdings	Kirayaka Bank
	Sendai Bank
Johnan Shinkin Bank	Johnan Shinkin Bank
Joyo Bank	Joyo Bank
Juroku Bank	Juroku Bank
Kanagawa Bank	Kanagawa Bank
Keiyo Bank	Keiyo Bank
Kinki Labour Bank	Kinki Labour Bank
Kita-Nippon Bank	Kita-Nippon Bank



TABLE 2

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Investigated in this research

IN ALPHABETICAL ORDER, A TO H

Parent company

Subsidiary

Kiyo Holdings

Kiyo Holdings

Kyushu Financial Group

Higo Bank

Kagoshima Bank

Kyushu Labour Bank

Kyushu Labour Bank

Meiji Yasuda Life Insurance

Meiji Yasuda Life Insurance

Michinoku Bank

Michinoku Bank

Mie Bank

Mie Bank

Minami Nippon Bank

Minami Nippon Bank

Minato Bank

Minato Bank

Mitsubishi UFJ Financial

Bank of Tokyo Mitsubishi UFJ

Mitsubishi Trust & Banking

Mitsubishi UFJ Asset Management

Mitsubishi UFJ Morgan Stanley

MU Investments

MUFG Union Bank

Nippon Yusen

Miyazaki Bank

Miyazaki Bank

Miyazaki Taiyo Bank

Miyazaki Taiyo Bank

Chiba Kogyo Bank

Mizuho Financial

DIAM

Mizuho Asset Management

Mizuho Bank

Mizuho Financial

Mizuho International

Mizuho Securities

TABLE 2

LIST OF SELECTED FINANCIAL INSTITUTIONS

Investigated in this research

IN ALPHABETICAL ORDER, A TO H

Parent company	Subsidiary
	Mizuho Trust & Banking
	Shinko Asset Management
MS&AD Insurance Group	MS&AD Insurance Group
Musashino Bank	Musashino Bank
Nagano Labour Bank	Nagano Labour Bank
Naganobank	Naganobank
Nanto Bank	Nanto Bank
Niigata Labour Bank	Niigata Labour Bank
Nippon Life Insurance	Nippon Life Insurance
	Nissay Asset Management
Nishi-Nippon City Bank	Bank of Nagasaki
	Nishi-Nippon City Bank
Nomura	Nomura Asset Management
	Nomura International
	Nomura Securities
	Nomura Trust & Banking
Norinchukin Bank	Norinchukin Bank
	Norinchukin Zenkyoren Asset Management
North Pacific Bank	North Pacific Bank
Ogaki Kyoritsu Bank	Ogaki Kyoritsu Bank
Oita Bank	Oita Bank
Okinawa Kaiho Bank	Okinawa Kaiho Bank
Okinawa Labour Bank	Okinawa Labour Bank
Orix Corporation	Boston Partners
	Orix Corporation
	Robeco

TABLE 2

LIST OF SELECTED FINANCIAL INSTITUTIONS

Investigated in this research

IN ALPHABETICAL ORDER, A TO H

Parent company	Subsidiary
Rakuten	Rakuten
Resona Holdings	Resona Bank
	Resona Holdings
	Saitama Resona Bank
Saga Kyoei Bank	Saga Kyoei Bank
Saikyo Bank	Saikyo Bank
San-in Godo Bank	San-in Godo Bank
SBI Holdings	SBI Holdings
	SBI Sumishin Net Bank
Seibu Shinkin Bank	Seibu Shinkin Bank
Senshu Ikeda Holdings	Senshu Ikeda Bank
Seven & I Holdings	Seven Bank
Shiga Bank	Shiga Bank
Shikoku Bank	Shikoku Bank
Shikoku Labour Bank	Shikoku Labour Bank
Shimane Bank	Shimane Bank
Shimizu Bank	Shimizu Bank
Shinkin Central Bank	Shinkin Asset Management
	Shinkin Central Bank
	Shinkin International
	Shinkin Securities
Shinsei Bank	Shinsei Bank
Shizuoka Bank	Shizuoka Bank
Shizuoka Chuo Bank	Shizuoka Chuo Bank
Shizuoka Labour Bank	Shizuoka Labour Bank
Sompo Japan Nipponkoa Holdings	Sompo Japan Nipponkoa Holdings

TABLE 2

LIST OF SELECTED FINANCIAL INSTITUTIONS

Investigated in this research

Parent company	Subsidiary
Sony Financial Holdings	Sony Bank
Sumitomo Life	Sumitomo Life
Sumitomo Mitsui Financial	Kansai Urban Banking
	Mitsui Sumitomo Bank
	SMBC Friend Securities
	SMBC Nikko Capital Markets
	SMBC Nikko Securities
	SMBC Trust Bank
	Sumitomo Mitsui Asset Management
	Sumitomo Mitsui Banking
	Chuo Mitsui Trust & Banking
Sumitomo Mitsui Trust	Mitsui Trust & Banking
	Mitsui Trust Securities
	Nikko Asset Management
	Sumitomo Mitsui Trust
	Sumitomo Mitsui Trust Asset Management
	Sumitomo Mitsui Trust Bank
	Sumitomo Trust & Banking
	Suruga Bank
	T&D Holdings
Suruga Bank	Suruga Bank
T&D Holdings	T&D Holdings
	Taiyo Life
Taiko Bank	Taiko Bank
Tajima Bank	Tajima Bank
Tama Shinkin Bank	Tama Shinkin Bank
The Dai-ichi Life Insurance Company	The Dai-ichi Life Insurance Company
Tochigi Bank	Tochigi Bank

TABLE 2

LIST OF SELECTED FINANCIAL INSTITUTIONS

Investigated in this research

IN ALPHABETICAL ORDER, A TO H

Parent company

Subsidiary

Toho Bank	Toho Bank
Tohoku Bank	Tohoku Bank
Tohoku Labour Bank	Tohoku Labour Bank
Tokai Labour Bank	Tokai Labour Bank
Tokio Marine Holdings	Tokio Marine Holdings
Tokyo Star Bank	Tokyo Star Bank
Tokyo Tomin Bank	Tokyo Tomin Bank
Tomato Bank	Tomato Bank
Tomony Holdings	Tomony Holdings
	Kagawa Bank
	Taisho Bank
	Tokushima Bank
Tottori Bank	Tottori Bank
Towa Bank	Towa Bank
Toyokawa Shinkin Bank	Toyokawa Shinkin Bank
Tsukuba Bank	Tsukuba Bank
Yachiyo Bank	Yachiyo Bank
Yamagata Bank	Yamagata Bank
Yamaguchi Financial Group	Kitakyushu Bank
	Momiji Bank
	Yamaguchi Bank
Yamanashi Chuo Bank	Yamanashi Chuo Bank

1.2 Financing

This research focuses on syndicated loans, share and bond issuances, bondholding and shareholding. Financial data provided by Bloomberg and Thomson EIKON were used in this research. It should be noted that this research does not cover financing through direct (bilateral) loans. Data and information on direct loans are not publicly available.

The financial institutions can be involved in the financing of the selected companies by providing corporate loans, by assisting companies with share and bond issuances (underwriting), and by (managing) investments in shares and bonds of these companies. Further on in this section, the financing categories are discussed in more detail.

1.2.1 Corporate loans

The easiest way to obtain capital for a project is to borrow money. In most cases, money is borrowed from commercial banks. Loans can be either short-term or long-term in nature. Short-term loans (including trade credits, current accounts, leasing agreements, et cetera) have a maturity of less than a year. They are mostly used as working capital for day-to-day operations. Short-term debts are often provided by a single commercial bank, which does not ask for substantial guarantees from the company.

A long-term loan has a maturity of at least one year, but generally of three to ten years. Long-term corporate loans are in particular useful to finance expansion plans, which only generate rewards after some period. The proceeds of corporate loans can be used for all activities of the company. Often long-term loans are extended by a loan syndicate, which is a group of banks brought together by one or more arranging banks. The loan syndicate will only undersign the loan agreement if the company can provide certain guarantees that interest and repayments on the loan will be fulfilled.

1.2.2 Share issuances

Issuing shares on the stock exchange gives a company the opportunity to increase its equity by attracting a large number of new shareholders or increase the equity from its existing shareholders.

When a company offers its shares on the stock exchange for first time, this is called an Initial Public Offering (IPO). When a company's shares are already traded on the stock exchange, this is called a secondary offering of additional shares.

To arrange an IPO or a secondary offering, a company needs the assistance of one or more (investment) banks, which will promote the shares and find shareholders. The role of investment banks in this process therefore is very important.

The role of the investment bank is temporary. The investment bank purchases the shares initially and then promotes the shares and finds shareholders. When all issued shares that the financial institution has underwritten are sold, they are no longer included in the balance sheet or the portfolio of the financial institution. However, the assistance provided by financial institutions to companies in share issuances is crucial. They provide the company with access to capital markets, and provide a guarantee that shares will be bought at a pre-determined minimum price.

1.2.3 Bond issuances

Issuing bonds can best be described as cutting a large loan into small pieces, and selling each piece separately. Bonds are issued on a large scale by governments, but also by corporations. Like shares, bonds are traded on the stock exchange. To issue bonds, a company needs the assistance of one or more (investment) banks which underwrite a certain amount of the bonds. Underwriting is in effect buying with the intention of selling to investors. Still, in case the investment bank fails to sell all bonds it has underwritten, it will end up owning the bonds.

1.2.4 Shareholdings

Banks can, through the funds they are managing, buy shares of a certain company making them part-owners of the company. This gives the bank a direct influence on the company's strategy. The magnitude of this influence depends on the size of the shareholding.

As financial institutions actively decide in which sectors and companies to invest, and are able to influence the company's business strategy, this research will investigate the shareholdings of financial institutions of

the selected companies. Shareholdings are only relevant for stock listed companies. Not all companies in the study are stock listed companies. The company selection has tried to take this into account by including the major companies in the relevant sectors. However, some ownership forms may dominate in certain sectors under analysis. Additionally, some ownership forms are more prominent in some countries.

Shareholdings have a number of peculiarities that have implications for the research strategy. Firstly, shares can be bought and sold on the stock exchange from one moment to the next. Financial databases keep track of shareholdings through snapshots, or filings. This means that when a particular shareholding is recorded in the financial database, the actual holding, or a portion of it, might have been sold, or more shares purchased. Secondly, share prices vary from one moment to the next.

Given these peculiarities, shareholdings will be analyzed at the most recent filing dates. Shareholdings will be researched using financial databases such as Thomson and Bloomberg.

1.2.5 Investments in bonds

Banks can also buy bonds of a certain company. The main difference between owning shares and bonds is that owner of a bond is not a co-owner of the issuing company; the owner is a creditor of the company. The buyer of each bond is entitled to repayment after a certain number of years, and to a certain interest during each of these years.

Bond holdings have a number of peculiarities that have implications for the research strategy. Firstly, bonds can be bought and sold from one moment to the next. However, only the most recent bond holding information is available. Given these peculiarities, bond holdings will be analyzed at the most recent filing dates. Bond holdings will be researched using financial databases such as Thomson and Bloomberg

1.3 Analysis of financial relationships

Financial relationships between the selected companies and the selected financial institutions were established on the basis of:

- Loans and underwriting (bond and share issuances) from financial databases (Thomson EIKON and Bloomberg).
- Bondholding and shareholding data from financial databases (Thomson EIKON)

1.4 Calculated elements

Financial databases often record loans and issuance underwriting when these are provided by a syndicate of financial institutions. The level of detail per deal often varies. These often do not report on the proportions of a given deal that can be attributed to the participants in deal. In such instances, this research calculated an estimated contribution based on the rules of thumb described in the Appendix 1.

1.5 Time frame

This research focused on syndicated loans, and underwritings over the period January 2011 to April 2016, and the most recent bond- and shareholdings.

A large, light blue opening quotation mark on a solid blue background.

"The relationship between energy and climate change risk is becoming an unavoidable consideration in the financial sector for institutional investors and individuals alike."

A large, light blue closing quotation mark on a solid blue background.



CHAPTER 1 - ANALYSIS

This section provides rankings of the financial institutions in terms of the value of their loans and underwriting services to the selected company, and rankings of the financial institutions in terms of the value of their bondholdings and shareholdings attributable to fossil fuels and nuclear power generation.

. The chapter is organized as follows: 2.1 provides the ranking of selected financial institutions in term of the value of their identified loans and underwriting services to the selected companies. Section 2.2 provides the rankings of selected financial institutions in term of the value of their bondholdings and shareholdings in the selected companies. Section 2.3 provides the list of financial institutions, for which no syndicated loans, underwritings, bondholdings and shareholding were identified in the selected companies. Section 2.4 provides supplementary analysis of the financial institutions for which no investments in selected companies were identified.

2.1 Loans and underwritings

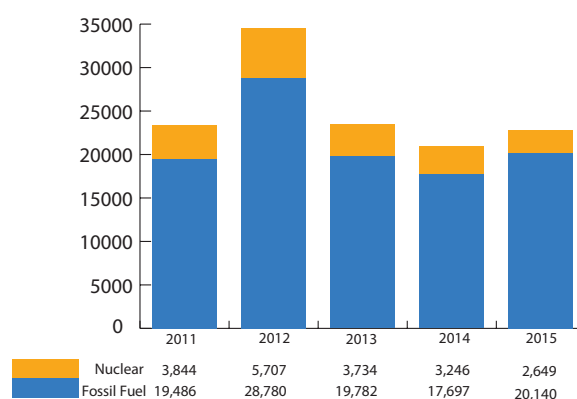
33

Total amount of loans and underwritings identified as being provided by the selected financial institutions to the 23 companies was over 130 billion for both the fossil fuels and nuclear power sector combined. For the period 2011 to 2015, the biggest annual amount of loans and underwritings were identified for the year 2012. Figure 5 provides an overview of total annual loans and underwritings provided by the selected financial institutions to the selected companies.

FIGURE 5

TOTAL ANNUAL LOANS AND UNDERWRITINGS

provided by the selected financial institutions to the selected companies (2011-2015, US\$ million)



Sources: Bloomberg Database, viewed in May 2016; Thomson Reuters Database, viewed in May 2016

Below, this section provides a ranking of the selected financial institutions in terms of the value of their loans and underwriting services attributable to fossil fuels and nuclear power to the selected companies over the period January 2011 to April 2016.

2.1.1 Fossil fuels

This research identified loans and underwriting services provided by 61 parent companies of the selected financial institutions to the selected companies. The total amount of these syndicated loans was approximately US\$ 82 billion, while the total amount of the underwriting services was approximately US\$ 27 billion. Table 3 shows the ranking of the financial institutions that provided loans and underwriting services to the selected companies attributable to fossil fuels over the period January 2011 to April 2016.

TABLE 3

RANKING OF LOANS AND UNDERWRITINGS (FOSSIL FUELS)

for the selected financial institutions financing the selected companies, attributable to fossil fuels (2011-2016, US\$ million)

Rank	Parent company	Subsidiary	Loan	Underwriting	Total
1	Mizuho Financial	Chiba Kogyo Bank	34		34
		Mizuho Bank	28,872		28,872
		Mizuho Financial	31		31
		Mizuho International		410	410
		Mizuho Securities		7,115	7,115
		Mizuho Trust & Banking	1,933	1,933	
	Mizuho Financial Total		30,871	7,525	38,396
2	Mitsubishi UFJ Financial	Bank of Tokyo			
		Mitsubishi UFJ	15,594		15,594
		Mitsubishi Trust & Banking	3,276		3,276
		Mitsubishi UFJ			
		Morgan Stanley		6,535	6,535
		MUFG Union Bank	63		63
	Mitsubishi UFJ Financial Total		18,934	6,535	25,469

TABLE 3

RANKING OF LOANS AND UNDERWRITINGS (FOSSIL FUELS)

for the selected financial institutions financing the selected companies, attributable to fossil fuels (2011-2016, US\$ million)

Rank	Parent company	Subsidiary	Loan	Underwriting	Total
3	Sumitomo Mitsui Financial	SMBC Friend Securities		3	3
		SMBC Nikko Capital Markets		82	82
		SMBC Nikko Securities		3,773	3,773
		Sumitomo Mitsui Banking	15,204		15,204
	Sumitomo Mitsui Financial Total		15,204	3,858	19,062
4	Sumitomo Mitsui Trust	Chuo Mitsui Trust & Banking	2,468		2,468
		Sumitomo Mitsui Trust Bank	3,250		3,250
		Sumitomo Trust & Banking	1,244		1,244
	Sumitomo Mitsui Trust Total		6,963		6,963
5	Nomura	Nomura International		446	446
		Nomura Securities		4,807	4,807
	Nomura Total			5,253	5,253
6	Daiwa Securities	Daiwa Capital Markets		80	80
		Daiwa Securities		3,826	3,826
	Daiwa Securities Total			3,907	3,907
7	Norinchukin Bank	Norinchukin Bank	1,837		1,837
8	77 Bank	77 Bank	1,729		1,729
9	Shinkin Central Bank	Shinkin Central Bank	273		273
		Shinkin International		26	26
		Shinkin Securities		465	465
	Shinkin Central Bank Total		273	491	764

TABLE 3

RANKING OF LOANS AND UNDERWRITINGS (FOSSIL FUELS)

for the selected financial institutions financing the selected companies, attributable to fossil fuels (2011-2016, US\$ million)

Rank	Parent company	Subsidiary	Loan	Underwriting	Total
10	Fukuoka Financial Group	Bank of Fukuoka	614		614
		Fukuoka Securities		2	2
		Shinwa Bank	103		103
	Fukuoka Financial Group Total		717	2	719
11	Hiroshima Bank	Hiroshima Bank	708		708
12	Nishi-Nippon City Bank	Nishi-Nippon City Bank	627		627
13	Hokuhoku Financial Group	Hokkaido Bank	304		304
		Hokuriku Bank	177		177
	Hokuhoku Financial Group Total		482		482
14	Akita Bank	Akita Bank	384		384
15	Yamaguchi Financial Group	Kitakyushu Bank	1		1
		Momiji Bank	12		12
		Yamaguchi Bank	361		361
	Yamaguchi Financial Group Total		375		375
16	Nippon Life Insurance	Nippon Life Insurance	354		354
17	North Pacific Bank	North Pacific Bank	332		332
18	Juroku Bank	Juroku Bank	195		195
19	Resona Holdings	Resona Bank	185		185
		Saitama Resona Bank	2		2
	Resona Holdings Total		187		187

TABLE 3

RANKING OF LOANS AND UNDERWRITINGS (FOSSIL FUELS)

for the selected financial institutions financing the selected companies, attributable to fossil fuels (2011-2016, US\$ million)

Rank	Parent company	Subsidiary	Loan	Underwriting	Total
20	Shinsei Bank	Shinsei Bank	170		170
21	Hyakujushi Bank	Hyakujushi Bank	166		166
22	Hokkoku Bank	Hokkoku Bank	155		155
23	Chiba Bank	Chiba Bank	146		146
24	Hachijuni Bank	Hachijuni Bank	145		145
25	Fukui Bank	Fukui Bank	117		117
26	The Dai-Ichi Life Insurance Company	The Dai-Ichi Life Insurance Company	104		104
26	Bank of Yokohama	Bank of Yokohama	101		101
27	Shizuoka Bank	Shizuoka Bank	83		83
28	Ashikaga Bank	Ashikaga Bank	65		65
29	Nanto Bank	Nanto Bank	62		62
30	Joyo Bank	Joyo Bank	61		61
31	Keiyo Bank	Keiyo Bank	57		57
32	Mie Bank	Mie Bank	55		55
33	Yamagata Bank	Yamagata Bank	50		50
34	Tochigi Bank	Tochigi Bank	47		47
35	Iyo Bank	Iyo Bank	44		44
36	Kyushu Financial Group	Higo Bank	44		44
Kyushu Financial Group Total			44		44

TABLE 3

RANKING OF LOANS AND UNDERWRITINGS (FOSSIL FUELS)

for the selected financial institutions financing the selected companies, attributable to fossil fuels (2011-2016, US\$ million)

Rank	Parent company	Subsidiary	Loan	Underwriting	Total
37	Oita Bank	Oita Bank	42		42
38	Bank of Kyoto	Bank of Kyoto	39		39
39	Musashino Bank	Musashino Bank	36		36
40	Shikoku Bank	Shikoku Bank	34		34
41	Daishi Bank	Daishi Bank	34		34
42	FIDEA Holdings	Hokuto Bank	34		34
	FIDEA Holdings Total		34		34
43	Gunma Bank	Gunma Bank	34		34
44	Shiga Bank	Shiga Bank	30		30
45	San-in Godo Bank	San-in Godo Bank	26		26
46	Aozora Bank	Aozora Bank	26		26
47	Senshu Ikeda Holdings	Senshu Ikeda Bank	24		24
48	SBI Holdings	SBI Holdings		21	21
49	Ogaki Kyoritsu Bank	Ogaki Kyoritsu Bank	20		20
50	Saikyo Bank	Saikyo Bank	18		18
51	Daito Bank	Daito Bank	18		18
52	Minato Bank	Minato Bank	18		18
53	Aomori Bank	Aomori Bank	12		12

TABLE 3

RANKING OF LOANS AND UNDERWRITINGS (FOSSIL FUELS)

for the selected financial institutions financing the selected companies, attributable to fossil fuels (2011-2016, US\$ million)

Rank	Parent company	Subsidiary	Loan	Underwriting	Total
54	Jimoto Holdings	Kirayaka Bank	10		10
	Jimoto Holdings Total		10		10
55	Eighteenth Bank	Eighteenth Bank	9		9
56	Miyazaki Bank	Miyazaki Bank	7		7
57	Chugoku Bank	Chugin Securities		7	7
58	Aichi Bank	Aichi Bank	3		3
59	Higashi Nippon Bank	Higashi Nippon Bank	3		3
60	Toho Bank	Toho Bank	1		1
61	Tokyo Tomin Bank	Tokyo Tomin Bank	0.4		0.4
Total			82,320	27,597	109,917

2.1.2 Nuclear power

This research identified loans and underwriting services provided by 35 banks to the selected companies. All of these 35 banks were also financing the fossil fuel sector. The total amount of these syndicate loans was approximately US\$ 23.7 billion, while the total amount of the underwriting services was approximately US\$ 2 million. Mizuho Financial, Sumitomo Mitsui Financial and Mitsubishi UFJ Financial were also the top three providers of syndicated loans attributable to nuclear power. Their loans together account for 78% of the total loans attributable to nuclear power. Table 6 shows the ranking of the banks that provided loans and underwriting services to the selected companies attributable to nuclear power over the period January 2011 to April 2016.

TABLE 4

RANKING OF LOANS AND UNDERWRITINGS (NUCLEAR)

for the selected financial institutions financing the selected companies, attributable to nuclear power (2011-2016, US\$ million)

Rank	Parent company	Subsidiary	Loan	Underwriting	Total
1	Mizuho Financial	Mizuho Bank	5,799		5,799
		Mizuho Securities		1,994	1,994
		Mizuho International		91	91
		Mizuho Trust & Banking	55		55
		Mizuho Financial Total	5,853	2,085	7,938
2	Sumitomo Mitsui Financial	Sumitomo Mitsui Banking	2,903		2,903
		SMBC Nikko Securities		942	942
		SMBC Nikko Capital Markets		17	17
		SMBC Friend Securities		1	1
		Sumitomo Mitsui Financial Total	2,903	960	3,863
3	Mitsubishi UFJ Financial	Mitsubishi UFJ			
		Morgan Stanley		1,454	1,454
		Bank of Tokyo			
		Mitsubishi UFJ	869		869
		Mitsubishi Trust & Banking	343		343
		Mitsubishi UFJ Financial Total	1,212	1,454	2,667

TABLE 4

RANKING OF LOANS AND UNDERWRITINGS (NUCLEAR)

for the selected financial institutions financing the selected companies, attributable to nuclear power (2011-2016, US\$ million)

Rank	Parent company	Subsidiary	Loan	Underwriting	Total
4	Nomura	Nomura Securities		1,251	1,251
		Nomura International		65	65
		Nomura Total		1,315	1,315
5	Daiwa Securities	Daiwa Securities		1,044	1,044
		Daiwa Capital Markets		17	17
		Daiwa Securities Total		1,061	1,061
6	Sumitomo Mitsui Trust	Sumitomo Mitsui Trust Bank		483	483
		Chuo Mitsui Trust & Banking		446	446
		Sumitomo Trust & Banking		20	20
		Sumitomo Mitsui Trust Total		949	949
7	77 Bank	77 Bank	389		389
8	Fukuoka Financial Group	Bank of Fukuoka	272		272
		Shinwa Bank	103		103
		Fukuoka Securities		1	1
		Fukuoka Financial Group Total	375	1	376
9	Nishi-Nippon City Bank	Nishi-Nippon City Bank	292		292
10	Norinchukin Bank	Norinchukin Bank	198		198
11	Hokuhoku Financial Group	Hokkaido Bank	119		119
		Hokuriku Bank	69		69
		Hokuhoku Financial Group Total	188		188
12	Hiroshima Bank	Hiroshima Bank	172		172
13	Yamaguchi Financial Group	Yamaguchi Bank	119		119

TABLE 4

RANKING OF LOANS AND UNDERWRITINGS (NUCLEAR)

for the selected financial institutions financing the selected companies, attributable to nuclear power (2011-2016, US\$ million)

Rank	Parent company	Subsidiary	Loan	Underwriting	Total
14	North Pacific Bank	North Pacific Bank	119		119
15	Juroku Bank	Juroku Bank	103		103
16	Hachijuni Bank	Hachijuni Bank	103		103
17	Shinkin Central Bank	Shinkin Securities		92	92
18	Hyakujushi Bank	Hyakujushi Bank	73		73
19	Resona Holdings	Resona Bank	55		55
20	Nippon Life Insurance	Nippon Life Insurance	49		49
21	Hokkoku Bank	Hokkoku Bank	45		45
22	Bank of Yokohama	Bank of Yokohama	37		37
23	The Dai-ichi Life Insurance Company	The Dai-ichi Life Insurance Company		24	24
24	Joyo Bank	Joyo Bank	14		14
25	Minato Bank	Minato Bank	10		10
26	Chugoku Bank	Chugin Securities		2	2
27	Iyo Bank	Iyo Bank	2		2
28	Shiga Bank	Shiga Bank	2		2
29	Daito Bank	Daito Bank	2		2
30	Kyushu Financial Group	Higo Bank	2		2
Total			13,292	6,971	20,263

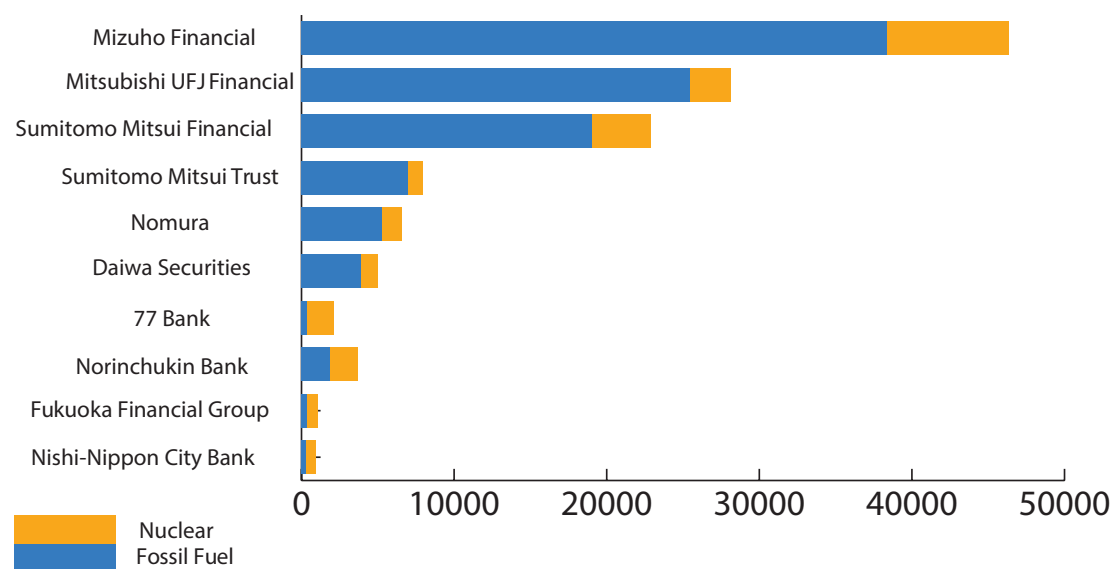
2.1.3 Fossil fuels and nuclear power

The total amount of loans and underwriting services attributable to fossil fuels was much more significant than that attributable to nuclear power. Total loans and underwriting services attributable to fossil fuels amounted to more than US\$ 109.9 billion, while total loans and underwriting services attributable to nuclear power amounted to just over US\$ 20 billion. Figure 6 provides an overview of the 10 largest providers of loans and underwritings among the selected financial institutions to the selected companies attributable to fossil fuels and nuclear power over the period January 2011 to April 2016.

FIGURE 6

TOP 10 FINANCIERS OF FOSSIL FUELS AND NUCLEAR POWER

of loans and underwritings to the selected fossil fuel and nuclear related companies (2011-2016, US\$ million)



Sources: Bloomberg Database, viewed in May 2016; Thomson Reuters Database, viewed in May 2016

Table 5 shows ranking of the selected financial institutions that provided loans and underwriting services to the selected companies attributable to both fossil fuels and nuclear power in the period January 2011 to April 2016.

TABLE 5

RANKING OF LOANS & UNDERWRITINGS FOSSIL FUELS & NUCLEAR

(for the selected financial institutions financing the selected companies, attributable to fossil fuel and nuclear power (2011 - 2016))

Rank	Parent company	Subsidiary	Loan	Underwriting	Total
1	Mizuho Financial	Chiba Kogyo Bank	34		34
		Mizuho Bank	34,670		34,670
		Mizuho Financial	31		31
		Mizuho International		501	501
		Mizuho Securities		9,109	9,109
		Mizuho Trust & Banking	1,988		1,988
	Mizuho Financial Total		36,724	9,610	46,334
2	Mitsubishi UFJ Financial	Bank of Tokyo			
		Mitsubishi UFJ	16,463		16,463
		Mitsubishi Trust & Banking	3,620		3,620
		Mitsubishi UFJ Morgan Stanley		7,990	7,990
		MUFG Union Bank	63		63
	Mitsubishi UFJ Financial Total		20,146	7,990	28,136
3	Sumitomo Mitsui Financial	SMBC Friend Securities		5	5
		SMBC Nikko Capital Markets		98	98
		SMBC Nikko Securities		4,715	4,715
		Sumitomo Mitsui Banking	18,107		18,107
	Sumitomo Mitsui Financial Total		18,107	4,818	22,925

TABLE 5

RANKING OF LOANS & UNDERWRITINGS FOSSIL FUELS & NUCLEAR

(for the selected financial institutions financing the selected companies, attributable to fossil fuel and nuclear power (2011 - 2016))

Rank	Parent company	Subsidiary	Loan	Underwriting	Total
4	Sumitomo Mitsui Trust	Chuo Mitsui Trust & Banking	2,915		2,915
		Sumitomo Mitsui Trust Bank	3,733		3,733
		Sumitomo Trust & Banking	1,264		1,264
	Sumitomo Mitsui Trust Total		7,911		7,911
5	Nomura	Nomura International Nomura Securities		511 6,057	511 6,057
	Nomura Total			6,568	6,568
6	Daiwa Securities	Daiwa Capital Markets Daiwa Securities		97 4,870	97 4,870
	Daiwa Securities Total			4,967	4,967
7	77 Bank	77 Bank	2,118		2,118
8	Norinchukin Bank	Norinchukin Bank	2,035		2,035
9	Fukuoka Financial Group	Bank of Fukuoka Fukuoka Securities Shinwa Bank	886 207	 2	886 2 207
	Fukuoka Financial Group Total		1,093	2	1,095
10	Nishi-Nippon City Bank	Nishi-Nippon City Bank	919		919
11	Hiroshima Bank	Hiroshima Bank	880		880

TABLE 5

RANKING OF LOANS & UNDERWRITINGS FOSSIL FUELS & NUCLEAR

(for the selected financial institutions financing the selected companies, attributable to fossil fuel and nuclear power (2011 – 2016))

Rank	Parent company	Subsidiary	Loan	Underwriting	Total
12	Shinkin Central Bank	Shinkin Central Bank	273		273
		Shinkin International		26	26
		Shinkin Securities		557	557
	Shinkin Central Bank Total		273	583	856
13	Hokuhoku Financial Group	Hokkaido Bank	423		423
		Hokuriku Bank	247		247
	Hokuhoku Financial Group Total		670		670
14	Yamaguchi Financial Group	Kitakyushu Bank	1		1
		Momiji Bank	12		12
		Yamaguchi Bank	480		480
	Yamaguchi Financial Group Total		494		494
15	North Pacific Bank	North Pacific Bank	450		450
16	Nippon Life Insurance	Nippon Life Insurance	403		403
17	Akita Bank	Akita Bank	384		384
18	Juroku Bank	Juroku Bank	298		298
19	Hachijuni Bank	Hachijuni Bank	248		248
20	Resona Holdings	Resona Bank	240		240
		Saitama Resona Bank	2		2
	Resona Holdings Total		242		242
21	Hyakujushi Bank	Hyakujushi Bank	239		239
22	Hokkoku Bank	Hokkoku Bank	200		200
23	Shinsei Bank	Shinsei Bank	170		170

TABLE 5

RANKING OF LOANS & UNDERWRITINGS FOSSIL FUELS & NUCLEAR

(for the selected financial institutions financing the selected companies, attributable to fossil fuel and nuclear power (2011 - 2016))

Rank	Parent company	Subsidiary	Loan	Underwriting	Total
24	Chiba Bank	Chiba Bank	146		146
25	Bank of Yokohama	Bank of Yokohama	137		137
26	The Dai-Ichi Life Insurance Company	The Dai-Ichi Life Insurance Company	128		128
27	Fukui Bank	Fukui Bank	117		117
28	Shizuoka Bank	Shizuoka Bank	83		83
29	Joyo Bank	Joyo Bank	76		76
30	Ashikaga Bank	Ashikaga Bank	65		65
31	Nanto Bank	Nanto Bank	62		62
32	Keiyo Bank	Keiyo Bank	57		57
33	Mie Bank	Mie Bank	55		55
34	Yamagata Bank	Yamagata Bank	50		50
35	Tochigi Bank	Tochigi Bank	47		47
36	Kyushu Financial Group	Higo Bank	45		45
Kyushu Financial Group Total			45		45
37	Iyo Bank	Iyo Bank	45		45
38	Oita Bank	Oita Bank	42		42
39	Bank of Kyoto	Bank of Kyoto	39		39
40	Musashino Bank	Musashino Bank	36		36

TABLE 5

RANKING OF LOANS & UNDERWRITINGS FOSSIL FUELS & NUCLEAR

(for the selected financial institutions financing the selected companies, attributable to fossil fuel and nuclear power (2011 – 2016))

Rank	Parent company	Subsidiary	Loan	Underwriting	Total
41	Daishi Bank	Daishi Bank	34		34
42	Shikoku Bank	Shikoku Bank	34		34
43	FIDEA Holdings	Hokuto Bank	34		34
44	Gunma Bank	Gunma Bank	34		34
45	Shiga Bank	Shiga Bank	32		32
46	Minato Bank	Minato Bank	28		28
47	San-in Godo Bank	San-in Godo Bank	26		26
48	Aozora Bank	Aozora Bank	26		26
49	Senshu Ikeda Holdings	Senshu Ikeda Bank	24		24
50	SBI Holdings	SBI Holdings		21	21
51	Ogaki Kyoritsu Bank	Ogaki Kyoritsu Bank	20		20
52	Daito Bank	Daito Bank	20		20
53	Saikyo Bank	Saikyo Bank	18		18
54	Aomori Bank	Aomori Bank	12		12
55	Jimoto Holdings	Kirayaka Bank	10		10
	Jimoto Holdings Total		10		10
56	Eighteenth Bank	Eighteenth Bank	9		9
57	Chugoku Bank	Chugin Securities		9	9

TABLE 5

RANKING OF LOANS & UNDERWRITINGS FOSSIL FUELS & NUCLEAR

(for the selected financial institutions financing the selected companies, attributable to fossil fuel and nuclear power (2011 - 2016))

Rank	Parent company	Subsidiary	Loan	Underwriting	Total
58	Miyazaki Bank	Miyazaki Bank	7		7
59	Aichi Bank	Aichi Bank	3		3
60	Higashi Nippon Bank	Higashi Nippon Bank	3		3
61	Toho Bank	Toho Bank	1		1
62	Tokyo Tomin Bank	Tokyo Tomin Bank	0.4		0.4
Total			95,612	34,568	130,179

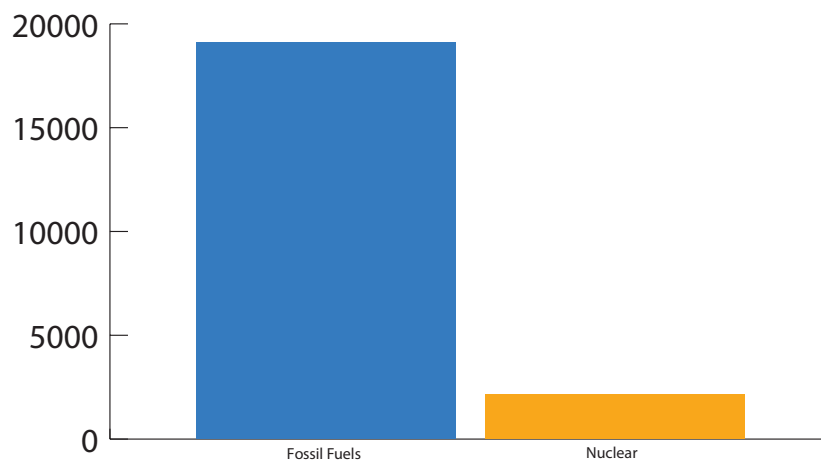
2.2 Bondholding and shareholding

The total amounts of bondholdings and shareholdings attributable to fossil fuels was much more significant than those attributable to nuclear power. Total bondholdings and shareholdings attributable to fossil fuels amounted to US\$ 19.1 billion, while total bondholdings and shareholdings attributable to nuclear power amounted to only US\$ 2.1 billion. Figure 7 provides an overview of total bondholdings and shareholdings of the selected financial institutions in the selected companies attributable to fossil fuels and nuclear power.

FIGURE 7

TOTAL BONDHOLDINGS AND SHAREHOLDINGS

of the selected financial institutions in the selected companies attributable to fossil fuels and nuclear power (most recent, US\$ million).



Sources: Bloomberg Database, viewed in May 2016; Thomson Reuters Database, viewed in May 2016

Below, this section provides a ranking of the selected financial institutions in terms of the value of their bondholdings and shareholdings attributable to fossil fuels and nuclear power of the selected companies.

2.2.1 Fossil fuels

Bonds and shares in the selected companies engaged in fossil fuel sector were identified to have association with nine of the selected institutional investors. The total amount of bondholding identified was relatively small compared to the total amount of shareholding in the selected companies. The total amount of bondholding and shareholding attributable to fossil fuel were approximately US\$ 98 million and almost US\$ 6 billion respectively. Table 8 shows the ranking of the institutional investors' bondholding and shareholding in the selected companies attributable to fossil fuels.

TABLE 6

BONDHOLDINGS AND SHAREHOLDINGS RANKING (FOSSIL FUEL)

attributable to fossil fuel (most recent, US\$ million,)

Rank	Parent company	Subsidiary	Bonds	Shareholding	Total	
1	Mitsubishi UFJ Financial	Bank of Tokyo		958	958	
		Mitsubishi Trust & Banking		1,811	1,811	
		Mitsubishi UFJ Asset Management	18	454	471	
		Mitsubishi UFJ Morgan Stanley		188	188	
		MU Investments		3	3	
		Nippon Yusen		122	122	
		Mitsubishi UFJ Financial Total		18	3,536	3,553
2	Nippon Life Insurance	Nippon Life Insurance		2,754	2,754	
		Nissay Asset Management		49	68 118	
Nippon Life Insurance Total		49	2,822	2,871		
3	Nomura	Nomura Asset Management	15	1,577	1,592	
		Nomura International		11	11	
		Nomura Securities		15	15	
		Nomura Trust & Banking		534	534	
		Nomura Total		15	2,137	2,152
4	Sumitomo Mitsui Trust	Nikko Asset Management	2	705	706	
		Sumitomo Mitsui Trust Asset Management	4	152	155	
		Sumitomo Mitsui Trust Bank		1,269	1,269	
		Sumitomo Mitsui Trust Total		5	2,126	2,131

TABLE 6

BONDHOLDINGS AND SHAREHOLDINGS RANKING (FOSSIL FUEL)

attributable to fossil fuel (most recent, US\$ million,)

Rank	Parent company	Subsidiary	Bonds	Shareholding	Total
5	Mizuho Financial	DIAM	70	143	212
		Mizuho Asset Management	5	38	43
		Mizuho Bank		1,330	1,330
		Mizuho Financial		0	0
		Mizuho Securities		13	13
		Mizuho Trust & Banking		260	260
		Shinko Asset Management	1	19	19
	Mizuho Financial Total		76	1,803	1,879
6	Meiji Yasuda Life Insurance	Meiji Yasuda Life Insurance	7	1,417	1,424
7	Sumitomo Mitsui Financial	Sumitomo Mitsui Asset Management		120	120
		Sumitomo Mitsui Banking		859	859
	Sumitomo Mitsui Financial Total			979	979
8	Tokio Marine Holdings	Tokio Marine Holdings	38	807	845
9	Daiwa Securities	Daiwa Asset Management	1	662	663
		Daiwa SB Investments	1	117	118
		Daiwa Securities		36	36
	Daiwa Securities Total		2	815	817
10	The Dai-ichi Life Insurance Company	The Dai-ichi Life Insurance Company		805	805
11	MS&AD Insurance Group	MS&AD Insurance Group		198	198

TABLE 6

BONDHOLDINGS AND SHAREHOLDINGS RANKING (FOSSIL FUEL)

attributable to fossil fuel (most recent, US\$ million,)

Rank	Parent company	Subsidiary	Bonds	Shareholding	Total
12	Fukoku Mutual Life Insurance	Fukoku Mutual Life Insurance		169	169
13	Iyo Bank	Iyo Bank		98	98
14	Hyakujushi Bank	Hyakujushi Bank		94	94
15	Hokuhoku Financial Group	Hokkaido Bank Hokuriku Bank		26 67	26 67
	Hokuhoku Financial Group Total			93	93
16	Resona Holdings	Resona Bank		80	80
17	San-in Godo Bank	San-in Godo Bank		69	69
18	Hachijuni Bank	Hachijuni Bank		65	65
19	North Pacific Bank	North Pacific Bank		64	64
20	Hiroshima Bank	Hiroshima Bank		62	62
21	Hokkoku Bank	Hokkoku Bank		52	52
22	Orix Corporation	Boston Partners Robeco		17 34	17 34
	Orix Corporation Total			51	51
23	77 Bank	77 Bank		47	47
24	Fukuoka Financial Group	Bank of Fukuoka		45	45
	Fukuoka Financial Group			45	45
25	Chugoku Bank	Chugoku Bank		37	37

TABLE 6

BONDHOLDINGS AND SHAREHOLDINGS RANKING (FOSSIL FUEL)

and shareholding in the selected companies, attributable to fossil fuel (most recent, US\$ million,)

Rank	Parent company	Subsidiary	Bonds	Shareholding	Total
26	Juroku Bank	Juroku Bank		31	31
27	Shinkin Central Bank	Shinkin Asset Management Shinkin Central Bank		9 20	9 20
	Shinkin Central Bank Total			29	29
28	Hyakugo Bank	Hyakugo Bank		25	25
29	Norinchukin Bank	Norinchukin Zenkyoren Asset Management	-	25	25
30	First Bank of Toyama	First Bank of Toyama		24	24
31	Bank of Nagoya	Bank of Nagoya		22	22
32	Daishi Bank	Daishi Bank		18	18
33	Fukui Bank	Fukui Bank		18	18
34	Gunma Bank	Gunma Bank		17	17
35	Bank of Iwate	Bank of Iwate		16	16
36	Aichi Bank	Aichi Bank		16	16
37	Nishi-Nippon City Bank	Nishi-Nippon City Bank		15	15
38	Bank of Yokohama	Bank of Yokohama		14	14
39	Kyushu Financial City Bank	Higo Bank		13	13
	Kyushu Financial Group Total			13	13

TABLE 6

BONDHOLDINGS AND SHAREHOLDINGS RANKING (FOSSIL FUEL)

and shareholding in the selected companies, attributable to fossil fuel (most recent, US\$ million,)

Rank	Parent company	Subsidiary	Bonds	Shareholding	Total
40	Tottori Bank	Tottori Bank		13	13
41	Eighteenth Bank	Eighteenth Bank		12	12
42	Toho Bank	Toho Bank		11	11
43	Bank of Kyoto	Bank of Kyoto		11	11
44	Yamanashi Chuo Bank	Yamanashi Chuo Bank		10	10
45	Miyazaki Bank	Miyazaki Bank		9	9
46	Shikoku Bank	Shikoku Bank		9	9
47	Bank of Saga	Bank of Saga		9	9
48	T&D Holdings	T&D Holdings		8	8
49	Oita Bank	Oita Bank		7	7
50	Aomori Bank	Aomori Bank		7	7
51	Akita Bank	Akita Bank		7	7
52	Shiga Bank	Shiga Bank		6	6
53	Mie Bank	Mie Bank		5	5
54	Awa Bank	Awa Bank		3	3
55	Daisan Bank	Daisan Bank		3	3
56	Kiyo Holdings	Kiyo Holdings		3	3
57	Chukyo Bank	Chukyo Bank		3	3
58	Minato Bank	Minato Bank		3	3

TABLE 6

BONDHOLDINGS AND SHAREHOLDINGS RANKING (FOSSIL FUEL)

and shareholding in the selected companies, attributable to fossil fuel (most recent, US\$ million,)

Rank	Parent company	Subsidiary	Bonds	Shareholding	Total
59	Michinoku Bank	Michinoku Bank		2	2
60	Sompo Japan Nipponkoa Holdings	Sompo Japan Nipponkoa Holdings	2		2
61	Chikuho Bank	Chikuho Bank		2	2
62	Yamagata Bank	Yamagata Bank		2	2
63	Suruga Bank	Suruga Bank		2	2
64	Bank of Kochi	Bank of Kochi		1	1
65	Fukuoka Chuo Bank	Fukuoka Chuo Bank		1	1
66	Tohoku Bank	Tohoku Bank		1	1
67	Tomato Bank	Tomato Bank		1	1
68	Taiko Bank	Taiko Bank		0.3	0.3
Total			212	18,906	19,118

Sources: Bloomberg Database, viewed in May 2016; Thomson Reuters Database, viewed in May 2016

2.2.2 Nuclear power

The nine institutional investors holding bonds and shares in the selected companies engaged in the fossil fuel sector were identified as also holding bonds and shares in the nuclear power sector. The total amount of bondholding and shareholding attributable to nuclear power were approximately US\$ 16 million and US\$ 690 million respectively. Table 9 shows the ranking of the institutional investors' bondholding and shareholding in the selected companies attributable to nuclear power.

TABLE 7

BONDHOLDINGS AND SHAREHOLDINGS RANKING (NUCLEAR)

and shareholding in the selected companies, attributable to nuclear power (most recent, US\$ million,)

Rank	Parent company	Subsidiary	Bonds	Shareholding	Total
1	Nippon Life Insurance	Nippon Life Insurance		465	465
		Nissay Asset Management	10	7	17
Nippon Life Insurance Total			10	472	482
2	Mitsubishi UFJ Financial	Mitsubishi Trust & Banking		217	217
		Bank of Tokyo			
		Mitsubishi UFJ		81	81
		Mitsubishi UFJ Asset Management	6	50	56
		Mitsubishi UFJ			
		Morgan Stanley		23	23
		Nippon Yusen		7	7
Mitsubishi UFJ Financial Total			6	378	383

TABLE 7

BONDHOLDINGS AND SHAREHOLDINGS RANKING (NUCLEAR)

and shareholding in the selected companies, attributable to nuclear power (most recent, US\$ million,)

Rank	Parent company	Subsidiary	Bonds	Shareholding	Total
3	Mizuho Financial	Mizuho Bank		199	199
		DIAM	24	16	41
		Mizuho Trust			
		& Banking		32	32
		Mizuho Asset			
		Management	2	4	6
		Shinko Asset			
		Management	0	3	3
		Mizuho Securities		2	2
Mizuho Financial Total			26	256	282
4	Sumitomo Mitsui Trust	Sumitomo Mitsui		143	143
		Trust Bank			
		Nikko Asset			
		Management	1	88	89
		Sumitomo Mitsui			
		Trust Asset			
		Management	0	17	18
Sumitomo Mitsui Trust Total			1	248	249
5	Nomura	Nomura Asset			
		Management	5	187	192
		Nomura Securities		2	2
		Nomura International		2	2
Nomura Total			5	191	196
6	Sumitomo Mitsui Financial	Sumitomo Mitsui Banking			122
		Sumitomo Mitsui			122
		Asset Management		15	15
Sumitomo Mitsui Financial Total				137	137

TABLE 7

BONDHOLDINGS AND SHAREHOLDINGS RANKING (NUCLEAR)

and shareholding in the selected companies, attributable to nuclear power (most recent, US\$ million,)

Rank	Parent company	Subsidiary	Bonds	Shareholding	Total
7	Daiwa Securities	Daiwa Asset Management		0	80
		Daiwa SB Investments	0	15	15
		Daiwa Securities		5	5
		Daiwa Securities Total	0	99	100
8	Meiji Yasuda Life Insurance	Meiji Yasuda Life Insurance	3	67	70
9	Fukoku Mutual Life Insurance	Fukoku Mutual Life Insurance		49	49
10	The Dai-ichi Life Insurance Company	The Dai-ichi Life Insurance Company		49	49
11	Hokuhoku Financial Group	Hokuriku Bank		11	11
		Hokkaido Bank		4	4
	Hokuhoku Financial Group Total			15	15
12	North Pacific Bank	North Pacific Bank		11	11
13	San-in Godo Bank	San-in Godo Bank		10	10
14	Hokkoku Bank	Hokkoku Bank		9	9
15	Hiroshima Bank	Hiroshima Bank		9	9
16	Orix Corporation	Robeco		4	4
		Boston Partners		3	3
	Orix Corporation Total			7	7

TABLE 7

BONDHOLDINGS AND SHAREHOLDINGS RANKING (NUCLEAR)

and shareholding in the selected companies, attributable to nuclear power (most recent, US\$ million,)

Rank	Parent company	Subsidiary	Bonds	Shareholding	Total
17	Tokio Marine Holdings	Tokio Marine Holdings	1	5	6
18	Iyo Bank	Iyo Bank		6	6
19	Bank of Yokohama	Bank of Yokohama		6	6
20	Gunma Bank	Gunma Bank		5	5
21	Chugoku Bank	Chugoku Bank		4	4
22	Juroku Bank	Juroku Bank		4	4
23	First Bank of Toyama	First Bank of Toyama		4	4
24	Shinkin Central Bank	Shinkin Central Bank		3	3
		Shinkin Asset Management	0	1	1
	Shinkin Central Bank Total		0	4	4
25	Hyakugo Bank	Hyakugo Bank		3	3
26	Bank of Nagoya	Bank of Nagoya		3	3
27	Norinchukin Bank	Norinchukin Zenkyoren Asset Management		3	3
28	Fukui Bank	Fukui Bank		3	3
29	77 Bank	77 Bank		2	2
30	Hachijuni Bank	Hachijuni Bank		2	2
31	Shikoku Bank	Shikoku Bank		2	2
32	Aichi Bank	Aichi Bank		2	2

TABLE 7

BONDHOLDINGS AND SHAREHOLDINGS RANKING (NUCLEAR)

and shareholding in the selected companies, attributable to nuclear power (most recent, US\$ million.)

Rank	Parent company	Subsidiary	Bonds	Shareholding	Total
33	Bank of Iwate	Bank of Iwate		2	2
34	Tottori Bank	Tottori Bank		2	2
35	Oita Bank	Oita Bank		2	2
36	Yamanashi Chuo Bank	Yamanashi Chuo Bank		1	1
37	Sompo Japan Nipponkoa Holdings	Sompo Japan Nipponkoa Holdings	1		1
38	Minato Bank	Minato Bank		1	1
39	T&D Holdings	T&D Holdings		1	1
40	Daishi Bank	Daishi Bank		1	1
41	Mie Bank	Mie Bank		1	1
42	Aomori Bank	Aomori Bank		1	1
43	Resona Holdings	Resona Bank		1	1
44	Daisan Bank	Daisan Bank		0.5	0.5
45	Shiga Bank	Shiga Bank		0.4	0.4
46	Hyakujushi Bank	Hyakujushi Bank		0.4	0.4
47	Chukyo Bank	Chukyo Bank		0.4	0.4
48	Eighteenth Bank	Eighteenth Bank		0.4	0.4
49	Michinoku Bank	Michinoku Bank		0.4	0.4
50	Miyazaki Bank	Miyazaki Bank		0.4	0.4
51	Akita Bank	Akita Bank		0.3	0.3

TABLE 7

BONDHOLDINGS AND SHAREHOLDINGS RANKING (NUCLEAR)

and shareholding in the selected companies, attributable to nuclear power (most recent, US\$ million,)

Rank	Parent company	Subsidiary	Bonds	Shareholding	Total
52	Suruga Bank	Suruga Bank		0.3	0.3
53	Kyushu Financial Group	Higo Bank		0.2	0.2
	Kyushu Financial Group Total			0.2	0.2
54	Tomato Bank	Tomato Bank		0.1	0.1
	Total		53	2,081	2,134

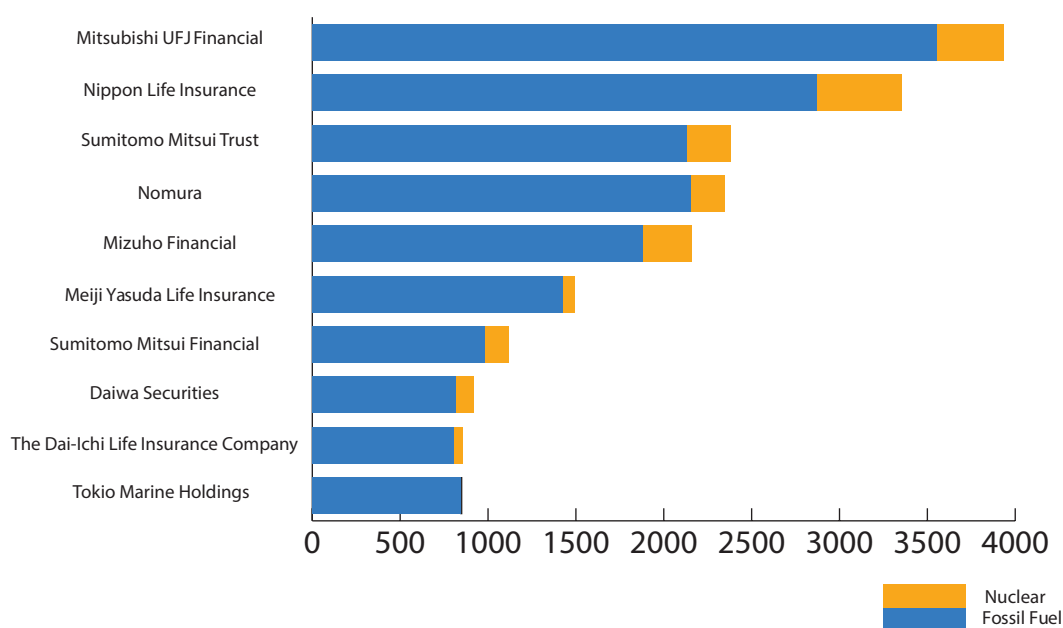
2.2.3 Fossil fuels and nuclear power

Total value of bonds and shares identified held by the selected financial institutions in the 23 companies was over US\$ 21 billion for both fossil fuels and nuclear power sector. All financial institutions that were identified as holding bonds and shares in the nuclear power sector were also holding bonds and shares in the fossil fuel sector. Figure 8 provides an overview of the 10 largest holders of bonds and shares among the selected financial institutions in the selected companies attributable to fossil fuels and nuclear power in May 2016.

FIGURE 8

THE 10 LARGEST HOLDERS OF BONDS AND IN THE SELECTED COMPANIES

(May 2016, US\$ million)



Sources: Bloomberg Database, viewed in May 2016; Thomson Reuters Database, viewed in May 2016

Table 8 shows the ranking of the financial institutions that hold bonds and shares in the selected companies attributable to both fossil fuels and nuclear power.

TABLE 8

TOTAL BONDHOLDING AND SHAREHOLDING FOSSIL FUELS AND NUCLEAR

and shareholdings in the selected companies, attributable to fossil fuels and nuclear power (most recent, US\$ million)

Rank	Parent company	Subsidiary	Bonds	Shareholding	Total
1	Mitsubishi UFJ Financial	Bank of Tokyo Mitsubishi UFJ Mitsubishi Trust & Banking Mitsubishi UFJ Asset Management Mitsubishi UFJ Morgan Stanley MU Investments Nippon Yusen	23	1,040 2,028 504 210 3 128	1,040 2,028 527 210 3 128
	Mitsubishi UFJ Financial Total		23	3,913	3,936
2	Nippon Life Insurance	Nippon Life Insurance Nissay Asset Management	59	3,219 75	3,219 134
	Nippon Life Insurance Total		59	3,294	3,353
3	Sumitomo Mitsui Trust	Nikko Asset Management Sumitomo Mitsui Trust Asset Management Sumitomo Mitsui Trust Bank	2 4	793 169 1,412	795 173 1,412
	Sumitomo Mitsui Trust Total		6	2,374	2,380

TABLE 8

TOTAL BONDHOLDING AND SHAREHOLDING FOSSIL FUELS AND NUCLEAR

and shareholdings in the selected companies, attributable to fossil fuels and nuclear power (most recent, US\$ million)

Rank	Parent company	Subsidiary	Bonds	Shareholding	Total
4	Nomura	Nomura Asset Management	19	1,765	1,784
		Nomura International		13	13
		Nomura Securities		17	17
		Nomura Trust & Banking		534	534
	Nomura Total		19	2,329	2,348
5	Mizuho Financial	DIAM	94	159	253
		Mizuho Asset Management	7	42	49
		Mizuho Bank		1,529	1,529
		Mizuho Financial		0	0
		Mizuho Securities		15	15
		Mizuho Trust & Banking		292	292
		Shinko Asset Management	1	21	22
	Mizuho Financial Total		102	2,059	2,161
6	Meiji Yasuda Life Insurance	Meiji Yasuda Life Insurance	10	1,484	1,493
7	Sumitomo Mitsui Financial	Sumitomo Mitsui Asset Management		135	135
		Sumitomo Mitsui Banking		981	981
	Sumitomo Mitsui Financial Total			1,116	1,116
8	Daiwa Securities	Daiwa Asset Management	1	742	743
		Daiwa SB Investments	1	132	133
		Daiwa Securities		41	41
	Daiwa Securities Total		2	914	917

TABLE 8

TOTAL BONDHOLDING AND SHAREHOLDING FOSSIL FUELS AND NUCLEAR

and shareholdings in the selected companies, attributable to fossil fuels and nuclear power (most recent, US\$ million)

Rank	Parent company	Subsidiary	Bonds	Shareholding	Total
9	The Dai-Ichi Life Insurance Company	The Dai-Ichi Life Insurance Company		853	853
10	Tokio Marine Holdings	Tokio Marine Holdings	39	812	851
11	Fukoku Mutual Life Insurance	Fukoku Mutual Life Insurance		218	218
12	MS&AD Insurance Group	MS&AD Insurance Group		198	198
13	Hokuhoku Financial Group	Hokkaido Bank Hokuriku Bank		30 78	30 78
	Hokuhoku Financial Group Total			108	108
14	Iyo Bank	Iyo Bank		104	104
15	Hyakujushi Bank	Hyakujushi Bank		95	95
16	Resona Holdings	Resona Bank		81	81
	Resona Holdings Total			81	81
17	San-in Godo Bank	San-in Godo Bank		79	79
18	North Pacific Bank	North Pacific Bank		75	75
19	Hiroshima Bank	Hiroshima Bank		70	70
20	Hachijuni Bank	Hachijuni Bank		67	67
21	Hokkoku Bank	Hokkoku Bank		61	61

TABLE 8

TOTAL BONDHOLDING AND SHAREHOLDING FOSSIL FUELS AND NUCLEAR

and shareholdings in the selected companies, attributable to fossil fuels and nuclear power (most recent, US\$ million)

Rank	Parent company	Subsidiary	Bonds	Shareholding	Total
22	Orix Corporation	Boston Partners		20	20
		Robeco		38	38
	Orix Corporation Total			58	58
23	77 Bank	77 Bank		50	50
24	Fukuoka Financial Group	Bank of Fukuoka		45	45
	Fukuoka Financial Group Total			45	45
25	Chugoku Bank	Chugoku Bank		41	41
26	Juroku Bank	Juroku Bank		35	35
27	Shinkin Central Bank	Shinkin Asset Management	0.4	9	10
		Shinkin Central Bank		23	23
	Shinkin Central Bank Total		0.4	32	32
28	Hyakugo Bank	Hyakugo Bank		28	28
29	First Bank of Toyama	First Bank of Toyama		28	28
30	Norinchukin Bank	Norinchukin Zenkyoren Asset Management		27	27
	Norinchukin Bank Total			27	27
31	Bank of Nagoya	Bank of Nagoya		25	25
32	Gunma Bank	Gunma Bank		22	22
33	Fukui Bank	Fukui Bank		21	21

TABLE 8

TOTAL BONDHOLDING AND SHAREHOLDING FOSSIL FUELS AND NUCLEAR

and shareholdings in the selected companies, attributable to fossil fuels and nuclear power (most recent, US\$ million)

Rank	Parent company	Subsidiary	Bonds	Shareholding	Total
34	Bank of Yokohama	Bank of Yokohama		20	20
35	Daishi Bank	Daishi Bank		19	19
36	Bank of Iwate	Bank of Iwate		18	18
37	Aichi Bank	Aichi Bank		18	18
38	Tottori Bank	Tottori Bank		15	15
39	Nishi-Nippon City Bank	Nishi-Nippon City Bank		15	15
40	Kyushu Financial Group	Higo Bank		14	14
Kyushu Financial Group Total				14	14
41	Eighteenth Bank	Eighteenth Bank		12	12
42	Shikoku Bank	Shikoku Bank		12	12
43	Toho Bank	Toho Bank		11	11
44	Yamanashi Chuo Bank	Yamanashi Chuo Bank		11	11
45	Bank of Kyoto	Bank of Kyoto		11	11
46	Miyazaki Bank	Miyazaki Bank		10	10
47	T&D Holdings	T&D Holdings		9	9
48	Oita Bank	Oita Bank		9	9
49	Bank of Saga	Bank of Saga		9	9
50	Aomori Bank	Aomori Bank		8	8

TABLE 8

TOTAL BONDHOLDING AND SHAREHOLDING FOSSIL FUELS AND NUCLEAR

and shareholdings in the selected companies, attributable to fossil fuels and nuclear power (most recent, US\$ million)

Rank	Parent company	Subsidiary	Bonds	Shareholding	Total
51	Akita Bank	Akita Bank		7	7
52	Shiga Bank	Shiga Bank		6	6
53	Mie Bank	Mie Bank		6	6
54	Daisan Bank	Daisan Bank		4	4
55	Minato Bank	Minato Bank		4	4
56	Sompo Japan Nipponkoa Holdings	Sompo Japan Nipponkoa Holdings		4	4
57	Awa Bank	Awa Bank		3	3
58	Chukyo Bank	Chukyo Bank		3	3
59	Kiyo Holdings	Kiyo Holdings		3	3
60	Michinoku Bank	Michinoku Bank		3	3
61	Chikuho Bank	Chikuho Bank		2	2
62	Suruga Bank	Suruga Bank		2	2
63	Yamagata Bank	Yamagata Bank		2	2
64	Bank of Kochi	Bank of Kochi		1	1
65	Fukuoka Chuo Bank	Fukuoka Chuo Bank		1	1
66	Tohoku Bank	Tohoku Bank		1	1
67	Tomato Bank	Tomato Bank		1	1
68	Taiko Bank	Taiko Bank		0.3	0.3
Total			265	20,987	21,252

2.3 Financial institutions for which fossil fuels & nuclear financing could not be identified

This section presents the financial institutions for which loans, underwriting, bondholding or shareholding was not identified to the selected companies in the financial databases used for this research.

2.3.1 Fossil fuels

Among the Japanese financial institutions selected for this research, this research did not identify financing provided by 49 parent companies of the financial institutions to the selected companies engaged in the fossil fuel sector.

Table 9 provides a list of 49 parent companies for which financing to theselected companies in the fossil fuel sector were not identified in the financial databases.

TABLE 9

INSTITUTIONS WITHOUT KNOWN FOSSIL FUEL FINANCING

to the selected companies engaged in the fossil fuel sector were not identified

No.	Parent company	No.	Parent company
1	Aeon Bank	11	Hokuetsu Bank
2	Bank of Okinawa	12	Hokuriku Labour Bank
3	Bank of The Ryukyus	13	Howa Bank
4	Chugoku Labour Bank	14	Japan Net Bank
5	Chuo Labour Bank	15	Japan Post Bank
6	Ehime Bank	16	Jibun Bank
7	Fukuho Bank	17	Johanan Shinkin Bank
8	Fukushima Bank	18	Kanagawa Bank
9	Hokkaido Bank	19	Kinki Labour Bank
10	Hokkaido Labour Bank	20	Kita-Nippon Bank

TABLE 9

INSTITUTIONS WITHOUT KNOWN FOSSIL FUEL FINANCING

to the selected companies engaged in the fossil fuel sector were not identified

IN ALPHABETICAL ORDER, H TO N

No	Banks	No	Banks
21	Kyushu Labour Bank	36	Shizuoka Chuo Bank
22	Minami Nippon Bank	37	Shizuoka Labour Bank
23	Miyazaki Taiyo Bank	38	Sony Financial Holdings
24	Nagano Labour Bank	39	Sumitomo Life
25	Naganobank	40	Tajima Bank
226	Niigata Labour Bank	41	Tama Shinkin Bank
27	Okinawa Kaiho Bank	42	Tohoku Labour Bank
28	Okinawa Labour Bank	43	Tokai Labour Bank
29	Rakuten	44	Tokyo Star Bank
30	Saga Kyoei Bank	45	Tomony Holdings
31	Seibu Shinkin Bank	46	Towa Bank
32	Seven & I Holdings	47	Toyokawa Shinkin Bank
33	Shikoku Labour Bank	48	Tsukuba Bank
34	Shimane Bank	49	Yachiyo Bank
35	Shimizu Bank		

It is, however, possible that the above listed banks did have financial relationships with the 23 selected companies. It should be noted that this research focused on syndicated loans, and did not cover financing through direct (bilateral) loans. Data and information on direct loans are not commonly available publically.

2.3.2 Nuclear power

Among the Japanese financial institutions selected for this research, this research did not financing provided by 78 parents companies of the financial institutions to the selected companies engaged in the nuclear power sectors.

Table 10 provides a list of 78 parents companies for which financing to the selected companies in the nuclear power sector were not identified in the financial databases.

TABLE 10

INSTITUTIONS WITHOUT KNOWN FINANCING FOR NUCLEAR

to the selected companies engaged in the nuclear power sector were not identified

No.	Parent company	No.	Parent company
1	Aeon Bank	17	Fukuoka Chuo Bank
2	Aozora Bank	18	Fukushima Bank
3	Ashikaga Bank	19	Higashi Nippon Bank
4	Awa Bank	20	Hokkaido Bank
5	Bank of Kochi	21	Hokkaido Labour Bank
6	Bank of Kyoto	22	Hokuetsu Bank
7	Bank of Okinawa	23	Hokuriku Labour Bank
8	Bank of Saga	24	Howa Bank
9	Bank of The Ryukyus	25	Japan Net Bank
10	Chiba Bank	26	Japan Post Bank
11	Chikuho Bank	27	Jibun Bank
12	Chugoku Labour Bank	28	Jimoto Holdings
13	Chuo Labour Bank	29	Johnan Shinkin Bank
14	Ehime Bank	30	Kanagawa Bank
15	FIDEA Holdings	31	Keiyo Bank
16	Fukuho Bank	32	Kinki Labour Bank

TABLE 10

INSTITUTIONS WITHOUT KNOWN FINANCING FOR NUCLEAR

to the selected companies engaged in the nuclear power sector were not identified

IN ALPHABETICAL ORDER, H TO N

No	Banks	No	Banks
33	Kita-Nippon Bank	57	Shinsei Bank
34	Kiyo Holdings	58	Shizuoka Bank
35	Kyushu Labour Bank	59	Shizuoka Chuo Bank
36	Minami Nippon Bank	60	Shizuoka Labour Bank
37	Miyazaki Taiyo Bank	61	Sony Financial Holdings
38	MS&AD Insurance Group	62	Sumitomo Life
39	Musashino Bank	63	Taiko Bank
40	Nagano Labour Bank	64	Tajima Bank
41	Nagano Bank	65	Tama Shinkin Bank
42	Nanto Bank	66	Tochigi Bank
43	Niigata Labour Bank	67	Toho Bank
44	Ogaki Kyoritsu Bank	68	Tohoku Bank
45	Okinawa Kaiho Bank	69	Tohoku Labour Bank
46	Okinawa Labour Bank	70	Tokai Labour Bank
47	Rakuten	71	Tokyo Star Bank
48	Saga Kyoei Bank	72	Tokyo Tomin Bank
49	Saikyo Bank	73	Tomony Holdings
50	SBI Holdings	74	Towa Bank
51	Seibu Shinkin Bank	75	Toyokawa Shinkin Bank
52	Senshu Ikeda Holdings	76	Tsukuba Bank
53	Seven & I Holdings	77	Yachiyo Bank
54	Shikoku Labour Bank	78	Yamagata Bank
55	Shimane Bank		
56	Shimizu Bank		

2.3.3 Fossil fuels and nuclear power

Among the Japanese financial institutions selected for this research, this research did not identify financing provided by 49 parent companies of the financial institutions to the selected companies engaged in both fossil fuel and nuclear power sectors. All financial institutions that were identified as financing the nuclear power sector were also financing the fossil fuel sector.

Table 11 provides a list of 49 parents companies for which financing to the 23 selected companies in the fossil fuel sector and nuclear sectors were not identified in the financial databases.

TABLE 11

INSTITUTIONS WITHOUT KNOWN FINANCING FOR FOSSIL FUELS AND NUCLEAR

to the selected companies engaged in the fossil fuel and nuclear power sectors were not identified

No.	Parent company	No.	Parent company
1	Aeon Bank	17	Johanan Shinkin Bank
2	Bank of Okinawa	18	Kanagawa Bank
3	Bank of The Ryukyus	19	Kinki Labour Bank
4	Chugoku Labour Bank	20	Kita-Nippon Bank
5	Chuo Labour Bank	21	Kyushu Labour Bank
6	Ehime Bank	22	Minami Nippon Bank
7	Fukuho Bank	23	Miyazaki Taiyo Bank
8	Fukushima Bank	24	Nagano Labour Bank
9	Hokkaido Bank	25	Nagano Labour Bank
10	Hokkaido Labour Bank	26	Naganobank
11	Hokuetsu Bank	226	Niigata Labour Bank
12	Hokuriku Labour Bank	27	Okinawa Kaiho Bank
13	Howa Bank	28	Okinawa Labour Bank
14	Japan Net Bank	29	Rakuten
15	Japan Post Bank	30	Saga Kyoei Bank
16	Jibun Bank	31	Seibu Shinkin Bank

TABLE 11

INSTITUTIONS WITHOUT KNOWN FINANCING FOR FOSSIL FUELS AND NUCLEAR

to the selected companies engaged in the fossil fuel and nuclear power sectors were not identified

No	Banks	No	Banks
32	Seven & I Holdings	41	Tama Shinkin Bank
33	Shikoku Labour Bank	42	Tohoku Labour Bank
34	Shimane Bank	43	Tokai Labour Bank
35	Shimizu Bank	44	Tokyo Star Bank
36	Shizuoka Chuo Bank	45	Tomony Holdings
37	Shizuoka Labour Bank	46	Towa Bank
38	Sony Financial Holdings	47	Toyokawa Shinkin Bank
39	Sumitomo Life	48	Tsukuba Bank
40	Tajima Bank	49	Yachiyo Bank

2.4 Supplementary analysis of financial institutions for which fossil fuels and nuclear financing could not be identified⁴

In order to further investigate whether the 49 financial institutions identified without investments in the selected companies are truly fossil and nuclear free investors or not, shareholdings in the 23 selected companies were investigated based on company securities reports or related disclosed documents. The 23 selected companies' outstanding borrowings from the 49 financial institutions were also investigated based on securities reports or related disclosed documents.

Of the 49 financial institutions investigated, 2 financial institutions were found to have either direct loans or, bonds or indirect shares (through their parent company) in the selected companies. 2 others had a relationship with bigger financial groups through shares owned by Sumitomo Mitsui Banking Corporation and Bank of Tokyo Mitsubishi UFJ respectfully, however since the institutions themselves do not have investments in the selected companies

they can still be identified as free of both fossil fuel and nuclear related investments. Therefore, 47 financial institutions overall were found not to have investments in fossil fuel and nuclear power related companies.

Table 12 provides additional commentary on the list of 49 parent companies for which financing to the 23 selected companies in the fossil fuel sector and nuclear sectors were not identified in the financial databases investigated.

TABLE 12

FINANCIAL INSTITUTIONS WITHOUT KNOWN FINANCING (SUPPLEMENTARY ANALYSIS)

for which financing to the selected companies engaged in the fossil fuel and nuclear power sectors were not identified

No.	Parent company	Results of Supplementary Analysis
1	Aeon Bank	Investment in selected companies was not identified ⁵ .
2	Bank of Okinawa	Investment in selected companies was not identified ⁶ .
3	Bank of The Ryukyus	Investment in selected companies was not identified ⁷ .
4	Chugoku Labour Bank	Investment in selected companies was not identified ⁸ .
5	Chuo Labour Bank	Investment in selected companies was not identified ⁹ .
6	Ehime Bank	Investment in selected companies was not identified ¹⁰ .
7	Fukuho Bank	Investment in selected companies was not identified ¹¹ .
8	Fukushima Bank	Investment in selected companies was not identified ¹² .
9	Hokkaido Bank	Investment in selected companies was not identified
10	Hokkaido Labour Bank	Investment in selected companies was not identified ¹³ .
11	Hokuetsu Bank	Investment in selected companies was not identified ¹⁴ .
12	Hokuriku Labour Bank	Investment in selected companies was not identified
13	Howa Bank	Investment in selected companies was not identified ¹⁵ .
14	Japan Net Bank	Investment in selected companies was not identified ¹⁶ . However, 41% of the bank's shares are owned by Sumitomo Mitsui Banking Corporation ¹⁷ , who has the loans for selected companies, as identified in the report.

TABLE 12

FINANCIAL INSTITUTIONS WITHOUT KNOWN FINANCING (SUPPLEMENTARY ANALYSIS)

for which financing to the selected companies engaged in the fossil fuel and nuclear power sectors were not identified

No.	Parent company	Results of Supplementary Analysis
15	Japan Post Bank	The name is Japan Post Bank ¹⁸ . Investment in selected companies was not identified. However, the bank has the huge amount of Japanese corporate bonds (JPY 10,362,715 million), as of March 31, 2016 ¹⁹ . Since the share of corporate bonds issued by Japanese electric power companies is around 20% in the Japanese corporate bond market ²⁰ , it is difficult to treat the bank as a fossil and nuclear free bank.
16	Jibun Bank	Investment in selected companies was not identified ²¹ . However, 50% of the bank's shares are owned by Bank of Tokyo Mitsubishi UFJ, who has the loans for selected companies, as identified in the report.
17	Johanan Shinkin Bank	Investments in selected companies are not identified ²² .
18	Kanagawa Bank	Investment in selected companies was not identified ²³ .
19	Kinki Labour Bank	Investment in selected companies was not identified ²⁴ .
20	Kita-Nippon Bank	Investment in selected companies was not identified ²⁵ .
21	Kyushu Labour Bank	Investment in selected companies was not identified ²⁶ .
22	Minami Nippon Bank	Investment in selected companies was not identified ²⁷ .
23	Miyazaki Taiyo Bank	Investment in selected companies was not identified ²⁸ .
24	Nagano Labour Bank	Investment in selected companies was not identified ²⁹ .
25	Nagano Bank	Investment in selected companies was not identified ³⁰ .
26	Niigata Labour Bank	Investment in selected companies was not identified ³¹ .
27	Okinawa Kaiho Bank	Investment in selected companies was not identified ³² .
28	Okinawa Labour Bank	Investment in selected companies was not identified ³³ .
29	Rakuten	Investment in selected companies was not identified
30	Saga Kyoei Bank	Investment in selected companies was not identified ³⁴ .
31	Seibu Shinkin Bank	Investment in selected companies was not identified
32	Seven & I Holdings	Investment in selected companies was not identified

TABLE 12

FINANCIAL INSTITUTIONS WITHOUT KNOWN FINANCING (SUPPLEMENTARY ANALYSIS)

for which financing to the selected companies engaged in the fossil fuel and nuclear power sectors were not identified

No.	Parent company	Results of Supplementary Analysis
33	Shikoku Labour Bank	Investment in selected companies was not identified ³⁵ .
34	Shimane Bank	Investment in selected companies was not identified ³⁶ .
35	Shimizu Bank	Investment in selected companies was not identified ³⁷ .
36	Shizuoka Chuo Bank	Investment in selected companies was not identified ³⁸ .
37	Shizuoka Labour Bank	Investment in selected companies was not identified
38	Sony Financial Holdings	Investment in selected companies was not identified
39	Sumitomo Life	Marubeni has an outstanding borrowing (JPY 52,200 million) from the company, as of March 31, 2016 ³⁹ . Mitsubishi Heavy Industry has an outstanding borrowing (JPY 10,000 million) from the company, as of March 31, 2016 ⁴⁰ . Tokyo Gas has an outstanding borrowing (JPY 18,000 million) from the company, as of March 31, 2016 ⁴¹ .
40	Tajima Bank	Investment in selected companies was not identified ⁴² .
41	Tama Shinkin Bank	Investment in selected companies was not identified ⁴³ .
42	Tohoku Labour Bank	Investment in selected companies was not identified ⁴⁴ .
43	Tokai Labour Bank	Investment in selected companies was not identified ⁴⁵ .
44	Tokyo Star Bank	Investment in selected companies was not identified ⁴⁶ .
45	Tomony Holdings	Investment in selected companies was not identified
46	Towa Bank	Investment in selected companies was not identified ⁴⁷ .
47	Toyokawa Shinkin Bank	Investment in selected companies was not identified ⁴⁸ .
48	Tsukuba Bank	Investment in selected companies was not identified ⁴⁹ .
49	Yachiyo Bank	Investment in selected companies was not identified ⁵⁰ .

Supplementary research uncovered additional investments in the selected companies by 2 of the 49 financial institutions. Table 13 provides a list of 47 parent companies for which financing to the 23 selected companies in the fossil fuel and nuclear power sectors were not identified in the financial databases and supplementary analysis.

TABLE 13

FINANCIAL INSTITUTIONS WITHOUT KNOWN FINANCING FOR FOSSIL FUELS AND NUCLEAR (FINAL)

No.	Parent company	No.	Parent company
1	Aeon Bank	25	Niigata Labour Bank
2	Bank of Okinawa	26	Okinawa Kaiho Bank
3	Bank of The Ryukyus	27	Okinawa Labour Bank
4	Chugoku Labour Bank	28	Rakuten
5	Chuo Labour Bank	29	Saga Kyoei Bank
6	Ehime Bank	30	Seibu Shinkin Bank
7	Fukuho Bank	31	Seven & I Holdings
8	Fukushima Bank	32	Shikoku Labour Bank
9	Hokkaido Bank	33	Shimane Bank
10	Hokkaido Labour Bank	34	Shimizu Bank
11	Hokuetsu Bank	35	Shizuoka Chuo Bank
12	Hokuriku Labour Bank	36	Shizuoka Labour Bank
13	Howa Bank	37	Sony Financial Holdings
14	Japan Net Bank	38	Tajima Bank
15	Jibun Bank	39	Tama Shinkin Bank
16	Johnan Shinkin Bank	40	Tohoku Labour Bank
17	Kanagawa Bank	41	Tokai Labour Bank
18	Kinki Labour Bank	42	Tokyo Star Bank
19	Kita-Nippon Bank	43	Tomony Holdings
20	Kyushu Labour Bank	44	Towa Bank
21	Minami Nippon Bank	45	Toyokawa Shinkin Bank
22	Miyazaki Taiyo Bank	46	Tsukuba Bank
23	Nagano Labour Bank	47	Yachiyo Bank
24	Naganobank		



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CHAPTER 3 - CONCLUSION

Research and analysis of the syndicated loans and underwritings by the selected financial institutions to the selected companies over the period 2011-2016 provided the following conclusions:

- 61 parent companies provided loans and underwritings attributed to fossil fuels amounted to approximately US\$ 109.9 billion; and
- 54 parent companies provided loans and underwritings attributed to nuclear power amounted to approximately US\$ 20 billion

Research and analysis on bondholdings and shareholdings of the selected financial institutions in the selected companies in May 2016 provided the following conclusions:

- 68 parent companies held bonds and shares attributed to fossil fuels with a total combined value of approximately US\$ 19 billion; and
- 54 parent companies held bonds and shares attributed to nuclear power with a total combined value of approximately US\$ 2 billion

Among the Japanese financial institutions selected for the research, 47 parent companies of the selected financial institutions were not found to provide financing to the selected 23 companies engaged in the fossil fuel and nuclear power sector based on data in the financial databases and supplementary research. All financial institutions that were identified as financing the nuclear power sector were also financing the fossil fuel sector.

The research findings demonstrate that Japanese financial institutions continue to provide massive sums of funding to fossil fuel and nuclear power, in spite of a global energy transition towards renewable energy. If Japan's financial sector fails to join the growing global movement towards decarbonization, it will be difficult for Japan to meet the promises it made at Paris and benefit from the transition towards a renewable energy future.



Continued support for fossil fuels and nuclear power by Japan's financial sector may be hindering the transition to a renewable future.



APPENDIX - CALCULATED ELEMENTS

This appendix describes the methodology used for the calculated elements of this research.

Loans and underwriting

Individual bank contributions to syndicated loans and underwriting were recorded to the largest extent possible where these details were included in financial database, in many cases, the total value of a loan or issuance is known and also the banks that participate in this loan or issuance. However, often the amount that each individual bank commits to the loan or issuance has to be estimated. The bookratio (see formula below) is used to determine the spread over bookrunners and other managers.

Bookratio:

(number of participants - number of bookrunners)

(number of bookrunners)

Table 14 shows the commitment assigned to bookrunner groups with our estimation method. When the number of total participants in relation to the number of bookrunners increases, the share that is attributed to bookrunners decreases. This prevents very large differences in amounts attributed to bookrunners and other participants.

TABLE 14
COMMITMENT ASSIGNED TO BOOKRUNNER GROUPS

Book ratio	Loans	Issurance
> 1/3	75%	75%
> 2/3	60%	75%
> 1.5	40%	75%
> 3.0	< 40%*	< 75%*

* In case of deals with a bookratio of more than 3.0, we use a formula, which gradually lowers the commitment assigned to the bookrunners as the bookratio increases. The formula used for this:

$$(1/\sqrt{\text{bookratio}})$$

$$1.443375673$$

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%. In case of issuances, the number in the denominator is 0.769800358.

Shareholding

The number of shares held by financial institutions is reported in financial databases, they were not subject to adjustment.

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Bondholding

The number of bonds held by financial institutions is reported in financial databases, they were not subject to adjustment.

Segment adjusters

Many of the selected companies are active in more than one sector. Power generation companies, for example, are also active in renewable energy, agriculture, manufacturing, etc. In order to estimate the proportion of received financing attributable to fossil fuel and nuclear related industry, segment adjusters were calculated in order to attribute a proportion of financing to each sector accordingly.

For loans for general corporate purposes or working capital, segment adjusters were calculated. Segment adjusters were calculated on the basis of the segment distribution of their total assets. In cases where no segment distribution of assets could be identified the following proxies were used in order of preference: segment distribution of costs, segment distribution of net income, or estimator based on company activity description. The segment

distribution of assets, costs and/or revenues were often included in company filings or investor presentations. Adjusters were calculated annually for the whole period of study. Since most companies have not issued annual reports or other operational data for the year 2016, data from 2015 were used instead to calculate the segment adjusters referring to 2016.

These adjusters were then multiplied by the financing and shareholding/bondholding values for the relevant periods. For example, Company A received a loan from Bank A in 2011 for US\$ 100 million. In 2011, 98% of Company A's assets were in fossil fuels, and 2% in other sectors not relevant to this study. In this case, US\$ 98 million was attributed as fossil fuel investment by the financial institution. To continue the example, in 2014 Company A again received a loan from Bank A for US\$ 100 million. However, in 2014 Company A had changes in the composition of its assets. In 2014 it stood at 50% fossil fuels, 48% electronic and 2% other. In this case, US\$ 2 million will not be included in the analysis (attributed to other or 2%), the US\$ 50 million will be considered as an investment to fossil fuels (coal) and US\$ 48 million will be considered an investment in electronic (also not included).

As this research includes companies engaging in power generation (e.g. Kansai Electric Power) and power systems manufacturing (e.g. Hitachi) a differentiation when calculating the adjusters was made. For the power generating companies segment adjusters were computed for their power generation activities. For the power systems manufacturing companies segment adjusters were computed for their power systems manufacturing segment.

Power generating adjusters

Power generation companies have different compositions of power generation technologies, including renewable energy, fossil fuels and nuclear energy. This research compiled data on the composition of their total installed capacity, broken down by energy source, in the period within the time frame of this research. These compositions and changes therein were then used to estimate changes in financing trends.

Data regarding the composition of installed capacity, broken down by energy source, was gathered from annual reports and Thomson EIKON. Power source adjusters were then calculated for each company and subsequently multiplied with the asset adjusters for power generation. However, since companies often only provide recent information regarding their activities

and not historical data, estimations needed to be made when data was not available. Consequently, in order to estimate the missing information annually, the trend of the breakdown of the installed capacity by source was taken into account. More specifically, since the data can be treated as time series, regression analyses and the method of linear least squares were used in order to estimate the missing information. In case the trend function was not a good fit (R^2 was too low), other methods such as non-linear least squares were used.

These proportions were then multiplied by the financing and shareholding values for the relevant periods. For example, Power Company A received a loan from Bank A in 2011 for US\$ 100 million. In 2011 the generating capacity of Power Company A was 98% fossil fuels, 1% renewable energy and 1% nuclear energy. US\$ 1 million was not included in the analysis. US\$ 98 million was attributed as fossil fuel investment by the financial institution, while US\$ 1 million was attributed as a nuclear energy investment. To continue the example, in 2014 Power Company A again received a loan from Bank A for US\$ 100 million. However, in this period Power Company A had adjusted the composition of its generating capacity. In 2014 it stood at 50% fossil fuels, 48% nuclear and 2% other. US\$ 2 million was not included in the analysis. US\$ 50 million was considered as a fossil fuel investment and US\$ 48 million was considered a nuclear energy investment. Shareholdings and bondholdings were adjusted in similar way.

The implication of these calculations is of course that the financial institution is not solely responsible for the resulting trends. As power generation capacity compositions change so do the financing trends. However, financial institutions can urge power generation companies to adjust the generating capacity compositions, or only provide project finance for sustainable energies.

Power systems manufacturing companies

Power systems manufacturing companies produce a variety of products with different end purposes. More specifically, fossil fuel and nuclear energy power systems were included while power systems for renewable energy were not.

These proportions were then multiplied by the financing and shareholding values for the relevant periods. For example, Company A manufactures nuclear reactors, thermal power systems, wind power turbines and other systems not relevant to power generation. Then, we estimate that a quarter of the manufacturer segment is attributed to fossil fuels and a quarter to nuclear. Thus, if company A received a loan for US\$ 100, US\$ 50 million was not included in the analysis. US\$ 25 million was attributed as nuclear investment by the financial institution, while US\$ 25 million was attributed as fossil fuel investment.

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