

GPFG Investments Commentary

Prepared for Framtiden – Future in our Hands



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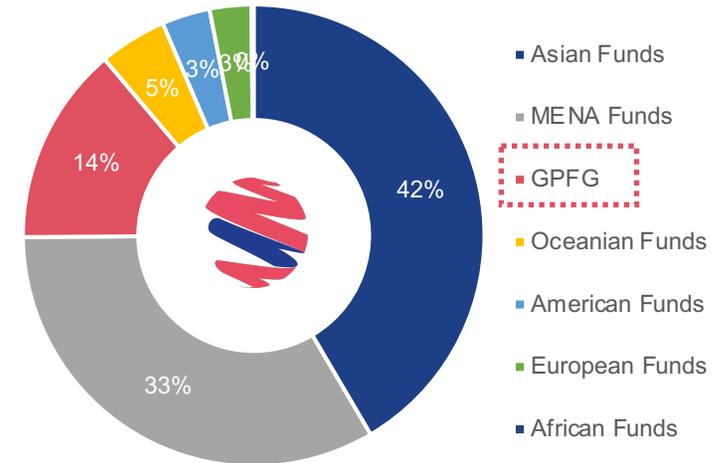
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Key introductory messages

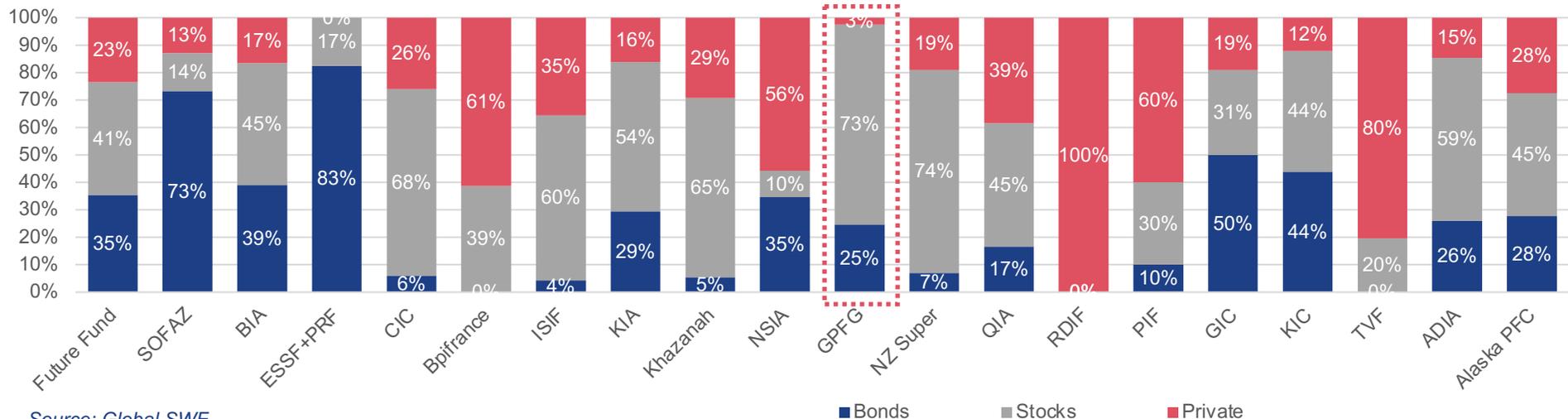
- The Oil Fund represents 14% of the SWF global industry
- It is the world's largest in \$\$; the 2nd largest as a % of GDP
- Despite its size, it has a fairly conservative risk profile
- Just like ADIA, GIC or KIC, it cannot invest domestically
- It maintains seven offices and 540 staff around the world
- It is the most accountable SWF, subject to public scrutiny
- Returns in the past 6 years have been 7.68% on average
- It just completed its first private investment in Renewables

Global SWF industry: \$9.2tn



Source: Global SWF

Risk Appetite of Major SWFs



Source: Global SWF

GPFG in the global context (2 of 2)



Comparative Table of Major SWFs

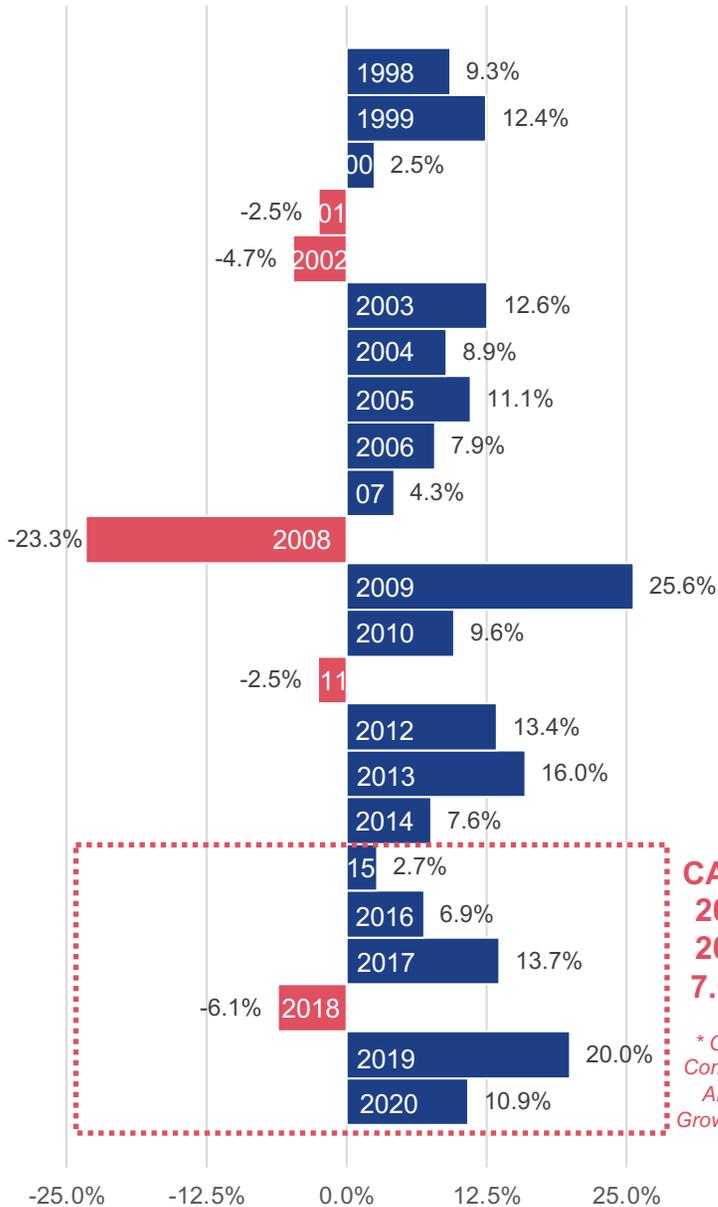
Country	Fund	Est.	AuM (US\$ bn)	AuM as % of GDP	% Portfolio in Private Markets	% Portfolio in Local Markets	# Offices	Staff
Australia	Future Fund	2006	168	0.12x	23%	20%	1	155
Azerbaijan	SOFAZ	1999	44	0.91x	13%	25%	1	100
Brunei	BIA	1983	49	3.63x	17%	20%	3	89
Chile	ESSF+PRF	2007	19	0.07x	0.0%	0.0%	1	15
China	CIC	2007	1,208	0.08x	26%	67%	3	660
France	Bpifrance	2008	33	0.01x	61%	100%	1	425
Ireland	ISIF	2014	11	0.03x	35%	100%	1	50
Kuwait	KIA	1953	588	4.37x	16%	5.0%	3	500
Malaysia	Khazanah	1993	31	0.08x	29%	67%	5	460
Nigeria	NSIA	2011	3	0.01x	56%	80%	1	50
Norway	GPFG	1997	1,279	3.17x	2.5%	0.0%	7	540
NZ	NZ Super	2001	38	0.18x	19%	13%	1	139
Qatar	QIA	2005	366	2.08x	39%	29%	4	320
Russia	RDIF	2011	31	0.02x	100%	96%	2	109
Saudi	PIF	1971	400	0.50x	60%	80%	1	1,000
Singapore	GIC	1981	550	1.48x	19%	0.0%	10	1,786
S. Korea	KIC	2005	183	0.11x	12%	0.0%	4	297
Turkey	TVF	2017	34	0.04x	80%	100%	1	60
UAE - AD	ADIA	1967	686	2.75x	15%	0.0%	3	1,700
USA - AK	PFC	1976	73	1.48x	28%	73%	1	57

Source: Global SWF Data Platform

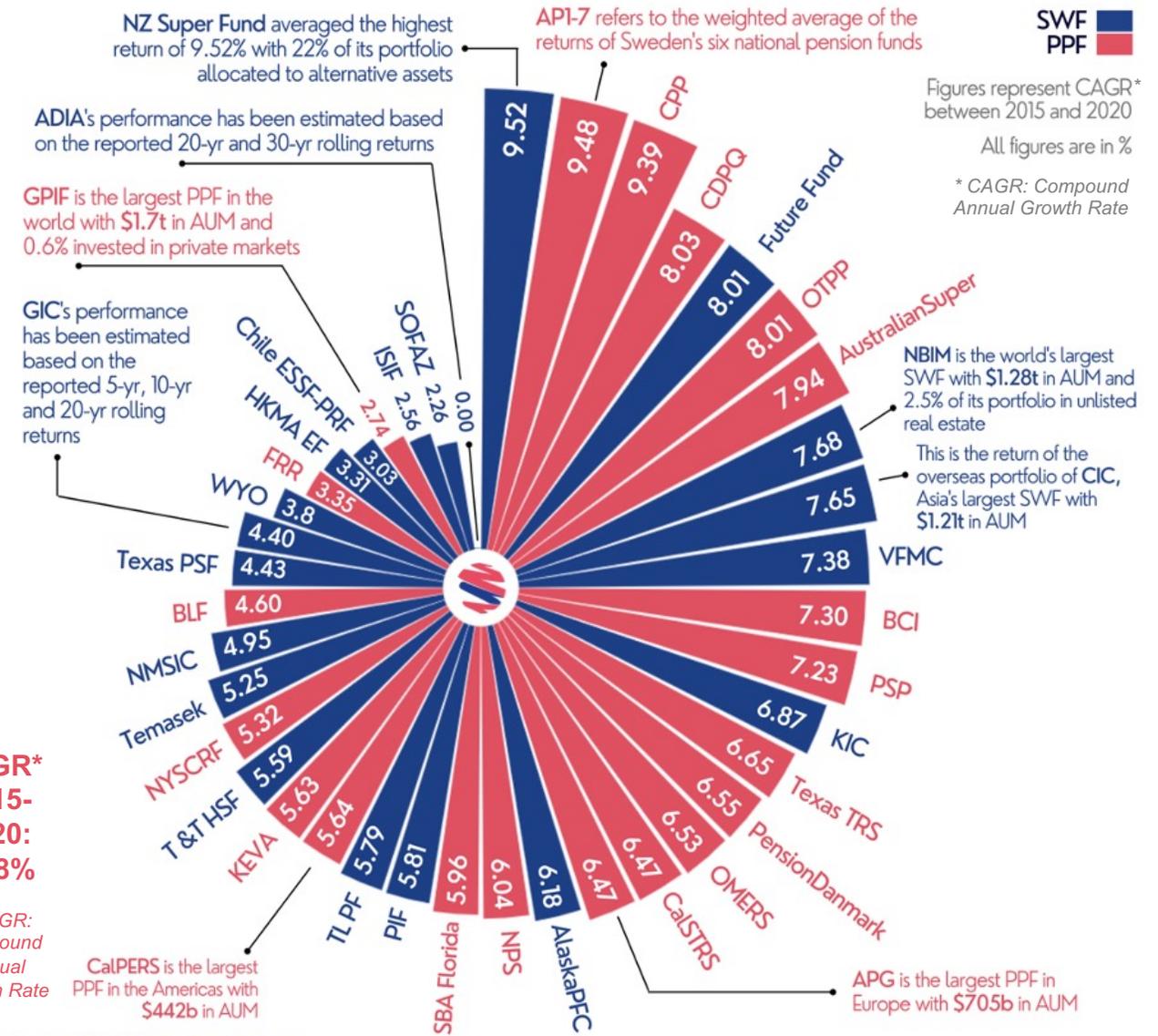
GPF's historical performance



GPFG annual returns



Performance GPFG vs Other SWFs & PPFs



Source: Global SWF Data Platform

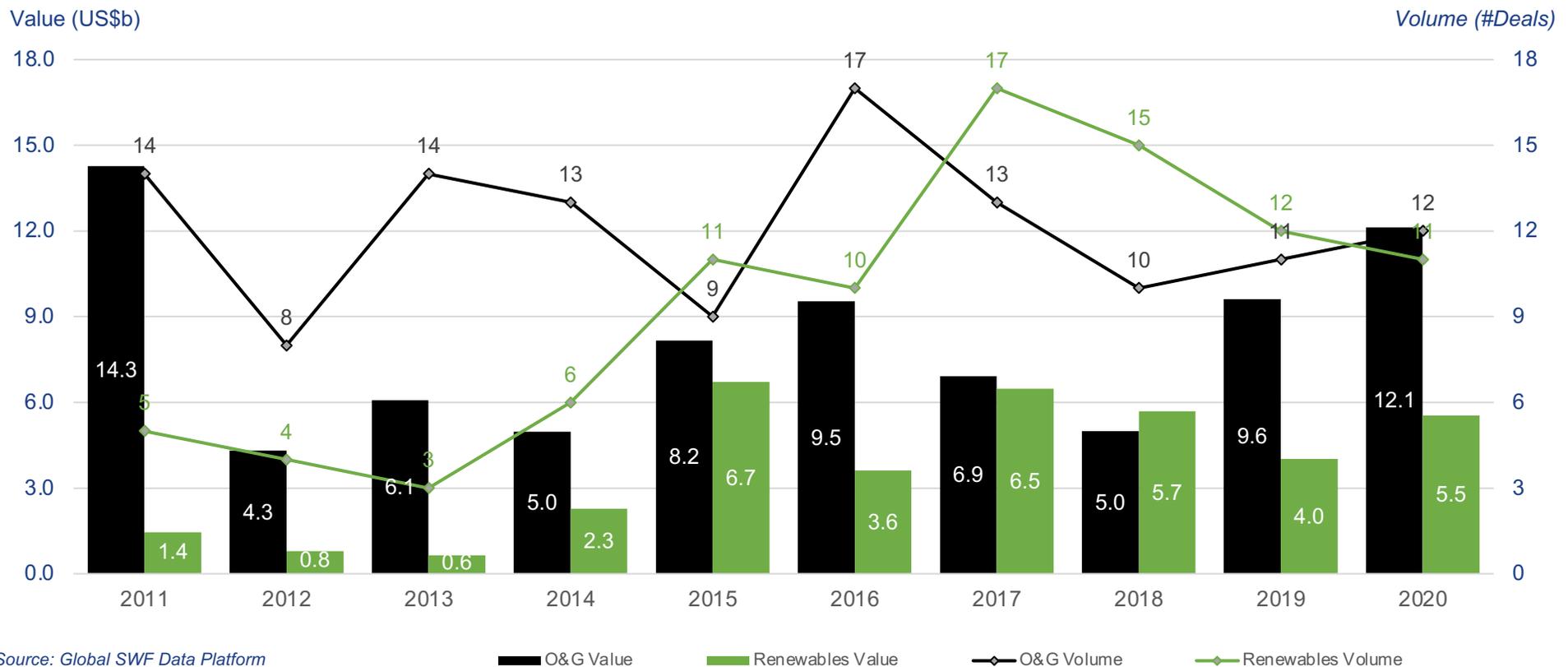
Source: NBIM

Green trends in private markets



- While SWFs have traditionally focus on public equities, their investments in private markets are having an increasing importance.
- The value of direct investment in **black energy** during 2011-2020 was US\$ 81.0b, compared to US\$ 37.2b in **green energy**. However, the number of deals in both segments was much closer, reflecting the smaller scale that renewable projects usually have.
- **GPIFG** (via **NBIM**) made its first direct investment in renewable energy infrastructure (50% of two wind farms for US\$ 1.6b) in Apr'21.
- Target is to invest up to 2% of the fund, or US\$ 14.4b max. in private renewables the next few years, which will push the rise of **green**.

Private markets investments in black vs green energy



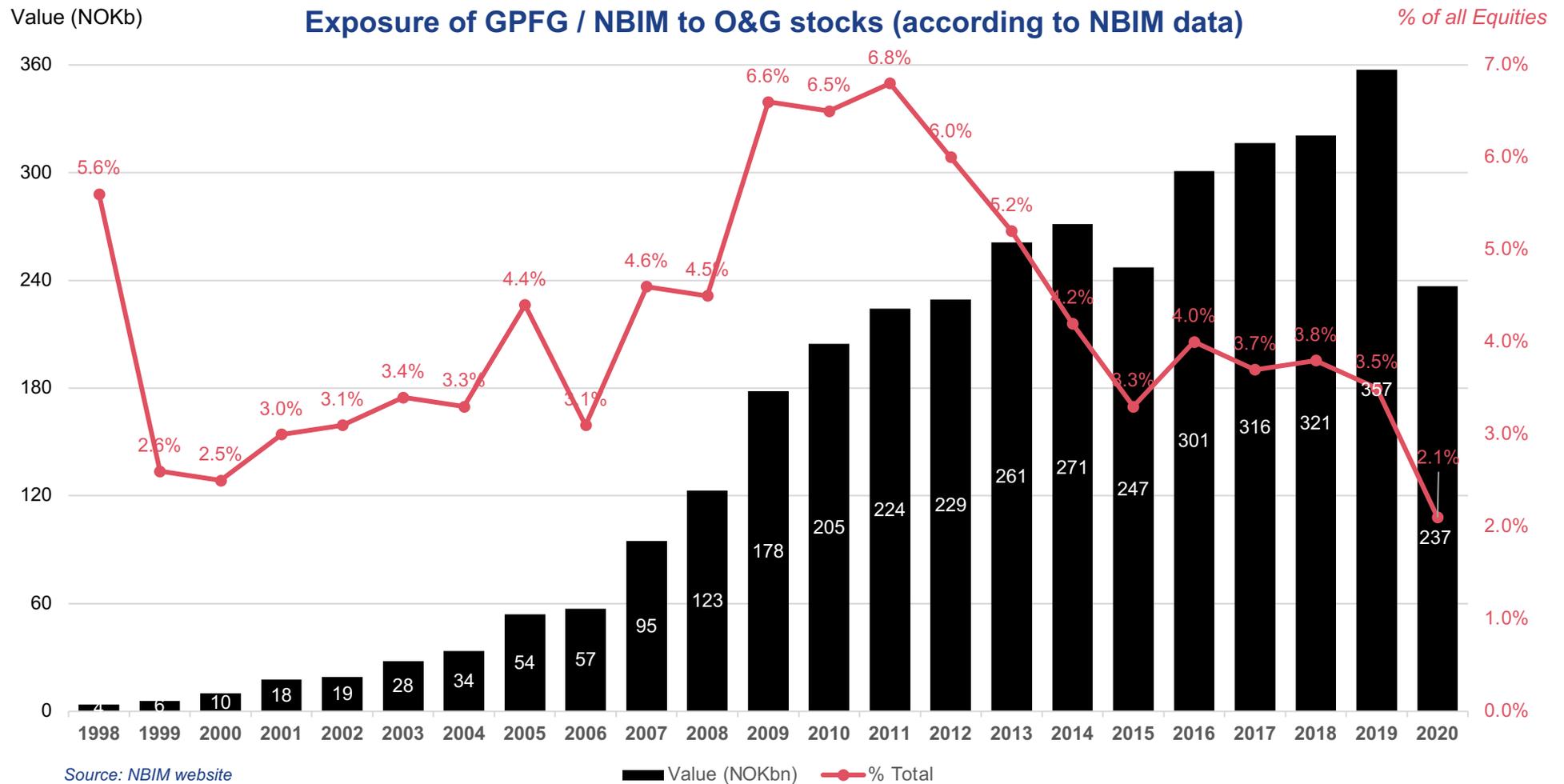


- In November 2017, Norges Bank recommended to the Ministry of Finance the removal of O&G stocks from GPFG’s benchmark index.
- We have sought to find out whether that decrease in exposure to fossil fuels has actually been the case (“Q1”), and the benefits for the fund, if they would have divested from fossil fuels stocks and invested in renewable energy stocks so more aggressively (“Q2”).
- **GPFG**, via **NBIM**, is a highly transparent fund that provides a list of its portfolio holdings on an annual fashion – we have therefore relied on the information posted on their website and on the list of equity investments as of December 31, 2017, 2018, 2019 and 2020.
- For Q1, we have done a due diligence on the stocks labelled as “oil and gas” and identified those related to renewable energy. In particular, we have analyzed **800+ stocks** invested by NBIM at some point during the period 2017-2020 and have labelled them as:
 - ✓ **black stocks** if they were primarily engaged in oil, gas, crude, E&P, midstream, propane and, to a lesser extent, uranium; and
 - ✓ **green stocks** if they were primarily engaged in hydroelectricity, solar, wind, bioenergy, geothermal and marine energy.
- The resulting table contains **407 black stocks** and **118 green stocks** that were invested at some point during 2017-2020 and is analyzed to compare the weight of NBIM in both samples over the same period. The results are presented on page 9 of this report.
- For Q2, we have filtered the stocks invested as of December 31, 2020 only, i.e., **198 black stocks** (with a market value of US\$ 23.3b) and **91 green stocks** (with a market value of US\$ 11.8b), and analyzed the 1-year, 2-year and 3-year returns of each of them.
- To do so, we have used the “**Adjusted close price**” which is adjusted for both dividends and splits, as provided by Yahoo Finance. We have considered the values in local currency, so that the returns are not influenced by foreign exchange movements.
- For both universes, we have assumed representative samples with **95%** of the total weight in value as of December 31, 2020.
- The returns of both portfolios are then used in three simulations to identify the opportunity cost that the fund has had for not having invested less aggressively into **black stocks** and more aggressively into **green stocks** during 2017-2020. Results are at page 11.
- All analyses are based on year-end data, given NBIM’s actual dates of investment / divestment are not disclosed publicly. The conclusions are therefore based on our most accurate estimation given data at hand.

Q1: Has GPFG reduced its exposure to O&G since 2017? (1 of 2)



➤ According to NBIM's categorization, the exposure to oil and gas would have decreased from 3.7% to 2.1% of all equities since 2017.



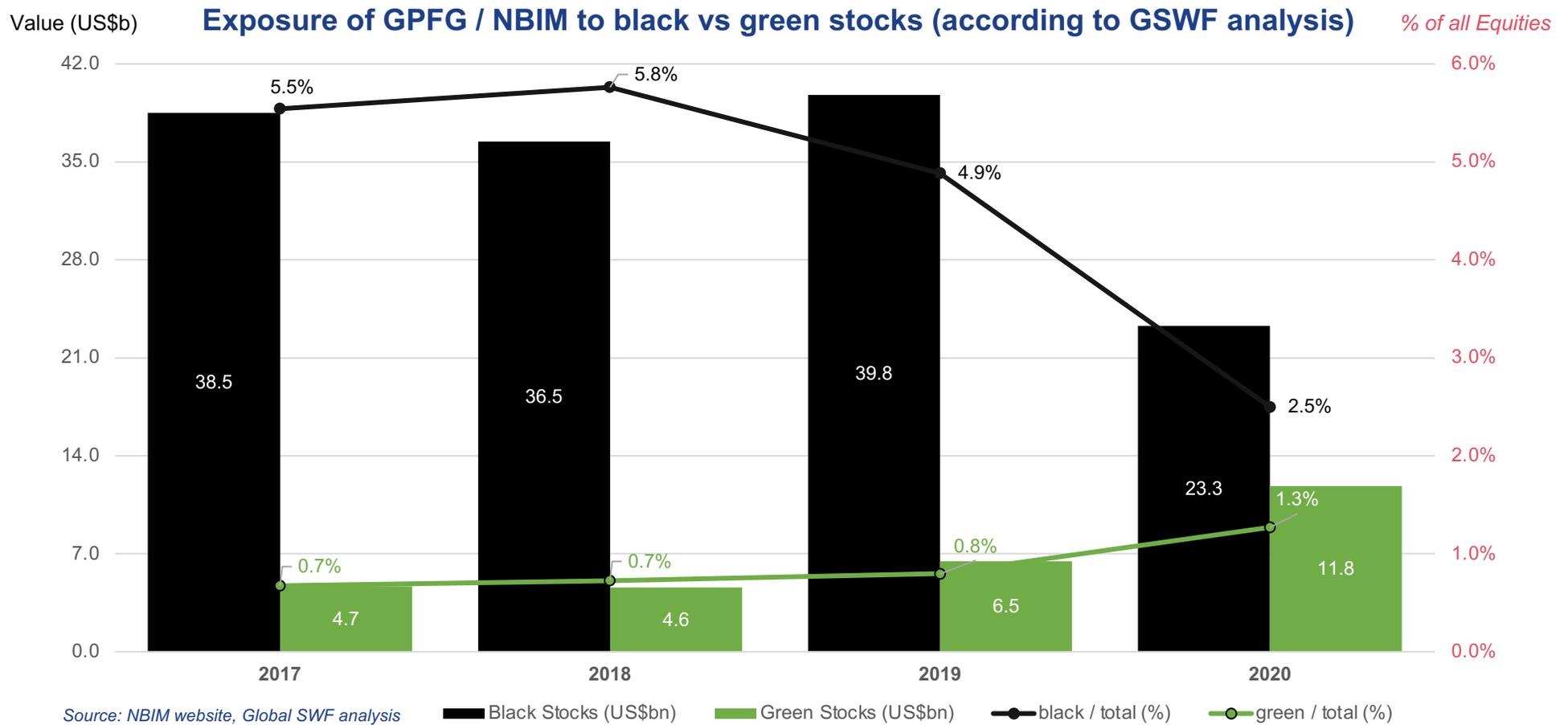
➤ However, we have noticed inconsistencies in the way stocks are classified and have run a parallel analysis on such change.

➤ Furthermore, **green stocks** are not identified, and these must be studied in conjunction to the movement in **black stocks**.

Q1: Has GPFG reduced its exposure to O&G since 2017? (2 of 2)



- According to our analysis, the exposure to **black stocks** has indeed decreased from 5.5% to 2.5% of all equities from 2017 to 2020.
- Also, the exposure to **green stocks** has increased from US\$ 4.7b (0.7% of total) in 2017 to US\$ 11.8b (1.3% of total) in 2020.
- Despite this trend, the weight of **black stocks** was still twice greater than the weight of **green stocks** as of December 31, 2020.



# Black Stocks	332	321	295	198
# Green Stocks	69	75	76	91

Q2: Potential benefits of a greener portfolio during 2017-2020 (1 of 2)



- We have analyzed the 1-year, 2-year and 3-year returns of those **black stocks** and **green stocks** invested as of December 31, 2020.
- The results are staggering: the **black portfolio** lost 23%, 10%, 11% while the **green portfolio** gained 92%, 257%, 316%, respectively.

Black Portfolio	Country	Value (\$m) - NBIM files				Stock price (XXX) - Yahoo finance				Returns as at 12/31/20		
		12/31/17	12/31/18	12/31/19	12/31/20	12/31/17	12/31/18	12/31/19	12/31/20	1yr	2yr	3yr
Royal Dutch Shell PLC	UK	6,144	5,921	5,940	3,830	62.76	58.23	59.97	33.61	-44%	-42%	-46%
TOTAL SA	France	2,500	2,862	3,353	2,754	45.14	44.79	49.41	41.22	-17%	-8%	-9%
Chevron Corp	USA	2,244	2,062	2,487	1,741	108.09	97.56	112.46	83.27	-26%	-15%	-23%
Exxon Mobil Corp	USA	3,089	2,700	2,955	1,598	69.79	59.25	63.54	40.53	-36%	-32%	-42%
BP PLC	UK	3,039	2,930	2,971	1,522	424.52	426.42	431.09	251.38	-42%	-41%	-41%
Petroleo Brasileiro SA	Brazil	436	659	876	625	9.66	12.33	15.26	10.85	-29%	-12%	12%
Neste Oyj	Finland	282	264	347	611	16.18	20.98	29.72	58.65	97%	180%	262%
Enbridge Inc	Canada	589	535	720	563	33.03	27.12	36.35	31.41	-14%	16%	-5%
Eni SpA	Italy	858	911	848	509	13.70	13.17	14.46	10.95	-24%	-17%	-20%
Gazprom PJSC	Russia	117	353	788	465	3.83	4.07	7.56	5.60	-26%	38%	46%
...
Total Black Stocks (\$m)		38,504	36,457	39,777	23,276					-23%	-10%	-11%
# Black Stocks		332	321	295	198							

Source: NBIM website, Yahoo Finance, Global SWF analysis

Green Portfolio	Country	Value (\$m) - NBIM files				Stock price (XXX) - Yahoo finance				Returns as at 12/31/20		
		12/31/17	12/31/18	12/31/19	12/31/20	12/31/17	12/31/18	12/31/19	12/31/20	1yr	2yr	3yr
Iberdrola SA	Spain	1,397	1,540	2,227	3,098	5.58	6.36	8.70	11.54	33%	81%	107%
NextEra Energy Inc	USA	963	1,145	1,612	2,308	36.18	41.35	59.01	76.75	30%	86%	112%
Orsted AS	Denmark	255	283	448	911	315.81	415.90	671.00	1,229.21	83%	196%	289%
Vestas Wind Systems A/S	Denmark	416	223	252	890	406.34	476.23	659.73	1,429.80	117%	200%	252%
Veolia Environnement SA	France	444	345	402	513	18.98	16.67	23.08	19.97	-13%	20%	5%
Siemens Gamesa Ren En	Spain	156	162	211	421	11.38	10.59	15.59	33.09	112%	212%	191%
First Solar Inc	USA	107	54	95	287	67.52	42.46	55.96	98.92	77%	133%	47%
Plug Power Inc	USA	0	0	0	221	2.36	1.24	3.16	33.91	973%	2635%	1337%
LONGi Green Energy Tech	China	0	0	23	195	20.66	13.92	24.61	92.20	275%	562%	346%
Northland Power Inc	Canada	0	5	23	179	20.26	19.85	26.10	45.37	74%	129%	124%
...
Total Green Stocks (\$m)		4,682	4,596	6,477	11,830					+92%	+257%	+316%
# Green Stocks		69	75	76	91							

Source: NBIM website, Yahoo Finance, Global SWF analysis

Q2: Potential benefits of a greener portfolio during 2017-2020 (2 of 2)



➤ Based on those portfolio returns; we can simulate three different scenarios to identify the opportunity cost that GPFG has had for not having invested less aggressively into **black stocks** and more aggressively into **green stocks** during the period 2017-2020.

➤ **1st Scenario (2019-2020):** If the fund had invested all of the energy basket into **green stocks** on Dec 31, 2019, the 1-year return of such portfolio would have been 92%, as opposed to -7%. The opportunity cost was **US\$ 45.8b**, 4% of GPFG's total value in Dec' 20.

	Value (\$m)	Return (%)	Return (\$m)
Black Stocks	39,777	-23%	-9,270
Green Stocks	6,477	92%	5,942
Blended Actual Portfolio	46,255	-7%	-3,328
All Green Portfolio	46,255	92%	42,431
Opportunity Cost			45,759

➤ **2nd Scenario (2018-2020):** If the fund had invested all of the energy basket into **green stocks** on Dec 31, 2018, the 2-year return of such portfolio would have been 257%, as opposed to 20%. The opportunity cost was **US\$ 97.2b**, 8% of GPFG's total value in Dec' 20.

	Value (\$m)	Return (%)	Return (\$m)
Black Stocks	36,457	-10%	-3,597
Green Stocks	4,596	257%	11,804
Blended Actual Portfolio	41,053	20%	8,206
All Green Portfolio	41,053	257%	105,436
Opportunity Cost			97,230

➤ **3rd Scenario (2017-2020):** If the fund had invested all of the energy basket into **green stocks** on Dec 31, 2017, the 3-year return of such portfolio would have been 316%, as opposed to 25%. The opportunity cost was **US\$ 125.8b**, 10% of GPFG's value in Dec' 20.

	Value (\$m)	Return (%)	Return (\$m)
Black Stocks	38,504	-11%	-4,194
Green Stocks	4,682	316%	14,786
Blended Actual Portfolio	43,186	25%	10,591
All Green Portfolio	43,186	316%	136,390
Opportunity Cost			125,799



- There is a lack of extensive literature about the financial benefits of investing in renewable power and divesting from fossil fuels. One such study is the one done by IEA and Imperial College in 2020 ([link](#)), which found that renewable power stocks outperformed fossil fuels in US and European markets over the past ten years (11.4% vs 7.0% respectively), and also five years and one year.
- **GPFG**, via **NBIM**, has been divesting significantly from fossil fuels and investing significantly in renewable energy since 2017. In fact, the weight of **black stocks** over **green stocks** in NBIM's portfolio has decreased from 8.2x to 2.0x during the past three years.
- However, we wonder if this change has been sufficient and the reason for black stocks to still weight as much, especially given the Oil Fund's origins and diversification mandate, and the reluctance to invest in coal-based energy as shown by its exclusion list ([link](#)).
- Financial profitability has stopped and must stop being an excuse, as evidenced by the present analysis on returns. NBIM's **green portfolio** as at Dec 31, 2020, outperformed significantly the **black portfolio** over a period of 1 year, 2 years and 3 years.
- If, at the time of NBIM's recommendation to remove O&G stocks from **GPFG**'s benchmark index in Nov'17, the fund had divested all of its **black stocks** and re-invested that capital into **green stocks** instead, Norwegians would have been **10% richer** today.
- Please note that in such scenario, NBIM's average shareholding in **green stocks** would have increased from 1.4% to 4.1%, which we do not find excessive, and there would have been plenty beyond those 91 **green stocks** to invest in.
- Now, we are aware of the relativity of such statement and that the fund cannot possibly have a crystal ball – if it had, it would have invested in December 2017 such energy basket into Tesla Inc. shares altogether instead, and it would have been a 34% larger today!
- However, the key message is that there is no reason for **GPFG** not to divest from its (still very significant) portfolio of fossil fuels stocks, and not to use the proceeds to pursue more investments in companies engaged in renewable energy, whether listed or not.

Appendix 1: List of green stocks invested as of Dec 31, 2020



Green Stock	Country	Wind	Solar	Hydro	Bio	Thermal
Absolute Clean Energy PCL	Thailand		x		x	
Adani Green Energy Ltd	India		x			
Aeris Industria E Comercio De Equipamentos	Brazil	x				
AES Tiete Energia SA	Brazil			x		
Albioma SA	France		x			
Algonquin Power & Utilities Corp	Canada	x	x	x		
Array Technologies Inc	USA		x			
Atlantica Sustainable Infrastructure PLC	USA	x	x			
Avangrid Inc	USA			x		
Ballard Power Systems Inc	Canada			x		
BCPG PCL	Thailand	x	x	x		
Beijing Enterprises Clean Energy Group Ltd	China	x	x			
Boralex Inc	Canada	x	x	x		
Brookfield Renewable Corp	USA	x	x	x		
Canadian Solar Inc	China		x			
China Conch Venture Holdings Ltd	China				x	
China Datang Corp Renewable Power Co Ltd	China	x				
China Everbright Greentech Ltd	China				x	
China High Speed Transmission Equipment	China	x				
China Longyuan Power Group Corp Ltd	China	x				
China Renewable Energy Investment Ltd	China	x				
China Shuifa Singyes Energy Holdings Ltd	China		x			
China Suntien Green Energy Corp Ltd	China	x				
CK Power PCL	Thailand			x		
Clearway Energy Inc	USA	x	x			
Concord New Energy Group Ltd	China	x	x			
Cosan Ltd	USA				x	
Cosan SA	Brazil				x	
CropEnergies AG	Germany				x	
CS Wind Corp	S. Korea	x				
E-Ton Solar Tech Co Ltd	Taiwan		x			
EDP Renovaveis SA	Portugal	x	x			
Encavis AG	Germany	x	x			
Energiekontor AG	Germany	x	x			
Energix-Renewable Energies Ltd	Israel	x	x			
Enlight Renewable Energy Ltd	Israel	x	x			
Enphase Energy Inc	USA		x			
eRex Co Ltd	Japan				x	
Falck Renewables SpA	Italy	x	x			
First Solar Inc	USA		x			
GCL-Poly Energy Holdings Ltd	China	x				
Gigasolar Materials Corp	Taiwan		x			
Green Plains Inc	USA				x	
Grenergy Renovables	Spain		x			
Hanergy Thin Film Power Group Ltd	China		x			

Green Stock	Country	Wind	Solar	Hydro	Bio	Thermal
Hannon Armstrong Sustainable Infrastructure	USA	x	x			
HLB Life Science CO LTD	S. Korea	x	x			
Hydro One Ltd	Canada			x		
Iberdrola SA	Spain	x	x	x		
Innervex Renewable Energy Inc	Canada			x		
JinkoSolar Holding Co Ltd	China		x			
LONGi Green Energy Technology Co Ltd	China		x			
Maxon Solar Technologies Ltd	USA		x			
McPhy Energy SA	France			x		
Motech Industries Inc	Taiwan		x			
Neoen SA	France	x	x			
Neoenergia SA	Brazil	x	x	x		
NextEra Energy Inc	USA	x	x			
NHPC Ltd	India			x		
Nordex SE	Germany	x				
Northland Power Inc	Canada	x	x			
Omega Geracao SA	Brazil	x				
Ormat Technologies Inc	USA					x
Orsted AS	Denmark	x			x	x
Plug Power Inc	USA			x		
Renewable Energy Group Inc	USA				x	
Renewi PLC	UK				x	
RENOVA Inc	Japan	x	x		x	
RusHydro PJSC	Russia			x		
Siemens Gamesa Renewable Energy SA	Spain	x				
SMA Solar Technology AG	Germany		x			
Solar A/S	Denmark		x			
Solar Applied Materials Technology Co	Taiwan		x			
SolarEdge Technologies Inc	USA		x			
Solaria Energia y Medio Ambiente SA	Spain		x			
Solarpack Corp Tecnologica SA	Spain		x			
Soltec Power Holdings SA	Spain		x			
SPCG PCL	Thailand		x			
Sunnova Energy International Inc	USA		x			
SunPower Corp	USA		x			
Sunrun Inc	USA		x			
Super Energy Corp PCL	Thailand		x			
Terna Energy SA	Greece					x
TransAlta Renewables Inc	Canada	x	x	x		
United Renewable Energy Co Ltd/Taiwan	Taiwan		x			
Veolia Environnement SA	France				x	
VERBIO Vereinigte BioEnergie AG	Germany				x	
Vestas Wind Systems A/S	Denmark	x				
Xinjiang Goldwind Science & Technology Co Ltd	China	x				
Xinyi Energy Holdings Ltd	China		x			
Xinyi Solar Holdings Ltd	China		x			

Appendix 2: Global SWF Credentials



Global SWF LLC is a financial boutique focused on State-Owned Investors, including Sovereign Wealth Funds and Public Pension Funds, founded in July of 2018. In the past three years, we have completed projects for the World Bank, for the United Nations and for a number of governments setting up SWFs around the world. We also run one of the most comprehensive data platforms on SWFs' / PPFs' strategies, portfolios and executives, subscribed to by some of the world's most respected organizations, including four large SWFs, three of the world's Top 5 asset management firms and two of the world's Top 3 management consulting firms.



Diego López
Managing Director
New York NY
PwC, KPMG
LSE

Diego López is the MD of Global SWF, based in NYC. During the past two years, he has worked as an external consultant of the World Bank, of the UN and supported the establishment of various SWFs. He is considered a global expert in SWF matters.

He is a seasoned banker and consultant with over 15 years of experience. Prior to founding Global SWF, he spent five years building up PwC's footprint in the SWF industry as the Director and COO of the global practice. Before PwC, he spent five years in KPMG and two in Accuracy.

Diego has lived and worked in Europe, the Middle East, China, Brazil and the US. He earned his Masters in Finance from the London School of Economics (LSE) after graduating in the Universities of Madrid and Milan. He is FINRA-registered representative with Series 62, 63 and 79.



Daniel Brett
Head of Data
London UK
Fitch Solutions
SOAS

Daniel Brett is the Head of Research & Data of Global SWF, based in London. He started his career in journalism before becoming editor of a business intelligence provider and has worked for 17 years as a consultant to Fitch with a focus on O&G & finance.

Prior to joining Global SWF's team, he was head of data and research at Institutional Investor's Sovereign Wealth Center. He has also worked for OPEC and other organizations providing intelligence on oil, gas, electricity and renewables in Africa, the Middle East and Asia.

Daniel is a fellow of the Royal Asiatic Society and a member of the Royal Africa Society, having graduated in political science at Queen Mary University of London and obtaining a Master of Science in international development at the School of Oriental and African Studies (SOAS).



Zoe Zongyuan Liu
Head of Content
New York NY
Columbia-Harvard
GWU, JHU

Zoe Liu is the Head of Content of Global SWF, based in New York. She is a postdoctoral research scholar at the Columbia-Harvard "China and the World Program", a research associate at NYU Stern and a lecturer at SAIS Johns Hopkins University.

She has over 14 years of experience on macro data and political risk. She has conducted extensive field research in eight countries on SWF-related issues, having worked for the Delma Institute (Abu Dhabi), for MUFG (Tokyo) and for China's MOFCOM (Beijing).

Zoe completed her PhD at John Hopkins University with a dissertation on SWFs and the landscape and different use of foreign reserves in China vs Japan. She also holds a Masters in International Relations from the George Washington University and is a CFA charter holder

The authors of this report would like to acknowledge Håvard Halland, Senior Economist at the OECD Development Centre, for proposing the broad concept for this analysis. Joint written pieces can be found published on the DN in Norwegian ([link](#)) and on OMFIF in English ([link](#)). Any errors or omissions are the authors' own.



Contact details:
Diego López
Managing Director
[+1 929 301 1895](tel:+19293011895)
diego.lopez@globalswf.com
www.globalswf.com

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