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ORIGINAL PAPER

Access and allocation: the role of large shareholders and investors in leaving fossil fuels underground

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Abstract
An under-researched story is how large shareholders (e.g. Pension Funds) and investors (e.g. Export Credit Agencies) whose investments in fossil fuels may amount to trillions of dollars are implementing the Paris Agreement on Climate Change and in particular leaving fossil fuels underground (LFFU). Hence, this paper addresses the question: What arguments are used by shareholders and investors in making their financial flows consistent with LFFU, and what do these arguments imply for: access to fulfilling needs; allocation of related resources, responsibilities and risks; and, the right to (sustainable) development? This paper identifies the different arguments used and clusters them into five investor/shareholder scenarios. It assesses these scenarios using the inclusive (access and allocation) development framework. We find that there is prima facie evidence that fossil fuels and associated infrastructure are doomed to become obsolete and hence stranded, which poses a series of risks for (potential) investors and various stakeholders. Three of the five identified scenarios indicate that Pension Funds and Export Credit Agencies may transfer their risks associated with fossil fuel resources, assets and/or related knowledge to developing countries justified by the latter's Right to Development. Such transfers have negative access and allocation impacts—creating, inter alia, a fossil fuel infrastructure and path dependency in the South and amounting to a de facto transfer of a carbon budget along with carbon dependency and related debt to the Global South.

Keywords Access and allocation · Pension Funds · Export credit · Fossil fuel · Socio-environmental justice · Inclusive development · North–South · Paris Agreement on Climate Change

Abbreviations

DC	Developing country
ECA	Export Credit Agency
ECs	Export credits
FF	Fossil fuel
IC	Industrialised country
LFFU	Leaving fossil fuel underground

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ODA Official Development Assistance
PF Pension Fund

1 Introduction

The Paris Agreement on Climate Change 2015 calls on countries to make "finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development" (PA 2015: Art 2c). Most climate mitigation research focuses on the energy transition (e.g. OECD 2015) and policies to promote greenhouse gas mitigation (e.g. Manley et al. 2016) including market mechanisms (e.g. Keenan et al. 2019) and climate funds (e.g. IPCC 2014) and their relationship with climate mitigation (e.g. Ayling and Gunningham 2017). However, there is little literature on the coherence between broader financial flows (from e.g. Pension Fund (PFs) and Export Credit Agencies (ECAs) funded by trade and aid agencies) and climate mitigation specifically through leaving fossil fuels underground (LFFU) (cf. McGlade and Ekins 2015). Thus, this paper addresses the question: What arguments are used by shareholders and investors in making their financial flows consistent with LFFU, and what do these arguments imply for: access to fulfilling needs; allocation of related resources, responsibilities and risks; and, the right to (sustainable) development? This contribution to the *Special Issue on Access and Allocation* uses the access and allocation framework developed by the Earth System Governance research programme (Biermann et al. 2010). We elucidate the links between various financial flows and LFFU, and stress the justice/equity challenges posed by fossil fuel (FF) financial flows to inclusive and sustainable development.

Our method has four steps. We (a) sketch the volume of investments and financial flows from publicly available documents of PFs and ECAs; (b) identify the relevant arguments from these documents, the scholarly and grey literature; (c) cluster these arguments into five scenarios of choices for Pension Funds (PFs) and Export Credit Agencies (ECAs), and (d) assess how these five scenarios compare in terms of justice/equity issues.

We operationalise our justice approach through applying the combined inclusive (access and allocation) development framework. Inclusiveness (e.g. social and ecological inclusiveness) (Pouw and Gupta 2017; Bavinck and Gupta 2017) is operationalised in terms of access and allocation. 'Access' is the "ability of individuals to secure a basic minimum of resources and ecospace" (Gupta and Lebel 2010: 379). 'Allocation' looks past basic needs and examines "how the remainder of the resources can best be divided amongst people and countries" (ibid: 379) by focusing on the distribution of resources, risks, and (environmental) responsibilities. We classify access through social, environmental and economic indicators that are linked to each other and applicable to low-income people. Low-income people need access to affordable energy and water; hence, these are used as proxy indicators under the social dimension. While FFs are considered cheap at present, renewable energy is forecasted to become cheaper in the future (Stark et al. 2015). Moreover, FF energy uses (and pollutes) significantly more water than renewable energy (Mekonnen et al. 2015). Given their relation with both FF and renewable energy, indicators for the environmental dimension are access to a stable climate, clean air/water/land, and a healthy biodiversity (Larrea and Murmis 2016; Rockström et al. 2018). Finally, we consider access to employment and reliable pensions under the economic dimension (ILO 2018; Stern 2011; Sarang 2015). In terms of allocation of resources, we examine how global capital is allocated via these investors and how the carbon budget gets de facto allocated. Under allocation of responsibility,

we see how investment processes reallocate mitigation and adaptation responsibilities. Under risk, we analyse how the social, economic, legal and ecological (residual impacts of climate change and other environmental) risks are distributed. The development narrative has been simplified to include two elements—climate-resilient development as required by the Paris Agreement and sustainable development under the Climate Change Convention; and the right to development (Gupta and Arts 2018). We posit that the decisions made by financial actors will have implications on access and allocation (see Table 1).

This paper first discusses PFs (see Sect. 2), then ECAs (see Sect. 3) and the implications of investment decisions on access, allocation and the right to development (see Sect. 4), before drawing conclusion (see Sect. 5).

2 Pension Funds

2.1 Introduction

PFs (whether private, state owned or hybrid) invest, inter alia, in energy and could promote LFFU and catalyse the energy transition. Their size and FF investments (see Sect. 2.2) make them influential stakeholders. Most PF literature covers their fiduciary duty to beneficiaries (e.g. Sarang 2015; Feit 2016), country- or state-specific legislation that restricts their investment decisions (e.g. Gharamani 2014), and risk exposure in PF investment portfolios (e.g. Candoni et al. 2017), but scarcely covers their role in LFFU. Hence, this section examines this role and the arguments to divest and remain invested in fossil energy.

2.2 Pension Funds and Leaving Fossil Fuels Underground

PFs receive contributions from employers and employees and are large savings accounts invested in businesses which allow them to pay pensions to pensioners (Sarang 2015). They globally manage assets worth USD 27.6 trillion (OECD 2018), or 29% of the global GDP (World Bank 2019). In 2018, the 300 largest PFs managed about USD 18 trillion (21% global GDP) in assets (Willis Tower Watson 2018).

PFs invest heavily in FFs. The UK's Local Government Pension Scheme had an estimated USD 14.9 billion and USD 19.8 billion invested in FFs in 2014 and 2017 (Fossil Free UK 2019), respectively. In 2015 and 2016, the Dutch fund ABP held USD 9.2 billion and USD 11.4 billion in fossil investments, respectively, showing an increase in FF assets (Brusa and Schucking 2017). Colorado's Public Employee Retirement Association held over USD 1.5 billion in FF assets in 2018 (Fossil Free PERA Colorado 2019). An additional sample of 15 PFs from industrialised countries (ICs) holds an estimated USD 88.8 billion in equity in the top 200 FF firms (Fossil Free 2018). These funds jointly own significant shares in FF conglomerates—including 3.74% of Shell, 4.09% of BP, 3.55% of ConocoPhillips and 2.43% of BHP Billiton (see "Appendix").

PF services range from government-organised linear plans to private schemes (de Kruijf and de Vries 2018). Decisions on FF investments are made by coalitions consisting of asset managers of investment portfolios, the boards which oversee PF operations and government bodies who regulate PFs (Knox 2016; Sarang 2015). Their decisions influence not only pensioners but also FF companies/infrastructure/users, and communities affected by the (negative) externalities of FF projects. For instance, the Dutch fund ABP (2018) manages €270 million in common shares of the coal mining firm Vale SA—the company that

Table 1 A framework for linking access and allocation and inclusive development. *Source*: Further developed from Gupta and Lebel (2010) and Pouw and Gupta (2017)

Actor	Inclusive		Development
	Access	Allocation	
	Whether and how access to basic needs/rights are met?	How are resources (and sinks), responsibilities and risks allocated?	How is development defined? How consistent is it with access and allocation?
Pension Funds	How do decisions by PFs to divest from or remain invested in fossil fuel firms affect access and allocation?		What do these decisions imply for how development is defined?
Export Credit Agencies	How do decisions by trade/aid agencies and ECAs to continue or discontinue funding fossil fuel projects affect access and allocation?		
	Access and allocation are operationalised as		
	Access to affordable/reliable energy/water Access to a stable climate; clean air, water and land; and healthy biodiversity Access to jobs, pensions	Resources: Allocation of carbon budget and investment flows Responsibilities: For mitigation and adaptation Risks: Economic, Legal, Ecological, Social	Implications for climate-resilient development and sustainable development Implications for the right to development

was responsible for a dam collapse in Brazil in 2019 that caused hundreds of deaths and displacements in addition to water and land contamination (MS 2019). As concerned shareholders, ABP could engage with Vale SA to ensure locals are compensated sufficiently or better still that investments are made to prevent such disasters; conversely, as indifferent shareholders, a lack of concern from ABP may risk future collapses and calamities (see Sects. 4.2 and 4.3).

2.3 PFs: arguments to divest from FFs or not to divest

As shareholders in FF firms, PFs can influence decisions on LFFU by either selling their FF equity (divesting) and absolving their responsibility as investors, or not divesting and remaining partial shareholders of FF companies.

Table 2 identifies six recurring arguments that make fossil fuel divestment attractive. First, (forthcoming) laws in compliance with the Paris Agreement 2015 may force PFs to alter investment behaviour (Mercure et al. 2018; IEA 2016); divesting now can help minimise future losses. Already, Denmark has banned onshore shale gas, natural gas, and oil exploration; The Netherlands has banned fracking and is restricting coal development financing; and Costa Rica had a moratorium on petroleum exploration and extraction (Lazarus and Verkuijl 2019) which has been subsequently revoked. Second, substituting FF investments with renewables can yield even greater short-to-medium-term returns on investment (Henriques and Sadorsky 2018), making divestment financially attractive and important for fulfilling their fiduciary responsibility to their pensioners (Feit 2016; Sarang 2015; Gharamani 2014). Third, irrespective of whether countries implement the Paris Agreement, FFs are becoming obsolete and FF investments are becoming high risk and will inevitably lose value (Bos and Gupta 2018; Caldecott and Robins 2014; Ansar et al. 2013; Madian 1997); by divesting now, PFs can both minimise future risks and yield a greater return than if they wait to sell FF assets in the future. Fourth, FF divestment can directly address the environmental dimension of Environmental, Social and Governance (ESG) factors considered by PFs in investment decisions (e.g. ABP 2018). Fifth, publicly announcing FF divestments may damage the FF industry's reputation, forcing them to re-design themselves (Ansar et al. 2013; Goranova and Verstegen-Ryan 2014). Finally, FF divestment may improve the reputation of the PF with its pensioners, board members,

Table 2 Arguments in favour of divestment from fossil firms

	Arguments for divestment
Legal	Anticipating new laws flowing from the Paris Agreement 2015, and risks from potential liability suits may motivate divestment now, to minimise future losses
Economic	As technologies develop, investing in alternatives (e.g. renewables) may yield a greater return on investment
	FFs will become obsolete in either the short term or medium term; selling FF shares before this inflection point may yield higher returns
Environmental	FF divestment can be considered environmentally responsible
	Public divestment in FF firms may lead other FF firms to move out of FFs
Social	FF divestment may enhance the reputation of PFs themselves amongst pensioners, board of directors, and government bodies

relevant government bodies and the general public, thus setting an example to others (GPF 2018; ABP 2018).

Conversely, Table 3 identifies seven arguments against divestment. First, legally binding obligations for the FF sector are unlikely to emerge soon, so divestment is premature and unnecessary (Griffin et al. 2015). Second, financially comparable substitutes for FF investments do not exist yet, so divestment is unattractive (ibid; IEA 2011). Third, divestments can be costly for pensioners; for example, voluntary divestment from the tobacco industry by the California Public Employees Retirement System cost USD 650 million from 2000 to 2006 (Gharamani 2014). Fourth, forecasts suggest that FFs will remain valuable until at least 2030, rendering divestment today financially unattractive as prices may not yet have peaked (Bauer et al. 2015), which means that pensioners may lose from divestment through lower returns. Fifth, improvements in carbon capture and storage technologies can reduce the need for LFFU (IEA 2012, 2013), rendering divestment unnecessary. Sixth, divestment—even by multiple investors simultaneously—is unlikely to directly influence business as usual and is thus unlikely to have significant climate benefits (Bergman 2018; Ansar et al. 2013). Finally, divestment can transfer ownership of FF firms to investors who are 'indifferent' to climate change arguments and become new vested interests. If an investor truly is concerned with the environment, direct engagement with firms may be more responsible than divestment (Ritchie and Dowlatabadi 2014; Ansar et al. 2013). Each argument has impacts on access, allocation and development (see Sects. 4.2 and 4.3).

3 Aid Agencies and Export Credit

3.1 Introduction

Industrialised Country (IC) trade and aid agencies are engaged in financial flows. These agencies have known since 1990 that they must eventually LFFU. Their funds for climate mitigation and adaptation are relatively limited compared to the broader trade and investment flows. Aid agencies are not yet mainstreaming climate change into these broader flows (Gupta and van der Grijp 2010). While scholarship examines the relationship between mitigation and public finance (e.g. Doornbosch and Knight 2008), how adaptation relates to development cooperation (e.g. Schroeder 2012), and climate finance funding techniques

Table 3 Arguments against divestment from fossil firms

Dimension	Arguments against divestment
Legal	Strong regulations are unlikely in the immediate future, so divesting now is premature
Economic	Comparable substitutes for FF investments yielding high returns do not yet exist
	Divestment can be costly for pension fund beneficiaries
	Because technologies will not develop fast enough, FFs will remain valuable at least until 2030, so PFs can better wait for peak prices
	Improvements in carbon capture and storage technologies may eventually render LFFU unnecessary
Environmental	Divestment may not impact FF markets to address the climate change problem and does not lead to climate-resilient development
	Divestment may lead to selling FF shares to investors who may be unwilling to support LFFU. Direct engagement is more environmentally responsible

(e.g. Bowen 2011), few papers examine whether trade/aid agencies are aligning their financial flows to promote or hamper LFFU, especially through instruments such as ECAs. This section examines the role of ECAs in LFFU.

3.2 Aid agencies, export credit and LFFU

IC governments established trade and development agencies to engage in cooperation with Developing Countries (DCs) (Gupta and Thompson 2010). Financial assistance goes through Official Development Assistance (ODA) and consists of loans and grants and Other Official Flows. These other flows include Export Credits (ECs) provided by government-supported ECAs to help national exporters by providing either capital flows to exporters or insurance to cover uncertainty in importing country demand (OECD 2019a, b).

ECAs have been funnelling resources to the FF industry. Court cases in the USA called for environmental impact assessments of FF projects financed by ECs, and Germany required ECAs to be transparent under the Access to Information Laws (Gupta 2014). In 2016, Germany and the UK allocated USD 24.7 billion (Donor Tracker 2017) and USD 16.6 billion (Carbon Brief 2017) to ODA. The UK provided USD 5.9 billion in FF support from 2010 to 2017. Of this, USD 4.4 billion were ECs financed by UK Export Finance (UKEF) (CAFOD 2017). Almost 99.2% of UKEF was used to finance FF projects in 2016 (ibid; Christian Aid 2016). From 2013 to 2015, Germany may have used USD 3.5 billion to finance fossil projects through ODA, including ECs compared to the USD 2.4 billion spent on clean and renewable energy (OCI 2017). In 2013 and 2014, the USA allocated a total of USD 7.5 billion in public spending on FFs (Doukas 2015). Jointly, these three countries have allocated at least USD 18 billion to fund overseas FF projects within the last decade as part of ODA, including EC. Despite advice to the Netherlands government to not finance fossil fuels using export credit (AIV 2019), this advice was ignored in the official response.

Like those pertaining to PFs, networks linking donor and recipient country governments are composed of various actors. In the UK, the national treasury allocates funds for development cooperation; government agencies (e.g. Department for International Development, Department for Business, Energy and Industrial Strategy, and the Foreign and Commonwealth Office) consult the private sector and NGOs on proposed funding, and this is monitored by the parliament and national audit office. Funds are earmarked for recipient countries; local and federal bodies, NGOs, private sector actors, development banks, and diplomatic posts, inter alia, receive ECs to implement planned projects (NAO 2017; DFID 2017; BEIS 2017).

ECA decisions to invest in FFs affect FF companies themselves in addition to FF users and communities susceptible to negative externalities resulting from exporting projects and subsequent impacts of climate change. The human and environmental repercussions of ECA-funded projects are seldom accounted for.

3.3 Aid agencies: arguments for and against support for FFs through ECs

Table 4 identifies the five key arguments for allocating public funds for FF projects in DCs. First, channelling IC funds to promote DC FF projects is in line with the DC Right to Development and builds trusting North–South partnerships (Gupta and van der Grijp (2010); Bos and Gupta 2016). Second, it provides affordable fuel, enhances energy access and meets growing energy demands (IEA 2016) in DCs which may not be

Table 4 Arguments supporting ECs for FFs

Dimension	Using ECs for supporting FFs is important as it
Political/legal	Promotes the right to development of DCs and enhances mutual trust
Social	Enables access to affordable energy in DCs also in line with the SDGs
Economic	Enables poverty reduction and increased GDP in DCs
	Technological development may enable FF infrastructure to allow for carbon capture and storage technology
	Benefits donor countries and companies with high returns

guaranteed through renewables (Alexander and Floyd 2018; Pyke 2017; Lazarus et al. 2015). Third, FFs are profitable (Pyke 2017) and can increase growth in DCs (Christian Aid 2016). Fourth, FF investments may be used to enable carbon capture and storage (IEA 2012, 2013; Clark and Herzog 2014; Nykvist 2013), reducing the risks of inevitably LFFU and the accompanying stranded assets (Bos and Gupta 2018, 2019). Finally, the profitability of FFs benefit donors as the ECs support IC businesses abroad (DFID 2015).

Table 5 identifies four recurring arguments that oppose using ECs to finance FF projects. First, such FF investments will further lock-in DCs into a carbon economy (Gupta and Arts 2018), which will intensify the risks of stranded assets (see Sect. 4.3) borne by recipient DCs (Bos and Gupta 2018). The financial risks resulting from this carbon lock-in may increase debt in recipient nations. Second, ECs used for supporting FF projects leave recipient nations energy-dependent on ICs, whereas investments in renewable energy promote energy-independence (Thaker and Leiserowitz 2014; Michaelowa and Michaelowa 2012). Third, given the urgency to LFFU in order to align with the Paris Agreement, and since most ICs have ratified the Agreement, using public funds to finance FF projects is incoherent and hypocritical (Josephson 2017). German domestic restrictions on coal subsidies (Lazarus and Verkuijl 2019) are undermined by state funds used for FF investments abroad and thus violate the spirit of multilateral agreements. Finally, fossil energy is more water-inefficient than renewables (Mekonnen et al. 2015; Spang et al. 2014), so financing renewables with ECs may be in the best interest of DCs from a broader environment-water lens.

Table 5 Arguments against ECs for FFs

Dimension	FF investments should not be supported through ECs because this
Economic	Locks-in DCs into a carbon economy/intensifies the risks of stranded assets, including the financial risk of long-term debt; OR creates vested interests in DCs that oppose LFFU does not lead to climate-resilient development
Political	Creates energy-dependence, whereas climate mitigation promotes energy-independence
Environmental	Shows domestic and international policy incoherence and/or hypocrisy in ICs and is counterproductive in that the climate problem is exacerbated
	Uses more water and is more polluting than renewable alternatives

4 Analysis: access and allocation

4.1 Introduction

The arguments on whether investors should hinder or foster fossil fuel investments (see Sects. 2.3 and 3.3) can be clustered in terms of choices that lead to five investor scenarios (three for PFs and two for ECAs). In the first scenario, PFs continue as climate-indifferent (i.e. investors who ignore climate change) shareholders. In the second, PFs divest and sell to climate-indifferent investors. In the third, PFs leverage their shareholder power to prompt FF firms to LFFU. In the fourth, aid agencies/ECAs support the export of fossil fuel, and in the fifth they support only renewables. This section assesses these investor scenarios using the combined access, allocation and inclusive development framework.

4.2 Access

Table 6 presents these five scenarios in the columns and denotes their implications on the access narrative with a four-point system: very positive (++); positive (+); negative (−); and very negative (− −).

Under the social dimension, we address access to affordable energy and water also targeted by the Sustainable Development Goals. Access to affordable energy, particularly in DCs, will be enhanced by decisions by PFs or aid agencies/ECAs to (continue to) invest in FF (or if PFs divest and sell their shares to indifferent investors), because fossil energy is cheap (IEA 2016; Lazarus et al. 2015). However, renewable energy is exponentially improving in efficiency and affordability (Stark et al. 2015) and may soon become affordable for low-income groups. These three investment scenarios will affect access to affordable water negatively as FF projects are water-intensive (Mekonnen et al. 2015).

Under the ecological dimension, we address a stable climate, the need for clean air, water and land and a healthy biodiversity—as most of the world's poor depend directly on these contributions of nature (Charlery and Walelign 2015). FF projects emit greenhouse gases (IPCC 2014; IPCC 2018), pollute air, water (e.g. through fracking) and land resources (ibid; Rozenberg et al. 2014; Stern 2011), and severely disrupt ecosystems and biodiversity with impacts on, e.g. poor farmers worldwide (Larrea and Murmis 2016; Rockström et al. 2018). Hence, access to all indicators in the ecological dimension will be reduced. If PFs and aid agencies/ECAs engage with FF firms and finance renewable energy, respectively, access to a stable climate, clean air, water and land, and functioning ecosystems will be dramatically improved in the short term and long term, particularly for DCs but also reduce the risk of overshooting on the Paris objective.

Under the economic dimension of access, we consider impacts on employment for low-income groups and pensions in general (while pensions benefit richer people, a collapse of the PFs will impact all pensioners). Access to employment will improve in all scenarios in the short term. FF projects supported by indifferent PFs, indifferent investors, and aid agencies/ECAs will generate employment in both the North and South in the FF and related industry (assuming that automation remains low). However, these fossil sector jobs will eventually be lost in the mid-term to long term as fossil fuels are inevitably left underground; Table 6 denotes this short-term gain and long-term loss with a '±'. Similarly, if PFs engage with FF firms and if aid agencies/ECAs finance renewable energy, new employment opportunities will arise in that sector which may provide more jobs than the

Table 6 Investor scenarios and implications for access

Access	Scenario				
	(1) PFs remain climate-indifferent	(2) PFs sell FF to climate-indifferent investors	(3) PFs keep shares and engage FF firms	(4) ECAs support fossil fuel exports	(5) ECAs promote renewables
Social					
Affordable energy	+	+	+	+	+
Affordable water	−	−	+	−	+
Ecological					
Stable climate	−	−	++	−	+
Clean air/water/land	−	−	++	−	+
Functioning ecosystem	−	−	++	−	+
Economic					
Employment	±	±	++	±	++
Pensions	High risk: − (IC)	Low risk: ++ (IC)	Medium risk: + (IC)	Na	Na
Climate-resilient/sustainable development	−	− −	++	− −	++

IC industrialised country, *Na* not applicable

++, very positive; +,positive; −, negative; − −, very negative impacts

fossil fuel sector (ILO 2018)—notably, jobs that will likely survive LFFU. However, these opportunities come for different people at different locations and may mean unemployment within the FF sector (Fay et al. 2015).

Implications on access to reliable pensions are only applicable to PF scenarios. PF portfolios will incur the highest medium-to-long-term risk exposure if they remain indifferently invested in FF firms (Ansar et al. 2013); portfolio risk will be minimised by divesting, and risks can be lowered over time if PFs engage with FF firms to reduce the financial instability linked to FF projects (Caldecott and Robins 2014). Divestment today by PFs thus has the greatest impact on access to a reliable long-term pension, while passive investment yields a negative impact. Shareholder engagement with FF firms will lower FF investment risks over time and could potentially improve long-term access to a reliable pension, simultaneously addressing climate change (Rozenberg et al. 2014). However, if FF assets have to be written off in order to address the climate problem, it will leave companies or PFs with stranded assets (Bos and Gupta 2018, 2019).

All scenarios recognise the DCs Right to Development (Gupta and Arts 2018); regardless of whether aid agencies/ECAs fund FFs or renewable energy projects in DCs, some funds will be used for generating energy in DCs. However, the negative impacts of FF use on the local environment and on climate change may on balance have greater negative impacts, especially on low-income groups in DCs and thus negatively affect their development prospects. If PFs and aid agencies/ECAs stimulate renewables this can enhance their prospects for sustained and inclusive development (Gupta and Arts 2018). Therefore, only the third and fifth scenarios promote climate-resilient/sustainable development.

4.3 Allocation

Table 7 shows how the five investor scenarios (see Sect. 4.1) allocate the relevant resources, responsibilities and risks. First, we consider the de facto allocation of the carbon budget. If either PFs remain indifferently invested in FF firms or if PFs divest and sell FF equity to indifferent investors, and if ECAs continue to finance fossil fuel, FF firms will likely continue financing FF projects in DCs (Menas Associates 2017), meaning that de facto the dwindling carbon budget allocation will be partly determined by FF firms. However, if PFs directly engage with FF companies to limit fossil exploration and production, and if ECAs redirect funds to renewable energy, there will be a shift from carbon investments into renewables or alternative energies. Note that this applies to PFs directly as PFs engage with FF firms to determine FF allocation to global markets, but not all PF investments are in DCs. This is indirectly the case for ECAs because by funding renewable energy in DCs, ECAs are increasing the supply of renewable energy into the DC market and indirectly influencing (shown in italics in Table 7) the allocation of FFs in the energy market.

We also consider the implications of the allocation of financial assets in each narrative. If PFs remain indifferent or engage with FF firms, FF equity remains with IC PFs. Conversely, if PFs sell equity to indifferent investors, these assets are reallocated to buyers in ICs and/or DCs. This disperses FF assets multilaterally and shifts the responsibility. Similarly, if aid agencies/ECAs continue supporting FF projects in DCs, relevant financial assets are allocated to both ICs (insurance guarantees) and DCs (direct capital flows to support FF projects)—dispersing FF assets multilaterally. However, if aid agencies/ECAs begin promoting renewable energy projects in DCs, there are no direct capital flows for FF projects to DCs (from aid agencies/ECAs), so FF assets remain allocated in ICs, but financial assets are made available to the renewable energy sector in DCs.

Table 7 Investor choices and implications for allocation

Allocation	Scenario				
	(1) PFs remain climate-indifferent	(2) PFs sell FF to climate-indifferent investors	(3) PFs keep shares and engage FF	(4) ECAs support fossil fuel exports	5) ECAs promote renewables
Resources					
Carbon budget	Firms and DC	Firms and DC	Firms and IC	Firms and DC	*Firms* and *IC*
Financial Assets	IC	IC and DC	IC	IC and DC	IC
Responsibilities					
Mitigation	Firms and DC	Firms and DC	Firms and IC	Firms and DC	*Firms* and *IC*
Adaptation	V. High and DC	V. High and DC	High and Global	V. High and DC	High and Global
Risks					
Ecological	DC and Heightened	DC and Heightened	IC and Reduced	DC and Heightened	IC and Reduced
Financial					
Legal					
Social					

Italics denote indirect impacts

V. High Very High

Allocation of responsibilities to mitigate and adapt to climate change differ between scenarios as well. If PFs either remain indifferent or divest, and if aid agencies/ECAs continue financing FF projects in DCs, the responsibility to mitigate the effects of climate change are directly allocated to FF firms and the ICs/DCs hosting their (forthcoming) projects. Most new investments will probably be in the DCs as they need greater energy supply and have recently stumbled upon valuable FF supplies (Menas Associates 2017). Conversely, if PFs engage with FF firms and if ECAs fund renewable energy projects in DCs, climate change mitigation responsibility is allocated to the same FF firms but simultaneously reallocated to investors in ICs where these firms are. This is once again indirectly true of ECAs, because funding renewable energy initiatives in DCs increases the supply of renewable energy on the market and indirectly allocates the responsibility of climate mitigation to ICs while reducing the mitigation burden of DCs.

Furthermore, in scenarios 1, 2 and 4, the need for continuous climate adaptation becomes very high and increases the cost of adaptation for DCs as they are more vulnerable and susceptible to climate change impacts. Conversely, in scenarios 3 and 5, the necessity to adapt to climate change is slightly reduced.

Finally, the allocation of ecological, financial, legal and social risks varies per investor narrative. In scenarios 1, 2 and 4, FF projects will continue to rise in DCs. This may lead to DCs not wishing to prematurely decommission FF assets (because of the economic repercussions; Knottnerus 2018) and lead to violation of the long-term objective of the Paris Agreement, with all people globally worse-off. However, if DCs implement the Paris Agreement and prematurely decommission FF assets, this will leave them with stranded assets (Bos and Gupta 2018). Economic risks include the need to write-off assets, debt and future asset decommissioning costs. Legal risks include the growing climate change litigation (Peel and Osofsky 2015). Social risks include related health issues (UN Environment 2019) and violations of the rights of indigenous groups in the extractive arena (Bos and Gupta 2018). However, some of these risks are both reduced and allocated to ICs if both PFs directly engage with FF firms and ECAs fund renewable energy projects in DCs, as this spares DCs from accumulating long-lasting FF infrastructure that is destined for premature decommission.

5 Conclusion

This paper shows that there are billions—if not trillions—of funds allocated to the FF sector by ‘indirect’ actors like PFs and ECAs, though these are scarcely the subject of international debate within the climate regime nor are they the subject of extensive scholarship. There continues to be incoherence in the financial flows. We believe that our combined inclusive (access and allocation) development framework enables us to comprehensively analyse the justice issues involved in achieving financial coherence in the global arena.

We have identified social, ecological and economic arguments that need to be considered in making decisions with respect to supporting or hindering financial flows to the fossil fuel and related industry. These arguments could lead to five different choices clustered into five plausible scenarios (1–3 pertaining to PFs and 4–5 pertaining to ECAs): PFs remain neutrally invested in FF; PFs divest from their FF shares; PFs engage with FF firms to alter business as usual; ECAs continue supporting FF projects; ECAs promote renewable energy.

Scenarios 1, 2 and 4 will amplify the risks of stranded assets (and associated debt) or create vested interests in DCs who will subsequently oppose LFFU. These scenarios result in the problematic de facto allocation of economic and ecological risks to the South. In particular, divesting (scenario 2) is problematic when it implies sales to 'climate-indifferent' investors who then have a vested interest in opposing or delaying LFFU; it shifts responsibilities elsewhere while negatively affecting access and allocation. Arguments supporting scenario 1 include that comparable alternative investments to FFs do not yet exist, and for scenarios 2 and 4 include that DCs have a right to development, cheap energy and rapid GDP growth. Scenarios 2 and 4 help IC industries to, inter alia, transfer their FF knowledge and assets to DCs. This amounts to a de facto transfer of the carbon budget to DCs, which is ironic given the continuing reluctance at the global level to discuss how the remaining carbon budget is to be shared de jure within the climate regime.

Scenarios 3 and 5 have positive long-term effects. Scenario 3 (responsible shareholder engagement by PFs) keeps the risk of stranded assets in the rich ICs and uses shareholder power to move the industry out of FF. Responsible shareholders write off the FF assets—such that it neither leads to a collapse of the global financial markets nor does it lead to a breach of the fiduciary responsibility that the PFs have towards their pensioners. Scenario 5 (responsible trade/aid agencies) does not promote FF dependency in DCs because they cannot promote LFFU worldwide by committing to the Paris Agreement while enabling trade and export credits to export fossil dependency. Arguments favouring scenario 5 include, inter alia, that it helps unlock DCs from a prospective and calamitous carbon lock-in.

If the Paris Agreement implies that FF and related infrastructure is destined to become obsolete and hence a stranded asset, the big question is: who is going to bear the cost of stranding these assets? Investors and countries are trying to profit from these doomed assets before prices collapse, which our analysis shows is problematically reallocating risks to the global South. By doing so, the problem of climate change is not resolved as new vested interests will try to hamper the LFFU process. Apart from the equity challenges involved in shifting the risk of fossil fuel lock-in, stranded assets and related economic debt to DCs, is the much bigger risk of losing control over the climate change problem by transferring such assets to DCs. Coherence in financial flows under the Paris Agreement calls for closely examining these flows and the underlying contradictions. Financiers and investors must resist the temptation to provide short-term economic relief to the domestic FF industry and aim short-term fossil fuel generated growth; it will have long-term costs on the global society. ICs and their companies should stop using the 'right to development' as a fig leaf to reduce the risk of domestic stranded assets in ICs and DC governments need to wake up!

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Appendix: Industrialised Country Pension Fund Investments in FF Firms

Pension Fund (PF)	Year	Country	FF Securities (millions)		Source
			Euro	USD	
Local Government PF Scheme	2014	GBR	13,540.00	14,894.00	Fossil Free UK (2019)
Stichting Pensioenfonds ABP	2015	NLD	8400.00	9240.00	Brusa and Schucking (2017)
Stichting Pensioenfonds ABP	2016	NLD	10,400.00	11,440.00	Brusa and Schucking (2017)
Colorado Public Employees Retirement Ass.	2018	USA	1363.64	1500.00	Fossil Free PERA Colorado (2019)
Norway Government PF	2018	NOR	35,952.46	39,547.71	*Norges Bank (2018)
Stichting Pensioenfonds ABP	2018	NLD	9389.50	10,328.45	*ABP (2018)
California Public Employees Retirement System	2018	USA	8843.56	9727.92	*CalPERS (2018)
California State Teachers Retirement System	2018	USA	6671.44	7338.58	*CalSTRS (2018a; 2018b; 2018c)
New York City Common Retirement Fund	2018	USA	4434.59	4878.05	*New York City Comptroller (2018)
Caisse de dépôt et placement du Québec	2018	CAN	4245.10	4669.61	*CDPQ (2018)
Canada Pension Plan	2019	CAN	3723.68	4096.05	*CPPIB (2019a, 2019b)
Pensioenfonds Zorg en Welzijn (PFZW)	2018	NLD	3432.68	3775.94	*PFZW (2019a, b)
AP Fonden 4	2019	SWE	570.05	627.05	*Fjarde AP Fonden (2019)
Fonds de Réserve pour les Retraites	2018	FRA	546.90	601.59	*FRR (2018)
The ATP Group	2018	DNK	424.31	466.74	*The ATP Group (2019a, b)
Teachers Retirement System of New York City	2018	USA	380.10	418.11	*TRSNYC (2018)
AP Fonden 2	2018	SWE	366.12	402.73	*Andra AP Fonden (2019)
AustralianSuper	2018	AUS	353.42	388.77	*Australian Super (2018a, b, c)
AP Fonden 1	2018	SWE	271.60	298.76	*Första AP Fonden (2019)
		Total	113,309.15	124,640.06	

*Computed from

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