

Article

Assessing How Big Insurance Firms Report and Manage Carbon Emissions: A Case Study of Allianz

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Abstract: Carbon management is an important topic for investigation to ensure the accountability of firms in meeting Paris Agreement targets. Transparency and rigorous scrutiny are needed to keep industries on track to accomplish a reduction in greenhouse gas emissions. To maintain a healthy environment, and promote human and ecosystem health, it will be vital to limit global warming to below 2 °C. Allianz presents a good example of carbon management as they are a leading insurance firm that utilises the Global Reporting Initiative (GRI) standards to report their greenhouse gas emissions. Allianz has promoted important initiatives such as the Net-Zero Climate Alliance and made an array of pledges that promote net-zero business operations by 2050. In 2020, Allianz reported greenhouse gas emissions equivalent to 384,178 tCO₂, a 31% reduction in their emissions compared to 2019 figures. Procuring carbon credits is the main mechanism that Allianz has used to reduce their reportable emissions, as well as making investments into renewable energies—wind and solar. This study is limited by the information provided by Allianz and the accuracy in which they have reported their greenhouse gas emissions and emissions reductions. In the last reporting year, Allianz produced the greatest carbon emissions in the EU/USA insurance sector, producing 189,061 tCO₂e more than their closest competitor. To achieve net-zero emissions, Allianz will need to increase their investment into carbon offsets and transition to 100% renewable energy use, while concurrently reducing their investment into coal and gas mining industries. This research gives an insight into the greenhouse gas emissions being produced by insurance/investment firms while also detailing the emissions reduction methods that are being employed. This study synthesises scientific literature with business reports to present a detailed account of industry carbon emissions, emissions reductions, and overall progress towards meeting net-zero pledges, in line with Paris Agreement targets. The recommendations made in this study are based on the information provided by Allianz and are designed to be within the scope of what would be possible for this firm. The aim of this study was to determine the actions and issues in the process of carbon management with a specific focus on Allianz. Key objectives of this research are: 1. To determine the net-zero pledges made by Allianz; 2. To determine the carbon emissions and emissions reductions made by Allianz compared to other firms in the sector; and 3. To determine how these emissions reductions have been achieved.

Keywords: net-zero; corporate sustainability; climate change mitigation; carbon trading



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1. Introduction

Carbon management is important in order to limit global warming to 1.5 °C, in line with the Paris Agreement targets [1]. To achieve this goal, a global reduction in greenhouse gas emissions will be vital [1]. The importance of addressing climate change has become a growing priority for governments, industries, and businesses [2]. Climate change is presenting an area of growing uncertainty for businesses in their future operations [3] and is projected to have detrimental impacts on ecosystems and subsequently, on human lives [4]. Thus, carbon management is important in order to protect human health and, in the specific case of Allianz, to ensure successful future operations amidst uncertainty [3,4].

The objective of transitioning to a low carbon economy has become important around the world, with global communities making commitments to the Kyoto Protocol in 1997 and the Paris Agreement in 2015 [4,5]. The transition to green practices has become prominent due to increasing pressure from stakeholders and market conditions [4]. The need for environmental transparency has also been demanded as a crucial element for stakeholders and investors in order to rationalise expectations for corporate environmental responsibility [4,6].

Allianz is one of the world's 500 largest publicly listed companies and is a leading integrated financial services provider [7,8]. In 2010, it was estimated that 11% of anthropogenic greenhouse gas emissions could be accounted for by these Global 500 companies [8]. A study by Kreibich and Hermwille (2021) found that the finance industry has the highest proportion of companies that have made a pledge of net-zero emissions, compared to a variety of other sectors (real estate, hospitality, automotive, etc.). Finance companies also rely most heavily on carbon offset credits to reduce their reportable emissions [5]. This uptake in carbon neutrality pledges has likely been stimulated by agreements such as the United Nations convened Net-Zero Insurance Alliance [9]. The United Nations Climate Change Conference (COP21) in 2015 was a defining event that led to firms from around the world committing to decarbonise and even divest fossil fuel assets [6]. This paper focuses on carbon management in the insurance and asset management sector. Allianz presents an interesting case study as a significant portion of insurance and investment mechanisms occur online, requiring a substantial expenditure of electricity. Firms that operate in this sector have considerably higher scope two greenhouse gas emissions compared to scope one and scope three. To achieve net-zero emissions in a meaningful way, these firms will need to transition to an electricity network that utilises more renewable energy. A significant number of emissions from Allianz's asset managing portfolio are produced from investments into the coal and gas mining industries. To truly achieve carbon neutrality, big investment firms will need to stop funding these harmful industries and promote a green energy transition.

This research gives an insight into the greenhouse gas emissions being produced by insurance/investment firms while also detailing the emissions reduction methods that are being employed. This study synthesises scientific literature with business reports to present a detailed account of industry carbon emissions, emissions reductions, and overall progress towards meeting net-zero pledges, in line with Paris Agreement targets. The recommendations made in this study are based on the information provided by Allianz and are designed to be within the scope of what would be possible for this firm. The aim of this study is to determine the actions and issues in the process of carbon management with a specific focus on Allianz. Key objectives of this research are: 1. To determine the net-zero pledges made by Allianz; 2. To determine the carbon emissions and emissions reductions made by Allianz compared to other firms in the sector; and 3. To determine how these emissions reductions have been achieved.

2. Results

2.1. The Firm

Allianz is one of the largest insurers and asset managers globally, operating in more than 70 countries with over 100 million corporate and private customers [10]. Allianz was founded in 1890 and has grown to be the top European insurance firm [11] and listed in the top five insurance firms globally, in terms of assets and market capitalisation [12]. In 2020, Allianz reported having 150,269 employees, with 148,929 of those in their core business [10]. Allianz was founded in Germany and has continued to maintain its base of operations in Europe. The greatest proportion of their staff operate out of Germany, followed by France and then England [10]. In 2020, Allianz reported 140.5 billion euros in revenues, with 48% of those revenues coming from their European business [13]. Of Allianz's total revenues, 42% was from property/causality insurance, 53% was from life/health insurance, and 5% was from asset management, culminating to a total profit of 10.8 billion euros [13].

Climate change issues are particularly relevant for this firm as they are a leading insurance company. As climate change effects human health and property, insurance policies will have to change, and the financial burdens associated with them will likely increase [4,14]. Allianz's biggest business portfolio is life and health insurance, thus as global climate change impacts develop and worsen, there will be a negative impact on human health—which will affect their business model [14].

2.2. Pledges

Allianz has pledged to reach net-zero greenhouse gas emissions in their proprietary investment portfolio by 2050 [14]. They have pledged to deliver and promote the goals of the Paris Agreement, to limit global warming to 1.5 °C [14]. Allianz has committed to fully phase out coal-based business models by 2040, starting with the 2023 intermediary goal of no longer insuring or investing in companies that exceed thresholds for thermal coal mining or energy use and production [14]. Alongside this, Allianz has also set a target to achieve 100% green electricity within Allianz Group operations by 2023 [14]. Allianz recently made a commitment to the Net-Zero Asset Owner Alliance (AOA) and the Net-Zero Insurance Alliance (NZIA), that will be launched at the Glasgow United Nations Climate Change Conference 2021 [15]. The NZIA pledges to uphold the Paris Agreement targets and defines a framework of regulations and guidelines to meet these goals [9].

These pledges have been made by Allianz as they recognise that climate change will trigger adverse societal and environmental impacts that may lead to acute or chronic conditions affecting human health and property [14]. They have determined that climate change risks will likely impact their business in two key ways. Firstly, climate change is anticipated to impact insurance policies, such as policies that cover health impacts and property damage [14]. Secondly, Allianz holds significant stakes in an array of economies, companies, infrastructure, and real estate that may be affected by the physical impacts of climate change as well as the transition to a low carbon economy [14]. Allianz recognises that there will likely be an increase in tariffs on carbon emissions that may prove costly to their future business revenues, especially in addition to the current European Union emissions trading scheme [7,16]. Thus, they have proactively adopted climate change response strategies to avoid future losses in revenue and profits.

2.3. Emissions Estimates

Allianz has reported their emissions following the GRI 302 (energy) [17] and GRI 305 (emissions) standards [18]. The scope one emissions reported by Allianz, and other firms in the sector, encompass both stationary and mobile combustion. Scope two emissions are generally reported as market and location based, while scope three emissions encompass travel, paper usage and related upstream emissions [19].

Tables 1–3 show that amongst the top three insurance firms, emissions are declining over time. The emissions of Allianz over the past three years can be seen in Figure 1, which displays a reduction in all areas from 2018 to 2020. Overall, Allianz has the highest carbon emissions, with especially high scope two emissions. Cigna has reported more scope two (market) emissions than Allianz but performs better than both Allianz and AXA with their scope one and scope three emissions. Allianz made an additional scope three emissions estimate, not undertaken by the other leading firms. They measured financed emissions from their listed equity and corporate bonds portfolio, which for 2020 was estimated to be 23,241,052 tCO₂e [14]. These emissions have not been included in their scope one, two, or three reporting. Overall, Allianz reported a 62% reduction in emissions since 2010, not inclusive of financed emissions [14].

Figure 2 displays the emissions of Allianz compared to two other insurance firms of similar size, while their revenues have been compared in Figure 3. It can be seen in Figure 2, that scope two emissions account for the majority of emissions in this sector. Figure 3 compares the revenues of six major insurance/investment firms that operate out of the

USA and EU, while Figure 4 compares the emissions reductions made by each of these firms [14,20–24].

Table 1. Allianz greenhouse gas emissions for the past three years categorised by source [14].

Type of Emissions	Source	Units	2020	2019	2018
Scope 1	Direct GHG emissions	tCO ₂ e	28,714	42,011	46,734
Scope 2	Indirect GHG emissions (market based)	tCO ₂ e	100,722	142,563	159,181
Scope 2	Indirect GHG emissions (location based)	tCO ₂ e	180,826	224,315	239,132
Scope 3	Other indirect GHG emissions	tCO ₂ e	73,916	149,459	167,533

Table 2. AXA greenhouse gas emissions for the past three years categorised by source [20,25].

Type of Emissions	Source	Units	2020	2019	2018
Scope 1	Direct GHG emissions	tCO ₂ e	26,292	37,889	38,778
Scope 2	Indirect GHG emissions (market based)	tCO ₂ e	40,894	67,765	69,260
Scope 2	Indirect GHG emissions (location based)	tCO ₂ e	64,924	88,558	95,476
Scope 3	Other indirect GHG emissions	tCO ₂ e	17,460	90,584	64,948

Table 3. Cigna greenhouse gas emissions for the past three years categorised by source [21].

Type of Emissions	Source	Units	2020	2019	2018
Scope 1	Direct GHG emissions	tCO ₂ e	12,814	16,894	10,961
Scope 2	Indirect GHG emissions	tCO ₂ e	116,420	119,427	58,992
Scope 3	Other indirect GHG emissions	tCO ₂ e	7765	23,693	21,371

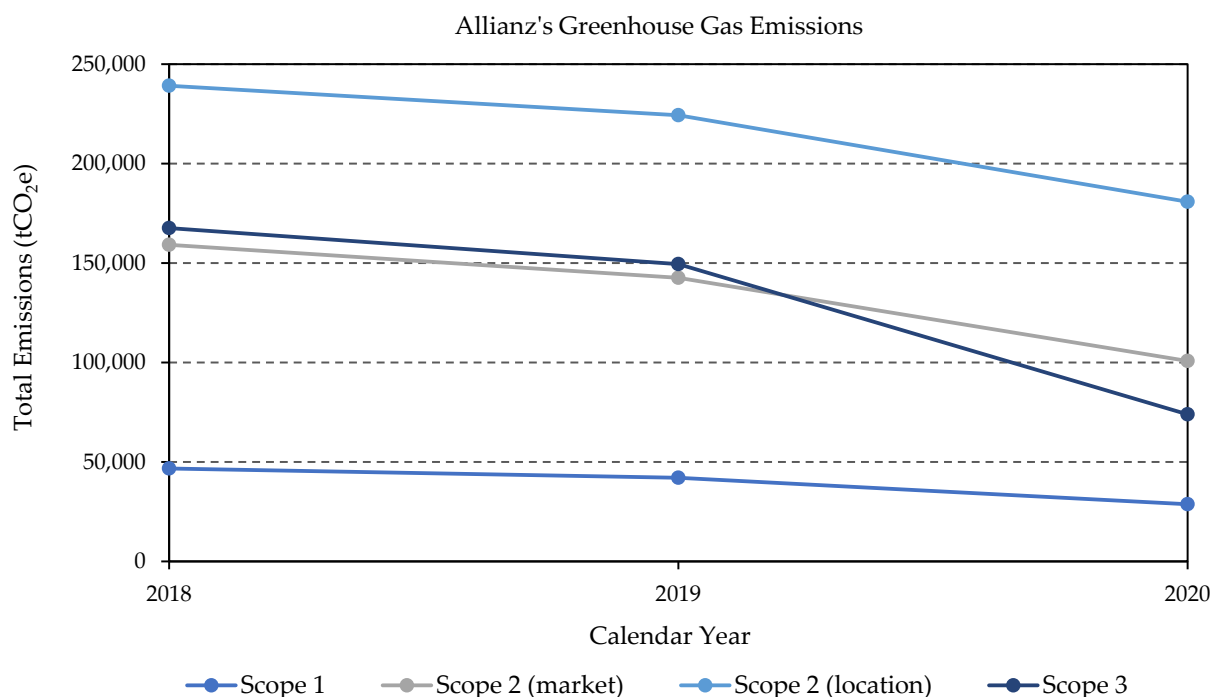


Figure 1. Allianz’s greenhouse gas emissions over time [14].

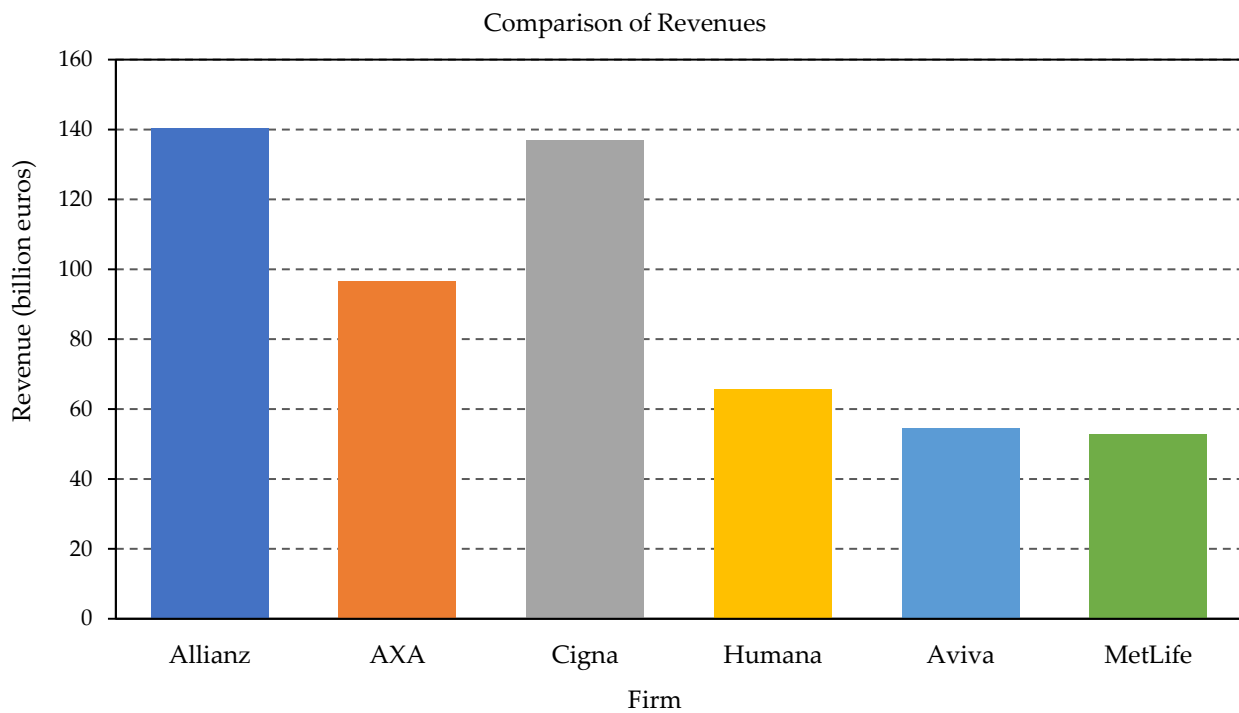


Figure 2. Comparison of greenhouse gas emissions between three top insurance firms in 2020 [14,21,25].

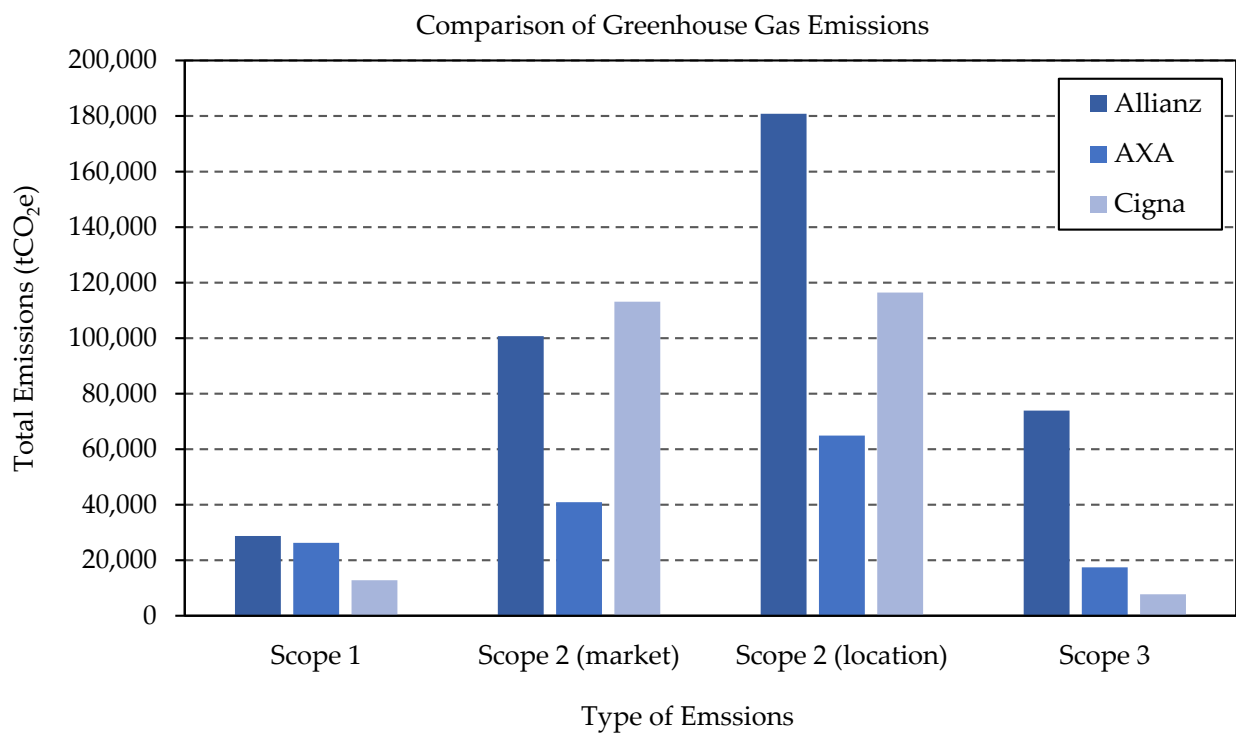


Figure 3. Revenues for 2020 of six of the largest global insurance firms that operate out of the USA and EU [14,20–24].

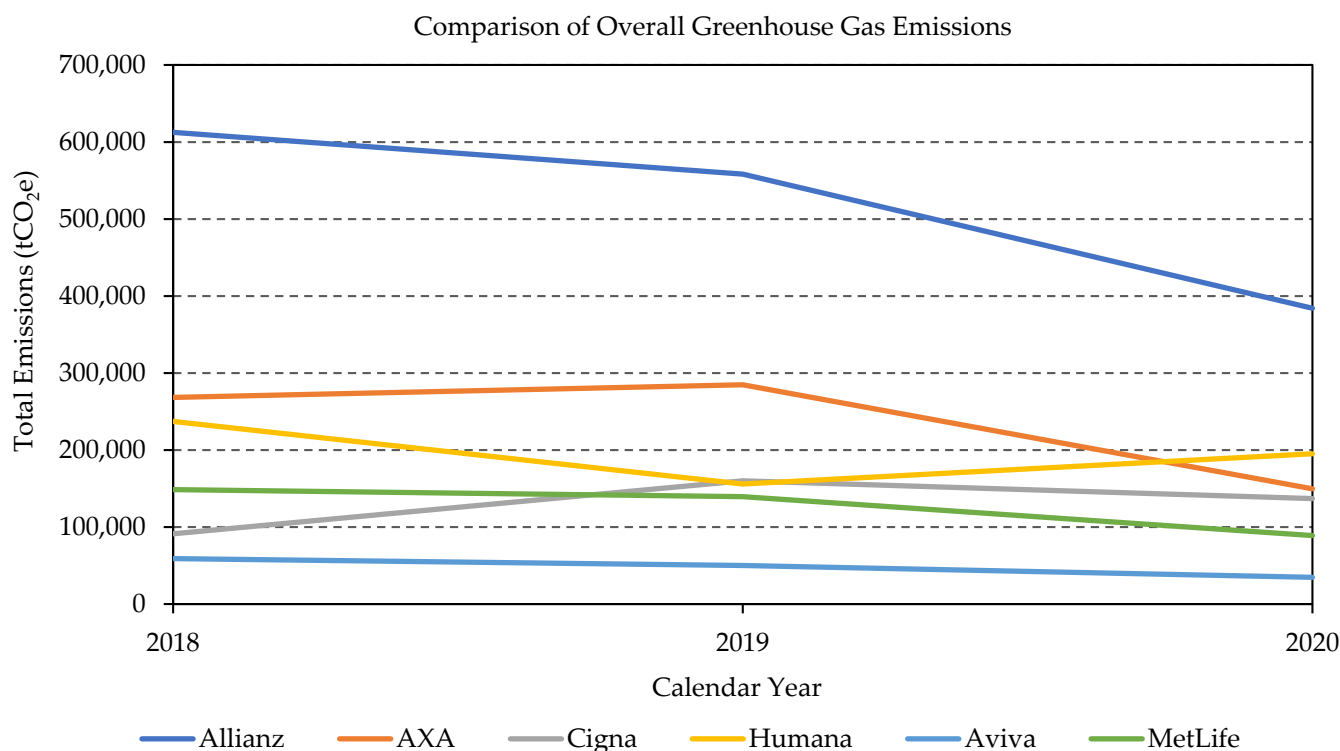


Figure 4. Comparison of the total greenhouse gas emissions by firm over the past three years [14,20–24].

2.4. Emissions Reductions

Allianz has reported that their operations have been carbon-neutral since 2012 [14]. This has been achieved through investments in projects that offset their operational emissions [14]. In 2020, Allianz reported 203,352 tCO₂e in carbon offsets, sourced from investing in low-carbon initiatives [14]. Instead of simply buying carbon credits on the carbon market, Allianz directly invests in high-quality carbon projects, which are used to neutralise their carbon footprint [19]. One carbon credit accounts for one metric ton of carbon avoided, thus in 2020, 203,352 carbon credits were retired from their projects, equal to 203,352 tCO₂e [19]. The investments made by Allianz were into the protection of existing rainforests (Wildlife Works Carbon and Rimba Raya), to maintain important carbon sinks [14]. Allianz holds a ten percent share in Wildlife Works Carbon (WWC); the exact monetary sum is undisclosed [14]. WWC is a leading developer of reducing carbon emissions from deforestation and forest degradation (REDD) projects [14]. Investment in WWC supports forest protection in the Democratic Republic of Congo (DRC) and in Kenya [14]. The Kenyan REDD project aims to offset one million tons of carbon emissions annually, while the DRC project offsets approximately 5.7 million tons of carbon emissions annually [14]. Allianz first began investing in the Rimba Raya project in 2013 [14]. This is a REDD+ project that aims to reduce emissions from deforestation and forest degradation as well as promote the conservation of forest carbon stocks [14]. This project occurs in Borneo and has helped prevent deforestation of almost 65,000 hectares of peat swamp [14]. It is the largest project of its kind and aims to avoid over 130 million tons of carbon emissions [14].

Allianz has also worked to reduce their greenhouse gas emissions by making improvements in their energy efficiency and increasing the share of renewable energy in their energy mix [14]. In 2020, Allianz invested 6.8 billion euros into renewable energy while in 2019, 7.2 billion euros were invested [14]. The investment made by Allianz was into 116 wind and solar parks, aiming to promote a green energy transition [14]. In total, 39.3 billion euros were invested into sustainability-themed investments by Allianz in 2020 [14]. 18.3 billion euros were invested into green buildings, 13.8 billion euros into a variety of sustainable bonds, and 0.4 billion euros in other ‘green’ investments [14]. Allianz

has increased their sustainable investments from 29.5 billion euros in 2019 to 39.3 billion euro in 2020 [14]. Furthermore, Allianz increased the sustainable third-party investment assets that they manage from 157.7 billion euros in 2019, to 231.9 billion euros in 2020 [14]. In 2020, 57 percent of the electricity used in Allianz's operations came from renewable, low-carbon sources [14]. This is an eight percent increase from their 2019 renewable energy use [14].

Finally, Allianz has worked to reduce their greenhouse gas emissions in their business travels [14]. In 2020, 26 percent of Allianz's operational greenhouse gas emissions were from business travel [14]. In 2019, this was 37 percent [14]. The reduction in business travel in 2020 was largely due to the COVID-19 pandemic causing limited travel, but is a strategy that Allianz has put forward to reduce their emissions in the future [14]. Overall, the principal method that Allianz has used to reduce their emissions is through investment into carbon offset programs. Allianz has only provided the emissions reduction figures for the carbon offsets achieved through these investments and have not disclosed their monetary values. While Allianz has also made efforts to reduce carbon emissions in their workforce travel and through promoting and investing in renewable energy, the number of emissions reductions achieved through these methods are largely undisclosed. Figure 4 shows that, compared to other firms in the sector, Allianz has achieved the greatest results in reducing carbon emissions in the past three years. The emissions reductions made by Allianz follow similar methods employed by other firms in the sector. AXA and Cigna both reported using carbon offsets as a main method in reducing their reportable emissions as well as trying to increase their operational efficiency to reduce scope two emissions [20,21].

3. Discussion

A study by Liesen et al. (2017) found that companies that accurately report their greenhouse gas emissions in line with GRI standards generate significance risk-adjusted abnormal returns. Comparatively, major firms that provide incomplete reports are penalised on the financial markets [26]. Thus, it is in the best interests of large institutions to accurately disclose their emissions and report on their management strategies [26]. There is a growing emergence of carbon disclosure being an integral decision-making factor when considering large investments [27]. Allianz has followed recommendations from the G20 Financial Stability Board's Task Force on Climate-related Financial Disclosures (TCFD) and the United Nations Net-Zero Asset Owner Alliance (AOA) [14]. Allianz's approach to reporting greenhouse gas emissions appears to be the most rigorous and transparent across the sector. Not only has Allianz reported scope one, two, and three emissions, they have also estimated the emissions financed through investments. Allianz has also been the most transparent firm in reporting and detailing the sources of their emissions reductions. They are an industry leader in promoting emissions reductions, joining the Net-Zero Insurance Alliance (NZIA) with only seven other insurance firms while also becoming a signatory to the United Nations Principles for Sustainable Insurance [14]. These alliances have been formed in an effort to pool expertise to reach Paris Climate goals [9].

The emissions estimates by Allianz appear to be both accurate and reliable, using GRI 302 and GRI 305 reporting standards. It must be noted that these estimates were completed internally by the Allianz Group, so considerations must be made on the accuracy and transparency from company subjectivity. When comparing the emissions of Allianz to other firms in the sector, their reportable emissions are much greater; this lends to the belief that they either have significantly more emissions than any other insurance firm or that other firms are under-reporting their own emissions. Good carbon management can be seen as reducing emissions generated by a company as well as investing in projects that will lead to a reduction in carbon emissions [5]. Allianz's investment in carbon offsetting projects have produced significant results in companywide emissions reductions. Direct investments into carbon abatement projects have offset 53% of Allianz's 2020 greenhouse gas emissions [14]. The sustainable targets set by Allianz have also promoted new investments into sustainable business opportunities, such as renewable power supplies, as well as promoted stronger

stakeholder relations and relationships with other organisations. Compared to other firms, the performance by Allianz is industry-leading, especially when considering their input into United Nations lead projects. Allianz has consistently reported their emissions and made actions into investing in new sustainable solutions in many aspects of their business. When considering the size of Allianz against its smaller competitors—Aviva, Humana, and MetLife—Allianz's performance is almost on par. Unfortunately, when Allianz is compared to their biggest competitors—Cigna and AXA—its environmental performance is very disappointing, with much larger reported greenhouse gas emissions than other firms. Overall, their carbon management practices are in line with industry standards, even going above and beyond what is expected of them [28]. Thus, the overall opinion put forward by this report is that Allianz has done an adequate job in managing their carbon emissions.

There are multiple areas where Allianz could make significant improvements in their carbon management and reporting. Allianz has not reported on the financial cost of their investments into Wildlife Works Carbon and Rimba Raya and has not disclosed the carbon abatements received from investing in other sustainable projects and renewable energies. Allianz has also not included financed emissions in their own scope three emissions. If these emissions were included, their carbon footprint would be significantly larger and require a much higher investment into carbon management strategies. Allianz has made positive steps in the transition away from the coal and gas industries, which has been viewed favourably by stakeholders and investors. Overall, Allianz has presented a wealth of information and data on the efforts made to promote Paris Agreement targets. The main area of improvement they could make would be in clearly presenting the costs of emissions reductions and how each investment has specifically reduced reportable emissions. The transition that Allianz has started to make into renewable energies addresses the considerable climate risk that arises from coal and gas-based energy sources. Their pledges to reduce investments into the coal and gas industries and reach 100% green energy, are important targets in achieving net-zero by 2050 and promoting a sustainable business model. The transparency presented by Allianz supports its licence to operate, even with the large greenhouse gas emissions made by the company. They are an interesting case of large emissions but also of large emissions reductions.

4. Conclusions

This study analysed the emissions reporting of a leading global insurance firm—Allianz. It found that Allianz emitted 384,178 tCO₂e in 2020, 189,061 tCO₂e more than their closest competitor. Whilst Allianz may have the largest greenhouse gas emissions in the sector, they also have the largest reported emissions reductions, shrinking emissions by 228,402 tCO₂e in three years. This study was limited by the transparency in key sources of information. Emissions were reported and published internally by Allianz; thus, reports were not generated by an objective third party. It is unknown how skewed the results may be and if there are undisclosed emissions that were not reported. Liesen et al. (2017) and Schiemann and Sakhel (2018) suggest that accurately reporting greenhouse gas emissions is in the best interests of firms as it promotes strengthened stakeholder relationships and places firms positively in the eyes of investors. We recommend that Allianz employs a third-party entity to report on their carbon footprint, to increase transparency and ensure reliable and rigorous findings. Furthermore, Allianz will need to significantly reduce their emissions to be on an equivalent level with other firms in the sector. To reduce emissions, it is recommended that Allianz follow through on their pledges and transition to 100% renewable energy and phase out their coal-based business models. Allianz will also need to keep reducing their scope three emissions relating to business travel and continue investing in carbon offsets, to achieve net-zero emissions by 2050.

In a global context, this work could be used in an assessment of how different industries are contributing to climate change and how they are working to reduce those emissions. This paper could also be used by other firms in the sector to assess how they

compare to Allianz in terms of emissions and emissions reductions. This paper provides insight into where significant greenhouse gas emissions are coming from, broken down into scope one, scope two, and scope three emissions. This will allow global actors to target the insurance and investment industries for emissions reduction policies.

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References

- Duscha, V.; Denishchenkova, A.; Wachsmuth, J. Achievability of the Paris Agreement targets in the EU: Demand-side reduction potentials in a carbon budget perspective. *Clim. Policy* **2018**, *19*, 161–174. [CrossRef]
- Stuhlmacher, M.; Patnaik, S.; Streletskiy, D.; Taylor, K. Cap-and-trade and emissions clustering: A spatial-temporal analysis of the European Union Emissions Trading Scheme. *J. Environ. Manag.* **2019**, *249*, 109352. [CrossRef] [PubMed]
- Lee, S.-Y.; Klassen, R.D. Firms' Response to Climate Change: The Interplay of Business Uncertainty and Organizational Capabilities. *Bus. Strategy Environ.* **2016**, *25*, 577–592. [CrossRef]
- Giannarakis, G.; Zafeiriou, E.; Sariannidis, N. The Impact of Carbon Performance on Climate Change Disclosure. *Bus. Strategy Environ.* **2017**, *26*, 1078–1094. [CrossRef]
- Kreibich, N.; Hermwille, L. Caught in between: Credibility and feasibility of the voluntary carbon market post-2020. *Clim. Policy* **2021**, *21*, 939–957. [CrossRef]
- Lister, J. The Policy Role of Corporate Carbon Management: Co-regulating Ecological Effectiveness. *Glob. Policy* **2018**, *9*, 538–548. [CrossRef]
- Allianz, S.E. *Allianz Group Annual Report 2020*; Allianz Group: Munich, Germany, 2021; pp. 1–256.
- Doda, B.; Gennaioli, C.; Gouldson, A.; Grover, D.; Sullivan, R. Are Corporate Carbon Management Practices Reducing Corporate Carbon Emissions? *Corp. Soc. Responsib. Environ. Manag.* **2016**, *23*, 257–270. [CrossRef]
- UN Environment Program. *The Net-Zero Insurance Alliance*; United Nations: Nairobi, Kenya, 2021; pp. 1–4.
- Allianz, S.E. *People Fact Book 2020*; Allianz Group: Munich, Germany, 2021; pp. 1–57.
- ADV Ratings. Top Insurance Companies in Europe. Available online: <https://www.advratings.com/insurance/top-insurance-companies-in-europe> (accessed on 16 September 2021).
- Commercial Insurance. Top 10 Global Insurance Companies By Revenues. 2020. Available online: <https://www.iii.org/publications/commercial-insurance/rankings> (accessed on 16 September 2021).
- Allianz, S.E. *Allianz Starter Kit: Group Investor Relations*; Allianz Group: Munich, Germany, 2021; pp. 1–15.
- Allianz, S.E. *Collaborating for a Sustainable Future*; Allianz Group: Munich, Germany, 2021; pp. 1–133.
- Rojas, M. Allianz Affirms Commitment to Addressing Climate Change. Available online: <https://www.allianz.com.au/media/news/2021/allianz-affirms-commitment-to-addressing-climate-change> (accessed on 16 September 2021).
- Wang, J.; Gu, F.; Liu, Y.; Fan, Y.; Guo, J. Bidirectional interactions between trading behaviors and carbon prices in European Union emission trading scheme. *J. Clean. Prod.* **2019**, *224*, 435–443. [CrossRef]
- Global Reporting Initiative. *GRI 302: Energy 2016*; GRI Standards: Amsterdam, The Netherlands, 2016; pp. 1–16.
- Global Reporting Initiative. *GRI 305: Emissions 2016*; GRI Standards: Amsterdam, The Netherlands, 2016; pp. 1–23.
- Allianz, S.E. *Environmental Management at Allianz Group*; Allianz Group: Munich, Germany, 2021; pp. 1–5.
- AXA. *Climate Report: The Decisive Decade*; AXA Group: Paris, France, 2021; pp. 1–82.
- Cigna. *The Power of Purpose*; Cigna Connects: Bloomfield, CT, USA, 2021; pp. 1–146.
- MetLife. *2020 Sustainability Report*; MetLife Services and Solutions: New York, NJ, USA, 2021; pp. 1–168.
- Aviva. *Creating a Better Tomorrow*; Aviva Insurance Limited: London, UK, 2021; pp. 1–37.
- Humana. *Corporate Social Responsibility Report*; Humana Incorporated: Louisville, KY, USA, 2021; pp. 1–19.
- AXA. *Universal Registration Document 2020*; AXA Group: Paris, France, 2021; pp. 1–488.

26. Liesen, A.; Figge, F.; Hoepner, A.; Patten, D.M. Climate Change and Asset Prices: Are Corporate Carbon Disclosure and Performance Priced Appropriately? *J. Bus. Financ. Account.* **2017**, *44*, 35–62. [[CrossRef](#)]
27. Schiemann, F.; Sakhel, A. Carbon Disclosure, Contextual Factors, and Information Asymmetry: The Case of Physical Risk Reporting. *Eur. Account. Rev.* **2018**, *28*, 791–818. [[CrossRef](#)]
28. Secinaro, S.; Brescia, V.; Calandra, D.; Saiti, B. Impact of climate change mitigation policies on corporate financial performance: Evidence-based on European publicly listed firms. *Corp. Soc. Responsib. Environ. Manag.* **2020**, *27*, 2491–2501. [[CrossRef](#)]