

The contribution of the banking and insurance industry to climate change: a case study of carbon-neutral commodities

Chih-Jen Wang*

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Abstract

This article reviews the important international efforts to address climate change and protect biodiversity, with a particular focus on the key role played by the banking and insurance industry in this global challenge. From the Kyoto Protocol to the Paris Agreement, and including related initiatives such as ESG (Environmental, Social, and Governance) and TCFD (Task Force on Climate-related Financial Disclosures), the international community is consistently striving to advance carbon emissions management and climate risk mitigation. In this context, the banking and insurance industry is transforming from traditional financial support to a promoter of sustainable finance, committed to providing financial services in line with the Sustainable Development Goals of United Nations.

This paper further analyzes the specific actions of the insurance industry in responding to climate change. In addition to its investment efforts, the insurance industry is actually involved in carbon management and decarbonization through innovative products and services, such as solar insurance and carbon neutral commodities. In particular, this paper introduces in detail the design and implementation of a new type of insurance product, an indemnity insurance to cover the cost of accidental greenhouse gas emissions emphasizing its importance in compensating for losses caused by accidentally increased carbon emissions and preventing the risk of carbon leakage.

Finally, this paper proposes the potential contribution of the insurance industry in promoting green procurement, emphasizing its role in promoting the greening of supply chains in the future. Overall, this paper calls for more insurance institutions to join the ranks of climate change response and points out the positive role and potential contribution that the insurance industry can play in this process.

Keywords: Climate Change, Finance and Insurance, Sustainable Finance, Carbon Emissions Management, Green Procurement

Corresponding*, Senior Risk Manager, Southeast Asia, Wilson Re (Taiwan) Limited, 3F, No. 181, Minquan E. Rd., Songshan, Dist., Taipei 105002, Taiwan (R.O.C.), Email: richardwang@wilsonre.com.tw

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Introduction

Background

With the increasing severity of global climate change, the international community has gradually paid more attention to carbon emissions management and climate risk management. Extreme weather and ecological changes brought about by climate changes on human societies and natural ecosystems have had a profound impact. In this context, the banking and insurance industry, as one of the important economic pillars, has been forced to re-examine its role and responsibility in addressing climate changes. In the past, the banking and insurance industry focused primarily on risk transfer and capital flows, but now its role has expanded to promote sustainability and carbon emissions management.

Research Motivation

This study explores the specific actions and actual contributions of the banking and insurance industry in addressing climate change. Although a series of international climate agreements and carbon emissions management mechanisms have been put in place (Schneider & La Hoz Theuer, 2019), the actual participation and contribution of the insurance industry in this area are still relatively vague. Therefore, it is necessary to conduct an in-depth study on the role of the insurance industry in the response to climate change, to explore its specific actions, challenges, and future development directions.

Purpose of the study

This study analyzes the role and contribution of the banking and insurance industry in climate change response and discusses its practical actions in carbon emissions management, sustainable finance, and green procurement. Specific objectives include:

- 1) Explore how the insurance industry can actively participate in climate change response
- 2) Analyze the specific measures and effects of the insurance industry in carbon emissions management and sustainable finance;
- 3) Discuss the role of the insurance industry in promoting green procurement.

Contribution to this study

This paper deeply explores the role and contribution of the banking and insurance industry in climate change response, which has important theoretical and practical value for promoting the insurance industry to actively participate in climate change response and promote the transformation of the banking and insurance industry from traditional finance to sustainable finance. At the same time, this study can also provide reference and suggestions for relevant policy formulation and practice, and promote the banking and insurance industry to better fulfill its social responsibilities and jointly respond to the challenges of global climate change.

Literature Review

Greenhouse Effect Management Regulations

International agreements

In the process of responding to the challenge of climate change, countries have actively formulated and implemented a series of greenhouse effect management regulations. These regulations aim to regulate and manage greenhouse gas emissions and promote carbon emissions reduction and climate risk management. Typical regulations include:

(1) Kyoto Protocol: It aimed to reduce greenhouse gas emissions, especially from industrialized countries in 1997 (COP 3). The agreement establishes specific emission reduction targets and implementation mechanisms (Kim et al., 2020).

(2) Paris Agreement: The annual adoption aims to limit the global average temperature rise to not more than Celsius 2 degrees above pre-industrial levels and strive to achieve Celsius 1.5 degrees above pre-industrial levels in 2015 (COP 21). The agreement requires countries to submit specific emissions reduction targets and action plans (Liu et al., 2020)

Regional laws and regulations

Countries have also enacted a series of domestic laws and regulations to address the challenges of climate change, such as:

European Union Carbon Trading Market

It has been implemented since 2005 and is the world's first carbon trading mechanism, which formally gives carbon emissions rights to the trading price, the so-called carbon price. Such a market, the mechanism has been effective in encouraging companies to reduce their emissions while creating an emerging financial market (Zhang & Wei, 2010).

International initiatives and action plans

The international community is increasingly concerned about climate change and has developed several initiatives and action plans to address greenhouse gas emissions. These initiatives include:

Table 1 International Initiatives on Climate Change

Abbreviation	Full Title	Year	Reference
CDM	Clean Development Mechanism	1980	(Burian, 2006) The Clean Development Mechanism, Sustainable Development and its Assessment, HWWA-Report 264, ISSN 0179-2253.
CPM	Customer Data Platform		

Table 1 Cont.

Abbreviation	Full Title	Year	Reference
EPs	Equator Principles	2003	Conley and Williams (2011). Global banks as global sustainability regulators?: The equator principles. <i>Law & Policy</i> , 33(4), 542-575.
II	Impact Investing	2007	Crédit Agricole CIB (2019). Launch of the first Sustainability-Linked Bond for Enel.
SASB	Sustainability Accounting Standards Board	2011	Schooley and English (2015). SASB: A pathway to sustainability reporting in the United States. <i>The CPA Journal</i> , 85(4), 22.
PSI	Principles for Sustainable Insurance	2012	Scordis et al. (2014). Principles for sustainable insurance: Risk management and value. <i>Risk Management and Insurance Review</i> , 17(2), 265-276.
IIR	International Integrated Reporting Framework	2013	International Integrated Reporting Council – IFRS Foundation.
RE100	Renewal Energy 100	2014	The Climate Group and Carbon Disclosure Project (CDP).
SBTi	Science Based Target initiative	2015	SBTs (2022). Science Based Targets initiative.
PRI	Principles for Responsible Investment	2005	Gond and Piani (2013). Enabling institutional investors' collective action: The role of the principles for responsible investment initiative. <i>Business & Society</i> , 52(1), 64-104
PCAF	Partnership for Carbon Accounting Financials	2015	Ascuri and Lovell (2012). Carbon accounting and the construction of competence. <i>Journal of Cleaner Production</i> , 36, 48-59.
PRB	Principles for Responsible Banking	2019	Griffiths and Griffiths (2021). To be or not to be: Principles for responsible banking. <i>Corporate Governance in the Knowledge Economy: Lessons from Case Studies in the Finance Sector</i> , 181-210.

Table 1 Cont.

Abbreviation	Full Title	Year	Reference
GRI	Global Reporting Initiative	2016	Wright (2009). Setting standards for responsible banking: examining the role of the International Finance Corporation in the emergence of the Equator Principles. <i>In International Organizations in Global Environmental Governance</i> (pp. 65-84). Routledge.
TCFD	Task Force on Climate-related Financial Disclosures	2017	Force (2017). Climate-related Financial Disclosures.
PBAF	Partnership for Biodiversity Accounting Financials	2022	Addison et al. (2019). Using conservation science to advance corporate biodiversity accountability. <i>Conservation Biology</i> , 33(2), 307-318.
TNFD	Task Force on Nature-related Financial Disclosures	2023	Board (2017). Recommendations of the task force on climate-related financial disclosures.
TIFD	Task Force on Inequality-related Financial Disclosures	2024	Cort and Nascimento (2022). Disclosure of Corporate Risk from Socio-Economic Inequality. <i>Available at SSRN 4018590</i> .

These initiatives and action plans have played an important role in driving global climate action, prompting companies and financial institutions to be more proactive in addressing the challenges of climate change.

The impact of greenhouse effect regulations on the financial sector

With the increasing impact of climate change on the financial industry, governments and regulators have begun to formulate corresponding climate change adaptation regulations to protect the stability and sustainable development of the financial system. These regulations typically include the following:

- 1) Risk assessment and disclosure requirements, which require financial institutions to assess and disclose climate-related risks, such as the likely impact of climate events on asset values and liabilities;

2) Climate risk management requirements require financial institutions to formulate and implement corresponding climate risk management policies and procedures to cope with the uncertainty and volatility brought about by climate change.

3) The establishment of a climate change supervision and supervision mechanism strengthens the supervision and supervision of financial institutions on climate change, and ensures that they fulfill their corresponding social responsibilities and climate risk management functions.

The implementation of these regulations will have a profound impact on the business strategy and risk management of the banking and insurance industry, prompting it to pay more attention to climate risk management and sustainable development, so as to better cope with the global climate change challenge. First of all, international agreements such as the Kyoto Protocol and the Paris Agreement. (Kim et al., 2020; Liu et al., 2020) will have an impact on the financial industry. Second, it will explore how governments and regulators can develop laws and regulations to regulate the climate risk management and sustainability practices of financial institutions. Finally, the impact of greenhouse effect regulations on the strategies and business models of the financial industry will be discussed, as well as the corresponding measures taken by financial institutions to address the challenges of climate change.

Research Concept

Innovative application of financial products and climate change adaptation

Greenhouse gas emissions and innovative applications of financial commodities

Studying the impact of greenhouse gas emissions on business and society? It proposes how to use the innovative application of financial products to help enterprises promote climate change adaptation. Discuss the cost structure of the increase in carbon emissions, including the cost of carbon emissions verification and verification of accidents and the cost of carbon credit by CDM specifications. At the same time, how to design financial commodities to cover these costs and the application prospects of financial commodities in carbon neutrality and climate risk management are discussed.

Risk and feasibility analysis of financial products

In-depth analysis of the risks and viability of new financial instruments. Assess the various risks that this financial product may face, including market risk, operational risk and legal risk. At the same time, the feasibility of this financial product is discussed, including market demand, product design return on investment, etc., to ensure its effective operation and promotion in the market.

Potential impact of financial instruments and policy recommendations

Analyze the potential impact of new financial products on financial markets and global climate change governance, and put forward corresponding policy recommendations and prospects. Discuss the

impact of this financial product on the business model and risk management of financial institutions, as well as the positive impact on climate change adaptation and the achievement of carbon neutrality goals. At the same time, we will propose corresponding measures that should be taken by governments, regulators and financial institutions to promote the development and application of this financial product.

Promotion and application of financial products on climate change

Roles and Responsibilities of Financial Institutions

1) Roles & Responsibilities Financial institutions play an important role in the promotion and application of climate change financial products and have corresponding responsibilities. Firstly, the importance and necessity of climate change adaptation and the realization of carbon neutrality goals are analyzed. Secondly, the social responsibility and moral obligations of financial institutions in promoting the development of climate change financial products are discussed. Finally, this paper explores how financial institutions can promote the promotion and application of climate change financial products through internal management and external cooperation.

2) Importance and Necessity Financial institutions play a key role in climate change adaptation and achieving carbon neutrality goals. First, they can mitigate the economic and social impacts of climate change by providing financial and investment support to promote the development and implementation of climate-friendly projects. Second, financial institutions can help companies and individuals deal with the risks brought about by climate change and protect their assets and investments through risk assessment and management. Finally, financial institutions can also promote the development and application of the carbon market through financial innovation and product design, and promote the reduction of carbon emissions and the realization of climate goals.

3) Social Responsibility and Moral Obligation As an important social and economic participant, financial institutions should bear corresponding social responsibilities and moral obligations. First of all, they should be aware of the serious impact of climate change on people and the planet, and actively participate in climate action to fulfill their responsibilities for sustainable development and environmental protection. Second, financial institutions should follow ethical guidelines and principles to ensure that their business activities are in line with social values and ethical standards and do not have a negative impact on the environment and society. Finally, financial institutions should also actively participate in climate change disclosure and transparency, providing investors and stakeholders with accurate and reliable information to facilitate the assessment and management of climate risks.

4) Promotion and Application Financial institutions can promote the promotion and application of climate change financial products through internal management and external cooperation. First, they can develop policies and guidelines that encourage the active participation of internal departments and employees in climate action and promote the development and application of climate-related products

and services. Second, financial institutions can also work together with stakeholders such as governments, enterprises, and non-governmental organizations to jointly promote the development and application of climate change financial products and achieve climate goals. Finally, financial institutions should strengthen cooperation with international organizations and standard-setting bodies to promote the construction and improvement of the global climate financial system and promote global cooperation and coordination of climate action.

Government Policies and Market Environment

In this process, in addition to the contribution of the insurance industry in terms of "investment", it is difficult to summarize the "specific actions" in which it has actually participated. For example, products such as comprehensive solar insurance (household and commercial), comprehensive engineering insurance for new and renewable energy, performance guarantee insurance for corporate bonds issued due to industrial transformation, and environmental pollution insurance, as well as the use of online insurance and electronic insurance policies can all be considered relevant measures. However, the effect of these measures on the actual help of decarbonization may be limited, and these measures are not widespread and mature in different jurisdictions and economic maturity levels. Perhaps the in-depth research and application of carbon credit will be a more promising direction.

Analyze the impact and role of government policies on the promotion and application of climate change financial commodities. First, it will discuss the relevant measures and policies adopted by the government in financial regulation, climate change governance and green finance policies. Second, it will discuss how governments can promote the market development and application of climate change financial products through laws and regulations, fiscal policies and financial incentives. Finally, the cooperation mechanisms and models between the government and financial institutions, enterprises and social organizations will be analyzed to promote the promotion and application of climate change financial products.

Social Participation and Public Education

The importance and role of social participation and public education in the promotion and application of financial products on climate change are noteworthy. First, it is necessary to analyze the attention and participation of social organizations, non-governmental organizations and the public in climate change financial products. Second, we will discuss how to increase public awareness and acceptance of climate change financial products through public education and social advocacy. Finally, the roles and responsibilities of social organizations and the public in the development and application of climate change financial products will be discussed, and how to promote the promotion and application of climate change financial products through multi-party participation and cooperation.

Results and Discussion

The development and application of the above climate change financial products will be conducted. The basic content and characteristics of the carbon offset cost insurance for accidental greenhouse gas emissions (tentatively known as carbon neutrality insurance) developed by the company are evaluated and analyzed based on actual data and cases. Finally, the relevant policy measures and future development trends are discussed, to provide reference and suggestions for the further promotion and application of financial products for climate change.

The basic characteristics of carbon-neutral insurance

The European Union Emissions Trading System (EU ETS) has been implemented since 2005 and is the world's first carbon trading mechanism system, the carbon emissions rights are officially given to their trading prices, referred to as carbon rights trading. Therefore, carbon emissions, which is counted a "negative asset" as liability, can be offset by carbon credit. Taiwan, the Republic of China, has longed been concerned about the purposes of the United Nations and has been discussing climate change in line with international codes and norms to actively participate. The previous regulations called Greenhouse Gas Reduction and Management Act was upgraded to Climate Change Response Act in 2023 as the national level law which set the action targets of 24% voluntary carbon reduction by 2030 and net-zero carbon emissions by 2050. The introduction of various relevant sub-laws and the promotion of private enterprises, such as the implementation of carbon verification/validation, carbon trading, carbon fee/tax, etc., have led the carbon-neutral insurance products to be developed. (Wang, et al., 2021).

The basic content and characteristics of carbon-neutral insurance include underwriting guidelines, coverages, rating tables, terms & conditions, etc. This product was analyzed the operation and protection effects of carbon neutrality through specific cases and data to evaluate its application value in climate change adaptation and carbon neutrality.

Among the circumstance, the banking and insurance industry has expanded the scope of green banking to sustainable finance. It means that the banking and insurance industry not only provides financial and insurance tools for industrial transformation and/or investment, but also expands its scope to the auxiliary operation and management for all human beings, all species, and all environments. In the process of such transformation, the banking and insurance industry shall consider each and every investment, financial management, and protection in a more comprehensive and balanced way to meet the requirements of the indicators of the 17 Sustainable Development Goals (SDGs) of the United Nations.

Evaluation of application effectiveness and market potential

Based on actual data and cases, the application effectiveness and market potential of carbon-neutral insurance are evaluated and analyzed. This article will review the practical effects of carbon neutrality insurance in terms of carbon emission reduction, risk transfer, corporate liability, etc., and discuss its prospects and development trends in the financial market.

"Carbon Credit" is methodologically valued, in addition to establishing its economic trading value; In terms of insurance, the "insurable value" and "insurable interest" are also formed. Therefore, in 2022, we began to study the worldwide market looking for the similar products to introduce them into the Taiwanese insurance market. However, due to the limited information on carbon issues and the absence of specific products, we invested ourselves to write "Carbon Offsets Indemnity Insurance" (Carbon Neutrality Insurance, tentative) to cover the accidental losses of greenhouse gas emissions during operations. The policy wordings have been revised for the second time which is reviewing by the international chief underwriter for their approve and confirmation. The risk premium is based on the statistics of historical Fire and Natural disasters for the past 50 years in Taiwan and the average carbon emissions per person rated by Chung-Hua Institution for Economic Research (Country-level Social Cost of Carbon for Taiwan, Chung-Hua Institution for Economic Research, ISBN 978-986-5795-51-1) including the loss trends.

This insurance product is to cover the accidental increase in carbon emissions for the indemnity of the relevant expenses according to offset unexpected carbon emissions. Those fees are defined to pay for verification/validation and carbon rights conformed CDM/CDP specifications, such as Gold Standard. This indemnity also helps the Insured to keep their carbon neutrality to survive in the supply chain and prevent the compensation involving with the carbon leakage – Greenwashing (Seda, 2023).

Although this insurance policy is a "non-removable carbon neutrality" product, it must be verified and valid to complete the registration on the official website (https://ghgregistry.moenv.gov.tw/epa_ghg/) supervised by the Ministry of Environment. To encourage the Insured for reducing their carbon emissions actively, the carbon reduction label approved and given by the Authorized (Product Carbon Footprint Information Network (cfp-calculate.tw)) is considered to be an additional intensive for premium discounts during our underwriting.

At the same time, in response to Taiwan's "112 Year Plan to Promote the Implementation of Green Procurement by Private Enterprises and Organizations", it is proposed to assist the insurance companies to apply for green credits by issuing this policy to comply with the domestic and international trends which is also complied with Government Act pressed by Public Construction Commission, Executive Yuan and the potential green procurement among the supply chain.

The governmental policy measures and the prospects

Discussing on the relevant policies and the prospects proposed above, this paper analyzes the role and function the Government acts in the promotion and application of financial products for climate change. We also look forward to the future development and potential challenges of the financial market, and put forward corresponding suggestions and market strategies to promote the prosperous and sustainable development of the financial products addressed climate change.

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