



Carbon Credit and Eco Friendly Business

Dr.Madhu Jain

Associate Professor & UGC Research Award Fellow, Govt. Girls College, Ajmer, Rajasthan, India

ABSTRACT: The trading of carbon credits can help entities and the world meet their climate goals by cutting carbon emissions and practicing sustainable business. While some companies have various means to get rid of their footprint, many simply don't have any at their disposal. And so using carbon credits is a necessity for them.

But how can carbon credits help promote the best practices that ensure the future of sustainable business? How can they be instrumental in advancing both corporate sustainability and global sustainable development?

This article will explain how by looking into best practices that can scale up the voluntary carbon market and help businesses achieve their climate change goals.

KEYWORDS: carbon,credits,ecofriendly,business,sustainable

I.INTRODUCTION

The number of businesses pledging to help put an end to climate change by slashing their own GHG emissions continues to grow. Yet many of them find that they cannot fully get rid of their emissions, or even reduce them as fast as they may like. [1,2,3]

The challenge is particularly tough for entities with net zero emissions targets, meaning removing as much carbon as they emit. For them, it helps to use carbon credits to offset emissions they can't eliminate by other means.

Voluntary carbon credits, also known as carbon offsets, are bought by companies for reasons other than compliance. These market instruments help direct private financing to climate-related projects and initiatives that won't otherwise be developed or take off. More importantly, these projects also offer added benefits beyond just carbon reduction like job creation and biodiversity conservation.

Carbon credits also have the potential to bring down the cost of emerging climate technologies by providing startups enough capital. And most importantly, this market tool can help drive investments to places where nature-based emissions reduction projects are most viable. [7,8,9]

How Can Carbon Credits Help Companies Reach Their Climate Goals

Achieving climate goals seems to be the finish line among organizations these days. But what does it really mean?

Collectively, that means limiting the rise in global temperatures to 2.0°C above pre-industrial levels, and ideally 1.5°C. Putting that in context, it means cutting global GHG emissions by 50% of current levels by 2030 and bringing them to net zero by 2050.

More and more businesses are aligning themselves with this global sustainable development agenda. In fact, the number of companies with net zero climate commitments doubled in less than a year – from 500 (2012) to 1,000 (2011).[10,11,12]



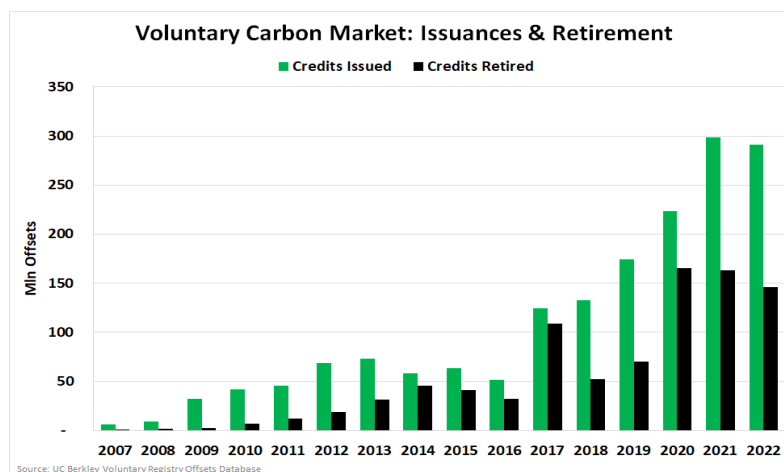
Among those businesses, reducing carbon emissions to be carbon neutral or net zero has major limitations. For instance, a big part of the pollution of companies operating in the cement industry comes from processes they simply can't just stop.

So, how can they reduce their emissions without stopping their business operations? By buying carbon credits.

- Carbon credits work like permissions allowing holders the right to emit a certain amount of carbon under the compliance market. Within the VCM, carbon credits represent the corresponding quantity of carbon that has been reduced or removed by an initiative.

Remember that each carbon credit is equal to one tonne of carbon removed or prevented from entering the atmosphere.

Carbon credits have been in use for years now, but their voluntary use has grown immensely only in recent years. As seen in the chart from Katusa Research, buyers have retired (claimed the impact of the credit) about 150 million credits per year since 2011.



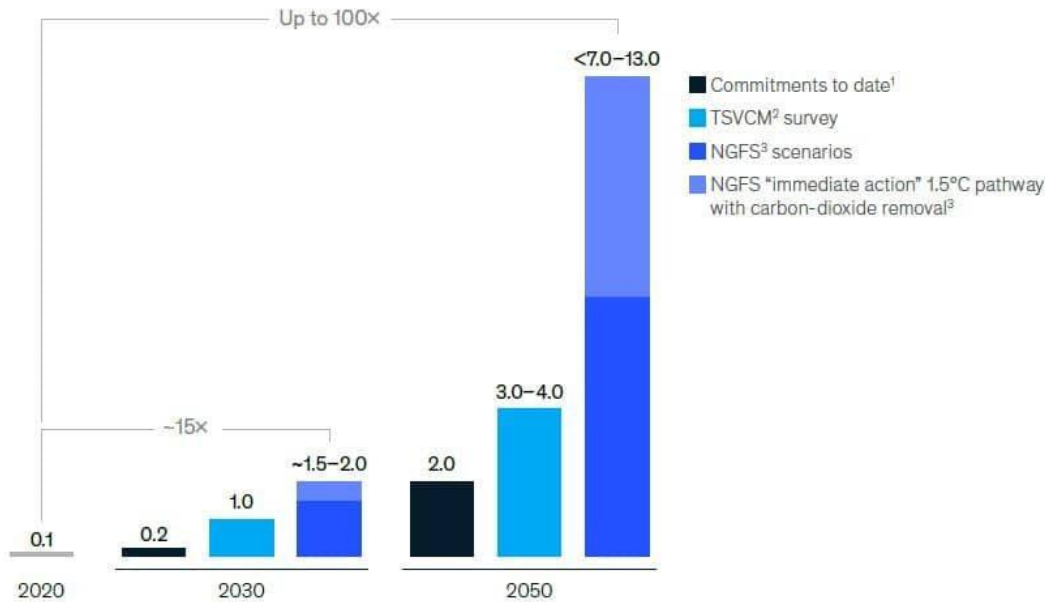
And as global efforts to transition to low-carbon and sustainable practices intensify, demand for carbon credits will also grow. Based on industry estimates, annual global demand for carbon credits can go up to 1.5 to 2.0 gigatons of CO₂ by 2030 and up to 7 to 13 GtCO₂ by 2050.

That also means the VCM size can be between \$30 billion and \$50 billion by the end the decade, depending on various factors such as price. [17,18,19]



Global demand for voluntary carbon credits could increase by a factor of 15 by 2030 and a factor of 100 by 2050.

Voluntary demand scenarios for carbon credits, gigatons per year



Source: McKinsey & Company

Per McKinsey analysis, the supply of carbon credits to meet such projected demand will come from these categories:

- avoided nature loss (including deforestation);
- nature-based sequestration, such as reforestation;
- avoidance or reduction of emissions such as methane from landfills; and
- technology-based removal of carbon dioxide from the atmosphere.

While the future of sustainable business becomes possible through carbon credits, some challenges exist that may prevent VCM's scale up. If not addressed fully, these roadblocks can bring down supply from 8• -12 GtCO₂ per year to 1-5 GtCO₂. [20,21,22]

Key challenges include:

- Most nature-based supply of carbon credits is concentrated in few countries
- Difficulty in attracting enough financing
- Long lag times between capital raising and selling carbon credits
- Carbon accounting and verification methods vary, making supply of high-quality carbon credits
- Some confusions in the definition of the credits' co-benefits (benefits beyond carbon reductions)
- Long lead times in verifying carbon credits quality, which is crucial to achieve market integrity
- Other problems include unpredictable demand, low liquidity and limited data availability

Though these challenges are indeed daunting, they are not invincible. By adopting best practices in using and integrating carbon credits into climate change mitigation measures, the VCM can help secure the future of sustainable business. [27,28,29]



Best Practices to Scale Up the VCM

As we have demonstrated, carbon credits can help promote corporate sustainability by helping companies reach their climate goals. And as most of us know, large companies are the most guilty in dumping carbon into the air.

As long as they are making efforts in cutting their carbon footprint and bringing it to net zero, they can still continue doing business sustainably. But what can these big businesses and other market players do to ensure that the market doesn't wither but grow[30,31,32]

Here are the top four ways that could further develop the VCM and scale it up for more carbon reductions.

Having Uniform Principles for Carbon Credit Definition and Verification

The market for voluntary carbon credits still lacks ample liquidity to transact efficient trading. What causes this is the fact that the credit attributes vary a lot, affected mostly by the project generating it. The carbon credit price depends on the specific project type and/or its location.

Each project also delivers a different set of benefits and added values, which value varies as well. This attribute makes the process of matching the buyer and seller quite difficult and time-consuming. [37,38,39]

- But with uniform features that define or describe the credits, the match-making process would be easier. One of these features would be the quality of the credit.

The recent release of the International Council for the VCM of its "Core Carbon Principles" is a good starting point for both suppliers and buyers to refer to. The principles provided offer a good reference in verifying the carbon reductions claim of the credits.

This is also important when developing reference contracts of carbon credit deals and their corresponding trading prices on the exchanges. In this case, it would make it more efficient for the market to aggregate smaller supplies to match the larger bids of corporate buyers.

II.DISCUSSION

Developing Flexible Trading and After-Trade Infrastructure

A well-functioning VCM requires a flexible trading infrastructure. That function is to facilitate high-volume listing and trading of contracts. In effect, this enables the establishment of structured financing for project developers.

The top carbon exchanges often have this infrastructure in place, enabling them to support and help shape up the market. [50,51,52]

The same goes for post-trade infrastructure, such as registries and clearinghouses. They must support the creation of futures markets and provide the necessary counterparty default protection.

- Carbon registries, in particular, should be providing necessary services and facilitating the issuance of identification numbers for each project.

These infrastructures can help promote transparency of data and information in the market, and so, increase trust among buyers and sellers alike. This is currently not the case in the VCM as access is limited, making tracking difficult. Issues in transparency are plaguing the market, putting some projects under query and further investigation.



Analytics and reports that put together accessible reference data from various registries, like how APIs do, can help advance transparency. This startup that developed the first API for carbon credits seeks to address this task, aiming to improve transparency.

Building Guidelines for the Correct Use of Credits

Though many companies use carbon credits to offset their emissions, they're not the automatic option in reducing emissions. Some skeptics said that they deter businesses to offset their footprint instead of reducing them directly. Others argued that they become a tool for greenwashing – claiming to be eco-friendly though the business continue to emit more.

This is why there must be clear and robust principles governing the use of carbon credits to eliminate doubts. [53]

Specifically, offsetting should be an option for emissions that are too difficult to abate. They should not overtake other climate mitigation measures while ensuring more carbon reductions actually happen.

This best practice requires a business to disclose its carbon emissions first and create a baseline for it. From there, carbon reductions targets and strategies will follow. Only by doing so can the company know how much emissions it needs to offset and buy the corresponding credits.

Safeguarding Integrity of the VCM

Same with transparency, the VCM is also facing the issue of integrity. The main culprit is the wide differences in the carbon credits' nature, making them plausible for fraudulent transactions.

One solution is to have a digital system in place that registers and verifies the credits authenticity before issuance. Verifiers must be able to monitor the project's impact regularly to confirm their carbon reduction claims. [55]

That won't just safeguard the integrity of the carbon credits but can also help developers in cutting down associated costs. Digitization translates to standardization that lowers issuance costs while improving offset credibility in corporate climate commitments.

Ultimately, a governing body is critical to enhancing integrity by overseeing market players' behavior and the overall market functions.

In sum, businesses and other organizations can reduce their carbon footprint by employing clean energy technologies and sources. Still, many need carbon credits to complement their climate change mitigation efforts while aligning them with their corporate sustainability goals.

By following the four best practices identified, a scaled up voluntary carbon credit market can help secure the future of sustainable business.

III.RESULTS

Zefiro Methane Corporation, a private methane offsets originator, acquired a majority ownership stake in Plants & Goodwin (P&G), an oil well plugging company.

Led by executives from the former carbon market team at J.P. Morgan, Zefiro seeks to reduce methane emissions by plugging orphaned and abandoned oil and gas wells. This then enables the company to produce methane emission offsets, also known as carbon offset credits.



P&G is a Pennsylvania-based provider of services to plug orphaned oil and gas wells for over 50 years.

Methane Emissions from Abandoned Wells

Methane (CH₄) is the second most abundant greenhouse gas (GHG) after carbon dioxide that's responsible for about 20% of global emissions. This gas is at least 25x to over 80x more potent as CO₂ at trapping heat in the atmosphere.

Methane concentrations in the air have increased alarmingly since 2007. Scientists said that this rising CH₄ emissions may be the biggest threat to keep global temperatures below 1.5C.

Recently, a NASA satellite revealed that Turkmenistan is one of the worst methane 'super-emitters' in the world.[50,51]

The increasing methane pollution is largely because of human-related activities. And one such activity is abandoning oil and gas wells that are causing serious problems to the U.S.

According to recent estimates, there are more than 4 million orphaned oil and gas wells in the U.S., spreading out across 26 states. Here's the percentage share of orphaned oil and gas wells in Canada and the US, according to a study published in the American Chemical Society.

These abandoned, unplugged wells spew out methane that can greatly pollute the air that people breathe. The leaking methane is equal to burning over 16 million barrels of oil, per government estimates.

As such, the inactive wells pose as one of the country's most pressing concerns in advancing a sustainable economic growth. In response, the Infrastructure Investment and Jobs Act 2010 specifically set aside almost \$5 billion to help states plug abandoned wells. To date, all 26 states have applied for funding.

Zefiro comes to the government's aid by addressing the methane pollution from unplugged oil and gas wells. Its acquisition of P&G shows that commitment. [52]

In translating that commitment to reality, Zefiro's Founder & Chairman, Talal Debs, remarked that:

"Zefiro's strategy is to integrate real (physical process) innovation with new forms of capital, through the 'environmental' credit markets; the result will be a new kind of enterprise. By enlisting veteran operators like Plants & Goodwin, we are taking the first big step to making our unique vision a reality."

Zefiro's Methane Emission Reductions and Carbon Credits

Acquiring Plants and Goodwin will position Zefiro as the leader in fixing the environmental and health problems left behind by the oil and gas companies that abandoned the wells, allowing them to emit methane for decades.

P&G is a family-owned company that has been plugging wells for more than 5 decades. It is focusing on idle wells in shale and sandstone formations across the Appalachian Basin.

They said that their partnership with Zefiro is "a game-changer for finally bringing about a large-scale, nationwide solution to methane emissions from abandoned wells."



Luke Plants, assuming the CEO role for P&G, further pointed out that with Zefiro, they'll be among the first to tackle the problem and be a model for other basins across the U.S.

Zefiro's methane emission reductions efforts not only align with the industry's goal of a greener future. The Vancouver-based company is also expanding the supply of carbon credits working as offsets crucial for achieving net zero targets.

The company primarily trades in the voluntary carbon markets, believing that firms that go "above and beyond" mandated emission reductions bring a higher environmental benefit that aligns with their ESG policy.

How Does Zefiro Generate Carbon Credits

Every project is unique because of the many variables of an abandoned oil well. But Zefiro's projects generally follow the six major steps below as described in their website.

1. **Project Setup.** Zefiro measures pre-plugging emissions and prepares the project document outlining emission baselines, project boundaries and activities. [53]
2. **Engage Third-Party Verifying/Validating Body (VVB).** Zefiro enlists a 3rd-party VVB to audit and certify each project, ensuring it meets all criteria for carbon credit issuance. The independent body needs to confirm that the project will indeed achieve the methane emission reductions it claims.
3. **Undertake Well Decommissioning.** Zefiro will plug each well, ensuring that no emissions can escape by using advanced technologies and adhering to applicable standards and regulations.
4. **Final Emission Assessment.** Once decommissioning is over, Zefiro will do the final assessment to make sure that all project deliverables are met.
5. **Issue Offsets.** The applicable standards organization (e.g., Verra, American Carbon Registry, Gold Standard) issues the appropriate number of offsets.
6. **Retire Offsets.** Offsets are retired or removed from circulation for GHG reductions claim toward a net zero goal or other use. Retirement happens in accordance with the program's registry processes. Once retired, offsets are not transferable and can't be used again for other environmental claims.

Zefiro will roll-out to different states, deploying staff to decommission wells nationwide.

IV. CONCLUSIONS

3M, a leading manufacturer and science company, has partnered with Svante Technologies, a carbon capture and removal firm known for its expertise in carbon capture and removal. Together, they aim to create Direct Air Capture (DAC) products, designed to capture carbon dioxide directly from the air and permanently remove it

The deal reaffirms the companies' commitment to providing materials science-based solutions to reach net zero emissions and fight global warming.

Scaling Up Supply of Carbon Capture and Removal Materials

3M has 120+ years of expertise in producing and supplying materials science-based solutions at unmatched scale. It manufactures a broad range of products, from building materials and adhesives to medical and cleaning supplies. [55]

The company brings that massive experience and expertise in the carbon dioxide removal (CDR) industry by working with Svante. An executive from 3M, Ray Eby, asserts the company's commitment to scaling up climate tech solutions, saying that:



“3M is committed to helping build a low-carbon economy... We are driven by a need to solve the world’s most pressing challenges. and our partnership with Svante to create innovative climate solutions is an exciting prospect for us.”

Just like how the company tripled the supply of N95 respirators during the early days of COVID-19, 3M is as eager to scale the production of carbon removal materials over the next decade. Through its 51 tech platforms, 3M innovates and creates new technology capabilities to meet the growing needs of the industry.

This is important in meeting the demand for CDR, which climate scientists believe critical in achieving the Paris goal. CDR solutions include bioenergy combined with CCUS (BECCS) and direct air carbon capture with storage (DACCS or DAC). [56]

That said, the market for carbon removal is expanding rapidly. Investments came pouring in from large companies wanting to help early-stage CDR tech startups scale up and bring costs down. In fact, the industry has its own dedicated venture capital fund called Counteract, while government support reached billions of dollars.

Joining the CDR supporters and investors, the venture capital arm of 3M, 3M Ventures, participated in Svante’s Series E fundraising. The said round raised \$318 million to accelerate the manufacturing of Svante’s carbon capture and removal technology.

Capturing Millions of Tons of CO₂

Svante manufactures solid sorbent-based filters and rotary contactor machines that capture large-scale carbon emissions for storage or further industrial use. Its filters are available for point-source capture from hydrogen, cement, steel, aluminum, pulp & paper plants, and refineries, and DAC applications.

Because of the broad range of markets Svante serves, the company’s CEO Claude Letourneau says Svante’s tech is applicable to 85% of the total carbon capture and removal market. By adding 3M into their global partners, it will further help Svante in capturing millions of tons of CO₂ worldwide.

In order to help meet that goal, 3M has to scale the production of DAC materials over the next few years. It will be the company’s first CDR products in the U.S. for Svante’s DAC applications.

The joint development agreement between the companies focuses on developing and manufacturing carbon adsorbent technology for the carbon removal industry. This venture is part of 3M’s plans to invest about \$1 billion to accelerate new environmental goals and one of them is to be carbon neutral by 2050.[55]

REFERENCES

1. Goodward, Jenna; Kelly, Alexia (August 2010). "Bottom Line on Offsets". World Resources Institute. Archived from the original on 2012-01-17. Retrieved 2010-09-08.
2. ^ "Carbon offset". Collins English Dictionary - Complete & Unabridged 11th Edition. Retrieved September 21, 2012 from CollinsDictionary.com. Archived from the original on October 4, 2012. Retrieved September 24, 2012.
3. ^ "What are Offsets?". Carbon Offset Research & Education. Archived from the original on 2012-11-21. Retrieved 2012-10-23.
4. ^ What is a Voluntary Carbon Market Credit? (PDF) (Report). S&P Global Commodity Insights. 2010. Retrieved May 4, 2010.
5. ^ Fredman, Alex; Phillips, Todd (October 7, 2010). The CFTC Should Raise Standards and Mitigate Fraud in the Carbon Offsets Market (Report). Center for American Progress. Retrieved May 4, 2010.
6. ^ "Emissions Trading – UNFCCC". United Nations. Retrieved May 4, 2010.



7. ^ Hamrick, Kelley; Gallant, Melissa (May 2013). "Unlocking Potential: State of the Voluntary Carbon Markets 2013" (PDF). Forest Trends' Ecosystem Marketplace. p. 10. Archived (PDF) from the original on 2011-08-14. Retrieved 2012-01-29.
8. ^ a b "Carbon offsetting". Travelinho.com. Archived from the original on 2011-10-19. Retrieved 2011-02-08.
9. ^ "Climate Explainer: Article 6". World Bank. Retrieved 2010-03-29. Essential, expensive and evolving: The outlook for carbon credits and offsets (PDF). Sydney: EY Net Zero Centre. 2010. Page 22. Retrieved April 18, 2010.
10. ^ a b Periodicals that have covered this issue include: Christian Science Monitor [1] Archived 2013-05-24 at the Wayback Machine The Guardian [2], Archived 2010-01-20 at the Wayback Machine Mother Jones [3] Archived 2008-12-17 at the Wayback Machine The New York Times [4] Archived 2013-06-25 at the Wayback Machine.
11. ^ SEI-GHGM 2012, pp. 32–33; Hamrick, Kelle; Myers, Kim (2010). Offsets as Ordered: Buyer Due Diligence to Ensure Credit Quality (PDF) (Report). The Nature Conservancy.
12. ^ "What is a Carbon Offset?". Carbon Offset Guide. Retrieved 2010-04-06.
13. ^ a b Cadman, Tim; Hales, Robert (2010-06-01). "COP26 and a Framework for Future Global Agreements on Carbon Market Integrity". The International Journal of Social Quality. 12 (1): 79–80. doi:10.3167/IJSQ.2010.120105. hdl:10072/422013. ISSN 1757-0344. S2CID 256659556.
14. ^ "Carbon Offset Programs". Carbon Offset Guide. Retrieved 2010-04-19.
15. ^ a b Crook, Jonathan (December 7, 2010). "Was COP27 the beginning of the end for corporate offsetting?". Carbon Watch. Retrieved March 26, 2010.
16. ^ "Claims Guidelines Version 2.0" (PDF). Gold Standard. September 6, 2010. Retrieved March 26, 2010.
17. ^ Gillenwater, Michael (2012). What is Additionality? Part 1: A long standing problem (PDF) (3rd ed.). Silver Spring, MD: Greenhouse Gas Management Institute. Page 10.
18. ^ Conniff, Richard (August 2009). "The Political History of Cap and Trade". Smithsonian Magazine. Retrieved 2010-03-23.
19. ^ "The Clean Development Mechanism". United Nations - Climate Change. Retrieved 2010-03-23.
20. ^ LoPucki, Lynn M. (May 20, 2010). "Corporate Greenhouse Gas Disclosures". 56 UC Davis Law Review, No. 1, UCLA School of Law, Public Law Research Paper No. 22-11. Page 416. SSRN 4051948. Retrieved December 20, 2010.
21. ^ "CARBON PRICING: Why do prices vary by project type?". Gold Standard. Archived from the original on 2012-01-26. Retrieved 2012-01-25.
22. ^ "CDM: Designated Operational Entities (DOE)". cdm.unfccc.int. Retrieved 2010-03-23.
23. ^ "Offset Verification | California Air Resources Board". ww2.arb.ca.gov. Retrieved 2010-03-23.
24. ^ "Avoiding Overestimation". Carbon Offset Guide. Archived from the original on 2010-01-21. Retrieved 2011-12-30.
25. ^ a b "Carbon Offset Projects". Carbon Offset Guide. Retrieved 2010-03-23.
26. ^ Regan, Courtney M.; Connor, Jeffery D. (2011). "The influence of crediting and permanence periods on Australian forest-based carbon offsets supply". Land Use Policy. 97: 104800. doi:10.1016/j.landusepol.2011.104800. S2CID 225204587. Archived from the original on 2010-04-16. Retrieved 2010-04-09 – via Elsevier Science Direct.
27. ^ "United States Environmental Protection Agency, Carbon Sequestration in Agriculture and Forestry". Archived from the original on 2008-09-06. Retrieved 2008-03-26.
28. ^ Michaelowa, Axel; Shishlov, Igor; Hoch, Stephan; Bofill, Patricio; et al. (2012). Overview and Comparison of Existing Carbon Crediting Schemes (PDF) (Report). Helsinki: Nordic Initiative for Cooperative Approaches (NICA) and Perspectives Climate Group GmbH. Pages 10-17. Retrieved December 20, 2010.
29. ^ "How to Acquire Carbon Offset Credits". Carbon Offset Guide. Retrieved 2010-03-23.
30. ^ Streck, Charlotte; von Unger, Moritz (2015). "Creating, Regulating and Allocating Rights to Offset and Pollute: Carbon Rights in Practice". Carbon & Climate Law Review. 10 (3): 178–189. doi:10.21552/cclr/2015/3/4. ISSN 1864-9904. JSTOR 44135347.
31. ^ a b World Bank 2010, p. 35
32. ^ a b World Bank 2010, p. 15



33. ^ Wagner, Gustav C. (2010-06-08). "A Guide to Carbon Credit Exchanges". CarbonMarketCap. Retrieved 2010-04-06.
34. ^ Stebbing, Jen (2010-11-01). "Compliance and voluntary carbon markets: What is the difference?". Respira International. Retrieved 2010-04-07.
35. ^ "Summary for Policymakers" (PDF). Climate Change 2010: Mitigation of Climate Change. IPCC. 2010. Fig.SPM.1, p.7.
36. ^ "The Mechanisms under the Kyoto Protocol". UNFCCC. Archived from the original on 2010-02-11. Retrieved 2010-01-27.
37. ^ Carraro, C.; Christensen, J.; Edmonds, J.; Flannery, B.; et al. (2001). "Chapter 10: Decision Making Frameworks" (PDF). TAR Climate Change 2001: Mitigation. p. 660.
38. ^ Bashmakov, I.; et al., "6. Policies, Measures, and Instruments", 6.3 International Policies, Measures, and Instruments, archived from the original on 5 August 2009, in IPCC TAR WG3 2001
39. ^ Hourcade, J.-C.; et al., "8. Global, Regional, and National Costs and Ancillary Benefits of Mitigation", 8.3.1 International Emissions Quota Trading Regimes, archived from the original on 11 January 2012, in IPCC TAR WG3 2001
40. ^ "Carbon Offsets after 2011: the World Under Paris". Carbon Offset Guide. Archived from the original on 2010-01-21. Retrieved 2011-12-30.
41. ^ Grubb, M. (July–September 2003). "The Economics of the Kyoto Protocol" (PDF). World Economics. 4 (3): 143–189. Archived from the original (PDF) on 2011-07-17. Retrieved 2010-03-25.
42. ^ "The Clean Development Mechanism". UNFCCC. Retrieved 2010-03-24.
43. ^ "Joint Implementation". Carbon Offset Guide. Retrieved 2010-03-25.
44. ^ Nuclear Power and Market Mechanisms Under the Paris Agreement (PDF). International Atomic Energy Agency. 2013. Retrieved March 26, 2010.
45. ^ "International Emissions Trading". UNFCCC. Retrieved 2010-03-26.
46. ^ "Climate Explainer: Article 6". World Bank. Retrieved 2010-03-27.
47. ^ Crook, Jonathan (November 2, 2010). "COP27 FAQ: Article 6 of the Paris Agreement explained". Carbon Watch. Retrieved March 26, 2010.
48. ^ ^{a b c d} Bassam, Fattouh; Maino, Andrea (2010). Article 6 and Voluntary Carbon Markets (PDF) (Report). Oxford Institute for Energy Studies. Pages 1-9. Retrieved March 26, 2010.
49. ^ Minas, Stephen (2010-07-03). "Market making for the planet: the Paris Agreement Article 6 decisions and transnational carbon markets*^a". Transnational Legal Theory. 13 (2–3): 287–320. doi:10.1080/20414005.2010.2174690. ISSN 2041-4005. S2CID 257001813.
50. ^ Sheikh, P. A.; Procita, Kezee; Riddle, A.A.; Hoover, Katie (November 2010). Reduction in Emissions from Deforestation and Forest Degradation (REDD+) (Report). Congressional Research Service. Cover page. Retrieved 2010-03-26.
51. ^ "Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA)". www.icao.int. Retrieved 2010-03-28.
52. ^ "Offsetting CO2 Emissions with CORSIA". www.iata.org. Retrieved 2010-03-28.
53. ^ "Cap and Trade: Key Terms Glossary" (PDF). Climate Change 101. Center for Climate and Energy Solutions. January 2011. Archived from the original (PDF) on 2013-10-05. Retrieved 27 October 2014.
54. ^ US EPA, OAR (2015-03-16). "How Do Emissions Trading Programs Work?". www.epa.gov. Retrieved 2010-03-28.
55. ^ "Emissions Trading in the U.S.: Experience, Lessons, and Considerations for Greenhouse Gases". Center for Climate and Energy Solutions. Retrieved 2010-03-28.
56. ^ ^{a b} "California Cap and Trade". Center for Climate and Energy Solutions. Retrieved 2010-12-15.