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ECONOTE No. 101: Carbon Neutrality and Zero Carbon: A guide to a minefield 30/4/2021

Summary

"When I use a word," Humpty Dumpty said, in rather a scornful tone, "it means just what I choose it to mean—neither more nor less." "The question is," said Alice, "whether you can make words mean so many different things." "The question is," said Humpty Dumpty, "which is to be master—that's all. (Alice Through the Looking Glass).Carbon neutrality or zero carbon (CNZ) is now a keyword in climate policy, from countries promising to be CNZ by 2050 or 2060 and companies proclaiming CNZ initiatives. The widespread adoption of the ESG metrics and green funding have made emissions policies a huge corporate precoccupation.This report highights the fact that there is no agreed definition of carbon neutrality /zero carbon and policies presented as CNZ frequently leave the total amount of emissions constant or increase them, rather than reducing them. Carbon trading and offsets can be innocent participants in misleading.

The basics of carbon credits and offsets

To understand the concept/definition of neutrality it is essential to understand the use of carbon credits and of offsets. The term CO2 is used here generically for Green House Gases (GHG). Once again, the definitons of credits and offsets vary widely and in fact credits and offsets can be considered as the same tools, credits being compliance related and voluntary offsets being part of private initiatives. Here we outline briefly the biggest market for carbon credits the European Emission Allowances (EEA) and will follow this on the use of offesets. The EU applies a "cap and trade" system. About 11,000 enterprises from all the 27 EU members, and accounting for 45.0% of all EU emissions, participate in the scheme. EU member countries propose national maximum emissions which, once approved at the EU level, are "translated" to EEA certificates per ton of CO2 which are then allocated to member countries. These EEA are then either distributed free, or are auctioned off.Individual enterprises must accumulate enough to cover their annual cap emissions. If their holdings do not suffice, they will need to buy EEA in the open market. If they have a surplus of EEA they can sell it off. In successive phases, the total amount of EEA available declined as the cap on emissions also decreased and free allocations fell. The EU strives to use the price mechanism by continuously decreasing the amount of EEA issued so as to force reduction in CO2 emissions and to encourage cleaner production. This can yield profits through the sale of surplus EEA or incur cost penalties by not decreasing emissions.Fig.1 shows the dynamics of the market price of EEA from very low levels caused by overissuance to steep increases as pressures on emissions grew. Carbon offsets, on the other hand, is a certified reduction in CO2 for an emission made elsewhere. A wind or solar farm produces electricity without any CO2 emissions. The farm can issue and sell certified offsets for the CO2 not emitted to a firm

Investment Conclusions

This report does not claim that there are ethical or even legal issues in CNZ claims. It simply points out that if these claims are consistent with individually specified definitions of neutrality, then there is no problem. The problem is that claims of neutrality leave definitions out, especially if carbon credits or offsets are used to arrive to the claim. This report is based on the simple principle that policies which shift the source of emission from one country or corporation to another or where carbon trading or offsets are not based on new, additional sources of clean energy, the terms "carbon neutral" or "zero carbon" are misleading. The report bases this stance on the simple assumption that the whole purpose of emission policies is to reduce the absolute total emitted and not just keep it stable and unchanged.

which emitts. The transaction thus produces one action which yields clean energy cancelling out the CO2 emitted by another action. The wind/solar farm uses the money to produce clean energy, and preferably adds to its capacity, while the firm paying is incentivised to reduce its emissions and its costs. The reason why these offsets are voluntary is that corporates are engaged in them in order to show their socially responsible policies and because these actions are essential in getting high scores in their **Environmental -Social-Corporate Governance (ESG)** evaluation and to raise green funding.



Source: Bloomberg

Neutrality :Simple examples and simpler numbers

A simple example will show that offsets and carbon credits may not lead to absolute reduction in CO2 emissions. Unit A has a 100 CO2 reduction plan and meets it 50% by increased efficiency, etc. Unit B produces solar electricity with zero CO2 emissions and it can sell certificates reflecting the amount of CO2 emissions avoided per unit of power produced. Unit A buys enough of these offsets to fulfill its 50 CO2 emissions shortfall. Total emissions have decreased, but there are still 50 units in the air, which is better than 100.Suppose, however, that Unit A fails completely in its plan and it emits 100 CO2 but then buys enough certificates from Unit B to show a complete offset. Total emissions in the air remain unchanged at 100.A truly transparent "equation" will require that the credits are produced by a new addition of a plant producing clean energy, and not by an existing one, in order to yield a true net emissions position. Also consider the use of carbon trading, whereby Unit A has 100 credits but uses only 50 because it hits its CO2 targets. Unit B has also 100 credits but does not meet its targets by 50.It then buys the 50 unused credits from Unit A. The result is that the total CO2 emissions have remained the

Fig. 3 Defining Neutrality (Well, sort of...)

Carbon neutral signals that an emitting unit reduces, within its plan, as much as it is technically or economically possible CO2 emissions, and then covers the remaining through the purchase of carbon credits or offsets. Net Zero Carbon: The emitting unit reduces its CO2 emissions as much as possible within its plan and then the rest are not offset in any way other than by physical removal of CO2 from the atmosphere by investing in new (NB new!) tree plantations, CO2 scrubbers etc. Zero Carbon The unit does not emit any CO2 at all. These definitions make it clear that the overwhelming majority of Carbon neutral policies fall under the first category of Carbon Neutral with the use of offsets. But as the report shows there is no guarantee that under this definition total emissions are reduced instead of simply being kept steady. But also as the report shows offsets and carbon trades can incentivize the reduction of CO2 emissions.

same as the 50 reduction of Unit A was cancelled out by the 50 overproduction of Unit B. Hence the sobriguet of carbon credits as "permission to pollute". Wealthy companies (countries) can pay poor companies (countries) and pollute on "their behalf. This report is careful not to appear to condemn the use of offsets and trades but to show the oversimplicity of carbon neutral etc claims without strict definitional bases. The use of markets and of price mechanism can, and does, result to efforts to reduce emissions (See summary in Fig.2) But equally, there is mounting evidence that the efficacy of a lot of what passes as offsets is low, nonexistent or even negative. And when it comes to countries declaring "carbon neutrality" without specifics or without strict domestic definitions of not pushing emissions next door via offsets, the situation is far more serious. In an injection of reality, a World Bank study in 2017 concluded that carbon credit prices should be around USD 100 by 2030 (EUR 83 currently) if the Paris global warming targets were to be met.Fig.3 shows that if costs of emissions were to rise to USD 100 per ton this would be in excess of 100% of the EBITDA for about 45.0% for the EU firms in the sample. In Fig. 1 the current price of EEA is about EU49.0. Enough said!

Fig.2 Quantitative evidence of efficacy of offsets

How effective in reducing CO2 emissions are these trading and offsetting initiatives? For the EU plan, academic research has found that the scheme did cause a reduction of CO2, which otherwise would not have happened, irrespective of the level of carbon prices. "According to our estimates, EU carbon markets saved cumulative emissions of about 1.2 bl tons of CO2 from 2008-2016 or roughly 3.8% relative to total emissions over these years" .The sum total saved might not appear significant but equally, low prices did not stop companies from reducing their emissions. (P. Bayer & M. Aklin in Proceedings of the Nat.Acad.of Sciences of US, April 21 2020).But for offsets in general, some of the evidence is negative A study for the European Commission into United Nations-sanctioned offset projects found that "Overall, our results suggest that 85% of the projects covered in this analysis and 73% of the potential 2013-2020 - Certified Emissions Reduction (CER) supply have a low likelihood that emission reductions are additional and are not over-estimated. Only 2% of the projects and 7% of potential CER supply have a high likelihood of ensuring that emission reductions are additional and are not over-estimated. (Oko-Institut Berlin 2016, 173pp.)



Source: FT 4/2/2021 CONCLUSIONS

1."Carbon neutral" as currenty used can mean, literally, anything in terms of an absoute reduction of CO2 emissions. At the extreme end of the use of the term it can mean "permission to pollute" with even rises in the absolute of CO2 emitted. On the other hand it can, through the price mechanism, encourage the production of clean energy and of goods through payments to "green firms" and added costs to emitters. **2.** The issue of definition is extended to the area of ESG ranking and of green bonds and green financing. Both the last two are now riding at the back of ill-defined "net reductions" or "zero net solutions" or any other verbal combination of these words thus adding to the confusion. **3.** A great deal of attention has to be paid to the question whether zero neutral etc projects are additional and not existing. For example selling offsets from an existing forest does not add to CO2 reduction, but selling shares in a foret to be planted, does. Andrew Freris (30/4/2021)