

Not any simpler: Key concepts for air pollution offsetting

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The recent, long awaited, presentations on air pollution offsetting by Dr Thulie Mdluli, Ms Elizabeth Masekoameng and Mr Peter Lukey at the National Business Initiative (NBI), the Air Quality Lekgotla, IUAPPA and Kempton Park and the subsequent discussion focused the attention on the prospect of an air pollution offset dispensation in South Africa. In the presentations themselves and discussion that followed the presentations, the idea of simplicity was mentioned more than once. In what follows, I will discuss the idea of simplicity within the context of air quality offsets. I will argue that to establish an offset dispensation one needs to formulate a small set of principles or axioms on which an offset dispensation is based. One can view simplicity as a system with few axioms or as a system with a small number of propositions following from the axioms - lets call them implications. A system with few implications can certainly be simple but it is also information-poor. A system with a small number of axioms may, on the other hand, be rich in information (meaning that there is a large number of true propositions that follow from its axioms) depending on how fertile the axioms are in creating meaning within the system. I propose that we explore the possibility of finding a limited number of principles to form the basis of an offset dispensation that is deeply simple - i.e. that it has small number of principles but can generate consistent guidelines for complex cases.

Definitions

To start the discussion I will explore a few definitions of offsets and extract the axiomatic concepts present in those definitions. I will then consider whether these are sufficient and sufficiently simple to resolve some of the questions that arise when considering specific cases of air quality offsets. The Department of Environmental Affairs' (DEA) working definition for environmental offsets is:

"An environmental offset is an intervention, or interventions, specifically implemented to counterbalance an adverse environmental impact of land-use change, resource use, discharge, emission or other activity at one location that is implemented at another location to deliver a net environmental benefit"

The specific version of this definition for air quality offsets has been formulated as:

"An intervention/s specifically implemented to counterbalance the adverse environmental impacts of atmospheric emissions to deliver a net ambient air

quality benefit within an airshed."

In another presentation by Ms Elizabeth Masekoameng of DEA at the Air Quality Lekgotla, the following were listed as principles for air quality offsets: An air quality offset is *outcome based*, provides *net benefit in terms of air quality*, must *complement and not substitute legislative requirements*. It should furthermore be *acceptable to the national air quality officer, the licensing authority and the community*, and should be *sustainable in the long term*, and have *measurable air quality outcomes*

Following a workshop at the NBI on 30 August 2013, the NBI adapted a document drafted by Sasol containing proposed principles for air quality offsets.

The definition used for environmental offsets is:

"Environmental offsets are alternative actions made to measurably mitigate the residual negative environmental impacts of an industrial activity. An environmental offset is an action(s), designed to compensate for a negative environmental impact of resource use, a discharge, emission or other activity to deliver net sustainable development benefit, through an appropriately balanced assessment of the 5 Capitals (Natural/Environmental, Social, Human, Financial, Manufactured)"

When read in a redaction-critical manner, a seam in this text becomes apparent. Sentence one can stand on its own as a definition of environmental offsets and is not completely harmonised with sentence two.

Purpose

It is clear that an offset programme will be established for some purpose. The purpose contained in the DEA definitions for offsets in general is *net environmental benefit* and *net ambient air quality benefit* for air

<http://www.nbi.org.za/Lists/Publications/Attachments/345/Environmental%20Offsetting%20-%20A%20Key%20Governance%20Tool%20For%20Sustainable%20Development%20Peter%20Lukey%20Chief%20Policy%20Advisor%20DEA.pdf>

<http://www.nbi.org.za/Lists/Publications/Attachments/345/Offsets%20in%20the%20Context%20of%20Air%20Quality%20Dr%20Thuli%20Mdluli%20Chief%20Dir%20Air%20Qual%20Man%20Dept%20Env%20Affairs%2030Aug2013.pdf>

quality offsets in particular. The outcomes to which the DEA principles refer are given as ... *the improvement in ambient air quality within the airshed*. The NBI / Sasol document has *net sustainable development benefit* as its stated purpose. These are important differences since in the DEA definition, the purpose and therefore the accounting domain remains within the ambit of the environment (i.e. it concerns what the five capital model refers to as natural capital) whereas the NBI / Sasol definition makes trade-offs between domains (capitals, if you like) conceivable. This difference is further emphasised by the use of the terms *counterbalance* and *compensate* respectively. Counterbalance takes place within the same medium (in this case the environment) while compensation takes place across media (exchanging the one capital for the other). The definitions from the spheres of government and business both agree that it is the adverse or negative environmental impact that is to be offset.

Agency and responsibility

Any conception of air quality offsets contains some implicit or explicit concept agency of therefore of responsibility. Where offsets are used for legal compliance, responsibility can be understood as liability. It is critical that the same agent be responsible for the activity to be offset and the offset activity. The definitions from both the government and the business sphere emphasise that offsets are intentional and focussed actions counterbalancing or compensating for (depending on which line of thought you follow) an activity that has an environmental impact. Both government and business articulate the idea that, in a compliance scenario, offsets should take place after other options have been exhausted.

Knowledge

There is wide support for the idea that offsets should be measurable. This part of the Sasol / NBI definition. It is, correctly to my mind, not taken up in the working definition by DEA but in their principles. I have argued elsewhere that the accounting principles of relevance, completeness, consistency, transparency, accuracy that underlie greenhouse gas accounting systems (WBCSD and WRI, 2005) can also be applied to air pollution offset accounting. The basic question that arises around the measurement of offsets is what exactly should be measured. It seems like the working definition by DEA generates a simple response: ambient air quality.

<http://www.airqualitylekgotla.co.za/Presentations/2013/Session%203/3.4%20Towards%20an%20Offset%20Policy%20for%20AQM.pdf>

<http://www.nbi.org.za/Lists/Publications/Attachment%20s/345/Offsets%20Framework%20Principles%20Summary%20%20NBI%20Carbon%20and%20Air%20Quality%20Offset%20Event%20-%20August%202013%20-%20v1.pdf>

The definition from Sasol / NBI also makes its offset epistemology explicit: an action should be assessed in terms of the balance of the five capitals. Once again the differences in approach is apparent. For something as complex as a balanced assessment of the five capitals one will need to have rules for how the value of one capital can be derived from the others. The problem is that there is a hard core of irreducibility as far as at least human capital and eco-capital is concerned. Nothing can replace the individual human being, practically nothing can replace the services that ecosystems provide for use (e.g. water, air and biodiversity). Some forms of capital are clearly derived from others. Manufactured capital is the result of the application of knowledge, bodily power and motivation to matter, almost always in cooperation with other people. In the same way social capital is created through communication and human interaction, mostly facilitated by artefacts. There are interactions between the capitals even where not all can be derived from the others. The contribution of one form of capital to the protection of another can be estimated (e.g. how life expectancy increases with increased wealth). If some of the things of value are really irreducible to the other forms, it means that a balanced assessment of the five capitals will have to be done in stages where incommensurable objects of value are accounted for separately and where simplification cannot be done without distortion.

Baseline and additionality

The idea of the baseline scenario and additionality is explicitly treated in the Sasol / NBI document. The idea of a baseline scenario is also present in the DEA's principle number two (Net benefit in terms of air quality) where it is clear that for DEA the baseline scenario is the compliance scenario: "The implementation of the offset project should result in ambient air quality that is better than it would be if the facility was to comply with stricter plants emission standards".

For an offset dispensation to be successful, the procedure has to be established to determine what the baseline state of the atmosphere would have been in the absence of the offset activity. The baseline is a projected state because after an intervention is implemented, the baseline does not exist anymore. This is one area that has conflict potential because it is possible that air quality standards may still be exceeded after the successful implementation of an offset intervention in cases where the regulated emissions make a relatively small contribution to the total ambient air pollution. An unambiguous procedure to project what the situation would have been without the offset activity and in the scenario where an industry met minimum emission standards is needed before such a situation arises.

Environmental impact

It has been noted that representatives from both the government and business sphere view negative

environmental impact as the consequence to be avoided, i.e. to be offset. It makes sense then to further define what an environmental impact is. There are two possible interpretations of the word. It can be understood as impact on the natural environment or as impact by way of the environment. Most people, I think, intuitively favour the second, more functional, interpretation where a change in the natural environment is interpreted in light of its effects on other life domains such as human health and economic activity or on other aspects of the natural world that we value such as biodiversity.

The way in which the effects to be offset are defined determines the scope and procedures of an offset programme. If negative environmental impact is defined in terms of ambient concentrations of certain pollutants then an offset programme is applicable to activities that emit the same pollutants that are transported to the same receptors. This limits the potential scope of such a programme but makes monitoring easier. It is, in other words, simple. The limitation in scope is not the only possible drawback of defining effects in such a way. The human health effects of respirable particles depend not only on a maximum size (say < 10 micrometers) but also on their exact size, shape and chemical composition. It is therefore not exactly true that the effects of similar concentrations of say PM10 are exactly the same. The simplicity offered by a procedure where the accounting takes place by definition in terms of ambient concentrations of priority pollutants may lead to a scenario where the offset does not deliver net environmental benefit because it is too simple.

At this point the question arises if it is possible define a principle that will generate guidelines of equal simplicity for the case mentioned above but that also guards against over-simplification and is able to generate unambiguous solutions for complex scenarios.

I propose the following:

That the environmental impact of an activity be understood as all significant primary and secondary effects of an activity by way of the environment. Significance refers to the magnitude of the effect as well as the certainty of the association between the activity and the effect

That offsets be accounted for on an effect-for-effect basis, i.e. that equivalence of effect is the basis for offsetting

That uncertainty in estimations be compensated for through the principle of conservativeness

This has certain procedural implications. The project proponent will start by listing all significant primary and secondary environmental (understood as described above) effects of the activity to be offset. If offsets are undertaken for compliance purposes the term significant may be interpreted to mean that which is regulated. For every significant effect (interpreted both as effect type and affected entity) a candidate offset activity or group of offset activities

has to be identified that has a similar effect in terms of magnitude, effect type and affected entities. This may seem unnecessarily complex but can in practice be very simple and in fact no different than the procedure proposed in Mr Lukey's presentation at NBI for certain cases. It is not unreasonable to believe that similar concentrations of similar substances will have similar effects. Ambient concentration can therefore be used as indicator where the project proponent can prove the equivalence of the pollutants (i.e. same particle composition, size distribution etc.). The principle of equivalence of effect allows for even greater simplification. It may be reasonable to assume that similar substances emitted to the atmosphere at similar concentrations and at similar heights in close proximity to each other (e.g. adjacent stacks) will be dispersed in a similar way and lead to similar resulting ambient concentrations with similar effects on the same entities. In such a case it is conceivable that emissions may be measured directly without recourse to dispersion modelling. The level of complexity or simplicity is therefore related to the similarity of the activities. The principle of equivalence of effect can however also be used in cases where pollutants are not the same but lead to similar effects. The more dissimilar the effects are, the greater the uncertainty becomes and the wider the margin that has to be allowed to ensure that the offset does indeed lead to a net positive effect.

If the principle of equivalence of effect is adopted, one does not need a separate principle to answer the question on the appropriate spatio-temporal range of an offset activity. The idea of a project boundary, both spatially and temporally, is derived from an understanding of the effects of an activity as the spatial and temporal range of that effect. The geographic project boundary is therefore the geographic extent of all primary and secondary effects. The temporal extent of the offset activity is the duration of the effect of the activity for which it is the offset.

At the beginning of an offset programme, it is not necessary to have all the procedures in place to handle all the most complex cases, but to provide a structure according to which the programme can develop over time to address increasingly complex cases in a consistent manner while still maintaining the necessary simplicity for the most common cases. I think the adopting equivalence of effect as the basis for offsetting will provide that flexibility.

Reference

WBCSD and WRI. The GHG protocol for project accounting. World Business Council on Sustainable Development and World Resources Institute, 2005