Mitigation outcome assessment method

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Agenda

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1. Overview of ‘mitigation outcome assessment’ method
2. Standards
3. Differences between CLCA and MOA
4. ALCA and removals accounting
5. Why isn’t MOA more widely recognized/used?
6. Future development

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Overview of ‘mitigation outcome assessment’ methods

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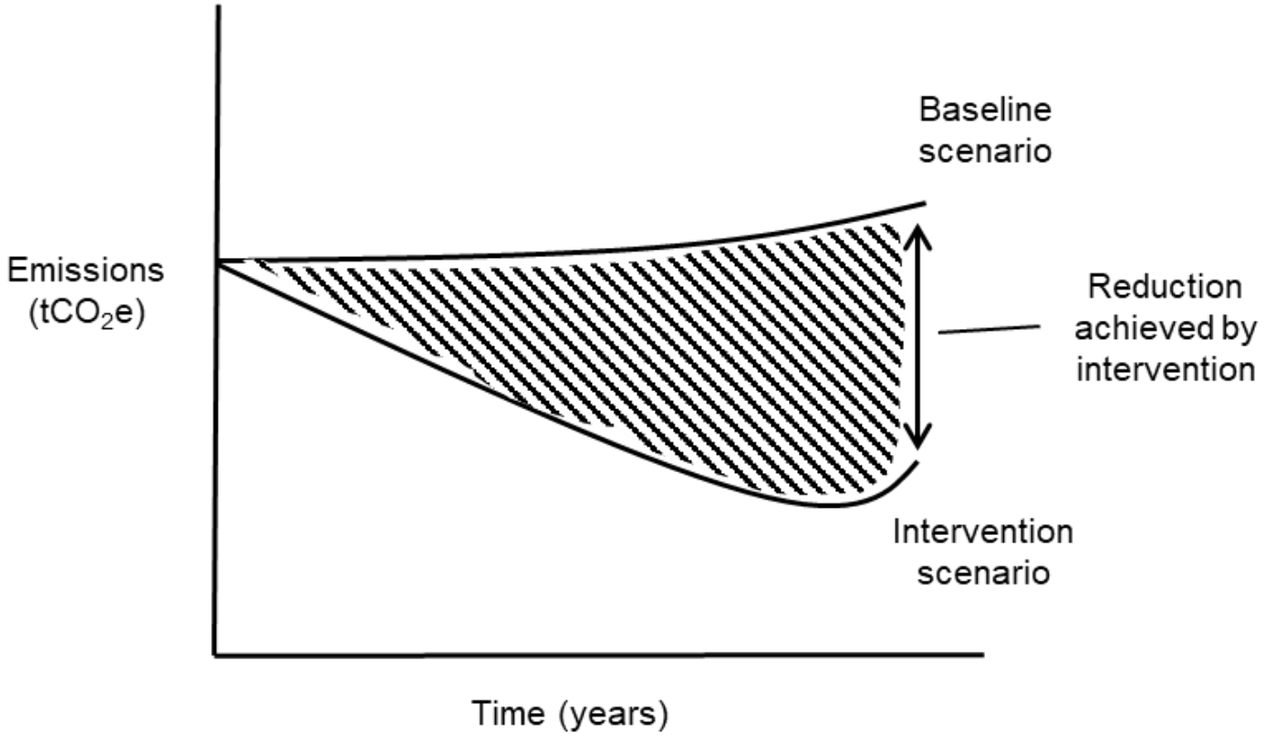

Purpose:
Quantifying change caused by an ‘intervention’ (positive or negative)

Change caused by intervention = Intervention scenario – Baseline scenario

Overview of ‘mitigation outcome assessment’ methods

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Can be applied to any scale of ‘intervention’:

1. **Government policies** (e.g. taxes, subsidies, mandates, etc)
2. **Projects** (e.g. wind farm, tree planting, data centre)
3. **Individual decisions** (e.g. cycling to work, buying an electric car etc.)

Could be applied to any impact category – now just GHGs

Overview of ‘mitigation outcome assessment’ methods

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No single name for method:

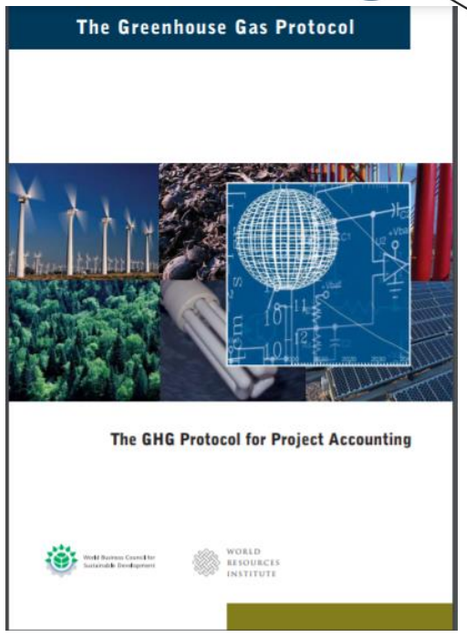
1. ‘Mitigation outcome assessment’ (MOA)
2. Consequential time-series method
3. Baseline-and-credit method
4. Project-level accounting
5. Policy-level accounting

More the application of the method than generic term

Standards

Standards

GHG Protocol for Project Accounting (2005). https://ghgprotocol.org/project-protocol



ISO 14064-2 (2019). Specification with guidance at the project level for quantification, monitoring and reporting of greenhouse gas emission reductions or removal enhancements.

Standards

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Technology/project specific methodologies:

- **Paris Agreement Crediting Mechanism:** https://unfccc.int/process-and-meetings/the-paris-agreement/article-64-mechanism
- **Clean Development Mechanism:** https://cdm.unfccc.int/index.html
- **Verra:** https://verra.org/methodologies/
- **Gold Standard:** https://www.goldstandard.org/project-developers/standard-documents
- **Many others…**

United Nations Climate Change

Verified Carbon Standard

Gold Standard for the Global Goals

Standards

GHG Protocol Policy and Action Standard (2014). https://ghgprotocol.org/policy-and-action-standard

International Financial Institutions (World Bank etc) – guidance on reporting the impact from financed projects: https://unfccc.int/topics/mitigation/resources/ifis-harmonization-of-standards-for-ghg-accounting

IFIs - Harmonization of Standards for GHG accounting.

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Differences between CLCA and MOA

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Difference 1: MOA has transparent and separate ‘baseline’ and ‘intervention’ scenarios

1. **‘Baseline’** = scenario that would exist in absence of intervention/decision
2. Consequential LCA tends to be for ‘X more units of product/function’ – so **baseline is effectively ‘No extra units of function’**
3. Can compare to other possible baseline scenarios, e.g. **other products** providing the same extra units of function

Differences between CLCA and MOA

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Difference 1: MOA has transparent and separate ‘baseline’ and ‘intervention’ scenarios

1. **CLCA uses substitution** to deal with multi-functionality (e.g. co-products)
2. E.g. low-grade off-cuts/offal from beef production **avoids alternative production** for pet food
3. The **emissions that are avoided occur in the baseline** – not in the intervention scenario
4. CLCA lumps emissions and avoided emissions together

Differences between CLCA and MOA

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Difference 2: MOA provides transparent time-series of emissions/removals (or any other impacts)

1. CLCA (and LCA generally) is **not good at modelling when things actually occur**
2. MOA is modelled as a **time-series** (shows when flows and impacts occur)

Differences between CLCA and MOA

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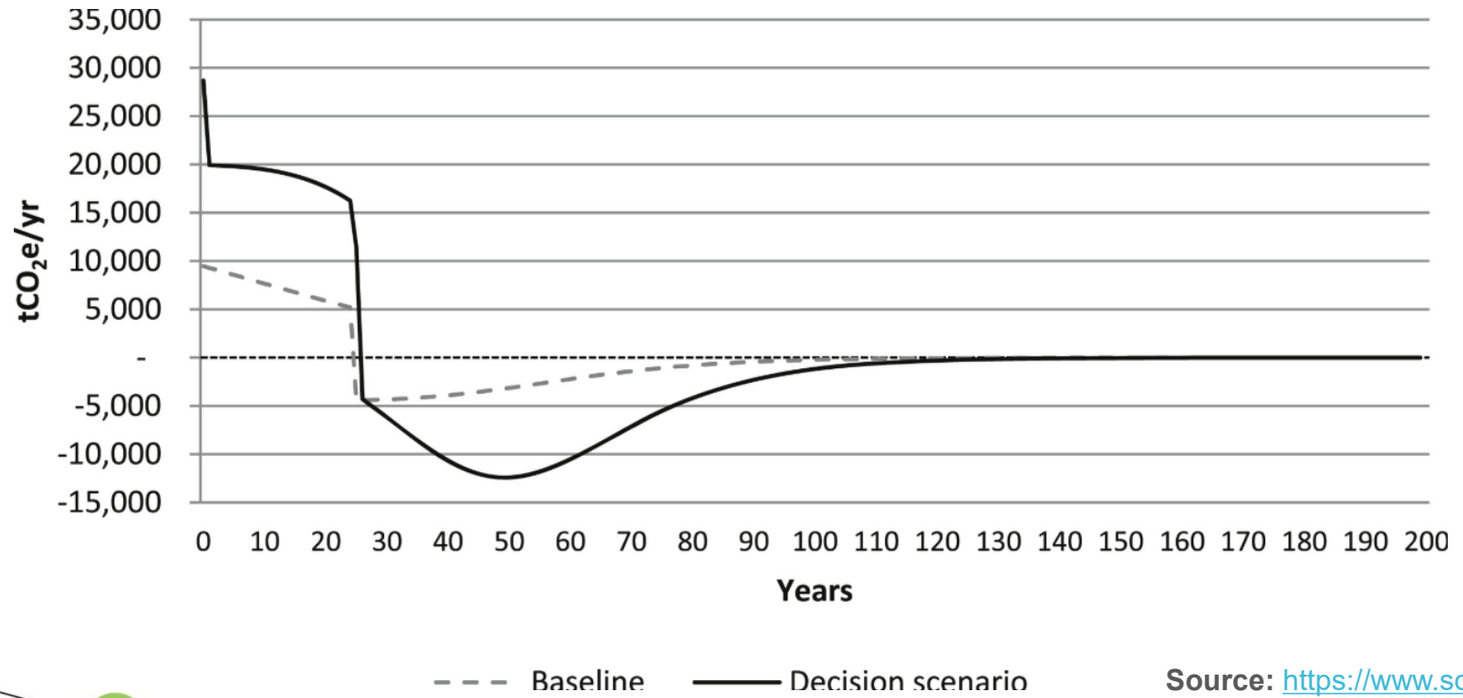
Difference 2: MOA provides transparent time-series of emissions/removals (or any other impacts)



Information on timing is important for calculating **carbon pay-back period**

E.g. of **bioheat plant** – carbon payback period is **75 years**

Source: https://www.sciencedirect.com/science/article/pii/S0959652617303116

ALCA and removals accounting

ALCA and removals accounting

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Worryingly – attributional LCA is increasingly being used for carbon offset removal accounting

1. **ALCA does not show** (and isn't intended to show) the **total change in emissions caused by an intervention**
2. **Fundamentally the wrong method to use** for carbon offset quantification

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ISOMETRIC

ALCA and removals accounting

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Worryingly – attributional LCA is increasingly being used for carbon offset removal accounting

- **ALCA uses direct or average data.** E.g.

Brazil electricity **grid average is 133 gCO_2**/kWh

Brazil electricity **grid margin is 201 gCO2**/kWh

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ISOMETRIC

ALCA would underestimate emissions by 33%, e.g. for DACCS

Sources: https://unfccc.int/sites/default/files/resource/Harmonized_Grid_Emission_factor_data_set.pdf and https://ember-energy.org/data/yearly-electricity-data/

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Why isn’t MOA more widely recognized/used?

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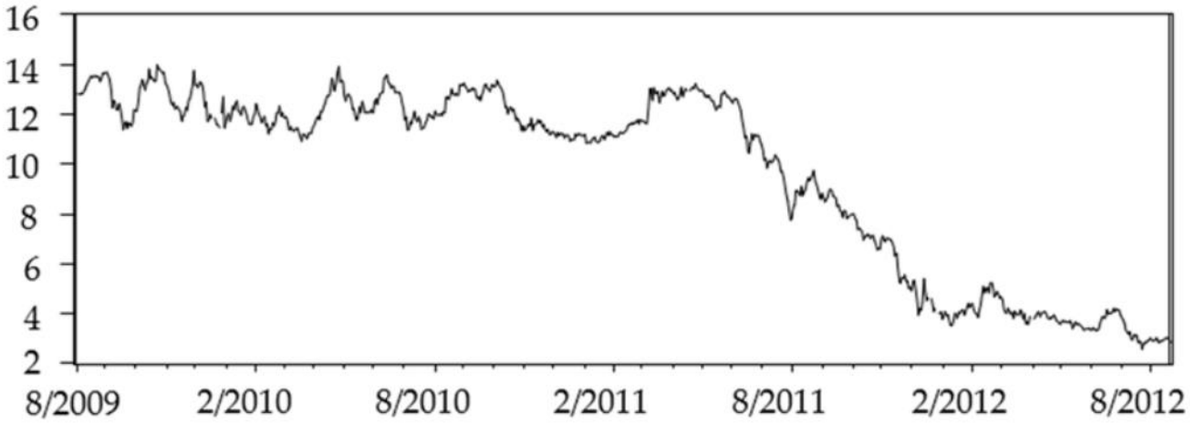
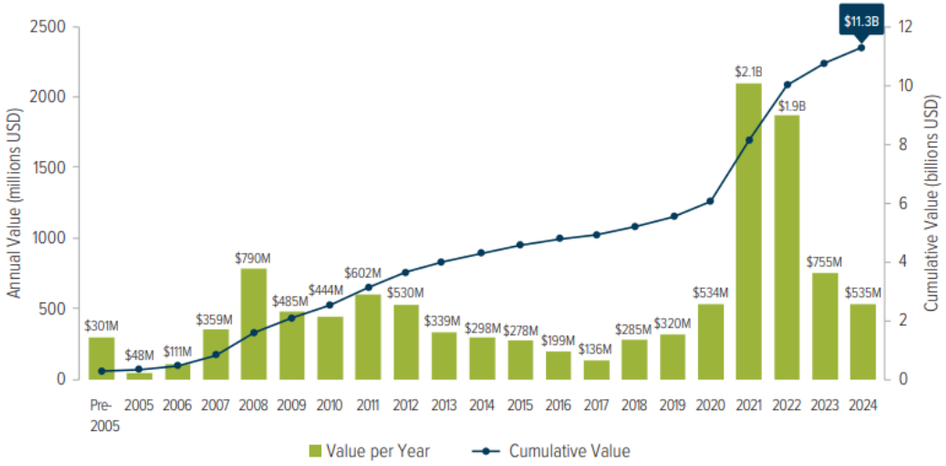
Expertise/institutional knowledge lost due to crash in compliance and voluntary offset market?



Certified Emission Reduction (CER) futures price trend graph.

Source: https://www.mdpi.com/2071-1050/12/18/7317

Figure 2. Voluntary Carbon Market Size by Value of Traded Carbon Credits, pre-2005 to 2024



Source: https://www.ecosystemmarketplace.com/publications/2025-state-of-the-voluntary-carbon-market-sovcm/

Why isn't MOA more widely recognized/used?

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1. **No single recognized name for the method** (and often named in relation to type of intervention, e.g. project level, policy level etc.)
2. Standards for specific contexts, but **no generic scientific articulation of the method**.
3. **Perceived complexity of method**, e.g. identifying marginal systems
4. Relatively **few academic studies** exemplifying how to use the method (i.e. publishing case studies).
5. **Very few PhD students** trained in MOA.
6. **No conferences, dedicated journals** (unlike with LCA)

Future development

Future development

1. **Development of generic standard/methodology**

2. **Conference to share knowledge across areas of practice** (e.g. development banks, offset community, corporate-level avoided emissions etc.)

3. **Single name for the method! …**'MOA', or something else?

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Thank you – and any questions?