CLEAN AIR TASK FORCE

CARBON LIMITS

Understanding a Marginal Abatement Cost Curve (MACC)

This fact sheet is part of a broader study assessing the costs and financial implications of methane abatement options across nine countries in Africa and Latin America. It presents the key elements needed to understand what a Marginal Abatement Cost Curve (MACC) is, the key components and methodology used to build it, how policymakers can interpret it, and the main limitations and points of caution to consider when using this tool.

The full report, published in June 2026, is available via the QR code.

SCAN TO READ FULL REPORT

What is a MACC?

A MACC is a graphical representation of a set of greenhouse gas mitigation options, where each option is shown as a block combining its abatement potential and its cost per unit of emissions reduced. It enables comparison of options by ranking them from the cheapest to the costliest. As an analytical tool, a MACC supports the identification of cost-effective mitigation options and the prioritization of actions. For policymakers, it provides a structured basis to inform climate strategies, resource allocation, and the design of policy and financing mechanisms.

How a MACC is built

For each mitigation option, its abatement potential and its marginal abatement cost are calculated. These two elements serve as the basis of the MACC.

1 **Calculate the abatement potential (tCH_4)**

Mitigation option

Abatement potential (tCH_4) = Baseline emissions (tCH_4) x Estimated fraction of emissions reduced (%)

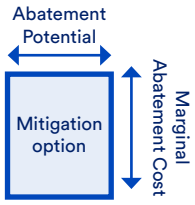
- What is the mitigation option adoption rate in the baseline scenario?
- What are the emissions in the baseline scenario?
- What are the emissions with the mitigation option in place?
- What are the emissions that can still be reduced with the mitigation option, considering mitigation potential by technology, current level of technology deployment, technical applicability, and regulations?

2 Calculate the marginal abatement cost (USD/tCH_4)

Marginal Abatement Cost (USD/tCH_4) = Net Present Value (USD) / Abatement potential (tCH_4)

- What are the total and incremental CAPEX and OPEX in the baseline scenario?
- What are the total and incremental CAPEX and OPEX to implement the option?
- What are the revenues generated by the implementation of the option?
- What is the lifetime of the option?
- What is the discount rate?

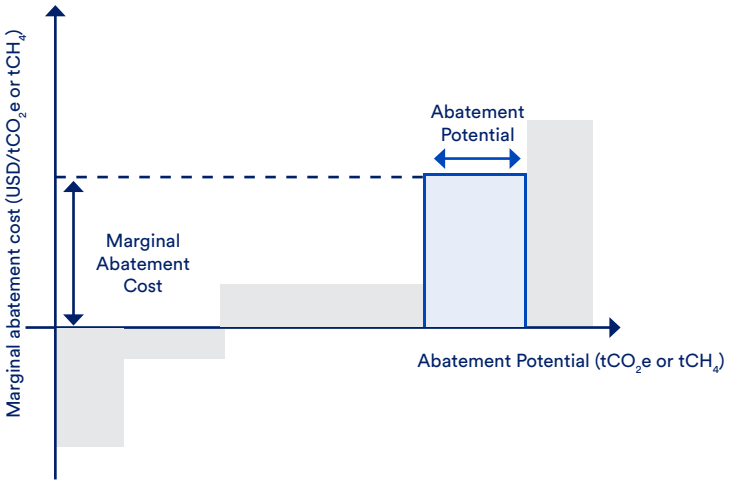
3 Draw the element of the mitigation option



Once both metrics have been established, each option can then be visualized as a box, where the height indicates its marginal abatement cost and the width reflects its abatement potential.

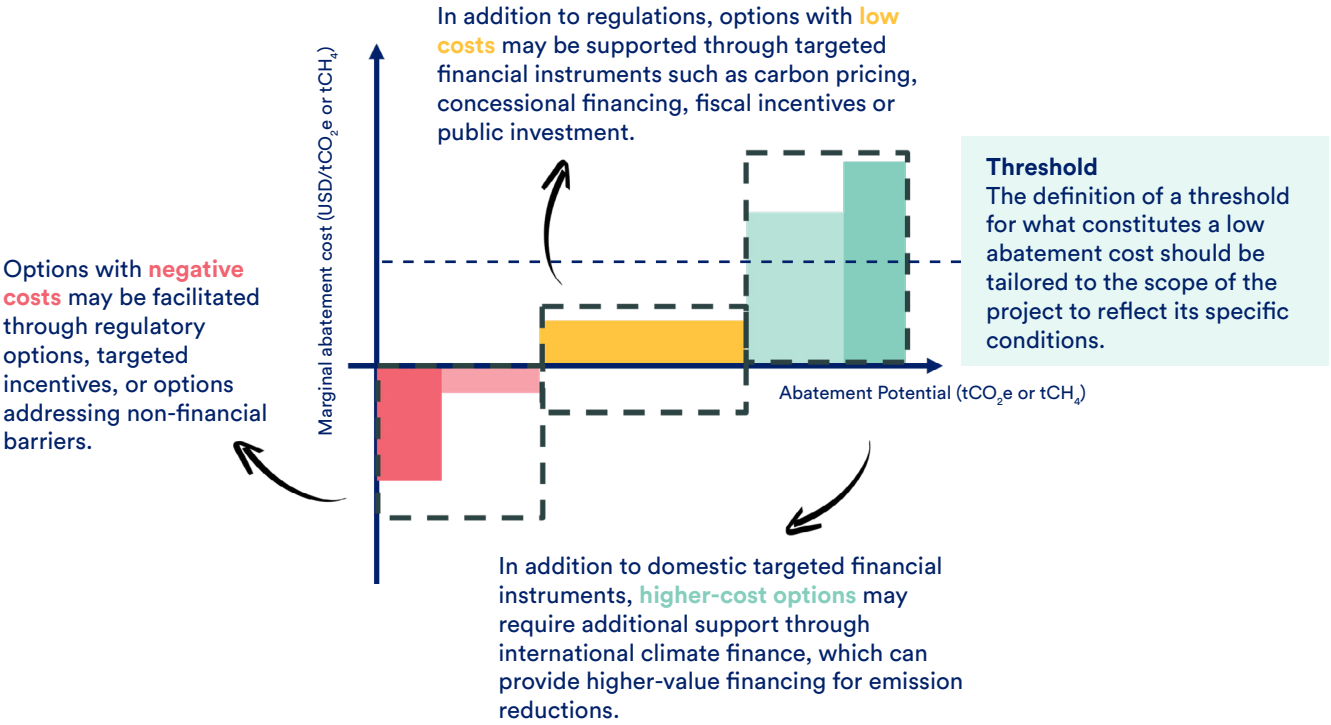
4 Draw the MACC to visualize the results

Plot all boxes of each mitigation options on a line sorted by increasing marginal abatement cost.



How to interpret a MACC for policymakers

A MACC provides a comparative view of mitigation options, showing how much emissions reduction each option can deliver and at what abatement cost. Options with negative abatement costs represent net economic savings over their lifetime, meaning they provide a positive return on investment, while those with positive costs require additional financial resources.



Estimated abatement costs are impacted by several factors, such as technology availability, economics or operational barriers and incentives, interest rates and import taxes.

By linking cost levels to **potential policy and financing approaches**, MACCs help structure discussions on how mitigation options could be enabled in practice. However, they do not prescribe specific decisions. MACCs should be understood as **decision-support tools that provide a simplified and comparative view of options** under a defined set of assumptions, and their interpretation should be adapted to broader policy, institutional, and economic contexts.

Limits and points of caution

MACCs have several limitations that must be considered when interpreting results.

Interactions between options not accounted

MACCs present the abatement potential of each option independently, without accounting for possible interactions between measures. In practice, it means that the actual abatement potential of one option may be impacted by the deployment of another, meaning that their actual combined effect cannot be obtained by simply adding individual estimated potentials. As a result, aggregating options in a MACC can lead to a misestimation of the total achievable emissions reductions.

Co-benefits or broader costs excluded

MACCs focus on direct economic costs and do not include broader costs and benefits, such as transaction costs, behavioral factors, or co-benefits related to health, environment, or employment. As a result, some options may appear less favorable than they are from a societal perspective.

Static and average representation

MACCs provide a static representation of mitigation options and do not reflect technological progress, cost reductions over time, or changing market conditions. In addition, results rely on national average values and assumptions, which does not reflect variability among different types of operators or regions within a country. Therefore, the actual abatement costs for individual projects might be different.

Significant upfront CAPEX not intuitively remarkable

Marginal abatement cost reflects both CAPEX and OPEX. However, looking at a MACC doesn't allow to tell which mitigation option requires significant upfront investment or ongoing operating expenses. This distinction is important, as it can strongly influence the feasibility, financing, and prioritization of mitigation measures in practice.

Assumptions lead to uncertainties

The analysis is sensitive to input data and key assumptions, such as discount rates, energy prices, and emission factors, which introduces uncertainty. For these reasons, MACCs should be complemented with additional quantitative and qualitative analyses and used as one input among others in policy decision-making.