RMOA guidance – Overarching principles and method note

Final report

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Document evolution

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1. Purpose and scope

The purpose of this document is to set out the methodological foundations and guiding principles for conducting high-quality Risk Management Options Analyses (RMOAs). It is designed to provide practitioners with a clear framework that supports consistency, transparency, and robustness in the assessment process, while also allowing for flexibility to adapt the methodology to the specific context of each RMOA.

This document:

- Explains the core logic of an RMOA and its relationship to socio-economic assessment (SEA) and proportionality and appraisal tools, such as multi-criteria analysis (MCA), cost-benefit analysis (CBA), and cost-effectiveness analysis (CEA).
- Sets out the principles that underpin good practice in defining objectives, identifying and describing options, developing attributes and criteria, applying scoring and weighting methods, and comparing results.
- Highlights the importance of assumptions, and transparency, so that the reasoning behind each assessment can be clearly understood and scrutinised.
- Provides guidance that is relevant to both public sector RMOAs conducted by regulators) and industry-led RMOAs.
- Emphasises that the methodology is not a rigid template but is flexible and can be tailored to the specific risk being addressed.
- Includes practical examples to illustrate the theory and improve the ease of use of the methodology.

This document is not intended to replace by existing guidance but instead can be used alongside it and in combination with the proposed draft structure and content mapping.

2. Terminology

To support consistency and clarity, the following key terms are used throughout this document:

- **Risk Management Option (RMO):** A regulatory or non-regulatory measure designed to reduce or control risks associated with the manufacture, use, or emission of a substance. Examples include restrictions, authorisation requirements, workplace exposure limits, or voluntary industry initiatives.

- **Sub-option:** A variation in how a particular RMO could be implemented. Sub-options define the conditions under which an RMO would apply, such as different concentration thresholds, timelines, or exemptions. For example, a restriction may have sub-options that set different concentration limits in finished products (e.g., paints, jewellery, textiles etc) for the same substance.

- **Attribute:** A high-level characteristic that reflects what matters in evaluating RMOs and sub-options. Attributes represent broad categories such as effectiveness, technical and regulatory feasibility, economic cost, and wider economic impacts.

- **Assessment criterion:** A more specific and measurable indicator used to evaluate performance under each attribute – typically these reflect different types of impacts. Several criteria can sit under a single attribute. For example, under the attribute of *wider economic impacts*, criteria might include *impacts on employment*, *impacts on competitiveness*, and *fairness of cost distribution*.

- **Performance matrix:** A structured table used to present how each (sub)option scores against each assessment criterion. Each row represents an option, and each column represents a criterion. The matrix makes trade-offs transparent by showing where options perform well or poorly.

- **Weighting scenario:** A way of testing how the relative importance assigned to different attributes or criteria influences the relative ranking of the (sub)options assessed. Different scenarios may reflect alternative stakeholder perspectives or policy priorities. For example, one scenario may weigh *effectiveness* more heavily, while another emphasises *costs to private actors*. Comparing results across scenarios helps test the robustness of the preferred option(s).

3. Methodology overview

3.1 Risk management options analysis (RMOA)

A Risk Management Options Analysis (RMOA) is a structured assessment used to identify and evaluate the regulatory or non-regulatory measures to address the risks posed by a substance. It provides a systematic way to compare different Risk Management Options (RMOs) – such as restrictions, authorisation, classification and labelling changes, workplace exposure limits, or voluntary measures – against a consistent set of objectives and criteria.

An RMOA takes a societal perspective, considering economic, environmental, health, social and practical factors across all affected actors. This distinguishes it from assessments carried out from the viewpoint of a single actor (e.g. a regulator or an individual company). Its primary aim is to support authorities and industry in making transparent, balanced, and evidence-based decisions about how to manage risks associated with the use of a substance, and which regulatory instruments may be most appropriate to address the concern. Alternatively, it may conclude that no further regulatory action is required.

By taking this broader, societal perspective, RMOA falls within the wider family of socio-economic appraisal frameworks. A range of proportionality and comparison tools can contribute to such appraisals, as illustrated in **Figure 3.1**. These tools vary in complexity and evidence required, ranging from qualitative assessments, through to more data-intensive approaches such as cost-effectiveness analysis (CEA) and cost-benefit analysis (CBA).

RMOA typically use a Multi-Criteria Analysis (MCA) approach for comparing options, which involves:

- Identifying overarching characteristics and performance criteria
- Assessing how well different options perform against those criteria
- Weighing trade-offs between competing objectives
- Supporting reasoned, transparent comparison of options, even when some impacts are difficult to quantify

The benefit of this approach is that it enables different types of impacts (e.g. economic, social, environmental, and technical) to be compared on a consistent basis without requiring all impacts to be expressed in monetary terms. This makes RMOA particularly useful where data are limited, impacts are varied and are best evaluated qualitatively.

In practice, RMOAs draw on a variety of inputs such as health and environmental risk assessments, supply chain considerations and compliance costs analyses – examples of which are shown at the bottom of **Figure 3.1**. These inputs are then structured into attributes and assessment criteria, which are scored and compared using a transparent methodology.

RMOAs provide a flexible but structured framework for comparing risk management options, sitting between simple qualitative appraisals and more resource-intensive economic analyses such as CBAs.

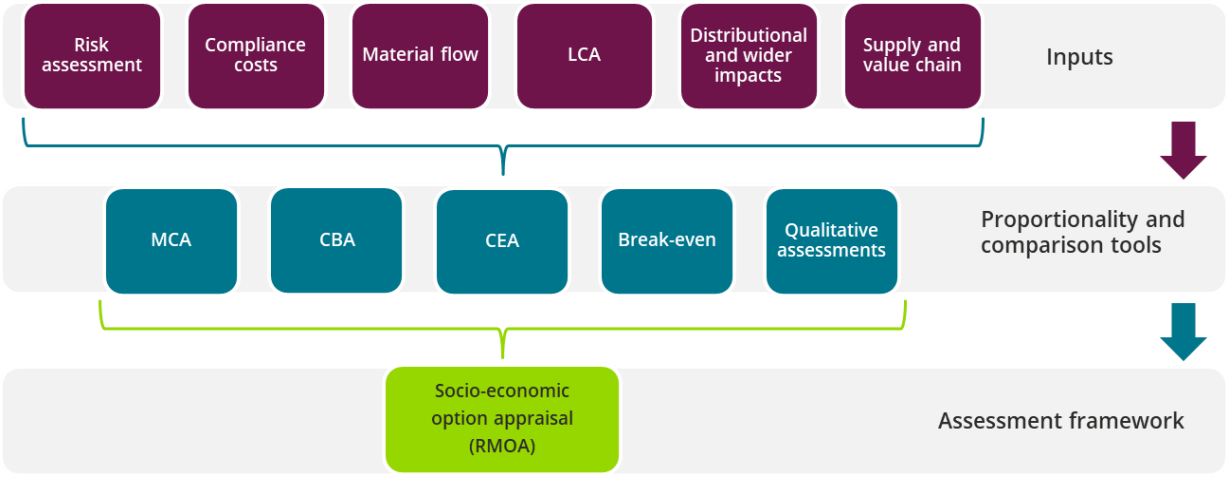

Figure 3.1: RMOA framework with illustrative inputs and analytical tools

4. Core concepts

4.1 Defining the objectives of the RMOA

Clear and well-defined objectives is essential for conducting a high-quality RMOA. The overarching objective is consistent across RMOAs, which is to identify the most *effective* and *appropriate* risk management option(s) to reduce the risk(s) associated with a substance of potential concern. However, an RMOA may have a specific focus based on the substance, its uses, the nature of the risk, and the stakeholders affected. This focus shapes how the objectives are interpreted and how this is translated into a set of attributes and assessment criteria. Attributes and assessment criteria represent performance aspects against the objective will be measured. They will define what *effective* or *appropriate* means, based on the specific risk being addressed, the outcomes of concern, and the perspectives of relevant stakeholders.

Table 4.1 provides an example of how the specific focus of the RMOA may influence the framing of the objective and selection of attributes and assessment criteria.

Table 4.1: Example RMOA focus and objectives and impact on attribute and assessment criteria selection

Focus aspect	Example objective	Attribute	Assessment Criteria
Worker exposure to a carcinogen (Risk type)	Identify the most effective and feasible option to reduce occupational cancer risk from exposure in industrial settings	Effectiveness	Reduction in worker exposure
Persistent environmental pollutant in consumer products (Risk type)	Identify the most effective and feasible option to reduce long-term environmental contamination from continued use of a persistent substance	Effectiveness Broader impact (market impact)	Emissions to water or soil Impact on product availability

4.2 Defining a Risk Management Option

4.2.1 Baseline

A well-defined baseline is essential in any RMOA because it provides the reference point against which all Risk Management Options (RMOs) are assessed. The baseline represents the “do nothing” scenario and is the expected situation if no additional regulatory or non-regulatory action is taken. The baseline should include uses and products, markets, use volumes, emission and/or exposure, risks, known impacts assumptions about trends, regulatory developments, or technological changes.

A baseline must be in place before defining and assessing the risk management (sub)options. This ensures that everyone is assessing RMOs against the same common reference point, rather than against their own assumptions. For example, if one practitioner assumes baseline emissions remain constant while another

assumes they will decline due to unrelated market changes, their scores for the same RMO could differ substantially.

4.2.2 Defining Risk Management Options

Defining Risk Management Options (RMOs) is a key step in the RMOA process that should come after the objectives of the analysis have been clearly established. A potential pitfall is to begin with a list of RMOs before clarifying what those options are meant to achieve. RMOs only have value in the context of the objectives they are intended to fulfil.

In practice, RMOAs often start with a prior understanding of what some of the potential RMOs might be. This is because the EU has a framework of recognised regulatory tools for managing chemical risk, such as restriction and authorisation under REACH (EC 1907/2006), harmonised classification under the CLP Regulation (EC 1272/2008), and workplace exposure limits under the Chemical Agents Directive (CAD) (98/24/EC) and Carcinogens, Mutagens, and Reprotoxic Substances Directive (CMRD) (2004/37/EC), which can serve as an initial starting point for identifying candidate RMOs.

RMOs need to be defined in sufficient detail to allow meaningful assessment against the chosen criteria. For example, rather than stating "introduce a restriction under REACH", the RMO should specify what uses the restriction would apply to, whether exemptions are considered, and which uses or actors would be affected.

Broadly defined measures can be a useful starting point when initially scoping RMOs, which can then be refined iteratively by considering how it would work in practice, what implementation would involve, and how it would interact with existing legislation.

In some cases, the feasibility of an option can only be determined once the analysis has started, meaning that the definition of the RMO may evolve as new information is gathered.

4.2.3 Distinguishing Risk Management Options vs Sub-Options

RMOs represent the main types of interventions being considered, such as restriction or authorisation under REACH, harmonised classification, or non-regulatory measures, whereas sub-options refer to variations in how a RMO could be implemented. In other words, a sub-option represents the form that the intervention could take. For example, a proposed RMO might be a restriction under REACH and within this RMO, there may be multiple sub-options that define different conditions under which the restriction would apply (see **Table 4.2**). These could include:

- Different concentration limits in finished products (e.g., paints, jewellery, textiles)
- Whether certain uses are exempted or included
- Whether the restriction applies immediately or is phased in over time

Sub-options can be useful in identifying the most effective or acceptable form of a particular RMO. It can also provide a more meaningful result than comparing broader regulatory instruments.

Table 4.2: Example RMO and associated sub-options

RMO	Sub-option
RMO 1: Prohibit the placing on the market of plastic articles for consumer use that contain Substance X in concentrations above 0.1%.	RMO 1A: The restriction would apply from 1 January 2026, but articles containing recycled plastic would be exempt until 1 January 2029.
	RMO 1B: The restriction would apply from 1 January 2026, but articles containing recycled plastic would be exempt until 1 January 2031. In addition, plastic articles for use in construction works that are inaccessible during normal use (excluding maintenance) would also be exempt if the concentration of Substance X is below 0.5%.

4.2.4 Importance of scoping and assumptions

Documenting both the scope and assumptions serves three key purposes:

- **Clarity** – ensures a consistent understanding of what is being assessed and that the RMOA is interpreted in the same manner by the intended audience.
- **Transparency** – makes underlying assumptions and conditions explicit so that others understand how the RMO would be implemented and is expected to operate
- **Robustness** – enables sensitivity testing of results under alternative assumptions or scenarios, showing whether conclusions hold.

Scoping and assumptions should be revisited as the analysis progresses and refined when necessary. For example, if new information emerges that changes the feasibility or likely impact of the (sub)option.

4.2.4.1 Scoping

A clear and well-documented scope for each (sub)option is essential to ensure consistency and transparency in the assessment. Without this, there is a risk that analysts may interpret options differently, leading to inconsistencies in scoring, weighting, and overall results.

For each (sub)option, the following should be clearly set out:

- **Who must comply** – the actors or sectors directly responsible for meeting the requirements (e.g. manufacturers, importers, downstream users, retailers)
- **Who will be impacted** – both directly and indirectly affected stakeholders (e.g. manufacturers, importers, downstream users, consumers, public authorities)
- **Uses and products affected** – the specific applications, sectors, or product types to which the (sub)option applies
- **Geographic coverage** – including any relevant regional impacts
- **Timing** – when the obligations would come into force, and whether there are transitional measures, e.g., delayed or stepwise phase-in.

4.2.4.2 Documenting assumptions

It may not always be possible to accurately predict all aspects of how a (sub)option would operate or how actors may respond. Assumptions may therefore be needed to fill such gaps, and these should be

transparently reported so that practitioners understand what needs to be considered when undertaking the analysis. Examples of assumptions include:

- Implementation and enforcement mechanisms (e.g. whether inspections, reporting systems, or penalties will be in place)
- Prerequisite actions by regulators, such as developing new guidance, establishing standards, or creating infrastructure needed to make the measure effective
- Behavioural responses, such as the expected compliance levels in different sectors

4.2.5 Example of a well-defined RMO and poorly defined RMO

Table 4.3 provides an example of a well-defined RMO and a poor defined RMO.

In the good practice example, the RMO is well-defined as it specifies exactly what the restriction applies to, who must comply and the geographical coverage, and clearly indicates the restriction timelines, enforcement mechanisms, and exemptions.

In the bad practice example, the RMO is poor defined as, while the target sector, geographical scope, and compliance timeline as defined, there is no information on the concentration threshold, making it unclear whether trace contamination would be in scope. "Consumer products" is also ambiguous, making in unclear whether it applies to all product categories. As industrial uses are not mentioned, there is the assumption that they are excluded, but this is not explicitly stated. Without these clarifications, different practitioners may make inconsistent assumptions, leading to scoring differences and reducing the robustness of the RMOA.

Table 4.3: Example of a well and poorly defined RMO

	Good Practice Example	Bad Practice Example
RMO	Restriction under REACH on the placing on the market and use of *Substance X* in paints and varnishes	Restriction under REACH on the use of *Substance X* in consumer products
Actor scope	Applies to all manufacturers, importers, and distributors supplying paints and varnishes containing ≥0.05% *Substance X* by weight	Not specified
Geographical scope	All EU Member States	All EU Member States
Product scope	Includes paints and varnishes for both professional and consumer use. Exemptions for industrial paint used in protective applications.	Ambiguous: "consumer products" (unclear whether all categories are covered). Industrial uses not mentioned – assumed excluded but not explicit
Concentration threshold	Defined: ≥0.05% by weight	Not specified – unclear if trace contamination included
Timeline	All restrictions apply 18 months after Entry into Force (EiF). Exemption granted for 5 years after EiF	Restriction applies 18 months after EiF
Assumptions	Enforcement through national inspections and	Enforcement assumed to be through existing

product sampling.	product safety legislation.
Authorities would provide guidance on which applications would fall under the exemption for protective coatings. This would include applications that are critical in achieving a high level of human health and safety (i.e. anti-corrosive coatings).	Aspects of implementation are not specified

4.3 Actors, triggers, and behavioural response

When defining and assessing (sub)options, it is important to understand who will be affected, what will prompt them to act, and how they are likely to respond. This should not only include the directly affected actors, but also those who may be indirectly affected through market changes, supply chain adjustments, or other downstream impacts.

4.3.1 Actors

Actors can be public and private organisations as well as individuals who may be impacted by the RMO. These may include:

- **Directly affected actors** – those who face obligations (e.g., companies) and those benefit from RMO (e.g., workers).
- **Indirectly affected actors** – those influenced by changes in the market, supply chains, or product availability, such as component suppliers, alternative product manufacturers, consumers, and communities affected by environmental changes.
- **Enabling actors** – regulators, enforcement agencies, and standards bodies responsible for implementing or monitoring the measure.

4.3.2 Triggers and behavioural responses

Triggers are different elements of an (sub)option that may create incentives for behavioural changes amongst affected actors. These can include:

- **Direct economic incentives** are payments or charges designed to encourage or discourage certain behaviours. For example, subsidies might be given to support safer alternatives, while fines or fees might be used to penalise harmful activities. The idea is to make sure companies take into account the *true costs or benefits* of their actions when making decisions.
- **Forced behavioural responses** are rules that require companies to act in a certain way, such as a ban on using a hazardous substance or mandatory reporting. This type of trigger pushes companies to take certain actions, but it may also create indirect economic incentives (described below).
- **Information incentives** involve making useful information available so that companies, regulators, or the public can make better decisions. For example, if companies gain knowledge of suitable alternatives or emission reduction technologies (e.g. BAT), they might choose to utilise this information to make positive changes to their operation.

- **Indirect economic incentives** are knock-on effects that happen as a result of other triggers. For example, if a company raises product prices due to increased compliance costs, customers then face a financial reason to reduce their demand for that product. These are not direct consequences of the policy itself, but indirect effects that flow from how actors respond.

Behavioural responses are the actions taken by actors triggered by market interventions. These can be intended or unintended, and both types matter for assessing the likely outcomes of an RMO. Examples include:

- Substituting the hazardous substance with a less hazardous alternative
- Redesigning products or processes
- Scaling back, ceasing, or relocating production
- Absorbing costs or passing them on to customers

4.4 Defining attributes and assessment criteria

The next step is to develop a set of attributes and assessment criteria that will be used to assess the selected RMOs.

4.4.1 Defining attributes

Attributes are high-level characteristics that reflect what matters in evaluating (sub)options. Attributes represent broad categories such as effectiveness, technical and regulatory feasibility, economic cost, and wider economic impacts. In other words, these are elements a well-designed RMO would display.

Attributes typically include variation(s) of effectiveness, other impacts on human or environment health, financial impacts and technical feasibility, and are closely linked to objectives of the RMOA.

4.4.2 Defining assessment criteria

Once the attributes have been defined, the next step is to develop a set of assessment criteria under each attribute.

Assessment criteria are more specific and measurable indicators used to evaluate how well a (sub)option performances in relation to each attribute and typically these reflect different types of impacts. Several criteria can sit under a single attribute. For example, if an RMOA has an attribute representing *Effectiveness*, relevant assessment criteria could be *Emission reduction*, *Level of compliance and uptake,* and *Time to take effect*.

This stage of the RMOA involves deciding how options will be compared in terms of their contribution to the objectives. Each criterion must be specific enough to allow a judgement, whether quantitative or qualitative, of the options performance.

Developing an effective set of assessment criteria is often an iterative process. A useful approach is to begin with a brainstorming exercise to generate a longlist of potential criteria. This encourages open thinking and ensures that important aspects are not overlooked. When developing the longlist, it is helpful to think about “what would distinguish a good RMO from a bad RMO?”

Once the longlist has been developed, the next step is to reduce this to a shortlist of criteria that will be used in the analysis by considering the following key principles:

- **Completeness** – All relevant aspects of performance that are considered important should be covered by the criteria.
- **Redundancy** – Criteria should also be removed if they do not differentiate between options (e.g., if all options are expected to score similarly against a criterion). Being mindful of redundancy helps to ensure the number of criteria is kept to a minimum, which reduces the amount of resource needed to complete the analysis. There is no rule on the number of criteria, but typically it should be no more than 20.
- **Operationality –** Each criterion must be defined clearly enough to be assessed, whether quantitatively or qualitatively, and must be able to be applied consistently across all the options. Criterion that are vague (e.g., environmental impact) should be avoided.
- **Avoid Double Counting** – Criteria should be assessed independently, and no impacts should be measured under more than one criterion, as this will lead to double-counting. For example, if risk of a chemical and human health impact of a chemical is included as two separate criteria, this will double count the impacts following an exposure reduction. Another issue relates to interdependencies. For example, cost to companies may be transferred in higher prices of consumer products, so there is a risk of counting the same cost twice if included as separate assessment criteria

4.4.3 Example of good and bad assessment criteria design

Table 4.4 below provides examples of assessment criteria that exhibit some of the pitfalls that should be avoided, such as double-counting and redundancy.

Table 4.4: Example of good and bad practice when designing assessment criterion

Attribute	Poorly Designed Criterion	Issues	Well-Designed Criterion	Why This is Better
Effectiveness	1. Reduction in emissions of Substance X to air	Overlaps with Criterion 2 meaning a risk of double counting benefits	1. Reduction in human health risk via reduction of emissions of *Substance X* to air	Combines emissions and exposure into one criterion that captures the ultimate objective (reducing risk), avoiding duplication
	2. Reduction in human exposure to Substance X	Strongly correlated with emissions as exposure reduction largely results from reduced emissions	*--Removed to avoid double counting--*	Provides a single, clear measure of effectiveness rather than two interdependent ones
Financial impacts	3. Financial impacts on private actors	Appropriate criterion, no issue	2. Financial impacts on private actors	Retained as-is – distinct and necessary criterion
	4. Cost-effectiveness of emissions reduction	Redundant – combines other criteria 1 and 3 (emissions + cost) into a new one, which leads to double counting	*--Removed due to redundancy--*	Cost-effectiveness captured by criteria 1, 2, and 3 and this can be explored in the comparison of (sub)options

4.4.4 Defining assessment criteria

Once the final set assessment criteria have been selected, they should be defined clearly to help ensure that different practitioners or stakeholders interpret each criterion in the same way, thereby reducing inconsistencies in scoring. When defining assessment criteria, it's recommended to start with a short name (e.g. *Emission reduction*, *Implementability*, *Enforceability*), which makes it easy to present criteria in tables, performance matrices, and figures. Because a short name can be ambiguous, each criterion should therefore be accompanied by a description that explains what is being measured and how it will be assessed.

This description should specify:

- The scope (e.g. which emissions, which costs, which stakeholders)
- The basis for assessment (e.g. quantitative data, expert judgment, qualitative scoring)
- Any relevant assumptions or boundaries (e.g. time horizon, sectors included, indirect effects considered)

Table 4.5 provides some examples of criterion and their descriptions.

Table 4.5: Example descriptions of criterion

Criterion	Description
Emission reduction	This criterion assesses the extent to which the (sub)option reduces releases of Substance X to air, water, and soil compared with the baseline scenario. It considers reductions achieved during manufacture, use, and disposal stages. Assessment will be based on available emissions data and expert judgment where data are incomplete.
Implementability	This criterion assesses the practical feasibility of putting the (sub)option into practice, both for companies that must comply and for authorities responsible for implementation and enforcement. It considers the extent to which the option can be effectively rolled out, monitored, and maintained over time without creating disproportionate difficulties. Key factors include: • For companies: availability of the technical expertise, systems, and resources needed to comply (e.g. product reformulation, process change, reporting systems). • For authorities: capacity to develop supporting guidance, establish monitoring and enforcement mechanisms, and allocate sufficient resources and expertise to oversee compliance.

Mapping the Four Pillars to the New Framework

The existing guidance structures the analysis of RMOs into four "pillars": chemicals management, circular economy, climate change, and criticality. Under the new framework outlined in this document, these elements are fully captured and integrated into attributes and assessment criteria. This change allows for greater consistency, transparency, and flexibility, while ensuring continuity with previous practice.

- **Chemicals management** is addressed mainly through assessment criteria under the *Effectiveness*, *Feasibility*, and *Financial impacts* attributes. Examples include *Emission reduction*, *Monitorability*, *Enforceability Implementability* (for both industry and regulators), *Time to implementation*, and *Regulatory consistency*.
- **Circular economy** can be covered under a dedicated sustainability and circularity criterion, capturing impacts on recycling loops and resource efficiency.
- **Climate change** can be reflected by criteria within an *Indirect impacts on human health and the environment* attribute, such as *Impact on energy use, GHG emission* and *Air quality*.
- **Criticality** can be captured under a dedicated criticality criterion, focusing on the importance of the substance to essential uses, strategic supply chains, and security of supply.

When data is limited, it might not be possible to assess circular economy, climate change, and criticality under dedicated criteria. In this case, proxy criteria can be considered, such as Alignment *with policy goals*, which would assess a (sub)options contribution to action plans and strategies relating to these three pillars.

The analyst can choose how to define criteria that best represents the objectives of the RMOA and the availability of supporting evidence.

Box 4.1: Mapping the Four Pillars to the New Framework

4.5 Approaches to scoring

4.5.1 Qualitative assessment

A critical point that is often overlooked is that a qualitative assessment of all (sub)options against the full set of assessment criteria should be completed before any scoring takes place. Scoring option by option – assessing one (sub)option and immediately assigning it a score – risks inconsistency, because the meaning of scores only becomes clear when performance is judged across the full set of (sub)options. More importantly, starting with scoring can also introduce bias, as analysts may consciously or unconsciously adapt their assessments to fit a preconceived score. Conducting a qualitative assessment first allows practitioners to step back, compare (sub)options in context, and then apply scores consistently and without bias.

4.5.2 Choosing the scoring scale

A key consideration when selecting a scoring scale is balancing granularity and simplicity. Granularity is needed to meaningfully distinguish between options, while simplicity ensures that the scoring can be applied consistently and transparently. A three-point scale, such as a "traffic light system", is straightforward to use but may mask important differences that are relevant for policy decisions, and is therefore only suitable where differences are clear-cut. At the other end, a ten-point scale offers more precision but may create ambiguity. It requires more effort to differentiate between, for example, a "6" and a "7", and the evidence may not always be strong enough to justify such fine distinctions. In practice, a five- to seven-point scale usually provides the best balance between precision and usability.

The structure of the scale should be designed so that higher values represent better performance and lower values indicate poorer performance, with intermediate values covering outcomes in between. The midpoint does not necessarily need to represent a neutral or "no impact" outcome: the distribution should be adapted to the expected range of performances. For instance, if none of the options are expected to have negative impacts on emissions, the scale may be skewed towards different levels of positive performance.

The way a scoring scale is designed depends on the nature of the criterion and the availability of data. Two main approaches can be used: absolute scoring and anchored (relative) scoring.

Absolute scoring

Absolute scoring is the preferred approach but can only be applied when performance can be clearly quantified or assigned to well-defined categories. In this approach, each point on the scoring scale is defined in advance, with unambiguous thresholds separating the different levels of performance.

For example, the criterion *time to take effect* could be scored on a 7-point scale with each score representing a clear time period (e.g. 1 = more than 10 years; 4 = 4–5 years; 7 = less than 2 years). Because the data are available and the categories are clear, each option can be scored consistently against the same definitions.

Absolute scoring therefore works best where:

- There is sufficient evidence to define the full scale.
- The criterion naturally allows for clear distinctions (e.g. quantifiable time periods, cost ranges, emission reductions).

Anchored (relative) scoring

If evidence is limited or the criterion cannot be clearly defined, it may not be possible to specify each point of the scale in advance. In these circumstances, an anchored scoring approach is recommended.

Anchoring works by fixing the scores to either one end of the scale (the best or worst performance) or, if possible, both ends. The scores of all other options are then judged relative to these anchored points.

- **Single-anchor approach**: Only the best or worst performing (sub)option can be defined with certainty. Other (sub)options are scored relative to the anchored point, without fixed positions or

thresholds for the remaining points on the scale.

- **Dual-anchor approach**: Both the worst and best performance can be defined. The full width of the scale can be used, and intermediate points can be interpreted more consistently.

Anchored scoring is particularly useful for criteria that are qualitative or subjective, such as *implementability* or *acceptability*, where it is difficult to pre-define absolute levels of the scale. For example, if the score is anchored to the best performing (sub)option, this would be given the highest score (e.g. 7 on a 7-point scale), with other options scored relative to how closely they compare to this benchmark. Anchoring helps ensure that the full scoring scale is meaningful and proportionate to the actual performance range of the options.

When using anchored scoring it's important to document the rationale behind each score, including the evidence and reasoning used, so that the scoring remains transparent and defensible.

In practice, scoring definitions are rarely fixed from the outset, whether absolute or anchored approaches are used. They are usually developed iteratively as evidence is gathered and expert judgement applied. Early definitions may be broad and indicative but should remain flexible enough to adapt as the analysis progresses. Developing definitions during or after the analysis also helps avoid bias: if thresholds are fixed too early, there is a risk that analysts unconsciously interpret evidence to fit pre-decided scores, rather than allowing the evidence to drive the outcome. An iterative approach helps ensure that scoring reflects careful consideration of the evidence rather than pre-set assumptions.

4.5.3 Example scoring scales

The following four scales illustrate the two scoring approaches outlined in Section 4.5.2. Two scales show absolute scoring, where each point on the scale can be clearly defined, while the two others demonstrate anchored (relative) scoring, where only the best performance can be defined with certainty.

Emissions reduction (absolute scoring)

Emissions reduction is a criterion that can often be quantified as percentage reduction compared to the baseline. Each point on the scale can therefore be explicitly defined (see Table 4.6).

Table 4.6: Example of absolute scoring scale for emissions reduction criterion

Score	1	2	3	4	5	6	7
Emissions reduction	Reduces <15% of total emissions	Reduces 15 - 30% of total emissions	Reduces 30-45% of total emissions	Reduces 45 - 60% of total emissions	Reduces 60 - 75% of total emissions	Reduces 75 - 90% of total emissions	Reduces >90% of total emission

Time to take effect (absolute scoring)

Time to take effect is another example of an absolute scale, as the performance of each (sub)option can be categorised into clear time periods, allowing for predefined and unambiguous thresholds (see Table 4.7).

Table 4.7: Example of absolute scoring scale for time to take effect criterion

Score	1	2	3	4	5	6	7
Time to take effect	> 10 years	7 – 10 years	5 – 7 years	4 – 5 years	3 – 4 years	2 – 3 years	< 2 years

Financial impacts on private actors (anchored / relative scoring)

Financial impacts on private actors can, in principle, be quantified on an absolute scale where robust cost data allow reasonable intervals to be defined across all (sub)options. However, the evidence available may not be sufficient to establish credible thresholds. In these circumstances, the criterion is better assessed using an anchored approach. For example, the best performing (sub)option may be cost neutral (i.e., negligible costs). Other (sub)options are then scored relative to this anchor, with lower scores indicating higher costs to private actors. The intermediate and maximum points of the scale are not fixed in advance but are determined by the evidence available for each (sub)option.

Table 4.8: Example of anchored scoring scale for financial impacts on private actors

Score	1	2	3	4	5	6	7
Financial impacts on private actors	Costs larger than score of 2	Costs larger than score of 3	Costs larger than score of 4	Costs larger than score of 5	Costs larger than score of 6	Costs larger than score of 7	Negligible costs

Implementability (anchored / relative scoring)

Implementability is difficult to score on an absolute scale, as the effort and resources required to implement a (sub)option are not easily quantified or captured in fixed intervals. However, the best performing (sub)option can typically be identified and used as the anchor (see Table 4.9). Other (sub)options are scored relative to this benchmark, with lower scores reflecting progressively greater effort and resource requirements. The intermediate points are not predefined and the scoring is instead determined by comparing the relative difficulty of each (sub)option against the anchor.

Table 4.9: Example of anchored scoring scale for implementability

Score	1	2	3	4	5	6	7
Implementability	Effort & resources larger than score of 2	Effort & resources larger than score of 3	Effort & resources larger than score of 4	Effort & resources larger than score of 5	Effort & resources larger than score of 6	Effort & resources larger than score of 7	Limited effort and resources required to implement

4.5.4 Conducting the scoring

RMOAs are best conducted by multidisciplinary teams given the multi-faceted nature of the analysis, which considers economic, environmental, and social impacts, as well as technological feasibility, implementability and other factors. Scoring should be undertaken in a collaborative setting, rather than

being conducted by a single individual or by several people working in isolation. Initial scores may be developed individually, but final decisions should ideally be reached through structured discussions or workshops that reconcile differences and ensure the final scoring reflects collective judgment. If consensus cannot be reached, the reasons for disagreement should be documented and a sensitivity analysis can be carried out to determine whether differences materially affect the RMOA results.

4.6 Ranking options

Once individual scores have been assigned to each option against the assessment criteria, the next step is to collate the scores to support a comparative analysis of each option's overall performance.

Firstly, the individual scores should be assembled into a performance matrix, with each (sub)option presented in rows and each assessment criterion in columns, or vice versa (see **Table 4.10**). The performance matrix allows for:

- A side-by-side comparison of how each option performs across all criteria
- Identification of clear strengths, weaknesses and trade-offs within individual options
- Identification of criteria that are not contributing to the comparison
- A structured basis for calculating an overall performance score, once criteria weighting is applied (see Section 4.6.2)

Before ranking options, any redundant criteria that do not differentiate between options should be removed. This includes criteria where all options receive the same score or where variation is minimal, meaning the criterion is not contributing to distinguish between (sub)options. Including these criteria will reduce the weight of more meaningful criteria that drive the results.

Ideally, such criteria should be identified as early as possible – ideally when defining the assessment criteria. This helps practitioners avoid unnecessary data collection, analysis, and scoring. However, similarities in scoring across (sub)options may only become apparent during the analysis, so it is good practice to check for this before final aggregation.

The example performance matrix shown in **Table 4.10**, illustrates consistent trade-offs across different, such as between *emission reduction* and *financial impacts on private actors*. It also demonstrates how certain criteria, such as implementability, provide clearer differentiation between (sub)options – making fuller use of the scoring scale, while others contribute less to distinguishing performance. The matrix highlights that some (sub)options deliver strong results on one criterion but weaker results on another, while others achieve a more balanced profile. Taken together, these observations underline the value of the performance matrix in making strengths and weaknesses visible before moving on to weighting and aggregation.

Table 4.10: Example performance matrix

Attribute	Assessment criteria	RMO 1	RMO 2	RMO 3 A	RMO 3B	RMO 4	RMO 5A	RMO 5B

Effectiveness	Emission reduction	1	3	3	3	6	7	5
	Compliance and uptake	7	4	3	3	6	6	6
	Time to take effect	1	3	4	4	5	6	6
	Improving future regulation	6	5	6	7	4	5	4
Feasibility	Intelligibility	7	2	3	2	5	5	5
	Implementability	7	3	3	2	4	3	5
	Likelihood of substitution	1	3	2	3	6	7	7
	Monitorability and enforceability	7	2	3	2	6	6	6
Financial Impacts	Financial impacts on public actors	3	3	5	4	7	6	6
	Financial Impacts on private actors	7	3	5	4	2	2	4
Indirect impacts	Regrettable substitution	3	5	4	7	3	3	3
	Human health and safety	5	7	4	4	3	3	4
	Sustainability	4	4	5	4	3	3	7
Wider economic impacts	Impacts on employment	5	4	4	4	3	3	1
	Fairness of cost distribution	4	2	4	4	5	5	7

4.6.1 Aggregating scores

A straightforward and transparent way to compare RMOs is to use an additive model, where the total score for each (sub)option is calculated by summing its scores across all criteria. This approach treats all criteria as equally important and can be useful as a neutral reference point for discussion and comparison with weighted scores. An equal-weighted approach is generally considered the default or starting point, because it represents an unbiased scenario where no stakeholder priorities influence the results. There are two different 'equal weight' approaches:

- **Attribute-level weighting (recommended):** Each attribute (e.g. effectiveness, feasibility, financial impacts) are assigned equal weights. For example, if there are five attributes, each receives a 20% weight. The weight assigned to each attribute is then distributed equally across its criteria. If an attribute with a 20% weight has four criteria, each criterion contributes 5% to the total. This ensures that attributes, not just individual criteria, drive the weighting balance.
- **Criteria-level weighting:** Each individual criterion is given an equal weight. If there are 20 criteria, each receives a 5% weight, and the number of criteria within each attribute determines the attribute weight. This can unintentionally bias the analysis towards attributes with more criteria, even if they are not inherently more important.

Attribute-level weighting is generally the recommended approach, as it better reflects objectives of the analysis and avoids overemphasising attributes that have been broken down into many criteria.

4.6.2 Scenarios analysis

Decision-makers and stakeholder groups may have different views on what matters most, meaning it may not be appropriate to aggregate raw scores as if all criteria were equivalent. For example:

- Policymakers may prioritise human health or environmental impacts
- Industry may be most concerned about cost and feasibility
- Regulators may value monitorability, enforceability, and legal feasibility

Consequently, one stakeholder might see a score of "5" against one criterion as being less important than a "5" against a different criterion, whilst another stakeholder may have the opposite view.

To reflect the relative importance of different criteria, multiple weighting scenarios can be devised, each reflecting different priorities. These can be used to see how (sub)options perform across each scenario and determine where trade-offs exist between competing objectives. Weights are assigned – typically through discussions with stakeholders – before aggregating scores.

Unequal weights can be applied at different levels of the assessment framework (see **Table 4.11**):

- **At the attribute level** – certain attributes (e.g. health, environment, cost, feasibility) can be given more weight than others, reflecting their relative importance to decision-making.
- **At the criteria level** – within a given attribute, some criteria may be weighted more heavily than others. For example, under an *Effectiveness* attribute, *emission reduction* could be given more weight than *Compliance and uptake*. This indicates that *emission reduction* is treated as a more important or stronger performance indicator of *Effectiveness.*
- **At both levels** – attributes can be weighted unequally, and then criteria within those attributes can also be assigned unequal weights. This allows the weighting structure to reflect both broad strategic priorities (via attribute weights) and more detailed preferences within each attribute (via criteria weights).

Scores under each scenario can be aggregated using a weighted sum model, where each score is multiplied by a weight representing the importance of that criterion. The weighted scores are then summed to generate an overall performance score for each (sub)option. This method ensures that the final ranking reflects not just how well an option performs, but also how much those areas of performance matter to stakeholders or decision-makers.

Applying different weighting scenarios allows practitioners to explore how sensitive the ranking of (sub)options is to changes in the relative importance of criteria. This helps test the robustness of the preferred option(s) by assessing whether it remains favourable even when different stakeholder perspectives or policy priorities are applied.

Visual tools, such as bar charts, ranking tables, or radar plots can help communicate differences clearly.

4.6.3 Example scenario weighting

Table 4.11 provides examples weighting across attributes and assessment criteria.

1. Scenario 1 represents an equally weighted scenario at the attribute level.
2. Scenario 2 represents unequal weighting at the attribute level, where *Effectiveness* given more weight and all assessment criteria within attributes weighted equally
3. Scenario 3 represents unequal weighting at both the attribute and assessment criteria levels, as the *Effectiveness* attribute is given more weight and *emission reduction*, *Time to take effect*, and *Impacts on employment* are given more weight than other criteria

Table 4.11: Example scenario weighting of attributes and assessment criteria

Attribute	Assessment criteria	Scenario 1		Scenario 2		Scenario 3	
		Attribute weight	Criterion weight	Attribute weight	Criterion weight	Attribute weight	Criterion weight
Effectiveness	Emission reduction	20%	5%	50%	12.5%	50%	25%
	Compliance and uptake		5%		12.5%		5%
	Time to take effect		5%		12.5%		15%
	Improving future regulation		5%		12.5%		5%
Feasibility	Intelligibility	20%	5%	12.5%	3.1%	12.5%	3.1%
	Implementability		5%		3.1%		3.1%
	Likelihood of substitution		5%		3.1%		3.1%
	Monitorability and enforceability		5%		3.1%		3.1%
Financial Impacts	Financial impacts on public actors	20%	10%	12.5%	6.25%	12.5%	6.25%
	Financial Impacts on private actors		10%		6.25%		6.25%
Indirect impacts	Regrettable substitution	20%	6.66%	12.5%	4.2%	12.5%	4.2%
	Human health and safety		6.66%		4.2%		4.2%
	Sustainability		6.66%		4.2%		4.2%
Wider economic impacts	Impacts on employment	20%	10%	12.5%	6.25%	12.5%	7.5%
	Fairness of cost distribution		10%		6.25%		5%

4.7 Synergies and RMO design

During the analysis, it may become clear that a (sub)option performs poorly predominantly due to one or a few selected criteria. Rather than discarding the (sub)option outright, practitioners should examine the specific weaknesses driving the low scores and consider how the design could be adjusted to address them. This could result in a change to the scope of the (sub)option. Alternatively, identified weaknesses could be addressed by implementing the (sub)option alongside other measures. For example:

- If an RMO scores low on *Implementability*, the design could be revised to include a longer transition period for certain uses.
- If an RMO scores poorly on *Likelihood of substitution*, authorities could provide support to companies in developing alternatives.
- If an RMO scores low on *Financial impacts on private actors*, complementary support measures (e.g. subsidies, innovation funding, or tax incentives) could be added to ease compliance.
- A restriction may achieve greater compliance and uptake if accompanied by financial support to help companies transition to safer alternatives.
- A voluntary industry initiative could be reinforced by a mandatory reporting requirement, ensuring accountability and consistency across companies.

By identifying and documenting these potential synergies, practitioners can ensure the RMOA provides decision-makers with a realistic picture of how (sub)options are likely to perform in practice and highlight opportunities for policy packages that are stronger than the sum of their parts.

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