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Title of document: Integrating the Sound Management of Chemicals and Waste in Climate Change Decision-making (*draft)*

About this document:

This draft Primer highlights key linkages between two important sustainable development priorities: addressing climate change and ensuring the sound management of chemicals and waste.

The Primer aims at encouraging decision-makers in the climate community to support the integration of chemicals and waste considerations into climate mitigation and adaptation actions. At the same time, and to achieve this, it encourages the international chemicals and waste community to strengthen its understanding of these linkages and to engage with climate decision-makers at all levels.

The Global Framework on Chemicals (GFC) provides an institutional mechanism with the potential to promote leadership on these issues. To stimulate further considerations this Primer proposes a set of actions that could form part of a GFC Implementation Programme.

This draft document has been developed by the IOMC to support the implementation of ICCM-5 Resolution V/8, which encouraged "Integrating sound chemicals and waste management in sustainable development decision-making processes, as appropriate" as an area of work for possible implementation programmes. While the IOMC does not intend to propose a specific Implementation Programme on this topic, the draft primer may serve as a starting point for stakeholders interested in advancing the topic further. GFC stakeholders interested in taking this work forward are encouraged to contact: Oliver Wootton (Oliver.WOOTTON@unitar.org)

Integrating the Sound Management of Chemicals and Waste in Climate Change Decision-making

A primer to support sustainable development

DRAFT

November 2026

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1 About this Primer

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2 Why Integrate Sound Chemicals and Waste Management and Climate Change?

2.1 The Sustainable Development Context

Climate change is affecting livelihoods, biodiversity, and the long-term sustainability of societies. Addressing climate change is therefore central to achieving the United Nations Sustainable Development Goals. Yet, climate actions undertaken without consideration of chemicals and waste may lead to unintended negative impacts on human health and the environment.

Integrating the sound management of chemicals and waste into climate change decision-making and the implementation of the Paris Agreement—including in Nationally Determined Contributions (NDCs) and National Adaptation Plans (NAPs)—is therefore important. Conversely, actions that advance climate objectives, such as sustainable chemistry, resource efficiency, and emissions reduction, can also contribute significantly to the implementation of the Global Framework on Chemicals.

2.2 Current Global Situation

Global chemical production is projected to continue expanding rapidly, driven by urbanization, and rising consumption. At the same time, climate change is increasing temperatures, intensifying extreme weather events, and disrupting ecosystems. These changes influence how chemicals are produced, transported, transformed, and released into the environment, as well as drive a change in the consumption and use of chemicals.

Chemicals are present throughout climate-relevant sectors: energy systems, agriculture, construction, electronics, healthcare, and transport. Waste streams — including plastics, e-waste, batteries, and industrial residues — are growing in both volume and complexity. At the same time, climate stressors — higher temperatures, extreme precipitation, droughts, and wildfires — are modifying chemical behavior, increasing the probability of releases, and intensifying exposure risks.

Climate change policy and chemicals management policy have typically been developed in parallel, despite strong functional linkages. Hazardous chemicals contribute directly to greenhouse gas emissions (for example fluorinated gases), influence the life-cycle emissions of low-carbon technologies, and affect ecosystem resilience. Conversely, climate change alters chemical fate, transport, exposure pathways, and accident risks.

Despite the growing intersection between chemicals production and use and climate change, most global institutions continue to address these issues separately. Climate finance and research mechanisms, multilateral climate initiatives, and sectoral climate programs rarely incorporate chemical risk assessments, while chemicals conventions and agreements typically do not account for climate-related amplification of chemical risks. This institutional separation limits coordinated action, reduces efficiency, and increases the likelihood of unintended consequences, underscoring the need for a platform such as the GFC to bridge the gap.

2.3 Consequences and Costs of Policy Separation

Without integrated policy approaches, climate policies risk unintentionally increasing chemical exposures, while chemicals policies risk overlooking climate implications.

Adaptation Risks: Increased Vulnerability and Exposure

Climate change amplifies chemical risks by increasing the frequency and intensity of extreme events and climate-related disasters. For example:

- Flooding may trigger toxic releases from industrial facilities, waste sites, tailings dams, fuel storage systems, and pesticide storage areas.
- Wildfires may volatilize hazardous substances from plastics, treated materials, and consumer products.
- Heat may accelerate chemical reactions and the degradation of materials.

Climate adaptation measures that neglect chemical safety may, therefore inadvertently create long-term health and environmental burdens. Examples include increased reliance on hazardous pesticides under climate stress, rapid substitution of materials without adequate risk assessment, or emergency infrastructure decisions that introduce persistent, bioaccumulative, or toxic substances.

Undermining Climate Mitigation

Many hazardous chemicals directly affect climate outcomes. Certain substances, including fluorinated gases, are potent greenhouse gases. Others contribute indirectly through energy-intensive production processes, inefficient technologies, or emissions arising from waste mismanagement. Mismanaged waste — particularly plastics and organic waste streams — contributes to methane emissions, toxic releases, microplastic pollution, and ecosystem degradation, thereby weakening natural carbon sinks. Some chemicals used for climate change mitigation can pose environmental and human health risks, depending on how they are produced, used and disposed of.

In mitigation policy, insufficient attention to chemicals and waste management can undermine emissions reduction efforts. Examples include leakage of high-global-warming-potential refrigerants, unsustainable use of solvents and process chemicals, hazardous substances embedded in low-carbon technology supply chains, and poorly managed waste streams generating methane and black carbon. Poor planned chemicals emission-reduction actions can unintentionally undermine climate change mitigation efforts if policies are not aligned across climate, chemicals, air quality and waste management. E.g. banning incineration (reduce CO2 and emissions of other chemicals) might trigger organic waste going to landfills and methane emissions might increase.

Economic and Social Costs

Failure to integrate chemicals and waste considerations into climate policies generates substantial economic and social costs. Climate-amplified chemical exposures increase public health burdens, raise healthcare expenditures, and reduce workforce productivity. Chemical releases associated with climate-related disasters impose avoidable remediation costs, infrastructure damage, and long-term environmental liabilities.

These impacts are not evenly distributed. Vulnerable populations — including low-income communities, informal workers, women, and children — are disproportionately affected by combined climate and chemical risks. Policy inaction therefore exacerbates inequalities, undermines social resilience, and may erode public confidence in climate policies where unintended harms occur.

2.4 Benefits of Integrated Action

Targeted integration of chemicals and waste management and climate policies can deliver tangible climate, health, and economic gains. Immediate benefits could include engaging climate change decision makers to recognize chemicals and waste management issues and ensuring that climate and financing and investments consider these interlinkages
In the medium term and long term benefits may include the following:

- Phasing down high-GWP substances, such as certain refrigerants and industrial gases directly lowers greenhouse gas emissions and strengthens progress toward climate mitigation targets.
- Safer material selection and technology choices reduce life-cycle environmental burdens and minimize the risk of maladaptation.
- Improved waste management cuts methane emissions, prevents toxic releases, and enhances ecosystem resilience.
- Reducing chemical exposure lowers public health costs, protects workers, and improves productivity.
- Finally, stronger prevention and regulatory frameworks reduce accident risks and avoid costly remediation, while reinforcing the credibility and effectiveness of climate strategies.

3 Specific Sub-Topics, Policy Options, and Financing

3.1 Climate Mitigation Linkages

Chemicals management influences mitigation outcomes across several domains:

- **Fluorinated gases and refrigerant transitions**: These substances are extremely potent greenhouse gases, and leakage or inefficient use can undermine emissions reductions. Transitioning to low-GWP alternatives directly contributes to achieving national mitigation targets.
- **Chemical footprints of batteries, photovoltaics, wind technologies**: Hazardous chemicals in low-carbon technologies affect life-cycle emissions and end-of-life waste risks. Managing these chemicals ensures that clean energy deployment delivers net climate benefits without negative tradeoffs.
- **Solvents, catalysts, and industrial process chemicals**: Many industrial chemicals have high embodied emissions or produce harmful by-products. Optimizing their use and substituting safer alternatives reduces overall greenhouse gas emissions and environmental impact.
- **Plastics production, recycling, and waste emissions**: Plastic production is energy-intensive, and mismanaged plastic waste generates methane and black carbon. Integrating chemicals safety into production and waste policies strengthens mitigation outcomes and supports circular economy goals.
- **Agriculture and food systems:** Fertilizers, pesticides, and preservatives contribute to direct and indirect greenhouse gas emissions, soil degradation, and water pollution. Managing chemical use, promoting safer alternatives, and improving waste and residue handling reduces emissions, enhances carbon sequestration, and supports sustainable food production.

3.2 Climate Adaptation Linkages

Adaptation policies intersect with chemicals management in several critical areas:

- **Agricultural inputs (pesticides, fertilizers)**: Increased pest pressures under climate stress can drive higher chemical use. Integrating safer chemicals management protects soil, water, and biodiversity while sustaining food security.
- **Climate-resilient construction materials**: New or substituted building materials may contain hazardous substances. Green and sustainable chemistry innovation may ensure infrastructure resilience without introducing environmental or health risks.
- **Emergency response and disaster risk reduction**: Extreme events can mobilize hazardous chemicals from storage or industrial sites. Planning for chemical safety in disaster management reduces exposure and limits environmental contamination.
- **Water treatment and sanitation systems**: Adaptation measures often involve new chemicals for water purification or infrastructure. Ensuring safe chemical selection prevents health hazards and supports resilient communities.

Priority actions include risk screening of adaptation technologies, preventing maladaptation, strengthening storage and accident prevention systems, and integrating chemicals risk assessments into resilience planning.

3.3 Policy Options

Decision makers can employ a range of policy instruments to integrate chemicals and waste management and climate strategies. Regulatory measures include standards, safer-by-design requirements, restriction or phase-down schedules for particularly hazardous substances, ensuring that low-carbon technologies and adaptation investments do not introduce new chemical risks. Economic instruments such as taxes, subsidies, or incentives can encourage safer alternatives, circular design, and resource-efficient practices. Procurement standards and disclosure requirements help align public and private sector investments with sustainability and climate objectives, promoting transparency across supply chains.

Innovation incentives — including research and development support, grants, or prizes — can accelerate safer, low-carbon, low toxicity design, low-emission technologies. Cross-ministerial coordination mechanisms ensure that climate, chemicals, health, and industrial policies are mutually reinforcing rather than contradictory. Together, these instruments enable governments to maximize mitigation and adaptation co-benefits, reduce maladaptation risks, and strengthen the credibility and effectiveness of climate commitments under the Paris Agreement.

3.4 Financing Options

Integrating sound chemicals and waste management and climate strategies can unlock access to existing climate finance by demonstrating clear mitigation and adaptation co-benefits. Relevant funding channels may include the Green Climate Fund, Global Environment Facility, Adaptation Fund, and climate-aligned financing from multilateral development banks. Measures such as phasing down high-global-warming-potential substances, sustainable cooling transitions, methane-reducing waste management, circular economy investments, climate-resilient infrastructure, and sustainable agricultural practices can often meet climate financing criteria when emissions reduction, resilience, or risk-reduction benefits are demonstrated.

Domestic climate budgets, green industrial policies, waste management budgets and blended finance instruments also offer opportunities to support integration. Framing chemicals management as making a contribution to emissions reductions, technology efficiency, avoided maladaptation, public health protection, and reduced long-term liabilities strengthens investment cases. Integrated approaches can therefore improve resource efficiency while enhancing the effectiveness and durability of climate investments.

4 From Analysis to Action: Stakeholder and Institutional Engagement

4.1 National Level

Integration requires structured coordination between climate authorities, chemicals management bodies, industry regulators, disaster risk agencies, and ministries, such as those dealing with health or education. Embedding chemicals considerations into NDCs, NAPs, and climate change considerations into NIPs for POPs, MIAs for mercury and national investment strategies provides immediate entry points.

Practical Action Checklist for GFC National Focal Points.

- Map chemicals–climate interactions in priority sectors
- Integrate climate change aspects in chemical initiatives and reports
- Integrate chemicals into NDCs and NAPs
- Identify maladaptation risks
- Promote safer alternatives
- Align financing proposals with co-benefits
- Promote innovation policies and actions (safer-by-design, green chemistry)
- Strengthen monitoring and information systems

4.2 Engaging UNFCCC, IPCC, and Related Climate Processes

Chemical management policy makers can make the case for integration into international climate processes by strategically linking chemicals policy to climate objectives, mitigation, and adaptation. The approach would be to make chemical risks tangible to climate negotiators by demonstrating direct effects on mitigation, adaptation, and co-benefits, and provide clear, actionable recommendations that can be incorporated into national and international climate strategies. This could be achieved through:

- **Evidence-Based Positioning**: e.g. preparing concise policy briefs and sector-specific case studies demonstrating how chemical risks amplify climate vulnerability or undermine mitigation and highlighting co-benefits such as reduced GHG emissions, avoided maladaptation, improved public health, and ecosystem protection.
- **Participation in Formal UNFCCC Processes**: e.g. through National Climate Delegations during COP negotiations, technical workshops, and NDC update consultations.
- **Submit inputs:** e.g. to the UNFCCC's technical expert review processes or the Long-Term Low-Emission Development Strategy (LT-LEDS) dialogues.
- **Engagement with the IPCC and Scientific Assessments**: e.g. contributing research, data, and case studies to IPCC Working Groups, highlighting links between chemicals management, GHG emissions, and climate risks.

- **Cross-Agency and Multilateral Alignment**: e.g. collaborating with other international conventions and climate-related funds to ensure chemical issues are recognized in climate investment strategies.
- **Leverage Financing and Investment Platforms**: e.g. framing chemicals interventions as eligible for climate finance (GCF, GEF, MDBs) to strengthen the argument for international uptake.

4.3 Considerations for a Possible GFC Implementation Programme

Possible activities

A dedicated programme could support governments and stakeholders in integrating chemicals and waste management into climate mitigation and adaptation strategies. Practical activities might include:

- **Analytical Guidance:** Developing tools to assess chemical-climate linkages, identify co-benefits and trade-offs, and screen sector-specific risks.
- **Policy Integration Support:** Providing guidance for embedding chemicals considerations into NDCs, National Adaptation Plans, low-emission development strategies, and sectoral policies.
- **Capacity-Building Modules:** Training GFC N and other Focal Points, policy makers, and technical staff on chemical risk management in climate-relevant sectors such as energy, agriculture, cooling, and waste.
- **Case Studies and Good Practice Compendium:** Highlighting successful national or sectoral experiences in integrating chemical safety with mitigation and adaptation measures.
- **Financing and Investment Support:** Mapping climate finance opportunities, developing project concepts, and preparing investment briefs that link chemicals management to mitigation, adaptation, and co-benefits.
- **Stakeholder Dialogue and Networking:** Facilitating cross-sectoral and multi-stakeholder engagement, including dialogue between climate authorities, chemicals regulators, industry, finance institutions, civil society, and research organizations.
- **Monitoring and Evaluation Tools:** Designing simple metrics to track progress on chemical-climate integration, co-benefits achieved, and policy effectiveness.

Exploring stakeholder interest

Taking into account that climate change is mentioned in the GFC, interested stakeholders may consider the value of developing an Implementation Programme on this topic. Relevant stakeholders may include chemicals regulators, industry sectors, development agencies, financial institutions, and scientific bodies. If of interest to stakeholders, a draft workplan and TOR could be developed for possible future consideration at the International Conference.